

STATE OF MISSISSIPPI
ANTIDEGRADATION IMPLEMENTATION METHODS
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Prepared by

Mississippi Department of Environmental Quality

Office of Pollution Control
Surface Water Division



MDEQ

ANTIDEGRADATION IMPLEMENTATION METHODS
Forms and Instructions
(January 28, 2010)

I. Introduction

The Mississippi Department of Environmental Quality (MDEQ) State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters (WPC-2) provides:

“Antidegradation: The policy inherent in the standards shall be to protect water quality existing at the time these water quality standards were adopted and to upgrade or enhance water quality within the State of Mississippi. Waters whose existing quality is better than the established standards will be maintained at high quality unless the Commission finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In no event, however, may degradation of water quality interfere with or become injurious to existing instream water uses. Further, in no case will water quality be degraded below (or above) the base levels set forth in these standards for the protection of the beneficial uses described herein. In addition, the State will assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control. Where the Commission determines that high quality waters constitute an Outstanding National Resource, such as waters of National and State Parks and Wildlife Refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected. For the purposes of this section, existing uses are defined as those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the Water Quality Criteria.”

Further, the federal antidegradation policy (40 CFR Section 131.12(a)(2)) provides:

“Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife, and recreation in and on the water, that quality shall be maintained and protected, unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located.”

Each state or tribe is required to identify methods for implementation of its antidegradation policy (40 CFR Section 131.12(a)):

“The State shall develop and adopt a statewide antidegradation policy and identify the methods for implementing such policy pursuant to this subpart.”

On June 25, 2008, the State of Mississippi's antidegradation policy was determined by the United States Environmental Protection Agency, Region 4, to be consistent with the requirements of federal regulations.

II. Water Body Tiers

Antidegradation is generally considered in a tiered approach. Tier 1 waters are those waters in which the existing water quality does not support designated uses. Tier 2 waters are those waters in which the water quality meets or exceeds the mandatory minimum levels to support the Clean Water Act (CWA) goal of propagation of fish, shellfish, and wildlife, and recreation in and on such waters. Tier 3 waters are those high quality waters that constitute Outstanding National Resource Waters (ONRWs). MDEQ will decide which tier applies for State waters based on a review of applicable information as described below. All existing uses must be maintained and protected in all waters of the State regardless of whether they are considered a Tier 1, 2, or 3 water.

All waters in Mississippi are considered to be Tier 2 waters unless one of the following conditions is met:

- (1) the water is designated as an Outstanding National Resource Water (ONRW), in which case, it is a Tier 3 water;
- (2) the water is identified on Mississippi's current §303(d) list, in which case it is defined as a Tier 1 water with respect to the pollutant(s) causing impairment; or
- (3) the water has been subject to an established final Total Maximum Daily Load (TMDL), in which case it is defined as a Tier 1 water with respect to the pollutant(s) addressed by the TMDL.

Tier 1 Waters

Tier 1 waters are those water body segments that are known to be impaired by a pollutant. Such waters have an established as final TMDL or are listed in the State's most recently adopted §303(d) list. For Tier 1 waters, the antidegradation policy is implemented through the State's NPDES Permit Issuance Process. New or expanding discharges are not allowed in Section 303(d) listed waters if there is an increase in pollutants proposed for which the water is listed, unless there is a TMDL developed that can be attained due to available assimilative capacity within the wasteload allocation as part of the TMDL. Tier 1 water bodies are pollutant specific, and this designation does not relieve a permit applicant from the requirements of an antidegradation report for this or other "non-listed" pollutants as required proposed to be discharged.

Tier 2 Waters

Tier 2 waters are those water bodies that:

- (1) have been determined to have assimilative capacity based on assessment of water quality data and/or water quality modeling tools; or
- (2) are assumed to have assimilative capacity because there are insufficient data or information to conclude that there is no assimilative capacity.

An antidegradation report is required for all proposed new or expanding discharges into Tier 2 waters. The level of detail involved in an antidegradation review will generally be dependent upon the State's judgment of the potential impact on water quality from a proposed activity considering factors such as the type of activity (e.g., covered by a general or individual permit) and magnitude of the discharge (e.g., major or minor).

Tier 3 Waters

When the Commission determines that high quality waters constitute an Outstanding National Resource, such as waters of National and State Parks and Wildlife Refuges and waters of exceptional recreational or ecological significance, the water quality of such waters shall be maintained and protected by adopting Tier 3 designation. Tier 3 waters are considered Outstanding National Resource Waters (ONRW). In order to achieve this designation, the stream must be nominated as a Tier 3 ONRW and adopted by the Mississippi Commission on Environmental Quality (MCEQ). Any person may submit a nomination to the Commission which will include the rationale and documentation citing the historical, recreational or ecological significance of the water body. The submission must include documentation as shown in Exhibit G. Upon receipt of the nomination, the Commission staff will review the water body, assess any available data or information to determine the impairment status, identify the current NPDES permits in the watershed, and make a recommendation to the Commission for consideration. If adopted as a Tier 3 water, the water body will not be allowed to experience any further permanent degradation.

III. Applicability of Antidegradation Policy Review Methods

The methods outlined herein focus on how the State will implement the antidegradation policy for discharges to surface waters. The methods include the following components:

- (1) A determination of the impact of the discharge upon state waters;
- (2) alternatives analysis;
- (3) socio-economic issues;
- (4) a preliminary State antidegradation decision;
- (5) public review/input; and
- (6) a final State decision.

A report regarding compliance with the antidegradation policy shall be conducted for all new or expanding wastewater discharges into Mississippi surface waters that require an NPDES permit.

NPDES Permit reissuances will not be subject to the report procedures provided there are no proposed changes to the facility's effluent which would result in increases in pollutant loadings. General permit coverage will undergo an antidegradation review. MDEQ will conduct the antidegradation review for each activity for which a Notice of Intent (NOI) to discharge is received for coverage under a general permit. The procedures for general permits follow:

- (1) An application is received for coverage (NOI).
- (2) The NOI is posted on MDEQ's website at http://opc.deq.state.ms.us/report_gnp_notice.aspx. Typically, the notice is posted for at least a 10-day period prior to action on the NOI.
- (3) The permit manager uses the NOI application and other available data and information to answer a list of questions that relate to a proposed project including alternatives analysis and socio-economic issues.
- (4) The information in the completed project awareness checklist provides the basis for MDEQ to complete its antidegradation review.
- (5) If, based on the results of the antidegradation review, MDEQ determines that the applicant can receive coverage under a general permit, notice of coverage by a general permit is posted on MDEQ's website at: http://opc.deq.state.ms.us/report_gnp_issued.aspx.
- (6) If, based on the results of the antidegradation review, MDEQ determines that the applicant can not receive coverage, the applicant must apply for an individual NPDES permit and fulfill the requirements of Section IV of this methodology.

IV. Required Antidegradation Components

The antidegradation report requirements must be addressed as described in this section and contained in the forms attached hereto. The **Antidegradation Instruction Form** along with the **Calculation of Total Annualized Project Costs** worksheets should be incorporated into the appropriate NPDES application forms.

These forms shall be completed by all individual NPDES permit applicants for new discharges or existing discharges with proposed effluents that contain new or additional pollutants or an increase in flow that results in an increase in pollutant loading. Antidegradation requires documentation that discharge and treatment alternatives and socio-economic impacts have been evaluated and considered. The applicant may utilize EPA's "The Interim Economic Guidance for Water Quality Standards Workbook" dated March, 1995, for guidance in completing the report.

Project Information

The applicant should supply the required information from the Antidegradation Instruction Form providing the specific information regarding the name and other pertinent details of the proposed discharge. The location information and/or a map must be provided. The proposed effluent discharge flow details should also be given in this section. MDEQ reserves the right to require completion of the remaining sections of the Antidegradation Instruction Form for any proposed NPDES permit application.

Alternatives Analysis

An analysis of alternatives is required to ensure that the applicant has considered alternatives that would reduce impacts to state surface waters. The analysis should include a description of each alternative in terms of both technical and economic feasibility. Alternatives to be considered should include (but are not limited to):

- (1) a centralized no discharge system;
- (2) connection to an existing wastewater treatment facility;
- (3) an alternative discharge point; and
- (4) product or raw material substitution.

Alternatives may also consider:

- (5) other treatment options which would reduce the predicted impact to the stream;
- (6) improved operation and maintenance of existing treatment operations;
- (7) seasonal or controlled discharge options to avoid critical conditions; and
- (8) pollution prevention, increased efficiency, water conservation, recycle or reuse alternatives.

Socio-Economic Impacts Analysis

Socio-economic or environmental / public health issues may be considered as justifications for lowering water quality. This analysis is not necessary if a non-degrading alternative is chosen following the alternatives analysis.

Factors to be considered in making a determination include:

- (1) employment (increasing production and jobs, maintaining, or avoiding reduction in employment),
- (2) improved community tax base; and
- (3) correction of an environmental or public health problem; and
- (4) providing a social benefit to the community.

The Interim Economic Guidance for Water Quality Standards Workbook, published by the U.S. Environmental Protection Agency, March 1995, may be used as a guide in preparing this analysis.

Public Review / Input

Prior to issuance of an individual NPDES permit, the proposed permit is sent to public notice in accordance with the Environmental Permits Division's administrative procedures. The NPDES permit public notice will state that an antidegradation report has been prepared for the project and is available for public inspection. All applications for coverage under a general permit will consider available alternatives and socio-economic issues. Public notice of proposed general permit coverage is accomplished by website notification.

Final Action

At the completion of the public review / input process, any comments received will be reviewed and considered to determine if changes should be made to the proposed discharge permit. Significant changes may require an update to the antidegradation report for the project and/or an additional public notice.

ANTIDEGRADATION INSTRUCTION FORM

FOR NEW/EXPANDING DISCHARGES TO TIER 2 WATERS

Individual Permits

Project Information

The information in this section is not required again if it has already been provided with the NPDES permit application or request for coverage under a general permit.

- Name of project
- Location of project (map showing proposed discharge point and location of treatment facility)
- Proposed treatment type
- Proposed influent constituents
- Proposed design flow
- Name of discharge stream
- Latitude and Longitude of discharge point if available
- Contact information for permit applicant
- Is the applicant seeking coverage under a general permit for this discharge?

Alternatives Analysis

The demonstration should include, but not be limited to, consideration of the alternatives listed below:

- (1) a centralized no discharge system;
- (2) connection to an existing wastewater treatment facility;
- (3) an alternative discharge point; and
- (4) product or raw material substitution.

Alternatives may also consider:

- (5) other treatment options which would reduce the predicted impact to the stream;
- (6) improved operation and maintenance of existing treatment operations;
- (7) seasonal or controlled discharge options to avoid critical conditions; and
- (8) pollution prevention, increased efficiency, water conservation, recycle or reuse alternatives.

The applicant should consider if the alternative is technically feasible. If it is technically feasible, then the applicant must consider if it is economically feasible. If the alternative is economically feasible, then degradation of the stream may not occur. If the alternative is not

feasible, then the next alternative should be considered. Documentation is required for all technical and economic feasibility considerations.

The applicant must complete the **Calculation of Total Annualized Project Costs** worksheet for each technically feasible alternative considered. Then the Total Annualized Project Cost for each alternative must be compared to the chosen alternative. Those alternatives that have a Total Annualized Project Cost less than 110% of the chosen alternative are considered economically feasible.

Social and Economic Impact Analysis

All applicants for a new or expanded discharge must demonstrate that the proposed discharge is necessary for important economic or social development in the area. This section is not applicable if a non-degrading alternative such as a no discharge system or connection to an existing treatment facility has been selected.

Socio-economic or environmental / public health issues which would justify the proposed discharge may include:

- (1) employment (increasing production and jobs, maintaining, or avoiding reduction in employment);
- (2) improved community tax base; and
- (3) correction of an environmental or public health problem; and
- (4) provide a social benefit to the community.

The applicant should estimate the number of new jobs (both direct and indirect jobs) created as a result of the project. Documentation should also predict the effect of the new jobs on the local and state tax base – i.e. tax revenues expected to be gained by local and state governments and/or any other economic benefits.

The permit applicant should document any existing environmental or public health problem, as well as the expected effect of the proposed project on the existing problem.

For example, a description of the environmental benefits from a proposed wastewater treatment plant which will take failing septic tanks offline.

Others – Please list and describe.

MDEQ may require additional documentation and calculations or require consideration of other alternatives as necessary to justify the proposed degradation.

Calculation of Total Annualized Project Costs

This form must be completed for the chosen alternative. All figures presented must be supported with documentation.

Capital Costs Chosen Alternative

Alternative _____

Capital Cost of Project (show a breakout of costs on a separate sheet) \$ _____

Other One-Time Costs of Project
(Please List, if any):

_____ \$ _____

_____ \$ _____

_____ \$ _____

Total Capital Costs (Sum columns) \$ _____

Interest Rate Used (expressed as decimal) (i) _____

Time Period of Financing (in years) (n) _____

Annualization Factor (af) _____

(or see Table of
Annualization Factors)

$$\frac{i(1+i)^n}{(1+i)^n - 1}$$

Annualized Capital Cost [(Total Capital Cost) x (af)] (acc)\$ _____

Operating and Maintenance Costs

List Annual Costs of Operation and Maintenance (O&M) (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement.)

_____ \$ _____

_____ \$ _____

Total Annual O & M Costs (Sum column) \$ _____

Total Annual Cost of Project \$ _____

Calculation of Total Annualized Project Costs For No Discharge Alternative

This form must be completed for the no discharge alternative considered. All figures presented must be supported with documentation.

Capital Costs No Discharge Alternative

Alternative _____

Capital Cost of Project (show a breakout of costs on a separate sheet) \$ _____

Other One-Time Costs of Project
(Please List, if any):

_____ \$ _____

_____ \$ _____

_____ \$ _____

Total Capital Costs (Sum columns) \$ _____

Interest Rate Used (expressed as decimal) (i) _____

Time Period of Financing (in years) (n) _____

Annualization Factor (af) _____

(or see Table of
Annualization Factors)

$$\frac{i(1+i)^n}{(1+i)^n - 1}$$

Annualized Capital Cost [(Total Capital Cost) x (af)] (acc)\$ _____

Operating and Maintenance Costs

List Annual Costs of Operation and Maintenance (O&M) (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement.)

_____ \$ _____

_____ \$ _____

Total Annual O & M Costs (Sum column) \$ _____

Total Annual Cost of Project \$ _____

Table of Annualization Factors

| Year | Interest Rate | | | | | | | | | | | |
|------|---------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 0.0050 | 0.0100 | 0.0150 | 0.0200 | 0.0250 | 0.0300 | 0.0350 | 0.0400 | 0.0450 | 0.0500 | 0.0550 | 0.0600 |
| 1 | 1.0050 | 1.0100 | 1.0150 | 1.0200 | 1.0250 | 1.0300 | 1.0350 | 1.0400 | 1.0450 | 1.0500 | 1.0550 | 1.0600 |
| 2 | 0.5038 | 0.5075 | 0.5113 | 0.5150 | 0.5188 | 0.5226 | 0.5264 | 0.5302 | 0.5340 | 0.5378 | 0.5416 | 0.5454 |
| 3 | 0.3367 | 0.3400 | 0.3434 | 0.3468 | 0.3501 | 0.3535 | 0.3569 | 0.3603 | 0.3638 | 0.3672 | 0.3707 | 0.3741 |
| 4 | 0.2531 | 0.2563 | 0.2594 | 0.2626 | 0.2658 | 0.2690 | 0.2723 | 0.2755 | 0.2787 | 0.2820 | 0.2853 | 0.2886 |
| 5 | 0.2030 | 0.2060 | 0.2091 | 0.2122 | 0.2152 | 0.2184 | 0.2215 | 0.2246 | 0.2278 | 0.2310 | 0.2342 | 0.2374 |
| 6 | 0.1696 | 0.1725 | 0.1755 | 0.1785 | 0.1815 | 0.1846 | 0.1877 | 0.1908 | 0.1939 | 0.1970 | 0.2002 | 0.2034 |
| 7 | 0.1457 | 0.1486 | 0.1516 | 0.1545 | 0.1575 | 0.1605 | 0.1635 | 0.1666 | 0.1697 | 0.1728 | 0.1760 | 0.1791 |
| 8 | 0.1278 | 0.1307 | 0.1336 | 0.1365 | 0.1395 | 0.1425 | 0.1455 | 0.1485 | 0.1516 | 0.1547 | 0.1579 | 0.1610 |
| 9 | 0.1139 | 0.1167 | 0.1196 | 0.1225 | 0.1255 | 0.1284 | 0.1314 | 0.1345 | 0.1376 | 0.1407 | 0.1438 | 0.1470 |
| 10 | 0.1028 | 0.1056 | 0.1084 | 0.1113 | 0.1143 | 0.1172 | 0.1202 | 0.1233 | 0.1264 | 0.1295 | 0.1327 | 0.1359 |
| 11 | 0.0937 | 0.0965 | 0.0993 | 0.1022 | 0.1051 | 0.1081 | 0.1111 | 0.1141 | 0.1172 | 0.1204 | 0.1236 | 0.1268 |
| 12 | 0.0861 | 0.0888 | 0.0917 | 0.0946 | 0.0975 | 0.1005 | 0.1035 | 0.1066 | 0.1097 | 0.1128 | 0.1160 | 0.1193 |
| 13 | 0.0796 | 0.0824 | 0.0852 | 0.0881 | 0.0910 | 0.0940 | 0.0971 | 0.1001 | 0.1033 | 0.1065 | 0.1097 | 0.1130 |
| 14 | 0.0741 | 0.0769 | 0.0797 | 0.0826 | 0.0855 | 0.0885 | 0.0916 | 0.0947 | 0.0978 | 0.1010 | 0.1043 | 0.1076 |
| 15 | 0.0694 | 0.0721 | 0.0749 | 0.0778 | 0.0808 | 0.0838 | 0.0868 | 0.0899 | 0.0931 | 0.0963 | 0.0996 | 0.1030 |
| 16 | 0.0652 | 0.0679 | 0.0708 | 0.0737 | 0.0766 | 0.0796 | 0.0827 | 0.0858 | 0.0890 | 0.0923 | 0.0956 | 0.0990 |
| 17 | 0.0615 | 0.0643 | 0.0671 | 0.0700 | 0.0729 | 0.0760 | 0.0790 | 0.0822 | 0.0854 | 0.0887 | 0.0920 | 0.0954 |
| 18 | 0.0582 | 0.0610 | 0.0638 | 0.0667 | 0.0697 | 0.0727 | 0.0758 | 0.0790 | 0.0822 | 0.0855 | 0.0889 | 0.0924 |
| 19 | 0.0553 | 0.0581 | 0.0609 | 0.0638 | 0.0668 | 0.0698 | 0.0729 | 0.0761 | 0.0794 | 0.0827 | 0.0862 | 0.0896 |
| 20 | 0.0527 | 0.0554 | 0.0582 | 0.0612 | 0.0641 | 0.0672 | 0.0704 | 0.0736 | 0.0769 | 0.0802 | 0.0837 | 0.0872 |

| Year | Interest Rate | | | | | | | | | | | |
|------|---------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 0.0650 | 0.0700 | 0.0750 | 0.0800 | 0.0850 | 0.0900 | 0.0950 | 0.1000 | 0.1050 | 0.1100 | 0.1150 | 0.1200 |
| 1 | 1.0650 | 1.0700 | 1.0750 | 1.0800 | 1.0850 | 1.0900 | 1.0950 | 1.1000 | 1.1050 | 1.1100 | 1.1150 | 1.1200 |
| 2 | 0.5493 | 0.5531 | 0.5569 | 0.5608 | 0.5646 | 0.5685 | 0.5723 | 0.5762 | 0.5801 | 0.5839 | 0.5878 | 0.5917 |
| 3 | 0.3776 | 0.3811 | 0.3845 | 0.3880 | 0.3915 | 0.3951 | 0.3986 | 0.4021 | 0.4057 | 0.4092 | 0.4128 | 0.4163 |
| 4 | 0.2919 | 0.2952 | 0.2986 | 0.3019 | 0.3053 | 0.3087 | 0.3121 | 0.3155 | 0.3189 | 0.3223 | 0.3258 | 0.3292 |
| 5 | 0.2406 | 0.2439 | 0.2472 | 0.2505 | 0.2538 | 0.2571 | 0.2604 | 0.2638 | 0.2672 | 0.2706 | 0.2740 | 0.2774 |
| 6 | 0.2066 | 0.2098 | 0.2130 | 0.2163 | 0.2196 | 0.2229 | 0.2263 | 0.2296 | 0.2330 | 0.2364 | 0.2398 | 0.2432 |
| 7 | 0.1823 | 0.1856 | 0.1888 | 0.1921 | 0.1954 | 0.1987 | 0.2020 | 0.2054 | 0.2088 | 0.2122 | 0.2157 | 0.2191 |
| 8 | 0.1642 | 0.1675 | 0.1707 | 0.1740 | 0.1773 | 0.1807 | 0.1840 | 0.1874 | 0.1909 | 0.1943 | 0.1978 | 0.2013 |
| 9 | 0.1502 | 0.1535 | 0.1568 | 0.1601 | 0.1634 | 0.1668 | 0.1702 | 0.1736 | 0.1771 | 0.1806 | 0.1841 | 0.1877 |
| 10 | 0.1391 | 0.1424 | 0.1457 | 0.1490 | 0.1524 | 0.1558 | 0.1593 | 0.1627 | 0.1663 | 0.1698 | 0.1734 | 0.1770 |
| 11 | 0.1301 | 0.1334 | 0.1367 | 0.1401 | 0.1435 | 0.1469 | 0.1504 | 0.1540 | 0.1575 | 0.1611 | 0.1648 | 0.1684 |
| 12 | 0.1226 | 0.1259 | 0.1293 | 0.1327 | 0.1362 | 0.1397 | 0.1432 | 0.1468 | 0.1504 | 0.1540 | 0.1577 | 0.1614 |
| 13 | 0.1163 | 0.1197 | 0.1231 | 0.1265 | 0.1300 | 0.1336 | 0.1372 | 0.1408 | 0.1444 | 0.1482 | 0.1519 | 0.1557 |
| 14 | 0.1109 | 0.1143 | 0.1178 | 0.1213 | 0.1248 | 0.1284 | 0.1321 | 0.1357 | 0.1395 | 0.1432 | 0.1470 | 0.1509 |
| 15 | 0.1064 | 0.1098 | 0.1133 | 0.1168 | 0.1204 | 0.1241 | 0.1277 | 0.1315 | 0.1352 | 0.1391 | 0.1429 | 0.1468 |
| 16 | 0.1024 | 0.1059 | 0.1094 | 0.1130 | 0.1166 | 0.1203 | 0.1240 | 0.1278 | 0.1316 | 0.1355 | 0.1394 | 0.1434 |
| 17 | 0.0989 | 0.1024 | 0.1060 | 0.1096 | 0.1133 | 0.1170 | 0.1208 | 0.1247 | 0.1285 | 0.1325 | 0.1364 | 0.1405 |
| 18 | 0.0959 | 0.0994 | 0.1030 | 0.1067 | 0.1104 | 0.1142 | 0.1180 | 0.1219 | 0.1259 | 0.1298 | 0.1339 | 0.1379 |
| 19 | 0.0932 | 0.0968 | 0.1004 | 0.1041 | 0.1079 | 0.1117 | 0.1156 | 0.1195 | 0.1235 | 0.1276 | 0.1316 | 0.1358 |
| 20 | 0.0908 | 0.0944 | 0.0981 | 0.1019 | 0.1057 | 0.1095 | 0.1135 | 0.1175 | 0.1215 | 0.1256 | 0.1297 | 0.1339 |