

Missouri Antidegradation Implementation Workshop



Missouri Department of Natural Resources Staff
June, 2008

Introduction

Refaat Mefrakis, PE
Permits and Engineering Section, Chief

Donna Menown
Environmental Specialist

Keith Forck, PE
Environmental Engineer

Todd Blanc
Environmental Specialist



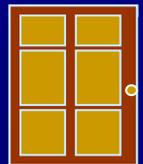
Department of Natural Resources

Implementation Procedure Agenda

- Background
- Applicability and Alternatives Analysis
- Importance of Water Quality Review Assistance
- Application Processing- CP and OP
- Questions and Answers

Responsibilities of Antidegradation Review Process

- Submittal of Antidegradation Review to Permits and Engineering Section.
- Water Quality Data, Modeling and Quality Assurance Project Plans Review (Monitoring and Assessment Section)
- Preliminary Determination by Permits and Engineering Section.
- Submittal of a Permit Application for Public Notice (Regional Office, except for SRF projects)
- Issuance of Construction Permits



Antidegradation

Approved degradation is the *justified* use of a water's ability to assimilate pollutants without an adverse impact to the beneficial uses of the water.

Applicability of the Procedure

- Applicant provides the information
- Applies to regulated discharges
- Applies to new and expanding discharges
- Applies to pollutants of concern on a pollutant-by-pollutant basis (except for Tier 3 waters)
- Applies to pollutant amounts that may result in significant degradation
- Applies to degradation of existing water quality
- Designed to require justification for degradation, not promote water quality restoration

Antidegradation

If you are planning an expansion or new discharge or are *even thinking about it....*

...you need to be thinking about antidegradation **NOW.**

Your planning efforts may be wasted if you are not considering antidegradation today.

Antidegradation

August 30, 2008

Missouri's Antidegradation Implementation Procedure

- *Background* -

aka "How'd we get here?"



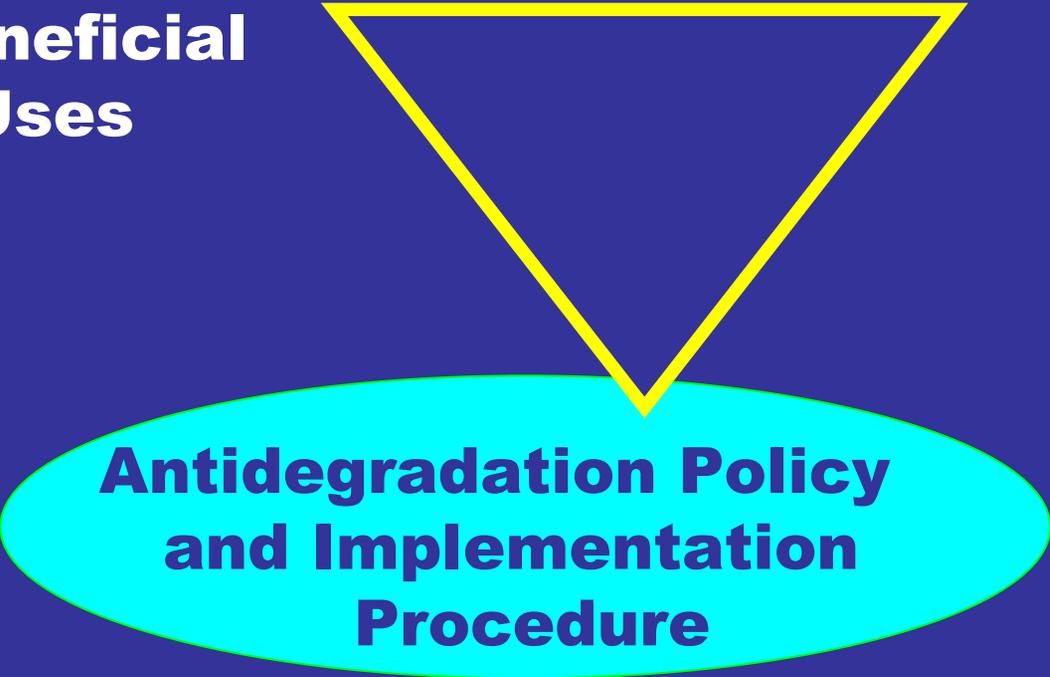
MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Antidegradation Workshops - June, 2008

Water Quality Protection Triad

**Designated
Beneficial
Uses**

**Water Quality
Criteria**
(Narrative
& Numeric)



**Antidegradation Policy
and Implementation
Procedure**

Missouri's WQS & Antidegradation

- Reference to antidegradation has been in Mo. statutes (i.e., law, policy) & Water Quality Standards (i.e., rules) for over 25 years
- Some felt not to a detail that provided consistent application
- Oct. 2003: Mo. Coalition for the Environment filed suit vs. EPA to ensure Missouri developed a specific Antidegradation Implementation Procedure (AIP)

On the Road to AIP-ville!

- Dec. 2004: Settlement Agreement between Mo. Coalition for the Environment & EPA Region 7 - Said by April 30, 2007, EPA must determine whether or not Missouri developed a procedure and rule that is adequate. If not, EPA will have to promulgate it themselves.
- Feb. 2006 – Feb. 2007: MoDNR held 13 stakeholder meetings through which an AIP was developed



Further Down the AIP Road...

- Nov. 2006 – Feb. 2007: 90-day Public Comment Period on draft AIP
- April 20, 2007: Mo.'s Clean Water Commission approved the new AIP and rulemaking began

Still Rolling...

- July 2007: Settlement Agreement modified to extend time for EPA to make a determination regarding adequacy of Missouri's new rules (by Sept. 30, 2008)
- July 2007 – Sept. 2007: The required 60-day Public Comment Period on Regulatory Impact Report

Getting Closer...

- Jan. - March 2008: Open Public Comment Period on proposed new antidegradation rule which will incorporate the AIP by reference
- March 12, 2008: Public Hearing (comments/testimony at: <http://www.dnr.mo.gov/env/wpp/cwforum/adv-antidegradation.htm>)
- May 7, 2008: Mo. Clean Water Commission adopted the “*Missouri Antidegradation Rule and Implementation Procedure*” with revisions to the April 20, 2007 version based on comments received

Implementation on the Horizon

- Anticipate July 15, 2008: Publish in the Missouri Register
- Anticipate July 31, 2008: Publish in the State Code of Regulations (CSR)
- August 30, 2008: New Rule becomes effective. *EPA must review and judge adequacy of Missouri rule by Sept. 30th.*

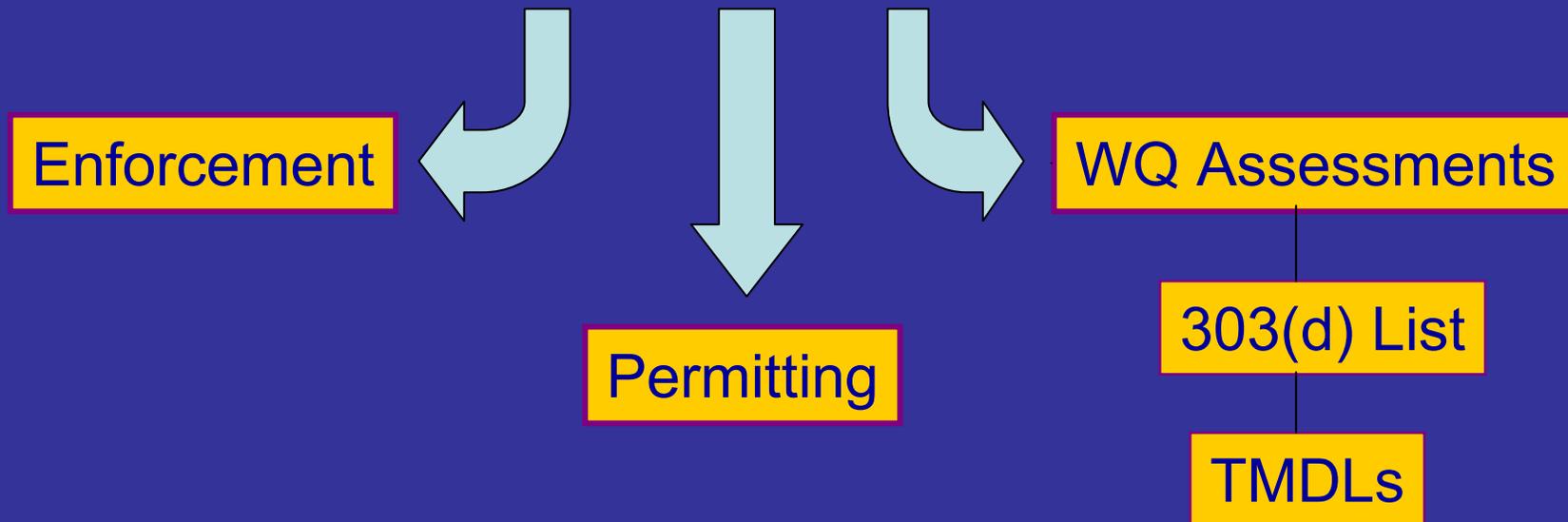


Where will the effects
of this new procedure
be felt first?

Permits.

Scope of Implementation

Antidegradation Implementation Procedure



Who's in Charge?

- Up until this point, effort led by MoDNR's **Water Quality Monitoring & Assessment Section** (Phil Schroeder, Chief)
- Now the **Permits and Engineering Section** (Refaat Mefrakis, Chief) are taking the reins as antidegradation is integrated into the permitting process

(All still in the Water Protection Program's
Water Pollution Control Branch)

Which Permits are Impacted?

State Operating Permit or Construction
Permit applications
for new or expanding discharges
received on or after the AIP effective date





“Approved degradation”
is the justified use
of a water’s ability to assimilate
pollutants
without adversely impacting
the beneficial uses
of the water.

“Justified”? How?

Degradation cannot be allowed without:

- 1.) demonstrating the necessity of a discharge and
- 2.) explaining the important socio-economic development supported by the discharging activity (See EPA's *Interim Economic Guidance-Workbook* at: <http://www.epa.gov/waterscience/standards/econworkbook/>).

Tiers of Water Quality

10 CSR 20-7.031(2)

Tier 1 - Water quality is at, near or violating WQS.

Tier 2 - Water quality is better than WQS and degradation *may* be allowed when justified.

Tier 3 - Outstanding National and State Resource Waters (i.e., 10 CSR 20-7.031(1)(Q)&(R), & Tables D and E in the WQS) *No degradation allowed.*

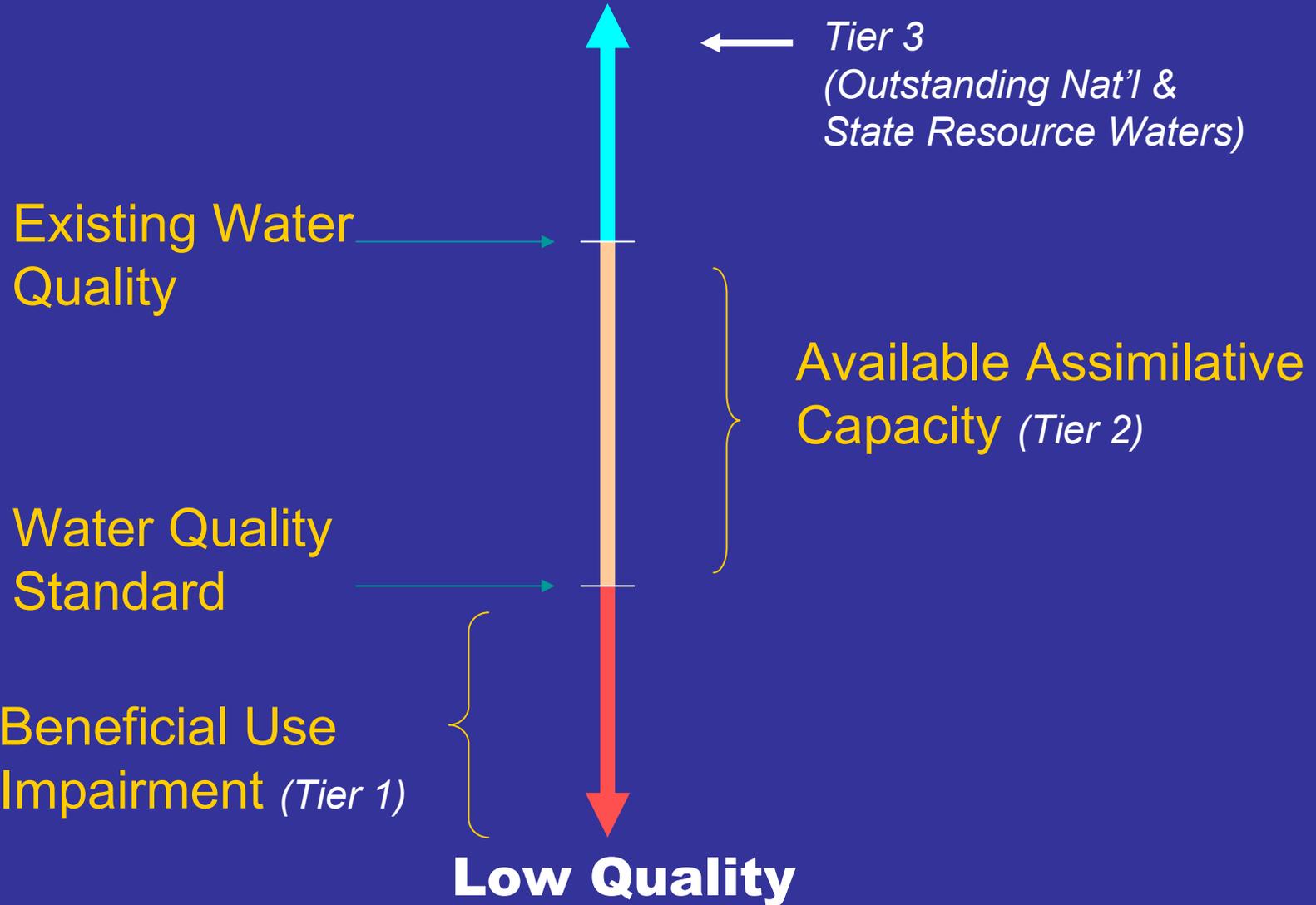
Tier Assigned to Each Pollutant

- A “water body-by-water body” approach to antidegradation review is the review of pollutants in a water body by assessing the overall or combined levels of the pollutants of concern.
- Missouri is instead using a “pollutant-by-pollutant” tier assignment.

Pollutant-by-Pollutant Basis

- Defined as, “The review of the pollutants in a water body by assessing the level of each pollutant of concern...for determining the level of antidegradation review applicable to the water.”
- “Pollutant of Concern” (POC): Discharged pollutants, or pollutants proposed for discharge that affect beneficial uses in waters of the state.

High Quality



Alternatives Analysis

- **Practicability**
 - technologically feasible
 - good “fit”
- **Economic Efficiency**
 - As a “rule of thumb,” no greater than 120% of operating costs necessary to achieve WQS, or technology-based standards, whichever is more stringent.
- **Affordability**
 - cost to community does not exceed 2% of median household income

How Do You Figure This?

- The Permits & Engineering Section staff are developing various forms and worksheets to help guide the applicants through the antidegradation review process.



To obtain a copy of the “*Missouri Antidegradation Rule and Implementation Procedure*”:

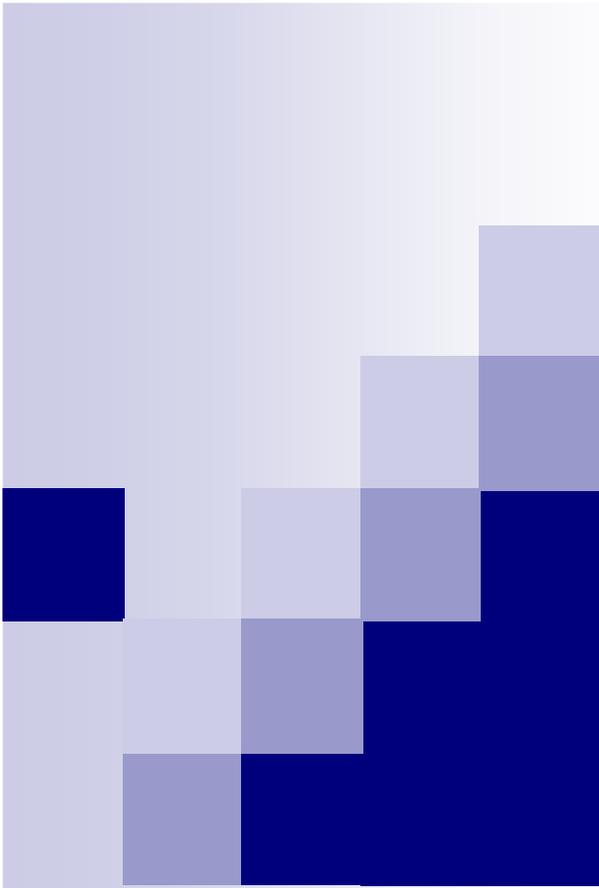
<http://www.dnr.mo.gov/env/wpp/docs/aip-cwc-appr-050708.pdf>



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Questions?

- AIP Development: Phil Schroeder, MoDNR, WQ Monitoring & Assessment Section Chief, (573) 751-6623, phil.schroeder@dnr.mo.gov
- Implementation of AIP: Refaat Mefrakis, MoDNR, Permits & Engineering Section Chief, (573) 526-2928, refaat.mefrakis@dnr.mo.gov



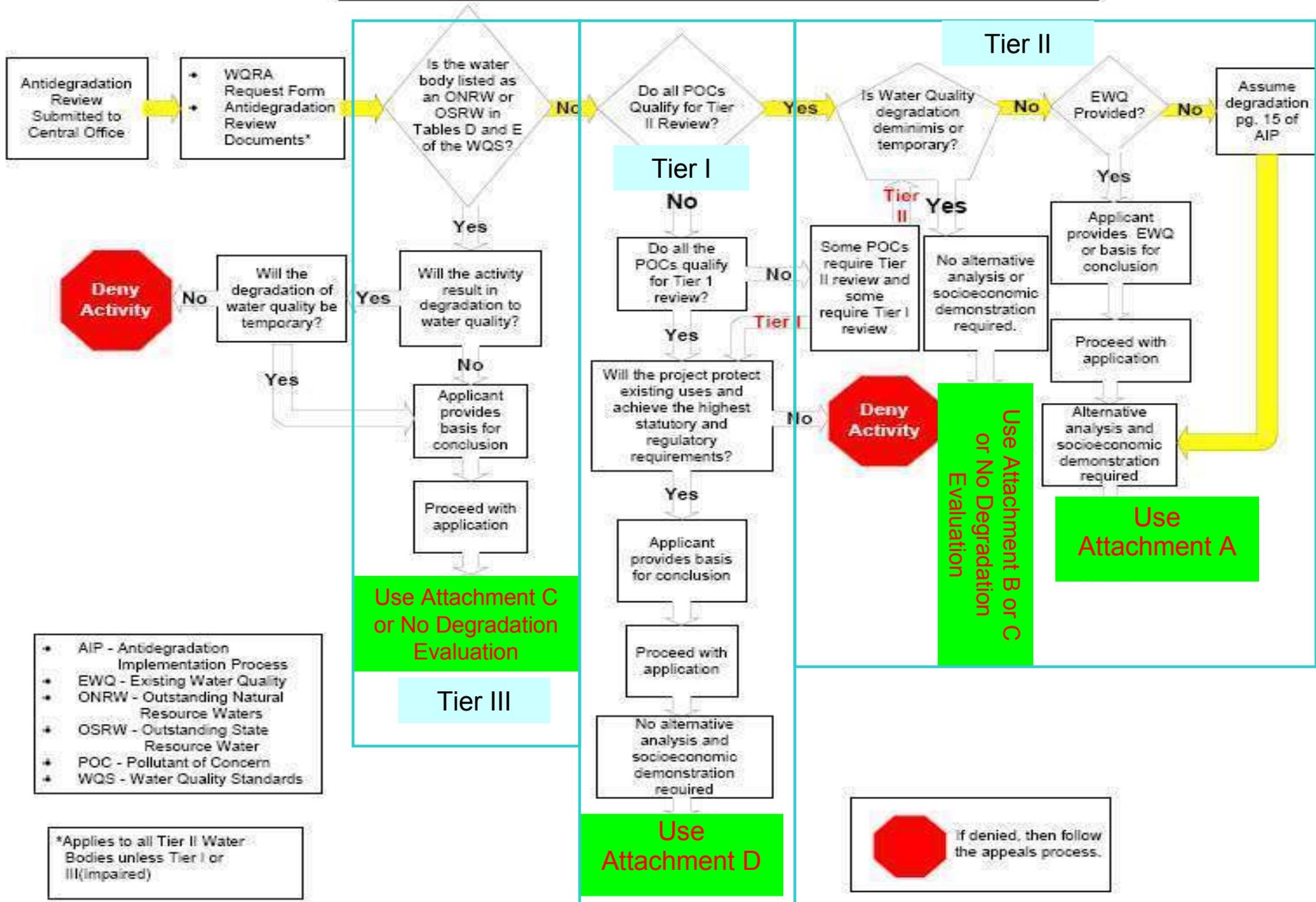
Antidegradation Applicability and Alternative Analysis

Presenters:

Keith Forck, keith.forck@dnr.mo.gov

Refaat Mefrakis, refaat.mefrakis@dnr.mo.gov

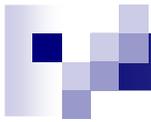
Antidegradation Review Applicability Process Diagram



- AIP - Antidegradation Implementation Process
- EWQ - Existing Water Quality
- ONRW - Outstanding Natural Resource Waters
- OSRW - Outstanding State Resource Water
- POC - Pollutant of Concern
- WQS - Water Quality Standards

*Applies to all Tier II Water Bodies unless Tier I or III(Impaired)

 If denied, then follow the appeals process.



Tier I

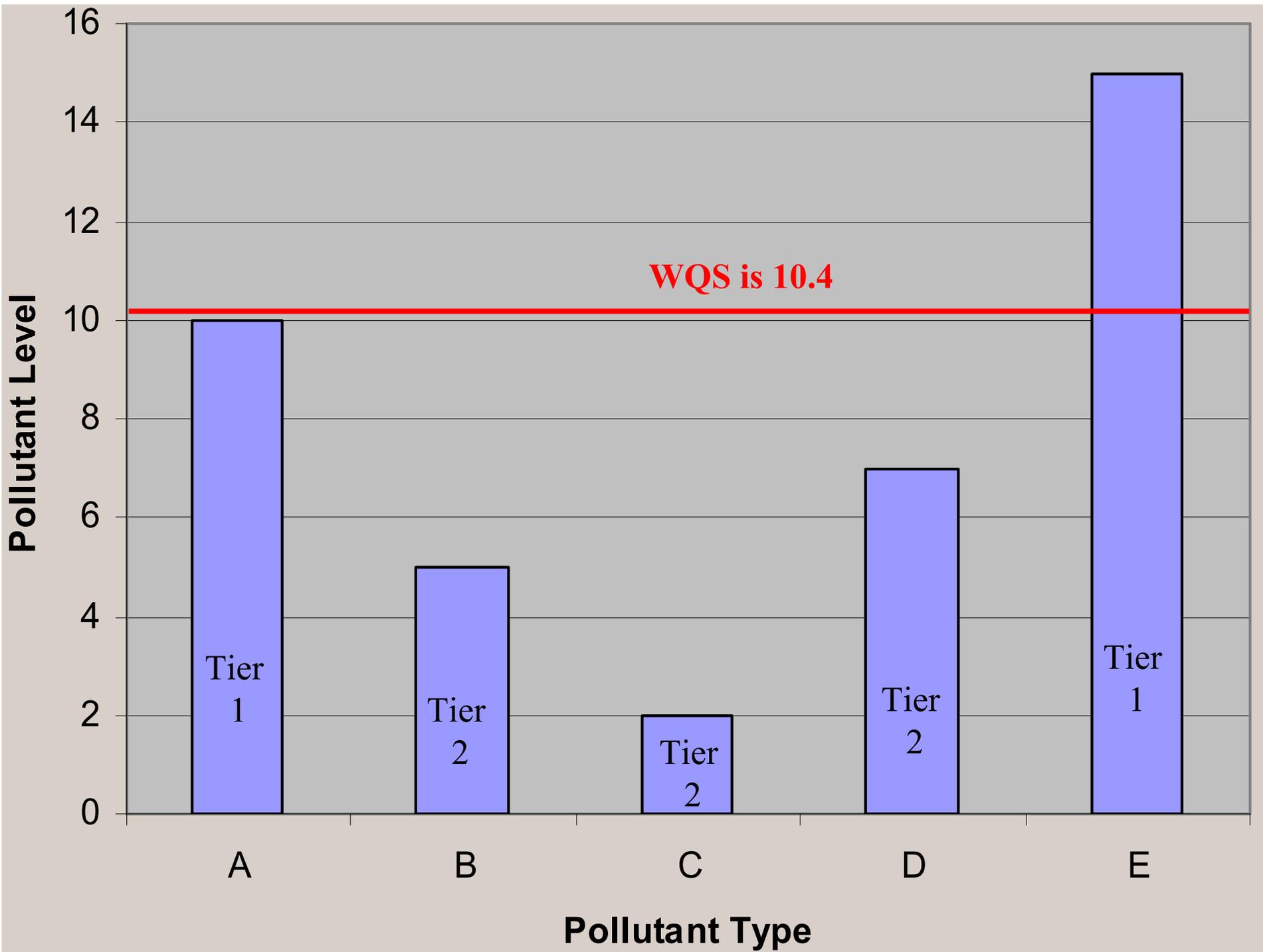
- Degradation has already been documented.
- Additional discharges allowed without a full antidegradation review if they do not result in further degradation.

Tier II

- No evidence of existing significant water quality degradation.
- Lowering water quality is allowed if justified by a full antidegradation review (No adverse impact to beneficial uses).

Tier III

- Designated ONRWs and OSRWs.
- No lowering of water quality allowed.
- NO new direct discharges allowed.



High Quality

Tiers of Water Quality

Existing Water
Quality

Available Assimilative
Capacity

Water Quality
Standard

Beneficial Use
Impairment

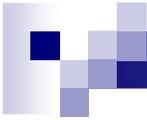
Tier II—Minimal Degradation
10 Percent of Available
Assimilative Capacity

Tier II—Significant
Degradation (may be assumed
in the minimal degradation area)

Tier I

Low Quality



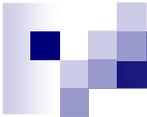


Antidegradation Summary Forms

Submit with the Water Quality Review Assistance Request Form

- Tier Determination and Effluent Limit Summary
- Attachment A: Tier II – Significant Degradation
- Attachment B: Tier II – Minimal Degradation
- Attachment C: Temporary Degradation
- Attachment D: Tier I Review
- No Degradation Evaluation – Conclusion of Antidegradation Review

These forms will soon be available at <http://www.dnr.mo.gov/forms/index.html>



ANTIDEGRADATION REVIEW SUMMARY TIER DETERMINATION AND EFFLUENT LIMIT SUMMARY

Facility Name: _____

Receiving Water Body Segment #1: _____

Up segment UTM or Lat/Long coordinates: _____

Down segment UTM or Lat/Long coordinates: _____

Water Body Segment #2 (if applicable): _____

Up segment UTM or Lat/Long coordinates: _____

Down segment UTM or Lat/Long coordinates: _____

Water Body Segment #3 (if applicable): _____

Up segment UTM or Lat/Long coordinates: _____

Down segment UTM or Lat/Long coordinates: _____

Is the receiving water body an Outstanding National Resource Water (ONRW), an Outstanding State Resource Water (OSRW), or drainage thereto? YES NO

In Tables D and E of 10 CSR 20-7.031, ONRWs and OSRWs are listed. Per the Missouri Antidegradation Rule and Implementation Procedure (AIP) Section I.B.3., "any degradation of water quality is prohibited in these waters unless the discharge only results in temporary degradation." Therefore, if degradation is significant or minimal, the Antidegradation Review will be denied.

Will the discharge result in temporary degradation? YES NO

If yes, complete Attachment C.

Tier Determination and Effluent Limit Summary (Continued)

Bottom of Page 1

Has the project been determined as non-degrading? YES NO

If yes, complete **No Degradation Evaluation – Conclusion of Antidegradation Review form**.
Submit with the appropriate Construction Permit Application as no antidegradation review is required.

Is Tier II with significant degradation assumed for all Pollutants of Concern? YES NO

If yes, complete **Attachment A**

The AIP Section II.A. states that an applicant may avoid having to determine the assimilative capacity of the receiving water and, consequently, may proceed directly into performing the alternatives analysis and the social and economic importance of the discharge.

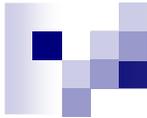
WET WEATHER ANTICIPATIONS:

If an applicant anticipates excessive inflow and/or infiltration and pursues approval from the department to bypass secondary treatment, a feasibility analysis is required. The feasibility analysis must comply with the criteria of all applicable state and federal regulations including 40 CFR 122.41(m)(4). Please attach the feasibility analysis to this report.

What is the Wet Weather Flow Peaking Factor in relation to Design Flow? : 1

Wet Weather Design Summary:

If yes to one of the above questions, skip the Existing Water Quality Data (EWQ) or Model Summary Section and the Pollutants of Concern (POCs) and the Tier Determination(s) Section (Page 2). Continue on Page 3.



Tier Determination and Effluent Limit Summary (Continued)

Page 2

EXISTING WATER QUALITY (EWQ) DATA OR MODEL SUMMARY:

Obtaining EWQ is possible by three methods according to the AIP Section II.A.1.: (1) using previously collected data with an appropriate Quality Assurance Project Plan (QAPP) (2) collecting water quality data by approved the Missouri Department of Natural Resources (department) methodology or (3) using an appropriate water quality model. QAPPs must be submitted to the department for approval well in advance (six months) of the proposed activity. Please provide all the appropriate corresponding data and reports which were approved by the department Water Quality Monitoring and Assessment Section (WQMA).

Date EWQ data was provided by the department WQMA: _____

Approval date of the QAPP by the department WQMA: _____

Approval date of the project sampling plan by the department WQMA: _____

Approval date of the data collected for all appropriate pollutants of concern (POC) by the department WQMA: _____

Comments/Discussion:

Tier Determination and Effluent Limit Summary (Continued)

Bottom of Page 2

POLLUTANTS OF CONCERN (POCs) AND TIER DETERMINATION(S):

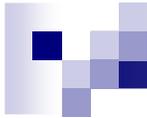
POCs to be considered include those pollutants reasonably expected to be present in the discharge per the AIP Section II.A. The tier protection levels are specified and defined in rule at 10 CSR 20-7.031(2).

Water Body Segment One		
Pollutants of Concern and Tier Determination(s)		
Tier I	Tier II with Minimum Degradation	Tier II with Significant Degradation

*Assumed Tier II with Significant Degradation.

Water Body Segment Two		
Pollutants of Concern and Tier Determination(s)		
Tier I	Tier II with Minimum Degradation	Tier II with Significant Degradation

- For pollutants of concern that are Tier II with significant degradation, complete Attachment A.
- For pollutants of concern that are Tier II with minimal degradation, complete Attachment B.
- For pollutants of concern that are Tier I, complete Attachment D. Additionally, a Tier II review must be conducted for each pollutant of concern on the appropriate water body segment.



Tier Determination and Effluent Limit Summary (Continued)

SUMMARY OF THE PROPOSED ANTIDEGRADATION REVIEW EFFLUENT LIMITS:

What are the proposed pollutants of concern and their respective effluent limits that the selected treatment option will comply with:

¶

Pollutant of Concern	Units	Wasteload Allocation	Average Monthly Limit	Daily Maximum Limit
BOD5	mg/L			
TSS	mg/L			
Dissolved Oxygen	mg/L			
Ammonia	mg/L			
Fecal Coliform	colonies/100mL			

Please attach the Antidegradation Review report and all supporting documentation. |

Tier Determination and Effluent Limit Summary (Continued)

Bottom of Page 3

Consultant: I have prepared/reviewed this form and all attached reports and documentation. The conclusion proposed is consistent with the AIP and current state and federal regulations.

Signature: _____ Date: _____
Print Name: _____
Company: _____ Address: _____
City: _____ State: _____ Zip Code: _____
Phone Number: _____ Email Address: _____

Owner: I have read and reviewed the prepared documents and agree with this submittal.

Signature: _____ Date: _____
Print Name: _____ Address: _____
City: _____ State: _____ Zip Code: _____
Phone Number: _____ Email Address: _____

Continuing Authority: Continuing Authority is the permanent organization which will be responsible for the operation, maintenance and modernization of the facility. The regulatory requirement regarding continuing authority is available at <http://www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf>.

I have read and reviewed the prepared documents and agree with this submittal.

Signature: _____ Date: _____
Name: _____ Address: _____
City: _____ State: _____ Zip Code: _____
Phone Number: _____ Email Address: _____

ANTIDegradation Review Summary

Attachment A: Tier II-Significant Degradation

Facility Name: _____

Receiving Water Body Segment (WBS) #1: _____

Water Body Segment (WBS) #2 (if applicable): _____

IDENTIFYING ALTERNATIVES:

Please supply a summary of the alternatives considered and the level of treatment attainable with regards to the alternative. "For discharges likely to cause significant degradation, an analysis of non-degrading and less-degrading alternatives must be provided," as stated in the AIP Section II.B.1. Per 10 CSR 20-6.010(4)(D)1., the feasibility of a no-discharge system must be considered. Please attach all supportive documentation in the Antidegradation Review report.

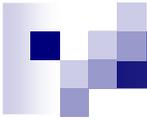
Non-degrading alternatives:



Alternatives ranging from less-degrading to degrading including Preferred Alternative (All must meet Water Quality Standards):

Alternatives	Level of treatment attainable for each POC					
	BOD	TSS	Ammonia as N			
	(mg/L)	(mg/L)	(mg/L)			
★						

Identifying Alternatives Summary:



Attachment A: Tier II – Significant Degradation (Continued)

Page 2

DETERMINATION OF THE REASONABLE ALTERNATIVE:

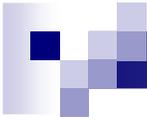
Per the AIP Section II.B.2, “a reasonable alternative is one that is practicable, economically efficient, and affordable.” Please provide basis and supporting documentation in the Antidegradation Review report.

Practicability Summary:

“The practicability of an alternative is considered by evaluating the effectiveness, reliability, and potential environmental impacts,” according to the AIP Section II.B.2.a. Examples of factors to consider, including secondary environmental impacts, are given in the AIP Section II.B.2.a.

Economic Efficiency Summary:

Alternatives that are deemed practicable must undergo a direct cost comparison in order to determine economic efficiency. Means to determine economic efficiency are provided in the AIP Section II.B.2.b.



Attachment A: Tier II – Significant Degradation (Continued)

Bottom of Page 2

Affordability Summary:

Alternatives identified as most practicable and economically efficient are considered affordable if the applicant does not supply an affordability analysis. An affordability analysis per the AIP Section II.B.2.c, “may be used to determine if the alternative is too expensive to reasonably implement.”

Preferred Chosen Alternative: _____

Reasons for Rejecting the other Evaluated Alternatives: _____

Comments/Discussion: _____

Attachment A: Tier II – Significant Degradation (Continued)

Page 3

SOCIAL AND ECONOMIC IMPORTANCE (SEI) OF THE PREFERRED ALTERNATIVE:

If the preferred alternative will result in significant degradation, then it must be demonstrated that it will allow important economic and social development in accordance to the AIP Section II.E. SEI is defined as the social and economic benefits to the community that will occur from any activity involving a new or expanded discharge.

Identify the affected community:

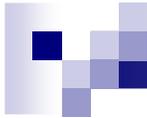
The affected community is defined in 10 CSR 20-7.031(2)(B) as the community “in the geographical area in which the waters are located.” Per the AIP Section II.E.1., “the affected community should include those living near the site of the proposed project as well as those in the community that are expected to directly or indirectly benefit from the project.”

Identify relevant factors that characterize the social and economic conditions of the affected community:

Examples of social and economic factors are provided in the AIP Section II.E.1., but specific community examples are encouraged.

Describe the important social and economic development associated with the project:

Determining benefits for the community and the environment should be site specific and in accordance with the AIP Section II.E.1.



Attachment A: Tier II – Significant Degradation (Continued)

Bottom of Page 3

PROPOSED PROJECT SUMMARY:

Please attach the Antidegradation Review report and all supporting documentation. This is a technical document, which must be signed, sealed, and dated by a registered professional engineer of Missouri.

Consultant: I have prepared/reviewed this form and all attached reports and documentation. The conclusion proposed is consistent with the AIP and current state and federal regulations.

Signature: _____ Date: _____

Print Name: _____ License #: _____

Phone Number: _____ Email Address: _____

Owner: I have read and reviewed the prepared documents and agree with this submittal.

Signature: _____ Date: _____

Continuing Authority: I have read and reviewed the prepared documents and agree with this submittal.

Signature: _____ Date: _____

ANTIDegradation Review Summary

Attachment B: Tier II – Minimal Degradation

Facility Name: _____

Receiving Water Body Segment (WBS) #1: _____

Water Body Segment (WBS) #2 (if applicable): _____

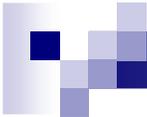
Modify this form as necessary for additional water body segments as required.

Assimilative Capacity Table:

Determining the facility assimilative capacity (FAC) and the segment assimilative capacity (SAC) for each pollutant of concern (POC) is explained in detail in the AIP Section II.A.3. and Appendix 3. POCs to be considered include those pollutants reasonably expected to be present in the discharge per the AIP Section II.A. Please provide all calculations in the Antidegradation Review report.

POC	FAC	New Load	Percent of FAC
	(lbs/day)	(lbs/day)	(%)

POC	WBS #1 SAC	Cumulative net increase in load	Cumulative Percent of WBS #1 SAC	WBS #2 SAC	Cumulative net increase in load	Cumulative Percent of WBS #2 SAC
	(lbs/day)	(lbs/day)	(%)	(lbs/day)	(lbs/day)	(%)



Attachment B: Tier II – Minimal Degradation (Continued)

Bottom of Page 1 and Top of Page 2

Assimilative Capacity Summary:

Is degradation considered minimal for all POCs? YES NO

Degradation is considered minimal if the new or proposed loading is less than 10% of the FAC and the cumulative degradation is less than 20% of the SAC according to the AIP Section II.A.3. If yes, an alternatives analysis and a social and economic importance analysis are not required.

Comments/Discussion:

MINIMAL DEGRADATION CALCULATIONS:

Attachment B: Tier II – Minimal Degradation (Continued)

Page 2 (continued)

OIL AND GREASE

Is this a publicly owned treatment works (POTW), restaurant, school or other domestic wastewater treatment facility with oil and grease as a POC? YES NO

In accordance with 10 CSR 20-7.031(3)(B), waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses. In accordance with 10 CSR 20-7.031 Table A, oil and grease has a chronic toxicity of 10mg/L for protection of aquatic life. This facility will meet the effluent limits (MDL and AML of 15 mg/l and 10 mg/L, respectively).

DECHLORINATION

If Chlorination and Dechlorination is the existing or proposed method of disinfection treatment, will the effluent discharged be equal to or less than the Water Quality Standards (WQS) for Total Residual Chlorine (TRC) stated in Table A of 10 CSR 20-7.031? YES NO

Based on the disinfection treatment system being designed for total removal of TRC, minimal degradation for TRC is assumed and the facility will be required to meet the water quality based effluent limits (MDL and AML of 17 µg/l and 8 µg/L, respectively). These compliance limits for TRC are much less than the method detection limit (MDL) of 0.13 mg/L.

Comments/Discussion:

PROPOSED PROJECT SUMMARY:

Signatures Below (Same as Attachment C)

ANTIDegradation Review Summary

Attachment C: Temporary Degradation

Facility Name: _____

Receiving Water Body Segment: _____

Modify this form as necessary for additional water body segments as required.

Pollutants of Concern (POCs):

POCs to be considered include those pollutants reasonably expected to be present in the discharge per the AIP Section II.A.

POC:

POC:

Is the degradation of water quality temporary? **YES** **NO**

If yes, the department will determine if temporary degradation is appropriate, based upon the information provided below.

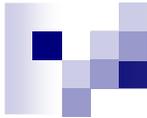
“Activities resulting only in temporary degradation will be given a Tier 1 review,” per the AIP Section II.A.4.

1) Length of time during which water quality will be lowered?

2) Percent change in ambient conditions?

3) Parameters affected?

4) Likelihood for long-term water quality benefits to the segment?



Attachment C: Temporary Degradation (Continued)

Bottom of Page 1

5) Degree to which achieving the applicable water quality standards during the proposed activity maybe at risk? _____

6) Potential for any residual long-term influences on existing uses?

PROPOSED PROJECT SUMMARY:

Please attach the Antidegradation Review report and all supporting documentation.

Consultant: I have prepared/reviewed this form and all attached reports and documentation. The conclusion proposed is consistent with the AIP and current state and federal regulations.

Signature: _____

Date: _____

Print Name: _____

Owner: I have read and reviewed the prepared documents and agree with this submittal.

Signature: _____

Date: _____

Continuing Authority: I have read and reviewed the prepared documents and agree with this submittal.

Signature: _____

Date: _____

ANTIDEGRADATION REVIEW SUMMARY

ATTACHMENT D: TIER I REVIEW

Facility Name: _____

Receiving Water Body Segment #1: _____

Water Body Segment #2 (if applicable): _____

Modify this form as necessary for additional water body segments as required.

Tier I Pollutant of Concern	Concentration Units (mg/L or µg/L)	95% of Water Quality Standard	90 th Percentile of water body segment #1 sampling results	90 th Percentile of water body segment #2 sampling results

Summary:

Please attach the Antidegradation Review report and all supporting documentation.

Signatures Below (Same as Attachment C)

NO DEGRADATION EVALUATION
CONCLUSION OF ANTIDegradation REVIEW
(Submit this form with the appropriate Permit Application.)

Wastewater Treatment Facility Name: _____
Address: _____ **County:** _____
City: _____ **State:** _____ **Zip:** _____
Facility Contact: _____ **Phone Number:** _____

Per the Missouri Antidegradation Rule and Implementation Procedure (AIP) Section II.B.1., the following are examples of non-degrading control alternatives:

NO DEGRADATION OPTIONS:

- Renewal without changes
- Sewer extensions
- CSO and SSO elimination projects
- No-discharge with land application
- No-discharge with subsurface irrigation
- Recycle/Reuse of effluent
- Discharge to a regional wastewater collection and treatment system.
- Addition/Replacement of disinfection system for an existing wastewater facility: Ultraviolet or Ozone
The facility will be required to meet regulatory effluent limits for bacteria.
- Addition/Replacement of Chlorination/Dechlorination disinfection system of existing facility.
The chlorination/dechlorination disinfection treatment system design must be for total removal of TRC. Therefore, the facility will be required to meet the water quality based effluent limits (MDL and AML of 17 µg/l and 8 µg/L, respectively). These compliance limits for TRC are much less than the method detection limit (MDL) of 0.13 mg/L. The facility will be required to meet regulatory effluent limits for bacteria.

No Degradation Evaluation (Continued)

Bottom of Page 1

Other, please describe: _____

NO DEGRADATION PROJECT SUMMARY:

Consultant: I have prepared/reviewed this form and all attached reports and documentation. The conclusion proposed is consistent with the AIP and current state and federal regulations.

Signature: _____ Date: _____

Print Name: _____

Phone Number: _____ Email Address: _____

Owner: I have read and reviewed the prepared documents and agree with this submittal.

Signature: _____ Date: _____

Phone Number: _____ Email Address: _____

Continuing Authority: Continuing Authority is the permanent organization which will be responsible for the operation, maintenance and modernization of the facility. The regulatory requirement regarding continuing authority is available at <http://www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf>.

I have read and reviewed the prepared documents and agree with this submittal.

Signature: _____ Date: _____

Phone Number: _____ Email Address: _____



City of Metropolis (Dry Run)

■ Existing:

- 2 MGD POTW
- Trickling Filter
- I&I issues
- Pretreated Industrial Waste

■ Proposed:

- 3.4 MGD POTW
- Biological Nutrient Removal
- I&I storage
- Pretreated Industrial Waste
- Discharge to Turkey Creek with second waterbody segment being Rock Lake (1.85 miles downstream)

City of Metropolis
100 Main St.
Metropolis, MO

RE: Water Quality Review Sheet / Antidegradation Review Preliminary Determination for Metropolis wastewater treatment facility.

Dear Mr./Ms. :

Enclosed please find the finalized water quality review sheet (WQRS) and Antidegradation Review Summary for the Metropolis wastewater treatment facility in Kent County. The WQRS contains effluent limitations and monitoring requirements for the facility discharge. It was developed in accordance with U.S. EPA guidance, the applicant-supplied antidegradation review documentation, and the State of Missouri's effluent regulations (10 CSR 20-7.015) and water quality standards (10 CSR 20-7.031). Please refer to the *General Assumptions of the Water Quality Review Sheet* section of the attached WQRS. The WQRS is preliminary and subject to change as new information becomes available during future permit application processing.

Based on the Department's initial review, the department's preliminary determination is that the applicant-supplied antidegradation review documentation satisfies the requirements of the *Missouri Antidegradation Rule and Implementation Procedure* (AIP). This WQRS/preliminary determination may be appealed within 30 days of this letter in accordance with the AIP Section II.F.4.

You may proceed with submittal of an application for an operating permit and antidegradation review public notice, an engineering report, or a complete application for a construction permit. The department will not be conducting any further review of this project until a submittal is received. Any changes in facility description or capacity will potentially require another antidegradation review.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

PAGE NUMBER 2 of 8

PERMIT NUMBER MO-xxxxxxx

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #001</u>						
Flow	MGD	*		*	Twice/week	24 hr. total
Biochemical Oxygen Demand ₅	mg/L	17		10	Twice/week	composite
Total Suspended Solids	mg/L	17		10	Twice/week	composite
pH – Units	SU	**		**	Twice/week	grab
Dissolved Oxygen***	mg/L	>6.0		>6.0	Twice/week	grab
Ammonia as N	mg/L				Twice/week	grab
(May 1 – Oct 31)		1.5		1.0		
(Nov 1 – April 30)		1.5		1.0		
Temperature	°C	*		*	Twice/week	grab
Oil & Grease	mg/L	15		10	Twice/week	grab
Fecal Coliform (Note 1)	#/100 ml	1000		400	Twice/week	grab
Total Residual Chlorine (Note 2)	mg/L	0.017		0.008	Twice/week	grab
Total Hardness	mg/L	*		*	Twice/week	grab
Lead, Total Recoverable	µg/L	5.0		2.5	Twice/week	grab
Zinc, Total Recoverable	µg/L	151		75	Twice/week	grab

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE _____, THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

Whole Effluent Toxicity (WET) test	100% Survival	See Special Conditions	once/year	24 hr. composite
------------------------------------	---------------	------------------------	-----------	------------------

MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE _____.

APPENDIX #2 – WATER QUALITY REVIEW SHEET:



**Missouri Department of Natural Resources
 Water Protection Program
 NPDES Permits and Engineering Section**

Water Quality Review Sheet

Determination of Effluent Limits and Monitoring Requirements

FACILITY INFORMATION

FACILITY NAME:	City of Metropolis WWTF—A Case Study	NPDES #:	NEW
-----------------------	--------------------------------------	-----------------	-----

Antidegradation: The Biological Nutrient Removal (BNR) is capable of nitrification that would produce an ammonia average monthly limit of one (1) mg/L, thus we are applying the following:

The ammonia AML_{am} is below chronic water quality standards and the default summer WQBEL of 1.4 mg/L for a C-stream; therefore should be protective of both existing water quality and Missouri standards.

Summer/Winter

$AML_{BNR} = 1.0 \text{ mg/L}$

$MDL = 1.0 \text{ mg/L} (1.5) = 1.5 \text{ mg/L}$ [EPA's Technical Support Document, Chapter 5, page 104]

Season	Maximum Daily Limit (mg/l)	Average Monthly Limit (mg/l)
Summer and Winter	1.5	1.0

DRAFT

APPENDIX #3 – ANTIDegradation ANALYSIS

**ANTIDegradation REVIEW SUMMARY
TIER DETERMINATION AND EFFLUENT LIMIT SUMMARY**

Facility Name: Metropolis WWTF

Receiving Water Body Segment (WBS) #1: Turkey Creek (C)

SUMMARY OF THE PROPOSED ANTIDegradation REVIEW EFFLUENT LIMITS:

What are the proposed pollutants of concern and their respective effluent limits that the selected treatment option will comply with:

Pollutant of Concern	Units	Wasteload Allocation	Average Monthly Limit	Daily Maximum Limit
BOD5	mg/L		10	17
TSS	mg/L		10	17
Dissolved Oxygen	mg/L		>6.0	>6.0
Ammonia	mg/L		1	unknown
Total Residual Chlorine	mg/L		0.017	0.008
Lead	µg/L	91	unknown	unknown
Zinc	µg/L	2.3	unknown	unknown
Fecal Coliform	colonies/100mL		400*	1000

*geometric mean

If yes to one of the above questions, skip the Existing Water Quality Data (EWQ) or Model Summary Section and the Pollutants of Concern (POCs) and the Tier Determination(s) Section.

APPENDIX #3 – ANTIDegradation ANALYSIS

**ANTIDegradation REVIEW SUMMARY
TIER DETERMINATION AND EFFLUENT LIMIT SUMMARY**

Facility Name: Metropolis WWTF

Receiving Water Body Segment (WBS) #1: Turkey Creek (C)

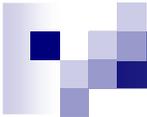
POLLUTANTS OF CONCERN (POCs) AND TIER DETERMINATION(S):

POCs to be considered include those pollutants reasonably expected to be present in the discharge per the AIP Section II.A. The tier protection levels are specified and defined in rule at 10 CSR 20-7.031(2).

Water Body Segment One- Turkey Creek		
Pollutants of Concern and Tier Determination(s)		
Tier I	Tier II with Minimum Degradation	Tier II with Significant Degradation
	Lead	BOD5*
	Zinc	TSS*
	Total Residual Chlorine (TRC)	Ammonia*
	Bacteria	

*Assumed Tier II with Significant Degradation.

Water Body Segment Two- Cove of Rock Lake		
Pollutants of Concern and Tier Determination(s)		
Tier I	Tier II with Minimum Degradation	Tier II with Significant Degradation
Lead		
Zinc		
Total Residual Chlorine (TRC)		



ANTIDEGRADATION REVIEW SUMMARY

ATTACHMENT A: TIER II-SIGNIFICANT DEGRADATION

Facility Name: Metropolis WWTF

Receiving Water Body Segment (WBS) #1: Turkey Creek (Class C stream)

Water Body Segment (WBS) #2 (if applicable): Cove of Rock Lake

Note: Facility is assuming significant degradation except for pre-treated metals and total residual chlorine (TRC). See Attachment B and D for further evaluation.

ALTERNATIVES ANALYSIS:

Determining the facility assimilative capacity (FAC) and the segment assimilative capacity (SAC) for each pollutant of concern (POC) is explained in detail in the AIP Section II.A.3. and Appendix 3. POCs to be considered include those pollutants reasonably expected to be present in the discharge per the AIP Section II.A. Please provide all calculations in the Antidegradation Review report.

Non-degrading or less-degrading alternatives:

If the non-degrading alternative is not an option, the consultant will be expected to explain why it is not practicable. For example, a non-discharging lagoon with land application was considered, however due to land cost and lack of available land and also available land with appropriate slopes (land in this area is approximately 15-25% slope) this alternative was abandoned. Based on the expanded flow, the price of land in this area is \$15,000 per acre and the needed area is 300 acres for a total cost of \$4.5 million. Also, the nearest regional treatment plant is twenty-three miles away and does not have adequate treatment capacity.

See attached Table 1, Sewage Treatment Processes with Typical Effluent Quality, for detailed analysis of alternatives.

Table 1. Selected Sewage Treatment Processes with Associated Effluent Quality, Affordability, Efficiency and Water Quality Impact

Sewage Treatment Processes with Associated Effluent Quality						
Process	Pollutants of Concern			Affordability	Economic Factor	Meets Water Body Standards
	BOD	TSS	NH3			
Tertiary Treatment						
	5	5	0.2	Not Affordable	Not Economically Efficient	YES
EBNR Treatment						
	10	10	0	Not Affordable	Not Economically Efficient	YES
BNR Treatment A						
-Without Filtration	15	15	1	Questionable Affordability	Economically Efficient	YES
-With Filtration	10	10	1			
BNR Treatment B						
-Without Filtration	15	15	1	Questionable Affordability	Economically Efficient	YES
-With Filtration	10	10	1			
BNR Treatment C						
-Without Filtration	15	15	1	Questionable Affordability	Economically Efficient	YES
-With Filtration	10	10	1			
-With Nitrification	15	15	0.5			
BNR Treatment D						
-Without Filtration	15	20	1	Questionable Affordability	Economically Efficient	YES
-With Filtration	10	10	1			
-With Nitrification	15	20	0.5			
Secondary Treatment A						
	25	20	1	Questionable Affordability	Economically Efficient	YES
Secondary Treatment B						
	15	15	1	Affordable	Not Economically Efficient	YES

ANTIDegradation Review Summary

ATTACHMENT B: TIER II – MINIMAL DEGRADATION

Facility Name: Metropolis WWTF

Receiving Water Body Segment (WBS) #1: Turkey Creek (C)

Water Body Segment (WBS) #2 (if applicable): Cove of Rock Lake

Modify this form as necessary for additional water body segments as required.

Assimilative Capacity Table:

Determining the facility assimilative capacity (FAC) and the segment assimilative capacity (SAC) for each pollutant of concern (POC) is explained in detail in the AIP Section II.A.3. and Appendix 3. POCs to be considered include those pollutants reasonably expected to be present in the discharge per the AIP Section II.A. Please provide all calculations in the Antidegradation Review report.

POC (Turkey Creek)	FAC	New Load	Percent of FAC
	(lbs/day)	(lbs/day)	(%)
Zinc	1.8	2.6	5.6
Lead	0.07	0.07	0

* Total Residual Chlorine is assumed as 0 mg/l for the design of the expanded treatment facility. This is well below the minimum detection/quantification level.

POC (Turkey Creek)	WBS #1 SAC	Cumulative net increase in load	Cumulative Percent of WBS #1 SAC	WBS #2 SAC	Cumulative net increase in load	Cumulative Percent of WBS #2 SAC
	(lbs/day)	(lbs/day)	(%)	(lbs/day)	(lbs/day)	(%)
Zinc	1.8	0.1	5.6		N/A	
Lead	0.07	0	0		N/A	

For Turkey Creek and its Tier II pollutants, minimal degradation calculations are as follows:

Zinc

Existing load = $Qd1 * Cd1 * CF = 3.1 * 0.151 * 5.4 = 2.5$ lbs/day

New load = $1.05 * \text{Existing Load} = 1.05 (2.5 \text{ lbs/day}) = 2.6 = Qd2 * Cd2 * CF = 5.3 * Cd2 * 5.4$

Therefore with 5% increase in loading, Cd2 is 91 $\mu\text{g/L}$ Zinc.

$FAC = [Cc * (Qs + Qd2) - Cs * (Qs + Qd1)] * CF$

$FAC = [0.151 * (0 + 5.3) - 0.151 * (0 + 3.1)] * 5.4 = 1.8$ lbs/day Zinc.

Percent of FAC = $(\text{Net increase} / FAC) * 100 = ((2.6 - 2.5) / 1.8) * 100 = 5.6\%$

Lead

Existing load = $Qd1 * Cd1 * CF = 3.1 * 0.004 * 5.4 = 0.067$ lbs/day

New load = $1.0 * \text{Existing Load} = 0.067$ lbs/day = $Qd2 * Cd2 * CF = 5.3 * Cd2 * 5.4$

Therefore with no increase in loading, Cd2 is 2.3 $\mu\text{g/L}$ Lead.

OIL AND GREASE

Is this a publicly owned treatment works (POTW), restaurant, school or other domestic wastewater treatment facility with oil and grease as a POC? YES NO

In accordance with 10 CSR 20-7.031(3)(B), waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses. In accordance with 10 CSR 20-7.031 Table A, oil and grease has a chronic toxicity of 10mg/L for protection of aquatic life. This facility will meet the effluent limits (MDL and AML of 15 mg/l and 10 mg/L, respectively).

DECHLORINATION

If Chlorination and Dechlorination is the existing or proposed method of disinfection treatment, will the effluent discharged be equal to or less than the Water Quality Standards (WQS) for Total Residual Chlorine (TRC) stated in Table A of 10 CSR 20-7.031? YES NO

Based on the disinfection treatment system being designed for total removal of TRC, minimal degradation for TRC is assumed and the facility will be required to meet the water quality based effluent limits (MDL and AML of 17 $\mu\text{g/l}$ and 8 $\mu\text{g/L}$, respectively). These compliance limits for TRC are much less than the method detection limit (MDL) of 0.13 mg/L.

Comments/Discussion:

The existing 2 MGD treatment plant discharge is not disinfected and discharges thousands of colonies per 100 mL of bacteria to the receiving stream. The new replacement 3.4 MGD treatment plant will be disinfected to meet the regulatory effluent limits for bacteria and therefore the resulting mass loading will be a decrease in the total bacteria.

ANTIDEGRADATION REVIEW SUMMARY

ATTACHMENT D: TIER I REVIEW

Facility Name: Metropolis WWTF

Receiving Water Body Segment #1: Turkey Creek (C)

Water Body Segment #2 (if applicable): Cove of Rock Lake

Tier I Pollutant of Concern	Concentration Units (mg/L or µg/L)	95% of Water Quality Standard	90 th Percentile of water body segment #1 sampling results	90 th Percentile of water body segment #2 sampling results
Zinc	µg/L	143.5	N/A	147.5
Lead	µg/L	3.8	N/A	3.9
Total Residual Chlorine*	µg/L	9.5	N/A	<100

Summary:

POC = Zinc, Dissolved in Rock Lake – Sample Results = 100 µg/L, 130 µg/L, 130 µg/L, 135 µg/L, 140 µg/L, and 155 µg/L (six values ranked in ascending order). The dissolved concentration of Zinc in the discharge will decrease to 91 µg/L from the 151 µg/L of the existing facility.

POC = Lead, Dissolved in Rock Lake – Sample Results = 3.2 µg/L, 3.4 µg/L, 3.6 µg/L, 3.7 µg/L, 3.7 µg/L, and 4.1 µg/L (six values ranked in ascending order). The mass loading for Lead will not change as the dissolved concentration of the proposed discharge will decrease to 2.3 µg/L from the 4.0 µg/L of the existing facility.

POC = Chlorine, Total Residual in Rock Lake – Sample Results = <100 µg/L, <100 µg/L, <100 µg/L, <100 µg/L, <100 µg/L, and <100 µg/L (six values ranked in ascending order). The Total Residual Chlorine will be maintained at below detection levels. Additionally with the travel time and decay rate of total residual chlorine over 99% of any, if any total residual chlorine would decay before the flow enters the Rock Lake.

Dear Mr./Ms. :

The Operating Permit and Antidegradation Review Public Notice for NAME wastewater treatment facility, Permit # MO-01XXXXX, has concluded on DATE +33. The public notice was dated DATE. Public notice comments were received.

Enclosed is a copy of the public notice comments. In accordance with the *Missouri Antidegradation Rule and Implementation Procedure*, the department needs a Water Quality and Antidegradation Review Request Addendum that addresses the applicable public notice comments.

You are requested to submit the Water Quality and Antidegradation Review Request Addendum within 30 days of the date of this letter. Specifically, this addendum should address public notice comments 1, 3, and 4 on Comment Letter A and comments X, Y, and Z on Comment Letter B.

If you have any further questions, please contact Ms. at () - in the Regional Office, address, city, MO 6zip.

Sincerely,

REGIONAL OFFICE

Regional Director

Dear Mr./Ms. :

The Operating Permit and Antidegradation Review Public Notice for NAME wastewater treatment facility, Permit # MO-01XXXXX, has concluded on DATE +33. The public notice was dated DATE. The department received public notice comments and responded.

Enclosed is a copy of the department's response regarding the public notice comments.

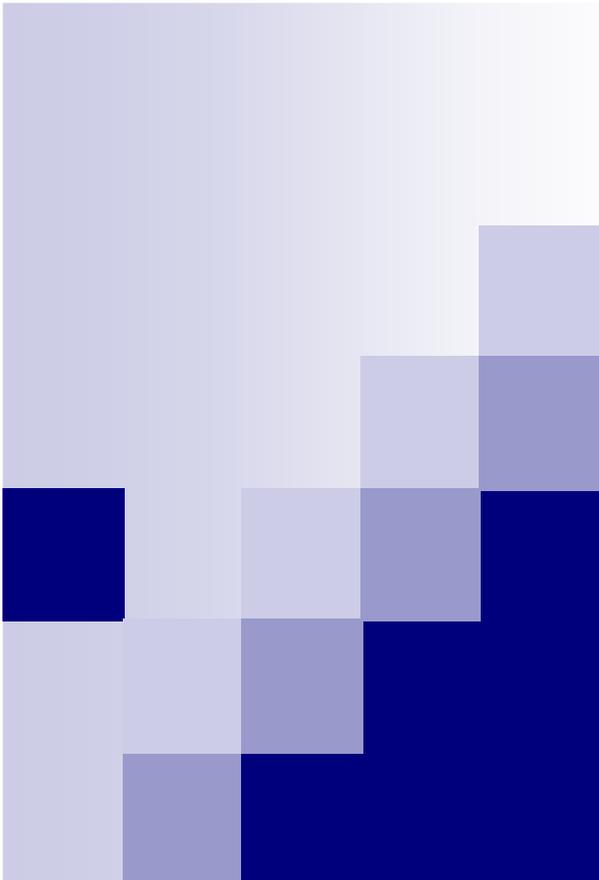
You may proceed with submittal of an engineering report or a complete application for a construction permit. The department will not be conducting any further review of this project until a submittal is received. Any changes in facility description or capacity will likely require another public notice and potentially another antidegradation review.

The department's public notice of draft Missouri State Operating Permit including the antidegradation review findings and preliminary determination of the social and economic importance has concluded. The comments received did not require any revisions to the findings or determinations. Therefore, the antidegradation review findings and preliminary determination of the social and economic importance are considered final. Following issuance of the construction permit and completion of the actual facility construction, the department will proceed with the issuance of the operating permit.

If you have any further questions, please contact Mr. at () - in the Regional Office, address, city, MO 6zip.

Sincerely,

REGIONAL OFFICE



Questions?

Contact information:

keith.forck@dnr.mo.gov

573-526-4232

Importance of Water Quality Reviews

Antidegradation Workshop
June 2008

Todd Blanc
Environmental Specialist



*Department of Natural Resources
Water Protection Program
Water Pollution Control Branch*

Basis for Water Quality Reviews

- Clean Water Act (CWA), Water Quality Standards (WQS), etc.

- Antidegradation Implementation Procedure

“Antidegradation reviews will be initiated by requests for water quality-based effluent limits for the individual permits.” AIP, P.34

Key Features of WQRS

- ◆ Site Specific Information
 - Facility
 - Receiving Waterbody
- ◆ Mixing Considerations
 - Mixing Zone - exceed chronic
 - Zone of Initial Dilution - exceed acute

- ◆ Effluent Characteristics & Permit Conditions
 - Document Effluent Limitations
 - Monitoring Requirements

- ◆ Derivation and Discussion

example

Missouri Department of Natural Resources
Water Protection Program
NPDES Permits and Engineering Section
Department of Effluent Monitoring Requirements

Water Quality Review Sheet

FACILITY INFORMATION

FACILITY NAME: Meadow Creek Sewerage Facility NPDES #: NOT AVAILABLE

FACILITY TYPE/DESCRIPTION: Effluent from a residential and three sewerage treatment. Discharge to Fall Creek

EPA#: 001 Missouri STATE: MISSOURI COUNTY: St. Louis

LEGAL DESCRIPTION: NW1/4, Sec 24, T21N, R21W LATITUDE/LONGITUDE: Not available

WATER QUALITY HISTORY: No history. This section of Lake Tawakoni is based on the 1993 (1) data because it has the lowest oxygen. Dissolved oxygen should be above 6.5 mg/L, surface 1-foot Tawakoni because of the presence of a cold water stream. See DO monitoring results discussion below and attached section in Appendix A.

OUTFALL	DESIGN FLOW (GPD)	TREATMENT LEVEL	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	8,085	Tertiary	Fall Creek	0.0

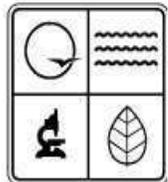
RECEIVING WATERBODY INFORMATION

WATERBODY NAME	CLASS	WBD	LOW FLOW VALUES (CF)			DESIGNATED USE ¹
			10Q5	10Q1	10Q10	
Fall Creek	C	3441	8	0	0.1	LAWS, AQU, WBC(B), General Springs
Lake Tawakoni	L1	7314	--	--	--	LAWS, AQU, WBC(A), CWF, DQ, SCR, General Springs

¹ See page 202, Council of Water Agencies (CWA) Position of New Water Agency Use and Stream Health-Fish Consumption (M2), Cold Water Fishery (CWF), Cold Water Trout (CWT), Warm Water Trout (WWT), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Salmon (SO).

COMMENTS: No specific chemical evaluation was conducted with the region. Further will be required to identify source of the problem in a classified segment. Specific Phosphorus analysis of treated effluent shows DO is also above discharge into the classified segment of Fall Creek was determined by MESA, Fayetteville. MESA located a two model scenarios that DO will be in the range 6.0-6.5 mg/L. The DO of the effluent was at the DO range standard and DO will be 1.0-1.5 mg/L. The DO range would be at a DO of 6.0 mg/L and 6.5 mg/L. The DO is not sufficient to be determined by the Department of Natural Resources of Ecology Data and Ecology's Permit Writing Manual-Department of Ecology Publication Number 20-1020. Model input and output are included in Appendix A.

The process starts with a request



Missouri Department of Natural Resources
Water Protection Program
NPDES Permits and Engineering Section
NPDES & Stormwater Permit Unit

Water Quality Review Assistance (WQRA)/Antidegradation Review Request Form (Pre-construction Review for Developing Water Quality-Based Effluent Limits)

Type of Project: Grant/SRF Loan All other projects

Requester: _____ Phone: _____
Permittee: _____ Phone: _____

REASON FOR REQUEST: New Facility Upgrade (No expansion) Expansion

(See Instruction #3.)

Description of Proposed Activity: _____

FACILITY INFORMATION

Facility Name: _____ NPDES #: _____
County: _____ SIC Code: _____
(if applicable)

How Effluent Limits Are Determined

- **Technology-Based Limits (TBELs)**
 - *10 CSR 20-7.015, Effluent Limitations Regulations & Federal Regulations*
- **Water Quality-Based Limits (WQBELs)**
 - *Mass balance equation*
 - *“Technical Support Document for Water Quality-based Toxics Control,” EPA/505/2-90-001*
 - *Draft guidance: “Guidance for Water Quality Reviews and Effluent Limit Determination”*
- **Minimally Degrading Effluent Limits (MDELs)**
 - *Drafting guidelines.*

Effluent Limit Scenarios

To demonstrate how limits may be determined.



Effluent Limitation Determination

- Effluent Limit Scenario #1:
 - 5-day BOD for a C-stream
 - Antidegradation Review indicated that POC is assumed to be Tier 2 and discharge of 5-day BOD assumed to be “Significantly Degrading.”
(AIP, Section II. A., P 15)

Effluent Limitation Determination

- Effluent Limit Scenario #2:
 - Ammonia discharge to a P-stream
 - Antidegradation Review has determined POC to be Tier 2 and discharge of POC to be “Minimally Degrading.”
(AIP, Section II. A., P 16)

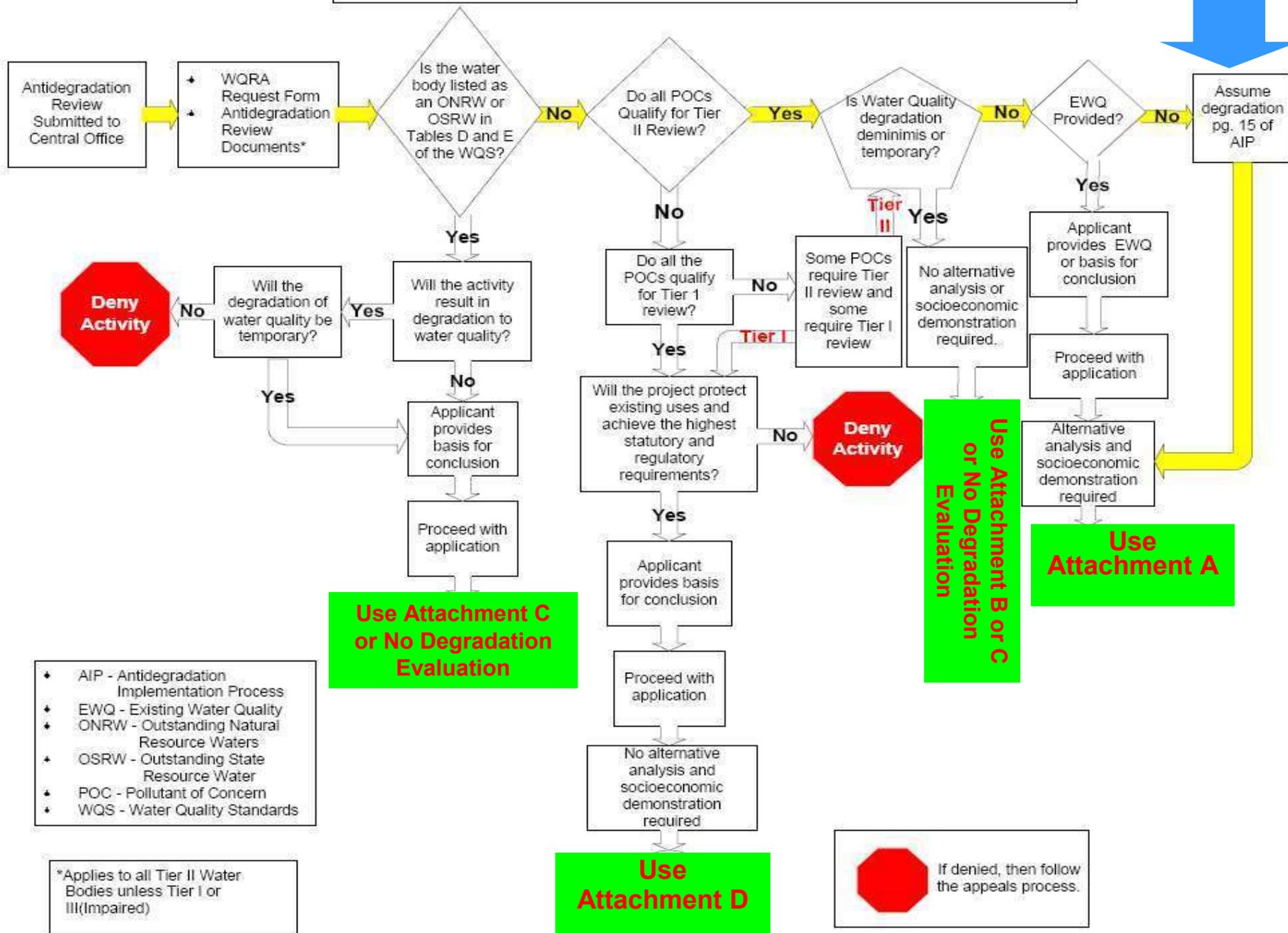
Effluent Limitation Determination

- Effluent Limit Scenario #3:
 - Discharge of metals to a C-stream
 - A short distance to a lake that Antidegradation Review has determined to be Tier 1 for the metals.
- (AIP, Section II. A., P 17)

Effluent Limit Scenario #1

- 5-day BOD for a C-stream
 - POC in stream **assumed** to be Tier 2 and POC in discharge “Significantly Degrading.”
 - From the submitted alternative analysis, applicant provides TBEL, and possibly EWQ, with Streeter-Phelps modeling.
 - Based on treatment capability, consultant proposes limits of:
Max. DL = 17 mg/L and Ave. ML = 10 mg/L.

Antidegradation Review Applicability Process Diagram



Biochemical Oxygen Demand (WQRA Request Form)

Scenario#1

General Instructions:

- 1) Please attach: A) a copy of existing NPDES permit, if available, B) a list of pollutants expected to be discharged, and C) the location of each outfall clearly shown on the provided map(s).
- 2) **Discharge(s) to classified stream:** Applicant must submit dissolved oxygen (DO) analysis (i.e., using Missouri Department of Natural Resources (Department) approved models such as Streeter Phelps (<http://www.ecy.wa.gov/programs/eap/pwspread/pwspread.html>) or Qual2K/Qual2E (Q2K/Q2E) stream water quality study (<http://www.epa.gov/athens/wwqtsc/index.html>) indicating that the preferred alternative's BOD₅ effluent limitations from the alternative analysis or the technology-based/regulatory BOD₅ effluent limits are protective of Missouri's water quality standard for DO. *Note: If Q2K/Q2E is used, wasteload allocation for ammonia must be assumed. All Q2K/Q2E studies must have DNR approved Quality Assurance Project Plans. Starting points (may differ with type of degradation) for this analysis are available upon request.*
- 3) Discharge(s) to unclassified stream: Applicant may provide the time of travel to the confluence with the classified stream segment for modeling pollutant decay. Otherwise, the Department will determine limits based on no decay of discharge pollutants, which typically results in lower permit limits. Please use the TR-55 method (Natural Resource Conservation Service (NRCS), Urban Hydrology for Small Watersheds, Technical Release No. 55, June 1986) for time of travel determination (<http://www.info.usda.gov/CED/ftp/CED/tr55.pdf>). Please include a map, schematic, or description of flow segments with your calculations. *A worksheet with instructions is available upon request. Note: The department will perform decay calculations based on provided pollutant time of travel. If upon your review of the ammonia limit, the time of travel calculations are incorrect or the discharge location is changed, we ask that you resubmit a new request with all the revised ammonia decay calculations with the new time of travel.*

Streeter-Phelps Modeling

Scenario#1

Streeter-Phelps analysis of critical dissolved oxygen sag.

INPUT

Assumed discharge to C stream

1. EFFLUENT CHARACTERISTICS

Discharge (cfs):	5.27
CBOD5 (mg/L):	12
NBOD (mg/L):	5
Dissolved Oxygen (mg/L):	5
Temperature (deg C):	26

2. RECEIVING WATER CHARACTERISTICS

Upstream Discharge (cfs):	0
Upstream CBOD5 (mg/L):	0.0
Upstream NBOD (mg/L):	0
Upstream Dissolved Oxygen (mg/L):	0
Upstream Temperature (deg C):	26
Elevation (ft NGVD):	1036
Downstream Average Channel Slope (ft/ft):	0.005
Downstream Average Channel Depth (ft):	0.5
Downstream Average Channel Velocity (fps)*:	2.6

*Includes facility flow into 4-foot wide stream

3. REAERATION RATE (Base e) AT 20 deg C (day⁻¹):

89.00

Reference	Applic. Vel (fps)	Applic. Dep (ft)	Suggested Values
Churchill	1.5 - 6	2 - 50	93.37
O'Connor and Dobbins	.1 - 1.5	2 - 50	59.11
Owens	.1 - 6	1 - 2	147.70
Tsivoglou-Wallace	.1 - 6	.1 - 2	89.78

4. BOD DECAY RATE (Base e) AT 20 deg C (day⁻¹):

3.33

Reference	Suggested Value
Wright and McDonnell, 1979	3.33

Streeter-Phelps Modeling

Scenario#1

OUTPUT

1. INITIAL MIXED RIVER CONDITION	
CBOD5 (mg/L):	12.0
NBOD (mg/L):	5.0
Dissolved Oxygen (mg/L):	5.0
Temperature (deg C):	26.0
2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)	
Reaeration (day ⁻¹):	102.61
BOD Decay (day ⁻¹):	4.39
3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU	
Initial Mixed CBODU (mg/L):	17.6
Initial Mixed Total BODU (CBODU + NBOD, mg/L):	22.6
4. INITIAL DISSOLVED OXYGEN DEFICIT	
Saturation Dissolved Oxygen (mg/L):	7.815
Initial Deficit (mg/L):	2.82
5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):	0.00
6. DISTANCE TO CRITICAL DO CONCENTRATION (miles):	0.00
7. CRITICAL DO DEFICIT (mg/L):	2.82
8. CRITICAL DO CONCENTRATION (mg/L):	5.00

example



2.82

5.00

Conclusion

- Staff believes that average monthly limit and a maximum daily limit of 10 and 17 mg/L are protective of dissolved oxygen standards and existing water quality.

MDL = 17 mg/L

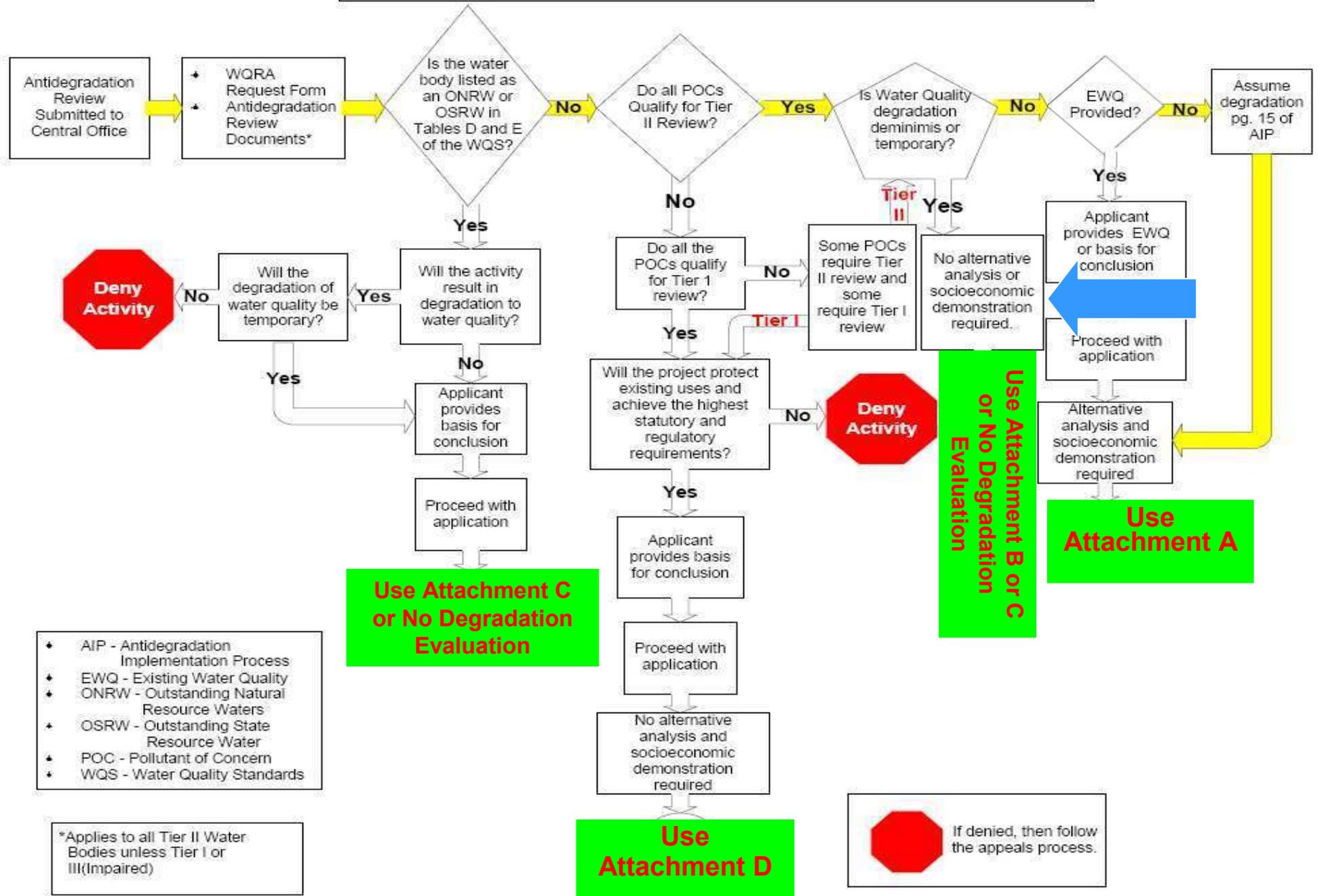
AML = 10 mg/L

Note: This is less than the TBEL of 45/30 in 10 CSR 20-7.015 (8).

Effluent Limit Scenario #2:

- Ammonia discharge to a **P-stream**
 - Antidegradation Review has determined POC to be Tier 2 in P-stream and POC in discharge to be “Minimally Degrading.”
 - Applicant provides EWQ data and/or WLA.
 - Using default or site-specific information after ~~regulatory~~ mixing, we determine a WLA and limit that is not significantly degrading and protects beneficial uses

Antidegradation Review Applicability Process Diagram

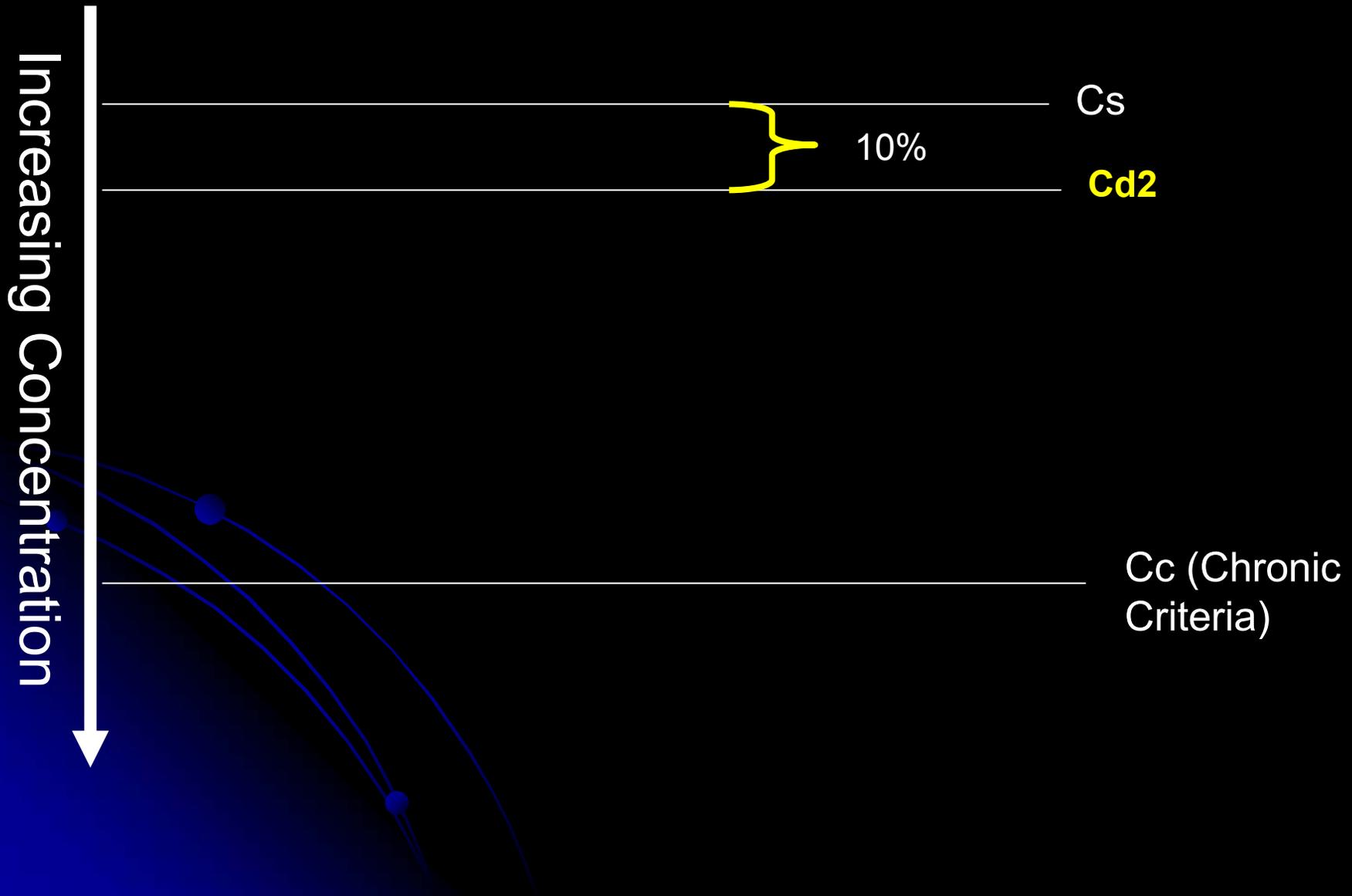


Calculating the MDEL

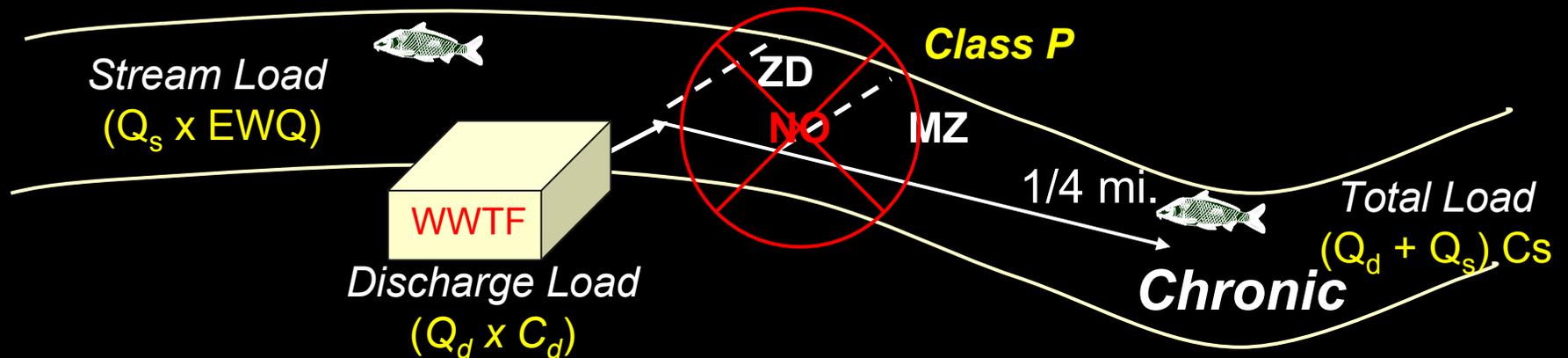
Scenario#2

- Step 1 --establish existing water quality (EWQ)
 - EWQ = water quality as of 08/30/2008
 - Downstream of discharge after complete mixing
- Step 2 –calculate $C_s = (EWQ*Q_s + C_d*Q_d)/(Q_s + Q_d)$
(variables defined in AIP, Appendix 3, P. 42.)
- Step 3 --calculate net loading increase
(new load – current load)
- Step 4- calculate $FAC*0.1$, then set equal to net loading increase and solve for new WLA (proposed), C_d2
 - C_c -- *(chronic water quality standard –unless acute criteria required)*
- Insignificant Degradation includes (see AIP, Page 15-16):
 - Loads that use < 10% of remaining assimilative capacity
(bioaccumulative pollutants may still have to be addressed)
 - Temporary impacts, etc.

MDEL Concept



Effluent Limit Scenario #2:



$$Q_d C_d + Q_s EWQ = (Q_d + Q_s) C_s$$

Effluent Limit Scenario #2:

Variables for calculations:

Qd1 = Existing WWTF effluent flow = 3.1 cfs

Cd1 = Existing WWTF wasteload allocation = 1.2 mg/L

Qd2 = Proposed WWTF effluent flow = 5.27 cfs

Cd2 = Proposed WWTF wasteload allocation = ??? mg/L

Qs = Upstream flow* = 2.1 cfs (30-Day Q10)

~~Qs = Upstream flow for mixing = 0.5 cfs (30-Day Q10)~~

EWQ = background water quality of receiving water* = 0.1 mg/L

Cc = Summer chronic criteria = 1.5 mg/L

*Applicant provided EWQ and flow.

Effluent Limit Scenario #2: Limit Determination

- Step 1: EWQ = 0.1 mg/L ammonia
- Step 2: $C_s = (EWQ * Q_s + C_{d1} * Q_{d1}) / (Q_s + Q_{d1})$
 $0.8 = (0.1 * 2.1 + 3.1 * 1.2) / (2.1 + 3.1)$
 $C_s = 0.8 \text{ mg/L}$
- Step 3:
 - A) Current load $(C_{d1} * Q_{d1}) * CF = (1.2 * 3.1) * CF$
 - B) New load $= (C_{d2} * Q_{d2}) * CF = (C_{d2} * 5.3) * CF$

Effluent Limit Scenario #2: Limit Determination

- Step 4: Net loading increase = $0.1 * FAC$

$$[(Cd2 * 5.3) - (1.2 * 3.1)] * CF$$

$$= 0.1 * [Cc * (Qs + Qd2) - Cs * (Qs + Qd1)] * CF$$

$$Cd2 * 5.3 - 3.7 = 0.1 * [1.5(2.1 + 5.3) - 0.8(2.1 + 3.1)]$$

$$Cd2 = (0.1 * [(11.1 - 4.2)] + 3.7) / 5.3$$

$$Cd2 = 0.8 \text{ mg/L ammonia}$$

Effluent Limit Scenario #2: Limit Determination

Scenario#2

WLA_c (proposed) = 0.8 mg/L (Chronic summer)

The WLA is then converted into a Long-Term Average (LTA) effluent concentration that will meet the criteria design characteristics.

$LTA = WLA \times \text{multiplier}$

$LTA_c = 0.8 \times (0.780) = 0.6 \text{ mg/L}$

[Coefficient of Variation(CV)=0.6, 99th Percentile, 30-day average]

Effluent Limit Scenario #2:

Summer Limits:

Maximum daily and average monthly effluent limitations are then calculated.

$$= \text{LTA} \times \text{multiplier}$$

$$\text{MDL} = 0.6 \text{ mg/L} (3.11) = 1.9 \text{ mg/L}$$

$$[\text{CV} = 0.6, 99^{\text{th}} \text{ Percentile}]$$

$$\text{AML} = 0.6 \text{ mg/L} (1.19) = 0.7 \text{ mg/L}$$

$$[\text{CV} = 0.6, 95^{\text{th}} \text{ Percentile, } n = 30]$$

“Technical Support Document for Water Quality-based Toxics Control”

EPA/505/2-90-001

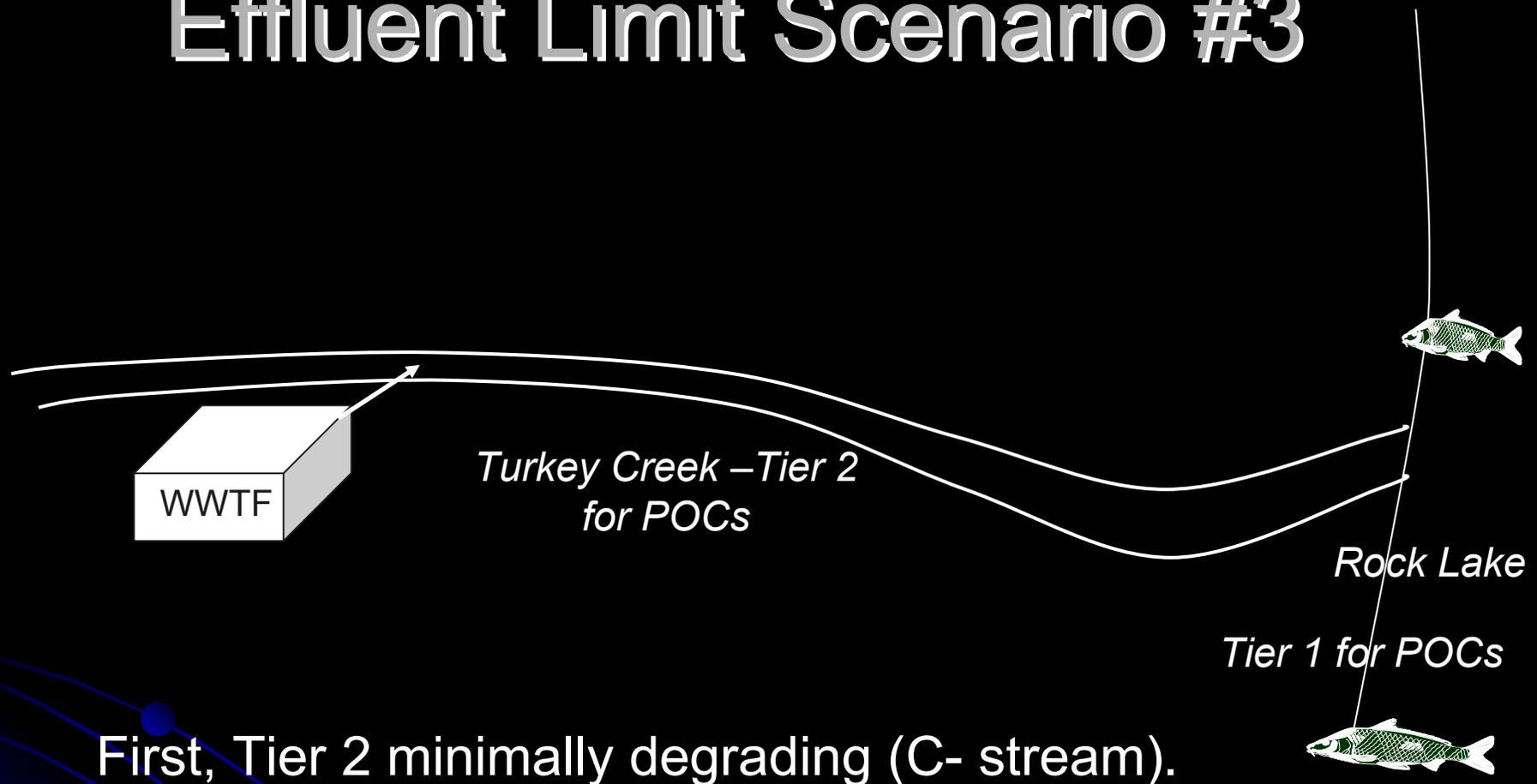
Scenario #2 Summary

- Waded into the newest concept of existing water quality (EWQ).
- Demonstrated a new WLA derivation method.
- Using MDEL, we will protect the remaining assimilative capacity (after mixing?). Also, beneficial uses will be protected.

Effluent Limit Scenario #3:

- Discharge of Metals to a C-stream
 - Segment #1: Zinc and Lead are Tier 2 within Turkey Creek (C-stream).
 - Segment #2: In Rock Lake, Antidegradation Review has determined Lead and Zinc to be Tier 1.

Effluent Limit Scenario #3



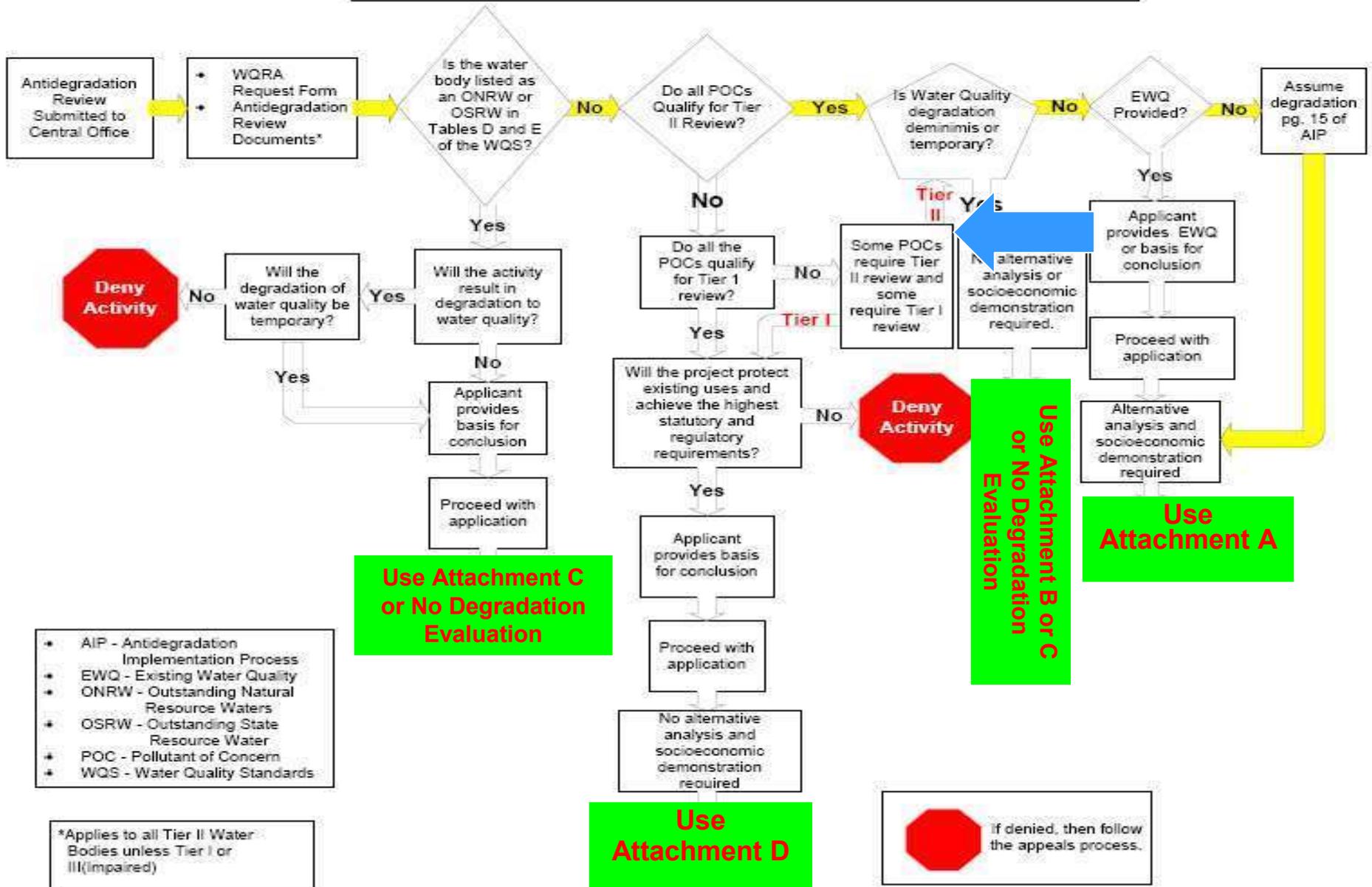
First, Tier 2 minimally degrading (C- stream).

- Loading determination process and facility assimilative capacity
- WLA determination

Second, Tier 1 analysis (Rock Lake)

- Develop limits that protect beneficial uses.

Antidegradation Review Applicability Process Diagram



- AIP - Antidegradation Implementation Process
- EWQ - Existing Water Quality
- ONRW - Outstanding Natural Resource Waters
- OSRW - Outstanding State Resource Water
- POC - Pollutant of Concern
- WQS - Water Quality Standards

*Applies to all Tier II Water Bodies unless Tier I or III(Impaired)

If denied, then follow the appeals process.

Tier 2 Minimally Degrading

C_c = water quality criterion (mg/L) = chronic lead and zinc criteria

Q_s = stream flow (7Q10--cfs) = 0 cfs

Q_{d1} = current average daily design flow of discharge (cfs) = 3.1 cfs

Q_{d2} = proposed average daily design flow of discharge (cfs) = 5.3 cfs

C_s = pollutant concentration in stream at a point below facility's effluent outfall = 0.151 mg/L Zinc

EWQ = existing water quality. Approved levels of POCs at point of discharge = unknown

CF = conversion factor to POC mass loading: (mg/L)*(cfs)*5.4 = (lbs/day)

Step 1-Calculate the Loadings:

- A) Stream Load ($EWQ * Q_s$)*CF+Current Load ($C_{d1} * Q_{d1}$)*CF = Total Load
- B) Use Total Load to determine $C_s = [Total\ Load / (Q_s + Q_{d1})] / CF$
- C) New or expanded load = ($C_{d2} * Q_{d2}$)*CF
- D) Note: C_{d2} is WLA.

Step 2-Calculate FAC, if applicable: $[C_c * (Q_s + Q_{d2}) - C_s * (Q_s + Q_{d1})] * CF$

Net increase load = New load – Current load < 10% FAC

Tier 2 Minimally Degrading 5% Increase in Loading

Step 1:

Zinc:

$$\text{Stream load} = \text{EWQ} * \text{Qs} * \text{CF} = 0 \text{ lbs/day}$$

$$\begin{aligned} \text{Current load} &= \text{Qd1} * \text{Cd1} * \text{CF} = 3.1 * 0.151 * 5.4 \\ &= 2.5 \text{ lbs/day} \end{aligned}$$

$$\text{Total load} = 0 \text{ lbs/day} + 2.5 \text{ lbs/day} = 2.5 \text{ lbs/day}$$

$$\begin{aligned} \text{New load} &= 1.05 * \text{Current load} = 1.05 (2.5 \text{ lbs/day}) \\ &= 2.6 = \text{Qd2} * \text{Cd2} * \text{CF} = 5.3 * \text{Cd2} * 5.4 \end{aligned}$$

Therefore with 5% increase in loading, **Cd2 (WLA) is 91 µg/L Zinc.**

Tier 2 Minimally Degrading 5% Increase in Loading

Step 2:

Net increase: 2.6 lbs/day – 2.5 lbs/day = 0.1 lbs/day

FAC = [POC mass loading]*Conversion Factor (CF)

FAC = [Cc*(Qs+Qd2)-Cs*(Qs + Qd1)] * CF

FAC = [0.151*(0+5.3)-0.151*(0+3.1)]*5.4=1.8 lbs/day

Percent of FAC = (Net increase/FAC) * 100 =
((2.6-2.5)/1.8) * 100 = 5.6%

Tier 2 Minimally Degrading-No Load Increase

Lead:

Stream load = $EWQ * Q_s * CF = 0 \text{ lbs/day}$

Current load (*also now total*) = $Q_{d1} * C_{d1} * CF = 3.1 * 0.004 * 5.4 = 0.067 \text{ lbs/day}$

Total load = $0 \text{ lbs/day} + 0.067 \text{ lbs/day} = 0.067 \text{ lbs/day}$

New load = $1.0 * \text{Current load} = Q_{d2} * C_{d2} * CF = 5.3 * C_{d2} * 5.4 = 0.067 \text{ lbs/day}$

Net increase: $0.067 \text{ lbs/day} - 0.067 \text{ lbs/day} = \text{zero}$

Therefore, with no increase in loading and no FAC necessary, **Cd2 (WLA) is 2.3 $\mu\text{g/L}$ Lead.**

Tier 2 Minimally Degrading- Summary

- With 5% load increase, Cd2 (WLA_C) is **91** $\mu\text{g/L}$ Zinc.
- With no load increase, Cd2 (WLA_C) is **2.3** $\mu\text{g/L}$ Lead.

Next, Rock Lake Segment.

Tier 1 Analysis

- In the Rock Lake segment, the following analysis was conducted to determine Tier I status of Lead and Zinc:

If P90 \geq 95% WQS, then Tier 1

If P90 < 95% WQS, then Tier 2

Metal	95% of WQS	90 th Percentile	Cd2 (new discharge)
Zinc	143.7 $\mu\text{g/L}$	147.5 $\mu\text{g/L}$	91 $\mu\text{g/L}$
Lead	3.8 $\mu\text{g/L}$	3.9 $\mu\text{g/L}$	2.3 $\mu\text{g/L}$

Effluent Limitations for Total Recoverable Lead

- Lead: Chronic Criteria = $4 \mu\text{g/L}$
Acute Criteria = $100 \mu\text{g/L}$

Hardness = 150 mg/L

WLA Chronic = $2.3 \mu\text{g/L} / 0.732 = 3.1 \mu\text{g/L}$

WLA Chronic = $3.1 \mu\text{g/L}$

$LTA_c = 3.1 \mu\text{g/L} * (0.527) = 1.6 \mu\text{g/L}$

[Coefficient of Variation (CV) = 0.6, 99th Percentile]

Effluent Limitations for Total Recoverable Lead

$$\text{MDL} = 1.6 \mu\text{g/L} * (3.11) = 5.0 \mu\text{g/L}$$

[CV = 0.6, 99th Percentile]

$$\text{AML} = 1.6 \mu\text{g/L} * (1.55) = 2.5 \mu\text{g/L}$$

[CV = 0.6, 95th Percentile, n = 4]

Effluent Limitations for Total Recoverable Zinc

- Zinc: Chronic Criteria = 151 $\mu\text{g/L}$
Acute Criteria = 165 $\mu\text{g/L}$

Hardness = 150 mg/L

WLA Chronic = $91 / 0.986 = 92.3 \mu\text{g/L}$

WLA Chronic = 92.3 $\mu\text{g/L}$

$\text{LTA}_c = 92.3 * (0.527) = 48.6 \mu\text{g/L}$
[CV = 0.6, 99th Percentile]

Effluent Limitations for Total Recoverable Zinc

$$\text{MDL} = 48.6 \mu\text{g/L} * (3.11) = 151 \mu\text{g/L}$$

[CV = 0.6, 99th Percentile]

$$\text{AML} = 48.6 \mu\text{g/L} * (1.55) = 75 \mu\text{g/L}$$

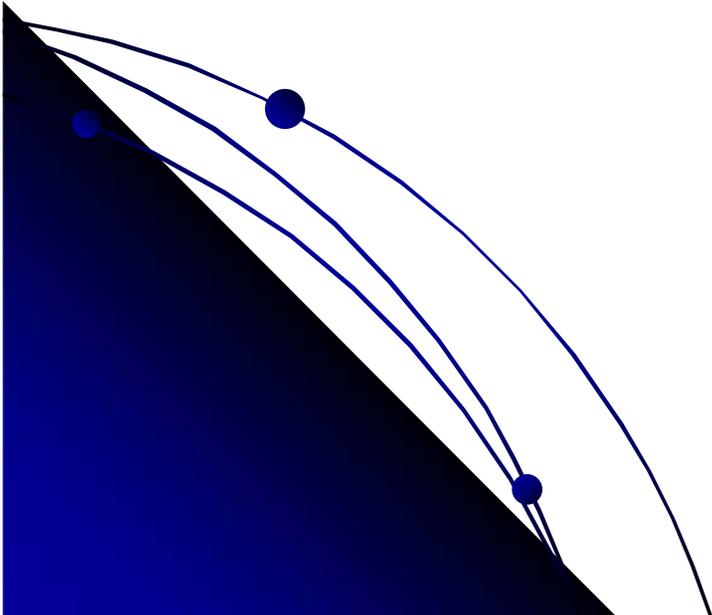
[CV = 0.6, 95th Percentile, n = 4]

Scenario #3 Summary

- Introduced a loading determination process and facility assimilative capacity.
- Determined WLA for Tier 2 POCs in a C-stream that was protective of both stream and downstream lake segment that was Tier 1 for same POCs.
- Reviewed the Tier 1 analysis.
- Used statistical permit limit derivation procedure for chronic criteria-based limit.
- **Result was that beneficial uses are protected.**

Questions ?

Contact: Todd Blanc, 573-751-5827
blanc.todd@dnr.mo.gov



Application Processing

Construction and Operating Permits

XXX Regional Office

XXX
Environmental Engineer
Email: XXX@mo.dnr.gov

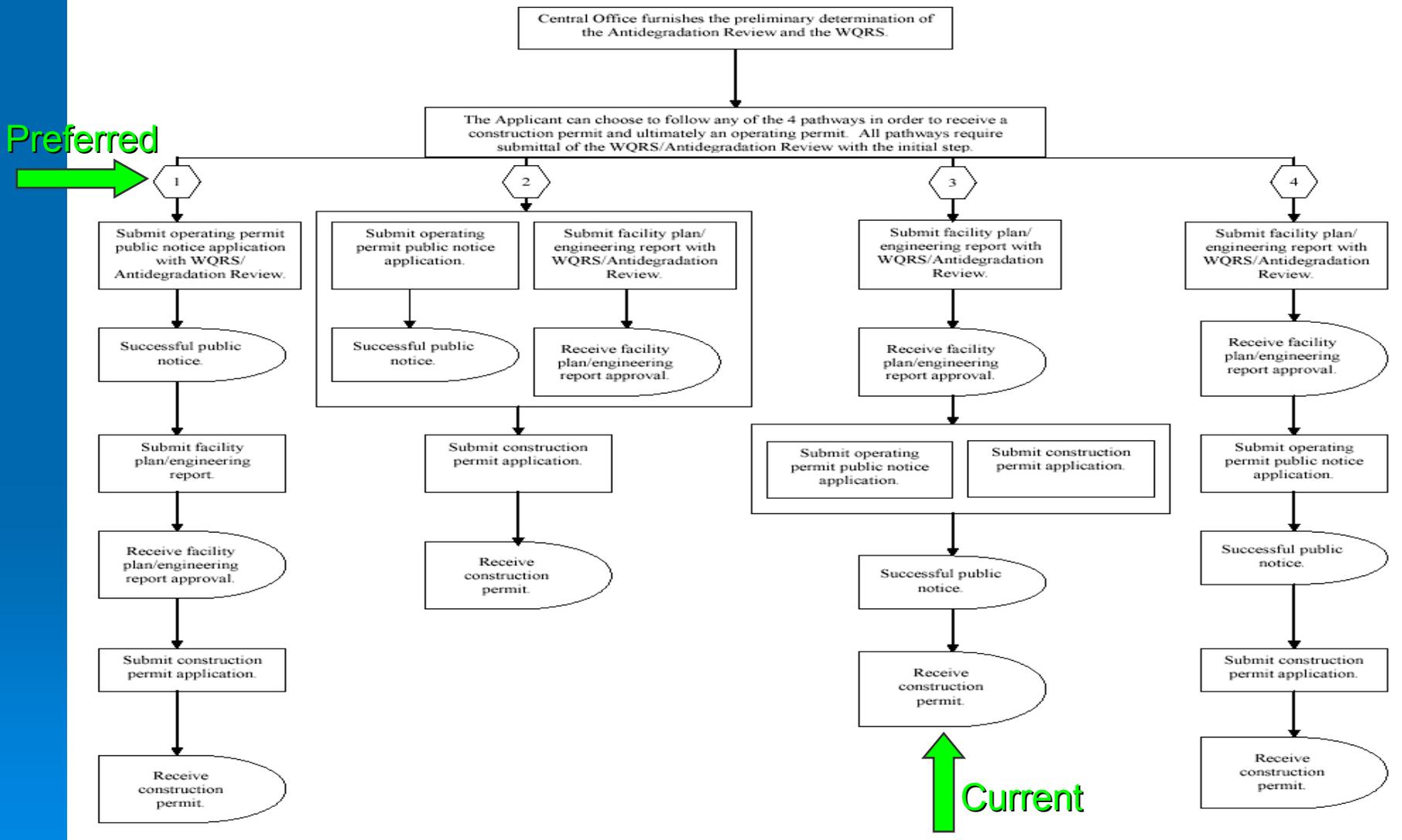
So you have a WQRS/Antidegradation Review Preliminary Determination now what...

- Starting **August 30, 2008**, Applicants will have the option to follow 1 out of 4 pathways possible in order to receive a construction permit and ultimately a final operating permit.

Choosing a Pathway

- A certain amount of risk is associated with each pathway
 - Delays?
 - Re-public notice?
 - An Addendum to the Antidegradation Review Report?
 - A new Antidegradation Review Report?

4 Pathways



Pathway 1

Consultant/Applicant Submissions

- 1) An operating permit public notice application with WQRS/Antidegradation Review
- 2) Facility plan/engineering report [if required]
- 3) A complete construction permit application

Regional Office Actions

- 1A) Public notice draft operating permit and WQRS/Antidegradation Review. After public notice, write/send successful public notice letter.
- 2A) Approve facility plan/engineering report
- 3A) Write/approve construction permit

Pathway 2

Consultant/Applicant Submissions

- 1) An operating permit public notice application with WQRS/Antidegradation Review. In conjunction, submit the facility plan/engineering report [if required].
- 2) A complete construction permit application

Regional Office Actions

- 1A) Public notice draft operating permit and WQRS/Antidegradation Review. After public notice, write/send successful public notice letter. Simultaneously, approve facility plan/engineering report.
- 2A) Write/approve construction permit.

Pathway 3

Consultant/Applicant Submissions

- 1) Facility plan/engineering report [if required] with WQRS/Antidegradation Review
- 2) An operating permit public notice application. In conjunction, submit a complete construction permit application.

Regional Office Actions

- 1A) Approve facility plan/engineering report.
- 2A) Public notice draft operating permit and WQRS/Antidegradation Review. After a successful public notice, write/approve construction permit.

Pathway 4

Consultant/Applicant Submissions

- 1) Facility plan/engineering report [if required] with WQRS/Antidegradation Review
- 2) An operating permit public notice application
- 3) A complete construction permit application

Regional Office Actions

- 1A) Approve facility plan/engineering report.
- 2A) Public notice draft operating permit and WQRS/Antidegradation Review. After public notice, write/send successful public notice letter.
- 3A) Write/approve construction permit.

Choosing a Pathway

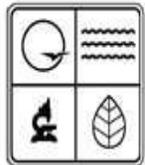
- The risks and uncertainties pose the question...

How much time and money
will be spent on design
before the public notice?

Updated Forms

- Forms A, B, and B2 have been updated
- Major changes:
 - More designations for the application
 - UTM coordinates
 - North American Industrial Classification System (NAICS)
 - Expanded instructions

Application Designation



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
**FORM B – APPLICATION FOR CONSTRUCTION OR
 OPERATING PERMIT FOR FACILITIES WHICH RECEIVE
 PRIMARILY DOMESTIC WASTE (≤100,000 gallons per day)
 UNDER MISSOURI CLEAN WATER LAW**

FOR AGENCY USE ONLY

CHECK NUMBER

DATE RECEIVED

FEE SUBMITTED

NOTE ► PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM

1.00 This application is for:



an operating permit and antidegradation review public notice ←

- a construction permit following an appropriate operating permit and antidegradation review public notice
- a construction permit and a concurrent operating permit and antidegradation review public notice
- a construction permit (submitted before August 30, 2008 or antidegradation review is not required)
- an operating permit for a new or unpermitted facility
- an operating permit renewal: Permit #MO- _____
- an operating permit modification: Permit #MO- _____

Construction Permit # _____

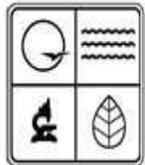
Expiration Date _____

Reason: _____

1.10 Is this a Federal/State Funded Project? YES NO Funding Agency/Project #: _____

1.20 Is the appropriate fee included with the application (See instructions for appropriate fee)? YES NO

Application Designation



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
**FORM B – APPLICATION FOR CONSTRUCTION OR
 OPERATING PERMIT FOR FACILITIES WHICH RECEIVE
 PRIMARILY DOMESTIC WASTE (≤100,000 gallons per day)
 UNDER MISSOURI CLEAN WATER LAW**

FOR AGENCY USE ONLY

CHECK NUMBER

DATE RECEIVED

FEE SUBMITTED

NOTE ► PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM

1.00 This application is for:

- an operating permit and antidegradation review public notice
- a construction permit following an appropriate operating permit and antidegradation review public notice 
- a construction permit and a concurrent operating permit and antidegradation review public notice
- a construction permit (submitted before August 30, 2008 or antidegradation review is not required)
- an operating permit for a new or unpermitted facility
- an operating permit renewal: Permit #MO- _____
- an operating permit modification: Permit #MO- _____

Construction Permit # _____

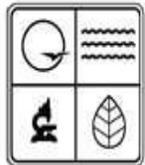
Expiration Date _____

Reason: _____

1.10 Is this a Federal/State Funded Project? YES NO Funding Agency/Project #: _____

1.20 Is the appropriate fee included with the application (See instructions for appropriate fee)? YES NO

Application Designation



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
**FORM B – APPLICATION FOR CONSTRUCTION OR
OPERATING PERMIT FOR FACILITIES WHICH RECEIVE
PRIMARILY DOMESTIC WASTE (≤100,000 gallons per day)
UNDER MISSOURI CLEAN WATER LAW**

FOR AGENCY USE ONLY

CHECK NUMBER

DATE RECEIVED

FEE SUBMITTED

NOTE ► PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM

1.00 This application is for:

- an operating permit and antidegradation review public notice
- a construction permit following an appropriate operating permit and antidegradation review public notice
- a construction permit and a concurrent operating permit and antidegradation review public notice
- a construction permit (submitted before August 30, 2008 or antidegradation review is not required)
- an operating permit for a new or unpermitted facility
- an operating permit renewal: Permit #MO- _____
- an operating permit modification: Permit #MO- _____

Construction Permit # _____

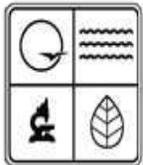
Expiration Date _____

Reason: _____

1.10 Is this a Federal/State Funded Project? YES NO Funding Agency/Project #: _____

1.20 Is the appropriate fee included with the application (See instructions for appropriate fee)? YES NO

Application Designation



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
**FORM B – APPLICATION FOR CONSTRUCTION OR
 OPERATING PERMIT FOR FACILITIES WHICH RECEIVE
 PRIMARILY DOMESTIC WASTE (≤100,000 gallons per day)
 UNDER MISSOURI CLEAN WATER LAW**

FOR AGENCY USE ONLY

CHECK NUMBER _____

DATE RECEIVED _____

FEE SUBMITTED _____

NOTE ► PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM

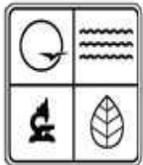
1.00 This application is for:

- an operating permit and antidegradation review public notice
- a construction permit following an appropriate operating permit and antidegradation review public notice
- a construction permit and a concurrent operating permit and antidegradation review public notice
- a construction permit (submitted before August 30, 2008 or antidegradation review is not required) ←
- an operating permit for a new or unpermitted facility Construction Permit # _____
- an operating permit renewal: Permit #MO- _____ Expiration Date _____
- an operating permit modification: Permit #MO- _____ Reason: _____

1.10 Is this a Federal/State Funded Project? YES NO Funding Agency/Project #: _____

1.20 Is the appropriate fee included with the application (See instructions for appropriate fee)? YES NO

Application Designation



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
**FORM B – APPLICATION FOR CONSTRUCTION OR
 OPERATING PERMIT FOR FACILITIES WHICH RECEIVE
 PRIMARILY DOMESTIC WASTE (≤100,000 gallons per day)
 UNDER MISSOURI CLEAN WATER LAW**

FOR AGENCY USE ONLY

CHECK NUMBER _____

DATE RECEIVED _____

FEE SUBMITTED _____

NOTE ► PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM

1.00 This application is for:

- an operating permit and antidegradation review public notice
- a construction permit following an appropriate operating permit and antidegradation review public notice
- a construction permit and a concurrent operating permit and antidegradation review public notice
- a construction permit (submitted before August 30, 2008 or antidegradation review is not required)
- an operating permit for a new or unpermitted facility ←
- an operating permit renewal: Permit #MO- _____
- an operating permit modification: Permit #MO- _____

Construction Permit # _____ ←

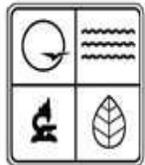
Expiration Date _____

Reason: _____

1.10 Is this a Federal/State Funded Project? YES NO Funding Agency/Project #: _____

1.20 Is the appropriate fee included with the application (See instructions for appropriate fee)? YES NO

Application Designation



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
**FORM B – APPLICATION FOR CONSTRUCTION OR
 OPERATING PERMIT FOR FACILITIES WHICH RECEIVE
 PRIMARILY DOMESTIC WASTE (≤100,000 gallons per day)
 UNDER MISSOURI CLEAN WATER LAW**

FOR AGENCY USE ONLY

CHECK NUMBER _____

DATE RECEIVED _____

FEE SUBMITTED _____

NOTE ► PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM

1.00 This application is for:

- an operating permit and antidegradation review public notice
- a construction permit following an appropriate operating permit and antidegradation review public notice
- a construction permit and a concurrent operating permit and antidegradation review public notice
- a construction permit (submitted before August 30, 2008 or antidegradation review is not required)
- an operating permit for a new or unpermitted facility
- an operating permit renewal: Permit #MO- _____ Construction Permit # _____
- an operating permit modification: Permit #MO- _____ Expiration Date _____
- Reason: _____

1.10 Is this a Federal/State Funded Project? YES NO Funding Agency/Project #: _____

1.20 Is the appropriate fee included with the application (See instructions for appropriate fee)? YES NO

Where do you find these forms?

- These new forms will be available in the future at the following web address
 - www.dnr.mo.gov/forms/index.html#WaterPollution
- Or visit www.dnr.mo.gov
 - Select “Forms, Permits, & Applications”
 - Select the “Water Pollution Control” category
 - Search for Forms A, B, & B2

Questions?

Thank you.



Missouri
Department of
Natural Resources

Antidegradation Implementation Procedure Questions and Answers

True or False?

- The primary purpose of the AIP is to prevent significant degradation of water quality?
 - False



True or False?

- The AIP always requires applicants to determine the existing and future water quality in the waters receiving the discharge?
 - False. EWQ is required only when the applicant wishes to demonstrate that the proposed discharge will be minimally degrading.



True or False?

- The AIP requires an applicant to document the basis for choosing a treatment alternative?
 - True.



True or False?

- The applicant must choose the alternative that offers the most pollution reduction.
 - True *when* the least degrading alternative is also practicable, economically efficient and affordable. False *when* one of these three factors are not met.



True or False?

- Significant Degradation is:
 - A) any amount of pollution that is measurable using standard analytical techniques.
 - False
 - B) pollution from new or expanded discharges that consume at least 10% of the water's available assimilative capacity.
 - True
 - C) when pollution causes the Water Quality Criterion to be exceeded.
 - False



True or False?

- All General Permits are required to undergo an antidegradation review before issuance.
 - True, but will be done during the renewal of the template.



Which is a POC Requiring an Antidegradation Review?

- BOD
 - True
- Metals
 - True
- pH
 - False
- Nutrients
 - True
- Emerging Chemicals
 - False



True or False?

- The Antidegradation Implementation Procedure will not result in any additional costs to permit holders.
 - Generally false.



Additional Information

- -- 319 NPS Program:

<http://www.dnr.mo.gov/env/wpp/nps/index.html>

- -- AgNPS SALTs:

<http://www.dnr.mo.gov/env/swcp/service/swcpsalt.htm>

- -- MDNR GIS Interactive Mapper:

<http://www.dnr.mo.gov/internetmapviewer/>

