Idaho Antidegradation Implementation Procedure

Idaho

Department of Environmental Quality

Surface Water Section

December 10, 2010

1st Public Draft

This document provides guidance for conducting reviews of permits or licenses to determine compliance with the antidegradation provisions in Idaho's Water Quality Standards (WQS). Antidegradation reviews will be governed by existing requirements of the Clean Water Act (CWA), Environmental Protection Agency (EPA) implementing regulations, and the WQS. This document does not substitute for those provisions, regulations or rules. The recommendations in this guidance are not binding; Idaho Department of Environmental Quality (DEQ) may consider other approaches consistent with the CWA, EPA regulations and the WQS. Decisions regarding compliance with the antidegradation provisions in the WQS will be made on a case-by-case basis, taking into account comments and information presented at that time by interested persons regarding the appropriateness of applying these recommendations to the particular situation. DEQ may vary from the recommended approach outlined in this document based upon site specific information and comments provided by the public and the permit or license applicant. DEQ may change this guidance in the future.

Executive Summary

[To be added.]

This page left blank for double-sided printing.

Contents

List of Figures

List of Tables

List of Equations

This page left blank for double-sided printing.

Glossary

In this glossary, terms are not defined so much as explained. Each term is explained the way it is used in this guidance and the way it should be understood for purposes of antidegradation analysis. Several of the terms do also have specific definitions in the rules and where that is the case, those definitions are provided here as well; *they are in italics if they are in the pending rule* rather than the currently adopted rule.

Adverse: A change in water quality to conditions that are worse for support of a beneficial use; an increase in temperature is adverse to aquatic life, as is a decrease in dissolved oxygen.

Administrative Record:

Alternatives Analysis (AA): An evaluation of reasonable alternatives for regulated activities or discharges that might degrade water quality, including less-degrading alternatives, non-degrading alternatives, and no-discharge alternatives. Examples of such alternatives include treatment process changes, relocated discharge facilities, land application, reuse, and subsurface discharges.

Ambient: The prevailing water quality conditions in waterbody; as opposed to effluent quality.

Antidegradation: A regulatory policy and implementation procedure to protect existing and designated uses of surface waters and to specify how DEQ will determine whether and to what extent, existing surface water quality may be degraded.

Applicant: As used in this document applicant means an applicant for a permit or license subject to certification under section 401 of the Clean Water Act.

Assessment Unit (AU): The geographic unit for reporting water quality in Idaho's Integrated Report. AUs are a subdivision of water body identification units (WBIDs) based on stream size that contain an area of water more likely to be of similar quality than the larger WBID they are a part of.

Assimilative Capacity: Assimilative capacity is the ability of a water body to handle added pollutants without causing a failure to support a beneficial use. It is the amount (load) of a pollutant that can be added to a specific water body under critical conditions without causing concentration to exceed water quality criteria associated with a beneficial use. It is calculated as the difference between the criterion level and the ambient level of a pollutant.

Beneficial Uses: All existing and designated uses on or in surface waters of the state. This term is often shortened to just use(s). This term is defined in rule (IDAPA 58.01.02) as:

> Any of the various uses which may be made of the water of Idaho, including, but not limited to, domestic water supplies, industrial water supplies, agricultural water supplies, navigation, recreation in and on the water, wildlife habitat, and aesthetics. The beneficial use is dependent upon actual use, the ability of the water to support a non-existing use either now or in the future, and its likelihood of being used in a given manner. The use of water for the purpose of wastewater dilution or as a receiving water for a waste treatment facility effluent is not a beneficial use.

Degradation: A decline in the chemical, physical, or biological conditions of a surface water as measured on a pollutant-by-pollutant basis. Degradation results in lower water quality. This term is defined in rule (IDAPA 58.01.02) as:

> *For purposes of antidegradation review, degradation or lower water quality means a change in a pollutant that is adverse to designated or existing uses as calculated upon appropriate mixing of the discharge and receiving water.*

Designated Use: A beneficial use assigned to a specific water body unit as tabulated in the Water Quality Standards – (IDAPA 58.0102.110-160), as well as the beneficial uses that apply to all waters of the state per IDAPA 58.0102.100. This term is defined in rule (IDAPA 58.01.02) as:

> Those beneficial uses assigned to identified waters in Idaho Department of Environmental Quality Rules, IDAPA 58.01.02, "Water Quality Standards and Wastewater Treatment Requirements," Sections 110 through 160, whether or not the uses are being attained.

Discharge: This term is defined in rule (IDAPA 58.01.02) as:

> When used without qualification, any spilling, leaking, emitting, escaping, leaching, or disposing of a pollutant into the waters of the state. *For purposes of antidegradation review, means "discharge" as used in Section 401 of the Clean Water Act.*

Existing Use: Beneficial uses actually attained in or on a surface water body on or after November 28, 1975, whether or not the uses are designated in the water quality standards. This term is defined in rule (IDAPA 58.01.02) as:

> Those beneficial uses actually attained in waters on or after November 28, 1975, whether or not they are designated for those waters in Idaho Department of Environmental Quality Rules, IDAPA 58.01.02, "Water Quality Standards.

Existing Water Quality: A measurement or estimate of surface water quality for pollutants under currently permitted pollutants loads at a specific location and time period.

High Water Quality: Refers to concentrations of parameters that are better than water quality criteria.

High Quality Water: Refers to overall quality of a waterbody unconstrained by water quality of individual parameters. For example: ORWs can be recognized for their high ecological value.

Integrated Report (IR): A report on the status of use support and compliance with water quality standards for state surface waters. The IR meets the regulatory reporting requirements of both Clean Water Act sections 305(b) and 303(d).

Jurisdictional Waters: Waters of the United States to which the Clean Water Act applies. This is a subset of the waters of the state of Idaho.

Less-Degrading Alternative: A reasonable alternative to a proposed activity or discharge that would result in less degradation to water quality than the minimum level of pollution control.

Listed: A waterbody identified in the integrated report in Category 5 for failure to meet one or more water quality criteria or for not fully supporting a use, e.g. bioassessment may directly determine aquatic life use is not fully supported.

Necessary: No reasonable alternative(s) exists to prevent or minimize degradation.

Non-Degrading Alternative: A reasonable alternative to a proposed or existing discharge that would not result in degradation of existing water quality.

Notice of Intent (NOI): A form or application that applicants must submit to EPA when seeking coverage under a general permit.

Outstanding Resource Water (ORW): A surface water body that the Idaho legislature has designated as an outstanding national or state resource water in the water quality standards. An ORW receives Tier 3 antidegradation protection. This term is defined in rule (IDAPA 58.01.02) as:

> A high quality water, such as water of national and state parks and wildlife refuges and water of exceptional recreational or ecological significance, which has been designated by the legislature and subsequently listed in this chapter. ORW constitutes an outstanding national or state resource that requires protection from point and nonpoint source activities that may lower water quality.

Parameter: A characteristic of water quality relevant to a beneficial use. Parameters may be a pollutant or something affected by pollutants, e.g. dissolved oxygen is a parameter often adversely affected by discharge of oxygen demanding organic waste (pollutant) , but also indirectly by nutrient enrichment (pollutant).

Presumed Use Protection: A level of water quality protection for undesignated waters based on presumption they can support of cold water aquatic life and primary or secondary contact recreation.

Regulated Activity: A regulated activity is an activity or discharge that requires a permit or license and is subject to CWA § 401 certification, e.g. CWA § 402 (NPDES permits), CWA § 404 (dredge and fill permits), or a FERC license.

Social or Economic Importance (SEI) (also socioeconomic justification or SEJ): An evaluation of whether the project causing degradation provides social or economic benefits important to the community in the area in which it occurs.

Special Resource Water (SRW): A surface water that has been designated as a special resource water in Idaho's water quality standards. This term is defined in rule (IDAPA 58.01.02) as:

> Those specific segments or bodies of water which are recognized as needing intensive protection:
>
> **a.** To preserve outstanding or unique characteristics; or
>
> **b.** To maintain current beneficial use.

Tier 1 Protection: Policies and procedures that require a review to prevent degradation which would result in a beneficial use not being fully supported or violation of water quality criteria. Tier 1 protection applies to all surface waters regardless of existing water quality as the minimum protection level.

Tier 2 Protection: Policies and procedures that require an analysis of reasonable alternatives and social or economic considerations to justify significant degradation or a determination the degradation is insignificant. Tier 2 protection level applies to all surface waters where existing water quality is sufficient to classify them as high quality on a water body-by-water body basis.

Tier 3 Protection: Policies and procedures that prohibit any degradation in waters designated in the water quality standards as an ORW. A new or expanded source of pollutants may be allowed if it is offset so as to avoid degradation.

Water Body: A generic term for a stream, river, lake, reservoir or other type of water, or a portion thereof, usually identified by name or boundaries.

Water Body Unit and WBID: The geographic unit used in Idaho's water quality standards for identifying and designating beneficial uses. Includes all the named and unnamed tributaries within a drainage and is considered a single unit unless designated otherwise. All water body units are assigned a unique identification number (WBID). This term is defined in rule (IDAPA 58.01.02) as:

> Includes all named and unnamed tributaries within a drainage and is considered a single unit unless designated otherwise.

Water Quality Criteria: Elements of water quality standards that are expressed as pollutant concentrations or narrative statements representing the level of chemical, physical or biological water quality that supports a beneficial use. Numeric criteria are use-specific, applying only to particular beneficial uses. Narrative criteria are general, applying to any and all uses applicable to a water body.

Acronyms and Abbreviations

Any abbreviations included in a definition are also defined at the appropriate point in this list.

303(d)	section of CWA requiring reporting of waters that need TMDLs
305(b)	section of CWA requiring reporting on status of WQ for all waters
401	section of CWA requiring certification that WQS will be met
AA	alternatives analysis
ACOE	Army Corps of Engineers
AU	assessment unit
BMP	best management practice
BURP	Beneficial Use Reconnaissance Program
CFR	Code of Federal Regulations
CWA	Clean Water Act
DEQ	Idaho Department of Environmental Quality
EPA	Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
GP	general NPDES permit
HUC	hydrologic unit code
IDAPA	Idaho Administrative Code
IC	Idaho Code
IR	Integrated §303(d)/§305(b) Report
MGD	million gallons per day
NPDES	National Pollutant Discharge Elimination System
ORW	Outstanding Resource Water
POTW	publicly owned treatment works
RDI	river diatom index
RFI	river fish index
RMI	river macroinvertebrate index
RPI	river physicochemical index
RPA	reasonable potential analysis
RPTE	reasonable potential to exceed [water quality criteria]

7Q10	7-day, 10-year minimum statistical flow value
SEI	social or economic importance
SEJ	social or economic justification
SFI	stream fish index
SHI	stream habitat index
SMI	stream macroinvertebrate index
SPI	stream periphyton index
SRW	Special Resource Water
TBEL	technology-based effluent limitation
30Q5	30-day, 5-year minimum statistical flow value
TMDL	total maximum daily load
TSD	EPA's Technical Support Document for Toxics Control (see references)
USGS	United States Geological Survey
WBAG II	Idaho's Water Body Assessment Guidance, second edition
WBID	waterbody identification [number]
WLA	waste load allocation
WQ	water quality
WQBEL	water quality-based effluent limitation
WQS	Idaho water quality standards

1 Purpose and Overview

The purpose of these procedures is to provide guidance to persons implementing Idaho's policy to protect surface water quality from degradation.

Federal antidegradation policy is found at Title 40 Code of Federal Regulations (CFR) § 131.12. The State of Idaho is required by 40 CFR §131.12(a) to develop and adopt a statewide antidegradation policy and to identify procedures for implementing that policy.

1.1 Applicable Laws and Regulations

Requirements for the protection and management of surface water quality are established in Idaho Code Title 39 Chapter 36. Section 3603 of this code establishes Idaho's antidegradation policy. Sections 3617 – 3620 establish procedures for designating and restricting nonpoint source activities on outstanding resource waters (ORWs).

The Board of Environmental Quality, with the assistance of the Department of Environmental Quality (DEQ) and approval of the Idaho Legislature, promulgates administrative rules on water quality. Idaho's Water Quality Standards (WQS) are specified in Idaho Administrative Code (IDAPA) Chapter 58.01.02 – Water Quality Standards. The statutory policy on antidegradation is echoed in rule at section 051 of the WQS and consists of three tiers of antidegradation protection, as required by federal rule. Section 052 of the WQS addresses implementation of the policy. Implementation steps are depicted in the flowchart in Appendix A, and include:

- identifying the antidegradation protection levels (i.e., the "tiers") that apply to a surface water body;
- determining whether a new, or change in an existing, activity or discharge will result in water quality degradation;
- assuring existing uses of the water body are maintained and protected in all cases;
- reviewing and approving less-degrading or non-degrading alternatives for high quality waters;
- assessing the importance of social or economic development to justify significant degradation of high quality waters;
- coordinating with other government agencies; and
- engaging the public in the process.

Regulatory Context

Antidegradation is one of three required regulatory elements of WQS. The other two elements are assignment of beneficial uses and adoption of water quality criteria (narrative and numeric). All three elements must be administered as a whole to effectively protect water quality and the uses dependent on that quality. Designated uses and water quality criteria applicable for each of the uses are found in Idaho's WQS.

Section 100 of the WQS describes designated uses and the use categories that may be applied in Idaho. Section 101 describes waters for which uses specified in section 100 have not been designated (undesignated surface waters as defined in section 101.01). Undesignated waters are presumed to support cold water aquatic life and primary or secondary contact recreation and therefore, DEQ applies the cold water aquatic life and contact recreation criteria when protecting and managing these waters.

For waters where uses have been designated, the specific use designations are identified in the WQS sections 110 – 160 by subbasin (USGS 4th Field hydrologic units, represented by hydrologic unit codes [HUCs]) and water body units (represented by water body identification numbers [WBIDs]). About 70% of Idaho's water bodies do not have specific use designations as of 2010 and are thus protected through the application of section 101.

Uses may exist in a water body even if they have not been designated in the WQS (sections 110-160) and are not presumed by default (section 101). Salmonid spawning, a recognized use in section 100, is a prime example. Many waters in Idaho support salmonid spawning yet have not been so designated. Such existing uses must be protected even though not designated. Designated uses normally reflect existing uses of a water body at the time of designation but may also reflect a potential not yet attained.

Water quality criteria specific to Idaho's beneficial use designations (i.e., numeric criteria) are contained in sections 210 and 250 – 253 of the WQS. All waters of the state are subject to general criteria contained in section 200 (i.e., narrative criteria), regardless of use.

Beneficial uses may vary within a water body; that is, they may change with location, water body size, or type. Most waters have more than one designated beneficial use or existing use. Where multiple uses exist or have been designated for a water body, the use with the most stringent water quality requirements must be maintained and protected.

All jurisdictional waters of the state are protected under at least one of three tiers of the antidegradation rule. Subsection 1.2 of this document describes these tiers. Subsection 1.3 of this document explains jurisdictional waters and the activities and discharges antidegradation applies to.

1.2 Tiers of Protection from Degradation

The federal antidegradation rule and Idaho's statutory antidegradation policy set up three levels or tiers of water quality protection.

Tier 1

Tier 1 protection requires that the level of water quality necessary to protect existing uses be maintained and that the water quality criteria be met. This is the minimum level of protection. Tier 1 protection applies to all surface waters, regardless of the existing water quality or designated use(s). A review is conducted to prevent authorizing an activity or discharge that would cause or contribute to a beneficial use not being fully supported or violation of water quality criteria.

Tier 2

Tier 2 protects high quality waters from degradation by requiring an analysis of the necessity of significant degradation and socio-economic importance of the activity before it is allowed. Under Tier 2 protection, insignificant degradation will be allowed without analysis. Significant degradation may occur only after an acceptable analysis of reasonable alternatives for avoiding or minimizing pollution of the water and an acceptable justification of the social or economic importance of the action causing the degradation. Procedures for determining whether degradation is insignificant and, if significant whether it is justified and may proceed, are presented in section 5 of this document.

Tier 2 protection is applied only to the subset of surface waters that are of high quality as determined on a waterbody-by-waterbody basis. For these high quality waters, Tier 2 provides an added layer of protection in addition to the Tier 1 minimum protection. This is an intermediate level of protection.

Tier 3 (Outstanding Resource Waters)

Tier 3 protection prohibits degradation. This protection applies only to waters of the highest quality or with other outstanding resource values that the legislature has designated by law as worthy of such protection. These waters are termed outstanding resource waters (ORWs). An activity or discharge that will not cause degradation may be allowed as described in Section 5 of this guidance. Temporary and limited degradation of waters receiving Tier 3 protection may also be allowed by DEQ on a case-by-case basis as explained in Section 3.4 of this document. This is the highest level of protection.

Special Resource Waters (SRWs)

Since 1980 Idaho has recognized its own category of protection from degradation of water quality in the form of special resource waters (SRWs). An SRW is protected from degradation in water quality due to point sources. SRWs were designated through rulemaking and are listed in the WQS use designation tables (IDAPA 58.0102.110-160).

SRWs are like ORWS in that they can be designated based on resource qualities other than high water quality, such as ecological significance or outstanding recreational or aesthetic value. This is sometimes referred to as high quality water, rather than high water quality, and perhaps better described as recognizing the high value of a water body regardless of the chemical or physical characteristics of its water.

There is no provision for analysis of alternatives and socio-economic justification to allow point source degradation of SRWs, and so their protection is greater than afforded by Tier 2 antidegradation protection. On the other hand, SRW designation is not as restrictive as ORW designation as it does not limit nonpoint source activities.

No List of Tier 1 and Tier 2 Waters

DEQ does not see the need to create a list of waters in the state that are given only Tier 1 protection (so called Tier 1 waters), as this protection applies to all water bodies. Nor does DEQ intend to create and maintain a complete list of waters that are given Tier 2 protection in addition to Tier 1 protection (so called Tier 2 waters). A list of all Tier 2 waters in Idaho would be dynamic and could not be complete unless all waters in the state are regularly monitored and assessed. DEQ has, in Appendix D, prepared a list identifying the tier of protection for waters in Idaho currently receiving NPDES-permitted discharges.

Tier 3 ORWs must be designated by the legislature. As of 2010, no ORWs have been designated.

Since it is already clear which waters get Tier 1 and Tier 3 protection, section 2 of this guidance describes how it will be determined whether a water body warrants Tier 2 antidegradation protection. This is based on Idaho's Integrated Report (IR) and its supporting data. Classification as a Tier 2 water reflects overall water body quality based on information used in compiling the IR. Since the IR is dynamic, this water body-by-water body classification will be dynamic. Therefore, it is DEQ's intent to determine whether Tier 2 protection is needed for each case in which an activity or discharge that might degrade water quality is proposed.

1.3 Waters and Activities to Which Antidegradation Applies

Idaho's antidegradation policy applies to all activities that may result in a discharge subject to certification under section 401 of the Clean Water Act (CWA). Such activities include all those that require a permit pursuant to CWA §402 (National Pollutant Discharge Elimination System [NPDES] discharge permits), CWA §404 (dredge and fill permits), or Federal Energy Regulatory Commission (FERC) licenses.
Jurisdictional waters are an unidentified subset of the waters of the state. The EPA and the U.S. Army Corps of Engineers (ACOE) have developed guidance (ACOE and EPA, joint memorandum, December 2, 2008) on making CWA jurisdiction determinations in accordance with the Supreme Court's decision in RAPANOS v. United States (547 U.S. 715,2006). The ACOE and/or EPA are responsible for making jurisdictional determinations.

Restoration Projects

Water quality restoration projects are those whose primary purpose is to return a water body to something closer to its natural or original condition. It is not necessary that a restoration project get all the way to the goal of natural or get there immediately. Restoration projects are a step in that direction and designed to improve water quality; if they do not, they are unlikely to qualify as restoration projects.

Even so, it is recognized that some projects whose goal is to improve water quality in the long run may still result in short-term worsening of water quality. For example, forest road obliteration projects or culvert replacements may cause a short-term pulse in sediment. This is expected and acceptable so long as reasonable measures (BMPs) are taken to minimize short-term worsening of water quality. Such measures should be incorporated into the design of restoration projects and be a consideration in the decision whether to approve a proposed project.

Emergency Actions

The rules regarding antidegradation do not speak to emergency actions. Most emergency activities do not require a permit or license that would trigger antidegradation review. Nor will there be time in most true emergencies for DEQ to consider antidegradation. DEQ will handle emergency actions on a case-by-case basis using its discretion to apply antidegradation provisions in a manner that is appropriate to the circumstances.

Temporary Degradation and Short Term Activities

As a general principle, DEQ believes degradation of water quality should be viewed in terms of permanent or long-term adverse changes. Therefore, short-term and temporary reductions in water quality, if reasonable measures are taken to minimize them, may be considered in the context of restoration projects and emergency actions subject to CWA permitting. This does not mean DEQ should overlook a collection of small short-term activities that in aggregate have a longer and more or less continuous impact.

Short term activities are addressed by Idaho's WQS at IDAPA 58.01.02.080.02 – Short Term Activity Exemption. This provision allows DEQ to exempt a discharge from the requirement to comply with the WQS, including from the WQS antidegradation requirements, for activities that are deemed essential to the protection or promotion of the public interest and that cause no permanent or long-term injury to beneficial uses.

2 Determining Where Tier 2 Protection Applies

Tier 1 antidegradation protection applies to all jurisdictional waters and Tier 3 waters are designated by statute; therefore, the only question is which water bodies warrant Tier 2 protection. This section of the document describes the procedure for determining whether or not Tier 2 protection applies for a particular water body.

By rule, Idaho has established a water body-by-water body approach for identifying waters that will receive Tier 2 antidegradation protection. This approach uses Idaho's Integrated Report (IR) of water quality status and its supporting data. The IR and its supporting data are dynamic; therefore, each determination will be made as applications for new or reissued permits or licenses come before DEQ.

Determination of whether Tier 2 antidegradation classification applies for a certain water body is based on:

- the water body's category of use support according to the most recent federally approved Integrated Report (IR);
- the beneficial use of the receiving water body; and
- whether data indicate that the water body as a whole is of high quality.

Section 2.1 provides a brief overview of the Integrated Report. Section 2.2 describes how DEQ will determine whether or not Tier 2 protection is appropriate.

2.1 The Integrated Report and Use-support Status Categories

Every two years, DEQ is required by the federal *CWA* to conduct a comprehensive analysis of Idaho's water bodies to determine whether they meet state *WQS* and support beneficial uses or if additional pollution controls are needed. This analysis is summarized in an "Integrated Water Quality Monitoring and Assessment Report"[1] (IR; DEQ 2008), which is submitted to EPA for approval. The report serves as a guide for developing and implementing water quality improvement plans (*total maximum daily loads, or TMDLs*) to protect water quality and achieve federal and state water quality standards. An IR must be approved by the EPA before it can be used by a state to guide its management decisions.

Category 5 of the Integrated Report is equivalent to the former 303(d) list of impaired waters. This list identifies waters that do not meet all water quality standards, that is, they fail to meet at least one criterion or measure of their quality, i.e. a parameter. The list identifies the water body and the cause(s) for listing. Causes are often parameters for which the water body fails to meet a criterion or failure of the biological community to

[1] As this guidance is being developed, the 2010 Integrated Report is being considered for final approval and may be the controlling report by the time this guidance is finalized.

achieve benchmark scores for biological indices (see WBAG II, Grafe and others 2002). A TMDL must be developed for the parameters for which a water body is listed.

The Integrated Report compiles environmental data and information from all components of DEQ's surface water quality program, as well as from other agencies, organizations, and individuals. This data and information gives water quality managers a comprehensive look at the relative quality of Idaho's water bodies and is used to set priorities and allocate resources accordingly. All of the state's waters are classified into at least one of five different use-support categories, which correspond to the five sections of the report. The five categories are described in the following paragraphs and summarized in Table 1.

Category 1: Waters supporting all uses

Because Idaho lacks methods to assess attainment of all uses (e.g., wildlife habitat and aesthetic uses), only waters that lie completely within wilderness or roadless areas appear in category 1. Because they lack regulated pollutant sources, such waters are assumed to support all their uses and meet all water quality standards.

Category 2: Waters supporting all uses that have been assessed

Category 2 waters fully support all their beneficial uses that have been assessed, but may have other uses that are un-assessed. This occurs because Idaho does not have a method to measure attainment of some beneficial uses, (e.g., wildlife and aesthetics), or may lack data for some uses (e.g. recreation or domestic water supply). This is the case for the vast majority of waters, and so, based on monitoring results, DEQ cannot say that all uses are supported and thus the water belongs in category 1.When the data in hand does not show impairment but there is not adequate data to assess all uses, DEQ conservatively places the water in category 2.

Category 3: Insufficient data to make an assessment

Category 3 consists of waters for which DEQ has insufficient data to make a determination whether or not any uses are fully supported and water quality standards are met. DEQ's experience has been that the majority of un-assessed waters, once sufficient data is obtained, are found to be high quality[2]. This makes sense considering that insufficient data often reflects remoteness and thus both lack of pollutant sources and difficulty in sampling.

[2] In the course of negotiated rulemaking in 2010, DEQ examined the change in status of 167 assessment units that were not assessed in the 2002 IR, but then were assessed for the 2008 IR when new data was available. Of the 167 2002 AUs in category 3, 92 or 55% were determined to belong in Tier 2 based on their 2008 assessments. Of the remaining 75 AUs, 58 failed to meet at least one water quality criterion but because they lacked biological data, were not classified for antidegradation.

Category 4: Waters not meeting one or more uses but not needing a TMDL

Category 4 waters fail to meet all water quality standards and thus do not fully support at least one beneficial use. These waters do not require a TMDL be developed to correct the impairment because: 1) a TMDL has already been developed and approved; 2) they are expected to meet water quality standards due to pollution control measures other than a TMDL; or 3) impairment is due to pollution such as flow alteration or habitat alteration but not pollutant loading and thus the impairment is not amenable to a TMDL to reduce pollutant loads.

Category 5: Waters not meeting one or more uses and needing a TMDL

Like waters in category 4, category 5 waters fail to meet all water quality standards and thus do not fully support at least one beneficial use. They do not, however, fit one of the three reasons for not needing a TMDL that would put them in category 4. Category 5 of the Integrated Report is equivalent to 303(d) lists that were prepared in the past and can also be described as a TMDL "to do" list.

Table 1. Integrated Report Categories

Integrated Report Category	Description
1	Waters[1] with all uses presumed to be fully supported. Presumption based on lack of pollution sources[2]
2	Waters for which all uses that have been assessed were found to be fully supported
3	Waters with no assessed uses due to lack of data
4a	Waters that have an EPA approved TMDL
4b	Waters with controls other than a TMDL expected to restore all uses to full support
4c	Waters for which lack of use support is caused by flow or habitat alteration which is not a pollutant
5[3]	Waters for which one or more uses are not fully supported, due to a pollutant[4]

[1] The term "waters" means assessment units (AUs), subdivisions of water body units represented with WBIDs in the Idaho WQS.

[2] This presumption is based on these waters being located entirely within wilderness/roadless areas.

[3] Category 5 is equivalent to the 303(d) list of impaired waters; a TMDL "to do" list.

[4] While assessment is done by use, an AU is listed as impaired for a specific cause or pollutant. If any one water quality criterion is not met or any one use is not fully supported, the AU is listed in category 5 unless the cause is flow or habitat alteration and then it is listed in 4c. When a TMDL is completed, the AU is listed in category 4a for the pollutant for which the TMDL was done. Because listing and TMDL development is by pollutant, a given AU can appear in both category 5 (for one or more causes) and 4 (for a different one or more causes).

All of the State's waters are broken into assessment units (as described in the following section), and an individual assessment unit may be classified in more than one of the above categories. This is because the Integrated Report lists by cause. For example, if a water body is listed due to temperature and flow alteration, it would be listed in Section 5 for temperature and in Section 4c for flow because flow is not a pollutant.

Water Body Units and Assessment Units

Water body units are the geographic basis for indentifying waters of Idaho and designating beneficial uses in the WQS. These units and their identification numbers (WBIDs) are based on 1:100K hydrography and break the state of Idaho up into unique non-overlapping drainage areas.

In headwaters areas, WBIDs correspond to true watersheds; that is, all surface water in a unit flows to a single point where it exits the unit. In Figure 1, this situation is exemplified by the stream labeled 003 (shown in red in the inset). Because water body units are non-overlapping by design, any unit downstream from a headwater unit has a drainage area represented by a WBID that has an entry and an exit point and is not a true watershed. This situation would correspond to the heavy green, purple, and blue lines in the inset of Figure 1. Each of these non-headwater water body units may consist of a large mainstem segment and a collection of many smaller tributaries that likely provide only a fraction of the flow in the mainstem. Water quality and uses within such a WBID may be quite varied.

This potential variation in water quality and uses within such a WBID becomes problematic when evaluating the effect that a discharge or activity might have on water quality, assessment of use support, and even designation of uses. The further removed from the headwaters a water body unit is, the more probable it is that the mainstem flow of water in and out of the unit is unlike that of the tributaries within the unit (e.g., WBID 001 in Figure 1). DEQ solved this problem for assessment purposes by using stream order (a measure of the number of tributaries upstream and thus size of a stream) to break water body units into smaller subunits for assessment; these are called assessment units. Small tributaries to larger streams, which can be very different in character but lumped in the same water body unit, are therefore separated into separate assessment units. This allows DEQ to do a better job of refining its assessment of water quality.

WBID 001 in Figure 1 has two very different assessment units, the 001_07 assessment unit (which is a portion of the 7th-order main stem represented by the heavy blue line) and the 001_02 assessment unit (represented by the collection of light blue lines indicating 1st- and 2nd-order tributaries to the main stem). Both assessment units are part of the 001 WBID and therefore have the same designated beneficial uses, but are assessed using different methodologies since it is unlikely that 1st- and 2nd-order tributaries would have the same characteristics as the 7th order Main Salmon River. The same can be seen with the tributaries to WBID 002 (green lines) and WBID 029 (purple).

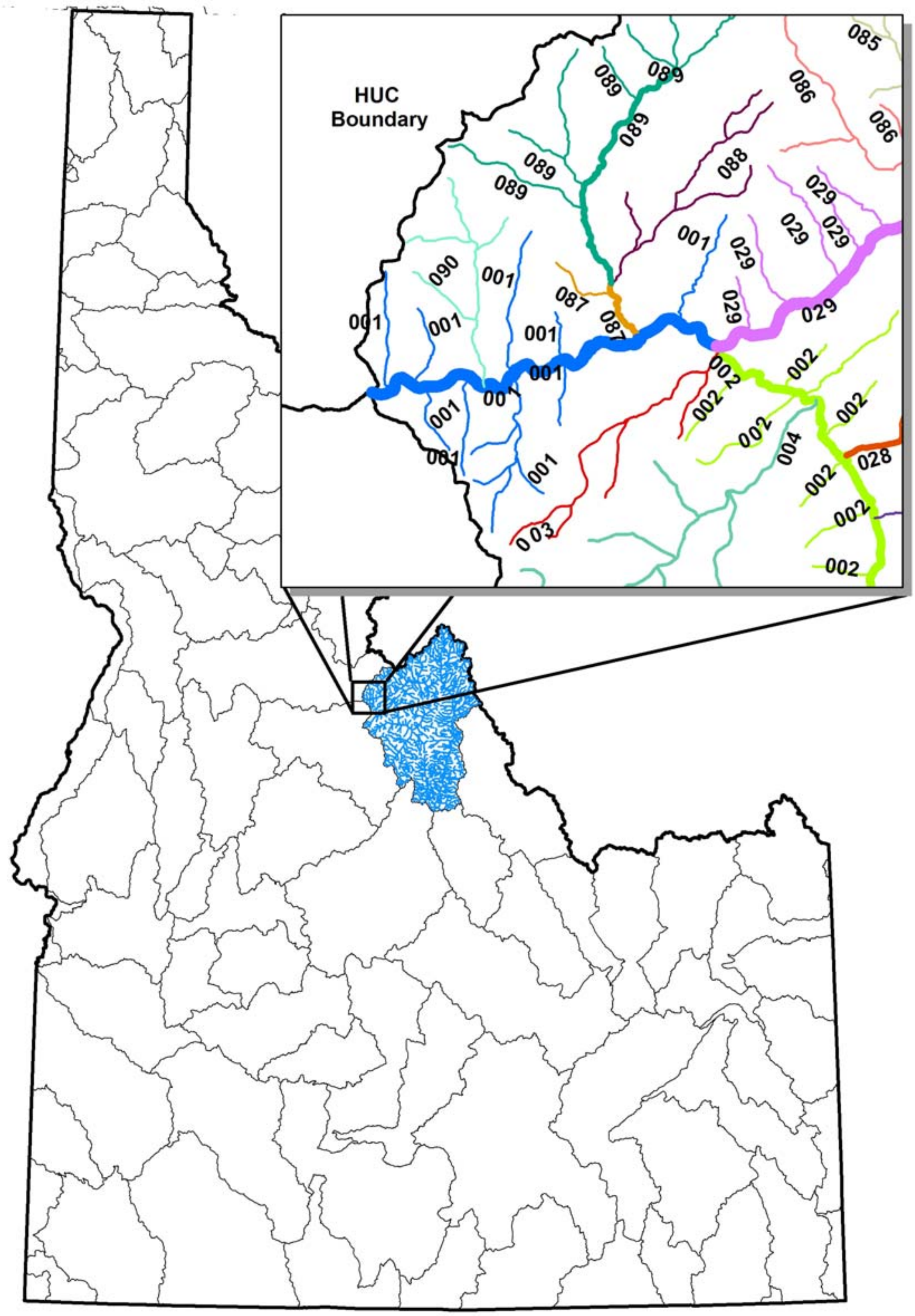


Figure 1. Map detailing WBIDs for HUC 17060203 Middle Salmon-Panther Subbasin. Inset shows how the individual waters are associated with a WBID number. WBIDs are color-coded to show the different stream segments that are part of that WBID. The size of the line corresponds to the stream order (thinner lines equate to 1st and 2nd order streams and thicker lines equate to larger order streams).

While better than undivided water body units (WBIDs), assessment units (AUs) are still not perfect since many separate 1st- and 2nd-order tributaries, draining different areas, may still be lumped together in one AU. Although these small tributaries may be in the same water body unit and thus likely to be similar in water quality condition, they may also experience different activities and discharges that differentially alter their quality. Consider again the situation represented by WBID 001 in Figure 1, and imagine that tributaries on one side of the river drain a largely roadless area with few human impacts while tributaries on the other side have impacts from recreational use (campgrounds) and timber harvest.

DEQ could subdivide AUs further but the basic problem is that we cannot afford to measure everywhere. Instead, we use data collected from specific sampling sites to infer water quality throughout an AU. It is possible that there are differences in activities and discharges within an AU and thus all water within the AU may not be of the same quality as found at the sampled sites. Even in larger streams, the location of a sampling site could reflect better or poorer water quality than the bulk of the assessment unit. We will come back to this in section 2.5 Spatial Extent of Tier 2 Protection.

2.2 Assignment of Tier 2 Protection

Tier 2 antidegradation classification of a water body is based on the most recent federally approved Integrated Report, its supporting data, and the beneficial uses of the receiving water body. Furthermore, to ensure that the level of protection reflects the water quality of a water body that would be affected by a proposed activity or discharge, DEQ may also consider the representativeness of the available data.

Use of Integrated Report

When a proposed project requires an antidegradation review, DEQ will use the most recent EPA-approved version of the Integrated Report to determine which category the water body of interest is in. If necessary, DEQ will examine the Integrated Report supporting data and more recent data that may be available at the time. This evaluation is summarized in Figure 2 and Table 2.

Water Bodies Supporting Assessed Beneficial Uses

All AUs considered to be fully supporting all their uses (i.e., those in category 1 of the Integrated Report) will be given Tier 2 protection for all uses. All AUs found to be fully supporting their assessed uses (i.e., those in category 2 of the Integrated Report) will be given Tier 2 protection for all uses.

Water Bodies with Un-assessed Uses

Many waters in Idaho have yet to be assessed due to lack of suitable data at the time assessments were performed for the latest Integrated Report. Assessment units with insufficient data to make an assessment (i.e., those in category 3 of the Integrated Report) will be evaluated on a case-by-case basis as to whether they are high quality and need to be given Tier 2 protection. This evaluation will not occur until DEQ receives an application for a new or reissued permit for a proposed discharge or activity that would degrade water quality.

All relevant information available when the activity or discharge is proposed will be used. If no new information has become available since the latest Integrated Report, DEQ will request the permit/license applicant to gather the information needed to determine the appropriate tier of antidegradation protection. If the applicant would rather forgo data collection and agrees that the affected water is high quality (and thus warrants Tier 2 protection), DEQ will proceed on that agreement.

Water Bodies Not Fully Supporting Beneficial Uses or Meeting all Criteria

DEQ assesses aquatic life and recreation uses differently because there are differences in water quality requirements in the criteria as well as the pollutants. However, even though uses are assessed separately, if one use is not supported the water body is considered not fully supporting beneficial uses and for the purposes of the Integrated Report is placed in Category 4 or 5.

While it may be appropriate to identify a water body as not fully supporting if it fails to meet even just one criterion, it is not considered to be consistent with antidegradation policy to dismiss protection from degradation that would affect another use that is fully supported. For assessment units indentified as not fully supporting at least one use, DEQ will evaluate aquatic life and recreational uses separately for antidegradation purposes. Because uses will be examined separately and there are different data requirements for evaluating each use (e.g., bioassessment data is not used in evaluating recreation uses and *Escherichia coli* data is not used in evaluating aquatic life uses), it is possible that a water body may warrant Tier 2 protection for recreation and Tier 1 for aquatic life, or vice-versa. This mixed, by-use assignment of antidegradation tiers is intended and will be resolved during the review of a proposed activity or discharge and its expected effect on water quality as described in section 3. Sections 2.3 and 2.4 describe how DEQ will evaluate potential degradation of aquatic life and recreation beneficial uses, respectively.

How the Integrated Report and antidegradation implementation interrelate is summarized in Table 2.

Table 2. Translation of Integrated Report Categories to Tiers of Antidegradation Protection

Integrated Report Category	Antidegradation Protection Tier
1	Tier 2 for all uses
2	Tier 2 for all uses
3	Tier 1 or 2, as data shows at time of antidegradation review
4a	Tier 1 for aquatic life use unless cause for listing is dissolved oxygen, pH, nutrients, sediment or temperature and bioassessment shows support of aquatic life use. Tier 1 for recreation use if recreational use is not fully supported or unassessed.
4b	Same as 4a above
4c	Tier 1 for recreation and aquatic life uses. AUs in category 4c are listed for causes other than those specified in the rule and therefore do not allow for biological data to provide addition of Tier 2 protection.
5	Same as 4a above

There are many causes for listing used in the Integrated Report. When determining the antidegradation tier of protection the cause identified in the Integrated Report may or may not line up exactly with one or more of the five listed parameters in the rule. Listing causes that fall in the category of nutrients include total phosphorus, total nitrogen, total Kjeldahl nitrogen, nitrogen-nitrate, nitrite/nitrate, and nutrient eutrophication. Listing causes that fall in the category of sediment include sedimentation/siltation, solids (suspended bedload), and total suspended solids (TSS). pH may be listed as either pH or pH, low. Temperature and dissolved oxygen do not have multiple listing causes associated with them.

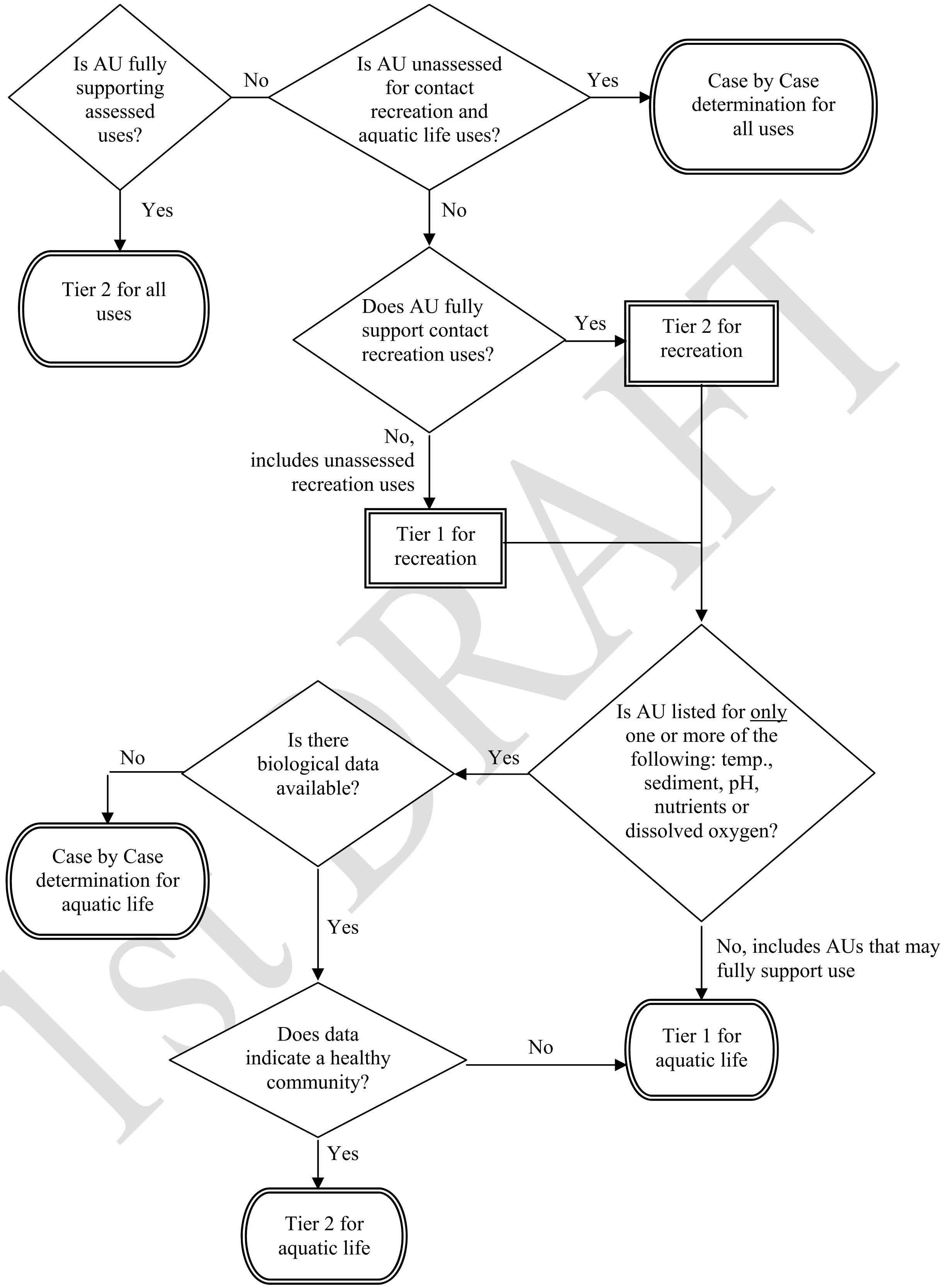


Figure 2. Flow chart for determining whether Tier 1 or Tier 2 protection is warranted.

2.3 Aquatic Life Beneficial Uses

An assessment unit may be identified as not supporting its aquatic life beneficial use based upon one or more of the following data types:

- chemical (dissolved oxygen, pH, or other pollutant concentrations),
- physical (turbidity and temperature), and/or
- biological (biological assessment data [see Box 2.2.1]).

> **Box 2.2.1 Biological Assessment**
>
> A biological assessment is an integration of biological data that is reflective of exposure of the sampled populations to pollution over time. Thus, a biological assessment is a holistic measure of a water body's condition.
>
> Much of the data available for biological assessment is data DEQ collects on macroinvertebrate and fish communities and on habitat quality, via its Beneficial Use Reconnaissance Program (BURP). BURP data is reduced to various multi-metric index scores. Individual index scores are then combined for each site and, if available, scores for multiple sites may be combined to arrive at a single score for each assessment unit, as described in WBAG II.

Biological data provides by far the major source of information for DEQ's assessment of aquatic life use support, although there are many instances where chemical or physical data may also be available or be the only data available. Chemical and physical data are relevant and easily compared to water quality criteria in the WQS, and they may, and often do in the case of temperature, indicate a problem when the biological data do not.

This conflict in signals among the various data types must be resolved in some manner. For purposes of the Integrated Report, DEQ is required to implement the federal "independent applicability" policy[3], which means a water must be listed if either the biology indicates lack of use support or any one of the associated water quality criteria are not met. Independent applicability means a water body can be assessed for its support of aquatic life without biological data.

It is somewhat counterintuitive that a single chemical or physical measure of water quality, such as a point-in-time measurement of temperature or copper concentration, can overrule a more integrative measure such as a multi-index biological assessment. However, this conservative approach is justified by EPA because chemical and physical measures are considered leading indicators of problems that may not yet have shown up in the biology. While it may be appropriate to queue up a TMDL to address a failure to meet one criterion, this does mean there are many water bodies in Idaho that are biologically healthy and would be considered high quality by most Idahoans, yet fail to meet one or two criteria. A prime example of this is the Lochsa River in north central Idaho, a high quality stream where temperature criteria set to protect cold water aquatic life are occasionally exceeded.

---

[3] While independent applicability originated with NPDES permitting, it has long been applied by EPA to reporting for CWA section 303(d) purposes.

In order to be similarly conservative in antidegradation and not discount the high quality of streams such as the Lochsa River, Idaho's antidegradation rule calls for basing assignment of Tier 2 protection on biological data when the listing cause is only dissolved oxygen, pH, nutrients, sediment or temperature, thus favoring biological data for these five chemical and physical measures of water quality.

The Integrated Report and its supporting data will be the primary determinant of whether or not a segment of water is high quality. For aquatic life uses, if a water body is listed for only one or more of the causes outlined in the rule, but the bioassessment data indicates a healthy and balanced biological community the water body will receive Tier 2 protection. If biological data is lacking or insufficient, other relevant data will be considered to make an antidegradation tier assignment for each case that arises from a proposal for an activity or discharge with degradation potential.

Use of Biological Data

When a water body is not fully supporting its aquatic life uses due only to dissolved oxygen, pH, nutrients, sediment, and/or temperature, DEQ will examine the underlying bioassessment data. In short, if the biological and aquatic habitat data indicate a healthy aquatic community, then the water body will be provided Tier 2 antidegradation protection. In this evaluation, DEQ will need to consider the representativeness of the data for the area that would be affected by a proposed discharge or activity (see section 2.5 for further discussion). Table 3 lists the biological assessment data that DEQ may have available.

Table 3. Multimetric indices currently used by DEQ in assessing aquatic life use support in streams and rivers

Wadeable Streams	Rivers
Stream Macroinvertebrate Index (SMI)	River Macroinvertebrate Index (RMI)
Stream Fish Index (SFI)	River Fish Index (RFI)
Stream Periphyton Index (SPI)	River Diatom Index (RDI)
Stream Habitat Index (SHI)	River Physicochemical Index (RPI)

In order to use these multimetric indices for determining whether Tier 2 antidegradation protection is appropriate, scores for at least two indices must be available. DEQ will follow the protocols outlined in Idaho's Water Body Assessment Guidance – Second Edition (WBAG II) (Grafe and others 2002) for evaluating the indices. If the average of the indices is greater than or equal to 2, then DEQ will consider the water body to be of high quality and will apply the Tier 2 level of protection. If the average of the indices is less than 2, then the water body will not be considered high quality, and Tier 1 protection will apply.

There may be instances where biological data is available but is not compatible with DEQ's biological assessment protocols (not BURP-compatible). This is particularly the case for very large rivers and reservoirs. In these instances, biological data collected by sources outside of DEQ (such as the USGS or Idaho Power, to name a few) is available, but the data may not have been collected in a manner that allows us to reduce it to the multimetric indices used by DEQ. This data can be useful; however, it will have to be evaluated on a case-by-case basis.

On the other hand, there may be instances for which no biological data is available. In these instances, DEQ will request the permit/license applicant to gather the information needed to determine the appropriate tier of antidegradation protection. If the applicant would rather forgo data collection and agrees the water body is high quality (and thus warrants Tier 2 protection), DEQ will proceed on that agreement.

2.4 Recreation Beneficial Uses

The assessment of recreational use support is typically based on traditional measures of water quality which can be compared to numeric criteria including bacteria criteria and toxics criteria. The most common measure of water quality used to assess support of contact recreation uses is the amount of bacteria indicative of human waste contamination. Measured bacteria such as *Escherichia coli* (*E. coli*) indicate the likely presence of pathogens that could affect the health of swimmers and others who may ingest the water while recreating on or in it.

BOX 2.2.2 Recreational Toxics Criteria

Toxics criteria applicable to protection of recreational use are mostly concentrations in water and are derived from the toxin’s tendency to bioaccumulate in fish tissue. An exception is mercury, whose criterion is a concentration in fish flesh that provides a more direct measure of human exposure, and bypasses the consideration of bioaccumulation from water in determining the risk.

Data on chemical concentrations of pollutants for recreation is also used to evaluate support of recreational uses such as fishing. While fishing is supported by a healthy reproducing population of fish and their food organisms, consumption of those fish requires they not have levels of contaminants that would make them unhealthy to eat. Because some fish that are caught are eaten, there are toxics criteria (see Box 2.2.2) for protection of human health that apply to waters designated for recreational use. Recreational toxics criteria are different from those for the protection of aquatic life. The relevant pollutants are different and the criteria values for the same pollutant can differ greatly.

Use of Available Data

Most often if a water body is found to be not fully supporting its primary or secondary contract recreation beneficial uses, there will be accompanying water quality data indicating a violation of the water quality criteria (most notably *E. coli* concentrations may be elevated). Unlike aquatic life uses, DEQ does not have any other assessment methodologies for evaluating the support of recreational beneficial uses. Therefore, when there is data for bacteria, toxic pollutants, or narrative criteria that indicate recreational uses are not fully supported, Tier 2 antidegradation will not be applicable. This will generally be the case when a water body has been determined to not support recreational uses.

The use that is more sensitive depends on the toxin – humans are more sensitive to arsenic while fish and many other aquatic organisms are more sensitive to zinc. Since the CWA requires all waters of the U.S. to support some form of both recreation and aquatic life uses (unless it is shown such uses are unattainable), and many water bodies have other designated uses as well, multiple criteria apply. The result of these multiple uses and overlapping criteria is that the use of a water body with the most restrictive criteria determines the required water quality.

2.5 Spatial Extent of Tier 2 Protection

BOX 2.2.3 Examples of Water Body Classification for Antidegradation Protection

This example will focus on several assessment units. AU 17060303CL001_05 is the Lochsa River from Deadman Creek to the mouth. This water body is in category 5 of the Integrated Report since it is not fully supporting its aquatic life beneficial use. However, the only identified cause for listing is temperature and there is no biological data available. This water body would be assigned an antidegradation Tier of protection based on a case specific evaluation. Although this water body may be listed for temperature, local knowledge suggests that this river is considered one of the best trout fisheries in the state.

Because water quality within a water body unit can vary considerably, DEQ will evaluate and assign the appropriate level of antidegradation protection to the smallest subdivision of a water body unit that makes sense in terms of representativeness of data, but at least as small as an assessment unit (AU).

While DEQ does its best to avoid sampling sites that are not representative of an AU, occasionally an AU may have a site or sites that are not completely representative of the unit as a whole due to the sheer number of smaller waters in the AU, access constraints, and some monitoring strategies based on probability design. For many AUs, it is also possible that there are multiple sampling sites to represent a single unit. In such cases, the sampling results are unlikely to be exactly the same among sites, possibly due to sampling in different years, and the results may actually be in conflict with regard to determination of support status.

In situations where there are multiple sampling sites, DEQ will evaluate whether these sites are representative of the water body that will be affected by a proposed discharge or activity. If all the data is determined to be representative, then DEQ will follow the procedures established in WBAG II for evaluating the information. WBAG II directs the assessor to use the lowest multi-index score when there are only two sampling sites. If data from more than two sampling sites is available, then the assessor is directed to average the multi-index scores. See Appendix B for examples of this.

If some or all of the sampling sites are not representative of the water body that would be affected by the discharge or activity, then DEQ may opt to use none of the data or only use data from those sampling sites that are representative. This means that, for antidegradation purposes, DEQ may further divide an AU where that makes sense.

This may be the case where an AU consists of a collection of 1st- and 2nd-order tributaries and the activities and thus quality of water differ among the streams included in the AU. In this case, it makes sense to use only the data from the tributary that would be affected by an increased discharge or activity, or only sampled tributaries with comparable influences on water quality in the case of a new proposed discharge or activity. Another example may be a higher order stream with sampling sites upstream and downstream of an activity or discharge. In this case it makes sense to use only the nearest sampling site, particularly if doing so avoids consideration of the effect that intervening tributary influences have on water quality.

The guiding principle is to look at and evaluate the tier of protection appropriate for the water that could or would be affected by a proposed activity or discharge. If this is only a portion of the AU, then it makes sense to use only the data that is relevant to the affected water's condition.

3 Evaluating Potential to Degrade

This portion of the document outlines the procedure for evaluating an activity or discharge to determine whether it will degrade or lower water quality. Only an activity or discharge that will cause degradation is subject to antidegradation limitation. This evaluation is performed parameter by parameter. If water quality is degraded by any one parameter, that will mean the activity as a whole degrades water.

A proposed activity can result in existing receiving water quality being worsened, improved, or unchanged. To evaluate which of these effects will occur, water quality for two different effluent scenarios must be mathematically mixed with water quality upstream under critical conditions and subsequently compared with each other. These two scenarios are without (now or current) and with new or increased activity or discharge (future or proposed). Existing water quality is that allowed to occur now, before any proposed changes in discharge. Proposed water quality is that which may be allowed to occur in the future after changes in an activity or discharge are licensed or permitted.

Mathematical mixing of the permitted discharge and receiving water is a calculation that provides the potential existing water quality. Performing this calculation with the proposed discharge gives the potential proposed future water quality. To perform these calculations we need to know five things:

1. the upstream water quality,
2. the effluent quality that is currently allowed (zeros if the proposal is for a new discharge),
3. the effluent quality that would be allowed under the proposal,
4. the activity's design or maximum production-based flow, and
5. the critical flow of the receiving water.

All new regulated activities or discharges are likely to degrade water quality as they present new pollutant loads added to the receiving water body. Similarly, an expansion or increase of an existing discharge is also likely to cause degradation of water quality. However, degradation may be avoided if, for example, the quality of the new discharge is as good as or better than receiving water body quality, or if the increased loads are offset.

Existing activities that propose no expansion or existing discharges that propose no change in their discharge upon renewal of their permit or license will not cause degradation of water quality[4]. Non-degrading activities and discharges are not subject to

[4] It is possible water quality could decline even if an activity or discharge does not increase, such as due to a decrease in flow and thus assimilative capacity of the receiving water body. If this change in flow is not due to the activity or discharge under review then that activity or discharge will be not be held responsible with regard to antidegradation requirements. In such a situation compliance with water quality-based

antidegradation limitation[5]. Thus, once it is determined that an activity would not expand or a discharge would not increase, the only question is whether Tier 1 requirements are met.

3.1 Receiving Water Quality

It is the change in downstream receiving water quality after mixing of the pollutant loads from an activity or discharge that is the concern of antidegradation policy. While our focus is on downstream water quality, in order to calculate this we need to know the receiving water body's quality unaffected by the activity or discharge in question. Thus, receiving water quality at two locations is of interest:

1. A location where the water body is not influenced by the source under consideration, either immediately upstream (in a river or stream) or outside the influence of the plume (for lakes or reservoirs); this is the upstream water quality.
2. The location where water quality would reflect the addition of pollutants from the proposed activity or discharge; this is the downstream water quality.

Existing/Proposed

Existing receiving water quality is what is allowed to occur before a new source commences activity or there is any change in an existing source. Proposed water quality is what is allowed to occur after a new source, or change in an existing source, is authorized. In either case what is allowed may not actually occur and thus may not be observed or measured. While it is possible that existing conditions reflect this potential worst case and could simply be measured, this is highly unlikely and so in practice, current water quality will be calculated instead of simply measured. Proposed water quality can only be calculated or estimated.

Furthermore, for both existing and proposed water quality, we are interested in the potential worst conditions allowed. Therefore, we are concerned with the maximum discharge the permit or license allows, in combination with critical conditions for dilution in the receiving water.

Although it is detrimental change in downstream water quality that would *potentially* result from a new source or change in an existing source that we are concerned with, we need to know the upstream water quality in order to calculate what the downstream water quality would be.

---

effluent limits may require a reduction in activity or discharge independent of antidegradation requirements.

[5] It is possible water quality could decline even if an activity or discharge does not increase, such as due to a decrease in flow and thus assimilative capacity of the receiving water body. If this change in flow is not due to the activity or discharge under review then that activity or discharge will be not be held responsible with regard to antidegradation requirements. In such a situation compliance with water quality-based effluent limits may require a reduction in activity or discharge independent of antidegradation requirements.

Upstream vs. Downstream

It is tempting to view degradation of water quality simply as the change in quality from upstream to downstream. While this comparison works for a new activity or discharge - it amounts to the same thing as the change in downstream water quality for new discharges - it does not work for an existing discharge. This is because once a discharge is authorized there will of course be a lowering of water quality from upstream to downstream, but this is not an indication of worsening conditions from a change in an discharge. Antidegradation is prospective and so to fairly judge existing discharges we look at the changes in downstream water quality they may cause.

Characterizing Upstream Water Quality

Knowing the upstream water quality data is essential to calculating degradation. While it is important to adequately characterize upstream water quality, how much data this takes will depend on water quality variability and how much uncertainty can be tolerated in the analysis. Depending upon the quantity of available background data, DEQ will generally use a conservative estimate of pollutant concentrations when calculating degradation.

It is common practice to use the 95th percentile (i.e., the value that is expected to be exceeded 5% of the time) of measurements as a conservative characterization of ambient concentrations. However, getting a reliable estimate of the 95th percentile requires sufficient data. Generally, 30 measurements across the full range of variation are recommended although as few as 12 (monthly samples for a year) will be acceptable. If fewer data than this are available, DEQ will use the maximum observed during low flow or other time period when receiving stream concentrations are expected to be high, rather than an estimated 95th percentile. If no data are available, DEQ will request that the applicant obtain such data.

In most cases, DEQ expects sufficient data to be available in the permit or license application and discharge monitoring reports for existing NPDES-permitted discharges. For the latter, DEQ also expects to rely heavily on EPA's calculation of upstream water quality prepared in their drafting of effluent limitations for the permit.

Measurements of upstream water quality are important but may not be sufficient. Measurement of upstream quality may not reflect potential upstream quality, the quality that would occur with other sources upstream discharging at their maximum permitted limits. Potential upstream quality must be determined so that we know what the remaining unallocated assimilative capacity is and ensure that we do not over-allocate it. This also affects the determination of whether an increase in discharge is significant or not (see section 5.1). Therefore, we may not be able to evaluate compliance with antidegradation requirements with determination of upstream quality based solely on measurement of upstream ambient conditions. Estimated upstream receiving water quality, for purposes of antidegradation, therefore must be calculated as well and may even need to be modeled.

Possibility of Modeling

Most pollutants, to some degree are not conservative, meaning that they do not just accumulate or steadily increase downstream; instead they are physically, chemically, or biologically active and they experience transformation or fractionation with time and travel. They may adsorb to sediments, combine with other constituents and precipitate, be converted into a gaseous form and lost to the atmosphere, be taken up by living organisms, or otherwise lost from the water column.

Although the possibilities are nearly endless, there are a few parameters and pollutants for which relatively common and dominant transformations are known well enough to be modeled. Dissolved oxygen, nutrients, and temperatures are examples of very non-conservative parameters. Any estimate of their concentration that is not representative of a physical point near the source of load increases will likely be more accurate if modeled to account for known transformations.

Upstream water quality may be affected by distant sources, some of which may not currently be discharging at their allowed limits. This is a situation in which modeling can be quite useful and perhaps necessary. Ultimately, the decision whether to estimate water quality with modeling or with simpler mixing calculations is up to the person analyzing effects on water quality. This decision should be driven by the pollutant acceptable error in the estimates, and whether time and data are available to conduct modeling.

Simple mixing estimates that ignore pollutant fate and transport are always a starting point and may be sufficient in many instances. There is no point in conducting modeling that will not improve upon simpler estimates.

Recommendations for modeling:

- Always model dissolved oxygen and temperature.
- Seriously consider modeling forms of phosphorus and nitrogen, as suggested by tolerance of uncertainty.
- Only model other pollutants if needed to reduce bias in conservative mixing estimates.

3.2 Effluent Characteristics

Much of the needed information on effluent quality and quantity will be found in the current and/or proposed permit or license. Additional information may be found in the permit application and, for an existing discharge, in discharge monitoring reports.

For pollutants with quantitative limitations in a permit or license, those limits will be used in calculation of the discharge's effect on water quality. However, there are two common situations in which data in the permit alone will be inadequate to assess the effect of a new or increased discharge on water quality:

- **No permit limits:** In either a new or existing discharge, a pollutant may be known to be present for which there are no effluent limitations (no technology-based effluent limitation requirements) and for which it has been determined there will be no reasonable potential to exceed (RPTE) criteria. In this case, there will be no permit limits in either the new or reissued permit from which to calculate degradation.
- **First time permit limits:** In the renewal of an existing permit, a pollutant may be added for the first time, either because of new regulation or due to an increase in discharge leading to RPTE. In this situation, there will be a limit in the reissued permit but not a limit in the old permit.

Even with no permit limits there can still be degradation of water quality. This would occur for any new discharge or for an increase in an existing discharge of a pollutant. Thus it will be necessary to determine both the current and proposed quality of the effluent for all pollutants of concern regardless of whether there are permit limits.

A first time permit limit implies degradation of water quality but this is not necessarily the case. A new limit could be due solely to a change in regulation, e.g., a new or more stringent criterion or a new effluent limitation guideline, and therefore not result in worse water quality. It will be necessary to determine the quality of the effluent prior to the limit, and compare it to the quality with the proposed new limit. Current quality for a pollutant without a prior effluent limitation must be based on discharge monitoring data or estimated based on other similar discharges. It is essential to use the same statistical procedures to characterize the quality of the effluent prior to a new limitation as is used in developing the new limit, e.g., procedures in EPA's Technical Support Document for Water-Quality Based Toxics Controls (TSD) (EPA, 1991). To do otherwise would be an unfair comparison. Information on proposed effluent quality with regard to a limited pollutant may be found in the permit application or discharge monitoring data, or may be estimated based on other similar discharges.

3.3 Calculating the Effect of an Activity or Discharge – Will Degradation Result?

Antidegradation is concerned with any adverse change in water quality that may occur due to a new or changed activity or discharge. Therefore, for rivers and streams, our focus is at a point downstream of the activity or discharge and on a comparison between calculated water quality now (under the current permit or license or lack thereof), and calculated water quality in the future (under the proposed permit or license). (For lakes and reservoirs, modified methods of calculating the effect are in the section on Modification for Lakes and Reservoirs, page 27.)

For all activities or discharges we calculate their effect on downstream water quality as:

$C_p - C_c = C_{diff}$ or ΔC *Equation 1. Effect on downstream water quality*

Where:

C_p = proposed downstream water quality

C_c = current downstream water quality

ΔC = change in downstream water quality

DEQ will evaluate the effect on water quality for each pollutant of interest. If ΔC is in an adverse direction, i.e., it makes water quality less suitable for a particular use, there is degradation of water quality.

Now let us turn our attention to calculating current and proposed water quality for use in Equation 1. For this, we will consider two situations: first, a completely new activity or discharge—a *new discharge;* second, an expansion or increase in an existing activity or discharge—an *increased discharge*.

For both new and increased discharges, the following simple mixing equation is used:

$$C = \frac{LR_{up} + LR_{dis}}{Q_{up} + Q_{dis}}$$

Equation 2. Mixing equation for new and increased discharges

Where:

C = fully mixed concentration in the receiving water body resulting from discharge, generally downstream

LR_{up} = receiving water body pollutant loading rate, upstream of the discharge

LR_{dis} = discharge pollutant loading rate

Q_{up} = receiving water body flow, upstream of the discharge

Q_{dis} = discharge flow

Loading rates are calculated as product of flow and concentration, such that:

$LR_{up} = Q_{up} \times C_{up}$, and *Equation 3. Loading rates*

$LR_{dis} = Q_{dis} \times C_{dis}$

Where:

C_{up} = pollutant concentration in receiving water body, upstream of the discharge

C_{dis} = pollutant concentration in the discharge

Equation 2 is generic and dynamic and has infinite solutions but we are interested in two solutions in particular for each pollutant. These solutions are for the current receiving water concentration (C_c) and for the receiving water concentration that would result from the proposed permit limits (C_p)[6]. These concentrations are determined using low-flow conditions in the receiving water body and permitted flows and pollutant concentrations for the discharge. These flow conditions are termed critical flow conditions and are described more in the following section.

Critical Conditions

When flow or volume in the receiving water body is low, addition of a pollutant will have a greater effect on its concentration than when flow or volume is high because there is less water to dilute the pollutant load. Therefore, to evaluate what could be a near worst case scenario, we must consider critical conditions. Critical conditions are a combination of the maximum permitted effluent flow, maximum projected effluent concentrations or maximum allowable effluent limitations, low-flow discharge conditions (aka “critical flows”) of the receiving stream, and an estimate of the near-worst-case upstream water quality concentrations.

The maximum discharge flow is based on the facility design capacity or production-based maximum discharge. This will be stated in the permit or license for the current discharge and in the permit application for the proposed discharge The receiving water body critical flow is determined according to the WQS (at §210.03) for each pollutant evaluated, e.g., for chronic aquatic life criteria, this is the 7Q10 flow. For nutrients, it is recommended that the 30Q10 flow during the growing season (April-September) be used. For temperature and dissolved oxygen, the 7Q10 flow is also useful but may be calculated on a monthly basis to account for seasonality.

For the effluent, the critical load is the maximum permitted load if stated in the permit or license or the product of:

- the maximum discharge flow as described above, and
- the maximum permitted effluent concentration.

The receiving water body critical load is the product of the critical flow described above and the potential worst case upstream concentration estimated or modeled as described in section 3.1 Receiving Water Quality.

There will be two sets of critical conditions to be evaluated; one for the current permit or license and one for the proposed permit or license. These will yield C_c and C_p in Equation 2, for each pollutant evaluated, to be then input into Equation 1. It is possible, but unlikely, that the receiving stream critical conditions used in the analysis will also differ between now and the future. An anticipated change in upstream flow regulation would create one such possibility.

[6] Note that *Equation 2* works as well if Q_{dis} were zero and the discharge load a direct input. Upstream load on the other hand is always calculated from *Equation 3*, because receiving stream flow must be known as well as concentration.

Modification for Lakes and Reservoirs

Application of criteria for lakes and reservoirs depends upon their detention time, how slowly water moves through them. A lake or reservoir with 15-days or less detention time are treated as flowing, i.e. as a stream or river. Those with more than a 15-day detention time are treated differently and the calculations described above need to be modified. This is because there is little flow and the concept of upstream and downstream loses meaning if there is not sufficient velocity in the receiving water to facilitate rapid mixing.

Instead of flow rate in the receiving water body flow rate we will look at volume. And instead of loading rates, we will need to look at total load added over some period of time. Similar to the situation with flowing waters, critical conditions determine the appropriate values for the input variables.

$$C = \frac{L_{10} + L_{dis}}{V_{10} + V_{dis}}$$

Equation 4. Mixing equation for lakes and reservoirs

Where:

C = mixed concentration resulting from discharge

L_{10} = receiving water body pollutant load in V_{10}

L_{dis} = effluent pollutant load delivered over the time it takes to exchange mixed volume of receiving water body at critical inflow

V_{10} = receiving water body volume available for mixing

V_{dis} = volume of effluent discharged over time it takes to exchange mixed volume of receiving water body at critical inflow

In place of Q_{up} we use V_{10}, the volume of the lake or reservoir beneath a circle centered on the point of discharge that encompasses one-tenth the minimum surface area of the water body. This volume should be limited to mixed surface layer (epilimnion) if the water body is stratified. The limitation on mixing volume is based on the limitation in the Idaho WQS that the horizontal extent of a mixing zone in a lake or reservoir is not to take up more than 10% of the surface area (IDAPA 58.0102.060.01.f). A circle is a simplified depiction of the plume, which could be modeled or determined through a tracer study if a more accurate assessment is desired. The ambient load is a product of this volume and the ambient concentration outside the influence of the discharge plume.

Whether the water body is stratified at the time of critical low inflow will be based on when that critical flow occurs and depends on the pollutant. For example, if the pollutant is a metal that is toxic to aquatic life, then the critical low inflow would be the 7Q10 for all inflows combined. If critical inflow occurs the last week of September then that is the time when presence or absence of stratification would be judged. It would also mark the time when the volume available for mixing would be determined.

To determine the appropriate volume of discharge, and thus corresponding load to use in the calculation, we must determine the time period over which the discharge should be evaluated. This renewal time is, the amount of time it would take critical inflow to replace the volume of water allowed for mixing. This volume is in turn the volume of the mixed upper layer that corresponds to 10% of the water body area centered on the plume, when critical inflow occurs.

Ideally, a measurement or estimate in the area surrounding the point of discharge would be used. In absence of this, it is recommended that a suitable time be based on the volume of the mixed layer (e.g., epilimnion) for the entire water body divided by the critical inflow for the entire water body; call this the residence time. For example, if the volume of the entire epilimnion of a lake or reservoir was 1,000 acre-feet and the 7Q10 for all inflow was 25 cubic feet per second (cfs), the residence time would be about 20 days (1,000 acre-ft / (25 cfs * 1.984 ac-ft/day/cfs) = ~20). So in the absence of more specific information about renewal time in the actual area allowed for mixing, we expect the volume allowed for mixing to exchange at the same rate as for the entire water body[7]. Thus, in this example, the volume and load of effluent used in Equation 4 would be that which is discharged in 20 days.

As with streams and rivers, Equation 4 would be calculated for current conditions and for proposed conditions and those results would be used in Equation 1 to quantify the proposed change in water quality.

Alternatively, a three-dimensional hydro-dynamic model could be used to identify the worst case water quality conditions at the edge of any authorized mixing zone, with the mixing zone not to exceed 10% of the lake or reservoir's surface area.

Degradation of water quality requires change in discharge

There has to be a change in an existing discharge in order for that discharge to cause a change in water quality. Therefore, for purposes of antidegradation review, we can conclude an existing discharge is non-degrading if there are no changes in discharge.

Normally, an existing discharge must increase its pollutant loading in order to degrade the receiving water body's quality[8]. Increase in load may occur through either an increase in concentration for any one pollutants or an increase in the discharge volume increasing the loads of all pollutants, or both. Typically, increased loads lead to worse water quality; however, it is possible for an increased discharge load to not result in increased concentrations of a pollutant in the receiving water body. This occurs only when effluent quality is equal to or better than receiving water quality.

[7] This is a crude approximation that is unlikely to hold true in portions of lakes and reservoirs that have irregular shorelines and deep bays. In such areas, the exchange rate could be considerably slower than for the water body as a whole and the residence time much longer. This simplifying assumption should be used with caution.

[8] Although unusual, it is possible that where effluent discharge dominates water quality the receiving water quality becomes worse even though discharge load decreases, e.g. a decrease in discharge volume coupled with an increase in effluent pollutant concentration.

Mixing

Below the point where an activity or discharge adds to the receiving water body, downstream water quality is in transition, changing more or less rapidly. Eventually, after full mixing, downstream receiving water quality will reach a steady state of lower quality. Mixing zone characteristics, particularly location and diffuser design, are important to minimizing the physical size of this transition zone and possible adverse effects, and these characteristics often limit the volume that may be used to dilute a discharge. We can calculate downstream water quality that results from an activity or discharge only if we know the volume of water it mixes with. Regulatory mixing zones represent partial mixing, may change with time, and are always sized so as to meet criteria at the edge of the zone. As a practical matter we can assess changes in water quality for antidegradation purposes based on full mixing, even though the magnitude of change would be less than would be calculated at some partial mix point. Appendix C contains some examples of how new or increased discharges would be addressed.

3.4 Other Considerations

In evaluating changes in water quality, there are several other things to consider, particularly whether upstream pollution reductions will offset downstream increases, whether adverse changes are temporary, and whether more information is needed to draw conclusions.

Use of offsets

The Idaho antidegradation rule allows for the use of offsets to proposed increases in pollutant load to Tier 2 and 3 waters (Tier 1 waters are already covered by pollutant trading under the mantle of a TMDL). The rule requires that the offsets occur before an activity or discharge commences and be upstream of any potential degradation. The diagram in Figure 3 shows degradation resulting from a discharge with no offset. The diagram in Figure 4 shows no degradation resulting because water quality upstream is improved before the discharge is added—the upstream raising of water quality offsets the lowering of water quality resulting from the discharge.

The idea is that through properly conducted offsets there will be no net degradation of water quality, not even locally, relative to current conditions. There would be, as the diagram above shows, upstream to downstream changes in water quality. However, due to placement of the offsets, water quality at all points in the stream would still be better after than before the discharge plus its associated offsets. Degradation is avoided and this avoids the need for antidegradation analysis in Tier 2 waters and makes it possible to allow new or increased discharge in Tier 3 waters.

Because of placement considerations and lack of flow, the use of offsets in lakes and reservoirs to assure no degradation is problematic but may be considered by DEQ.

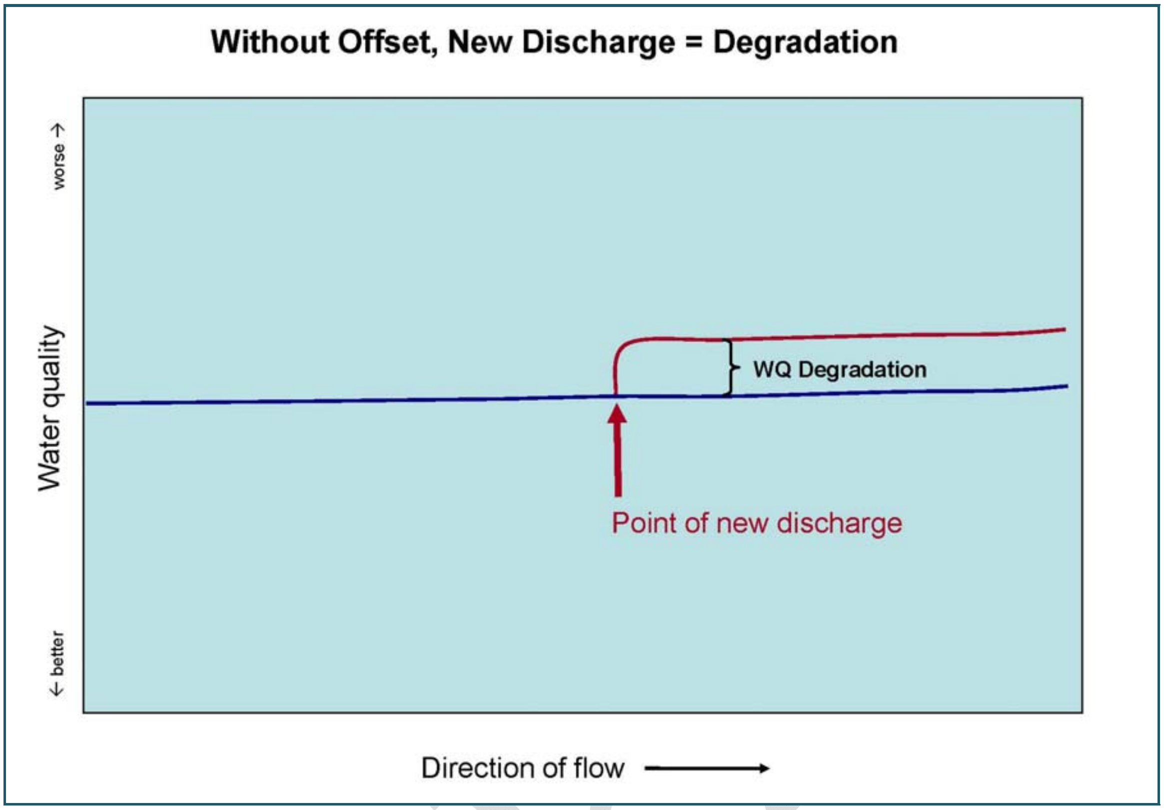


Figure 3. Diagram of discharge without offset.

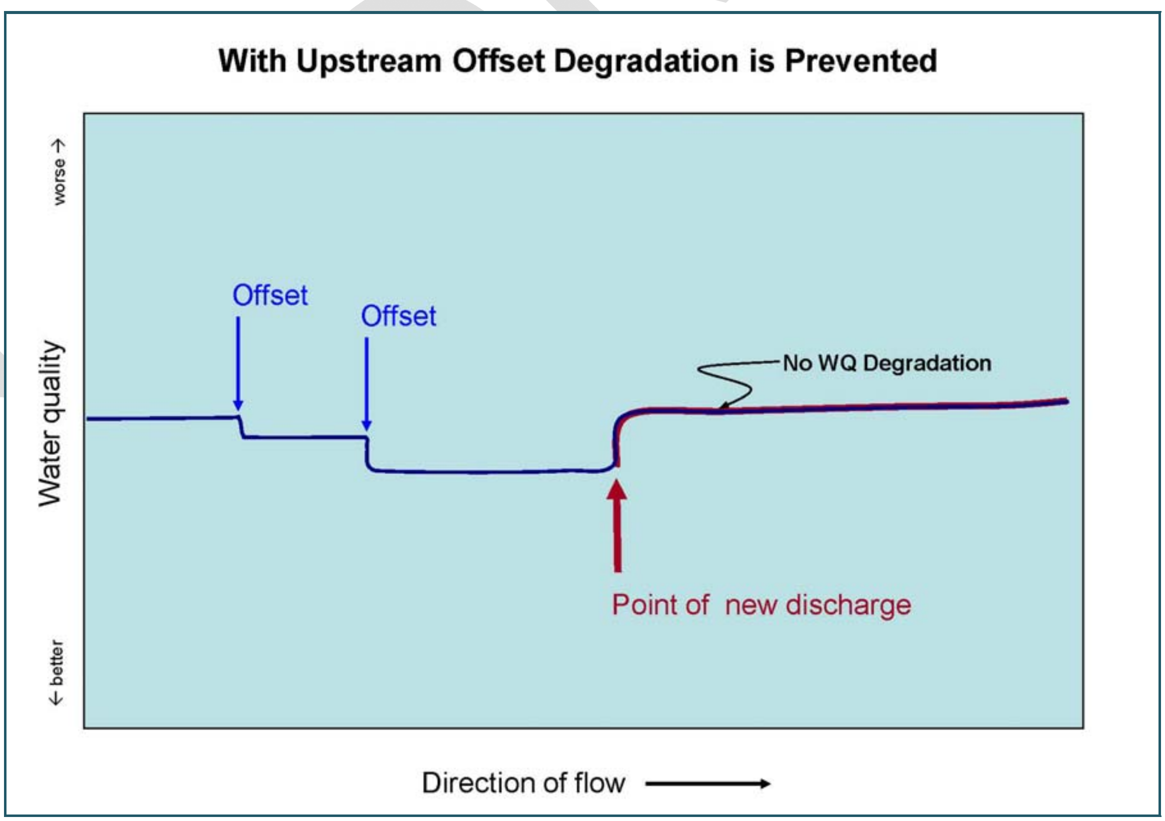


Figure 4. Diagram of discharge with offset.

Temporary Degradation

Some activities, e.g., a culvert replacement to enhance fish passage or reduce risk of road washout, are expected to worsen water quality only temporarily but result in long-term benefit to the public interest and cause no permanent injury to beneficial uses. Idaho's water quality standards allow for exempting such activities from meeting water quality standards (Short Term Activity Exemption IDAPA 58.01.02.080.02).

This allowance is consistent with the notion that degradation of real concern is that which is permanent or long-term, and that short-term degradation or even violations of water quality criteria are sometimes necessary to achieve long-term benefit. A properly designed activity that qualifies for a short-term activity exemption should incorporate measures to minimize its adverse short-term effects and thus would not cause degradation that needs antidegradation review.

Request for additional information

In evaluating proposed changes to water quality, DEQ may find it necessary to request information on the proposed activity or discharge. Such information may include details about the proposed project's location or operation of the, outfall design, effluent characteristics, or data for the receiving water body. This is particularly likely if modeling is involved, e.g., in estimating upstream water quality or plume configuration.

4 Tier 1 Review – Protecting Existing Uses

This section of the document describes the review that is performed to assure existing uses are protected.

Existing uses and the water quality necessary to protect those uses must be maintained. Thus, all activities or discharges must not cause or contribute to a violation of water quality criteria. For National Pollutant Discharge Elimination System (NPDES) permitting, this is assured through evaluating reasonable potential to exceed (RPTE) water quality criteria. The key in this process is to determine what the existing uses are and whether they are more sensitive than the water body's designated uses or undesignated presumed use protections.

4.1 What is an Existing Use?

The regulatory definition of an existing use is:

> Those beneficial uses actually attained in waters on or after November 28, 1975, whether or not they are designated for those waters in Idaho Department of Environmental Quality Rules, IDAPA 58.01.02, "Water Quality Standards."

Thus if historical data indicates a use has once occurred (between now and November 28, 1975), it would be an existing use.

Two questions that regularly come up when discussing existing uses are:

- What does it mean for a use to be actually attained?
- Is the suite of possible use choices limited to those described in the Idaho WQS?

It is not the purpose of this guidance to fully explore these questions, so as a practical matter the following answers are provided for purposes of antidegradation:

- A use may be determined as existing as described in Chapter 3 of Idaho's WBAG II (Grafe and others 2002). DEQ will use all available information to make this determination including information in any completed Subbasin Assessment (SBA).
- The beneficial use choices under consideration for an existing use are those defined in the Idaho WQS.

Once the applicable uses are determined—for most water bodies, there are several uses—a Tier 1 review is a matter of assuring that an activity or discharge will not cause or contribute to a failure to meet applicable criteria for the most sensitive use in the receiving water, which may mean at the edge of any authorized mixing zone.

Beneficial Uses

The Idaho WQS describe the beneficial uses that may be assigned to water bodies at IDAPA 58.0102.100, Surface Water Use Designations. Specifically, these are by category (aquatic life, recreation, or water supply) and subcategory (for example, *cold water* aquatic life or *primary contact* recreation):

Aquatic Life
Salmonid spawning, Cold water, Seasonal cold water, or Warm water

Recreation
Primary contact or Secondary contact

Water Supply
Domestic, Agricultural, or Industrial

In addition there are wildlife habitat and aesthetic uses recognized for all surface waters of Idaho.

Multiple use categories may apply to a given water body, and in fact all waters are required by the CWA to support both an aquatic life use and a recreation use. For aquatic life and recreation the subcategories are for the most part mutually exclusive; e.g. a water body is designated for either primary or secondary contact recreation and for either warm water or cold water aquatic life. An exception within the aquatic life category is that a water body may be designated as protected for both salmonid spawning and cold water aquatic life. Within the water supply category, however, the uses are not mutually exclusive. Agricultural and industrial water supply uses apply to all waters of the state; and domestic water supply is designated on a case-by-case basis. So any water body might have all three water supply uses designated.

The subcategories, as listed above, are in somewhat hierarchical order, e.g., domestic water supply generally requires better quality than agricultural water supply, but this is not strictly so. The most sensitive use is discussed in more detail below.

4.2 Determining Applicable Criteria

Uses are protected by criteria, which are specifications of:

- For some pollutants—a numeric limit on quality (numeric criteria), or
- For other pollutants—narrative statements that prohibit harmful quantities of a particular pollutant (e.g., sediment narrative) or class of pollutants (e.g., nutrient and toxics narratives).

Narrative criteria play an important role in protecting uses from harm due to pollutants for which there is limited knowledge of adverse effects or difficulty in specifying broadly applicable numeric criteria. A narrative criterion requires water body-specific interpretation, such as in a TMDL, to arrive at a numeric value useful in antidegradation. Together, numeric and narrative criteria cover all possible pollutants that may harm uses.

A Tier 1 review comes down to assuring that the applicable criteria for the most sensitive existing use, designated or not, will not be exceeded by the proposed activity or discharge.

Most Sensitive Use

There will always be multiple uses existing or designated for a water body, resulting in two kinds or levels of multiple criteria. First, each use has its own set of relevant parameters, e.g. dissolved oxygen, temperature, arsenic, etc. for aquatic life and bacteria and arsenic and other bioaccumulative toxins for recreation. Second, where parameters are the same, the criterion set for each use maybe different, e.g. the level of arsenic that will support aquatic life differs from that necessary to support fish consumption (recreational use). Thus, for each pollutant we are evaluating, we must determine whether there are multiple criteria values for that pollutant that differ by use. If different criterion values are applicable for a given pollutant, the focus in the Tier 1 review will be on the criterion for the use that requires better water quality. The use requiring better water quality is referred to as the most sensitive use[9]. This will vary from pollutant to pollutant. Some examples will clarify this.

Let us consider a water body that has cold water aquatic life and primary contact recreation as existing or designated uses.

Case 1 – Criterion for one use category but not the other.

If bacteria is the pollutant, then a criterion exists for the recreation use but not for aquatic life, so recreation use is the most sensitive use for bacteria. For temperature and dissolved oxygen, criteria exist for aquatic life but not recreational use, and so aquatic life is the most sensitive use for temperature and dissolved oxygen.

Case 2 – Criterion for both use categories.

If arsenic is the pollutant, then there are different criteria values to protect aquatic life uses and recreational uses. For arsenic, the criterion[10] for recreation, set to protect human health, is at lower levels than the arsenic criteria for aquatic life; thus, recreation is the most sensitive use. If selenium, zinc, or cyanide is the pollutant under evaluation, then the most sensitive use is aquatic life.

The example described above involves numeric criteria. Narrative criteria are fundamentally no different and can create either of the situations exemplified in the two cases above. A common example is sediment, for which aquatic life is generally the most sensitive use.

[9] When we say most sensitive it is in the context of what we know now. There may be a more sensitive use that we are not aware of when we make this determination.

[10] Human health criteria for toxins such as arsenic applicable to water protected for recreation are based on exposure due to consumption of fish.

5 Tier 2 Analysis – Is Degradation Necessary and Important?

This section of the document describes the analysis necessary to determine whether significant degradation of high quality (Tier 2) water is justified. It also describes how DEQ will determine if degradation is significant or not, and how DEQ will be assured that controls on other sources of pollution to a high quality water body are being implemented before allowing justifiable degradation. Examples of Tier 2 antidegradation reviews are provided in Appendix E.

For waters that are determined to be of high quality (see Tier 2 determination in section 2.2 Assignment of Tier 2 Protection), the rules at IDAPA 58.0102.051.02 require that before DEQ allows degradation that is significant it must be shown to be:

> "…. necessary to accommodate important economic or social development in the area in which the waters are located."

This requirement can be broken down into two components: 1) necessity of the degradation in water quality; and 2) importance of social or economic development associated with an activity or discharge. Hereafter we refer to this simply as necessary and important. For the latter the geographic scope—the area in which the waters are located—is a necessary consideration that must be defined during the analysis. Assuring that degradation of high quality waters is necessary and important has been part of the federal regulation since 1983 and DEQ policy in rule since 1993.

While necessity and importance are the core of Tier 2 analysis, federal regulations (40 CFR 131.12(a)(2)) and Idaho policy in rule (IDAPA 58.0102.051.02) also require:

> "In allowing such degradation or lower water quality, the Department shall assure water quality adequate to protect existing uses fully. Further, the Department shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and cost-effective and reasonable best management practices for nonpoint source control."

In 2011, Idaho codified in rule antidegradation implementation procedures that address the above longstanding policy requirements and provide details on the determination of necessary and important degradation. The new rules also provide for allowing insignificant discharges without Tier 2 analysis.

For allowable degradation, it is always necessary to assure water quality will still adequately protect existing uses. That is the purpose of Tier 1 protection, which is provided to all waters and is addressed in section 4 Tier 1 Review – Protecting Existing Uses. Tier 2 protection is, in effect, an extra level of protection for some waters that goes above and beyond Tier 1 protection.

The remainder of this section goes into detail on four questions that come up only in Tier 2 antidegradation analysis:

- Is the discharge insignificant?

- Are other required controls in place and operating?
- Is the degradation necessary?
- Does the activity bring important social or economic development to the affected community?

Before considering these questions, it should be noted they apply only to:

- activities or discharges that will cause degradation, of
- high quality water where Tier 2 protection is assigned, and
- when an applicant applies for a new or renewed permit or license.

5.1 Insignificant Degradation

Although the federal regulations make no mention of insignificant degradation, court cases have allowed for activities or discharges that are "de minimis," that is, too trivial to warrant governmental regulatory concern[11]. The purpose of determining whether some degradation is insignificant is to ensure that limited state resources are focused where they can provide the most good. A determination of insignificance simply means that Idaho is willing to overlook degradation that has little effect in order to focus on discharges or activities that create a larger amount of degradation. Determining that a discharge or activity is significant does not mean that the activity or discharge cannot take place, only that the discharge or activity will need to be justified as necessary and important before it can be permitted.

Idaho's antidegradation rule provides for determining a discharge is insignificant. Specifically, Idaho's rule at IDAPA 58.01.02.052.08.a provides:

> **a.** Insignificant Activity or Discharge. The Department shall consider the size and character of an activity or discharge or the magnitude of its effect on the receiving stream and shall determine whether it is insignificant. If an activity or discharge is determined to be insignificant, then no further Tier II analysis, as set forth in Subsections 052.08.b., 052.08.c., and 052.08.d., shall be required.
>
> i. The Department shall determine insignificance when the proposed change in an activity or discharge, from conditions as of July 1, 2011:
>
> (1) Will not increase ambient concentrations by more than ten percent (10%); and
>
> (2) Will not cumulatively decrease assimilative capacity by more than ten percent (10%).
>
> ii. The Department reserves the right to request additional information from the applicant in making a determination a proposed change in discharge is insignificant.

[11] In the specific case of antidegradation, the courts have accepted a loss of up to 10% of a water body's assimilative capacity as de minimis, as long as there is a cumulative cap on excused degradation (Kentucky Waterways Alliance v. EPA, 540 F.3d 466 (6th Circuit) Decided Sept. 3, 2008). A 10% threshold for significance is also stated in a August 10, 2005 EPA memo regarding "Tier 2 Antidegradation Reviews and Significance Thresholds" signed by Office of Science and Technology Director Ephraim King.

If ambient concentrations were the only factor in determining significance of degradation the water quality criteria could be exceeded or all the assimilative capacity used up without a Tier 2 analysis. This is prevented by having a cap on cumulative degradation in water quality that is considered insignificant. Idaho bases its cap on assimilative capacity.

Assimilative capacity is the difference between ambient concentration and concentration allowed by the controlling criterion. Idaho set a cumulative cap at 10% of assimilative capacity and establishes water quality conditions as of July 1, 2011 as the baseline. Without a cumulative cap, a series of insignificant discharges over time could cumulatively consume a significant share, or all, of the assimilative capacity and ultimately degrade water quality down to the level of the criterion without necessity and importance ever being questioned. A cumulative cap merely prevents the lack of analysis that could occur through a series of incremental steps, none of which are significant in themselves.

If a 10% reduction in assimilative capacity were the only factor used to determine insignificance it would result in the largest change in water quality in the best quality water. Additionally, the first activity to occur could use up the entire allowance for insignificance resulting in all later increases in discharge being subject to Tier 2 analysis. In Idaho's view, the better the water quality is to start with, the more significant a given quantity of change is. Therefore, Idaho limits the cumulative reduction in assimilative capacity to 10% combined with a limit on increase in ambient concentration of 10% for insignificance. The latter is not cumulative; thus, each change in discharge is limited to 10% of ambient concentration and if water quality is very high to begin with allows for multiple insignificant discharges before the cap is hit.

The two work together as depicted in Figure 5, so that the greatest amount of change in a pollutant concentration that can be dismissed as insignificant would occur when the ambient concentration of that pollutant as of July 1, 2011, is at half its criterion.

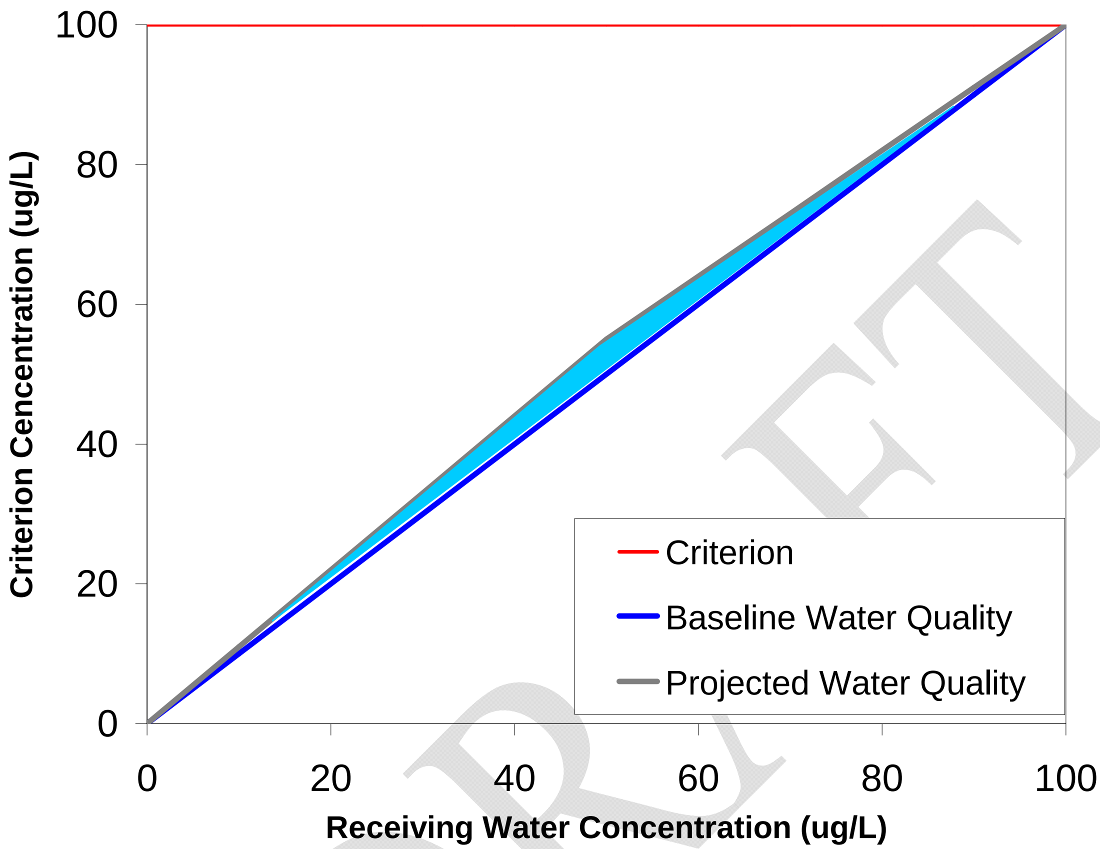


Figure 5. This graph illustrates what would be considered "insignificant" when examining a single new/increased discharge in a high quality water without consideration of a cumulative cap. First, you determine the applicable baseline water quality. From this information, you compare and determine which is more limiting – the proportion of baseline or the proportion of assimilative capacity. Whichever is more limiting is the basis for an insignificance determination. The blue shaded area is considered insignificant in this example.

This can also be tabulated as shown in Table 4.

As an example, consider pollutant "Y" with a criterion of 100 ug/L and an ambient concentration of 20 ug/L as of July 1, 2011. The threshold for determining significance based on ambient concentration is 2.0 µg/L. The assimilative capacity for Y in the water is 80 ug/L and the threshold based on assimilative capacity would be 8.0 ug/L with a cumulative cap of 28.0 ug/L (10% of 80 ug/L = 8 ug/L added to the ambient concentration of 20 ug/L = 28 ug/L). In this example 2.0 µg/L (10% of ambient), determines the significance of individual changes, up to the cumulative cap, after which all additional change is significant.

Table 4. Example of Ambient Concentration, Assimilative Capacity, and Associated Significance Thresholds (all values in ug/L)

Ambient Concentration (July 1, 2011)	Assimilative Capacity (July 1, 2011)	10% of Assimilative Capacity	10% of Ambient Concentration	Threshold Water Quality Change for Significance
10	90	9.0	1.0	1.0
20	80	8.0	2.0	2.0
30	70	7.0	3.0	3.0
40	60	6.0	4.0	4.0
50	50	5.0	5.0	5.0
60	40	4.0	6.0	4.0
70	30	3.0	7.0	3.0
80	20	2.0	8.0	2.0
90	10	1.0	9.0	1.0
100	0	0	10	0

For pollutant Y (ambient concentration of 20 ug/L as of July 1 2011 and criterion of 100 ug/L), Example 1 (Table 5) illustrates how this would work for a series of six proposed changes in discharge. In only two of the illustrated cases would the change in water quality be considered significant. The first case is the one caused by the discharge change on Aug 1, 2012 when the corresponding change in receiving water concentration would be greater than the 2.0 ug/L threshold. The second case is the final discharge. Although, in the latter case, the receiving water concentration would only change by 1 ug/L from the previous concentration, the cumulative change would exceed the allowed 10% change in assimilative capacity. Therefore, the last discharge would not be insignificant.

Table 5. Example 1 of Significance Determinations for a Series of Changes in Discharge

Date of Change in Discharge	Receiving Water Concentration (ug/L) After Mixing	Water Quality Change Significant?
(as of July 1, 2011)	20 ug/L	—
Sept 30, 2011	21	No
July 30, 2012	22	No
Aug 1, 2012	25	Yes, change is greater than 10% of starting ambient water concentration
Nov 30, 2012	26.5	No
Dec 16, 2012	28	No
Jan 1, 2013	29	Yes, cumulative change in receiving water concentration exceeds 10% of starting assimilative capacity

Consider a second example for the same pollutant (criterion of 100 ug/L) in another water body where the ambient concentration was 80 ug/L as of July 1, 2011. The threshold for determining significance based on ambient concentration would be 8.0 ug/L. The assimilative capacity for pollutant Y in the water would be 20 ug/L and the threshold based on assimilative capacity would be 2.0 ug/L with a cumulative cap of 82.0 ug/L (10% of 20 ug/L = 2 ug/L added to the ambient concentration of 80 ug/L = 82 ug/L). In this example 2.0 µg/L (10% of assimilative capacity), determines the significance of individual changes, up to the cumulative cap, after which all additional change is significant.

Example 2 in Table 6 illustrates how this would work for the same series of proposed discharge changes in discharge as in Example 1. Only the first discharge could claim insignificance. All subsequent discharges are over the cumulative cap and are thus significant, even though the incremental change for each of the fourth through sixth discharges is less than 2.0 μg/L.

Table 6. Example 2 of Significance Determinations for a Series of Changes in Discharge

Date of Change in Discharge	Receiving Water Concentration (ug/L) After Mixing	Water Quality Change Significant?
(as of July 1, 2011)	80	—
Sept 30, 2011	81	No, change is < 10% of assimilative capacity and under cap
July 30, 2012	82.1	Yes, change is < 10% of assimilative capacity but over cap
Aug 1, 2012	85	Yes, over cumulative cap
Nov 30, 2012	86.5	Yes, over cumulative cap
Dec 16, 2012	88	Yes, over cumulative cap
Jan 1, 2013	89	Yes, over cumulative cap

Analysis of insignificance is necessarily done by pollutant. Thus, it is possible that some proposed changes in pollutant discharge will be found insignificant while others are significant for the same discharge. When this is the case, even one pollutant causing significant change in water quality will trigger the need to take Tier 2 analysis further. If the proposed change in all pollutants evaluated is insignificant, then the discharge as a whole is insignificant and further Tier 2 analysis is not needed.

If a proposed activity or discharge is determined significant, it only means further Tier 2 analysis is required, it does not automatically mean the discharge is not allowed. It is possible that no changes in the discharge as proposed are needed before allowing the discharge but that is the subject of alternatives analysis.

Baseline Water Quality as of July 1, 2011

Conditions as of July 1, 2011 does not mean the water quality exactly on that date and that date alone, but rather the water quality under critical conditions that would exist given authorized discharges as of that date. This is the baseline water quality for judging degradation from new or increased activities or discharges after July 1, 2011.

For many water bodies, DEQ will lack the monitoring data to document the baseline water quality as of July 1, 2011. In this situation, it will be necessary for DEQ to do its best to estimate water quality under critical conditions by starting with measurements or calculations of present water quality, then “backing out” all increases in pollutant loads authorized since July 1, 2011, to find water quality as of that date.

See section 3.1 Receiving Water Quality for more on determining baseline water quality.

5.2 Assurance Other Controls Are Achieved

Federal regulations (40 CFR 131.12(a)(2)) and Idaho's policy in rule (IDAPA 58.0102.051.02) require that degradation of high quality water cannot be allowed unless measures to control other sources of water quality degradation in the watershed will be achieved. In the Idaho policy, this is stated as:

> In allowing any degradation of high water quality, the Department must assure that there shall be achieved in the watershed the highest statutory and regulatory requirements for all new and existing point sources and cost-effective and reasonable best management practices for nonpoint source controls. In providing such assurance, the Department may enter together into an agreement with other State of Idaho or federal agencies in accordance with Sections 67-2326 through 67-2333, Idaho Code.

The WQS define "cost-effective and reasonable best management practices (BMPs) for nonpoint source" as approved BMPs specified in the Idaho WQS and "highest statutory and regulatory requirements for point sources" as:

> "All applicable effluent limits required by the Clean Water Act and other permit conditions. It also includes any compliance schedules or consent orders. " IDAPA 58.0102.010.45

Because water and its pollutant load flow downhill this mandatory obligation on the part of DEQ is interpreted to apply only to sources that are upstream of the discharge under review. While no more is required of other sources than already is required before a new activity or discharge is proposed, this rule language does require DEQ to check up on other sources, in the context of proposed degradation of water quality, and verify they are doing what is required of them.

For other point sources that have NPDES permits, this verification means looking at permit compliance reports and identifying any matters of non-compliance that indicate more pollutants are being discharged than permitted, or that information is lacking, such as in any failure to monitor effluent as required. This is required to determine whether permitted discharges upstream are being exceeded. For nonpoint sources with mandatory BMPs, e.g., forestry activities, DEQ will assume programs that are in place, such as forest practice audits and development of site-specific BMPs, are ensuring compliance, unless DEQ is provided with information to the contrary.

DEQ will work with and rely on other agencies to verify all required pollution controls for point sources and cost-effective and reasonable BMPs for nonpoint sources are in fact in place and operating.

If noncompliance with required pollutant discharge controls is identified anywhere upstream, that will be reason for denying certification of a proposal for an activity or discharge that will significantly degrade water quality, at which point there is no point to carrying the analysis further. If other controls are what they should be, then it is appropriate to look at alternatives to degradation.

5.3 Assuring Necessity through Analysis of Alternatives to Degradation

As stated at the outset of this chapter, federal and state regulations require that in order for DEQ to allow degradation of high quality water it must be *necessary* <u>*and*</u> *important*. This section describes the process of determining whether it is necessary, and the process of determining importance is described in the next section.

Determining whether the proposed pollution is necessary requires an analysis of the various alternatives that are available to the discharger to reduce or eliminate the amount of pollution associated with the discharge. This analysis of alternatives identifies feasible alternatives, evaluates the reasonableness of implementing them, and selects one that contributes the least amount of pollution possible under reasonable circumstances.

The Idaho antidegradation implementation rule (IDAPA 58.0102.052.08) establishes principles to be followed in identifying alternatives and selecting the least degrading alternative that is reasonable.

> **c.** Alternatives Analysis. Degradation will be deemed necessary only if there are no reasonable alternatives to discharging at the levels proposed. The applicant seeking authorization to degrade high water quality must provide an analysis of alternatives aimed at selecting the best combination of site, structural, managerial and treatment approaches that can be reasonably implemented to avoid or minimize the degradation of water quality. To identify the least degrading alternative that is reasonable, the following principles shall be followed:
>
> i. Controls to avoid or minimize degradation should be considered at the earliest possible stage of project design.
>
> ii. Alternatives that must be evaluated, as appropriate, are:
> (1) Relocation or configuration of outfall or diffuser;
> (2) Process changes/improved efficiency that reduces pollutant discharge;
> (3) Seasonal discharge to avoid critical time periods for water quality;
> (4) Non-discharge alternatives such as land application; and
> (5) Offsets to the activity or discharge's effect on water quality.
>
> iii. The Department retains the discretion to require the applicant to examine specific alternatives or provide additional information to conduct the analysis.
>
> iv. In selecting the preferred alternative the applicant shall:
> (1) Evaluate economic impacts (total cost effectiveness, incremental cost effectiveness) of all technologically feasible alternatives;
> (2) Rank all technologically feasible treatment alternatives by their cost effectiveness at pollutant reduction;
> (3) Consider the environmental costs and benefits across media and between pollutants; and
> (4) Select the least degrading option or show that a more degrading alternative is justified based on Subsections 052.08.c.iv.(1), 052.08.c.iv.(2), or 052.08.c.iv.(3) above.

Thus, consideration of alternatives that would still allow the desired development with less or no pollution is a required part of the Tier 2 demonstration of necessity.[12]

[12] See EPA Advance Notice of Proposed Rulemaking (ANPRM) 63 Federal Register 36742, 36784 (1998).

Timing and Integration of Alternatives Analysis

DEQ believes earliest possible consideration of alternatives that will reduce or eliminate pollutant discharge is of paramount importance to minimizing project delay or redesign during water quality permitting and ultimately meeting the intent of antidegradation to maintain high water quality.

It is not DEQ's intent to create a whole separate analysis of alternatives in project design. Rather, to the extent there is a proposed discharge of pollutants that could degrade water quality, DEQ believes it is prudent to consider the implication of water quality degradation and the Idaho antidegradation requirements at the outset and integrate them into project design. To this end DEQ encourages early communication between project designers, EPA or ACOE permit writers, and DEQ staff that will be responsible for review of an application for permit or license.

Identifying Non-Degrading and Less-Degrading Pollution Control Measures

Minimizing degradation of water quality is not just a matter of better waste treatment. It is a matter of thinking through an entire process with attention to waste generation as well as treatment, and manner of waste disposal. This can involve changes in location or timing of discharge to surface water, as well alternatives to direct discharge to surface waters, such as land application, groundwater injection, or reuse. Finally an entity considering new or increased discharge of pollutants could work with other dischargers upstream in the same watershed to reduce upstream degradation and thereby offset their own proposed adverse effect on water quality.

For facilities that have an outfall, relocation or reconfiguration of an outfall or diffuser must be considered. While this action alone will not reduce pollutant loads it can be effective in reducing receiving water concentrations and thus the effect on beneficial uses. This is particularly true where a larger stream offering greater assimilative capacity is nearby and will be most useful as a consideration in location of a new facility, but for existing discharges it could be beneficial to extend pipe to a larger stream. Diffusers, which do not alter fully mixed concentrations, are effective in altering the extent and distribution of elevated pollutant concentrations and thus minimizing harmful effects..

Generation of waste that needs to be treated and discharged might be reduced through changes in industrial process or greater efficiency in raw material utilization. The latter will save material cost as well as reduce waste. Sometimes a substitution in materials is found to be worthwhile if more costly raw materials create even greater savings in waste treatment costs. For a municipality, waste reduction could include such things as hazardous waste education and collection to reduce loads at the source. Another example might be cogeneration or recovery of heat from an effluent.

Usually there is a critical or limiting time for waste discharge, typically during seasonal low flows when assimilative capacity of flowing waters is at a minimum. Such low flows also often correspond with seasonally high temperatures which are adverse to some forms of aquatic life. If wastewater can be stored seasonally or alternatively discharged seasonally, e.g. through land application or irrigation use during the summer, the critical time for aquatic life and recreation use may be avoided and thus reduce overall degradation of water quality and need for load reduction.

An overall goal of the CWA is zero discharge, an intent also captured in the National Pollution Discharge *Elimination* System. One way to achieve zero discharge, an alternative to total treatment, is to not discharge wastewater to surface water but rather to land apply it, inject it into ground water or use a closed loop reuse system. These all have their limitations, e.g. potential impacts to groundwater and indirectly to surface water, and their own permitting requirements. But for some processes in some settings such non-discharge alternatives can be viable. With the increasing shortage of water in many areas and overall increase in the value of water as a resource, some form of reuse, even if not in the original process, will likely become more attractive and commonplace with time.

Often there are multiple sources of pollution especially for any sizeable receiving water body. Some sources may have been operating for a long time and although they are discharging legally, redesigning their facilities or processes may provide for greater pollution reduction than better design of a new source would. This creates an opportunity for the operator of a proposed new or increased discharge to join forces with other dischargers and forge a binding agreement that would reduce their combined pollutant loads and improve water quality of the water body as a whole compared to what may otherwise be the case.

Technology advances, and society's values change as well. There are plenty of examples in which what was once unreasonable or not even considered becomes possible, then reasonable, and eventually the norm. This is the likely progression for water use and treatment. New efficiencies and treatment technologies are almost certain to arise, driven in part by society's values and also made affordable by society's relative values. But these things cannot be predicted beyond general terms. To account for such changes, DEQ has reserved the right to require an applicant to examine specific alternatives to reducing waste generation.

The overall goal of alternative analysis is to find ways to minimize or eliminate the detrimental effect on water quality by whatever means can be reasonably implemented. This analysis will likely result in the identification of multiple reasonable alternatives. While some cost savings may ensue from some of the alternatives, for the most part steps to discharge less pollution are going to cost more.

Evaluating Alternatives and Making a Choice

While only technologically feasible alternatives should be considered, they will likely vary in their level of pollutant loading and may not all be reasonable. They may vary widely and non-linearly in cost-effectiveness of pollution reduction and involve competing environmental costs and benefits. Discharge alternatives will also rank in cost to the discharger and at some point will become unaffordable. Choosing the preferred alternative becomes a matter of balancing cost of pollution reduction versus overall environmental gain, while remaining affordable.

This is not easy as it pits societal values and costs, often hard to quantify, against treatment costs to the project sponsor that are easier to quantify or otherwise delineate. It is always cheaper for a discharger to do the minimum level of pollution control and up to society to demand otherwise. In many cases, treatment costs can be and are passed on to the consumer, e.g. ratepayers in the case of a publicly-owned sewage treatment plant. Who will ultimately bear the cost is important in fairly assessing affordability.

To make the selection process more systematic a four step winnowing of alternatives is recommended, in which the following are determined:

1. amount of degradation caused,
2. cost-effectiveness of pollutant removal,
3. environmental cost-benefit tradeoffs, and
4. affordability of alternatives.

Because there are steps described in both the analysis of alternatives and the analysis of social and economic importance, the alternative analysis steps are labeled AA (the socioeconomic importance steps, in the next section, are labeled SEI).

AA Step 1 – Ranking alternatives from least to most degrading

First, all feasible alternatives should be ranked from least to most degrading of water quality. The applicant may bypass further analysis of alternatives (steps 2-4) by selecting the least degrading alternative feasible.

If the applicant opts for the least degrading alternative at this point, the test of degradation necessity is met and analysis to determine social and economic importance should be conducted. If the least degrading feasible option is not preferred, then the next least-degrading alternative may be justified as reasonable on the basis of cost-effectiveness of improved pollutant reduction, environmental trade-offs, or affordability. Steps 2-4 are optional, needed only if the applicant wishes to justify that an alternative other than the least degrading feasible alternative is reasonable.

AA Step 2 – Ranking alternatives by the cost-effectiveness of their pollutant reduction

If proceeding, step 2 is to rank alternatives by their pollutant-reduction cost-effectiveness. Cost-effectiveness looks at the cost per unit mass of pollutant removed, e.g., dollars per pound ($/lb). Most processes generate an effluent stream or volume per day, therefore cost-effectiveness becomes unitized as $/lb/million gallons per day [MGD], or other comparable units.

Greater pollution reduction will typically cost more, but economies of scale and alternate technologies will result in different per-unit costs.[13] It is not within the scope of this guidance to go into detail on treatment costing and the amortization of initial capital costs versus ongoing operation and maintenance costs. Suffice it to say that if alternatives are ranked by their per-unit pollutant reduction costs, the marginal cost of improved pollutant reduction can be simply compared. Doing so may allow the justification of a more-degrading alternative if the incremental cost of improved treatment far outweighs the incremental gain in pollutant reduction.

For example, if the least-degrading alternative removes 100 lbs of a pollutant for $10,000 per MGD, the unit cost is $100/lb/MGD. If the second-least-degrading alternative removes 90 lbs of the pollutant for only $900 per MGD, its unit cost is only $10/lb/MGD. The latter is much more cost-effective as there is a sharp jump in per- pound cost for removing the additional 10 lbs/MGD, a marginal cost of $910/lb/MGD (($10,000 - $900) / 10 lbs). In this case, it would be easy for the discharger to argue that the marginal cost of removing 10 more lbs of pollutant was unreasonable and thus the next best alternative should be accepted as the preferred alternative. In this way, alternatives that impose a cost that is disproportionate to the possible environmental gain may be eliminated from further consideration.

Consider the previous example further. If the third-least-degrading alternative could achieve pollutant reduction of 50 lbs at a cost of $450 per MGD, the cost per lb of treatment would be only slightly better at $9/lb/MGD and the marginal cost of nearly doubling pollutant removal compared to using the second-least-degrading alternative would be $11.25/lb/MGD ($900 - $450 / 40 lbs). Cost-effectiveness alone should not rule; it should be tempered by consideration of affordability and standard practice in the industry. In this example, the second-best alternative is only slightly less cost effective than the third-best ($11.25/lb/MGD vs $10/lb/MGD) but offers a large improvement in pollutant load reduction. While overall treatment costs double they may still be quite reasonable—both affordable and worthwhile give their cost-effectiveness. Furthermore, if the $900 per MGD second-best alternative is commonly practiced by similar modern dischargers, then the argument for the cheaper option is even weaker.

AA Step 3 – Considering environmental trade-offs

The example above, comparing alternatives' cost-effectiveness, looks at only one pollutant in isolation. There are almost always multiple pollutants in a discharge and what may be the best alternative for one may not be the best for another. This is a situation in which a lot of judgment is involved, both professional and through engagement with the public and their sense of value.

[13] Some costs of treatment will be scalable. For example, power costs and cost of reagents such as alum go up in proportion to the volume treated. However, differing treatment alternatives have differing costs that aren't always proportional to volume. Instead, a doubling of pollutant reduction may cost more or less than twice as much. Therefore, options are best compared on a per unit basis, taking into account all various costs and their timing.

As a hypothetical example, a discharge may involve adding heat as well as phosphorus to a receiving water. Some of the treatment processes and alternatives may be quite different, e.g., chilling for temperature and ultra-filtration for phosphorus; maximizing one will do nothing for the other and treatment costs will be additive. Finding the optimum environmental solution in this situation may involve some intermediate level of treatment of both, especially if affordability is an issue. A compromise in treatment may also be warranted if it is found that one of the pollutants is more limiting to support of beneficial uses. In the latter case, it would make more environmental sense to favor the treatment of the limiting pollutant; in this example, favoring temperature reduction over phosphorus reduction. This could be further complicated if costs of treating temperature are substantially greater than the cost of treating phosphorus. In that case phosphorus treatment may offer more environmental benefit per unit cost of pollutant reduction, even though temperature overall is judged the more limiting pollutant. Another alternative for treating both may avoid all this, e.g. land application could deal with both temperature and phosphorus at once, without additive costs for each pollutant, but a trade-off may occur in that there would be less water in the receiving water body.

Another form of environmental trade-off is between media—that is, reducing discharge to water may create more air pollution or solid waste to be disposed of. In addition to the direct effects of increased pollutant loads to other media, either of the latter may eventually affect water quality as well. For example, we may question the virtue of using electricity to run chillers to cool effluent temperatures (to keep our streams cooler) when we have every reason to believe the release of carbon dioxide from thermo-electric power generation contributes to global warming and thus to warming stream temperatures.

The choices may be difficult to delineate and hard to illuminate. It will be difficult if not impossible to quantify such trade-offs in a common currency such as $/lb/MGD but efforts to do so will be useful and will help reduce the amount of judgment that will otherwise be required. No easy answers can be given, but nonetheless DEQ believes that thinking about and considering such trade-offs is important if not necessary. The applicant is encouraged to raise issues of environmental trade-offs, and may but is not required to quantify them.

The only thing we know for sure is that the less pollution discharged to the environment the better environmental quality will be. Finding the best place or medium in which to discharge them, and determining what is the most economically efficient way to treat and handle waste considering both public and environmental health versus public or private economic health is an ongoing challenge. It is suggested that the best way to proceed through the fog of understanding that is still developing and values that are changing as well is to have open public discourse on the most environmentally beneficial alternative. The applicant must get concurrence from the agency and public in eliminating an alternative due to adverse environmental trade-offs.

AA Step 4 – Judging affordability

Following an analysis of pollutant-reduction cost-effectiveness and environmental trade-offs, the affordability of the best remaining alternatives may be assessed at the applicant's discretion. This assessment may be used to determine if an alternative is too expensive to reasonably implement. This approach might result in the selection of the next-least-degrading alternative, while maintaining affordability to the public or private entity. Alternatives identified as technologically feasible are considered affordable if the applicant does not supply an affordability analysis.

The determination of affordability for public and private entities is an emerging issue nationally. As such, federal guidance has not yet been finalized. Until such time, the applicant should use EPA's water quality standards handbook – "Interim Economic Guidance for Water Quality Standards," EPA-823-B-95-002 (1995). This guidance document presents one set of public and private sector approaches. This interim guidance is not binding and may be replaced or supplemented with other methods of analysis, if sufficiently justified.

If the applicant determines that the least-degrading remaining alternative is affordable, then it is the preferred alternative. If it is not affordable, then the affordability of the next alternative should be evaluated until an alternative is chosen that is practicable, economically efficient, and affordable.

A demonstration that an alternative is not affordable should be clearly documented and should show that it would have a substantial adverse economic impact that would preclude its use for the activity/discharge under review.

If, after appropriate discussions with the discharger, DEQ determines that the necessity of the preferred alternative has not been demonstrated, DEQ shall deny certification of the activity as proposed.

5.4 Evaluating Social or Economic Importance

If the preferred alternative will result in degradation to the receiving waters, then the applicant must demonstrate that this alternative (or "activity") will result in important economic or social development in the area in which the waters are located. *Social or Economic Justification* (SEJ) entails showing that the social or economic benefits occurring from an activity are important to the affected community. An activity need be socially or economically important, not both. Depending on the nature of the project, it may be prudent to focus on one or the other.

The Idaho antidegradation implementation rule (IDAPA 58.0102.052.08) establishes principles to be followed in showing socio-economic justification of an activity that will cause significant degradation:

> **d.** Socioeconomic Justification. Degradation of water quality deemed necessary must also be determined by the Department to accommodate important economic or social development. Therefore, the applicant seeking authorization to degrade water quality must at a minimum identify the important economic or social development for which lowering water quality is necessary and should use the following steps to demonstrate this:
>
> i. Identify the affected community;
>
> ii. Describe the important social or economic development associated with the activity which can include cleanup/restoration of a closed facility;
>
> iii. Identify the relevant social, economic and environmental health benefits and costs associated with the proposed degradation in water quality for the preferred alternative. Benefits and costs that must be analyzed include, but are not limited to:
>
> (1) Economic benefits to the community such as changes in employment, household incomes and tax base;
>
> (2) Provision of necessary services to the community; (3)Potential health impacts related to the proposed activity;
>
> (4) Impacts to direct and indirect uses associated with high quality water, e.g., fishing, recreation, and tourism; and
>
> (5) Retention of assimilative capacity for future activities or discharges.
>
> iv. Factors identified in the socioeconomic justification should be quantified whenever possible but for those factors that cannot be quantified a qualitative description of the impacts may be accepted; and
>
> v. If the Department determines that more information is required, then the Department may require the applicant to provide further information or seek additional sources of information.

A project that is socially justified is one that is important to the social development of the local community in at least one aspect, e.g., population growth. Socially justified projects are likely to be publicly-owned treatment works that provide capacity for wastewater treatment. Socially justified projects would need to demonstrate that there is some local need for the project, i.e., identify the social conditions and relate how the project would fulfill those needs.

A project that is economically justified is a project that is important to the economic development of the local community. Economic development projects would include those that increase the economic base of the local community. An analysis of the economic importance of a project would likely require more in-depth analysis covering how the costs of the proposed degradation (including downstream effects) are offset by benefits to the community. This would be a simplified cost-benefit analysis and is more applicable to non-public dischargers.

The applicant should use the following three steps to show the SEJ:

1. Identify the affected community.
2. Identify the relevant factors that characterize the environmental and social or economic conditions of the affected community.
3. Describe the important social or economic development associated with the activity.

SEI Step 1 – Identify the affected community

The affected community is the community in the geographical area in which the waters are located. This area should be large enough to include both the people living near the site of the proposed activity and those in the community who are expected to directly or indirectly benefit from the activity.

SEI Step 2 – Identify the factors that characterize the environmental and social or economic conditions of the affected community

In order to describe the economic or social development associated with the proposed project, the applicant will first need to determine the social and economic factors that best characterize the affected community. Examples of social and economic factors include:

- Employment rate
- Personal or household income
- Property values / community tax base
- Provision of necessary public services (e.g., fire department, school, infrastructure)
- Current or potential public health or safety problems (e.g., levels of lead in people's blood)
- Impacts to uses based on water quality (e.g. fishing, recreation, tourism)
- Retaining assimilative capacity for future industry and development

The social and economic measures identified above do not constitute a comprehensive list. Nor will all be relevant to all activities or discharges. Each situation and community is different and will require an analysis of unique social and economic factors. The applicant is encouraged to consider analyzing additional factors that characterize the specific community under consideration.

SEI Step 3 – Describe the important social or economic development associated with the activity

Following the identification of appropriate social and economic measures, the applicant must describe the expected changes in these factors that are associated with the project. The purpose of this step is to demonstrate whether important social or economic development will result from the project. The applicant should first describe the existing condition of the affected community. This baseline condition should then be compared to the predicted change (benefit or loss) in social or economic condition should the activity be allowed.

Upon the consideration of all relevant factors, the project will be considered to provide important social or economic development if the applicant demonstrates that the project will lead to overall beneficial changes in the factors presented (i.e., increased jobs, employment, housing, or other appropriate factors balanced against the benefits associated with maintaining a higher level of water quality). This determination will be made on a case-by-case basis using information provided with the application and obtained from the public. Activities which provide necessary public service such as a wastewater treatment plant, hospital, or school, or their expansion, will always be likely to be socially important regardless of economic effect on the community.

When information available to DEQ is not sufficient to make a determination regarding the social and economic benefits or environmental impacts associated with the proposed activity, DEQ may request that the applicant submit additional information.

If, after appropriate discussions with the discharger, DEQ determines that the SEI of the proposed activity has not been demonstrated, DEQ shall deny certification of the proposed activity.

5.5 Summary of the Justification for Degrading Water Quality

The preceding discussion describes the approach that shall be followed by the applicant for determining whether less- or non-degrading alternatives to the proposed activity will be required to prevent degradation of Idaho surface waters. The following steps summarize the alternatives analysis process and other relevant actions conducted during Tier 2 antidegradation reviews:

- If it is determined that significant degradation would likely occur due to the proposed activity, an analysis of less-degrading and non-degrading alternatives to the proposed activity will be required.
- The applicant will be required to identify feasible pollution control alternatives including those that would result in no degradation, and other less-degrading alternatives as appropriate, in addition to the minimum level of pollution control required.

- If the applicant does not prefer the least degrading feasible alternative, the applicant may justify the next least-degrading alternative or mix of alternatives as reasonable.
- To justify a more-degrading option as reasonable the applicant must evaluate the pollutant reduction cost-efficiency, environmental trade-offs, or affordability associated with each option or mix of options.
- The applicant will identify the least degrading alternative – or mix of alternatives – that is reasonable based on the above evaluation. This will be the preferred option.
- If the preferred option (i.e., pollution control alternative or mix of alternatives) will not result in significant degradation of the receiving water segment, DEQ will certify the activity.
- If the preferred option (i.e., pollution control alternative or mix of alternatives) will result in significant degradation of the receiving water, the applicant will be required to conduct an analysis of economic or social benefit.
- If the preferred option is deemed to be socially or economically important, DEQ will certify the activity.

X Outstanding Resource Waters

[To be added.]

6 General Permits, Dredge and Fill Permits, and FERC Licenses

A number of relatively similar discharges to surface waters may be authorized under a single general NPDES permit issued by Region 10 EPA. Such discharges include storm water runoff from industrial facilities, mining and processing facilities, aquaculture facilities, confined animal feeding operations, and construction sites that are one acre or larger. These NPDES permits are currently issued by EPA and thus subject to §401 certification by the State of Idaho. Section 401 certification is also required with §404 dredge and fill permits and FERC operation licenses. These permits and licenses must meet antidegradation requirements.

Except as described below, regulated activities authorized by existing general permits (that are currently in effect, not expired) are not required to undergo a Tier 2 antidegradation review as part of the Notice of Intent process. However, new and reissued general permits must be evaluated to consider the potential for degradation as a result of the collection of permitted discharges they cover.

6.1 Antidegradation Review of General Permits

All NPDES general permits require that permit conditions be met, including the general requirement that permitted discharges must ensure that water quality standards are not violated and best management practices contained in the permit are implemented. Compliance with the terms of the general permits issued by EPA and certified by DEQ is required to maintain authorization to discharge under the general permit. Discharges that might be covered by a general permit but cannot comply with general permit conditions or antidegradation requirements will be required to seek coverage under an individual permit.

For discharges authorized by new or reissued general permits, antidegradation reviews will be conducted for the entire class of general permittees at the time DEQ reviews the permit to decide whether or not to certify the general permit complies with state water quality standards. Antidegradation reviews will focus on pollutants that may contribute to water quality degradation, and will examine whether water quality criteria are met, whether degradation is likely to occur, and whether the permit conditions or permit record satisfies the requirements of the Tier 2 analysis. If DEQ finds that the general permit adequately addresses antidegradation at the time the permit is issued, then DEQ will not need to include conditions specific to antidegradation in its §401 certification of the permit.

However, if DEQ cannot determine that the general permit adequately addresses antidegradation at the time the permit is issued, DEQ must include conditions in the §401 certification that provide reasonable assurance that activities covered under the general permit will comply with the antidegradation policy. Depending on the type of activities covered under the general permit and the conditions and requirements of the general permit, conditions that DEQ may incorporate into the §401 certification include:

- Requiring sufficient controls such that no significant degradation, either individually or cumulatively, will be reasonably expected to occur. The effectiveness of such controls must be documented in the official administrative record for the permit.
- Subjecting all or a subset of new or expanding discharges to high quality waters to a Tier 2 analysis at the time a Notice of Intent for coverage (NOI) is submitted;
- Requiring an opportunity for public comment on submitted NOIs for all or a subset of new or expanding discharges to high quality waters.
- Retaining DEQ’s authority to, after reviewing submitted NOIs, require an eligible discharge to undergo a Tier 2 analysis if it is determined that degradation may occur as a result of cumulative impacts from multiple discharges to a water body, or as of result of impacts from a single discharger over time, or as a result of other individual circumstances.

Existing Activities or Discharges

Regulated activities authorized by currently effective general permits are not typically required to undergo a Tier 2 antidegradation review as part of the Notice of Intent process. Furthermore, existing activities or discharges currently covered under an effective general permit will be deemed to comply with the antidegradation policy when seeking coverage under a reissued general permit as long as the activity or discharge is not expanding. However, if the activity or discharge is expanding, it must comply with any new antidegradation requirements of the reissued general permit.

Additionally, existing activities or discharges that become regulated for the first time will generally be deemed to not cause degradation because the mere fact of becoming regulated will limit their discharge for the first time and will be a step toward reducing their degradation of water quality. It still needs to be determined that water quality standards will be met and thus Tier 1 antidegradation review requirements met.

New Activities or Discharges

New activities or discharges seeking coverage under a general permit for the first time will be required to comply with the antidegradation requirements of that general permit and associated §401 certification.

6.2 §404 Dredge and Fill Permits

Section 404 of the Clean Water Act regulates the placement of dredged or fill material into “waters of the United States.” The U.S. Army Corps of Engineers (ACOE or the Corps) administers the §404 permit program dealing with these activities (e.g., wetland fills, in-stream sand/gravel work, etc.) in cooperation with the EPA and in consultation with other public agencies.

In order to ensure that antidegradation and other water quality protection requirements are considered, reviewed, and met in a comprehensive and efficient manner, these requirements will be addressed and implemented through DEQ's §401 water quality certification processes. Under this approach, applicants who fulfill the terms and conditions of applicable §404 permits and the terms and conditions of the corresponding §401 water quality certification will have fulfilled the antidegradation requirements. Additional antidegradation considerations may be incorporated into §404 permits and the corresponding §401 certifications at the time of permit issuance. DEQ will not issue a §401 certification where degradation resulting from the project is not necessary to accommodate important social or economic development.

For activities covered under §404 general permits (e.g., road culvert installation, utility line activities, bank stabilization, etc.), the antidegradation review will be conducted at the time DEQ is reviewing the general permit for §401 certification. Similar to the process for general NPDES permits, the antidegradation review will focus on pollutants that may contribute to water quality degradation and will examine whether water quality criteria are met, whether degradation is likely to occur, and whether the permit conditions or the permit administrative record satisfies the requirements of the Tier 2 analysis

If the effects of an activity covered by a §404 general permit are short-term, DEQ may conclude because of the limited duration of discharge no degradation of water quality will occur. This would happen if, in DEQ's evaluation, we can determine that all appropriate and reasonable BMPs related to erosion and sediment control, project stabilization, and prevention of water quality degradation will be applied and maintained (e.g., preserving vegetation, stream bank stability, and basic drainage), As part of this evaluation, DEQ will consider cumulative impacts from other sources or impacts that result from an activity over a long period of time.

For discharges of dredged or fill material covered under an individual §404 permit, the ACOE must ensure that the §404(b)(1) guidelines have been met (40 CFR Part 230). These guidelines require that all appropriate alternatives to avoid and minimize degradation be evaluated. DEQ will coordinate with the Corps and the applicant to ensure that the analysis conducted to fulfill the 404(b)(1) guidelines will also fulfill the antidegradation review requirements.

6.3 Federal Energy Regulatory Commission Licenses

The Federal Energy Regulatory Commission (FERC) licenses the operation of dams that generate hydroelectric power. Applicants for these licenses are required to obtain §401 water quality certification. DEQ's certification will look at conditions that are necessary to comply with Idaho water quality standards, including antidegradation provisions.

Although dams merely impound water rather than adding anything to it, they do affect water quality in the impoundment and downstream. Water quality certification and antidegradation review thus are focused not on the effect of a traditional discharge but on the changes in water quality that result from the dam and its impoundment and how operations may alter that quality.

Under this approach, DEQ may place conditions on operations or require other actions to mitigate the effect on downstream water quality. Applicants who fulfill the terms and conditions of an applicable FERC license and the terms and conditions of the corresponding §401 water quality certification will have fulfilled antidegradation requirements. DEQ will not issue a §401 certification where degradation resulting from the project is not necessary to accommodate important social or economic development.

7 Public and Intergovernmental Participation in Antidegradation Review

Intergovernmental coordination in and public review of DEQ antidegradation reviews is perhaps the most important aspect of antidegradation protection. It is through intergovernmental coordination that achievement of other controls can be best assured and a full range of alternatives considered. Public review is essential to a legitimate determination of social and economic importance.

7.1 Intergovernmental Coordination

Intergovernmental coordination is required of DEQ prior to approving a regulated activity that would degrade Tier 2 surface water. This requirement seeks to ensure that all relevant public entities at the local, state, and federal levels are aware of any proposal to degrade high water quality and are provided with an opportunity to review, seek additional information, and comment on the proposal. An applicant may contact other government agencies to solicit their input, but if they do not DEQ will.

Agencies to be consulted as appropriate include:

- EPA Region 10
- U.S. Forest Service, Bureau of Land Management, Idaho Department of Lands, and other land management agencies in the affected watershed
- Idaho Department of Fish and Game, U.S. Fish and Wildlife Service, and National Marine Fisheries Service
- the district health department serving the county where the facility or activity discharges
- municipal governments of communities affected by the discharge
- the environmental agencies of other states whose waters may be affected by the issuance of the permit
- any other interested governmental organization, upon request

The intergovernmental coordination and review process is probably best if it occurs before the alternatives analysis and social and economic importance review are finalized but it may occur later, in tandem with the public notice procedures outlined in the next section.

7.2 Public Notification and Review

DEQ must provide public notice and opportunity for public comment on the alternatives analysis and the social and economic importance review. While public review is only required of Tier 2 degradation decisions, DEQ intends to provide public review of all antidegradation reviews. This will be in conjunction with public review of DEQ's draft

§401 water quality certification process, which provides a comment period lasting at least 30 days.

Public notice will be circulated within the geographical area of the proposed activity by publishing the notice at least one time in three local newspapers and periodicals, or, if appropriate, in a newspaper of general circulation for the county where the activity will occur.

Notice will also be posted on the Department's Web site at:

http://www.deq.idaho.gov/Applications/NewsApp/comment.cfm?CFID=169508&CFTOKEN=75960440

A copy of the public notice shall also be sent to other government agencies listed in Section 7.1 Intergovernmental Coordination.

The notice will identify the action being considered, list all beneficial uses identified for the surface water, and call for comments from the public regarding the proposed activity. It shall clearly state the time frame for submitting comments, the methods by which comments may be submitted, and to whom comments must be directed.

An applicant may also engage the public before the alternatives analysis and SEI review is finalized. This is recommended as it may lead to fewer questions later during formal public comment, but it is not required. If choosing to engage the public of its own accord, the applicant should provide DEQ with a summary of public comments received and the applicant's responses.

8 Antidegradation Review Decisions

Once the intergovernmental coordination and public notice requirements outlined above are satisfied, DEQ will review the applicant's alternatives analysis, the social and economic importance review, and the results of public comment.

Regulated activities that may result in degradation of Tier 2 waters can only be approved after DEQ makes all of the following findings:

- The level of water quality necessary to protect applicable beneficial uses is fully maintained. Water quality shall not be degraded to a level that does not comply with the applicable water quality standards (WQS).
- The highest statutory and regulatory requirements for new and existing point sources are achieved.
- All cost-effective and reasonable BMPs for nonpoint source pollution control are implemented.
- Allowing degradation of water quality is necessary and accommodates important social or economic development in the area where the surface water is located.

DEQ will then make a final determination concerning the proposed activity. If the decision is that degradation is justified then implementation of the preferred alternative will become a condition of the §401 certification to be incorporated in the permit or license. When information submitted to DEQ is not sufficient to justify the proposed degradation, DEQ may request additional information.

All antidegradation review decisions, including determinations to deny certification shall be documented by DEQ and made part of the permit or license issuer's Administrative Record of Decision. Review documents, including existing water quality assessments, determination of degradation, analysis of public comments, alternatives analyses, demonstration of social and economic importance and any other decisions or findings are public records.

To the extent allowed under Idaho Code sections 9-340D (1) and 9-342A, any information submitted pursuant to the rules of the Board of Environmental Quality that contains trade secrets shall be kept confidential by DEQ if notice of the existence of a trade secret appears on the information and DEQ determines the information constitutes a trade secret pursuant to the process provided in Idaho Code section 9-342A and the Rules Governing the Protection and Disclosure of Public Records, IDAPA 16.01.21.

References

Army Corp of Engineers (ACOE) and Environmental Protection Agency (EPA). 2008. *Clean Water Act Jurisdiction.* December 02, 2008.

Antidegradation Policy. Title 40 *Code of Federal Regulations*, part 131.12 (1983).

Davies, Tudor. 1995. *Interim Economic Guidance for Water Quality Standards Workbook.* Memorandum from Tudor Davies, Director Office of Science and Technology to Water Management Division Directors. April 27, 1995.

Department of Environmental Quality (DEQ). 2008. *Final 2008 Integrated Report* *http://www.deq.idaho.gov/water/data_reports/surface_water/monitoring/2008.cfm#_2008final*

Federal Water Pollution Control Act (FWPCA) of 1972, Aka "Clean Water Act", Public Law 92-500, 33 *U.S. Code* Section 1251-1387, as amended through April 2, 1987.

Grafe, C.S., C.A. Mebane, M.J. McIntyre, D.A. Essig, D.H. Brandt, and D.T. Mosier. 2002. The Idaho Department of Environmental Quality *Water Body Assessment Guidance, Second Edition-Final*. Department of Environmental Quality; Boise, Idaho.

King, Ephraim. 2005. *Tier 2 Antidegradation Reviews and Significance Thresholds.* Memorandum from Ephraim S. King, Director Office of Science and Technology to Water Management Division Directors. Aug 10, 2005.

Kentucky Waterways Alliance v. EPA, 540 F.3d 466 (6th Circuit) Decided Sept. 3, 2008.

RAPANOS ET UX., ET AL. v. United States, 547 U. S. 715 (Supreme Court) Decided June 19, 2006.

U.S. Environmental Protection Agency (EPA). 1991. *Technical Support Document For Water Quality-based Toxics Control.* EPA/505/2-90-001, March 1991. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

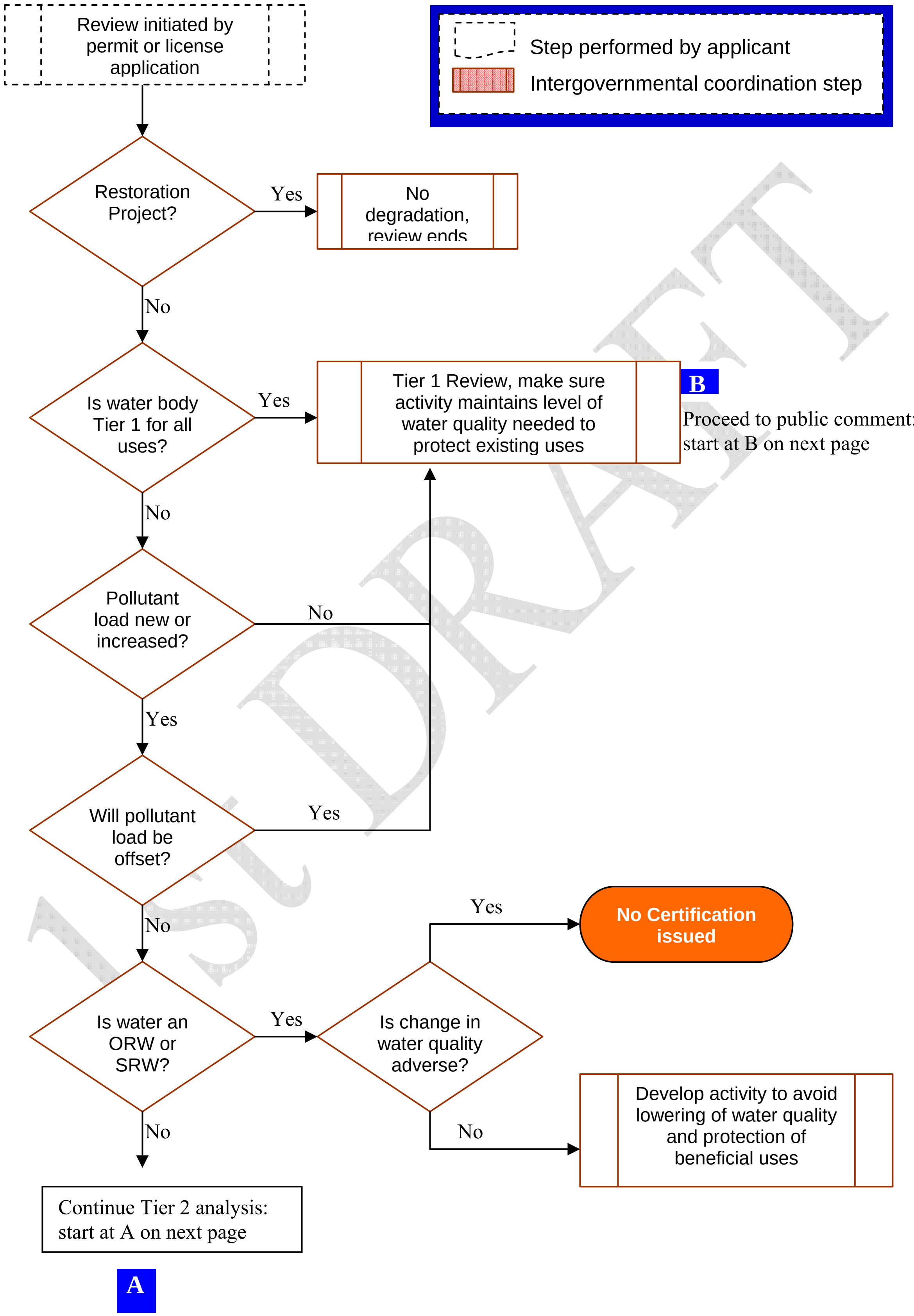
U.S. Environmental Protection Agency (EPA). *Water Quality Standards Handbook Second Edition.* Washington, D.C. Sept. 1993

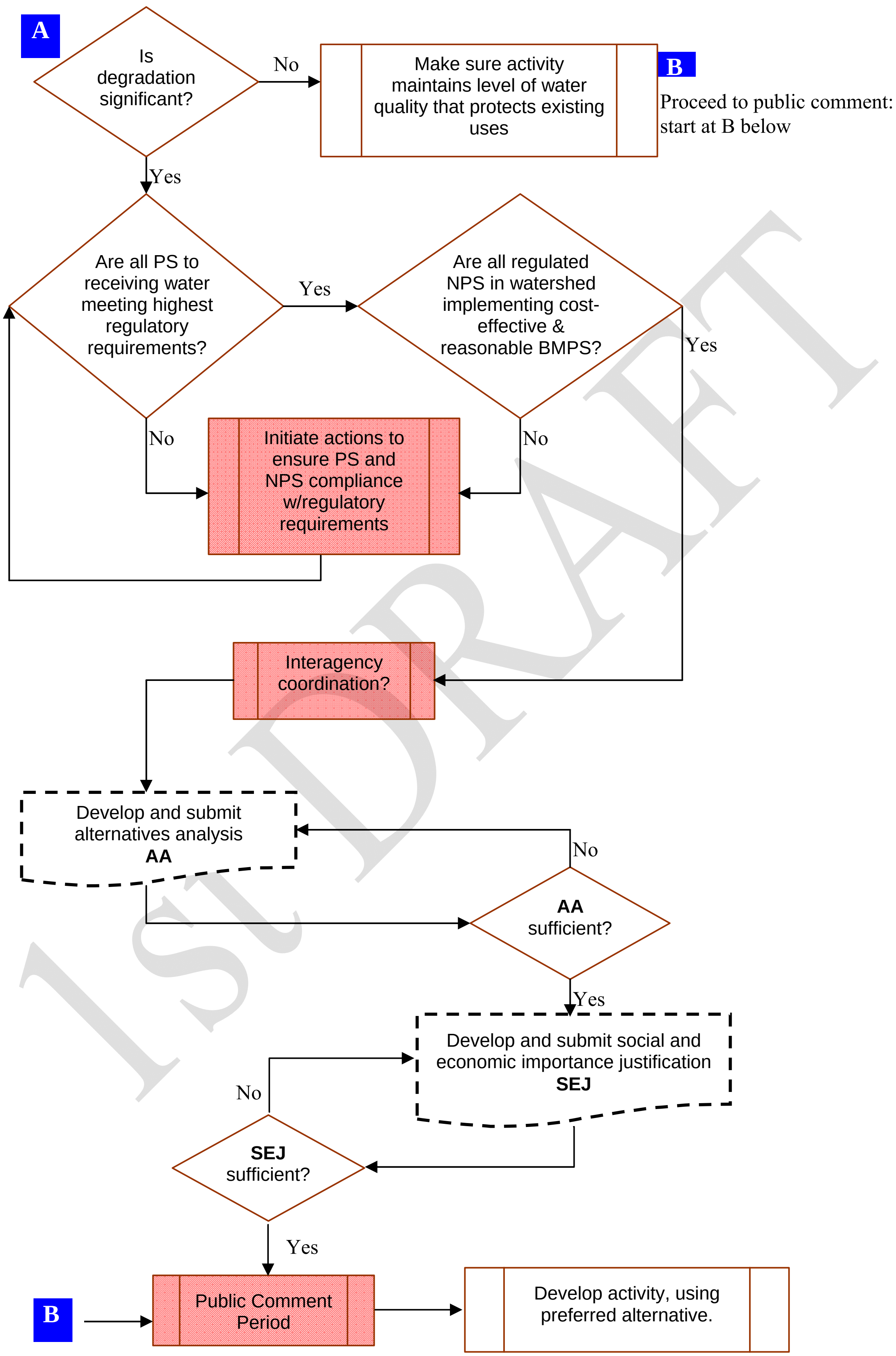
Water Quality Standards. Title 58, Chapter 01.02, *Idaho Administrative Code (IDAPA)*, 2011 ed. Antidegradation addressed in sections 051 and 052.

Water Quality. Title 39, Chapter 36, *Idaho Code (IC)*. 2010 ed. Antidegradation addressed in sections 39-3603, and 39-3617 to 39-3620.

Water Quality Standards Regulation, Advance Notice of Proposed Rulemaking (ANPRM). *Federal Register*, Volume 63, Number 129, Pgs 36741-36806. July 7, 1998.

Appendix A – Antidegradation Review Flow Chart




A
Is degradation significant?
No
Make sure activity maintains level of water quality that protects existing uses
B
Proceed to public comment: start at B below
Yes
Are all PS to receiving water meeting highest regulatory requirements?
Yes
Are all regulated NPS in watershed implementing cost-effective & reasonable BMPS?
Yes
No
Initiate actions to ensure PS and NPS compliance w/regulatory requirements
No
Interagency coordination?
Develop and submit alternatives analysis
AA
No
AA sufficient?
Yes
Develop and submit social and economic importance justification
SEJ
No
SEJ sufficient?
Yes
B
Public Comment Period
Develop activity, using preferred alternative.
ISU DRAFT

Appendix B – Examples of Water Body-by-Water Body Classification

These examples draw on information contained in Table 1 (page 8) that explains the categories of the Integrated Report, and Table 2 (page 13) that translates from Integrated Report category to tier of antidegradation protection.

Water body classification

1. If water is listed in Category 1 or 2 of Integrated Report, then it receives Tier 2 protection for all uses.

   Examples of assessment units in this category include:

   ID17060306CL008_03 Lapwai Creek, ID17050123SW016_04 North Fork Payette River, ID17060108CL016_04 Palouse River, ID17060306CL039_02 Canal Creek, ID17050122SW003_06 Payette River, ID17040204SK001_05 South Fork Teton River, ID17060201SL028_03 Thompson Creek, and ID17060201SL031_05 Salmon River

2. If water is listed in Category 3 of Integrated Report, then case-by-case evaluation is necessary.

   Examples of assessment units in this category include:

   ID17060306CL022_06 Clearwater River, ID17050122SW011_02 Payette River, ID17040221SK000_02 Little Wood River, ID17040221SK001_05a Little Wood River and ID17060108CL007b_02 Fourmile Creek.

3. If water is listed in Category 4 or 5 of Integrated Report

   a. Then for recreation uses, are applicable criteria met?

      i. no, water is Tier 1 for recreation.

         An example of this would be ID17040204SK050_02 Woods Creek – source to mouth. This AU is listed as not supporting contact recreation uses due to E. Coli violations. The aquatic life uses are un-assessed.

      ii. yes, water is Tier 2 for recreation.

         An example of this would be ID16010202BR005_02b Worm Creek. This AU fully supports its contact recreation use and is listed in category 4a of the Integrated Report for not supporting cold water aquatic life uses.

      iii. Un-assessed, water is Tier 1 for recreation.

         An example of this would be ID17010302PN001_04 South Fork Coeur d'Alene River. This AU is un-assessed for recreation and is therefore Tier 1 for recreation.

b. Then for aquatic life uses, is water listed for dissolved oxygen, pH, nutrients, sediment or temperature?

i. no, water is Tier 1 for aquatic life

An example of this would be ID17010302PN001_04 South Fork Coeur d'Alene River. This AU is un-assessed for recreation and therefore receives Tier 1 protection for recreation uses. It is in categories 4a and 5 of the Integrated Report for not supporting the cold water aquatic life beneficial use. The causes for listing include cadmium, lead, zinc and sediment. Because this AU is listed for pollutants other than the five outlined in the rule, it is provided only Tier 1 protection.

Another example of this would be ID17040219SK007_05 Big Wood River. This AU is un-assessed for recreation therefore receives Tier 1 protection for recreation uses. It is also listed as not supporting aquatic life. The listing cause is other flow regime. This AU is in category 4c of the Integrated Report, non-support caused by a non-pollutant.

A third example of this would be ID17060306CL001_07 Clearwater River. This AU is un-assessed for recreation and therefore receives Tier 1 protection for recreation uses. This AU is listed in category 5 as not supporting its aquatic life uses due to dissolved gas saturation.

ii. yes, then does biological assessment show use is supported?

1) no, water body receives Tier 1 protection for aquatic life

An example of this would be ID16010201BR023_02a Soda Creek. This AU is un-assessed for recreation and therefore receives Tier 1 protection for recreation. It is listed in category 4a as not supporting its aquatic life use due to nutrients (total phosphorus) and sediment. When evaluating the available biological data there are 2 sites located on the stream. One of those two sites scores an average of 0 in the index ratings and therefore indicates that there is not a healthy balance biological community present. This AU would receive only Tier 1 protection.

2) yes, water body receives Tier 2 protection for aquatic life

An example of this would be ID17010214PN053_02 Little Sand Creek. This AU fully supports contact recreation and therefore would be Tier 2 for recreation. It is listed in category 4A as not supporting its aquatic life use due to sediment. When evaluating the available biological data there is one site located on the steam. This site scored an average of 2 in the index ratings thereby indicating a healthy balanced biological community is present. This AU would receive Tier 2 protection as well as Tier 1 protection.

3) if no bioassessment data available, then case-by-case evaluation.

An example of this would be ID17060201SL021_04 Squaw Creek. This AU is un-assessed for recreation and therefore receives Tier 1 protection for recreation uses. It is listed in category 5 as not supporting its aquatic life use due to temperature. There is no current biological data available to evaluate the health of the biological community, therefore it would be evaluated on a case by case basis when a permit for a discharge to that stream came to the agency.

iii. A few water bodies listed as not fully supporting assessed uses, therefore found in category 4 or 5 of the Integrated Report, are listed only due to a recreation criterion exceedance. In some of these water bodies the aquatic life use may be assessed and found to be fully supporting or the aquatic life use is un-assessed. However, because the AU is listed in category 4 or 5 as not supporting at least one assessed use, this water body may receive only Tier 1 protection for aquatic life. Due to the wording of the rule in 052.05.c.i that assigns Tier 1 unless the water is listed for a subset of causes, this occurs when an AU in this example fully supports its aquatic life uses but is not listed for the five causes which then allows good biological data add Tier 2 protection.

One example of this would be ID17060204SL001_06 Lemhi River. This AU is listed as not supporting recreation uses due to exceedances of the E. Coli criteria. However, the aquatic life use was assessed and determined to be fully supporting. This AU receives only Tier 1 protection for both contact recreation and aquatic life uses.

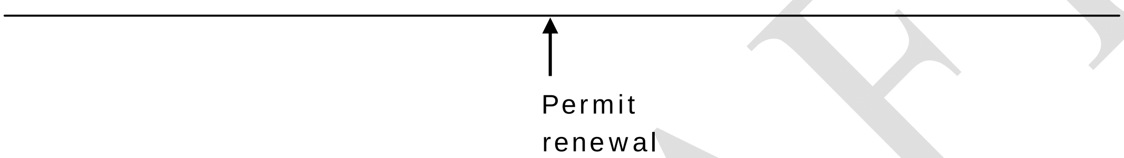
One example of this would be ID17040204SK050_02 Woods Creek – source to mouth. This AU is listed as not supporting contact recreation uses due to E. Coli violations. The aquatic life uses are un-assessed. This AU receives only Tier 1 protections for contact recreation and aquatic life uses.

Appendix C – Examples of New and Increased Discharge

Examples of new and increased discharge.

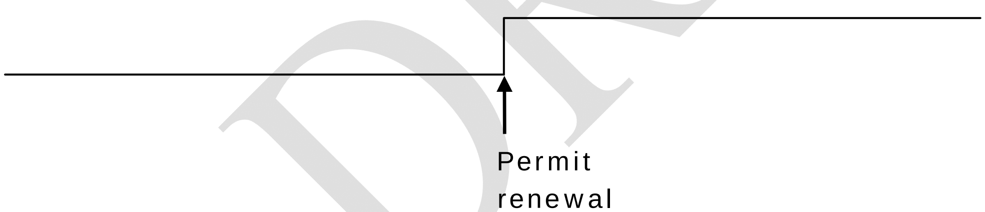
In each of the following examples the line represents the level of discharge with time, the beginning of the line indicates commencement of the discharge.

Discharge A – Existing permitted discharge, no increase



In this situation discharge does not increase with renewed permit thus there is no degradation of water quality. Discharge receives Tier 1 review only.

Discharge A2 – Existing permitted discharge, permitted discharge increases



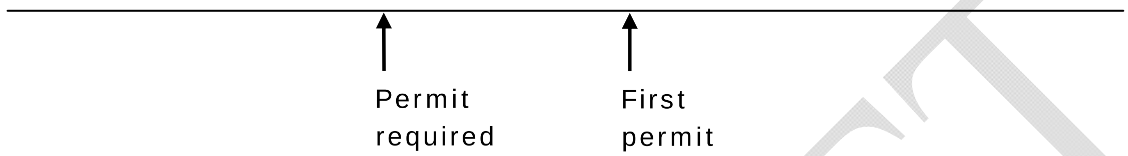
In this situation discharge increases with renewed permit thus there is degradation of water quality. IF this degradation is significant and of a Tier 2 water body, then there will be Tier 2 analysis in addition to Tier 1 review.

Discharge B – New permitted discharge

There will be degradation of water quality. IF this degradation is significant and of a Tier 2 water body, then there will be Tier 2 analysis in addition to Tier 1 review.

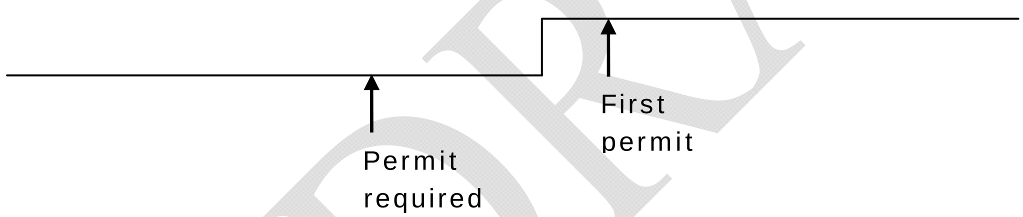
Examples of existing discharge without a permit

Discharge C – Change in regulation, existing discharge with no permit required when discharge commenced, no increase in discharge since permit required



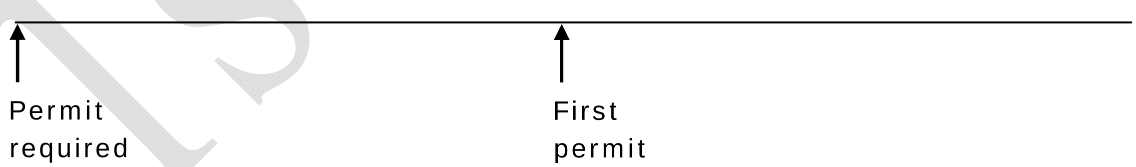
In this situation discharge does not increase with first permit thus there is no degradation of water quality. Discharge receives Tier 1 review only.

Discharge C2 – Change in regulation, existing discharge with no permit required when discharge commenced, discharges increases since permit required



In this situation discharge increases with first permit thus there is degradation of water quality. IF this degradation is significant and of a Tier 2 water body, then there will be Tier 2 analysis in addition to Tier 1 review.

Discharge D – Illegal discharge, existing discharge without required permit



In this situation a permit was required when the discharge commenced. When permitted for first time, this discharge will be treated as a new discharged (B above). Baseline will be water quality without discharge, i.e. upstream water quality. Thus there will be degradation of water quality. IF this degradation is significant and of a Tier 2 water body, then there will be Tier 2 analysis in addition to Tier 1 review.

Appendix D – Antidegradation Tier for Waters with NPDES-Permitted Discharge

The table in this appendix is created using information from the 2008 Integrated Report, only BURP monitoring data from 2001 to 2005 (years identified as appropriate in WBAG), GIS coverages of Idaho's 305(b) streams, 1:24K NHD streams, NPDES dischargers and permit information gleaned from Region 10 EPA's website (*http://yosemite.epa.gov/r10/water.nsf/NPDES+Permits/Current+ID1319#permits*) and EPA's *envirofacts* website. The antidegradation Tier for the appropriate assessment unit was determined according to the proposed rule section 052.05.c. The biological and aquatic habitat index score is listed to provide a reference for Tier 1 vs. Tier 2 for aquatic life tiers. The antidegradation tiers identified in this table are **preliminary only** and are subject to change as more information is identified and gathered from sources other than the BURP database used in creating this table as per WBAG assessment processes.

All permits were screened to determine the receiving water identified in the permit. This was then checked against the shapefile provided containing locations of the various dischargers. If the GIS stream that the point fell upon or was closest to matched the receiving water in the permit, that was the assessment unit used to determine the antidegradation tier. If the GIS stream that the point was closest to did not match the receiving water on the permit, a visual inspection of the NAIP 2009 aerial photography and the USGS 1:24K quadrangle map was done to determine if the discharge was to the GIS stream identified or to the receiving water listed on the permit. If a visual inspection could not identify the discharge source a comment was logged saying that the discharge could not be verified. In these cases a more in depth evaluation of the true discharge location would be necessary before determining the antidegradation tier. For the purposes of this preliminary table only, this further evaluation was not completed due to time and resource constraints. Comments are made where appropriate to identify problems either with the shapefile or the coordinates provided on the permits.

For those AUs appearing in either category 4 or 5 of the Integrated Report, the comments field lists those pollutants for which the water body is listed. A policy call was made that determined all receiving waters identified as canals or drains would be classified as Tier 1 waters. This is in keeping with IDAPA 58.01.02. 101.02 Man-Made Waterways.

There were 100 discharges to Aquatic Life Tier 1 water bodies, 16 to Aquatic Life Tier 2 water bodies, 1 discharge to a water with aquatic life uses removed and 73 to waters that require more information before assigning an antidegradation Tier. There were 118 discharges to Contact Recreation Tier 1 water bodies, 38 to Contact Recreation Tier 2 water bodies and 34 to waters that require more information before assigning an antidegradation Tier for Contact Recreation. There are 15 water bodies where the contact recreation and aquatic life tiers are different. These are highlighted by bold face type in the table.

This page intentionally left blank to accommodate change in page layout.

NPDESID	Status	Permit Stream	Cat	Assessment Unit	Contact Recreation Tier	Aquatic Life Tier	Average Index Score	Comments
ID0000019	EXP	Saint Joe River	3	ID17010304PN005_06	Case by Case			
ID0000027	ADC	Lake Creek	4/5	ID17010302PN009b_02	Tier 1	Tier 1		Cause unknown
ID0000060	ADC	South Fork Coeur d'Alene River	4/5	ID17010302PN001_03	Tier 1	Tier 1	1.00	Cadmium, Lead, Zinc, Sediment
ID0000159	ADC	South Fork Coeur d'Alene River	4/5	ID17010302PN001_03	Tier 1	Tier 1	1.00	Cadmium, Lead, Zinc, Sediment
ID0000167	ADC	South Fork Coeur d'Alene River	4/5	ID17010302PN011_03	Tier 1	Tier 1		Cause Unknown (metals suspected)
ID0000175	ADC	South Fork Coeur d'Alene River	4/5	ID17010302PN011_03	Tier 1	Tier 1		Cause Unknown (metals suspected)
ID0000213	EXP	Payette River	4/5	ID17050122SW001_06	Tier 1	Case by Case		Temperature, E. Coli
ID0000230	ADC	ID-002666-2 Main Drain	4/5	ID17040209SK001_02	Tier 1	Case by Case		Total phosphorus
ID0000388	EXP	Rock Creek	4/5	ID17040212SK013_05	Tier 1	Tier 1		Mercury, Total phosphorus, Sediment, Flow alteration, Fecal Coliform
ID0000612	EFF	Snake River	4/5	ID17040209SK001_07	Tier 1	Case by Case		Nutrients, Sediment
ID0000663	EFF	Snake River (Milner Pond)	4/5	ID17040209SK001_07	Tier 1	Case by Case		Nutrients, Sediment
ID0000787	ADC	Indian Creek	4/5	ID17050114SW003_04	Tier 1	Tier 1	0.67	Cause unknown, Sediment, Temperature
ID0001058	EFF	Clearwater River	3	ID17060306CL021_06	Case by Case			
ID0001155	EFF	Snake River	4/5	ID17050201SW004_08	Tier 1	Case by Case		Dissolved oxygen, Total phosphorus, Temperature, Sediment
ID0001163	EFF	Snake River	4/5	ID17060103SL001_08	Tier 1	Case by Case		Temperature
ID0001198	ADC	Soda Creek	4/5	ID16010201BR023_02a	Tier 1	Tier 1	1.00	Total phosphorus, sediment
ID0020001	EFF	Salmon River	4/5	ID17060203SL041_07	Tier 1	Tier 1		Combined biota
ID0020010	EFF	Dry Bed Canal	3	ID17040201SK004_06	Case by Case			

NPDESID	Status	Permit Stream	Cat	Assessment Unit	Contact Recreation Tier	Aquatic Life Tier	Average Index Score	Comments
ID0020028	ADC	Little Wood River	3	ID17040221SK001_05b	Case by Case			
ID0020036	EFF	Threemile Creek	4/5	ID17060305CL010_02	Tier 1	Tier 1		Dissolved oxygen, Sediment, Temperature, Nutrients, Habitat, Other flow regime, E. Coli
ID0020044	ADC	Snake River	3	ID17040206SK022_04	Case by Case			
ID0020061	EFF	Cedar Draw Creek	4/5	ID17040212SK012_02	Tier 1	Case by Case		Total phosphorus, Sediment, Fecal coliform
ID0020087	EXP	Weiser River	4/5	ID17050124SW007_05	Tier 2	Case by Case		Total phosphorus, Sediment, Temperature
ID0020095	ADC	Snake River	4/5	ID17040209SK001_02	Tier 1	Case by Case		Total phosphorus
ID0020117	EXP	South Fork Coeur d'Alene River	4/5	ID17010302PN001_04	Tier 1	Tier 1		Cadmium, Lead, Zinc, Sediment
ID0020125	**EFF**	**Cow Creek**	**4/5**	**ID17060108CL001_03**	**Tier 2**	**Tier 1**	**0.67**	**Nutrients, Temperature, Habitat**
ID0020133	ADC	Snake River	3	ID17040206SK022_04	Case by Case			
ID0020141	ADC	Woods Creek	4/5	ID17040204SK050_02	Tier 1	Tier 1		E. Coli
ID0020150	ADC	Clearwater River	3	ID17060306CL021_06	Case by Case			
ID0020168	ADC	J8 Canal		canal	Tier 1			
ID0020176	ADC	Aberdeen Drain to American Falls Reservoir	4/5	ID17040206SK025_02a	Tier 1	Tier 1	1.50	Combined Biota/Habitat
ID0020184	EXP	Lapwai Creek	2	ID17060306CL008_03	Tier 2		2.67	cannot verify location of discharge on map.
ID0020192	ADC	Fivemile Creek	4/5	ID17050114SW010_03	Tier 1	Tier 1	0.67	Habitat, Fish bioassessment, Combined biota, Cause unknown
ID0020206	EXP	Orofino Creek	3	ID17060306CL039_04	Case by Case			
ID0020214	**EFF**	**Worm Creek**	**4/5**	**ID16010202BR005_02b**	**Tier 2**	**Tier 1**	**0.50**	**Total phosphorus, Sediment**
ID0020222	ADC	Kootenai River	4/5	ID17010104PN029_08	Tier 1	Case by Case		Temperature

NPDESID	Status	Permit Stream	Cat	Assessment Unit	Contact Recreation Tier	Aquatic Life Tier	Average Index Score	Comments
ID0020231	ADC	North Fork Payette River	2	ID17050123SW016_04	Tier 2			
ID0020249	EFF	Portneuf River	4/5	ID17040208SK001_05	Tier 1	Tier 1		Oil & Grease, Sediment, Habitat, Temperature, Nutrients, Dissolved oxygen, Fecal coliform
ID0020265	EFF	Wilder Ditch Drain (N43"40"39 W 116:54:06)		canal	Tier 1			
ID0020281	ADC	Big Wood River	4/5	ID17040219SK007_05	Tier 1	Tier 1		Other flow regime
ID0020290	ADC	Snake River	4/5	ID17050201SW004_08	Tier 1	Case by Case		Dissolved oxygen, Total phosphorus, Sediment, Temperature
ID0020303	ADC	Big Wood River	4/5	ID17040219SK007_05	Tier 1	Tier 1		Other flow regime
ID0020311	ADC	Payette River	4/5	ID17050122SW001_06	Tier 1	Case by Case		Temperature, E. Coli
ID0020338	**ADC**	**Snake River (N44:2:20.4 W116:55:25)**	**4/5**	**ID17050115SW001_08**	**Tier 2**	**Tier 1**		**Sediment, Temperature, Cause unknown, shapefile incorrect.**
ID0020354	ADC	Jim Ford Creek	4/5	ID17060306CL035_03	Tier 1	Tier 1	0.67	Nutrients, Flow alteration, Habitat, Sediment, Temperature, Fecal coliform, shapefile incorrect.
ID0020362	ADC	Elk Creek	2	ID17060308CL030_03	Tier 2			
ID0020389	ADC	Payette River	4/5	ID17050122SW001_06	Tier 1	Case by Case		Temperature, E. Coli
ID0020397	ADC	Long Hollow Creek	4/5	ID17060306CL020_02	Tier 1	Tier 1		This AU is listed as not supporting Agricultural Water Supply: Cause Unknown. This reflects an error in the listing that is being corrected in future reports.
ID0020401	ADC	Henry's Fork	3	ID17040203SK002_06	Case by Case			

NPDESID	Status	Permit Stream	Cat	Assessment Unit	Contact Recreation Tier	Aquatic Life Tier	Average Index Score	Comments
ID0020427	**EXP**	**Snake River**	**4/5**	**ID17050103SW001_07**	**Tier 2**	**Tier 1**		**Temperature, Nutrients, Other flow regime**
ID0020443	ADC	Boise River	4/5	ID17050114SW011a_06	Tier 1	Tier 1		Low Flow, Habitat, Sediment, Temperature
ID0020451	EFF	Kootenai River	4/5	ID17010104PN029_08	Tier 1	Case by Case		Temperature
ID0020532	EFF	Palouse River	2	ID17060108CL016_04	Tier 2			
ID0020567	EXP	Big Creek	3	ID17010302PN007b_03	Case by Case			
ID0020664	EFF	Drainage ditch (N42:36:55 W 114:46:45)		canal	Tier 1			
ID0020672	ADC	Payette River	4/5	ID17050122SW001_06	Tier 1	Case by Case		Temperature, E. Coli
ID0020681	ADC	Pend Oreille River	4/5	ID17010216PN002_08	Tier 1	Tier 1		Total phosphorus, Temperature, Dissolved Gas Saturation
ID0020699	ADC	Red River	4/5	ID17060305CL045_03	Tier 1	Case by Case		Temperature
ID0020711	EXP	Selway River	3	ID17060302CL001_06	Case by Case			
ID0020737	EXP	Salmon River	3	ID17060209SL011_07	Case by Case			
ID0020753	ADC	Snake River	4/5	ID17040209SK011_02	Tier 1	Tier 1		Combined biota
ID0020788	ADC	Mount Deary Creek to Big Bear Creek	3	ID17060306CL056_02	Case by Case			shapefile incorrect
ID0020800	ADC	Pend Oreille River	4/5	ID17010214PN002_08	Tier 1	Tier 1		Total phosphorus, Temperature, Dissolved gas saturation
ID0020818	ADC	Bear River	4/5	ID16010201BR001_0L	Tier 1	Case by Case		Total phosphorus, Sediment
ID0020842	ADC	Pend Oreille River	4/5	ID17010214PN002_08	Tier 1	Tier 1		Total phosphorus, Temperature, Dissolved gas saturation
ID0020893	EFF	Canal Creek	2	ID17060306CL039_02	Tier 2		2.33	

NPDESID	Status	Permit Stream	Cat	Assessment Unit	Contact Recreation Tier	Aquatic Life Tier	Average Index Score	Comments
ID0020931	EXP	Salmon River	3	ID17060209SL019_07	Case by Case			
ID0020940	ADC	Snake River	4/5	ID17040209SK001_02	Tier 1	Case by Case		Total phosphorus
ID0021016	EXP	Conway Gulch	4/5	ID17050114SW001_06	Tier 1	Tier 1		Total phosphorus, Temperature, Sediment, Low flow, Physical substrate habitat alteration, Fecal coliform
ID0021024	ADC	Payette River	2	ID17050122SW003_06	Tier 2			
ID0021199	ADC	Payette River	4/5	ID17050122SW001_06	Tier 1	Case by Case		Temperature, E. Coli
ID0021202	ADC	Snake River	4/5	ID17050103SW006_07b	Tier 2	Case by Case		Total phosphorus, Temperature
ID0021211	EFF	Little Wood River	4/5	ID17040221SK001_05	Tier 2	Case by Case		Total phosphorus, Sediment, Temperature
ID0021229	ADC	Boyer Slough	4/5	ID17010214PN018_02b	Tier 1	Tier 1	1.00	Benthic Macroinvertebrates
ID0021237	EFF	Clearwater River	3	ID17060306CL021_06	Case by Case			
ID0021261	ADC	Snake River	3	ID17040201SK001_04	Case by Case			
ID0021270	ADC	Snake River	4/5	ID17040212SK019_07	Tier 1	Tier 1		Total phosphorus, Sediment, Other flow regime
ID0021288	EFF	John Dobbs Creek	4/5	ID17060306CL024_02	Tier 1	Tier 1		Oil & Grease, Temperature, Sediment, Dissolved oxygen, Nutrients, Ammonia, Flow alteration, Habitat, Fecal coliform. Shapefile incorrectly located this point. Coordinates not provided on permit, cannot find John Dobbs Creek on USGS 1:24K map or in 1:24K NHD.
ID0021296	EXP	South Fork Coeur d'Alene River	4/5	ID17010302PN011_03	Tier 1	Tier 1		Cause unknown (metals suspected)

NPDESID	Status	Permit Stream	Cat	Assessment Unit	Contact Recreation Tier	Aquatic Life Tier	Average Index Score	Comments
ID0021300	EXP	South Fork Coeur d'Alene River	4/5	ID17010302PN001_04	Tier 1	Tier 1		Cadmium, Lead, Zinc, Sediment
ID0021491	ADC	Paradise Creek	4/5	ID17060108CL005_02	Tier 1	Tier 1	0.75	Temperature, Sediment, Nutrients, Ammonia, Habitat, Other Flow regime, E. Coli
ID0021504	ADC	Boise River	4/5	ID17050114SW005_06	Tier 1	Tier 1		Sediment, Temperature, Low Flow, Habitat, Fecal coliform
ID0021776	ADC	Sand Hollow Creek	4/5	ID17050114SW017_03	Tier 1	Tier 1		Sediment, Fecal coliform, Cause Unknown (nutrients suspected)
ID0021784	ADC	Portneuf River	4/5	ID17040208SK001_05	Tier 1	Tier 1		Sediment, Temperature, Oil & Grease, Nutrients, Dissolved oxygen, Habitat, Fecal coliform
ID0021806	EFF	Weiser River	4/5	ID17050124SW007_05	Tier 2	Case by Case		Total phosphorus, Sediment, Temperature
ID0021814	ADC	South Fork Clearwater R	4/5	ID17060305CL001_05	Tier 2	Case by Case		Sediment, Temperature
ID0021822	EFF	Portneuf River	4/5	ID17040208SK016_03	Tier 1	Tier 1		Total nitrogen, Oil & Grease, Total phosphorus, Sediment, Temperature, Low Flow, Fecal coliform
ID0021831	ADC	Boise River	4/5	ID17050114SW005_06	Tier 1	Tier 1		Sediment, Temperature, Low flow, Fecal coliform
ID0021849	ADC	Cottonwood Creek	4/5	ID17060305CL003_02	Tier 1	Tier 1	1.50	Ammonia, Nutrients, Dissolved oxygen, Sediment, Temperature, Habitat, Fecal coliform
ID0021997	EFF	Coeur d'Alene River	4/5	ID17010303PN007_06	Tier 1	Tier 1		Lead, Zinc, Cadmium, Temperature, Sediment, Habitat
ID0022004	ADC	Snake River	4/5	ID17050101SW005_07	Tier 1	Case by Case		Total phosphorus, Sediment

NPDESID	Status	Permit Stream	Cat	Assessment Unit	Contact Recreation Tier	Aquatic Life Tier	Average Index Score	Comments
ID0022012	ADC	Big Elk Creek	4/5	ID17060305CL056_03	Tier 1	Case by Case		Temperature
ID0022047	ADC	Rock Creek	4/5	ID17040209SK008_04	Tier 1	Case by Case		Sediment
ID0022055	ADC	Clearwater River	4/5	ID17060306CL001_07	Tier 1	Tier 1		Dissolved gas saturation
ID0022063	ADC	Indian Creek	4/5	ID17050114SW002_04	Tier 1	Case by Case		Temperature, Fecal coliform
ID0022071	**EXP**	**McFarren Creek**	**4/5**	**ID17010302PN001_02**	**Tier 2**	**Tier 1**		**Sediment, Zinc, Cadmium, Lead**
ID0022446	EFF	unnamed canal		canal	Tier 1			Coordinates on permit are incorrect. They land outside of Hailey, not Hansen Idaho
ID0022501	EFF	Palouse River	3	ID17060108CL010_04	Case by Case			
ID0022713	EXP	Rock Creek	3	ID17010306PN005_02	Case by Case			
ID0022781	EFF	Plummer Creek	3	ID17010304PN002_03	Case by Case			
ID0022799	EFF	Saint Joe River	3	ID17010304PN005_06	Case by Case			
ID0022845	ADC	Saint Maries River	4/5	ID17010304PN012_05	Tier 2	Case by Case		Sediment, Temperature
ID0022853	ADC	Spokane River	4/5	ID17010305PN004_04	Tier 1	Tier 1		Cadmium, Lead, Zinc, Total phosphorus
ID0022861	**EFF**	**Potlatch River**	**4/5**	**ID17060306CL048_04**	**Tier 2**	**Tier 1**		**Temperature, Other flow regime, Habitat**
ID0023027	ADC	Big Lost River	3	ID17040218SK011_02	Case by Case			
ID0023159	EXP	Little Salmon River	4/5	ID17060210SL007_04	Tier 1	Case by Case		Temperature
ID0023167	ADC	North Fork Payette River	4/5	ID17050123SW001_06	Tier 1	Tier 1		Sediment, Other Flow regime
ID0023591	EXP	Lawrence Kennedy Canal		canal	Tier 1			
ID0023604	EXP	West Fork Little Bear Creek	3	ID17060306CL061_03	Case by Case			

NPDESID	Status	Permit Stream	Cat	Assessment Unit	Contact Recreation Tier	Aquatic Life Tier	Average Index Score	Comments
ID0023710	EXP	Spring Creek Trib to Henrys Fork	3	ID17040203SK012_02	Case by Case			
ID0023728	EFF	Little Wood River	3	ID17040221SK001_05a	Case by Case			
ID0023761	ADC	Potlatch River	4/5	ID17060306CL044_06	Tier 1	Tier 1	2.33	Sediment, Temperature, Physical habitat alteration, Other flow regime alterations.
ID0023817	ADC	South Fork Teton River	2	ID17040204SK001_05	Tier 2			
ID0023825	ADC	Grace Dam Impoundment	4/5	ID16010202BR009_06	Tier 1	Tier 1		Sediment, Total phosphorus, Other flow regime
ID0023914	ADC	Grasshopper Creek	4/5	ID17060306CL036_02	Tier 1	Tier 1		Nutrients, Temperature, Other flow regime, Habitat, Fecal coliform
ID0023981	ADC	Boise River	4/5	ID17050114SW005_06	Tier 1	Tier 1		Temperature, Sediment, Low flow, Habitat, Fecal coliform
ID0024350	EFF	Little Sand Creek	4/5	ID17010214PN053_02	Tier 2	Tier 2	2.00	Sediment. believe shapefile is incorrect
ID0024384	**ADC**	**Trib to Soldier Creek**	**4/5**	**ID17040220SK011_02**	**Tier 2**	**Tier 1**		**Sediment, Temperature, Other flow regime, shapefile incorrect.**
ID0024422	EXP	Big Wood River	4/5	ID17040219SK007_05	Tier 1	Tier 1		Other Flow regime
ID0024490	ADC	Lapwai Creek	2	ID17060306CL008_03	Tier 2		2.67	
ID0024503	ADC	Clearwater River	4/5	ID17060306CL013_07	Tier 1	Tier 1		Dissolved gas saturation
ID0024554	EFF	Potlach River	3	ID17060306CL044_02	Case by Case			
ID0024627	EXP	Lake Coeur d'Alene	4/5	ID17010303PN001L_0L	Tier 1	Tier 1		Cadmium, Lead, Zinc
ID0024953	ADC	Boise River	4/5	ID17050114SW005_06	Tier 1	Tier 1		Temperature, Sediment, Low flow, Habitat, Fecal coliform
ID0024988	EXP	Snake River	3	ID17040206SK022_04	Case by Case			
ID0025071	ADC	West Fork Saint Maries River	4/5	ID17010304PN017_04	Tier 1	Case by Case		Temperature, Sediment
ID0025101	ADC	Hangman Creek	3	ID17010306PN001_03a	Case by Case			

NPDESID	Status	Permit Stream	Cat	Assessment Unit	Contact Recreation Tier	Aquatic Life Tier	Average Index Score	Comments
ID0025143	PND	Unnamed spring fed creek	4/5	ID16010201BR022_03a	Tier 1	Tier 1		Total phosphorus, Sediment, Habitat
ID0025194	PND	Portneuf River	4/5	ID17040208SK016_03	Tier 1	Tier 1		Temperature, Total phosphorus, Sediment, Oil & Grease, Total nitrogen, Low flow, Fecal coliform
ID0025224	ADC	Clearwater River	3	ID17060306CL021_06	Case by Case			
ID0025259	ADC	Blackbird Creek	2	ID17060203SL012b_02	Tier 2	NONE	1.00	This AU is assessed for secondary contact recreation and fully supports secondary contact recreation. This AU has an aquatic life designation of NONE and is not assessed for aquatic life.
ID0025267	ADC	Lateral 185		canal	Tier 1			
ID0025305	PND		3	ID17060108CL002_02	Case by Case			
ID0025402	ADC	Squaw Creek	4/5	ID17060201SL021_04	Tier 1	Case by Case		Temperature
ID0025402	ADC	Thompson Creek	2	ID17060201SL028_03	Tier 2		3.00	
ID0025402	ADC	Thompson Creek	2	ID17060201SL028_03	Tier 2		3.00	
ID0025402	ADC	Salmon River	2	ID17060201SL031_05	Tier 2			
ID0025429	ADC	Lake Creek	4/5	ID17010302PN009b_02	Tier 1	Tier 1		Cause Unknown (metals suspected)
ID0025429	ADC	South Fork Coeur d'Alene River	4/5	ID17010302PN001_03	Tier 1	Tier 1	1.00	Cadmium, Lead, Zinc, Sediment
ID0025453	ADC	Farmers Cooperative Sebree Canal		canal	Tier 1			
ID0025488	EXP	Boise River	4/5	ID17050114SW011a_06	Tier 1	Tier 1		Temperature, Sediment, Habitat, Low flow
ID0025569	**EFF**	**Cub River**	**4/5**	**ID16010202BR002_04**	**Tier 2**	**Tier 1**	**1.00**	**Total phosphorus, Sediment, Other flow regime, Low flow**

NPDESID	Status	Permit Stream	Cat	Assessment Unit	Contact Recreation Tier	Aquatic Life Tier	Average Index Score	Comments
ID0025585	**ADC**	**Bear River**	**4/5**	**ID16010201BR002_05**	**Tier 2**	**Tier 1**		**Total phosphorus, Sediment, Low flow**
ID0025607	EXP	Clearwater River	4/5	ID17060306CL001_07	Tier 1	Tier 1		Dissolved gas saturation
ID0025747	**ADC**	**Little Wood River**	**4/5**	**ID17040221SK002_05**	**Tier 2**	**Tier 1**	**1.50**	**Temperature, Total phosphorus, Sediment**
ID0025852	EXP	Spokane River	4/5	ID17010305PN003_04	Tier 1	Tier 1		Cadmium, Lead, Zinc, Total phosphorus
ID0025887	EFF	Trib to Lawyer Creek	4/5	ID17060306CL024_02	Tier 1	Tier 1		Temperature, Dissolved oxygen, Sediment, Oil & Grease, Nutrients, Ammonia, Other flow regime, Habitat, Fecal coliform
ID0025941	PND	Snake River		canal	Tier 1			
ID0026077	**PND**		**4/5**	**ID17060207SL007_03a**	**Tier 2**	**Tier 1**		**Habitat. 305(b) stream says this is Warren Creek.**
ID0026085	**ADC**	**Bear River**	**4/5**	**ID16010202BR005_02b**	**Tier 2**	**Tier 1**	**0.50**	**Total phosphorus, Sediment**
ID0026174	ADC	Dry Bed Canal and Enterprise Canal		canal	Tier 1			
ID0026310	ADC	Fourmile Creek	3	ID17060108CL007b_02	Case by Case			
ID0026468	EFF	Jordan Creek	2	ID17060201SL042_03	Tier 2		2.67	Jordan Creek is a Tier 2, the two unnamed tribs that flow through the mine are unassessed.
ID0026531	ADC	Clearwater River	4/5	ID17060306CL001_07	Tier 1	Tier 1		Dissolved gas saturation
ID0026590	EXP	Spokane River	4/5	ID17010305PN004_04	Tier 1	Tier 1		Total phosphorus, Zinc, Lead, Cadmium
ID0026654	ADC	Main Drain		canal	Tier 1			
ID0026913	ADC	Roberts Slough		canal	Tier 1			
ID0026964	PND	Indian Creek	4/5	ID17050114SW002_04	Tier 1	Case by Case		Temperature, Fecal coliform
ID0027006	ADC	Little Wood River	3	ID17040221SK000_02	Case by Case			
ID0027022	NON	Napias Creek	2	ID17060203SL025_02	Tier 2			

NPDESID	Status	Permit Stream	Cat	Assessment Unit	Contact Recreation Tier	Aquatic Life Tier	Average Index Score	Comments
ID0027120	ADC	Little Wood River	3	ID17040221SK001_05a	Case by Case			
ID0027154	PND	Paradise Creek	4/5	ID17060108CL005_02	Tier 1	Tier 1	0.75	Ammonia, Nutrients, Sediment, Temperature, Other flow regime, Habitat, E. Coli
ID0027162	PND	Portneuf River	4/5	ID17040208SK001_05	Tier 1	Tier 1		Oil & Grease, Temperature, Sediment, Nutrients, Total phosphorus, Total nitrogen, Dissolved oxygen, Low flow, Habitat, Fecal coliform
ID0027171	NON	Portneuf River	4/5	ID17040208SK016_03	Tier 1	Tier 1		Temperature, Total nitrogen, Oil & Grease, Total phosphorus, Sediment, Low flow, Fecal coliform
ID0027383	PND	Indian Creek	4/5	ID17050114SW002_04	Tier 1	Case by Case		Temperature, Fecal coliform
ID0027421	PND	Rock Creek	4/5	ID17040212SK013_05	Tier 1	Case by Case		Total phosphorus, Sediment, Mercury, Fecal coliform
ID0027456	PND	Sand Creek	4/5	ID17010214PN048_03a	Tier 1	Case by Case		Sediment. cannot verify.
ID0027511	PND	South Slough		canal	Tier 1			cannot verify
ID0027545	ADC	Lawyer Creek	2	ID17060306CL024_04	Tier 2			
ID0027600	ADC	Lateral 12 (N42:42:35 W 114:31:10)		canal	Tier 1			shapefile incorrect
ID0027642	ADC	Trib to Canyon Creek (N43:3:19 W115:53:28)		canal	Tier 1			
ID0027693	NON	Pend Oreille River	4/5	ID17010214PN002_08	Tier 1	Tier 1		Dissolved gas saturation, Total phosphorus, Temperature
ID0027707	**PND**	**South Fork Clearwater R**	**4/5**	**ID17060305CL001_02**	**Tier 2**	**Tier 1**		**Temperature, Sediment, Habitat**
ID0027731	PND	Sand Creek	4/5	ID17010214PN048_03a	Tier 1	Case by Case		Sediment. cannot verify.

NPDESID	Status	Permit Stream	Cat	Assessment Unit	Contact Recreation Tier	Aquatic Life Tier	Average Index Score	Comments
ID0027855	PND	Finch Lateral		canal	Tier 1			cannot verify likely map error
ID0027901	PND	Drainage ditch upstream/Payette River	3	ID17050122SW001_02	Case by Case			
ID0027928	EFF	Big Wood River	4/5	ID17040219SK007_05	Tier 1	Tier 1		Other flow regime
ID0027944	PND	Pend Oreille River	4/5	ID17010214PN002_08	Tier 1	Tier 1		Dissolved gas saturation, Total phosphorus, Temperature
ID0027952	EFF	Tenmile Creek	4/5	ID17050114SW008_03	Tier 1	Case by Case		Sediment, Fecal Coliform
ID0027979	ADC	South Fork Boise River	2	ID17050113SW013_05	Tier 2			
ID0027995	ADC	Clark Fork River	4/5	ID17010213PN005_08	Tier 1	Tier 1		Zinc, Cadmium, Temperature, Dissolved gas saturation
ID0028002	EXP	Clearwater River	3	ID17060306CL022_06	Case by Case			
ID0028029	**EFF**	**Cold Creek (trib 2 Boulder 2 Cascade Reservoir)**	**4/5**	**ID17050123SW011_02**	**Tier 2**	**Tier 1**	**0.42**	**Total phosphorus, Habitat, Combined Biota**
ID0028037	EFF	Purdam Drain		canal	Tier 1			
ID0028266	EFF	Warm Springs Hydro-Canal		canal	Tier 1			N 44 23 30 W 114 6 40 Cannot locate facility at these coordinates.
ID0028291	PND	Kootenai River	4/5	ID17010104PN031_08	Tier 1	Case by Case		Temperature
ID0028304	EFF	Boise River		canal	Tier 1			Permit says Boise River, but GIS coverage suggests canal.
ID0028312	PND	Mores Creek (N43:54:14 W 115:59:18)	4/5	ID17050112SW009_06	Tier 1	Case by Case		Temperature. shapefile and coordinates from permit suggest discharge is to Clear Creek (Tier 2).
ID0028321	**EFF**	**Big Deer Creek**	**4/5**	**ID17060203SL005_03**	**Tier 2**	**Tier 1**	**2.33**	**Copper**
ID0028355	ADC	Indian Creek	4/5	ID17050114SW003_04	Tier 1	Tier 1	0.67	Temperature, Sediment, Cause unknown (suspect nutrients)

Appendix E – Examples of Antidegradation Reviews

**River City Publicly Owned Treatment Works;
Water Body Fully Supporting All Uses**

River City submitted an application for permit renewal for its publicly owned treatment works to EPA. River City is not planning to increase their design capacity or change their treatment processes or influent quality. As a result, EPA proposes a permit with the exact same effluent limitations as those currently in effect.

The receiving water body has the following designated beneficial uses: cold water aquatic life and secondary contact recreation. There are no existing uses beyond those already designated.

Antidegradation Review

Level of Antidegradation Protection: The receiving water body is fully supporting all of its beneficial uses; therefore, it is provided Tier 2 protection. Because existing uses are to be protected for all waters, the receiving water body will also receive Tier 1 protection.

Degradation: Because the permit is exactly the same as the previous permit, DEQ will conclude that no degradation will occur. Also, the permit limits ensure that the facility will not violate water quality criteria (narrative or numeric), thus DEQ concludes the permit is protective of existing uses.

Hayfield Mine; Water Body Impaired for Sediment

The Hayfield Mine submitted an application for permit renewal to EPA. The mine is planning on expanding their facility capacity from 0.65 million gallons per day (MGD) to 1.3 MGD. The quality of their influent is expected to stay the same and they aren't expecting to change their treatment processes.

The receiving water body has the following designated beneficial uses: cold water aquatic life and primary contact recreation. There are no existing uses beyond those already designated.

Antidegradation Review

Level of Antidegradation Protection: The receiving water body is fully supporting its primary contact recreation beneficial use; however, DEQ determined that due to exceedances of the narrative criteria for sediment, the receiving water body is not fully supporting its aquatic life beneficial use.

There is BURP biological data available for the receiving water body. The BURP sampling location is 2 miles from the discharge location and is determined to be representative. The overall BURP multi-index score is 1.5; therefore, the biological data indicates the ecological integrity of the water is not high quality.

- Tier 1 and 2 protection apply for Primary Contact Recreation
- Tier 1 protection applies for Cold Water Aquatic Life

The pollutants evaluated for this facility are arsenic and nickel. Table 7 summarizes the information used in the antidegradation review as well as the results of the Tier 1 and 2 analyses.

Table 7. Antidegradation review of the proposed permit authorizing increased discharge from the Hayfield Mine

		Current Permit	Proposed Permit	Tier 1 Met?	Tier 2 Met?
	Effluent Flow (MGD*)	0.65	1.3		
	Dilution Factor (100% mix)	21	11		
	Effluent Hardness (mg/L*)	300	300		
	Mixed Hardness (mg/L)	109.5	118.2		
Nickel	Average monthly limit (ug/L)	150	125		
	Background Receiving Water Conc (ug/L)	30	30		
	Receiving Water Conc after full mix (ug/L)	35.6	38.5		
	Recreation Criterion (ug/L)	4600		Yes	Insignificant degradation
	Cold Water Aquatic Life CMC (ug/L)	506	539	Yes	N/A*
	Cold Water Aquatic Life CCC (ug/L)	56	60	Yes	N/A
Arsenic	Average monthly limit (ug/L*)	25	45		
	Background Receiving Water Conc (ug/L)	2	2		
	Receiving Water Conc after full mix (ug/L)	3.1	5.9		
	Recreation Criterion (ug/L)	10		Yes	Significant degradation; SEJ* needed
	Cold Water Aquatic Life CMC* (ug/L)	340		Yes	N/A
	Cold Water Aquatic Life CCC* (ug/L)	150		Yes	N/A

*: mgd = million gallons per day; mg/L = milligrams per liter; ug/L = micrograms per liter; SEJ = socioeconomic justification; CMC = criterion maximum concentration; CCC = criterion continuous concentration; N/A = not applicable

Determine whether the high quality water for Primary Contact Recreation is degraded. Although the proposed concentration-based effluent limitation for nickel is lower, the increase in effluent flow is projected to increase the receiving water concentration, from 35.6 ug/L to 38.5 ug/L. The increase of 2.9 ug/L is less than 10% of the ambient (background) quality (30 * 0.10 = 3 ug/L), so DEQ considers this degradation to be insignificant. On the other hand, the proposed increase in arsenic concentration in the receiving water is considered significant. This is because the ambient (background) concentration for arsenic is only 2 ug/L, so the 2.8 ug/L increase is more than 10% of ambient (2.8 ug/L > 0.2 ug/L). As such, the Hayfield Mine will need to conduct a Tier 2 analysis and demonstrate that discharging at the proposed effluent limitation is necessary for important social or economic development in the area.

Because the proposed effluent limitations will not result in an exceedance of receiving water concentrations outside of the authorized mixing zone, DEQ concludes that the existing and designated beneficial uses (primary contact recreation) will be protected and Tier 1 antidegradation requirements have been met.

Evaluate whether the permit is protective of the Cold Water Aquatic Life beneficial use. The effluent limitations are the protective of the cold water aquatic life criteria; therefore, DEQ concludes that the existing and designated beneficial uses for aquatic life will be protected and Tier I antidegradation requirements have been met.

Appendix F – Questions and Answers

[To be added.]