Nevada's Antidegradation Permit Writers' Guidance

Version 101

June 2020

Humboldt River (2017)

Prepared by:
Nevada Division of Environmental Protection
Bureau of Water Pollution Control

Nevada's Antidegradation Permit Writers' Guidance

Contents

Appendices

Acronyms and Abbreviations

BMP	Best management practice
BWPC	Bureau of Water Pollution Control
BWQP	Bureau of Water Quality Planning
CFR	Code of Federal Regulations
Division	Nevada Division of Environmental Protection
EAW	Extraordinary Ecological or Aesthetic Water
EPA	U.S. Environmental Protection Agency
IBV	Interim baseline value
MDL	Method detection limit
MS4	Municipal separate storm sewer system
NAC	Nevada Administrative Code
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NRS	Nevada Revised Statutes
RMHQ	Requirement to maintain higher quality
SEC	State Environmental Commission
TMDL	Total maximum daily load

Nevada's Antidegradation Permit Writers' Guidance

1.0 Introduction

Nevada Revised Statutes (NRS) 445A.305(2), 445A.520(1) and (2) and 445A.565 contain the State's requirements to maintain water quality in Nevada surface waters and protect high quality waters. To fulfill these statutory requirements, the Nevada Division of Environmental Protection (Division) has developed an antidegradation policy applicable to all waters at Nevada Administrative Code (NAC) 445A.XXXX. Additionally, the Division developed Nevada's Antidegradation Implementation Procedures (June 2020), which describes the structure of the antidegradation program and provides guidance for maintaining the existing quality of all surface waters in the State.

The purpose of this document is to provide supplemental guidance to permit writers within the Division's Bureau of Water Pollution Control (BWPC) for performing antidegradation reviews during the permit development process for discharges to surface waters (i.e., National Pollutant Discharge Elimination System (NPDES) permits and Water Pollution Control permits). Permit writers should thoroughly review the State antidegradation policy and implementation procedures prior to utilizing this guidance to perform an antidegradation review.

The permit writer will be primarily responsible for performing the antidegradation review, based on information provided by the applicant, and documenting the findings of the review. However, certain decisions in the antidegradation review process will require coordination and direction from Branch Supervisors, the Bureau Chief, and/or the Division Administrator. This guidance identifies decisions where permit writers should seek such input during the antidegradation review process.

Appendix A provides an overview of Nevada's antidegradation review process for surface waters permits. Appendix B provides an antidegradation review checklist corresponding to the review procedures described in this guidance. Permit writers are encouraged to complete the checklist concurrent with the antidegradation review. The permit writer should save a copy of the completed checklist in the administrative record or include it as an attachment to the fact sheet to support their antidegradation review findings.

2.0 Activities Requiring Antidegradation Review

An antidegradation review is required as part of the permit development process for the following activities:

- A new discharge is proposed.
- An existing discharger proposes to increase the permitted effluent flow.
- An existing discharger proposes a significant facility modification that could result in new or increased pollutant concentrations or loading.
- An existing discharger proposes to relocate an outfall.[1]
- An existing discharger proposes a new or expanded mixing zone.
- Proposing a new or revised effluent limitation that is greater than baseline water quality.
- Other permitted activities that have potential to degrade existing water quality.

The following activities would not trigger a full antidegradation review. However, permits for such activities must ensure the level of water quality necessary to maintain and protect the designated and existing beneficial uses of the receiving water.

- Permit renewals with the same discharge limitations, requirements, and conditions as the previous permit.
- Application of less stringent effluent limitations calculated based on updated information (e.g., updated coefficient of variation reflecting facility performance, updated receiving water data for hardness to calculate water quality criteria for metals).
- Groundwater remediation projects.[2]

3.0 Application Process

3.1 Pre-Application

The Division strongly encourages applicants proposing an activity with the potential to degrade water quality to notify the Division as soon as possible prior to applying for a permit. Implementation of the Division's antidegradation policy will require considerable consultation, coordination, and cooperation to ensure that relevant issues are addressed early in the review process. Determining interim baseline values (IBVs), assessing impacts, analyzing possible alternatives, and evaluating economic or social benefits can require significant time and resources for the permit writer and applicant. Timely notification and early consultation with the Division will help ensure that the issuance of permits can proceed without disruption to facility design, construction, or other activities planned by the applicant.

[1] An antidegradation review would not be required if the relocated outfall is to the same body of water and will not result in a lowering of water quality in the area downstream of the new outfall.

[2] Note that a full antidegradation review is not required for a new or expanded discharge from a groundwater remediation project. The Division assumes such projects are necessary and important to ensure the protection of groundwater and its associated uses (e.g., drinking water supply).

When notified in advance of the permit application that an applicant is proposing an activity requiring an antidegradation review, permit writers are encouraged to:

- provide information to the applicant describing the antidegradation review process and information requirements; and
- meet with applicants for a pre-application conference to discuss the proposed activity, familiarize the applicant with the review process, and request information necessary to perform the antidegradation review.

3.2 Application Submittal

The antidegradation review process is initiated at the time that a permit application is submitted. Permit applications are required to be submitted at least 180 days before permit expiration (for existing dischargers) or 180 days before the date on which the discharge is to commence (for new dischargers).

The Division's Water Pollution Control E-Permitting Online Discharge Permit Application at https://wp-permits.ndep.nv.gov/ features an item requiring applicants to indicate whether they are applying for one of the activities requiring an antidegradation review listed in Section 2.0. For applicants applying for an activity requiring an antidegradation review, the application will direct the applicant to information on the antidegradation review process.

3.3 Application Review

The permit writer should review the permit application for completion upon submittal. As part of the completeness review, the permit writer should determine whether any activities requiring an antidegradation review are proposed. If so, the permit writer should notify the applicant in writing that an antidegradation review has been initiated and request any preliminary information that may be necessary to perform the review. Preliminary information that may be requested includes, but is not limited to:

The permit writer should notify the Permits Branch Supervisor upon determining that an activity requiring an antidegradation review is proposed.

- A description of the proposed activity.
- A flow diagram depicting the proposed treatment process (e.g., where significant facility modifications are proposed).
- Engineering reports for the proposed activity (for new discharges or where significant facility modifications are proposed).
- The anticipated effluent quality associated with the proposed activity (where the proposed activity is expected to alter effluent parameter concentrations).

- A copy of any alternative analyses performed to satisfy other program requirements (e.g., Clean Water Act Section 404, National Environmental Protection Act).

Where the applicant is requesting a new or expanded mixing zone, the applicant should provide a mixing zone study documenting the model inputs, model results, and mixing zone dimensions. Model outputs should be included in the body of the study report or as an appendix to enable validation of the modeling results. The permit writer should review the mixing zone study to ensure it satisfies the conditions specified in NAC 445A.295 through 445A.302.

4.0 Step 1: Determine the Tier Protection Level

The initial step of the antidegradation review is the determination of the tier protection level for the receiving water. This section specifies the procedures for determining where Tier 2.5, Tier 3, and Tier 1 protection are necessary. Section 5.0 specifies the procedures for determining where Tier 2 protection is necessary.

4.1 Identify Receiving Water and Applicable Water Quality Standards

The permit writer should review the application and other materials to identify the receiving water and, where appropriate, downstream waterbodies to which the receiving water is tributary.

Tributary Rule

The tributary rule at NAC 445A.1239 specifies that water criteria apply to all surface waters upstream of a control point, the next upstream control point, or the next water named in NAC 445A.123 to 445A.2234.

If there are no control points downstream of a control point, the criteria for that control point also apply to all downstream surface waters or to the next water named in NAC 445A.123 to 445A.2234.

The permit writer should then review the Standards for Water Quality (NAC 445A.11704 through 445A.2234) to determine the applicable designated beneficial uses and standards for the receiving water. NAC 445A.121 specifies water quality standards that are applicable to all surface waters. NAC 445A.123 through 445A.2234 specify water quality standards for select waterbodies (i.e., classified waters).

If the receiving water is not a classified water named in NAC 445A.123 through 445A.2234, but is a tributary to such a water, the permit writer must apply the "tributary rule" (NAC 445A.1239) to determine the appropriate designated beneficial uses and standards for the receiving water.

Note that Tier 2.5 and Tier 3 protection is not required for tributaries to Extraordinary Ecological or Aesthetic Waters (EAWs)[3]. However, the water quality standards, including the requirements to maintain higher quality (RMHQs), for an EAW must be applied to its

[3] This exception does not apply to tributaries to Lake Tahoe. NRS 445A.175 prohibits direct discharge of sewage or other wastes within 100 feet of a stream, reservoir, spring, well, or other water supply in the Lake Tahoe Watershed.

unclassified tributaries in accordance with the tributary rule. Proposed activities resulting in discharges to tributaries of an EAW requiring Tier 3 protection shall not lower the existing water quality in the EAW (see Section 4.2.2).

4.2 Tier 2.5 and Tier 3 Protection

The permit writer should review NAC 445A.XXXX to determine whether the receiving water is an Extraordinary Ecological or Aesthetic Water (EAW) which requires Tier 2.5 or Tier 3 protection or an unclassified tributary to an EAW requiring Tier 3 protection.[4] If so, the permit writer should perform the antidegradation review as specified below. If the receiving water is not an EAW requiring Tier 2.5 or Tier 3 protection or an unclassified tributary to an EAW requiring Tier 3 protection, skip to Section 4.3.

4.2.1 Activities Resulting in Temporary and Limited Lowering of Water Quality

Proposed activities that will result in temporary and limited lowering of water quality in an EAW requiring Tier 2.5 or Tier 3 protection may be allowed on a case-by-case basis.[5] Where such activities are proposed and would require an individual permit, the permit writer should review the application for the proposed activity to determine whether the resulting degradation is necessary to 1) achieve long-term ecological or water quality benefit or 2) to accommodate public health and safety activities in the area of the EAW.

The permit writer should consider the following factors when determining whether to allow temporary and limited lowering of water quality in an EAW requiring Tier 2.5 or Tier 3 protection:

- The length of time during which water quality will be lowered.
- The length of time required for the EAW to recover to attain the same or better water quality conditions that existed prior to the activity.
- The parameters of concern and the percent change expected in ambient concentrations.
- The likelihood for long-term water quality benefits (e.g., as may result from dredging of contaminated sediments).
- The potential for any residual long-term impacts for any designated and existing beneficial uses.
- Best management practices (BMPs) necessary to minimize the duration and magnitude of the degradation.
- The potential for the activity to alter the characteristics of the receiving water that make it an EAW.

[4] At the time of writing, Lake Tahoe is Nevada's only waterbody with Tier 3 protection.
[5] This section does not apply to tributaries to EAWs requiring Tier 2.5 or Tier 3 protection.

If, upon consideration of the factors above, the Division determines that the degradation associated with the proposed activity will not be temporary and limited, the permit writer should notify the applicant that the proposed activity is not permitted. Note that existing point source discharges that were permitted prior to designation of the water as an EAW will be allowed to continue.

The permit writer should coordinate and seek direction from Branch Supervisors, the Bureau Chief, and/or the Division Administrator when determining whether to allow temporary and limited lowering of water quality in an EAW requiring Tier 2.5 or Tier 3 protection.

If the Division determines that degradation associated with the proposed activity will be temporary and limited and is necessary to achieve long-term ecological or water quality benefit or accommodate public health and safety activities, the permit writer should prepare the draft permit, including any necessary provisions to minimize the duration and magnitude of the degradation, and document the antidegradation findings in the accompanying fact sheet. See Section 7.5 for additional information on documenting antidegradation review findings and the public input process.

4.2.2 Other Activities That Do Not Result in Lowering of Water Quality

Discharges to EAWs Requiring Tier 3 Protection

The existing water quality of EAWs requiring Tier 3 protection must be maintained and protected. All activities with the potential to cause a lowering of water quality, except those that are temporary and limited (see Section 4.2.1), are prohibited.

Discharges to Unclassified Tributaries of EAWs Requiring Tier 3 Protection

For unclassified tributaries to EAWs requiring Tier 3 protection, proposed activities, such as those listed in Section 2.0 requiring an antidegradation review, may be allowed if they do not lower the existing water quality in the downstream EAW. Where such activities are proposed, the permit writer should perform a parameter-by-parameter analysis to demonstrate whether the proposed activity would have an effect on the existing water quality in the downstream EAW. Note that the water quality standards, including the RMHQs, of the EAW must be applied to the unclassified tributary in accordance with the tributary rule (see Section 4.1).

To perform the parameter-by-parameter analysis, the permit writer should follow the procedures in Section 4.3 through 6.2, with the following exceptions:

- For Section 5.2, baseline water quality will be based on the conditions at the time of the EAW classification.
- For Section 6.2, if the effluent concentration exceeds baseline water quality for any parameter of concern, the proposed activity will result in a lowering of water quality in the downstream EAW and will not be allowed.

Alternatively, the applicant may submit a study to demonstrate that discharges containing effluent concentrations that exceed the baseline water quality of the downstream EAW for the parameters of concern will not result in degradation of the downstream EAW.

If the Division determines that degradation associated with the proposed activity will not have an effect on the existing water quality of the downstream EAW, the permit writer should prepare the draft permit, including any necessary provisions to ensure that no degradation will occur, and document the antidegradation findings in the accompanying fact sheet. See Section 7.5 for additional information on documenting antidegradation review findings and the public input process.

The permit writer should coordinate and seek direction from Branch Supervisors, the Bureau Chief, and/or the Division Administrator when determining whether to allow a proposed activity to a tributary of an EAW requiring Tier 3 protection.

Discharges to EAWs Requiring Tier 2.5 Protection

For EAWs requiring Tier 2.5 protection, the existing water quality or the unique ecological, aesthetic, or recreational value must be maintained and protected. Proposed activities, such as those listed in Section 2.0 requiring an antidegradation review, may be allowed where such activities would have no effect on the existing water quality or value of the EAW.

Where the EAW classification is based on the unique or exceptional water quality conditions of the waterbody or the water quality levels necessary to maintain ecological (e.g., aquatic life, wildlife) or recreational uses, the permit writer should perform a parameter-by-parameter analysis to demonstrate whether a proposed new or expanded point source discharge would have an effect on the existing water quality.

To perform the parameter-by-parameter analysis, the permit writer should follow the procedures in Section 4.3 through 6.2, with the following exceptions:

- For Section 5.2, baseline water quality will be based on the conditions at the time of the EAW classification.
- For Section 6.2, if the effluent concentration exceeds baseline water quality for any parameter of concern, the proposed activity will result in a lowering of water quality and will not be allowed.

Where the EAW classification is based on attributes of the waterbody other than water quality (e.g., historical significance, scenic and wilderness value, or other notable characteristics), the permit writer shall perform a qualitative analysis to demonstrate whether a proposed new or expanded point source discharge would have an effect on the unique value of the waterbody. The qualitative analysis should consider the attributes that formed the basis of the EAW classification and the potential for the proposed activity to cause short- or long-term impacts to those attributes.

If the Division determines that degradation associated with the proposed activity will not have an effect on the existing water quality or value of the EAW, the permit writer should prepare the draft permit, including any necessary provisions to ensure that no degradation will occur, and document the antidegradation findings in the accompanying fact sheet. See Section 7.5 for additional information on documenting antidegradation review findings and the public input process.

The permit writer should coordinate and seek direction from Branch Supervisors, the Bureau Chief, and/or the Division Administrator when determining whether to allow a proposed activity to an EAW requiring Tier 2.5 protection.

4.3 Tier 1 Protection

The permit writer should determine whether the receiving water requires Tier 1 protection for any parameters. To do so, the permit writer should review the most recent Water Quality Integrated Report to determine whether the receiving water has been identified as an impaired waterbody (i.e., Category 4 or 5) on the Clean Water Act Section 303(d) List. Tier 1 protection must be provided for any parameters for which the receiving water is impaired.[6]

If the receiving water is not identified as impaired for any parameters, skip to Section 5.0.

Where the receiving water is identified as Category 4 for a parameter, the permit writer should review the applicable total maximum daily load (TMDL). The permit writer should establish an effluent limitation(s) for the parameter in the permit in accordance with the applicable TMDL waste load allocation, as well as any additional provisions necessary to ensure that the existing beneficial uses and water quality necessary to protect these uses will be maintained and protected.

Where the receiving water is identified as Category 5 for a parameter, and the discharge exhibits reasonable potential to exceed the applicable water quality criteria, the permit writer should establish a concentration-based effluent limitation(s) for the parameter in the permit based on the applicable water quality criterion. If the discharge does not exhibit reasonable potential to exceed the applicable water quality criteria, the permit writer should require monitoring at a frequency sufficient to characterize the effluent and receiving water (e.g., quarterly) for that pollutant in the permit. If a TMDL is subsequently issued, the effluent limitation(s) may be modified (higher or lower) in accordance with the TMDL wasteload allocations.

No mixing zones should be provided for parameters requiring Tier 1 protection.

[6] Note that Tier 1 protection may be necessary for additional parameters if the IBV determined in Step 2 exceeds the applicable water quality criterion.

5.0 Step 2: Identify Parameters of Concern

5.1 Identify Parameters of Concern

Parameters of concern are parameters that the permit writer has reason to believe are or may be discharged by the facility and could affect the physical, chemical, or biological condition of the receiving water. The permit writer should compile a list of the parameters of concern that includes:

- Parameters subject to effluent limitations in the existing permit.
- Parameters identified as detected in the effluent in the permit application.
- Parameters identified as detected in the effluent in Discharge Monitoring Reports (DMRs) submitted during the term of the existing permit.
- Parameters subject to an applicable effluent limitations guideline (ELG).
- Parameters otherwise expected to be present in the discharge.

pH should not be identified as a parameter of concern for the purposes of the antidegradation review and a Tier 2 antidegradation review will not be required if the anticipated effluent quality from the proposed activity will be maintained within the range specified in the water quality standards (e.g., 6.5 to 9.0 standard units). Where the pH of the proposed activity is of concern, the permit writer may require the applicant to perform alternative analyses to determine whether a lowering of water quality will occur.

In general, temperature should not be identified as a parameter of concern and a Tier 2 antidegradation review will not be required unless the proposed activity includes a thermal discharge. Where the proposed activity includes a thermal discharge, antidegradation review requirements will be satisfied if the requirements of Clean Water Act Section 316(a) are met.

The permit writer should use their best judgement to determine whether biochemical oxygen demand or dissolved oxygen are parameters of concern. Generally, biochemical oxygen demand should be considered a parameter of concern for purposes of the antidegradation review when the discharge contains oxygen-demanding substances and an applicable water quality criterion is applicable to the receiving water[7]. Where dissolved oxygen is identified as a parameter of concern, the permit writer should characterize baseline water quality and evaluate the effects of the proposed activity as specified in Sections 5.2 through 6.2, except that the IBV (where calculated) and effluent levels should be representative of the minimum observed levels. Where the proposed activity is expected to result in significant loading increases of oxygen-demanding substances (e.g., biochemical oxygen demand or chemical oxygen demand) that could result in significant lowering of the dissolved oxygen in the

[7] At the time of writing, water quality criteria for biochemical oxygen demand have only been developed for the Truckee River at the state line (NAC 445A.1682), Idlewild (NAC 445A.1684), and East McCarran (445A.1686).

receiving water, the permit writer may require the applicant to perform alternative analyses (e.g., Streeter-Phelps Model) to determine whether a lowering of water quality will occur.

5.2 Characterize Baseline Water Quality

For each parameter of concern (other than the Tier 1 parameters already addressed under Section 4.3), the permit writer should characterize the baseline water quality. The baseline water quality should be established using the RMHQ or the IBV for the parameter, as discussed below.

5.2.1 Requirements to Maintain Existing Higher Quality (RMHQs)

The permit writer should review the Standards for Water Quality (NAC 445A.11704 through 445A.2234) to determine whether RMHQs have been developed for any parameters of concern. Tier 2 protection must be provided for any parameters of concern with an applicable RMHQ. The permit writer should establish the baseline water quality for such parameters at the RMHQ.

5.2.2 Calculate Interim Baseline Values (IBVs)

For the remaining parameters of concern, the permit writer should calculate an IBV, as specified below, to characterize the baseline water quality. In lieu of collecting additional data to calculate an IBV for a parameter of concern, the permit writer may establish the IBV at the lowest associated method detection limit (MDL) where the parameter of concern is not expected to be present at detectable concentrations in the receiving water (e.g., certain anthropogenically-derived chemicals).

Minimum Data Requirements

A minimum of three independent and representative samples of the upstream receiving water (outside the influence of the discharge) collected during periods of non-extreme flow conditions is necessary to calculate an IBV.

Review Existing Data Sources

Permit writers should encourage applicants to use available water quality data to the greatest extent possible to determine the level of antidegradation protection appropriate for a waterbody. Applicants should review the following data sources to compile available water quality data for the parameters of concern:

- Discharge Monitoring Reports (DMRs).
- Water quality monitoring reports containing receiving water monitoring data collected by the applicant.
- Monitoring data collected by Division staff during inspections.

- The Division's Water Quality Monitoring Warehouse.
- United States Geological Survey (USGS) National Water Information System (NWIS).

Additional Data Collection

Where available data does not meet the minimum data requirements, the permit writer should request that the applicant develop a sampling and analysis plan to acquire the representative water quality data needed to characterize baseline water quality. The permit writer should send the request to the applicant as soon as possible following submission of the application to avoid permit development delays. The request should specify:

- The deadline for submitting the sampling and analysis plan.
- The parameters of concern to be sampled.
- The minimum data collection requirements (e.g., sufficiently sensitive analytical methods approved under 40 CFR Part 136).
- The preferred format for submitting the sampling results.
- The deadline for submitting the sampling results (no later than 4 months following the approval of the sampling and analysis plan).

The permit writer should encourage the applicant to develop the plan in accordance with the Nevada Quality Assurance Program Plan for Surface Water Sampling (February 2020). The plan should include a map of the proposed sampling sites and proposed discharge point(s). The sampling and analysis plan does not need to be lengthy.

The permit writer should review the sampling and analysis plan to ensure that independent and representative samples will be collected during periods of non-extreme flow conditions.

Applicants and permit writers should contact the Bureau of Water Quality Planning (BWQP) for questions regarding the development and review of sampling and analysis plans.

- *Independent Samples.* The Division recommends a minimum interval between samples of no less than 1 month to ensure IBVs are based on independent samples. Independent samples are not strongly auto-correlated (also known as serial correlation). The true variability of the sample population may be poorly estimated if the interval between sampling events is too short. As an example, if one were to collect one sample per quarter for four quarters, versus collecting one sample per day on four consecutive days, the quarterly samples are likely to have higher variability than the daily samples, even though both sets represent "four samples per year."
- *Representative Samples.* Representative samples reflect the conditions you are trying to assess. That is, the sample typifies ("represents") in space and time, the part of the waterbody that is under consideration. For example, to characterize the average chemistry of a stream, it would be best to sample the water in the flowpath instead of in a backwater pool. Ideally, a representative sample is an unbiased reflection of the

chemical conditions in a waterbody. Choose sampling sites that offer a better estimate of well-mixed waters.

- *Flow Conditions.* Flow is an important factor to be considered when establishing baseline water quality. To the extent possible, samples should not be collected during periods of extreme conditions (i.e., high or low flows). Extreme conditions of high or low flow can markedly affect parameter concentrations and other characteristics. Rather than focusing on water quality levels during critical low-flow conditions, a variety of flow regimes and flow metrics should be examined to provide a more complete picture of background quality. For lakes and reservoirs, the permit writer should consider seasonal impacts, water level fluctuations, and other factors when selecting the appropriate sampling conditions.

Calculate the IBV

Based on the data compiled from the existing data sources and additional data collection, the permit writer should calculate an IBV for each parameter of concern. The IBV should be set at the extrapolated 95th-percentile value.[8]

For purposes of calculating the IBV, the permit writer should use the following values for censored data:

- If data are censored at the MDL (i.e., the MDL is used as the reporting limit) and are indicated as "not detected" at this level, the value of the MDL should be used as a proxy value for the non-detected result.
- If data are reported at a value greater than the MDL, but less than the quantitation limit (typically, the minimum level), the reported value[9] should be used.
- If data are censored at the quantitation limit (i.e., the quantitation limit is used as a reporting limit), a value of one-half the quantitation limit should be used as a proxy value for the non-detected result.

Some parameters, such as total dissolved solids, chloride and sulfate, have relatively high water quality criteria to protect beneficial uses. For such parameters, the IBV should not be established at less than 10% of the water quality criterion. For example, if the water quality criterion for sulfate is 250 mg/L, the lowest IBV that should be established is 25 mg/L.

[8] The "extrapolated 95th percentile" is calculated using the =PERCENTILE.INC(ARRAY,0.95) function in Excel. For example, using three results (10, 10, 20 mg/L) yields an extrapolated 95th percentile of 19.0 mg/L.
[9] This value should be qualified by the laboratory as "estimated" and have an associated data qualifier (e.g., J-qualified).

5.2.3 Consider Additional Information

The permit writer should consider additional information to characterize the overall quality and value of the receiving water. The permit writer may request such information from the applicant, if necessary. Additional information to be considered could include:

- Land use information.
- Presence of point or nonpoint source pollution.
- Health of the aquatic community.
- Existing watering of livestock, irrigation, aquatic life, recreation, aesthetic, or municipal or domestic supply uses.
- Overall value of the waterbody from an ecological and public use perspective.

5.3 Tier 2 Protection

Tier 2 protection must be provided for any parameters of concern with an applicable RMHQ, as determined in Section 5.2.1. Tier 2 protection must also be provided for parameters of concern with an IBV, as determined in Section 5.2.2, that is less than the applicable water quality criterion, unless the permit writer determines that the receiving water is not high quality with respect to that parameter based on the additional information considered in Section 5.2.3. The permit writer should evaluate the effect of the discharge or activity in accordance with Section 6.0 for all parameters of concern requiring Tier 2 protection.

Tier 1 protection must be provided for parameters of concern with an IBV, as determined in Section 5.2.2, that is greater than the applicable water quality criterion or where the permit writer determines that the receiving water is not high quality with respect to that parameter based on the additional information considered in Section 5.2.3. See Section 4.3 for guidance for establishing effluent limitations for parameters of concern requiring Tier 1 protection.

6.0 Step 3: Evaluate the Effects of the Proposed Activity

6.1 Quantify Effluent Levels

For each parameter of concern requiring Tier 2 protection, as determined in Section 5.3, the permit writer should quantify the effluent level of the parameter associated with the proposed activity.

For existing facilities, the permit writer should generally select the maximum monthly average effluent concentration of the pollutant unless the proposed activity will impact the effluent quality with respect to that parameter. In such instances, the permit writer may utilize the anticipated effluent quality from the proposed activity (e.g., from an engineering report or based on data for similar facilities). For example, where an existing facility is proposing an upgrade and expansion project to include nitrification/denitrification, the effluent levels for

ammonia, nitrate, and nitrite could be based on the anticipated effluent quality rather than historical monitoring data for the current treatment system.

For new discharges, the effluent quality should be based on the anticipated effluent quality. Note that NPDES Application Form 2A (New and Existing Publicly Owned Treatment Works) requires new dischargers to provide all information available to them at the time of the application and NPDES Application Form 2D (New Manufacturing, Commercial, Mining, and Silvicultural Operations That Have Note Yet Commenced Discharge of Process Wastewater) requires new dischargers to provide estimated effluent data. The permit writer may need to request additional information (e.g., engineering reports) from the applicant, or review information for facilities with similar types of processes and treatment systems to characterize the anticipated effluent quality from new facilities.

6.2 Evaluate Effects

For each parameter of concern requiring Tier 2 protection, the permit writer should evaluate whether existing water quality in the receiving water would be maintained and protected if the discharge or activity is authorized.

A regulated discharge would not cause degradation of higher water quality conditions if the levels of the parameters of concern at the point of discharge are at or below the corresponding baseline water quality (i.e., the RMHQ or IBV) in the receiving water. The permit writer should evaluate whether the proposed activity will satisfy this criterion for each Tier 2 parameter of concern. The evaluation should be performed by comparing the effluent concentration at the point of discharge determined in Section 6.1 to the baseline water quality (i.e., the RMHQ or IBV) determined in Section 5.2. If the effluent concentration does not exceed baseline water quality, the proposed activity is not expected to result in a lowering of water quality and no additional analysis is required. If the effluent concentration exceeds baseline water quality, the proposed activity will result in a lowering of water quality and the permit writer should proceed with additional analysis and evaluation under Section 7.0.

Note that all new or expanded mixing zones are expected to result in a lowering of water quality. The permit writer may limit the size of the regulatory mixing zone, as necessary, to minimize degradation to waters requiring Tier 2 protection. For example, consider a scenario in which a mixing zone study supports the allowance of a mixing zone length of 25 feet. However, effluent data demonstrate the facility can achieve effluent limitations associated with a mixing zone length of 10 feet. In this case, the permit writer could establish effluent limitations associated with a mixing zone length of 10 feet, limiting the amount of degradation and the size of the mixing zone. When considering whether and how to limit the size of the mixing zone, the permit writer should consider:

- Limiting the mixing zone to the end of near-field mixing.
- Compliance and performance history of the facility.

- Potential impacts to designated beneficial uses.
- Mixing zone allowances provided to other dischargers for the same waterbody.
- Assimilative capacity usage.

7.0 Step 4: Additional Analysis and Evaluation

7.1 Request Additional Analysis and Evaluation

If the results of the evaluation performed under Section 6.2 indicate that the proposed activity will result in the lowering of water quality for any parameters of concern requiring Tier 2 protection, the permit writer should request that the applicant provide an alternative analysis and justification of social or economic importance that satisfies State antidegradation requirements at NRS 445A.565, NAC 445A.XXXX, and Section 4.3.4 of Nevada's Antidegradation Implementation Procedures. The request should include:

- An identification of the parameters of concern requiring Tier 2 protection and the associated level of degradation, as determined in Section 6.2.
- Guidance for performing the alternative analysis (e.g., Appendices C and D).
- Guidance for performing the justification for social or economic importance (e.g., Appendices E and F).
- The deadline for submitting the alternative analysis and justification for social or economic importance (no later than 1 month following the date of the request).

7.2 Review the Alternative Analysis

The permit writer should review the applicant's alternative analysis to confirm that it satisfies State antidegradation requirements at NRS 445A.565, NAC 445A.1211.A.2, and Section 4.3.4 of Nevada's Antidegradation Implementation Procedures. The applicant's alternative analysis should focus on alternatives directly related to protecting water quality that are economically, environmentally, and technologically reasonable. The overall goal of the analysis is to identify whether a less-degrading alternative could be reasonably and economically implemented to reduce the levels of the parameters of concern requiring Tier 2 protection. Note that an alternative analysis completed as a requirement of other permitting activities is acceptable for antidegradation review purposes.

7.2.1 Identify Alternatives

The permit writer should review the alternative analysis to ensure that the applicant adequately identified and considered other less degrading and/or non-degrading pollution control measures. This analysis may result in identification of multiple reasonable alternatives. Where appropriate, the permit writer may request that the applicant analyze specific alternatives beyond those identified in its analysis. Alternatives may include, but are not limited to, the following:

- Pollution prevention.
- Improved operation and maintenance of the existing treatment system.
- Treatment process changes, including advanced or innovative biological, physical, and/or chemical treatment.
- Collection system improvements.
- Recycling/reusing wastewater.
- Land application.
- Regionalization.
- Groundwater recharge.
- Seasonal or controlled discharges to avoid critical periods.
- Relocation or reconfiguration of the outfall or diffuser.
- Reduction in the scope of the proposed activity.

The permit writer should review the alternatives identified by the applicant to ensure they are reliable, demonstrated processes or practices that can be reasonably expected to result in a defined range of treatment or pollutant removal. If experimental or unproven methods are proposed, the permit writer may request information on previous applications of the method, effectiveness, transferability (if applicable), and other information, as appropriate.

7.2.2 Amount of Degradation Reduced

The permit writer should review the alternative analysis to ensure that the applicant determined the amount of degradation caused by each alternative identified. The applicant should rank all feasible alternatives from least to most degrading to water quality. For less degrading alternatives, the applicant should quantify the level of pollution reduction accomplished.

To rank alternatives, the applicant must estimate the anticipated effluent concentration expected from each alternative. Consider creating ranking tables where the anticipated effluent concentration of a specific pollutant of concern is listed in ascending order. This display will allow for a simplistic view of which alternatives are the least degrading for a specific pollutant. It may be possible that an alternative with the least degradation for one pollutant is not the least degrading option for another pollutant. In these cases, the applicant will need to determine which alternative will create the least amount of degradation in the receiving water, taking into consideration the factors discussed in Section 7.2.4.

If the applicant opts to implement the least degrading alternative feasible for the parameters of concern, the applicant may bypass further alternative analysis (Sections 7.2.3 through 7.2.5) and should provide the justification of social or economic importance (see Section 7.3).

If the applicant prefers to implement an alternative other than the least degrading alternative, the next least degrading alternative may be justified upon review of the cost effectiveness of

pollutant removal (Section 7.2.3), cost of pollution versus environmental gain (Section 7.2.4), and affordability (Section 7.2.5).

7.2.3 Cost Effectiveness of Pollutant Removal

Where the applicant prefers to implement an alternative other than the least degrading alternative, the applicant should assess the costs related to each alternative to determine whether the preferred alternative is cost effective with respect to the parameters of concern. The applicant should clearly indicate the sources and rationale for all data and assumptions in the assessment. The permit writer should review the assessment for completeness, accuracy, and validity of assumptions.

Applicants may conduct cost assessments using a present worth approach (Appendix C), an absolute value approach described in EPA's Interim Economic Guidance for Water Quality Standards Workbook (Appendix D), or other approach. When assessing the costs for each alternative, applicants may consider capital costs, operating costs, and other costs (one-time costs, savings, opportunity cost, salvage value).

Based on the cost estimates for each alternative, the applicant should rank each alternative by its cost effectiveness for pollutant removal. Applicants may, but are not required to, evaluate cost effectiveness by evaluating the cost per unit mass of pollutant removed, such as dollars per pound ($/lb), $/lb/million gallons per day (MGD), or other units.

Greater pollution reduction will typically cost more, but economies of scale and alternate technologies can result in nonlinear per-unit costs.[10] If alternatives are ranked by per-unit pollutant reduction costs, the cost of improved pollutant reduction can be compared. This comparison may justify a more degrading alternative if the incremental cost of improved treatment far outweighs the incremental gain in pollutant reduction.

[10] 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. Differing treatment alternatives have differing costs that are not always proportional to volume. Instead, a doubling of pollutant reduction may cost more or less than twice as much. Options are best compared on a per unit basis, taking into account all various costs and their timing.

Example: Evaluating Cost Effectiveness of Pollutant Removal

Scenario: Alternative 1 removes 100 lb of a pollutant for $10,000 per MGD, so the unit cost is $100/lb/MGD. Alternative 2 removes 90 lb of the pollutant for only $900 per MGD, so its unit cost is only $10/lb/MGD.

Evaluation: Alternative 2 is more cost effective, as there is a sharp jump in per-pound cost for removing the additional 10 lb/MGD: $910/lb/MGD ([$10,000−$900]/10 lb). The permit writer could determine that the cost of removing 10 more pounds of pollutant is unreasonable and the next best alternative could be accepted as the preferred alternative. In this way, alternatives imposing a cost that is disproportionate to the possible environmental gain may be eliminated from further consideration.

Further, consider an additional Alternative 3, which could achieve a pollutant reduction of 50 lb at a cost of $450 per MGD. The cost per pound of treatment ($9/lb/MGD) would only be slightly better than Alternative 2, and the marginal cost of nearly doubling pollutant removal compared to using Alternative 2 would be $11.25/lb/MGD ([$900−$450]/40 lb). In this case, Alternative 2 remains the preferred alternative.

Example of Ranking Cost Effectiveness

Alternative	Pounds Removed	Cost ($)/MGD	Unit Cost ($) (lb/MGD)
1 – Least Degrading	100	10,000	100
2 – More Degrading	90	900	10
3 – Most Degrading	50	450	9

7.2.4 Cost of Pollution Reduction Versus Overall Environmental Gain

Cumulative Impacts to Water Quality

Under Section 7.2.3, the applicant evaluated the cost effectiveness of each alternative for each parameter of concern on an individual basis. However, because multiple pollutants usually exist in a discharge, the applicant should consider the cumulative impacts to water quality and environmental trade-offs for each alternative. The most effective alternative for one parameter of concern may not be the best for another.

Example: Cost of Pollution Reduction Versus Overall Environmental Gain

Scenario: The parameters of concern requiring Tier 2 protection include temperature and phosphorus. The treatment processes and alternatives to address these parameters are different (e.g., chilling for temperature and ultrafiltration for phosphorus).

Evaluation: Maximizing treatment for one parameter will not reduce the impacts for the other, and the treatment costs will be additive. Finding the optimum environmental solution in this situation may involve some intermediate level of treatment of both phosphorus and temperature. A compromise in treatment may be warranted if one of the pollutants is more limiting to the support of beneficial uses. In the latter case, it may be more environmentally beneficial to treat the limiting pollutant (e.g., reducing temperature over phosphorus if temperature is the greater impediment to support of beneficial uses).

This decision could be further complicated if the cost of treating temperature is greater than the cost of treating phosphorus. Phosphorus treatment may offer more environmental benefit per unit cost of pollutant reduction, although temperature is the more limiting pollutant. Another alternative for treating both may avoid such a trade-off (e.g., land application could address both temperature and phosphorus at once, without additive costs for each pollutant), but a trade-off may result in less water in the receiving water.

Other Environmental Impacts

The applicant should consider other environmental impacts for each alternative. While the alternatives considered may reduce degradation to the receiving water with respect to the parameters of concern, some alternatives may cause other environmental impacts. If an alternative creates a larger environmental impact on another type of water or media, the applicant may determine that the alternative is not preferred.

When considering other environmental impacts, the applicant should consider the following for each alternative:

- Potential to generate secondary water quality impacts (e.g., increased stormwater runoff, impacts to hydrology).
- Potential to impact groundwater.
- Potential to impact other media (e.g., air pollution or hazardous materials generation).
- Potential to impact endangered species.
- Other environmental impacts (e.g., odor, noise, energy consumption).

Some impacts, such as odor and noise impacts, may be addressed qualitatively. Others, such as energy use, air emissions, and solid waste generation, may be addressed quantitatively (e.g., expressed as a percent increase/decrease as compared to the proposed activity).

7.2.5 Affordability of Alternatives

After analyzing pollutant reduction cost effectiveness and environmental trade-offs, the applicant should assess the affordability of the best remaining alternatives. This assessment

determines if an alternative is too expensive to reasonably implement for the type of discharge or activity proposed for a specific industry. This approach might result in selecting 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.

If the applicant determines the remaining least degrading alternative is affordable, it should be selected as the preferred alternative. If it is not affordable, the affordability of the next alternative should be evaluated until an alternative is chosen that is practicable, economically efficient, and reasonable overall. The applicant should clearly document when an alternative is not affordable and demonstrate how its substantial adverse economic impact would preclude use for the activity or discharge under review.

If, upon review of the applicant's alternative analysis, the Division determines that an alternative other than the applicant's preferred alternative is feasible, affordable, and will result in less degradation or no degradation, the permit writer should work with the applicant to revise the permit application.

The permit writer should coordinate and seek direction from Branch Supervisors, the Bureau Chief, and/or the Division Administrator to determine whether an alternative other than the applicant's preferred alternative should be selected.

Determining Affordability Using the Present Worth Approach

Where the applicant uses the present worth approach for the cost assessment, an alternative is cost effective and reasonable if it is feasible and the cost is less than 110 percent of the base costs[11] of pollution control measures for the proposed discharge in present worth costs.

Note that the 110 percent cost effectiveness criterion is a general rule-of-thumb. If pollution control costs slightly exceed the 110 percent cost threshold for an alternative that would result in substantial water quality benefits, that alternative may be required.

Determining Affordability Using the Absolute Value Approach

Where the applicant uses the absolute value approach for the cost estimate, the test for determining affordability will depend on whether the applicant is a public or private entity.

For public entities, the criterion for affordability is 1 percent of the median household income of the rate-paying public. When projected annual rates are higher than 1 percent of the median income, criteria for secondary tests of affordability will be applied in a "scored" matrix. Appendix D provides an example worksheet to evaluate affordability by alternative for public

[11] The base cost is the cost of treatment to meet the applicable water quality criterion or the cost of meeting applicable technology-based effluent limitations, whichever is more stringent and legally applicable.

entities. Additional guidance for judging affordability for public sector entities is presented in Section 2 of EPA's Interim Economic Guidance for Water Quality Standards Workbook.

For private entities, the primary measure of economic impact to private entities is profitability. Secondary measures include indicators of liquidity (how easily can an entity pay its short-term bills), solvency (how easily can an entity pay its fixed and long-term bills), and leverage (how much money the entity can borrow). Appendix D provides an example worksheet to evaluate affordability by alternative for private entities. Additional guidance for judging affordability for private sector entities is presented in Section 3 of EPA's Interim Economic Guidance for Water Quality Standards Workbook.

7.3 Review the Justification of Social or Economic Importance

The permit writer should review the applicant's justification of social or economic importance to determine whether the degradation associated with the preferred alternative (as selected in Section 7.2) is necessary to accommodate important social or economic development in the area where the waterbody is located. The justification should demonstrate that the social or economic benefits occurring from an activity are important to the affected community. An activity must be either socially or economically important, not both; depending on the proposed activity, it may be prudent to focus on one or the other.

A proposed activity that is socially justified is important to the social development of the local community in at least one aspect (e.g., population growth or job growth) or results in improvements of important community service needs (e.g., construction of new wastewater treatment plant, public water supply project, or improved transportation infrastructure).

A proposed activity that is economically justified will promote economic development of the local community. A more in-depth analysis would be required to show the economic importance than a social justification and should cover how the costs associated with water quality degradation are offset by benefits to the community.

The applicant should provide a simplified cost-benefit analysis in accordance with Section 7.3.1 through 7.3.4 to support the social or economic justification.

7.3.1 Identify the Affected Community

The applicant should first identify the affected community. The affected community is the population in the geographical area where 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.

Once the affected community is identified, the applicant should describe the current economic and environmental conditions of that community to identify those areas that will be evaluated in Section 7.3.2 and 7.3.3. For example, residents of a small town with a wastewater treatment

plant that is proposing a change in its effluent discharge would be affected by the degradation of water. Downstream users affected by this change may be towns that rely on the waterbody to supply drinking water. Well water users should also be considered if their water supply could be impacted from degradation of groundwater from land application.

When evaluating current economic conditions, applicants should describe the overall economic health of the community, and include any pertinent information on household incomes, general employment rates, and growth. Descriptions of current water quality and biological health also help to accurately reflect current environmental conditions.

7.3.2 Describe the Important Social or Economic Development

The applicant must describe the benefits the activity will have on the economic or social development of the affected community. The applicant should describe why the proposed activity (or degradation of quality of water) is important to the overall social or economic health of the community. The applicant should establish the current condition of the affected community from Section 7.3.1 and estimate of the benefits to the community based on the effects of the proposed activity. The applicant should make every effort to quantify these changes, but the Division recognizes not all social indicators can be easily quantified and will accept a qualitative assessment of changes to these indicators.

The proposed activities may accrue the following benefits:

- Encourage job growth.
- Serve a larger area or greater population.
- Increase property values or the tax base in the affected community.
- Provide a necessary public service.
- Decrease in household expenses for services.
- Correct a public health or environmental problem.
- Retain assimilative capacity for future growth.

7.3.3 Determine the Overall Environmental, Social, and Economic Impacts

The applicant should determine the overall environmental, social, and economic impacts associated with the proposed activity and accompanying degradation of water quality. This step compares the benefits associated with the activity identified in Section 7.3.2 to the impacts associated with the discharge.

The applicant should consider the anticipated changes in the environmental, social, and economic indicators listed below. For each indicator listed, the applicant should estimate the potential change that would result from the proposed activity.

- Changes in employment rate.
- Changes in personal or household income.
- Changes in property values or community tax base.
- Percent of households below poverty line.
- Impact on community development potential.
- Providing necessary public services (e.g., fire department, school, infrastructure).
- Correcting a public health, safety, or environmental problem.
- Impact to uses based on water quality (e.g., fishing, recreation, or tourism).
- Reduction or reservation of assimilative capacity for future industry and development.
- Environmental benefits associated with reclamation and other restored property.
- Providing increased flood control.

The environmental, social, and economic measures identified above do not constitute a comprehensive list and will not be relevant to all activities or discharges. Each situation and community is different and will require an analysis of unique factors. The applicant is encouraged to analyze additional factors that characterize the specific community under consideration.

As with Section 7.3.2, the applicant should make every effort to quantify these changes. All information provided should be based upon the most current, available data (e.g., unemployment statistics, census data, etc.).

Social or Economic Justification Considerations: Public Versus Private

Because public and private sector entities often have different practices and goals, affecting different sectors of the community, the two types of activities may have different social or economic justification evaluations.

Public sector entities include publicly owned treatment works, public utilities, and other entities owned or operated by a governmental (local, state, or federal) agency. Public sector entities do not operate on a for-profit basis and gain most of their capital for expenses from user fees and obligation or revenue bonds. Evaluating impacts to public entities may include looking at financial impacts to the public entity and socioeconomic conditions of the surrounding community. The impact of those pollution control costs can affect a wider community, and the general financial and economic health of the community will determine if the impacts are important.

Private entities are owned and operated on a for-profit basis. These private entities use profits or investments from shareholders to raise the capital needed for pollution control costs and may pass those costs along to the end user through higher prices for the goods or services. For private entities, measuring substantial impacts may require estimating the financial impacts on their balance sheet and analyzing the overall impact on the surrounding community (e.g., the impact of lost employment on the community or the increased cost of goods or services).

The line between public and private entities may be blurred when the public entity provides a service to significant numbers of private entities (e.g., a wastewater treatment plant servicing a mainly industrial area or a private, for-profit hospital providing a substantial benefit to the public). In this case, the methods to evaluate public entities and those for private entities may both need to be employed to determine an overall economic impact.

7.3.4 Social or Economic Justification Evaluation

Based on the submitted information, the Division shall determine whether the proposed activity is important from an economic or social perspective. If the applicant demonstrates the proposed activity will lead to overall beneficial changes in the factors presented, the proposed activity will be considered to provide important social or economic development.

The permit writer should coordinate and seek direction from Branch Supervisors, the Bureau Chief, and/or the Division Administrator to determine whether the proposed activity will provide for important social or economic development.

When information provided in the applicant's justification is not sufficient to determine the social or economic benefits or environmental impacts associated with the proposed activity, the permit writer may request additional information.

If the Division determines the social and economic justification of the proposed activity has not been demonstrated, the permit writer should deny the proposed activity and provide the applicant with a written explanation of the deficiencies in the evaluation.

7.4 Ensure Other Controls Are Achieved

When allowing lowering of existing water quality for a parameter requiring Tier 2 protection, NAC 445A.XXXX and 40 CFR 131.12(a)(2) specify that the Division should ensure the highest statutory and regulatory requirements for all new and existing point sources are achieved and all cost-effective and reasonable BMPs for nonpoint source control are implemented.

The intent of this requirement is to assure that where there are existing point or nonpoint source control compliance problems in high quality waters, proposed new or expanded point sources are not allowed to contribute additional pollutants that could result in degradation. Where such compliance problems exist, it would be inconsistent with the philosophy of the antidegradation policy to authorize the discharge of additional pollutants in the absence of adequate assurance that any existing compliance problems will be resolved.

Note that this requirement does not require the Division to establish BMPs for nonpoint sources where such BMP requirements do not exist.

Requirements for Point Sources

The permit writer should determine if there are any compliance issues from existing dischargers that affect water quality within the same receiving water that would be affected by the proposed discharge and are related to the parameter or parameters for the proposed activity. For example, if the parameter for which water quality would be lowered is copper, the permit writer should examine if other dischargers that affect the same receiving water have had ongoing issues meeting effluent limitations for copper. If any dischargers have such compliance issues for relevant parameters and the Division has not entered into a formal agreement (e.g., a compliance schedule) to address and improve these issues, the Division may not allow additional lowering of water quality for the parameter or parameters in question. Once such an agreement is in place, the Division may consider authorizing lowering of water quality for that parameter.

Procedures for Nonpoint Source Control

Nevada's Nonpoint Source Management Program is non-regulatory and relies on voluntary participation from public agencies and private landowners. The 2015-2019 Nevada Nonpoint Source Management Plan describes Nevada's approach for protecting and improving water quality from nonpoint source pollution. Reduction in nonpoint source pollution is accomplished through a combination of technical and financial assistance, training, education, planning and implementation of water quality improvement projects.

During its antidegradation review, the permit writer should review the most recent Nonpoint Source Management Plan and consult with the Division's Nonpoint Source Management Program staff to verify that strategies are in place to address nonpoint source pollution in the

receiving water where nonpoint source pollution is known to be contributing to lower water quality with respect to a parameter of concern in the point source discharge.

7.5 Document Antidegradation Review Findings and Public Input Process

7.5.1 Develop Draft Surface Water Permit

The permit writer should develop the draft permit based on the results of the antidegradation review, including the establishment of effluent limitations, monitoring requirements, and other conditions, as appropriate.

Effluent Limitations

For parameters of concern requiring Tier 1 protection, the draft permit should include effluent limitations based on:

- the applicable water quality criterion (where the discharge exhibits reasonable potential), or
- the applicable TMDL.

For parameters of concern requiring Tier 2 protection, the draft permit should include effluent limitations based on:

- baseline water quality (i.e., RMHQ or IBV), or
- the anticipated effluent quality associated with the proposed activity (where the lowering of water quality is determined to be important and necessary based on the analyses in Sections 7.2 and 7.3).

Under no circumstances should effluent limitations allow for water quality to be lowered to a level that does not comply with the applicable water quality standards.

Where appropriate, the permit writer may include tiered effluent limitations corresponding to the different phases of implementation of the proposed activity. For example, where construction of an upgraded and expanded treatment facility will occur in multiple phases, the permit could have effluent limitations for the current condition (applicable until completion of the first phase of construction) and each subsequent phase of the project.

Monitoring Requirements

For parameters of concern requiring Tier 1 protection, the draft permit should include at least quarterly effluent and receiving water monitoring. This monitoring will be used to determine compliance with applicable effluent limitations and/or support TMDL development.

For parameters of concern requiring Tier 2 protection, the draft permit should include at least quarterly effluent monitoring to determine compliance with the applicable effluent limitations. For parameters for which an IBV was calculated in Section 5.2.2, the draft permit should include at least quarterly receiving water monitoring. The permit writer may include additional monitoring specifications (e.g., monitoring locations, analytical methods, etc.) in accordance with the applicant's sampling and analysis plan.

Other Conditions

The permit writer should include any additional conditions in the draft permit necessary to protect and maintain existing uses and the level of water quality to protect those uses. Examples of other conditions include discharge prohibitions, special studies, BMPs, and compliance schedules[12].

7.5.2 Document Antidegradation Review Findings

The permit writer should document the findings of the antidegradation review in the fact sheet for the draft permit. For activities requiring an antidegradation review (see Section 2.0), the fact sheet should include:

- A description of the proposed activity.
- An identification of the parameters of concern and how they were identified.
- The tier protection level for each parameter of concern.
- A summary of the baseline water quality (i.e., RMHQ or IBV).

If the proposed activity is determined not to cause a significant degradation of a Tier 2-protected water, the permit writer should provide sufficient evidence in the fact sheet to support this finding.

Where a lowering of water quality in a Tier 2-protected water is proposed, the fact sheet should include rationale to support the following findings:

- The lower water quality allowed is necessary to accommodate economic and social development in the area where the surface water is located and no reasonable or economical alternatives to lowering the water quality are available.
- Water quality is not lowered below the applicable water quality standards to protect the designated and existing beneficial uses.
- The lower water quality allowed will not cause or contribute to exceedance of water quality standard that has been established for a downstream surface water.

[12] A compliance schedule must meet the conditions specified in NAC 445A.244 and 40 CFR 122.47 to be included in an NPDES permit.

- 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.

7.5.3 Public Input Process

The Division must provide public notice and a 30-day public comment period for each draft permit in accordance with NAC 445A.234 and 40 CFR 124.10. The public notice must include contact information for interested persons to request a copy of the draft permit and fact sheet, which will include the antidegradation review findings.

The permit writer should consider any information and comments submitted during the public comment period regarding the findings of the antidegradation review, including any comments that are contrary to the justification of social and economic importance submitted by the applicant.

In cases where State Environmental Commission (SEC) approval is required for an activity projected to cause degradation, public comments on the proposed action will be considered during the SEC hearing (see Section 7.6). Additional public input may be solicited at other points in the permit development process, if deemed appropriate by the Division.

7.6 State Environmental Commission Hearing

A public hearing before the SEC is required for any draft permit for a proposed activity that will result in lowering the high water quality conditions for a parameter requiring Tier 2 protection. The Division must provide a notice of public hearing at least 30 days in advance of the hearing in accordance with NAC 445A.239 and 40 CFR 124.12.

During the hearing, the SEC will consider whether less restrictive permits limits, which would lower existing water quality levels, are justifiable because of economic or social considerations, and if an analysis of alternatives has been conducted to evaluate reasonable and practicable alternatives that would prevent degradation or result in less degradation. Pursuant to NRS 445A.520, the SEC could approve less stringent effluent limitations (i.e., higher than baseline water quality). However, under no circumstances should effluent limitations allow for water quality to be lowered to a level that does not comply with the applicable water quality standards.

7.7 Review Antidegradation Findings in Subsequent Permit Renewals

In subsequent permit renewals, the permit writer should evaluate whether the assumptions and conditions of the initial antidegradation review continue to be relevant and appropriate,

and whether the controls in the permit are protective of the level of quality authorized by the permit.

Where baseline water quality for a Tier 2 parameter of concern was based on an IBV, the permit writer should re-calculate the IBV based on the quarterly receiving water monitoring conducted during the permit term and following the procedures specified in Section 5.2.2. The permit writer should adjust the effluent limitation(s) for the parameter of concern, higher or lower, based on the re-calculated IBV. If the new effluent limitation(s) are more stringent, and applicant is unable to achieve consistent compliance, the permit writer may either:

- include a less stringent effluent limitation(s) if, after performing the additional analysis and evaluation specified Section 7.0, it is determined that a lowering of water quality with respect to the parameter is necessary to accommodate important economic or social development, or
- include the more stringent effluent limitation(s) and establish a compliance schedule[13].

If the new effluent limitation(s) are less stringent, they may be established in the draft permit if anti-backsliding requirements are satisfied. Clean Water Act Section 402(o)(1) prohibits the establishment of less stringent water quality-based effluent limits "except in compliance with Section 303(d)(4)." For attainment waters (i.e., those waters that are not impaired), Clean Water Act Section 303(d)(4)(B) specifies that a limitation based on a water quality standard may be relaxed where the action is consistent with the antidegradation policy. The relaxation of effluent limitations based on an updated IBV would continue to maintain the existing high quality of the waterbody and, thus, would be consistent with Nevada's antidegradation policy. The permit writer should document compliance with anti-backsliding requirements in the fact sheet.

8.0 Antidegradation Reviews for Stormwater and General Permits

8.1 General Permits

8.1.1 General Permit Coverage

Several discharges to surface waters are authorized under general permits issued by the Division. These include discharges of industrial wastewater and stormwater:

- Mining.
- Small municipal separate storm sewer systems.
- Construction sites – 1 acre or more.
- Multi-Sector General Permit (Industrial Permit).

[13] A compliance schedule must meet the conditions specified in NAC 445A.244 and 40 CFR 122.47 to be included in an NPDES permit.

- Pesticide discharges.
- De minimis discharges.

Discharges authorized by general permits are subject to Nevada's antidegradation policy. However, performing an antidegradation analysis for general permits and stormwater permits presents unique challenges that differ from those encountered with individual permits. These challenges include, but are not limited to:

- It is not practical to evaluate whether a particular receiving water parameter is Tier 1 or Tier 2 for all individual facilities.
- It is not practical to evaluate pollutant control and discharge alternatives for all individual facilities.
- It is not practical to characterize baseline water quality for all applicable receiving waters and establish numeric water-quality based effluent limitations using an applicable RMHQ.
- It is not practical to evaluate effluent quality and flow for all existing and future facilities for degrading impacts on the receiving waters.
- It is not practical to evaluate the economic and social impacts of all existing and future facilities covered under a general permit.

Due to these limitations, antidegradation analyses for general permits and stormwater permits require procedures and considerations that differ from those used for individual permits in many circumstances. Due to a lack of specificity related to a single facility/discharge and receiving water, these considerations are often more generalized than those applied for individual permits. However, permit writers should use the available information to reach sound conclusions. The level of detail and discussion should be commensurate with the potential impacts to water quality, the clarity of the decision, and the availability of information on which to base the analysis.

8.1.2 General Permit – Permit Conditions

Prior to assessing consistency with Nevada's antidegradation policy, the permit writer should ensure the following requirements are included in every general permit. These requirements are necessary to minimize degradation to water quality and comply with antidegradation requirements. All general permits should require:

- Permit conditions are met.
- Water quality standards are not violated.
- BMPs or other permit conditions contained in the permit are implemented.
- Compliance with applicable wasteload allocations as incorporated into the permit and specified in TMDLs.

- Additional requirements for discharges to impaired waterbodies without TMDLs that are protective of applicable water quality criteria. These requirements may be numeric or narrative.

Permits regulating discharges to waterbodies requiring Tier 1 protection, with an applicable TMDL, must include permit conditions consistent with any applicable wasteload allocation. Permits regulating discharges to waterbodies requiring Tier 1 protection without an applicable TMDL must include permit conditions sufficient to ensure their discharges are not causing or contributing to exceedances of applicable water quality criteria.

If practical, permits for discharges to waterbodies requiring Tier 2 protection should include permit conditions sufficient to protect existing water quality. Permits that fail to protect existing water quality require an antidegradation analysis as discussed in Section 8.1.4. Permit writers should include permit conditions that allow the Division to require additional control measures such as additional monitoring, more frequent site visits, and more rapid stabilization of exposed areas to minimize degradation or require coverage under an individual permit. Under no circumstances should permit conditions allow for water quality to be lowered to a level that exceeds applicable water quality standards.

Any discharge that is anticipated to impact the existing quality of an EAW requiring Tier 2.5 or Tier 3 protection is discouraged and permit writers should avoid allowing discharges to these waterbodies, with some exceptions. Discharges that are temporary and limited may be allowed, as discussed further in Section 4.2.1. If the permit writer determines that degradation associated with a newly proposed activity will be temporary and limited, the permit writer must conduct an antidegradation analysis as specified in Section 8.1.4.

Where permit writers allow for temporary and limited discharges to EAWs requiring Tier 2.5 and Tier 3 protection, the permit must include effluent limits and permit conditions sufficient to protect existing water quality. In these instances, permit writers must include permit conditions that allow the Division to require additional control measures such as additional monitoring, more frequent site visits, and more rapid stabilization of exposed areas to minimize degradation, or require coverage under an individual permit.

Discharges covered by a general permit that cannot consistently comply with the specified permit conditions are not adequately addressed in the antidegradation analysis and must be covered under an individual permit.

Where ambiguity associated with the effectiveness of pollutant controls exists regarding impacts on water quality, the permit writer should ensure adequate permit requirements are established to protect water quality. For example, reliance on BMPs, stormwater management plans, or storm water pollution prevision plans alone are not appropriate to ensure appropriate water quality is achieved. An adaptive management approach provides an effective method for permit writers to address uncertainty for various types of discharges regarding impacts on water quality. This approach requires dischargers to conduct effluent monitoring to evaluate if

necessary water quality is being attained, if pollutant control/treatment methods are sufficient, and requires escalating pollutant controls to be put in place if monitoring data indicates that necessary water quality is not being attained.

Considerations for Adaptive Management Approach

An adaptive management approach is often used in stormwater permits for evaluating the effectiveness of existing BMPs and identifying the need for and requiring the implementation of additional BMPs. At a minimum, adaptive management approach should:

- Ensure information (e.g., data) is developed and used to expeditiously evaluate the effectiveness of existing controls to attain the necessary water quality, and revise controls as necessary.
- Include a description of how information will be obtained and used to ensure full compliance with Nevada's antidegradation policy. This may include the development of performance evaluation criteria.
- Ensure the process is well defined, documented, and implemented.

The permit writer must ensure that the development of technology- and water quality-based effluent limitations and conditions is consistent with minimum State and federal requirements and Nevada's permitting practices.

Upon completion of any antidegradation analysis, the permit writer should review the draft permit based on the results of the antidegradation review. The permit writer should ensure all required effluent limitations, monitoring requirements, and other conditions have been incorporated based on the results of the analysis.

8.1.3 General Permit – Determining the Need for an Antidegradation Analysis

For practical purposes regarding the level of effort associated with the management and implementation of general permits, it is the Division's preference that antidegradation analyses occur during the permitting process, and not as a part of the notice of intent (NOI) submittal process for individual facilities. An antidegradation analysis should be conducted for the entire class of facilities to be covered under the general permit to decide whether the general permit complies with State water quality standards.

Permitting activities for existing facilities, or a class of facilities, that is not anticipated to degrade water quality do not require an antidegradation analysis. If the permitted activity to designated waterbodies was previously addressed via a general permit and the permit is being reissued (permit renewal), an antidegradation analysis may not be necessary. If the permit writer determines that the permit conditions are at least as protective of water quality as the current permit, the permitting action is not anticipated to result in degradation of receiving waters and an antidegradation analysis is not required. Permit conditions to be considered generally consist of numeric and narrative effluent limitations, BMPs or other pollutant control requirements, special conditions, and discharge prohibitions. If the general permit implements an adaptive management approach to ensure the necessary water quality is maintained,

monitoring and inspection requirements should also be considered. Adaptive management is discussed previously in Section 8.1.2.

Permitting actions that are anticipated to result in a degradation of water quality should undergo an antidegradation analysis by the permit writer. An antidegradation analysis should be performed for, but not limited to, the following scenarios:

- A newly permitted activity.
- Expanding coverage of an existing general permit to include new discharges.
- Expanding coverage of an existing general permit to include waterbodies not previously addressed.
- Less stringent effluent limitation or reduced permit condition that may result in the degradation of water quality.
- If the Division determines that cumulative degradation resulting from multiple dischargers within a watershed, degradation from a single discharge over time, degradation caused by permit noncompliance or permit inadequacies, or other individual circumstances warrant an antidegradation review.
- If facilities under existing individual permits are to be covered under a general permit with less stringent permit requirements.

8.1.4 General Permit – Performing an Antidegradation Analysis

Once the necessity for an antidegradation analysis has been established, the permit writer should identify all actions subject to antidegradation review.

The antidegradation analysis should focus on the parameters of concern related to the permitting action(s) identified above. Due to limitations associated with conducting the analysis in a general permit, quantification of the impacts to all receiving waters may not be practicable. The permit writer should qualify the anticipated impacts to water quality to the extent practicable given the available information. This will predominately include an assessment of the permitting action's impact(s) on pollutant concentrations discharged to receiving waters, and the resulting impact(s) on existing receiving water quality and designated uses. Available information may include, but is not limited to:

- Existing effluent and receiving water data.
- Industry characterizations.
    - Developed by the permit writer during the general permit writing process to establish technology-based effluent limits.
    - Using EPA's Industrial Stormwater Fact Sheet Series: https://www.epa.gov/npdes/industrial-stormwater-fact-sheet-series
    - Existing general (and individual) permit(s) and fact sheet(s) applicable to the permitting action and wastewaters.
    - Other EPA and State permits and fact sheets.

    - Inspection findings/reports.
    - Applicable ELG development documents and EPA/State categorical experts.
- Evaluations of treatment technology.
- International Stormwater BMP Database.
- Water quality standards and criteria applicable throughout the State.

Examples of impacts on water quality that may be considered include, but are not limited to:

- Reduction of assimilative capacity.
- Negative impacts on designative uses of the receiving water, including impacts to human health, aquatic life, and aesthetic enjoyment.
- Negatively impacting societal value for environmental quality.
- Negatively impacting other federal, State, or local environmental goals.

Following the identification of impacts of water quality, the permit writer should consider the social and economic importance of the permitting action and its implications to social or economic development in the impacted geographic area and the State. The analysis should evaluate if the degradation of water quality, and the resultant impacts are justified by the social or economic benefits from the permitting action. This process is similar to the process described in Section 7.3, however must be performed using a more generalized assessment.

Examples of social and economic benefits that may be considered include, but are not limited to:

- Creation or expansion of employment.
- Increase of median family income.
- Increase of community tax base.
- Providing necessary public and social services.
- Enhancing environmental attributes.
- Prevention or correction of a substantial environmental or public health threat.

The permit writer should document the social and economic benefits sufficiently to evaluate against the identified water quality impacts. The social and economic benefits should be weighed against the environmental cost to the extent practicable. Based on this evaluation, if the permit writer determines the permitting action will lead to an overall benefit for the impacted area or State, the proposed activity will be considered to provide important social or economic development.

Where the permit writer cannot justify the permitting action through an overall benefit for the impacted area or State, the permitting action fails to achieve consistency with Nevada's antidegradation policy, and the permit cannot be issued as written. Where permitting actions fail to be consistent with Nevada's antidegradation requirements, the permit writer may modify

the permit conditions to further reduce the anticipated degradation to water quality and reassess the social or economic evaluation based on the revised impacts to water quality.

8.1.5 General Permit – Document Antidegradation Review Findings and Public Input Process

The permit writer should document the findings of the antidegradation review in the fact sheet for the draft general permit. For activities requiring an antidegradation review, the fact sheet should include:

- A description of the proposed permitting action.
- The anticipated impacts from the propose permitting action and an identification of the parameters of concern related to the proposed permitting action.

If the proposed permitting action is determined not to cause a significant degradation of a Tier 2-protected water, the permit writer should provide sufficient discussion in the fact sheet to support this finding.

Where a lowering of water quality in a Tier 2-protected water is proposed, the fact sheet should include rationale to support the following findings:

- The lower water quality allowed will not cause or contribute to exceedance of water quality standard that has been established for downstream surface waters.
- The highest statutory and regulatory requirements for new and existing point sources are achieved.
- The permit writer's evaluation of appropriate technology-based effluent limitations within the fact sheet should be referenced regarding alternative pollutant controls considered. This discussion should convey that appropriate pollution controls will be implemented that are economically, environmentally, and technologically reasonable.
- The permit writer's evaluation of appropriate water quality-based effluent limitations and permit conditions for the protection of water quality within the fact sheet should be referenced regarding assurances that appropriate pollution controls will be implemented to protecting water quality.
- All cost effective and reasonable BMPs for nonpoint source pollution control are implemented.

A public hearing before the SEC is required for any draft permit for a proposed activity that will result in lowering the high water quality conditions for a parameter requiring Tier 2 protection. The Division must provide a notice of public hearing at least 30 days in advance of the hearing in accordance with NAC 445A.239 and 40 CFR 124.12.

During the hearing, the SEC will consider whether less restrictive permits limits, which would lower existing water quality levels, are justifiable because of economic or social considerations, and if an analysis of alternatives has been conducted to evaluate reasonable and practicable

alternatives that would prevent degradation or result in less degradation. Pursuant to NRS 445A.520, the SEC could approve less stringent effluent limitations (i.e., higher than baseline water quality). However, under no circumstances should effluent limitations allow for water quality to be lowered to a level that does not comply with the applicable water quality standards.

8.1.6 Review Antidegradation Findings in Subsequent Permit Renewals

In subsequent permit renewals, the permit writer should evaluate whether the assumptions and conditions of the initial antidegradation review continue to be relevant and appropriate, and whether the controls in the permit are protective of the level of quality authorized by the permit.

If new permit conditions are more stringent, and the applicant is unable to achieve consistent compliance, the permit writer may either:

- include a less stringent effluent limitation(s) if, after performing the additional analysis and evaluation specified Section 8.1.4, it is determined that a lowering of water quality with respect to the parameter is necessary to accommodate important economic or social development, or
- include the more stringent effluent limitation(s) and establish a compliance schedule.

8.2 Individual MS4 Permits

Antidegradation analyses associated with individual MS4 permits face similar challenges as general permits and should largely be conducted in a similar fashion to the more generalized procedures specified for general permits. However, there are a number of distinct differences that will impact the permit writer's considerations and permit requirements discussed in this section. Permit renewals or issuances for previously authorized MS4 activities imposing the same or more stringent requirements as the prior permit are not anticipated to lower water quality from existing water quality.

MS4 permits are designed to (1) reduce and eliminate stormwater pollution and (2) incorporate a systematic process for continually improving management policies and practices to minimize discharge of pollutants to the MS4 through the installation, implementation, and maintenance of stormwater control measures. The permit writer must ensure the applicant complies with all permit conditions, including the development and implementation of a stormwater management plan that reduces the discharge of pollutants to the maximum extent practicable.

Permit conditions for MS4 should include, but are not limited to:

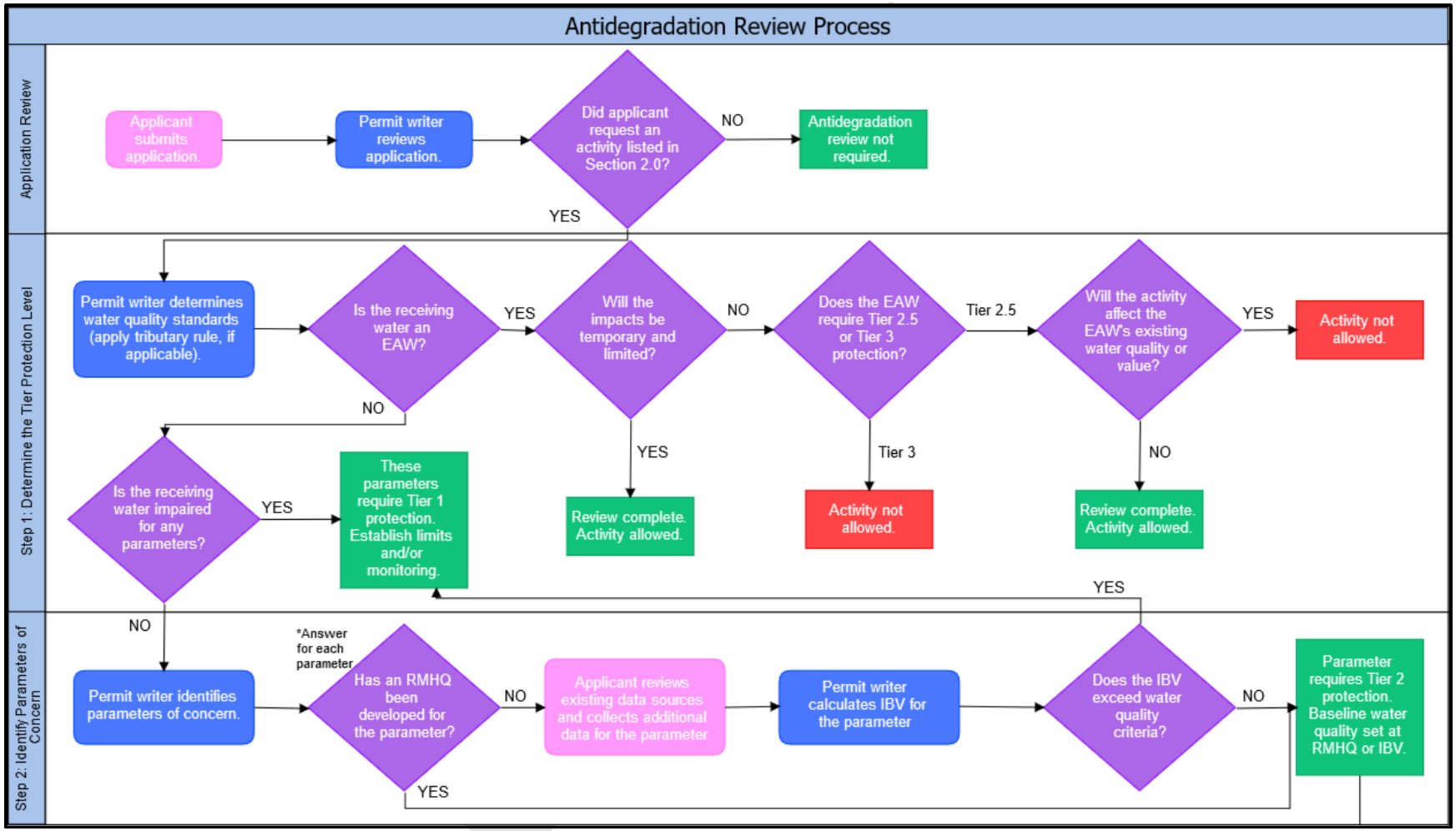
- Applicable wasteload allocations and monitoring necessary to comply with a TMDL.
- Assuring adequate legal authority.

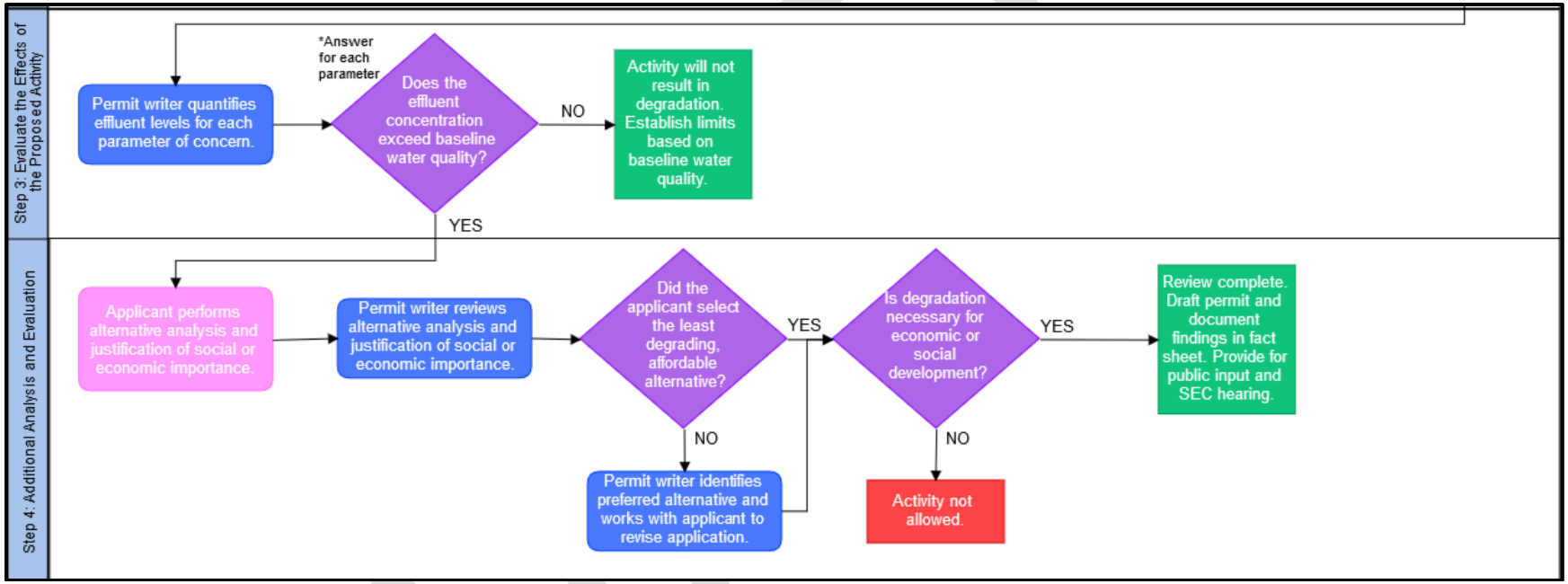
- Assuring the adequacy of the stormwater management program and though the inclusion of the following program areas (EPA guidance available at https://www.epa.gov/npdes/stormwater-discharges-municipal-sources):
    - Construction Site Runoff Control
    - Illicit Discharge Detection and Elimination
    - Pollution Prevention/Good Housekeeping
    - Post-Construction Runoff Control
    - Public Education and Outreach
    - Public Involvement/Participation
    - Program Effectiveness
    - Total Maximum Daily Loads

Permit conditions for individual stormwater permits that implement the necessary permit conditions are deemed consistent with Nevada's antidegradation requirements.

Appendix A

Antidegradation Review Process


Antidegradation Review Process
Application Review
Step 1: Determine the Tier Protection Level
Step 2: Identify Parameters of Concern
Applicant submits application.
Permit writer reviews application.
Did applicant request an activity listed in Section 2.0?
NO
Antidegradation review not required.
YES
Permit writer determines water quality standards (apply tributary rule, if applicable).
Is the receiving water an EAW?
YES
Will the impacts be temporary and limited?
NO
Does the EAW require Tier 2.5 or Tier 3 protection?
Tier 2.5
Will the activity affect the EAW's existing water quality or value?
YES
Activity not allowed.
NO
YES
Review complete. Activity allowed.
Tier 3
Activity not allowed.
NO
Review complete. Activity allowed.
Is the receiving water impaired for any parameters?
YES
These parameters require Tier 1 protection. Establish limits and/or monitoring.
YES
NO
Permit writer identifies parameters of concern.
*Answer for each parameter
Has an RMHQ been developed for the parameter?
NO
Applicant reviews existing data sources and collects additional data for the parameter
Permit writer calculates IBV for the parameter
Does the IBV exceed water quality criteria?
NO
Parameter requires Tier 2 protection. Baseline water quality set at RMHQ or IBV.
YES


Step 3: Evaluate the Effects of the Proposed Activity
Step 4: Additional Analysis and Evaluation
Permit writer quantifies effluent levels for each parameter of concern.
*Answer for each parameter
Does the effluent concentration exceed baseline water quality?
NO
Activity will not result in degradation. Establish limits based on baseline water quality.
YES
Applicant performs alternative analysis and justification of social or economic importance.
Permit writer reviews alternative analysis and justification of social or economic importance.
Did the applicant select the least degrading, affordable alternative?
YES
Is degradation necessary for economic or social development?
YES
Review complete. Draft permit and document findings in fact sheet. Provide for public input and SEC hearing.
NO
Permit writer identifies preferred alternative and works with applicant to revise application.
NO
Activity not allowed.

Appendix B

Nevada Permit Writers' Antidegradation Review Checklist

NEVADA PERMIT WRITERS' ANTIDEGRADATION REVIEW CHECKLIST		
APPLICATION REVIEW		
A.1	**Facility Name**	**Date Application Submitted**
A.2	Did the permit application request any of the following activities? ☐ New discharge ☐ Increase the permitted effluent flow ☐ Significant facility modification ☐ Outfall relocation ☐ New or expanded mixing zone ☐ New or revised effluent limitation greater than baseline water quality	☐ Other activity that may lower water quality (specify) ☐ Groundwater remediation project → STOP. Antidegradation review not required. ☐ No → STOP. Antidegradation review not required.
A.3	Did you notify the applicant that an antidegradation review has been initiated and, if necessary, request any preliminary information that may be necessary to perform the review? ☐ Yes	☐ No → Provide notification.
A.4	If the applicant requested a new or modified mixing zone, did you review the associated mixing zone study to confirm that it documented the model inputs, model results, and mixing zone dimensions and satisfies the conditions specified in NAC 445A.295 through 445A.302? ☐ Yes	☐ No → Perform review. ☐ Not applicable
STEP 1: DETERMINE THE TIER PROTECTION LEVEL		
1.1	**Receiving Water Name**	
1.2	Are standards of water quality established for the receiving water in NAC 445A.123 to 445A.2234? ☐ Yes	☐ No → Apply the tributary rule.
1.3	Indicate the citation and waterbody for the standards of water quality applicable to the receiving water (*e.g., NAC 445A.1256 Northwest Region: Boulder Reservoir*).	
1.4	Is the receiving water an Extraordinary Ecological or Aesthetic Water (EAW) requiring Tier 2.5 or Tier 3 protection or a tributary to an EAW requiring Tier 3 protection? ☐ Yes	☐ No → Skip to Item 1.11.
1.5	What type of activity is proposed? ☐ Temporary and limited	☐ Other → Skip to Item 1.8.
1.6	Is the activity necessary to 1) achieve long-term ecological or water quality benefit or 2) to accommodate public health and safety activities in the area of the EAW? ☐ Yes	☐ No → STOP. Activity not allowed.
1.7	After considering the factors specified in Section 4.2.1, will the lowering of water quality be temporary and limited in the EAW? ☐ Yes → Review complete. Prepare permit and document findings in the fact sheet.	☐ No → STOP. Activity not allowed.

<table>
<tr><th colspan="2">NEVADA PERMIT WRITERS'
ANTIDEGRADATION REVIEW CHECKLIST</th></tr>
<tr><td>1.8</td><td>To what type of receiving water does the proposed activity discharge?
☐ EAW requiring Tier 3 protection → STOP. Activity not allowed.
☐ Unclassified tributary to an EAW requiring Tier 3 protection → Skip to Item 1.11 and perform parameter-by-parameter analysis (see Section 4.2.2)
☐ EAW requiring Tier 2.5 protection</td></tr>
<tr><td>1.9</td><td>What is the basis of the EAW classification?
☐ Water quality conditions → Skip to Item 1.11 and perform parameter-by-parameter analysis (see Section 4.2.2).
☐ Other attributes</td></tr>
<tr><td>1.10</td><td>Based on the qualitative analysis performed in accordance with Section 4.2.2, will the proposed activity affect the unique value of the EAW?
☐ Yes → STOP. Activity not allowed.
☐ No → Review complete. Prepare permit and document findings in the fact sheet.</td></tr>
<tr><td>1.11</td><td>Is the receiving water or a downstream waterbody to which the receiving water is tributary listed as an impaired waterbody (Category 4 or 5) for any parameters on the most recent EPA-approved Clean Water Act Section 303(d) List?
☐ Yes
☐ No → Skip to Item 2.1.</td></tr>
<tr><td>1.12</td><td>List the parameter(s) identified as causing the impairment(s). These parameters require Tier 1 protection. For each parameter, indicate whether an applicable TMDL has been developed.
• If "Yes", establish effluent limitations based on the TMDL wasteload allocation.
• If "No", establish effluent limitations based on the applicable water quality standard and/or effluent and receiving water monitoring requirements.
<table>
<tr><th>Parameter</th><th>Applicable TMDL?</th><th>Parameter</th><th>Applicable TMDL?</th></tr>
<tr><td>1.</td><td>☐ Yes ☐ No</td><td>6.</td><td>☐ Yes ☐ No</td></tr>
<tr><td>2.</td><td>☐ Yes ☐ No</td><td>7.</td><td>☐ Yes ☐ No</td></tr>
<tr><td>3.</td><td>☐ Yes ☐ No</td><td>8.</td><td>☐ Yes ☐ No</td></tr>
<tr><td>4.</td><td>☐ Yes ☐ No</td><td>9.</td><td>☐ Yes ☐ No</td></tr>
<tr><td>5.</td><td>☐ Yes ☐ No</td><td>10.</td><td>☐ Yes ☐ No</td></tr>
</table></td></tr>
<tr><td colspan="2">STEP 2: IDENTIFY PARAMETERS OF CONCERN</td></tr>
<tr><td>2.1</td><td>Indicate the sources reviewed to identify parameters of concern. (Check all that apply.)
☐ Existing permit
☐ Application
☐ Discharge monitoring reports (DMRs)
☐ Effluent limitations guidelines (ELGs)
☐ Other (specify)</td></tr>
</table>

NEVADA PERMIT WRITERS' ANTIDEGRADATION REVIEW CHECKLIST

2.2 List the parameters of concern.

Parameter	Parameter	Parameter	Parameter
1.	6.	11.	16.
2.	7.	12.	17.
3.	8.	13.	18.
4.	9.	14.	19.
5.	10.	15.	20.

2.3 Have RMHQs been developed for any of the parameters of concern listed in Item 2.2?

☐ Yes ☐ No → Skip to Item 2.5.

2.4 List the applicable RMHQs. These parameters require Tier 2 protection. Baseline water quality for these parameters is equivalent to the RMHQs.

Parameter	RMHQ (specify units)	Parameter	RMHQ (specify units)
1.		6.	
2.		7.	
3.		8.	
4.		9.	
5.		10.	

2.5 Based on a review of the data sources below, do the available data meet the minimum data requirements to calculate an IBV for the remaining parameters of concern?

- DMRs.
- Water quality monitoring reports containing receiving water monitoring data collected by the applicant.
- Monitoring data collected by Division staff during inspections.
- The Division's Water Quality Monitoring Warehouse.
- United States Geological Survey (USGS) National Water Information System (NWIS).

☐ Yes → Skip to Item 2.7. ☐ No → Request that the applicant prepare a sampling and analysis plan.

2.6 Based on review of the applicant's sampling and analysis plan, will independent and representative samples be collected during periods of non-extreme flow conditions?

☐ Yes → Direct the applicant to conduct sampling and analysis in accordance with the plan. ☐ No → Request that the applicant revise the sampling and analysis plan.

NEVADA PERMIT WRITERS' ANTIDEGRADATION REVIEW CHECKLIST

2.7 Calculate the IBV as specified in Section 5.2.2. Baseline water quality for these parameters is equivalent to the IBV. For each parameter, list the applicable IBV and applicable water quality criterion (WQC). Based on comparison of the IBV to the WQC and consideration of additional information (see Section 5.2.3), assign the appropriate tier protection level.

Parameter	**IBV** (specify units)	**Applicable WQC** (specify units)	**IBV > WQC?**	**Does additional information indicate impairment?**	**Tier Protection Level**
1.			☐ Yes ☐ No	☐ Yes ☐ No	☐ Tier 1 ☐ Tier 2
2.			☐ Yes ☐ No	☐ Yes ☐ No	☐ Tier 1 ☐ Tier 2
3.			☐ Yes ☐ No	☐ Yes ☐ No	☐ Tier 1 ☐ Tier 2
4.			☐ Yes ☐ No	☐ Yes ☐ No	☐ Tier 1 ☐ Tier 2
5.			☐ Yes ☐ No	☐ Yes ☐ No	☐ Tier 1 ☐ Tier 2
6.			☐ Yes ☐ No	☐ Yes ☐ No	☐ Tier 1 ☐ Tier 2
7.			☐ Yes ☐ No	☐ Yes ☐ No	☐ Tier 1 ☐ Tier 2
8.			☐ Yes ☐ No	☐ Yes ☐ No	☐ Tier 1 ☐ Tier 2
9.			☐ Yes ☐ No	☐ Yes ☐ No	☐ Tier 1 ☐ Tier 2
10.			☐ Yes ☐ No	☐ Yes ☐ No	☐ Tier 1 ☐ Tier 2

NEVADA PERMIT WRITERS'
ANTIDEGRADATION REVIEW CHECKLIST

STEP 3: EVALUATE THE EFFECTS OF THE PROPOSED ACTIVITY

3.1 For each parameter of concern requiring Tier 2 protection, compare the effluent concentration at the point of discharge to the baseline water quality (i.e., the RMHQ or IBV).

- If the effluent concentration does not exceed baseline water quality, no additional analysis is required. Document findings in the fact sheet.
- If the effluent concentration exceeds baseline water quality, the permit writer should proceed to Item 4.1 for additional analysis and evaluation.

Parameter	Effluent Concentration (specify units)	Baseline Water Quality (specify units)	Effluent Concentration > Baseline Water Quality?	Additional Analysis Required?
1.			☐ Yes ☐ No	☐ Yes ☐ No
2.			☐ Yes ☐ No	☐ Yes ☐ No
3.			☐ Yes ☐ No	☐ Yes ☐ No
4.			☐ Yes ☐ No	☐ Yes ☐ No
5.			☐ Yes ☐ No	☐ Yes ☐ No
6.			☐ Yes ☐ No	☐ Yes ☐ No
7.			☐ Yes ☐ No	☐ Yes ☐ No
8.			☐ Yes ☐ No	☐ Yes ☐ No
9.			☐ Yes ☐ No	☐ Yes ☐ No
10.			☐ Yes ☐ No	☐ Yes ☐ No

STEP 4: ADDITIONAL ANALYSIS AND EVALUATION

4.1 Did the applicant provide an alternative analysis and justification of social or economic importance for the lowering of water quality for parameters requiring Tier 2 protection identified in Item 3.1?

☐ Yes ☐ No → Request analysis and justification.

4.2 Did the applicant adequately identify other less degrading and/or non-degrading pollution control measures?

☐ Yes ☐ No → Request analysis of additional alternatives.

4.3 Did the applicant rank all feasible alternatives from least to most degrading to water quality and, for less degrading alternatives, quantify the level of pollution reduction accomplished?

☐ Yes ☐ No → Request ranking of alternatives.

4.4 Did the applicant select the least degrading alternative feasible for all parameters?

☐ Yes → Alternative analysis complete. Skip to Item 4.10. ☐ No → Continue to Item 4.5.

NEVADA PERMIT WRITERS' ANTIDEGRADATION REVIEW CHECKLIST	
4.5	Did the applicant provide a cost assessment for each alternative and rank each alternative by its cost effectiveness for pollutant removal? ☐ Yes ☐ No → Request cost assessment.
4.6	Indicate the applicant's approach for performing the cost assessment. ☐ Present worth approach (Appendix B) ☐ Absolute value approach (Appendix C) ☐ Other
4.7	Did the applicant adequately consider the environmental impacts for each alternative? ☐ Yes ☐ No → Request analysis of environmental impacts.
4.8	Did the applicant provide an affordability analysis? ☐ Yes ☐ No → Skip to Item 4.10. The least degrading, technically feasible alternative is deemed affordable.
4.9	Did the applicant select the least degrading alternative determined to be affordable? ☐ Yes ☐ No → Identify the least degrading, affordable alternative and work with the applicant to revise the application
4.10	Did the applicant identify the affected community and describe its current economic and environmental conditions? ☐ Yes ☐ No → Request identification of the affected community.
4.11	Did the applicant describe the benefits the activity will have on the economic or social development of the community? ☐ Yes ☐ No → Request description of economic or social benefits.
4.12	Did the applicant determine the overall environmental, social, and economic impacts associated with the proposed activity and accompanying degradation of water quality? ☐ Yes ☐ No → Request analysis of overall environmental, social, and economic impacts.
4.13	Based on a review of the applicant's justification, is the lowering of water quality for the parameters requiring Tier 2 protection necessary to accommodate economic or social development in the area where the surface water is located? ☐ Yes → Review complete. Prepare permit and document findings in the fact sheet. ☐ No → STOP. Activity not allowed. Notify applicant of denial and, if a permit is to be issued, document findings in the fact sheet.
4.14	Will the highest statutory and regulatory requirements for all new and existing point sources be achieved and all cost-effective and reasonable BMPs for nonpoint sources be implemented? ☐ Yes → Review complete. Prepare permit and document findings in the fact sheet. ☐ No → STOP. Activity not allowed until requirements achieved or implemented.

Appendix C

Cost Assessments Using the Present Worth Approach

Cost Assessments Using the Present Worth Approach

1.0 Considerations for Cost Assessment

Direct cost comparisons of alternatives are typically performed based on present worth calculations or calculations of uniform annual cost (if the useful life of each alternative is different), using an applicable interest (discount) rate. The present worth calculation is a well-established method for integrating the upfront capital costs (and associated indebtedness) of a project with its ongoing annual costs of operation and transforming the integrated costs to one equivalent value. The calculation yields the total equivalent dollars which would have to be invested at the beginning of a project in order to finance it for the life of the facility. The monetary costs considered in the calculations include the total value of the resources, which are attributable to the wastewater treatment, control, and management systems and the component parts. To determine these values, all monies necessary for capital construction costs, operational costs, and maintenance costs should be identified.

Capital construction costs used in cost comparison analysis consist of estimates of:

- Construction costs, including overhead and profit.
- Costs of land (including land purchased for the treatment works site and land used as part of the treatment process or for ultimate disposal of residues), relocation expenses, and right-of-way and easement acquisitions.
- Costs of design engineering and field services (including cost of bond sales).
- Startup costs such as operator training.
- Financing costs and interest during construction.
- Costs of any other site-related environmental controls, such as erosion and sediment control practices.

Operational and maintenance costs are usually considered on an annual basis and should be averaged to account for variations that may occur year-to-year due to varying production or wastewater volume. Operational and maintenance costs include:

- Operational staff salaries.
- Cost of energy and fuels.
- Cost of treatment chemicals.
- Cost of routine replacement of equipment and equipment parts.
- Other expenditures necessary to ensure effective and dependable operation over the life of the facility.

The salvage value of equipment, tankage, and materials from the treatment works is part of the present worth calculation. Salvage value is estimated using straight-line depreciation during the useful life of the project and can generally only be claimed for equipment where it can be clearly demonstrated that a specific market or re-use opportunity will exist. Salvage value

estimation should also take into account the costs of any restoration or decommissioning of treatment units and final disposal costs. It is possible in some cases that these costs may be high enough that the net salvage value will be negative.

Land purchased for the treatment works site is also assumed to have a salvage value at the end of the project useful life equal to its market value at the end of the analysis period. The local inflation rate for land in the use area should be used to project the market value at the end of the analysis period.

It is also important to evaluate any opportunity costs associated with different alternatives. For example, lost opportunity costs for lots in a proposed subdivision that would be used for spray irrigation rather than housing, or losses related to a process change that results in a missed production run are legitimate and should be accounted for. Opportunity costs should not be considered for speculative growth or production increases claimed by an applicant. Any costs claimed should be clearly associated with integral portions of projects, which are realistically available, and are otherwise locally approvable.

Other costs, such as opportunity costs, while presented as one-time present losses, may also have an annual lost revenue component, which could be accounted for by apportioning the costs as both upfront and annual costs.

Discount rates shall incorporate the same interest rate assumption for each alternative. Since the present worth calculation is being performed more to compare alternatives rather than to obtain a very accurate estimation of actual costs, the fact that the same interest rate assumption is utilized for each alternative is more important than the actual interest rate selected. The applicant may use the interest rate at which they can borrow funds or the Real Interest Rates on Treasury Notes and Bonds of Specified Maturities in the latest version of 80 FR 4948, Appendix C of OMB Circular A-94.

The useful life of the facility or equipment shall be based upon similar facilities or equipment handling similar wastes and flows.

Cost estimates have an associated level of precision. The applicant's cost estimates should include an estimate of the error for each alternative. The applicant is responsible for documenting and defending all cost estimates used in the analysis.

2.0 Cost Estimate Equations

The equations below are the basic expressions of the present worth and equivalent annualized cost concepts. Additional mathematical factors and apportionment of costs are incorporated into the equations where appropriate.

2.1 Basic Present Worth Equation

The basic present worth calculation should be performed in accordance with the following equation:

$$P = C + O + [A * (P/A, d, n)] – S – L$$

Where:
P = present worth
C = capital cost
O = other costs (expressed as dollars invested at the beginning of the project)
A = annual operating costs
$(P/A,d,n)$ = equal series present worth factor $[(1 + d)^n – 1] / [d (1 + d)^n]$
d = discount rate
n = useful life in years
S = present worth of salvage value of facilities
L = present worth of salvage value of land

2.2 Accounting for Inflation of Annual Operating Costs

A gradient factor may be added into the equations to account for inflation of annual operating costs, as opposed to using an average value throughout the project life, by simply adding the additional following term onto the right-hand side of the above equation:

$$[G * (P/G,d,n)]$$

Where:
G = uniform increase in annual costs
$(P/G,d,n)$ = present worth factor for a gradient = $(1 – nd) [(1 + d)^n – 1] / [d^2 * (1 + d)^n]$

2.3 Accounting for Alternatives with Different Useful Lives

If the alternatives have different useful lives, the cost comparison may be performed using the Equivalent Uniform Annual Cost Method. The equation for this method is:

$$EUA = (C + O) * (A/P,d,n) + A – [(S + L) * (A/F,d,n)]$$

Where:
EUA = equivalent uniform annual cost
$(A/P,d,n)$ = capital recovery factor $[(1 + d)^n – 1] / [d (1 + d)^n]$
$(A/F,d,n)$ = uniform series sinking fund factor $d / [(1 + d)^n – 1)]$

To add a gradient factor, the following additional term is simply added to the right-hand side of the above equation:

[G * (A/G,d,n)]

Where:
(A/G,d,n) = EUA factor for a gradient = $[(1 + d)^n – 1 – nd] / d * [(1 + d)^n – 1]$

Appendix D

Cost Assessments Using the Absolute Value Approach

Cost Assessments Using the Absolute Value Approach

These worksheets can be used to perform cost assessments using the absolute value approach described in EPA's Interim Economic Guidance for Water Quality Standards Workbook.[1] The applicant should complete one worksheet per alternative.

1.0 Public Sector Cost Assessment Worksheet

PART 1: TOTAL ANNUALIZED PROJECT COSTS		
Capital Costs		
Capital cost of project	$	
List other one-time costs of project.		
	$	
	$	
	$	
Total capital costs (sum column)	**$**	**(1)**
Portion of capital costs to be paid for with grant monies	$	(2)
Capital costs to be financed [calculate: (1) – (2)]	$	(3)
Type of financing (e.g., general obligation bond, revenue bond, bank loan)		
Interest rate for financing (expressed as a decimal)		(i)
Time period of financing (in years)		(n)
Annualization Factor = $\frac{i}{[(1+i)^n-1]+i}$		(4)
Annualized capital cost [calculate: (3) x (4)]	**$**	**(5)**
Operating and Maintenance (O&M) Costs		
List annual costs of O&M (e.g., monitoring, inspection, permitting fees, waste disposal charges, repair, administration, and replacement)		
Total annual O&M costs (sum column)	**$**	**(6)**
Total Annual Cost of Project		
Total annual cost of project [calculate: (5) + (6)]	**$**	**(7)**

[1] Applicants may also use the spreadsheet tools available on EPA's website: https://www.epa.gov/wqs-tech/economic-guidance-water-quality-standards

PART 2: TOTAL ANNUAL COSTS PER HOUSEHOLD		
Current Pollution Control Costs		
Total annual cost of existing pollution control	$	(1)
Amount of existing costs paid by households	$	(2)
Percent of existing costs paid by households		% (3)
Number of households (do not use hook-ups)		(4)
Annual cost per household [calculate: (2)/(4)]	**$**	**(5)**
New Pollution Control Costs		
Are households expected to provide revenues for the new pollution control project in the same proportion that they support existing pollution control? (Select one of the following three options.)		
☐ Yes (fill in percent from (3))		% (6a)
☐ No, they will pay a different percentage		% (6b)
☐ No, they are expected to pay based on flow (continue to Part 3: Calculate Total Annual Costs Per Household Based on Flow)		
Total annual cost of project [Part 1, Item (7)]	$	(7)
Proportion of costs households are expected to pay [(6a or 6b)]		(8)
Amount to be paid by households [calculate: (7) x (8)]	$	(9)
Annual cost per household [calculate: (9)/(4)]	$	(10)
Total Annual Costs Per Household		
Total annual cost of pollution control per household [calculate: (5) + (10)]	**$**	**(11)**
PART 3: TOTAL ANNUAL COSTS PER HOUSEHOLD BASED ON FLOW		
Costs Incurred by Households Based on Flow		
Expected total usage of project (MGD for wastewater treatment)		(1)
Usage due to household use (MGD of household wastewater)		(2)
Percent of usage due to household use [calculate: (2)/(1)]		% (3)
Total annual cost of project	$	(4)
Industrial surcharges, if any	$	(5)
Costs to be allocated [calculate: (4) – (5)	$	(6)
Amount to be paid by households [calculate: (3) x (6)	$	(7)
Annual project cost per household [calculate: (7)/Part 2, Item (4)]	$	(8)
Total Annual Cost Per Household		
Current annual cost per household (Part 2, Item (5))	$	(9)
Total annual cost of pollution control per household [calculate: (8) + (9)]	**$**	**(10)**

PART 4: MUNICIPAL PRELIMINARY SCREENER	
Calculate the Municipal Preliminary Screener	
Total annual pollution control cost per household [Part 2, Item (11) or Part 3, Item (10)]	$ (1)
Median household income (from the most recent census, adjusted by Consumer Price Index inflation rate, if necessary)	$ (2)
Municipal Preliminary Screener [calculate: [(1)/(2)] x 100]	**% (3)**
Evaluate the Municipal Preliminary Screener	
Is the Municipal Preliminary Screener less than 1.0%? ☐ Yes → The cost will not impose an undue financial burden. The alternative is affordable. ☐ No → If the Municipal Preliminary Screener is between 1.0% and 2.0%, the project is expected to incur midrange impacts. If the Municipal Preliminary Screener exceeds 2.0%, the project may place an unreasonable financial burden on many of the households within the community. The applicant is encouraged to perform the secondary tests specified in Worksheets T and U of EPA's Interim Economic Guidance for Water Quality Standards Workbook.	

2.0 Private Sector Cost Assessment Worksheet

PART 1: TOTAL ANNUALIZED PROJECT COSTS		
Capital costs to be financed	$	(1)
Interest rate for financing (expressed as a decimal)		(i)
Time period of financing (assume 10 years[2])		10 years (n)
Annualization Factor = $\frac{i}{[(1+i)^n-1]+i}$		(2)
Annualized capital cost [calculate: (1) x (2)]	$	(3)
List annual costs of O&M (e.g., monitoring, inspection, permitting fees, waste disposal charges, repair, administration, and replacement)[3]		
Total annual O&M costs (sum column)	$	(4)
Total annual cost of project [calculate: (3) + (4)]	**$**	**(5)**
PART 2: DATA NEEDED TO CALCULATE THE PRIMARY AND SECONDARY INDICATORS		
Revenues	$	(1)
Cost of goods sold (including the cost of materials, direct labor, indirect labor, rent, and heat)	$	(2)
Portion of corporate overhead assigned to the applicant (e.g., selling, general, administrative, interest, research and development expenses, and depreciation on common property)	$	(3)
Net income after taxes	$	(4)
Depreciation	$	(5)
Current assets (sum of inventories, prepaid expenses, and accounts receivable)	$	(6)
Current liabilities (sum of accounts payable, accrued expenses, taxes, and the current portion of long-term debt)	$	(7)
Long-term debt	$	(8)
Long-term liabilities (long-term debt such as bonds, debentures, and bank debt, and all other noncurrent liabilities, such as deferred income taxes)	$	(9)
Owner equity (difference between total assets and total liabilities, including contributed or paid in capital and retained earnings)[4]	$	(10)

[2] While actual payback schedules may differ across projects and companies, assume equal annual payments over a 10-year period for consistency in comparing projects.

[3] For recurring costs that occur less frequently than once a year, pro-rate the cost over the relevant number of years (e.g., for pumps replaced once every 3 years, include one-third of the cost in each year).

[4] Because the firm, not the facility, usually borrows money, these values should be provided at the firm level.

PART 3: EARNINGS BEFORE TAXES		
Revenue	$	(1)
Cost of goods sold (including the cost of materials, direct labor, indirect labor, rent and heat)	$	(2)
Portion of corporate overhead assigned to the applicant (e.g., selling, general, administrative, interest, research and development expenses, and depreciation on common property)	$	(3)
Earnings without project costs [calculate: (1) – (2) – (3)]	**$**	**(4)**
Total annual cost of project (Part 1, Item (5))	$	(5)
Earnings with project costs [calculate: (4) – (5)]	**$**	**(6)**
PART 4: PROFIT RATES		
Earnings before taxes (Part 3, Item (4))	$	(1)
Revenues (Part 2, Item 1)	$	(2)
Profit rate without project costs [calculate: (1)/(2)]		**% (3)**
Before-tax earnings with project costs (Part 3, Item (6))	$	(4)
Profit rate with project costs [calculate: (4)/(2)]		**% (5)**
PART 5: CURRENT RATIO		
Current assets (sum of inventories, prepaid expenses, and accounts receivable)	$	(1)
Current liabilities (sum of accounts payable, accrued expenses, taxes, and the current portion of long-term debt)	$	(2)
Current ratio [calculate: (1)/(2)]		**(3)**
PART 6: BEAVER'S RATIO		
Net income after taxes	$	(1)
Depreciation	$	(2)
Cash flow [calculate: (1) + (2)]	$	(3)
Current debt	$	(4)
Long-term debt	$	(5)
Total debt	$	(6)
Beaver's ratio [calculate (3)/(6)]		**(7)**
PART 6: DEBT TO EQUITY RATIO		
Long-term liabilities (long-term debt such as bonds, debentures, and bank debt, and all other noncurrent liabilities, such as deferred income taxes)	$	(1)
Owner equity (difference between total assets and total liabilities, including contributed or paid in capital and retained earnings)	$	(2)
Debt to equity ratio [calculate: (1)/(2)]		**(3)**

PART 7: FINANCIAL ANALYSIS				
PRIMARY MEASURE: PROFIT TEST[5]				
Entity	**Annual Pollution Control Costs**	**Profit Rate Without Project**	**Profit Rate With Project**	**Percent Change in Profit Rate Due to Project**
Applicant	$	%	%	
SECONDARY MEASURE: COMPARISON WITH TYPICAL VALUES FOR SIMILAR FACILITIES[6]				
Entity	**Primary Measure: Profit Test (Profitability)**	**Secondary Measures**		
		Current Ratio (Liquidity)	**Beaver's Ratio (Solvency)**	**Debt/Equity Ratio (Leverage)**
Applicant	%			
Facilities in Similar Line of Business	%			
Summarize and discuss financial circumstances with and without the project and compare primary and secondary measures with the corresponding typical values for facilities in a similar line of business.				

[5] Based on the most recently completed fiscal year.

[6] Based on a typical fiscal year.

Appendix E

Social and Economic Justification Worksheet

Social and Economic Justification Worksheet

This worksheet can be used to document the justification of social or economic importance. See Appendix E for potential data sources.

PART 1: IDENTIFY THE AFFECTED COMMUNITY	
Identify and describe the affected community.	
Current unemployment rate in the affected community	%
Current number of households below the poverty line in the affected community	
Current population in the affected community	
Current median household income	$
Current median home value in the affected community	$
Current overall net debt as a percent of full market value of taxable property in the affected community (public sector)	%
Current total tax revenues paid to the affected community (private sector)	$
PART 2: DESCRIBE THE IMPORTANT SOCIAL OR ECONOMIC DEVELOPMENT	
Describe why the proposed activity is important to the overall social or economic health of the affected community.	
Expected unemployment rate in the affected community after implementing the proposed activity	%
Expected number of households below the poverty line in the affected community after implementing the proposed activity	
Expected population in the affected community to be served after implementing the proposed activity	
Expected median household income in the affected community after implementing the proposed activity	$
Expected median home value in affected community after implementing the proposed activity	$
Expected overall net debt as a percent of full market value of taxable property in the affected community after implementing the proposed activity (public sector)	%
Expected total tax revenues to be paid to the affected community after implementing the proposed activity (private sector)	$

PART 3: DETERMINE THE OVERALL ENVIRONMENTAL, SOCIAL, AND ECONOMIC IMPACTS		
Indicator	**Yes / No**	**Estimated Change**
Will the proposed activity reduce the unemployment rate?	☐ Yes ☐ No	
Will the proposed activity reduce the number of households below the poverty line?	☐ Yes ☐ No	
Will the proposed activity serve a larger population (e.g., accommodate anticipated growth in the community)	☐ Yes ☐ No	
Will the proposed activity increase the median household income?	☐ Yes ☐ No	
Will the proposed activity increase the median home value?	☐ Yes ☐ No	
Will the proposed activity improve the overall net debt as a percent of full market value of taxable property? (public sector)	☐ Yes ☐ No	
Will the proposed activity increase the tax revenues paid to the community? (private sector)	☐ Yes ☐ No	
Will the proposed activity improve the community development potential? ☐ Yes (describe) ☐ No		
Will the proposed activity provide for necessary public services (e.g., fire department, school, infrastructure)? ☐ Yes (describe) ☐ No		
Will the proposed activity correct a public health, safety, or environmental problem? ☐ Yes (describe) ☐ No		
Will the proposed activity beneficially impact uses based on water quality (e.g., fishing, recreation, or tourism)? ☐ Yes (describe) ☐ No		
Will the proposed activity reserve assimilative capacity for future industry and development? ☐ Yes (describe) ☐ No		
Will the proposed activity result in environmental benefits associated with reclamation or other restored property? ☐ Yes (describe) ☐ No		
Will the proposed activity provide for increased flood control? ☐ Yes (describe) ☐ No		
Will the proposed activity provide for other social, economic, or environmental benefits? ☐ Yes (describe) ☐ No		

Appendix F

Potential Data Sources for Social and Economic Justification

Potential Data Sources for Social and Economic Justification

The list below provides potential sources of information required to develop the justification of social or economic importance.

Indicator	Potential Data Source
Direct Net Debt	Community Financial Statements
Overlapping Debt	Community Financial Statements
Market Value of Property	Community Financial Statements. If community-specific information cannot be found, median property values by state can be found through American Community Survey Reports: http://www.census.gov/prod/2009pubs/acsbr08-6.pdf Combine data with the number of properties in the community.
Bond Rating	Standard and Poor's or Moody's
Community Unemployment Rate	U.S. Department of Labor, Bureau of Labor Statistics: Local Area Unemployment Statistics: http://www.bls.gov/lau/#tables U.S. Census Bureau (select state, then county or city within state; select "Browse data sets for…" then "Economic Characteristics" under "American Community Survey"): http://quickfacts.census.gov/qfd/index.html
National Unemployment Rate	U.S. Department of Labor, Bureau of Labor Statistics: Labor Force Statistics from the Current Population Survey: http://data.bls.gov/timeseries/LNS14000000
State Unemployment Rate	U.S. Census Bureau (select state; select "Browse data sets for…" then "Economic Characteristics" under "American Community Survey"): http://quickfacts.census.gov/qfd/index.html
Community Labor Force	U.S. Census Bureau (select state, then county or city within state; select "Browse data sets for…" then "Economic Characteristics" under "American Community Survey"): http://quickfacts.census.gov/qfd/index.html
State Labor Force	U.S. Census Bureau (select state; select "Browse data sets for…" then "Economic Characteristics" under "American Community Survey"): http://quickfacts.census.gov/qfd/index.html
Community Number of Households	U.S. Census Bureau (select state, then county or city within state): http://quickfacts.census.gov/qfd/index.html

Indicator	Potential Data Source
Community Median Household Income	U.S. Census Bureau: State & County QuickFacts (select state, then county or city within state; select "Browse data sets for…" then "Economic Characteristics" under "American Community Survey"): http://quickfacts.census.gov/qfd/index.html
State Median Household Income	U.S. Census Bureau: State Median Income: http://www.census.gov/hhes/www/income/data/statemedian/
Property Tax Collection Rate	Community Financial Statements. If community-specific information cannot be found, statewide data can be found at the U.S. Census Bureau's Quarterly Summary of State & Local Taxes: http://www.census.gov/govs/qtax/
Property Tax Revenues	Community Financial Statements. If community-specific information cannot be found, statewide data can be found at the U.S. Census Bureau's Quarterly Summary of State & Local Taxes: http://www.census.gov/govs/qtax/ Scale according to size of community relative to state.
Community Poverty Rate	U.S. Census Bureau: State & County QuickFacts (select state, then county or city within state; select "Browse data sets for…" then "Economic Characteristics" under "American Community Survey"): http://quickfacts.census.gov/qfd/index.html
State Social Service Expenditures	State Human Services Reports.
Community Social Services Expenditures	Community Financial Statements.
Community Tax Revenues	Community Financial Statements.