

The seal of the State of New Mexico is a large, faint watermark in the background. It features an eagle with wings spread, perched on a cactus. The eagle is holding a banner in its beak that reads "CRESCIT EUNDO". Below the eagle are two crossed arrows. The seal is circular with a rope-like border. The text "SEAL OF THE STATE OF NEW MEXICO" is written around the top and sides, and "1912" is at the bottom.

STATE OF NEW MEXICO CONTINUING PLANNING PROCESS

**Adopted in fulfillment of the requirements of Section 303(e)
of the Federal Clean Water Act**

NEW MEXICO WATER QUALITY CONTROL COMMISSION

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PART 1.
PURPOSE AND BACKGROUND

PURPOSE

The continuing planning process for waters of the United States described in Part 2 is adopted by the New Mexico Water Quality Control Commission in fulfillment of the requirements of Section 303(e) of the federal Clean Water Act. This continuing planning process supersedes that described in the previous State of New Mexico Continuing Planning Process for Water Quality Management. The previous continuing planning process was adopted by the Water Quality Control Commission in January 1987 and subsequently approved by the U.S. Environmental Protection Agency.

This continuing planning process does not apply to any waters under the jurisdiction of Indian Tribes pursuant to Section 518 of the Clean Water Act.

LEGAL REQUIREMENTS

Section 303(e) of the federal Clean Water Act requires that each state establish and maintain a continuing planning process. Each state is responsible for managing its water quality program to implement the processes described in the continuing planning process. The U.S. Environmental Protection Agency (EPA) is responsible for reviewing each state's continuing planning process periodically in order to ensure that it is consistent with the Clean Water Act. EPA must approve any continuing planning process for navigable waters that meets the requirements set forth in Section 303(e)(3)(A)-(H) of the Act. Under the Clean Water Act "navigable waters" are waters of the United States (Section 502(7)). Waters of the United States are defined in 40 CFR 122.2.

The required contents for the continuing planning process are also described in federal regulations for water quality planning and management (40 CFR 130.5(b)(1)-(9)). The contents must include the following:

- (1) The process for developing effluent limitations and schedules for compliance at least as stringent as those required by Sections 301 (b)(1), 301 (b)(2), 306 and 307 of the federal Clean Water Act and at least as stringent as any requirements contained in applicable water quality standards adopted pursuant to Section 303 of the Act.
- (2) The process for incorporating elements of any applicable areawide water quality management plans prepared pursuant to Section 208 of the Act, and applicable basin plans under Section 209 of the Act.
- (3) The process for developing total maximum daily loads (TMDLs) and individual water quality based effluent limitations for pollutants in accordance with Section 303(d) of the Act and 40 CFR 130.7(a).
- (4) The process for updating and maintaining the state water quality management plan, including schedules for revision.
- (5) The process for assuring adequate authority for intergovernmental cooperation in the implementation of the state water quality management program.

- (6) The process for establishing and assuring adequate implementation of new or revised water quality standards under Section 303(c) of the Act.
- (7) The process for assuring adequate controls over the disposition of residual waste from water treatment processing.
- (8) The process for developing the inventory and ranking in order of priority of needs for construction of waste treatment facilities to meet applicable requirements of Section 301 and 302 of the Act.
- (9) The process for determining the priority of permit issuance.

Two of the required contents listed above, (2) and (9), do not apply to the State of New Mexico and are not included in the continuing planning process set forth in Part 2. With regard to (2), New Mexico has chosen to do its water quality management planning on a statewide basis and therefore has no areawide water quality management plans or basin water quality management plans.

With regard to (9), permitting of discharges to surface waters in New Mexico is through the National Pollutant Discharge Elimination System (NPDES). NPDES permits for New Mexico are issued by EPA Region 6 in Dallas, Texas, and EPA determines the priority of permit issuance. In order to comply with Section 303(e)(2) of the Clean Water Act, New Mexico would have to include the process for determining the priority of permit issuance in its continuing planning process before the state could assume delegation of the NPDES permit program and thus implement the program at the state level.

WATER QUALITY MANAGEMENT IN NEW MEXICO

The basic authority for water quality management in New Mexico is provided through the New Mexico Water Quality Act, NMSA 1978, Sections 74-6-1 to 74-6-17 (1997). This statute establishes the New Mexico Water Quality Control Commission and specifies its duties and powers. The Commission's duties and powers are specified in Section 74-6-4 of the Water Quality Act and include the following:

- * the administration of loans and grants from the federal government and from other sources, public or private;
- * the adoption of a comprehensive water quality management program;
- * the development of a continuing planning process;
- * The adoption of water quality standards for surface and ground waters of the state;
- * the adoption and promulgation of regulations to prevent or abate water pollution in the state or in any specific geographic area, aquifer or watershed of the state or in any part thereof, or for any class of waters;
- * the adoption of regulations governing the disposal of septage and sludge and the use of sludge for beneficial purposes;
- * the delegation of administration of the Commission's regulations to constituent agencies so as to assure adequate coverage and prevent duplication of effort;
- * the authority to enter into or authorize constituent agencies to enter into agreements with the federal government or other state governments for purposes consistent with the Water Quality Act; and
- * the authority to grant an individual variance from any regulation of the Commission whenever the Commission finds after a public hearing that compliance with the regulation will impose an unreasonable burden upon any lawful business, occupation or activity. The Commission may only grant a variance conditioned upon a person effecting a particular abatement of water pollution within a reasonable period of time.

The Water Quality Control Commission is the state water pollution control agency for all purposes of the federal Clean Water Act and may take all action necessary and appropriate to secure the benefits of the Act to this state, its political subdivisions or interstate agencies. The Commission is composed of eight state agency heads and three representatives of the public as follows:

1. the secretary of environment or a member of his staff designated by him;
2. the director of the department of game and fish or a member of his staff designated by him;
3. the state engineer or a member of his staff designated by him;
4. the chairman of the oil conservation commission or a member of his staff designated by him;
5. the director of the state parks division of the energy, minerals and natural resources department or a member of his staff designated by him;
6. the director of the New Mexico department of agriculture or a member of his staff designated by him;
7. the chairman of the soil and water conservation commission or a soil and water conservation district supervisor designated by him;
8. the director of the bureau of mines and mineral resources at the New Mexico institute of mining and technology or a member of his staff designated by him; and
9. three representatives of the public to be appointed by the governor for terms of four years.

As the Water Quality Control Commission has no staff of its own, responsibilities for water quality management are delegated to constituent agencies. The Commission has divided responsibility for administering Commission regulations for discharges to surface water and to ground water between the New Mexico Environment Department (NMED) and the Oil Conservation Division of the Energy, Minerals and Natural Resources Department according to the type of facility or discharge. In addition to both these agencies, the Game and Fish Department and the State Parks Division of the Energy, Minerals and Natural Resources Department have also been delegated authority to enforce the Commission regulation on disposal of refuse in a watercourse. This is in accordance with the NM Water Quality Act, Sections 74-6-8 through 74-6-11.

NMED is responsible for development of most elements of the Statewide Water Quality Management Plan. Other local, state and federal agencies and other governmental and non-governmental entities, including watershed planning groups, may take responsibility for implementation of particular elements in the plan as described in the Statewide Water Quality Management Plan and in the State of New Mexico Nonpoint Source Management Program.

Among the other responsibilities delegated or assigned to NMED are the following:

- * administration of the utility operators certification regulations;
- * state certification that NPDES permits meet applicable requirements of the federal Clean Water Act and state law, regulations, and water quality standards;
- * state certification of other federal water pollution control permits, including dredge-and-fill permits issued pursuant to Section 404 of the federal Clean Water Act as well as hydropower licenses issued by the Federal Energy Regulatory Commission;
- * investigation of existing water quality;
- * determination of the causes and extent of water pollution;
- * administration of the state-and-federally funded wastewater construction loans program; and
- * development of a ranking system and ranking in order of priority of needs of projects eligible for funding under the wastewater construction loans program.

Other parts of state government also have responsibilities under other Acts which impact water quality. These include but are not limited to the State Engineer Office under laws governing the allocation and use of the waters of the state; the Oil Conservation Division under the Oil and Gas Act; the Mining and Minerals Division under the New Mexico Mining Act and the Coal Surface Mining Act; the Soil and Water Conservation Districts under the Soil and Water Conservation District Act; and the Department of Agriculture under the Pesticide Control Act. Coordination among the various programs is through the Water Quality Control Commission of which eight subdivisions of state government are constituent agencies, through memoranda of understanding, and through communications between the various departments.

PART 2.

**CONTINUING PLANNING PROCESS
FOR WATERS OF THE UNITED STATES**

INTRODUCTION

The seven elements of the required contents for the continuing planning process applicable to the State of New Mexico are described in this part. In order to keep the length of the part to manageable proportions, documents are incorporated by reference where applicable. The documents incorporated by reference may later be revised, after public notification and public participation appropriate to each document. Such revised documents are considered to be incorporated herein by reference. Documents requiring approval by the U. S. Environmental Protection Agency (EPA) are considered incorporated after EPA approval of the revised document. This procedure is in accordance with current EPA guidance on the continuing planning process.

PROCESS FOR DEVELOPMENT OF EFFLUENT LIMITATIONS

The Water Quality Control Commission has determined that the National Pollutant Discharge Elimination System (NPDES) permit program established under Section 402 of the federal Clean Water Act should be the primary mechanism for controlling point source discharges to surface waters in New Mexico. EPA Region 6 in Dallas, Texas is responsible for issuing the permits and enforcing effluent limitations in the permit, which specify the amount and concentrations of contaminants that a permittee may discharge to a surface watercourse.

The Water Quality Act Section 74-6-4.E assigns to the New Mexico Environment Department (NMED) authority to perform state certification of NPDES permits pursuant to Section 401 of the federal Clean Water Act. In state certification, NMED certifies that a NPDES permit meets applicable requirements of the federal Clean Water Act and state law, regulations, and water quality standards. If NMED certifies that additional or more stringent effluent limitations are necessary EPA is obligated to incorporate them into the NPDES permit.

Effluent limitations for many dischargers are found in the Statewide Water Quality Management Plan. Effluent limitations were previously found in the individual water quality basin plans. However, New Mexico's eleven water quality basin plans adopted in the 1970s were superseded in 1987 by the Statewide Water Quality Management Plan.

It is the policy of the Water Quality Control Commission that appropriate effluent limitations for publicly owned wastewater treatment plants and non-municipal facilities are secondary treatment (defined in 40 CFR 133.102) and applicable best available technology (BAT) (separate guidelines for each industry found in 40 CFR Subpart N - Effluent Guidelines and Standards) requirements, respectively, and any additional requirements imposed in the Statewide Water Quality Management Plan or imposed to meet water quality standards.

The process used by NMED for determining appropriate effluent limitations is found in the implementation plan incorporated into Section 1101 of the **State of New Mexico Standards for Interstate and Intrastate Streams**, 20 NMAC 6.1.1101 (Reference 1). NMED also uses **Region 6 Implementation Guidance for State of New Mexico Standards for Interstate and Intrastate Streams**, (Reference 2) as guidance in the evaluation of NPDES permits. In the future, NMED may develop its own implementation guidance, but until such guidance is developed, NMED will continue to use the Region 6 guidance.

The subsection on **Toxic Substances** in the **General Standards** section of the **State of New Mexico Standards for Interstate and Intrastate Streams** (20 NMAC 6.1 Subpart 1) sets forth guidelines for determining appropriate effluent limitations for these

substances (Reference 1). Like other general standards, these toxic substances standards apply at all times, unless a specified standard is provided elsewhere, to all surface waters of the State. In those cases where effluent limitations more stringent than secondary treatment or BAT requirements are needed to maintain water quality standards, NMED uses the Total Maximum Daily Load (TMDL) process set forth in 40 CFR 130.7 and develops a point source load allocation for the discharge (see section on **Process for Development of Total Maximum Daily Loads and Individual Water Quality Based Effluent Limitations** below). Point source load allocations are incorporated into the Statewide Water Quality Management Plan in accordance with procedures set forth below in **Process for Updating and Maintaining the State Water Quality Management Plan**. Pursuant to 40 CFR 130.12 and 122.4(d), NPDES permits must be consistent with the Statewide Water Quality Management Plan.

The subsection on **Compliance Schedules** in the **Compliance with Water Quality Standards** section of the **State of New Mexico Standards for Interstate and Intrastate Streams** (Reference 1) allows the inclusion of compliance schedules in NPDES permits issued to existing facilities in order to provide sufficient time to comply with permit limits based upon new or revised provisions of those standards. Compliance schedules will be established by EPA in a manner consistent with other schedules across Region 6. Compliance schedules will specify milestone dates and will include provisions for submitting progress reports and a final report detailing activities conducted toward meeting compliance schedule provisions.

PROCESS FOR THE DEVELOPMENT OF TOTAL MAXIMUM DAILY LOADS AND INDIVIDUAL WATER QUALITY BASED EFFLUENT LIMITATIONS

The total maximum daily load (TMDL) of a pollutant is the greatest loading or amount of the pollutant that may be introduced into a stream reach from all sources without resulting in a violation of water quality standards. The TMDL consists of the sum of load allocations (LA), which are the pollutant loads contributed by nonpoint sources of pollution and natural background sources, and point source load allocations or wasteload allocations (WLA), which are those portions of the total loading set aside for contributions of the pollutant from point source discharges (40 CFR 130.2(e)-(i)), and a margin of safety (MOS) required by the Clean Water Act Section 303(d)(1)(C).

Pursuant to Section 303(d) of the federal Clean Water Act, total maximum daily loads must be developed for water quality limited segments. Water quality limited segments are those segments where water quality does not meet or is not expected to meet applicable water quality standards even after point source discharges achieve the effluent limitations required by Sections 301 and 306 of the federal Clean Water Act (40 CFR 130.20)). TMDLs are to be done on a pollutant by pollutant basis taking into account seasonal variability. Identification of a segment by a state as water quality limited and still requiring TMDLs means that the state is to:

- * calculate a total maximum daily load (TMDL) for the segment;
- * develop more stringent effluent limitations and wasteload allocations (WLAs), if necessary, for point sources on the segment;
- * identify nonpoint sources of pollution and if possible quantify and assign load allocations (LAs) to them; and
- * identify Best Management Practices, where appropriate, to mitigate nonpoint source pollution.

The New Mexico Environment Department (NMED) is responsible for determining whether stream segments are water quality limited. The water quality limited segments identified are compiled into a list as required by Section 303(d) of the Clean Water Act and 40 CFR 130.7. These 303(d) lists are due to EPA on April first of each even numbered year. Public notice is issued and there is opportunity for public comment on proposed lists. Criteria used are described in the documents **Process for Developing Total Maximum Daily Loads for Point Source Wasteload Allocations, Nonpoint Source Load Allocations With the Methodology for Stream Reach Ranking in the State of New Mexico, pages 1-14** (Reference 3); and **State of New Mexico Procedures for Assessing Standards Attainment for 303(d) List and 305(b) Report, Assessment Protocol** (Reference 4).

Under Section 1201 of the Water Quality Control Commission Regulations, 20 NMAC 6.2.1201, any person intending to make a new water contaminant discharge or to alter the character or location of an existing water contaminant discharge must file a notice of intent to discharge with NMED. NMED then reviews the information provided using the implementation plan contained in the state water quality standards (Reference 1, Section 1101). On the basis of this review, NMED determines whether the stream segment affected is water quality limited and hence requires TMDLs. NMED also collects data from the following sources:

- * the most recent New Mexico Report to Congress under Section 305(b) of the Federal Clean Water Act;
- * dilution calculations and predictive models for waters not meeting applicable water quality standards;
- * federal, state and local agencies/municipalities;
- * members of the public and academic institutions;
- * intensive water quality surveys conducted by the NMED Standards and Surveillance Section;
- * waters identified in Nonpoint Source 319 assessment; and
- * any and all other entities that come forth with valid scientific information on New Mexico's water quality.

This water quality data is compiled, screened for scientific validity and incorporated into the process for determining water quality limited segments and into the TMDL process.

Ranking of water quality limited reaches requiring development of TMDLs is accomplished on the basis of a ranking system developed by NMED and explained in Reference 3 cited above. This system takes into account the severity of the pollution, the uses to be made of the waters, the location of the waterbody, and the presence or absence of threatened or endangered species or of acute public health concerns, and includes a factor for uncertainty due to data limitations. NMED revisits the Priority Ranking System from time to time to determine the need for revision. Whenever revision is proposed there will be public notice and opportunity for public comment. Any subsequent revisions are considered incorporated herein by reference.

The procedures by which the state utilizes the total maximum daily load process to improve water quality are described in the document referenced above (Reference 3). All sampling and analysis methodologies must conform to the requirements of the **Sampling and Analysis and Compliance with Water Quality Standards** sections of the **State of**

New Mexico Standards for Interstate and Intrastate Streams, 20 NMAC 6.1 (Reference 1). They must also comply with EPA approved Quality Assurance Project Plans (QAPPs). QAPPs can vary depending on the type of waterbody and pollutants of concern. As TMDLs are developed by NMED, the following items will be described in the TMDL document: the segment of river/stream/lake, the type of monitoring, data collection and analysis, the type of model used (if a model is needed), statistical techniques, the rationale behind the margin of safety, and all other aspects of the TMDL process.

The results of the determination of a TMDL and corresponding point source load allocations are incorporated into the water quality management plan as specific effluent limitations for the point source discharge under Work Elements 5 and 6. Procedures for updating the plan are described below under the section **Process for Updating and Maintaining the Statewide Water Quality Management Plan**. Pursuant to 40 CFR 130.12(a), NPDES permits must be consistent with the Statewide Water Quality Management Plan.

PROCESS FOR UPDATING AND MAINTAINING THE STATEWIDE WATER QUALITY MANAGEMENT PLAN

The Statewide Water Quality Management Plan sets forth directions for further study of water pollution, options to be considered in the development of water pollution control mechanisms, and, most importantly, strategies to be implemented by state, local, and federal agencies to maintain and improve water quality in New Mexico. The plan consists of the initial plan completed by the state in 1979 and subsequent updates of the plan.

The Water Quality Control Commission adopts the plan under the statutory authority of the New Mexico Water Quality Act. See NMSA 1978, 74-6-4(B). The Commission has delegated responsibility for development of most elements of the plan to the New Mexico Environment Department (NMED). Other local, state and federal agencies and other governmental and non-governmental entities, including watershed planning groups, may take responsibility for implementation of particular elements in the Statewide Water Quality Management Plan as described in the plan and in the State of New Mexico Nonpoint Source Management Program.

Water Quality Management Plan Updates: To ensure that the plan continues to provide an effective framework for water quality management, updates and new work elements are developed as needed and work elements no longer required may be deleted. Updates may be needed to reflect population growth, economic development, changing water quality conditions, results of implementation activities, new and revised effluent limitations, and new requirements, including new laws and regulations.

Consistency with Federal Programs: The federal regulatory definition of a water quality management plan given in 40 CFR 130.2(k) includes both the Statewide Water Quality Management Plan and the state's water quality basin plans. However, New Mexico's eleven water quality basin plans adopted by the Commission during the 1970s were superseded in 1987 by the Statewide Water Quality Management Plan. EPA uses the Statewide Water Quality Management Plan to insure consistency between programs.

* EPA may not issue an NPDES permit which is in conflict with an approved water quality management plan (40 CFR 130.12(a)). The federal Clean Water Act requires minimum treatment levels of secondary treatment for publicly owned

treatment plants and best available technology (BAT) for non-municipal discharges and allows states to impose more stringent or additional requirements on the basis of state law, regulations, and water quality standards. EPA uses the effluent limitations set forth in the Statewide Water Quality Management Plan as a basis for compliance with the consistency requirement along with any additional or more stringent requirements prescribed in Work Element 5, Total Maximum Daily Loads or in Work Element 6, Point Source Load Allocations, in the plan.

- * The state must review wastewater treatment facility plans developed under the federal construction loans program for consistency with the Statewide Water Quality Management Plan. Construction loans funds may be awarded only to wastewater management agencies designated in the plan (40 CFR 130.12(b)).

Public Participation: Because the water quality management plan plays an important role in guiding the state's water pollution control programs, changes in the plan require open processes of government and efforts to promote public awareness and input.

Public participation activities for updates to work elements of the Statewide Water Quality Management Plan fall into several categories:

* **Administrative Updates**

Updates to planning area boundaries under Work Element 1, population projections under Work Element 3 and the effluent limitations inventory under Work Element 6 are administrative tools necessary to meet the consistency requirements discussed above.

Parties interested in the planning area boundary for a wastewater facility can be so specifically identified that the parties can be contacted directly to request input and public notice is not needed. In accordance with the procedure established by Work Element I of the Statewide Water Quality Management Plan, the final planning area is established by NMED after consideration of input from interested parties.

Population projections under Work Element 3 are developed by the Bureau of Business and Economic Research at the University of New Mexico based on the most recent census.

The effluent limitations inventory under Work Element 6 lists effluent limitations certified by NMED for the state's NPDES permits and other information pertinent to the permits. No public participation is associated with the establishment or updating of this inventory, because EPA provided the public with an opportunity to request a public hearing on individual NPDES permits when the draft permits were issued.

For these administrative updates, placement of a proposed update on the agenda of a Water Quality Control Commission meeting constitutes adequate public

notification. Like other parts of the Statewide Water Quality Management Plan, these administrative updates must be approved by the Water Quality Control Commission at an open public meeting.

For administrative flexibility, parts of several work elements (including maps of wastewater management planning area boundaries under Work Element 1, wastewater management planning area population projections under Work Element 3, and the effluent limitations inventory under Work Element 6) are contained in the water quality management plan appendix. Appendix materials do not have to be certified by the Governor or approved by EPA. All other updates are contained in the plan itself.

*** Updates That Require Formal Public Notice and May Require a Public Hearing**

Updates that may or may not affect substantial numbers of people or generate significant public interest include the following: updates to the Introduction to the Statewide Water Quality Management Plan; updates to Work Element 2, Assessment of Stream Segment Classifications; Work Element 5, Total Maximum Daily Loads; the point source load allocation portion of Work Element 6; Work Element 11, Public Participation Program; Work Element 13, Designation of Management Agencies; Work Element 14, Implementation Schedules; and any other non-administrative work elements proposed for update or deletion, or new non-administrative work elements proposed for addition. During development of a proposed update, NMED (alone or in conjunction with other entities) may provide information, solicit comments, or hold informal public meetings in the geographic area likely to be impacted or other appropriate area. Where appropriate, a proposed update may be submitted to EPA in draft form for technical review before presentation to the Water Quality Control Commission.

The formal schedule for adoption, certification, and approval of plan updates begins with the presentation of the proposed update to the Commission. The proposed update is put on the agenda of a Water Quality Control Commission meeting and formal public notice of it, including notice to EPA, is issued. There shall be at least thirty days allowed for the public to comment and to request a public hearing before the Commission acts on a proposed update.

The Commission shall hold a formal public hearing if there are written requests for a hearing and the Commission determines that there is significant public interest. The time, date and place of the hearing and any prehearing schedule shall be determined by the Commission and notice shall be issued at least 45 days before the hearing.

The Commission may issue such orders specifying procedures for the conduct of the hearing as may be necessary and appropriate to fully inform the Commission of the matters at issue in the hearing or control the conduct of the hearing. Such orders may include requirements for giving additional public notice, holding

prehearing conferences, filing direct testimony in writing prior to the hearing, or limiting testimony and cross-examination.

At the hearing the Commission shall allow all interested persons reasonable opportunity to submit data, views or arguments orally or in writing and to examine witnesses testifying at the hearing. The Commission may designate a hearing officer to take evidence in the hearing. The Commission shall make an audio recording of the hearing. If a person other than a Commissioner requests a written transcript or certified copy of the audio recording, the requestor shall pay the cost of the transcription or audio copying.

*** Inactive Work Elements and Work Elements Now Covered by Other Programs**

Work Elements which are inactive work areas under the Statewide Water Quality Management Plan include the following: Work Element 4, Nonpoint Sources; Work Element 7, Municipal Waste Treatment Systems Needs; Work Element 8, Industrial Waste Treatment System Needs; Work Element 9, Ground Water Control Needs; and Work Element 10, Urban Stormwater Runoff. There is no Work Element 12. Some of these work elements are being actively pursued under the New Mexico Nonpoint Source Management Program or under other programs, and on some others no future work is anticipated at this time. Other work elements may become inactive in the future. All work elements, whether active or inactive, remain part of the Statewide Water Quality Management Plan until formally removed by an update. 40 CFR 130.6 allows referencing of other documents, such as the Nonpoint Source Management Program, instead of including all details in the Statewide Water Quality Management Plan. Such referencing would be done by an update of the Statewide Water Quality Management Plan. The list of work elements under the plan can be adjusted to take account of inactive work elements or those now covered by other programs after public notice and opportunity for public hearing, as described above in the subsection on **Updates That Require Formal Public Notice and May Require a Public Hearing**.

Adoption and Approval of Updates: After appropriate public participation as described above, plan updates are adopted by the Water Quality Control Commission. The Governor or his or her designee then certifies by letter to the regional administrator of the U.S. Environmental Protection Agency, Region 6, that the update is consistent with all other parts of the plan, and the update is submitted to EPA for approval. Finally, the update is approved by EPA.

PROCESS FOR ASSURING INTERGOVERNMENTAL COOPERATION IN THE IMPLEMENTATION OF THE STATEWIDE WATER QUALITY MANAGEMENT PROGRAM

Intergovernmental cooperation in the implementation of the Statewide Water Quality Management Program is provided by five factors: (1) the composition of the Water Quality Control Commission, (2) the delegation of responsibilities to constituent agencies by the Commission, (3) the authority of the Commission to enter into or to authorize its constituent agencies to enter into agreements with federal or state agencies for purposes consistent with the New Mexico Water Quality Act, (4) the designation of management agencies to carry out specific responsibilities under the Statewide Water Quality Management Plan, and (5) the review of all grant applications and amendments through the New Mexico Department of Finance and Administration's "Clearinghouse System".

Eight of the eleven members of the New Mexico Water Quality Control Commission are representatives of state agencies involved in some aspect of water quality management, and the other three members are representatives of the public appointed by the Governor. Thus, the Commission itself serves as a forum for exchange of information, coordination, and cooperation.

The Water Quality Control Commission assures that its programs and responsibilities are carried out and coordinated with adequate coverage but without duplication of effort through delegation of responsibilities to constituent agencies. The Commission reviews and adopts such delegations at its regular open meetings and the specific delegation of responsibility becomes part of the permanent record of Commission actions. Commission delegations are summarized in Part 1.

The authority of the Water Quality Control Commission to enter into or to authorize its constituent agencies to enter into agreements with other agencies provides the Commission with a means of formally coordinating with agencies outside of the Commission. This mechanism also allows the Commission to use the expertise of other agencies in fulfilling its responsibilities.

The Water Quality Control Commission also assures coordination in implementing the Statewide Water Quality Management Plan by designating management agencies to carry out specific responsibilities. Management agencies must satisfy the requirements of 40 CFR 130.6(c)(5).

Specifically, management agencies must have the legal, institutional, managerial, and financial capability and programmatic activities to carry out the designated responsibilities. The designation must also provide for intergovernmental cooperation between the designated agency and the Commission. Management agencies must formally accept the designated responsibilities. After the Commission has formally

adopted a management agency designation, it is certified by the Governor. These designations are addressed in Work Element 13 of the Statewide Water Quality Management Plan.

PROCESS FOR ESTABLISHING AND ASSURING IMPLEMENTATION OF WATER QUALITY STANDARDS

Under the New Mexico Water Quality Act, the New Mexico Water Quality Control Commission adopts water quality standards for surface and ground waters of the State. As required by Section 303(c) of the federal Clean Water Act, the Commission reviews its surface water quality standards (Reference 1) at least once every three years. The New Mexico Environment Department (NMED) is responsible for conducting the triennial standards review; however, others, including the general public, are allowed to propose new or revised water quality standards to the Commission at any time under the New Mexico Water Quality Act.

Adoption of new or revised surface water quality standards is done in conformance with requirements in the federal Clean Water Act, federal regulations, and the New Mexico Water Quality Act. Testimony presented at a public hearing will be the basis for Commission decisions to establish any water quality standard or to allow degradation of any surface water to accommodate important economic and social development pursuant to the antidegradation policy in the standards. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall 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. Public notice of the hearing is published in at least one newspaper of general circulation and in the New Mexico Register and is sent to the Commission mailing list. Upon request, proposed amendments are made available to the public in advance of the hearing. All interested agencies and individuals are permitted to present testimony at the hearing and to cross-examine witnesses.

New or revised water quality standards adopted by the Commission are filed with the State Records Center. Pursuant to the provisions of the State Rules Act, the standards become effective 30 days after filing.

In addition, new or revised surface water standards adopted by the Commission are certified by the state attorney general as being duly adopted pursuant to state laws and then submitted to the U.S. Environmental Protection Agency (EPA), Region 6 in Dallas, Texas for review and approval. EPA must notify New Mexico of its approval within 60 days or its disapproval within 90 days. A federally disapproved surface water standard remains in effect, even though disapproved by EPA, until the state revises the standard to bring it into conformance with the federal Clean Water Act and water quality standards and regulations promulgated pursuant to the Act, or until EPA promulgates a surface water quality standard to supersede the disapproved state standard.

Implementation of new or revised surface water quality standards is through controls on point source pollutant discharges (see **Development of Effluent Limitations** section above) and through best management practices applied to nonpoint sources of pollution. The Clean Water Act makes no distinction in its goals between point source and nonpoint source discharges. The federal Clean Water Act, Section 101(a)(7) states: "It is the national policy that programs for the control of nonpoint sources of pollution be developed and implemented in an expeditious manner so as to enable the goals of this Act to be met through the control of both point and nonpoint sources of pollution." The process for implementing water quality standards is described in the implementation plan in the state surface water standards, Section 1101 (Reference 1). Water quality standards are enforceable pursuant to the NM Water Quality Act through administrative penalties under Section 74-6-10 or through civil actions under Section 74-6-10.1(B), whether violations of standards are caused by point or nonpoint sources.

Processes used by the state to assure that surface water quality standards will be met differ depending on whether or not the receiving water body is water quality limited. A water quality limited segment is any water body segment where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after the application of the technology-based effluent limitations in NPDES permits required by section 301(b) and 306 of the Clean Water Act. The judgment on whether a water body segment is water quality limited is made contaminant by contaminant; a segment could be water quality limited for some contaminants but not for others. In any case, whether or not a segment is water quality limited, the State's antidegradation policy requirements described below must be met.

Evaluation of Water Body Segments

Data on the quality of surface waters of the State that has been gathered over a period of years by the NMED, the US Geological Survey, and other entities (see **Process for the Development of Total Maximum Daily Loads and Individual Water Quality Based Effluent Limitations** section above) is analyzed by NMED. If necessary, additional data are obtained through water quality surveys. On the basis of available data, NMED identifies those surface water segments not meeting water quality standards. These waters are identified in reports issued by NMED and in the biennial water quality report prepared by NMED and approved by the Water Quality Control Commission pursuant to section 305(b) of the federal Clean Water Act. A list of water quality limited segments is prepared and submitted to EPA for approval pursuant to Section 303(d) of the Clean Water Act.

Water Body Segments Not Water Quality Limited

If a water body segment already meets and is expected to continue meeting standards, and thus is not water quality limited, the implementation of standards is relatively straightforward. Every point source application for a new or revised NPDES permit will be evaluated, permit limitations set, and State certification provided by NMED in accordance with **Region 6 Implementation Guidance for State of New Mexico Standards for Interstate and Intrastate Streams** (Reference 2) and with the State antidegradation policy. Any existing nonpoint sources are already being adequately controlled through existing voluntary best management practices (BMPs), since water quality standards are being met. Organizations or individuals planning new nonpoint sources can obtain information and apply for assistance from NMED, Soil and Water Conservation Districts and other entities to enable them to adopt effective BMPs so that standards, including the antidegradation policy, will continue to be met.

Water Quality Limited Segments

Total Maximum Daily Loads (TMDLs): TMDLs are to be developed for water quality limited segments where effluent limitations or other pollution control requirements are not stringent enough to implement applicable water quality standards. TMDLs are the sum of the wasteload allocations (WLAs) contributed by point sources, plus the load allocations (LAs) contributed by nonpoint sources of pollution and natural background sources, plus a margin of safety. These loads must be established at a level necessary to implement the applicable water quality standards as required by the Clean Water Act Section 303(d)(1).

The State of New Mexico has developed TMDLs for some water quality limited segments. The document **The Process for Developing Total Maximum Daily Loads for Point Source Wasteload Allocations and Nonpoint Source Load Allocations with the Methodology for Stream Reach Ranking in the State of New Mexico** (Reference 3) was developed by NMED to carry out this process. The April 1997 Consent Decree in the case of Forest Guardians and Southwest Environmental Center v. Carol Browner, Administrator, U.S. Environmental Protection Agency (US District Court for the District of New Mexico CIV. NO. 96-0826 LH), and the subsequent Memorandum of Understanding (MOU) between EPA Region 6 and NMED resulted in a twenty year watershed schedule which is superimposed upon the Stream Reach Ranking System. These two 1997 documents, the Consent Decree and the MOU, spell out the schedule by which TMDLs in New Mexico are to be promulgated.

Point Sources: Each NPDES permit issued must contain requirements necessary to achieve water quality standards (40 CFR 122.4(d)). Where a WLA has been assigned through the TMDL process, the WLA will be incorporated in the permit. Where a WLA has not been developed, NMED (along with EPA) will review effluent discharge data to ensure that NPDES permits are protective of water quality standards. In reviewing such data, NMED will use recognized assessment protocols and other documentation to establish effluent limits when certifying NPDES permits. Documentation includes **Region 6 Implementation Guidance for State of New Mexico Standards for Interstate and**

Intrastate Streams (Reference 2) and the NM antidegradation policy found in the surface water quality standards.

Nonpoint Sources: The federal Clean Water Act states as the national policy that the goals of this Act are to be met through the control of both point and nonpoint sources of pollution. Further, the Code of Federal Regulations (CFR) 40 CFR 130.6(c)(4) provides that as part of its Water Quality Management Plan each State shall describe the regulatory and non-regulatory programs, activities and Best Management Practices (BMPs) which the agency has selected as the means to control nonpoint source pollution where necessary to protect or achieve approved water uses. The antidegradation policy calls for all cost-effective and reasonable BMPs for nonpoint source control. Neither the Act nor the CFR specify how nonpoint sources are to be controlled; that is left up to each State. But it is clear that under the Clean Water Act nonpoint sources must not be allowed to cause surface water standards to be violated. To deal with nonpoint sources of pollution New Mexico has chosen a voluntary BMP program which has proved to be successful where appropriately applied. Many agencies and organizations in New Mexico participate in promoting the control of nonpoint source pollution, reflecting the widespread desire that the voluntary program prove adequate to fully protect stream standards and existing and designated uses statewide and meet the antidegradation policy.

The New Mexico Nonpoint Source Management Program (NPSMP) describes the activities and resources devoted to the control of nonpoint source pollution. The NPSMP does not differentiate in application on the basis of whether or not load allocations (LAs) for nonpoint sources have been developed through the TMDL process for a particular stream reach under consideration. NMED is the lead agency for the NPSMP, and the nonpoint source interagency task force and other governmental and non-governmental entities actively participate in the program, as described in the NPSMP.

In New Mexico the primary sources of surface water nonpoint source pollution are erosion from rangelands, construction, silviculture, resource extraction, land disposal, roads, and recreation. The goal of the NPSMP is to develop and implement a program which will reduce, to the extent feasible, man-induced pollutants from nonpoint sources. Achievement of this goal is defined as attainment of surface water quality that will fully protect designated uses described in the State's surface water quality standards and meet the goals of the federal Clean Water Act. Nonpoint source controls are typically established through implementation of BMPs which can be either structural or nonstructural in nature.

Many of the stream segments which have been or are water quality limited due to nonpoint source pollution pass through public lands. NMED in 1990 signed a Management Agency Agreement with the U.S. Forest Service, Southwestern Region, and in 1992 signed a Memorandum of Understanding with the U.S. Bureau of Land Management (BLM), both for the purpose of achieving the water quality objectives of the federal Clean Water Act. Under each of these documents the federal agency involved agreed to ensure that all new and renewed land use authorizations, easements, rights-of-way documents, allotment management plans, term-grazing permits, and other

agreements involving permitted activities on properties administered by the federal agency would have enforceable provisions for compliance with water quality standards. Efforts under these agreements have resulted, and are expected to continue to result, in the implementation of BMPs and mitigation measures at many sites.

Road construction and maintenance (or lack thereof) has been a major source of nonpoint source pollution throughout the State. In 1994 NMED signed a Memorandum of Understanding with the NM State Highway and Transportation Department which has resulted, and is expected to continue to result, in an expanded program of sound BMP implementation at road construction and maintenance sites.

Antidegradation Policy

The Code of Federal Regulations, 40 CFR 131.12, states:

The State shall develop and adopt a statewide antidegradation policy and identify the methods for implementing such policy pursuant to this subpart. The antidegradation policy and implementation methods shall, at a minimum, be consistent with the following:

- (1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.*
- (2) 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. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall 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.*
- (3) Where 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.*

- (4) *In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementation method shall be consistent with section 316 of the Act. (The Act referred to is the federal Clean Water Act.)*

The State of New Mexico has incorporated its antidegradation policy, which is based on these EPA requirements, into its surface water quality standards (Reference 1). See 20 NMAC 6. 1.1101.A. The antidegradation policy is reviewed by the Water Quality Control Commission every three years during the triennial review of the standards. All of the antidegradation categories or tiers are implemented according to the "Antidegradation Policy Implementation Procedures" in Appendix A of this document.

PROCESS FOR CONTROLLING DISPOSITION OF RESIDUAL WASTE FROM WASTEWATER TREATMENT PROCESSING

New Mexico recognizes the importance of proper sewage sludge management to prevent ground and surface water pollution. The state accordingly allows three methods for the disposal of municipal sludge:

- * the disposal of dry sludge in landfills regulated by the New Mexico Environmental Improvement Board Solid Waste Management Regulations (20 NMAC 9.1);
- * land application including the injection of liquid sludge into subsurface soil, covered by the New Mexico Water Quality Control Commission Regulations (20 NMAC 6.2) and 40 CFR 503, Subpart B; and
- * surface disposal within an approved disposal unit, covered by 40 CFR 503, Subpart C and the New Mexico Water Quality Control Commission Regulations (20 NMAC 6.2).

PROCESS FOR PRIORITY RANKING OF WASTEWATER CONSTRUCTION LOANS PROJECTS AND MANAGEMENT OF THE PRIORITY LIST

The federal Clean Water Act as amended in 1987 authorized the U.S. Environmental Protection Agency (EPA) to make capitalization grants to the states to establish revolving loan funds, to which the states must make 20% matching contributions. The revolving fund provides loans for the construction of wastewater treatment facilities to prevent or abate water pollution in eligible communities. Any municipality, county, sanitation district, authorized Indian tribal organization, other public body created under state law which has jurisdiction over the disposal of domestic sewage, industrial wastes, or other waste may apply for loan assistance under the Act provided they qualify for such funding. The New Mexico Environment Department (NMED) administers the loan program under 20 NMAC 7.5 to 7.7 and the New Mexico Water Quality Act Sections 74-6A-1 to 74-6A-15 NMSA 1978.

As part of its administration of the wastewater construction loans program, NMED has devised the priority system used to rank projects eligible for funding. The priority system is set forth in the document: **Water Quality Control Commission Priority Rating System for Wastewater Facility Construction Loan Fund Projects** (Reference 5). NMED reviews the priority system annually and proposes any amendments deemed necessary for effective program implementation. The system as amended and the priority list are brought to public hearing. The final decision by the Water Quality Control Commission on any revisions to the priority system are based on the hearing. The amended system must then be approved by the U.S. Environmental Protection Agency.

DOCUMENTS INCORPORATED BY REFERENCE

- (1) New Mexico Water Quality Control Commission. 1995. State of New Mexico Standards for Interstate and Intrastate Streams. As amended through January 23, 1995. Santa Fe. 51 p.
- (2) Environmental Protection Agency, Region 6. 1995. Implementation Guidance for State of New Mexico Standards for Interstate and Intrastate Streams. Dallas, TX. 15 p.
- (3) New Mexico Environment Department. 1996. The Process for Developing Total Maximum Daily Loads for Point Source Wasteload Allocations and Nonpoint Source Load Allocations With the Methodology for Stream Reach Ranking in the State of New Mexico, pages 1-14. Santa Fe.
- (4) New Mexico Environment Department. 1998. State of New Mexico Procedures for Assessing Standards Attainment for Section 303(d) List and Section 305(b) Report, Assessment Protocol. Santa Fe. 18 p.
- (5) New Mexico Water Quality Control Commission. 1986. Water Quality Control Commission Priority Rating System for Wastewater Facility Construction Loan Protects. Santa Fe. 4 p.

State of New Mexico Continuing Planning Process

(Appendix A)



Antidegradation Policy Implementation Procedure

**Adopted by the New Mexico Water Quality Control Commission
December 14, 2004**

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ANTIDegradation Policy Implementation Procedures

I. INTRODUCTION

The Antidegradation Implementation Procedures (Procedures) establish the process for implementing the Antidegradation Policy (Policy) in the *Standards for Interstate and Intrastate Surface Waters* (New Mexico Water Quality Standards), 20.6.4.8 NMAC. The Procedures should be construed in conjunction with other planning tools approved by the Water Quality Control Commission, including the Integrated Clean Water Act (CWA) Section 303(d)/305(b) List and Report, and the Statewide Water Quality Management Plan.

II. SCOPE

The Procedures apply to every proposal for a new or increased discharge of a pollutant to a "surface water of the State."¹ "New or increased discharge" includes NPDES permits issued by the USEPA pursuant to CWA Section 402 and Dredge-and-Fill Permits issued by the U.S. Army Corps of Engineers (Army Corps) pursuant to CWA Section 404. The Procedures also apply to the renewal of permits for existing discharges in certain circumstances as determined by the Department, including a single discharge causing degradation over time, a single source contributing to cumulative degradation, and a single source with a history of permit noncompliance. The Procedures do not apply to other water quality-related actions, including revision of Commission documents (e.g., New Mexico Water Quality Standards, Continuing Planning Process, Water Quality Management Plan, and Nonpoint Source Management Program), the Commission's establishment of Total Maximum Daily Loads (TMDLs), or the conduct of studies, including use attainability analyses, by any party, including the Department.² These types of water quality-related actions already are subject to extensive requirements for review and public participation, as well as various limitations on degradation imposed by state and federal law.

These procedures do not apply to nonpoint sources. Section 74-6-10 of the New Mexico Water Quality Act addresses the enforceability of the water quality standards as they relate to nonpoint sources of pollution.

III. TIER DEFINITIONS

¹The term "surface water of the State" is defined in the New Mexico Water Quality Standards, 20.6.4.7.RR NMAC.

² See Section 4.8, *Water Quality Standards Handbook* (USEPA 1994).

The Policy establishes three categories of waters. These categories herein are called "tiers". The tier designation requires different levels of review and allows different levels of degradation. Tier 1 and 2 designations are made on a parameter-by-parameter basis. As a result, a water may be Tier 1 for one parameter and Tier 2 for a different one. Tier 3 designation is made based on the special nature of the water.

Figure 1 illustrates the tier designation process.

A. Tier 1

Tier 1 applies to waters that do not meet or meet but are not better than the water quality standards for existing or designated uses.³ Tier 1 waters that require Tier 1 review will be identified by assessing water quality information pursuant to established protocols. Waters identified as "impaired" for any existing or designated use according to the current *State of New Mexico Procedures for Assessing Standards Attainment for the Integrated §303(d) / §305(b) Water Quality Monitoring and Assessment Report: Assessment Protocol*⁴ automatically will be Tier 1 for the parameter of concern. Waters not identified as impaired on New Mexico's Integrated CWA 303(d) / 305(b) List will be evaluated on a case-by-case basis. The Department will conduct the evaluation using the available water quality information and the same protocols used to develop the Integrated 303(d) / 305(b) report.

The Policy defines the level of protection for Tier 1 waters: "Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." 20.6.4.8.A.1 NMAC. Existing uses are uses "actually attained in a surface water on or after November 28, 1975, whether or not they are actually included in the water quality standards." See 40 CFR 131.3(e); 20.6.4.6.Q NMAC. Tier 1 defines the minimum level of protection afforded to all waters regardless of tier designation.

B. Tier 2

Tier 2 applies to waters whose quality is better than necessary to protect the CWA Section 101(a)(2) goals. Tier 2 applies to all classified waters (e.g., identified in the New Mexico Water Quality Standards, Sections 101 through 899) that are not designated as Tier 1 on a parameter-by-parameter basis or as Tier 3. Tier 2 may apply

³ The terms "existing use" and "designated use" are defined in the *Code of Federal Regulations* (40 CFR 131.3) and the New Mexico Water Quality Standards (20.6.4.7 NMAC). The terms are not interchangeable and are subject to different levels of protection depending on the specific use. See, e.g., 40 CFR 131.10.

⁴ The protocol is based in part upon USEPA's *2002 Integrated Water Quality Monitoring and Assessment Report Guidance*; 2001 Memorandum from Robert H. Wayland, Office of Wetlands, Oceans, and Watersheds. Washington D.C.

to unclassified waters on a parameter-by-parameter basis depending on the available water quality information. Like Tier 1 waters, Tier 2 waters will be identified by assessing water quality information pursuant to established protocols.

The Policy defines the level of protection for Tier 2 waters:

Where the quality of a surface water of the state exceeds levels necessary to support the propagation of fish, shellfish, and wildlife, and recreation in and on the water, that quality shall be maintained and protected unless the commission finds,⁵ 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 and social development in the area in which the water is located. In allowing such degradation or lower water quality, the state shall assure water quality adequate to protect existing uses fully. Further, the state shall 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 BMPs for nonpoint source control. Additionally, the state shall encourage the use of watershed planning as a further means to protect surface waters of the state.

20.6.4.8.A.2 NMAC.

In Tier 2 waters, limited degradation may be allowed after consideration of several factors, including:

- 1) the discharge's potential to affect existing or designated uses or to interfere with CWA Section 101(a)(2) goals (water quality which provides for the "protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water");⁶
- 2) the need to accommodate important economic and social development in the area in which the water is located; and
- 3) the availability of discharge alternatives, including no discharge, reuse, land disposal, pollution prevention or reduction, and pollutant trading with point and non-point sources.

⁵ Pursuant to the New Mexico Water Quality Act, Section 74-6-4.E, the Commission delegated responsibility for implementing the antidegradation policy to the Department. See 20.6.4.8.E NMAC.

⁶ Commonly referred to as the "fishable/swimmable goals".

Even if the decision is made to allow degradation in Tier 2 waters, water quality must be maintained to ensure the protection of existing uses. Water quality also must be maintained to ensure the protection of designated uses unless the designated uses are modified through a use attainability analysis, 40 CFR 131.10(j) and 20.6.4.14 NMAC, or adequately protected by segment-specific water quality standards. Finally, water quality must be maintained to ensure the protection of the CWA Section 101(a)(2) uses. The applicant for the new or increased discharge (or an existing discharge in certain circumstances as described on page 7) bears the burden of demonstrating the social and economic need for degrading water quality.

C. Tier 3

The Policy defines the level of protection for Tier 3 waters:

No degradation shall be allowed in high quality waters designated by the commission as outstanding national resource waters (ONRWs). ONRWs may include, but are not limited to, surface waters of the state within national and state monument, parks, wildlife refuges, waters of exceptional recreational or ecological significance, and waters identified under the Wild and Scenic Rivers Act.

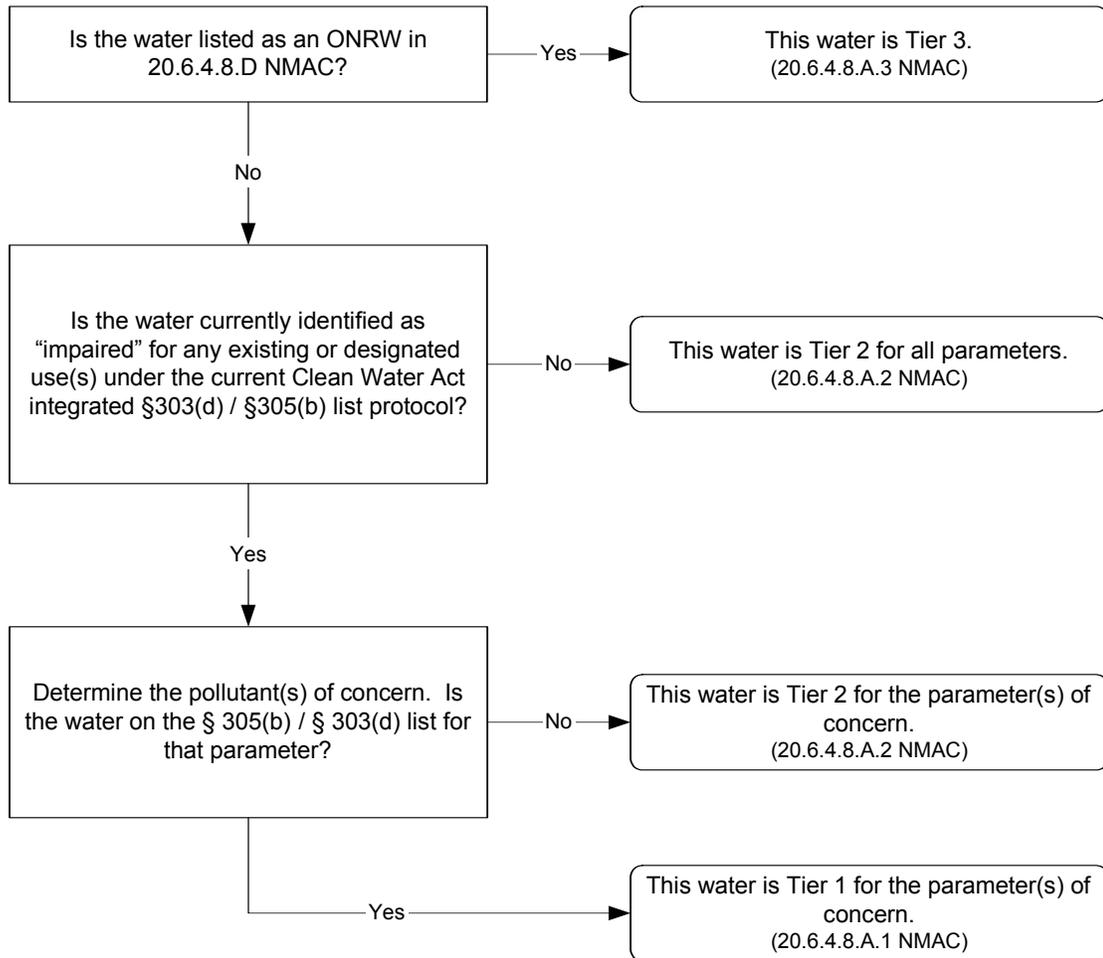
Tier 3 applies to waters that are designated by the Commission as "outstanding national resource waters." The Commission designates Tier 3 waters after public notice and comment pursuant to procedures established in the New Mexico Water Quality Standards. See 20.6.4.8.B NMAC.

The Policy prohibits any degradation in Tier 3 waters. 20.6.4.8.A.3 NMAC. However, this prohibition does not mean that all discharges are prohibited. In special circumstances, a discharge may be allowed if it does not cause degradation or causes only temporary and short-term changes in water quality that do not impair existing uses or if the activity is intended to implement the §101(a) objectives of the CWA. Such special circumstances must undergo antidegradation review.

Nonpoint source pollution resulting from preexisting land-use activities allowed or specifically authorized by federal or state law prior to designation as an ONRW, and controlled by best management practices (BMPs) shall not be considered to be sources of degradation for surface waters designated as ONRWs.

Figure 1. Tier Determination Flowchart

(Flow chart summarizes preceding narrative description, refer to narrative for complete detail)



IV. IMPLEMENTATION

A. Tier 1

The Department employs the CWA Section 401 certification process to ensure that water quality that does not meet or that meets but is not better than the water quality standards for existing uses in Tier 1 waters is not degraded by a new or increased discharge or the renewal of a permit for an existing discharge. See *Continuing Planning Process - Process for the Development of Effluent Limitations*. Section 401 certification ensures that NPDES and Dredge-or-Fill permits are consistent with state law, protect the water quality standards, and implement the water quality management plan, including TMDLs. Section 401 certification also ensures that NPDES permits comply with the federal requirement that a new or increased discharge will not cause or contribute to a violation of water quality standards, unless such discharge is authorized by a TMDL waste load allocation or similar mechanism prior to TMDL establishment. See 40 CFR 122.4(i).⁷

There are a number of opportunities for public participation in the review of new and increased discharges into Tier 1 waters. The Commission adopts TMDLs for Tier 1 waters not meeting water quality objectives. This process includes public notice and comment. The USEPA and Army Corps follow detailed procedures requiring public notice and comment when issuing NPDES and Dredge-or-Fill permits. Finally, the Department's Section 401 certification can be appealed and a full hearing held before the Commission.

B. Tier 2

1. Determination of Necessity

Tier 2 screening is triggered when a new or increased discharge or the renewal of a permit for an existing discharge is proposed for a receiving water with existing water quality better than necessary to support the propagation of fish, shellfish, and wildlife, or recreation in and on the water. The initial focus is the magnitude of the effect on water quality. If the magnitude of the effect on water quality exceeds a specified level, Tier 2 review will be conducted. Below that specified level, Tier 2 review will not be conducted. By establishing a *de minimis* level above which Tier 2 review will be conducted, limited state resources are directed to new or increased discharges and the renewal of permits for existing discharges with the likelihood of causing significant

⁷There is no comparable federal requirement for Dredge-or-Fill Permits, but the Department uses Section 401 certification to ensure that a new or increased discharge complies with TMDL waste load allocations.

degradation of water quality. Establishing *de minimis* action levels also helps reduce overall costs for the Department, the general public and dischargers.

In rare instances the WQCC may consider either establishing or revising a TMDL – Waste Load Allocation (WLA) in a Tier 2 water. This situation might arise where a previously established TMDL for a former Tier 1 water has been successful in restoring water quality and there is a subsequent application to revise the TMDL-WLA to allow an increase in the discharge of pollutants. In this situation two processes come into consideration, the public and commission review of the TMDL and the Department's review of the TMDL under the antidegradation policy. When this situation occurs, the two processes may for efficiency be held simultaneously or sequentially depending on the specific circumstances of the case.

The Department will evaluate whether the magnitude of the effect on water quality exceeds a specific level on a parameter-by-parameter basis. The evaluation will be conducted using numeric criteria only, because of the impracticability of applying the process to narrative criteria. It should be noted that the decision to use numeric criteria does not expose Tier 2 waters to substantial degradation of water quality because these waters are protected by overlapping designated and existing uses and their associated criteria, as well as by the NPDES and Dredge-or-Fill permits and Section 401 certification that must be written to protect the narrative criteria.

Figure 2 illustrates the process for determining whether a new or increased discharge is subject to Tier 2 review. The following text explains the figure in more detail.

a) Publicly Owned and Private Domestic Treatment Work Discharges

For purpose of Tier 2 review, the following new or increased discharges and the renewal of permits for existing discharges by publicly owned treatment works (POTWs) and privately owned domestic treatment works (PODTWs) are considered *de minimis* and are not subject to Tier 2 review provided that the assimilative capacity is more than 10% of the criterion for the parameter of concern and:

- 1) the POTW or PODTW has a design capacity of 0.1 million gallons per day or less and is eligible to omit Part B of the NPDES permit application form (OMB Number 2040-0086, Approved 1/14/99);⁸

⁸ During the development of the revised NPDES permit application form, USEPA studied the potential for minor POTWs and PODTWs to cause violations of water quality standards. USEPA found that these facilities posed an extremely low probability of causing a violation of water quality standards because of their low volume and effluent quality (even without considering the ameliorative effect of dilution). 64 Fed. Reg. 42433 (August 4, 1999).

- 2) the design capacity of the POTW or PODTW or the pollutant load (measured on a parameter-by-parameter basis) will increase 10 percent or less in a five-year period, and the exemption is not used for two consecutive permits;
- 3) the design capacity of the POTW or PODTW will increase by 10 to 25 percent in a five-year period, the POTW or PODTW demonstrates to the Department's satisfaction that it is implementing a water conservation or wastewater reuse or diversion program designed to reduce the discharge pollutant load by at least 10 percent in that five-year period, and the exemption is not used for two consecutive permits;
- 4) the design capacity of the POTW or PODTW is 10 percent or less of the critical low flow of the receiving stream (as defined in the water quality standards);
- 5) the POTW or PODTW demonstrates to the Department's satisfaction that its pollutant load (measured on a parameter-by-parameter basis) will be offset by enforceable reductions by other point or nonpoint sources within the same waterbody segment as the new or increased discharge; or
- 6) the new or increased discharge or the renewal of a permit for an existing discharge was reviewed in an Environmental Assessment (EA) or Environmental Impact Statement (EIS) that considered water quality impacts and the social and economic development in the area in which the water is located and that was conducted in accordance with federal regulations, and in the case of an EA, the responsible federal agency made a Finding of No Significant Impact (FONSI).

Notwithstanding these *de minimis* activities, the Department shall conduct Tier 2 review for any new or increased discharge or the renewal of a permit for an existing discharge by a POTW or PODTW when the discharge, taken together with all other activities allowed after the baseline water quality is established⁹, would cause a reduction in the available assimilative capacity of 10 percent or more for the parameter of concern.

For purpose of this section, available assimilative capacity is defined as the difference between the baseline water quality and the water quality criterion for the parameter of concern. (See Appendix C to this document for guidelines for calculating assimilative capacity).

Figure 2 illustrates the process for determining whether a new or increased discharge or the renewal of a permit for an existing discharge by a POTW or PODTW is

⁹ When evaluating the "baseline" condition, the Department will consider any previous antidegradation reviews for the same body of water to prevent cumulative impacts.

subject to Tier 2 review. Figure 2 is presented for illustration only and may not address all possible circumstances. In the event of omission, ambiguity or conflict, the written provisions of these procedures will control.

b) Industrial Discharges

For purpose of Tier 2 review, the following new or increased discharges and the renewal of permits for existing discharges by industrial activities are considered *de minimis* and are not subject to Tier 2 review provided that the assimilative capacity is more than 10% of the criterion for the parameter of concern and:

- 1) the discharger demonstrates to the Department's satisfaction that the new or increased discharge will consume 10 percent or less of the available assimilative capacity for the pollutant of concern;
- 2) the discharger demonstrates to the Department's satisfaction that its pollutant load (measured on a parameter-by-parameter basis) will be offset by enforceable reductions by other point or nonpoint sources within the same waterbody segment as the new discharge; or
- 3) the new or increased discharge or the renewal of a permit for an existing discharge was reviewed in an EA or EIS that considered water quality impacts and the social and economic development in the area in which the water is located and that was conducted in accordance with federal regulations, and in the case of an EA, the responsible federal agency made a FONSI.

Notwithstanding these *de minimis* activities, the Department shall conduct Tier 2 review for any new or increased discharge or the renewal of a permit for an existing discharge by an industrial activity when the discharge, taken together with all other activities allowed after the baseline water quality is established, would cause a reduction in the available assimilative capacity of 10 percent or more for the parameter of concern.

For purpose of this section, available assimilative capacity is defined as the difference between the baseline water quality and the water quality criterion for the parameter of concern. (See Appendix C to this document for guidelines for calculating assimilative capacity).

c) General Permits

New or increased discharges and the renewal of permits for existing discharges covered by NPDES General permits and Dredge-or-Fill Nationwide and Regional

permits present special considerations regarding Tier 2 review because of their approach of authorizing categories of discharges over a broad geographic range. Three categories of NPDES General permits (No Discharge, Storm Water, and Aquifer Remediation) and several categories of Nationwide (Dredge-or-Fill) permits have been issued in New Mexico.

EPA has not issued any national guidance regarding Tier 2 review for general permits. Accordingly, the Commission adopts the following approach for general permits in New Mexico. Further, the Department reserves the right to require that any new or increased discharge or the renewal of a permit for an existing discharge (1) be subject to Tier 2 review if warranted by the facts and circumstances, or (2) be required to obtain an individual NPDES or Dredge-or-Fill permit (and thereby subject to Tier 2 review).¹⁰

i) No Discharge General Permits

Existing and former “No Discharge General Permits” include NPDES General Permits for Oil and Gas Facilities in the Onshore Subcategory of the Oil and Gas Extraction Point Source Category (Onshore O&G)¹¹ and Concentrated Animal Feeding Operations (CAFOs).

The Onshore O&G NPDES General Permit prohibited all discharges of pollutants to waters of the United States. 56 Fed. Reg. 7698 (February 25, 1991). Because discharges covered by this general permit were prohibited, water quality would not be degraded. In addition, Onshore O&G activities generally are considered to have social and economic importance to New Mexico.

The CAFO General Permit prohibits all discharges unless caused by (1) a storm event greater than the 25-year 24-hour storm for the CAFO location; (2) chronic rainfall greater than the 25-year 24-hour storm for the CAFO location; or (3) a catastrophic event, such as a tornado, provided that the CAFO is properly designed and operated. 58 Fed. Reg. 7611 (February 8, 1993). Because discharges covered by this general permit are prohibited except in exceptional circumstances beyond the control of the CAFOs, the degradation of water quality, beyond temporary or short-term impacts, is unlikely. In addition, CAFOs

¹⁰ Federal regulations for NPDES General Permits (40 CFR 122.28) and Dredge-and-Fill Nationwide and Regional Permits (33 CFR 325.7) require a discharger to obtain an individual NPDES or Dredge-and-Fill permit if, *inter alia*, circumstances have changed since the original authorization or the discharge is deemed to be "significant".

¹¹ The oil & gas permit expired on February 25, 1996. As of August 2004, EPA has no plan to reissue the permit. It is included in this discussion as an example of the types of general permits that have occurred in NM and therefore may occur in the future.

- primarily dairies and cattle feedlots - generally are considered to have social and economic importance to New Mexico.

ii) Storm Water General Permits

Storm Water General Permits include the NPDES General Permits for Storm Water Discharges from Construction Activities, 68 Fed. Reg. 39087 (July 1, 2003), and the NPDES General Permit for Storm Water from Industrial Activities, 65 Fed. Reg. 64746 (October 30, 2000). Storm water discharges are transient in nature, particularly in the desert climate of New Mexico. Storm water discharges from construction activities are even more transient because they occur only during the construction itself. Further, storm water dischargers seeking coverage under these general permits are required to identify pollutants on a parameter-by-parameter basis and to design and implement controls to prevent or reduce their discharge. As a result, storm water discharges that comply with general permits are not likely to cause significant degradation of water quality. In addition, industrial and construction activities generally are considered to have social and economic importance to New Mexico.

iii) Aquifer Remediation General Permits

The Aquifer Remediation General Permit was the NPDES General Permit for Discharges Resulting from Implementing Corrective Action Plans for Cleanup of Petroleum UST Systems. 62 Fed. Reg. 61116 (November 14, 1997). These discharges resulted from projects implemented to remediate groundwater contaminated with petroleum products from leaking underground storage tanks. The general permit imposed stringent effluent limitations on these discharges, even though they are considered to be relatively clean. Accordingly, these kinds of discharges are not expected to cause degradation to water quality. Moreover, because 90 percent of New Mexico's population relies on groundwater for drinking water (2000 CWA § 305(b) Report, page 87), these discharges are considered to have social and economic importance to New Mexico.

iv) Dredge or Fill General Permits

The Dredge-or-Fill General Permit authorizes the discharge of fill material within the ordinary high water mark of waters of the United States. The Army Corps under CWA Section 404 regulates these

discharges. The Department, pursuant to its CWA Section 401 certification of this general or "Nationwide" permit, requires dischargers to obtain specific authorization before commencing the discharge. As a result, dischargers are subject to Section 401 certification review. Based on this review, the Department may grant the authorization, grant the authorization with conditions, or deny the authorization. To implement the Policy, the Department will use the authorization process to evaluate whether a discharge will cause significant degradation of water quality. A discharge will be deemed to cause significant degradation of water quality if the load of pollutants is quantifiable¹² and (1) the new or increased discharge or the renewal of a permit for an existing discharge will consume 10 percent or more of the total assimilative capacity for the pollutant of concern, or (2) the new or increased discharge or the renewal of a permit for an existing discharge, taken together with all other activities allowed after the baseline water quality is established, would cause a reduction in the available assimilative capacity of 10 percent or more for the parameter of concern.

For purpose of this section, available assimilative capacity is defined as the difference between the baseline water quality and the water quality criterion for the parameter of concern.

If the Department determines that a discharge will cause significant degradation, the Department will either impose conditions to avoid significant degradation or require Tier 2 review.

v) Future General Permits

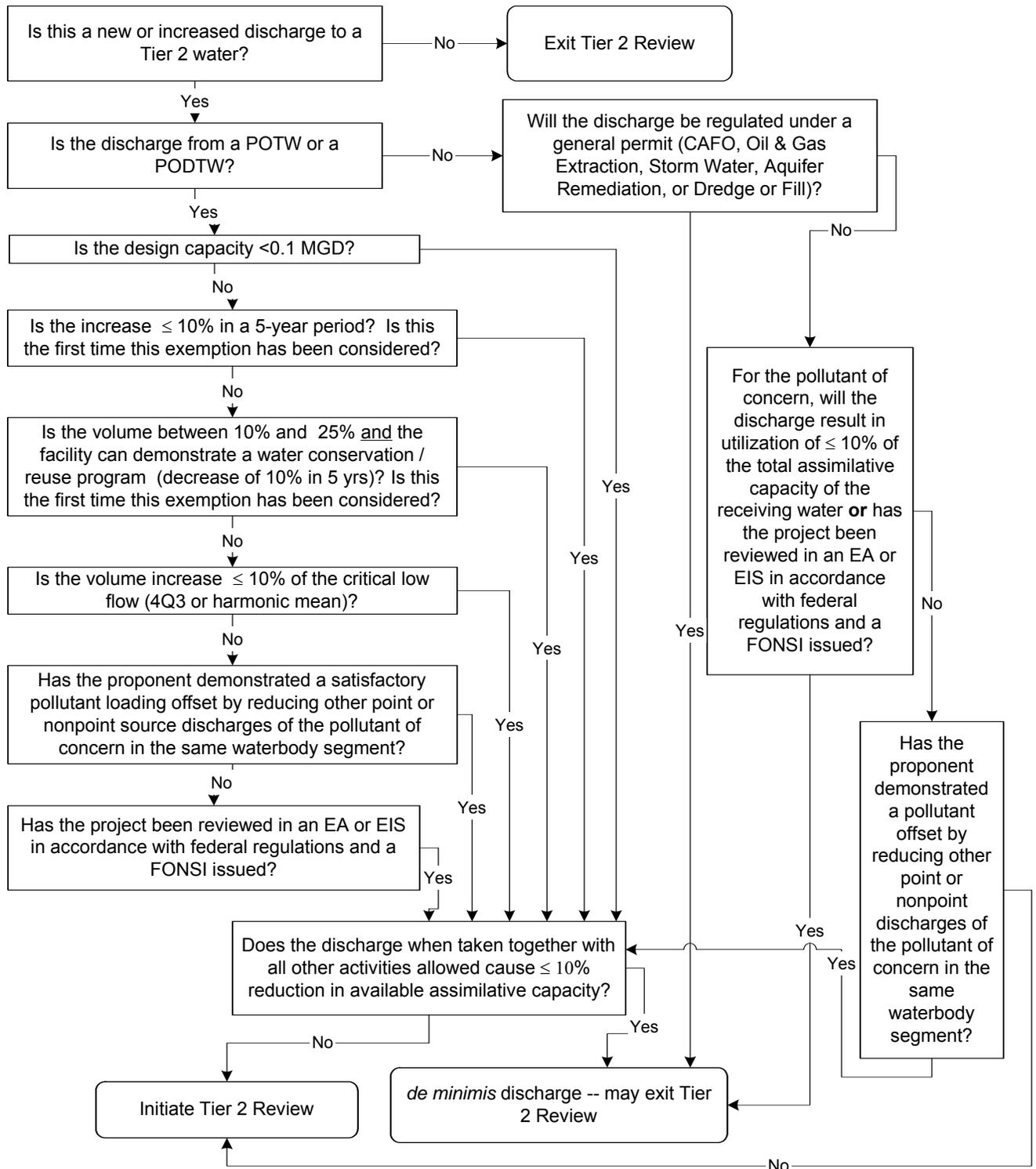
General permits are an important tool in addressing categories of discharges where large numbers of facilities are engaged in similar activities such as those described above. Review of future proposed general permits will be on a case-by-case basis. The Department will consider the nature of the permit requirements and determine a course of action.

¹² Pollutant loads from Dredge or Fill permits are often difficult or impossible to quantify in the same manner as practiced in NPDES permits. Dredge or Fill permits are often temporary construction measures in or near a watercourse that may result in disturbance or deposition of sediments in the water. The primary tool for limiting the discharge of pollutants (e.g., sediment and contaminated sediment) from these activities is through permit requirements mandating the installation and operation of best management practices (BMPs) that prevent pollutant transport to a watercourse and thereby degradation. The SWQB reviews dredge or fill projects pursuant to conditions of the State's CWA Section 401 certification of the Nationwide permits. The SWQB has long employed a strategy of requiring the implementation of BMPs, necessary to protect state water quality standards that are designed to prevent to maximum extent possible the discharge of pollutants instead of allowing a particular quantity of pollutant to be discharge.

As practical guidance:

1. No Discharge general permits such as the no discharge CAFO and Oil & Gas cited above may be considered *de minimis* impacts and may not be required to proceed through full Tier 2 antidegradation review. The Department may at its discretion initiate a review if it deems the case-by-case circumstances warrant such action;
2. Storm Water general permits for industrial activities such as those cited above may be considered *de minimis* and may not be required to proceed through full Tier 2 antidegradation review. The Department may at its discretion initiate a review if it deems the case-by-case circumstances warrant such action;
3. Storm Water general permits for municipal or urban runoff may be proposed to comply with CWA Section 402(p). Urban runoff from municipalities has existed historically but has not been regulated under the NPDES program. Consideration should be given that these discharges may be from existing systems and as such are existing discharges. New permit requirements such as implementation of best management practices will reduce existing loads of pollutants entering the storm sewer system and therefore the receiving water. Therefore these permit actions should be considered as reducing any degradation that may result from these discharges and therefore not require Tier 2 antidegradation review;
4. Environmental remediation permits such as the Aquifer Remediation general permit cited above may be considered *de minimis* impacts and in the public interest for social and economic benefit and may not be required to proceed through full Tier 2 antidegradation review. The Department may at its discretion initiate a review if it deems the case-by-case circumstances warrant such action;
5. Dredge or Fill Permits General Permits (or Nationwide Permits) should continue to be reviewed in the same manner as existing Dredge or Fill permits. The Department may at its discretion initiate a review if it deems the case-by-case circumstances warrant such action;
6. The Department should consider other types of general permits on a case-by-case basis with the same principles as considered in the above examples. The Department shall advise the Commission of *de minimis* determinations in respect to general permit certifications at the first WQCC meeting after the permit certification is completed.

Figure 2. Tier 2 Review - Eligibility Flowchart
 (Flow chart summarizes preceding narrative description, refer to narrative for complete detail)



2. Conducting Tier 2 Review

The steps for reviewing whether a new or increased discharge or the renewal of a permit for an existing discharge to a Tier 2 water may cause significant degradation are: 1) information gathering, 2) preliminary decision-making, 3) public-intergovernmental participation, and 4) final decision-making.

a) Information Gathering

Within 30 days of receipt of the complete permit application, the Department shall notify the applicant regarding the standard of review for the new or increased discharge or the renewal of a permit for an existing discharge and its obligation to submit the information described below, as well as any other information that the Department may require to conduct the review. Within 30 days of receipt of the Department's notification, the applicant shall submit the required information. Within 30 days of receipt of the applicant's response, the Department shall notify the applicant whether the response is adequate and whether additional information is required. Upon the applicant's satisfaction of the Department's requests for information, the Department shall determine that the application is complete and initiate the antidegradation review. The applicant's failure to submit the requested information may result in certification denial or delay in permit issuance.

The Department shall request at least the following information:

- 1) An analysis of important social or economic activities and development in the area in which the water is located that may be *beneficially* impacted by the new or increased discharge or the renewal of a permit for an existing discharge;
- 2) An analysis of important social or economic activities and development in the area in which the water is located that may be *adversely* impacted by the new or increased discharge or the renewal of a permit for an existing discharge;
- 3) An analysis of the following factors, quantified to the greatest extent possible;
 - a) employment;
 - b) production of goods and services;
 - c) tax base;
 - d) housing;
 - e) effect on existing or expected environmental and public health problems;

- f) any other relevant information; and
- 4) An analysis of alternative disposal options (including no discharge to a surface water) or discharge reduction options, including any option that would minimize degradation.

The Department also may require, in its discretion, that the applicant complete the Antidegradation Data Worksheets in Appendix 1 or Appendix 2.

b) Preliminary Decision-Making

Within 60 days of the Department's determination that the information submitted pursuant to the above paragraph is complete, the Department shall make a preliminary decision to deny or authorize the degradation. The Department shall prepare a written statement of basis for the preliminary decision containing the following information (as applicable):

- a) Applicant's name, facility, and location;
- b) Description of the discharge, including the nature and concentration of pollutants;
- c) Description of receiving water, existing and designated uses, and applicable criteria;
- d) Identification of the permit and the facility's permitting and enforcement history;
- e) Description of treatment or best management practices to be employed and a brief description of alternative disposal options evaluated by the applicant.
- f) Estimation of the amount of requested degradation and impact on receiving water and existing and designated uses;
- g) Analysis of economic or social importance and whether and what magnitude of degradation is necessary to accommodate it;
- h) Description and brief discussion of conditions to be imposed upon discharge; and
- j) Description of the procedures for reaching a final decision including:

- 1) The comment period and address where comments may be sent;
- 2) Procedure for obtaining a public hearing;
- 3) Other procedures for public participation in the final decision;
- 4) Departmental contact for additional information.

c) Public Comment and Intergovernmental Coordination

The Department will publish notice and provide an opportunity to comment on the preliminary decision and statement of basis. The public comment period shall be no less than 30 days. During the public comment period, any interested person may submit written comments and request a public hearing. A request for a public hearing must be in writing and must state the nature of the issues to be raised. If the Department determines that the request for public hearing raises issues of significant public interest within the scope of the antidegradation policy, the Department will hold a public hearing. The public hearing will be held in a location near the water affected by the discharge.

With respect to the public notice, the Department shall:

- 1) Publish legal notice in a newspaper of general circulation in the affected area;
- 2) Post the legal notice on the Department website;
- 3) Mail the legal notice to all persons who have submitted a written request to the Commission for advance notice of preliminary decisions and provided the Commission with a mailing address; and
- 4) The legal notice shall describe where a copy of the preliminary decision and statement of basis may be obtained.

d) Final Decision

Within 60 days after the later of the close of the public comment period or the public hearing, the Department shall issue a final decision and a written statement of basis. The statement of basis shall:

- 1) Review the relevant facts, including the applicant, facility, water, uses, and criteria;
- 2) Identify changes from the preliminary decision and statement of basis;

- 3) Identify and summarize the basis for any conditions to be imposed on the discharge, including citations to applicable statutory and regulatory provisions;
- 4) Respond to comments on the preliminary decision and statement of basis, including comments during the public comment period and public hearing, if any; and
- 5) Describe the process for filing an appeal with the Commission.

The Department shall send the final decision to the applicant and to each person who submitted written comments or requested notice of the final decision. The final decision shall be effective immediately.

C. Tier 3

The Policy prohibits the degradation of Tier 3 waters by a new or increased discharge or the renewal of a permit for an existing discharge, but this prohibition is not the same as prohibiting any new or increased discharge or the renewal of a permit for an existing discharge. It is theoretically possible for an applicant to make a case-by-case demonstration that a new or increased discharge or the renewal of a permit for an existing discharge will not cause degradation or will cause only temporary and short-term changes in water quality that do not impair existing uses. Any application for a new or increased discharge or the renewal of a permit for an existing discharge in a Tier 3 water will be considered on a case-by-case basis applying the Tier 2 review process as modified by the Department to reflect unique factors associated with the Tier 3 water. The unique factors should include the specific goal and the environmental impact of these activities, and the intensity and duration of those impacts and how the impacts will be minimized.

V. APPEALS

Persons adversely affected by any final decision of the Department may appeal to the Commission in accordance with the New Mexico Water Quality Act.

APPENDIX – 1 Tier 2 Review of a Public Facility

Appendix 1 includes additional information that may be required by the Department to evaluate socio-economic factors of a public facility during a Tier 2 review. This evaluation is based on two types of impacts, referred to as “substantial” and “widespread”. The Substantial Impacts analysis is found in Tables 1-3 – 1-7. The Widespread Impacts¹³ analysis is found in Table 1-8.

SUBSTANTIAL IMPACTS - SUMMARY

Purpose of Substantial Impacts analysis: Determine whether a public facility can afford pollution controls in order to avoid any degradation of water quality.

The first step in a Substantial Impacts analysis is to provide data on the socio-economic factors listed in the worksheets in Tables 1-1 and 1-2. This data is then used to determine two indicators called the “Municipal Affordability Screener” (Table 1-3) and the “Secondary Affordability Test” (Tables 1-4 – 1-6). The results of these indicators are then compared in the “Assessment of Substantial Impacts Matrix” (Table 1-7) as a way to determine overall affordability to the community.

Widespread Impacts - Summary

Purpose of Widespread Impacts Analysis: evaluates the social costs of pollution control requirements by: 1) defining the affected community; 2) evaluating the community’s current characteristics; and 3) evaluating how community characteristics would change if discharger must avoid degradation to water quality.

If the conclusion from the Substantial Impacts analysis is “Questionable Affordability” or “Community cannot afford the pollution control”, then a Widespread Impacts analysis may be completed to further resolve the affordability issue. This analysis is primarily a qualitative evaluation based on community socioeconomic factors that are expanded to a larger scale than the Substantial Impacts analysis.

¹³ Widespread Impact Analysis forms derived from EPA’s Water Quality Standards Academy Participant Manual Update-4, 2000 [EPA 823-B-00-005].

Table 1-1. Antidegradation Data Worksheet

SOCIO-ECONOMIC INDICATORS	DATA
CITY'S DEMOGRAPHICS	
Population _____ (year)	
Current Population _____ (year)	
Type of household moving away from _____ (city)	
Number of households	
Median Household Income (U.S. Census, Census Designated Place)	
Median Household Income (Local Planning Board Estimates, City)	
Median Household Income (U.S. Census, State)	
Median Household Income (U.S. Census, County)	
Major Type of Employment	
Regional Economic Conditions	
% of Total Wastewater Flow from Residential & Municipal Sources	
Unemployment Rate (City)	
Unemployment Rate (County)	
Unemployment Rate (State)	
CITY'S FINANCIAL HISTORY	
Property Tax Revenues _____ (year)	
Sales Tax & Miscellaneous Revenues _____ (year)	
Total Government Revenues _____ (year)	
Property Tax Revenues (FY _____)	
Sales Tax & Miscellaneous Revenues (FY _____)	

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Total Government Revenues (FY _____)	
Current Market Value of Taxable Property (FY _____)	
Property Tax Delinquency Rate	
Bond Rating - insured sewer	
Bond Rating - non insured sewer	
Overall Net Debt (FY _____)	

Table 1-2. Antidegradation Data Worksheet

SOCIO-ECONOMIC INDICATOR	DATA
Cost of Treatment Options (pollution controls) that will Avoid Degradation of Water Quality	
Capital Improvements	
OPTION 1. (year) _____ dollars	
OPTION 2. (year) _____ dollars	
Annual Operating Costs	
OPTION 1. (year) _____ dollars	
OPTION 2. (year) _____ dollars	
FINANCING FOR WASTEWATER TREATMENT OPTIONS	
OPTION 1. Source of Financing	
Repayment Term, Vehicle	
Bond Rate	
Total Annual Cost of Existing Plant	
OPTION 2. Source of Financing	
Repayment Term, Vehicle	

Bond Rate	
Total Annual Cost of Existing Plant	

Table 1-3. Substantial Impacts Analysis – Part I

PART I. CALCULATING THE MUNICIPAL AFFORDABILITY SCREENER	
This screener is used to evaluate expected impacts to households. It indicates whether community households can afford to pay the total annualized pollution control costs to avoid water quality degradation.	
A. Calculate Average Annualized Cost Per Household	
1. Calculate the Total Annual Cost of the Project	
Interest Rate for Financing (<i>i</i>) =	_____ (expressed as a fraction)
Time Period for Financing (<i>n</i>) =	_____ (years)
Annualization Factor: $\frac{i}{(i + 1)^n - 1} (+ i) =$	_____ (1)
Total Capital Cost of Project to be Financed =	_____ (2)
Annual Operating Costs of Project =	_____ (3)
Annualized Capital Cost [(1) x (2)] =	_____ (4)
Total Annual Cost of Project [(3) + (4)] =	_____ (5)
2. Calculate the Total Annual Cost to Households	
Total Annual Cost of Project (5) x Percentage of Total Wastewater Flow Attributable to Residential and Municipal Wastewater Flows =	_____ (6)
Total Annual Cost of Existing Plant (\$) x Percentage of Total Wastewater Flow Attributable to Residential and Municipal Wastewater Flows =	_____ (7)
Total Annual Cost to Households [(6) + (7)] =	_____ (8)
3. Calculate the Average Annualized Cost Per Household	
$\frac{\text{Total Annual Cost to Households (8)}}{\text{Number of Households}} =$	_____ (9)
B. Calculate Screener Value:	
$\frac{\text{Average Annualized Cost Per Household (9)}}{\text{Median Household Income}} (x 100) =$	_____ % municipal affordability screen (10)

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What type of impact does the Municipal Affordability Screener Indicate in table below?			_____ impact
Little Impact < 1.0 %	Mid-Range Impact 1.0% - 2.0%	Large Impact > 2.0%	
Explanation of Impacts: <u>Little Impact</u> – high affordability; households can afford to pay pollution control costs <u>Mid-Range Impact</u> – uncertain affordability <u>Large Impact</u> – low affordability; pollution control costs may cause economic hardship on households			
Is there a need to proceed to the Secondary Affordability Test? (yes, if large impact or mid-range impact)			_____ (yes/no)

Table 1-4. Substantial Impacts Analysis – Part II

PART II. APPLYING THE SECONDARY AFFORDABILITY TEST																				
A. EVALUATING THE DEBT INDICATORS																				
Bond Rating: This is a Measure of the Credit Worthiness of a Community																				
What is Bond Rating of (name of municipality) _____ ?				_____																
What is the resulting score? (assign score from table below)																				
<table border="1"> <tr> <td>Source of Bond Rating</td> <td>Weak</td> <td>Mid-Range</td> <td>Strong</td> </tr> <tr> <td>S&P</td> <td>below BBB</td> <td>BBB</td> <td>above BBB</td> </tr> <tr> <td>Moody's</td> <td>below Baa</td> <td>Baa</td> <td>above Baa</td> </tr> <tr> <td>Score</td> <td>1</td> <td>2</td> <td>3</td> </tr> </table>	Source of Bond Rating	Weak	Mid-Range	Strong	S&P	below BBB	BBB	above BBB	Moody's	below Baa	Baa	above Baa	Score	1	2	3				
Source of Bond Rating	Weak	Mid-Range	Strong																	
S&P	below BBB	BBB	above BBB																	
Moody's	below Baa	Baa	above Baa																	
Score	1	2	3																	
				_____ score points (11)																
Overall Net Debt to Market Value of Taxable Property: This measures Debt Burden on Residents within the Community																				
(municipality) _____ Overall Net Debt =				_____ (12)																

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(municipality) _____ Market Value of Taxable Property =	_____ (13)												
$\frac{\text{Overall Net Debt (12)}}{\text{Market Value of Taxable Property (13)}} \times 100 =$	_____ % (13a)												
What is the resulting score? (assign score from table below)													
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 15%;"></td> <td style="width: 25%;">Weak</td> <td style="width: 25%;">Mid-Range</td> <td style="width: 35%;">Strong</td> </tr> <tr> <td>Compare % from 13a</td> <td>>5%</td> <td>2% - 5%</td> <td><2%</td> </tr> <tr> <td>Score</td> <td>1</td> <td>2</td> <td>3</td> </tr> </table>		Weak	Mid-Range	Strong	Compare % from 13a	>5%	2% - 5%	<2%	Score	1	2	3	_____ score points (14)
	Weak	Mid-Range	Strong										
Compare % from 13a	>5%	2% - 5%	<2%										
Score	1	2	3										
<p>Explanation of Ratings:</p> <p><u>Weak</u> = negative effect on indicator from increased costs for pollution controls</p> <p><u>Mid-Range</u> = uncertain effect on indicator</p> <p><u>Strong</u> = indicator can withstand increased costs for pollution controls</p>													

Table 1-5. Substantial Impacts Analysis – Part II

PART II. APPLYING THE SECONDARY AFFORDABILITY TEST (continued)													
B. EVALUATING THE SOCIOECONOMIC INDICATORS													
<p>Unemployment Rate: This measures the General Economic Health of the Community</p>													
What is (municipality) _____ Unemployment Rate?	_____												
Is this above, below, or equal to the State's rate?	_____												
What is the resulting Score? (assign score from table below)													
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 15%;"></td> <td style="width: 25%;">Weak</td> <td style="width: 25%;">Mid-Range</td> <td style="width: 35%;">Strong</td> </tr> <tr> <td>Compare unemployment rate</td> <td>Above State Average</td> <td>State Average</td> <td>Below State Average</td> </tr> <tr> <td>Score</td> <td>1</td> <td>2</td> <td>3</td> </tr> </table>		Weak	Mid-Range	Strong	Compare unemployment rate	Above State Average	State Average	Below State Average	Score	1	2	3	_____ score points (15)
	Weak	Mid-Range	Strong										
Compare unemployment rate	Above State Average	State Average	Below State Average										
Score	1	2	3										

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Median Household Income: This Measure Provides an Overall Indication of Community Earning Capacity				
What is (municipality) _____ Median Household Income?				
Is this above, below, or equal to the State's rate?				
What is the resulting Score? (assign score from table below)				
	Weak	Mid-Range	Strong	
Compare median income	Below State Average	State Average	Above State Average	
Score	1	2	3	_____ score points (16)

Table 1-6. Substantial Impacts Analysis – Part II

PART II. APPLYING THE SECONDARY AFFORDABILITY TEST (continued)				
C. EVALUATING THE FINANCIAL MANAGEMENT INDICATORS				
Property Tax Revenue to Full Market Value of Taxable Property: This Measures Funding Capacity Available to Support Debt Based on Community's Wealth				
What is (municipality) _____ Property Tax Revenue?				(17)
What is the Full Market Value of Taxable Property?				(18)
$\frac{\text{Property Tax Revenue (17)}}{\text{Full Market Value of Taxable Property (18)}} \times 100 =$				_____ % (18a)
What is the resulting Score? (assign score from table below)				
	Weak	Mid-Range	Strong	
Compare % from 18a	<2%	2% - 4%	>4%	
Score	1	2	3	_____ score points (19)
Property Tax Collection Rate: This Measures How Well the Local Government is Administrated				

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What is the Property Tax Collection Rate of (municipality)	_____%_												
What is the resulting Score? (assign score from table below)													
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20%;"></td> <td style="width: 25%;">Weak</td> <td style="width: 25%;">Mid-Range</td> <td style="width: 30%;">Strong</td> </tr> <tr> <td style="text-align: left;">Compare tax collection rate</td> <td><94%</td> <td>94% - 98%</td> <td>>98%</td> </tr> <tr> <td style="text-align: left;">Score</td> <td>1</td> <td>2</td> <td>3</td> </tr> </table>		Weak	Mid-Range	Strong	Compare tax collection rate	<94%	94% - 98%	>98%	Score	1	2	3	_____ score points (20)
	Weak	Mid-Range	Strong										
Compare tax collection rate	<94%	94% - 98%	>98%										
Score	1	2	3										
D. CALCULATE THE CUMULATIVE SECONDARY AFFORDABILITY TEST SCORE: This is the average score of all the indicators calculated above.													
$\frac{(11) + (14) + (15) + (16) + (19) + (20)}{6} =$	_____ cumulative score (21)												
In what impact range does the cumulative secondary score fall?													
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20%;"></td> <td style="width: 25%;">Weak</td> <td style="width: 25%;">Mid-Range</td> <td style="width: 30%;">Strong</td> </tr> <tr> <td style="text-align: left;">Compare cumulative score from 21</td> <td>< 1.5</td> <td>1.5 – 2.5</td> <td>> 2.5</td> </tr> </table>		Weak	Mid-Range	Strong	Compare cumulative score from 21	< 1.5	1.5 – 2.5	> 2.5	_____ impact range				
	Weak	Mid-Range	Strong										
Compare cumulative score from 21	< 1.5	1.5 – 2.5	> 2.5										

Table 1-7. Substantial Impacts Analysis – Part III

Part III. Assessment of Substantial Impacts Matrix																
THE MUNICIPAL AFFORDABILITY SCREENER (10) =	_____ %															
THE CUMULATIVE SECONDARY AFFORDABILITY TEST SCORE (21) =	_____ score points															
Where does (municipality) _____ appear in the Substantial Impacts Matrix below?																
Substantial Impacts Matrix																
Secondary Assessment Score	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="3" style="padding: 5px;">Municipal Affordability Screener</th> </tr> <tr> <th style="width: 33%; padding: 5px;"><1.0%</th> <th style="width: 33%; padding: 5px;">1.0% - 2.0%</th> <th style="width: 33%; padding: 5px;">>2.0%</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">< 1.5</td> <td style="padding: 5px;">?</td> <td style="padding: 5px;">X</td> </tr> <tr> <td style="padding: 5px;">1.5 – 2.5</td> <td style="padding: 5px;">√</td> <td style="padding: 5px;">?</td> </tr> <tr> <td style="padding: 5px;">> 2.5</td> <td style="padding: 5px;">√</td> <td style="padding: 5px;">?</td> </tr> </tbody> </table>	Municipal Affordability Screener			<1.0%	1.0% - 2.0%	>2.0%	< 1.5	?	X	1.5 – 2.5	√	?	> 2.5	√	?
Municipal Affordability Screener																
<1.0%	1.0% - 2.0%	>2.0%														
< 1.5	?	X														
1.5 – 2.5	√	?														
> 2.5	√	?														
<p>? = Questionable affordability √ = Community can afford the pollution control X = Community cannot afford the pollution control</p>																
Based on the Substantial Impacts Matrix above, what is the affordability status (afford, not afford, or questionable) of the (municipality) _____? In other words, can the project proponent afford to upgrade the facility in order to avoid water quality degradation?	_____ Matrix Result															
If the conclusion from the Substantial Impacts analysis is either “Cannot Afford” or “Questionable Affordability”, then proceed to the Widespread Impacts analysis for further evaluation.	Complete Widespread Impacts Analysis? _____(yes/no)															

Table 1-8. Widespread Impacts Analysis – Public Facility

<p>1. <u>Define the Affected Community</u> Evaluate the Discharger’s Contribution to the Community:</p> <ul style="list-style-type: none"> ○ Contribution to economic base (e.g., property taxes and employment) ○ Provides product or service upon which other businesses or the community depend
<p>2. <u>Evaluate Community’s Current Characteristics</u></p> <p>Evaluate how community’s current socioeconomic health may change if proposed project must avoid degradation to water quality by considering the following factors:</p> <ul style="list-style-type: none"> ○ Median household income ○ Unemployment rate ○ Rate of industrial development ○ Developing and declining industries ○ Percent of households below poverty line ○ Ability of community to carry more debt ○ Local and regional factors <p>Other applicable information on the local and regional economy that should also be reviewed includes:</p> <ul style="list-style-type: none"> ○ Annual rate of population change ○ Current financial surplus as a percentage of total expenditures ○ Percentage of property taxes actually collected ○ Property tax revenues as a percentage of the market value of real property ○ Overall debt outstanding as a percentage of market value of real property ○ Overall debt per capita ○ Percentage of outstanding debt due within 5 years
<p>3. <u>Evaluate How Community Characteristics Would Change if Discharger Must Avoid Degradation to Water Quality</u></p> <p>Evaluate the projected adverse socioeconomic impacts of adding pollution controls to the project to meet antidegradation requirements by considering the following:</p> <ul style="list-style-type: none"> ○ Property Values ○ Employment Rate ○ Commercial Development Opportunities ○ Tax Revenues ○ Expenditure on Social Services ○ State level impacts such as loss of revenues and increased expenditures

APPENDIX – 2 Tier 2 Review of a Private Facility

Appendix 2 includes additional information that may be required by the Department to evaluate socio-economic factors of a private facility during a Tier 2 review. This evaluation is based on two types of impacts, referred to as “substantial” and “widespread”. The Substantial Impacts analysis is found in Table 2-2. The Widespread Impacts analysis is found in Table 2-3.

SUBSTANTIAL IMPACTS - SUMMARY

Purpose of Substantial Impacts analysis: Determine whether a private facility can afford pollution controls in order to avoid any degradation of water quality.

The first step in a Substantial Impacts analysis is to provide data on the socio-economic factors listed in the worksheet in Table 1. This data is then used to calculate four financial tests that in turn indicate the financial health of a private entity (Table 2).

WIDESPREAD IMPACTS - SUMMARY

Purpose of Widespread Impacts analysis: Evaluates the social costs of pollution control requirements by: 1) defining the affected community; 2) evaluating the community’s current characteristics; and 3) evaluating how community characteristics would change if discharger must avoid degradation to water quality.

If the Substantial Impacts analysis (i.e., the four financial tests) indicates that the private entity’s financial health is questionable, then a Widespread Impacts analysis may be completed to further resolve the affordability issue. This analysis is primarily a qualitative evaluation based on community socioeconomic factors that are expanded to a larger scale than the Substantial Impacts analysis.

Table 2-1. Data Worksheet for Financial Factors

Financial Factor	Data
Current Assets	
Current Liabilities	
Cash flow per given year	
Total debt of the entity	
Amount firm has borrowed (debt)	
Amount of stockholders' capital (equity)	
Pre-tax earnings	
Annualized pollution control cost	

Table 2-2. Substantial Impacts Analysis - Financial Tests Used to Measure the Financial Health of a Private Entity

<p>1. Liquidity Test - Indicates how easily an entity can pay its short-term bills.</p> <p>Current Ratio = Current Assets / Current Liabilities</p> <p>NOTE: A ratio greater than 2 indicates affordability</p>
<p>2. Solvency Test - Indicates how easily an entity can pay its fixed and long-term bills.</p> <p>Beaver's Ratio = Cash flow per given year / Total debt of the entity</p> <p>NOTE: > 0.20 Indicates private entity is solvent < 0.15 Indicates private entity may go bankrupt</p>
<p>3. Leverage Test - Indicates how much money the entity can borrow.</p> <p>Debt-to-Equity Ratio = Amount firm has borrowed (debt) / Amount of Stockholders' capital (equity)</p> <p>NOTE: The larger the Debt-to-Equity Ratio, the less likely that the entity will be able to borrow funds</p>
<p>4. Earnings Test - Indicates how much the entity's profitability will change with the additional pollution control needed to avoid degradation of water quality.</p> <p>Earnings = Pre-tax – Annualized Pollution Control Cost</p> <p>NOTE: Compare earnings result with entity's revenues to measure post-compliance profit rate</p>
<p>Guidelines to evaluate financial tests:</p> <ul style="list-style-type: none">○ Results of all four tests above should be considered jointly○ Ratios and tests should be compared over several years○ Financial ratios should also be compared against those of "healthy" entities○ The role the entity plays in a parent firm's operations should also be considered

Table 2-3. Widespread Impacts Analysis – Private entity/facility

1. Define the Affected Community

Evaluate the Discharger's Contribution to the Community:

- Contribution to economic base (e.g., property taxes and employment)
- Provides product or service upon which other businesses or the community depend

2. Evaluate Community's Current Characteristics

Evaluate how community's current socioeconomic health would change if proposed project must avoid degradation to water quality by considering the following factors:

- Median household income
- Unemployment rate
- Rate of industrial development
- Developing and declining industries
- Percent of households below poverty line
- Ability of community to carry more debt
- Local and regional factors

Other applicable information on the local and regional economy that should also be reviewed includes:

- Annual rate of population change
- Current financial surplus as a percentage of total expenditures
- Percentage of property taxes actually collected
- Property tax revenues as a percentage of the market value of real property
- Overall debt outstanding as a percentage of market value of real property
- Overall debt per capita
- Percentage of outstanding debt due within 5 years

3. Evaluate How Community Characteristics Would Change if Discharger Must Avoid Degradation to Water Quality

Evaluate the projected adverse socioeconomic impacts of adding the pollution control to the project to meet antidegradation requirements by considering the following:

- Property Values
- Employment Rate
- Commercial Development Opportunities
- Tax Revenues
- Expenditure on Social Services
- State level impacts such as loss of revenues and increased expenditures

APPENDIX – 3 Assimilative Capacity Calculation Guideline

The intent of this guideline is to provide a screening tool that will allow an estimate of the magnitude of the impact of a discharge on receiving water (i.e., *de minimis* or not).

This guideline and accompanying spreadsheets are intended to serve as a guideline for calculation of assimilative capacity for purposes of the Antidegradation Implementation Procedure. This procedure is intended only for use in these guidelines. Where the Procedure calls for calculation of assimilative capacity, the value is used as a screening tool to determine if a proposed discharge will have *de minimis* effects or not. Since this is a screening tool, that is not being used for more rigorous determinations such as calculating enforceable NPDES permit effluent limits or TMDL waste load allocations, the method has been kept as simple as possible and is viewed as an estimate. Users of this guideline may find it necessary in the course of events to slightly modify the process in order to accommodate unique problems with data sets or circumstances that might occur.

The spreadsheets illustrate the calculations to estimate assimilative capacity. The first set of calculations addresses pollutants other than Biochemical Oxygen Demand (BOD). The second set of calculations addresses BOD. The second set of calculations is necessary because BOD is the parameter regulated in discharge permits to prevent undue depletion of Dissolved Oxygen (DO) in receiving waters.

The following data gathering guidelines should be used to compile the information required for the two sets of calculations. However, because of variations in data availability, as well as other relevant case-specific factors, the guidelines may be adjusted to ensure the compilation of appropriate information. In circumstances indicating the need to adjust the guidelines, the reviewer should consult with the Department, as well as other NMED water quality assessment protocols and Quality Assurance Plans.

Data Gathering Guidelines.

- 1) Obtain ambient water quality data for the pollutant of concern in the receiving water upstream but as close to the discharge as possible. Optimally, use the water quality station and data used by NMED SWQB in the most recent evaluation of the stream segment for purposes of the biennial Clean Water Act Section 303(d) evaluation.
 - a) Possible sources of data include:
 - i) NMED SWQB water quality database
 - ii) USEPA STORET
 - iii) USGS water quality monitoring stations
 - b) Use all valid data points regardless of the stream flow or time of year when collected
 - c) Valid data is data that has met quality assurance / quality control protocols established by the SWQB
- 2) Obtain data about the discharge.

Appendix - 3

- a) Possible sources of data include:
 - i) NPDES Permit Applications
 - (1) Supplemental sampling requested by the permitting authority to support the permitting process may be used.
 - ii) USEPA STORET
 - iii) USEPA Permit Compliance System (PCS)
 - iv) Other valid data that has met quality assurance / quality control protocols established by the SWQB
- 3) Summarize the data by calculating the arithmetic mean for all parameters except bacteria. Use geometric mean to summarize bacteria data. This value will be used as the upstream concentration in the calculation below.
 - a) If the data value is reported as less than a number, that usually means the test result was below the lab's minimum quantification level.
 - i) If all data points are "less than"; treat them all as zeros.
 - ii) If some of the data are "less than" and some are quantified values, use the actual quantified values and one half of the "less than" value to calculate the geometric mean.
 - (1) For example in a data set that has the following 4 values: 1.2, <0.5, <0.6 and 1.4, input the following numbers into the calculation 1.2, 0.25, 0.3 and 1.4. The result in this example would be 0.6
- 4) Obtain critical low flow data for the stream above the discharge.
 - a) Critical low flow for purpose of the calculation is the minimum average four consecutive day flow which occurs with a frequency of once in three years (4Q3)
 - i) In most cases it will only be necessary to find the 4Q3. However if the only concern is estimating the assimilative capacity necessary to meet a human health criterion then the harmonic mean¹⁴ flow may be substituted.

¹⁴ Refer to Water Quality Standards for Interstate and Intrastate Surface Waters, 20.6.4.10.B.

Calculation of Assimilative Capacity -- Parameters other than BOD				
Step 1 - Collect Basic Information				
(Instructions: Fill in yellow boxes - Spreadsheet will calculate blue boxes)				
Upstream Data				
critical low flow of stream (4Q3 or Harmonic Mean)	Symbol	Value	Units	
	Qu	22	cfs	
pollutant concentration	Cu	0.01	mg/L	
Effluent Data				
design flow (existing) -- [if new discharge use 0]	Qe	1.50	cfs	
design flow (proposed)	Qp	2.30	cfs	
existing pollutant limit concentration -- [if new discharge use 0]	Ce	0.10	mg/L	
proposed pollutant limit concentration -- [use Ce if no change is proposed]	Cx	0.10	mg/L	
Downstream Data				
water quality criterion for pollutant of concern	Cs	0.50	mg/L	
downstream flow under 4Q3 conditions with existing discharge (Qu + Qe)	Qd	23.50	cfs	
downstream flow under 4Q3 conditions with proposed discharge (Qu + Qp)	Qx	24.30	cfs	
Constants				
conversion factor for (mg/L to lbs/day)	cf	8.34		
Step 2 - Determine Available Pollutant Assimilative Capacity with the Discharge at Existing & Proposed Design Flows				
	Symbol	Value	Units	
waterbody pollutant assimilative capacity ($Qx \cdot Cs \cdot cf$)	Ac	101.33	lbs/day	
background pollutant load ($Qu \cdot Cs \cdot cf$)	Lb	1.83	lbs/day	
existing permit load ($Qe \cdot Ce \cdot cf$)	Le	1.25	lbs/day	
proposed permit load ($Qp \cdot Cu \cdot cf$)	Ln	1.92	lbs/day	
Remaining Assimilative Capacity with existing discharge ($Ac - Lb - Le$)	Ae	98.25	lbs/day	
Remaining Assimilative Capacity with proposed discharge ($Ac - Lb - Ln$)	An	97.58	lbs/day	
Step 3 - Determine if proposed new or added discharge is <i>de minimis</i> or if a full antidegradation review will be required. Antideg review is required if the new discharge will consume greater than 10% of the remaining assimilative capacity. Discharges that consume 10% or less of the remaining assimilative capacity will be considered "<i>de minimis</i>" and do not require a full antidegradation review.				
	Symbol	Value	Units	
10% of Remaining Assimilative Capacity [prior to new discharge] ($Ae \cdot 0.1$)	Ar	9.82	lbs/day	
Added Capacity Utilization by new discharge ($Ae - An$)	Au	0.67	lbs/day	
Determine if Antideg review is required or if new discharge is " <i>de minimis</i> " If $Ar > Au$ then the discharge is <i>de minimis</i> . If $Ar \leq Au$ then an antidegradation review is required.		de minimis discharge		
Helpful Tools				
Convert million gallons per day [mgd] to cubic feet per second [cfs] ($mgd / 0.646272$)		1.50	mgd	2.32 cfs
Convert micrograms [ug] to milligrams [mg] ($ug / 1000$)		1.00	ug	0.001 mg

	A	B	C	D
1	Calculation of Assimilative Capacity -- BOD/DO			
2	Based upon Streeter-Phelps Model in Hammer, M.J., 1975. <i>Water and Waste-Water Technology</i> . Wiley & Sons, Inc.			
3	Step 1 - Collect Basic Information			
4	(Instructions: Fill in yellow boxes - Spreadsheet will calculate blue boxes)			
5				
6	Upstream Data	<u>Symbol</u>	<u>Value</u>	<u>Units</u>
7	critical low flow of stream (4Q3)	Q1	22	cfs
8	Biochemical Oxygen Demand - 5-day (BOD5)	B1	2	mg/L
9	Dissolved Oxygen (DO)	D1	8.2	mg/L
10	Temperature	T1	17	Deg.C.
11	Conductivity	C1	500	uS/cm
12				
13	Effluent Data			
14	design flow (existing)	Q2	1.5	cfs
15	design flow (proposed)	Q3	1.8	cfs
16	Biochemical Oxygen Demand - 5-day (BOD5) [use current permit limit or secondary treatment limit - usually 30 mg/l]	B2	30	mg/L
17	Biochemical Oxygen Demand - 5-day (BOD5) [use proposed permit limit or secondary treatment limit - usually 30 mg/l]	B3	30	mg/L
18	Dissolved Oxygen (DO) (existing)	D2	3	mg/L
19	Dissolved Oxygen (DO) (proposed)	D3	3	mg/L
20	Temperature (existing)	T2	18	Deg.C.
21	Temperature (proposed)	T3	18	Deg.C.
22	altitude of facility (feet above sea level)	a	5000	feet
23	conductivity (existing)	C2	500	uS/cm
24	conductivity (proposed)	C3	500	uS/cm
25				
26	Downstream Data			
27	enter water quality criterion for D.O. below discharge	WQ	5.0	mg/L
28	enter mean velocity of flow, feet per second (below discharge)	v	0.6	ft./sec
29	enter mean depth of flow, feet (below discharge)	h	4	feet
30	deoxygenation rate, per day @ 20 deg C -- (A deoxygenation rate may be determined in the laboratory, typical rates vary between 0.05 and 0.2. If unknown use 0.1. The actual rate is not greatly important to this exercise because the intent is to <u>estimate</u> the relative impact of a new discharge not a precise impact.)	k1	0.1	
31				
32	Step 2 - Calculate Downstream Concentrations Based Upon Mixing			
33	Downstream Data			
34	calculate existing BOD concentration based upon mixing (existing scenario) [cbe=((Q1*B1)+(Q2*B2))/(Q1+Q2)]	Cbe	3.8	mg/L
35	calculate existing DO concentration based upon mixing (existing scenario) [Cde=((Q1*D1)+(Q2*D2))/(Q1+Q2)]	Cde	7.9	mg/L
36	calculate existing Temperature based upon mixing (existing scenario) [Cte=((Q1*T1)+(Q2*T2))/(Q1+Q2)]	Cte	17.1	Deg.C.
37	calculate existing Conductivity based upon mixing (existing scenario) [Cce=((Q1*C1)+(Q2*C2))/(Q1+Q2)]	Cce	500.0	uS/cm
38				
39	calculate projected BOD concentration based upon mixing (proposed scenario) [Cbp=((Q1*B1)+(Q3*B3))/(Q1+Q3)]	Cbp	4.1	mg/L
40	calculate projected DO concentration based upon mixing (proposed scenario) [Cdp=((Q1*D1)+(Q3*D3))/(Q1+Q3)]	Cdp	7.8	mg/L
41	calculate projected Temperature based upon mixing (proposed scenario) [Ctp=((Q1*T1)+(Q3*T3))/(Q1+Q3)]	Ctp	17.1	Deg.C.

	A	B	C	D
42	calculate projected Conductivity based upon mixing (existing scenario) [Ccp=((Q1*C1)+(Q3*C3))/(Q1+Q3)]	Ccp	500.0	uS/cm
43				
44	Step 3 - Streeter-Phelps Estimate of Oxygen Sag - Deoxygenation and Reaeration Coefficients			
45	Estimate Deoxygenation Coefficients			
46				
47	calculate temperature adjusted k1 rate for existing scenario [k1e=k1*1.047^(Cte-20)]	K1e	0.09	
48	calculate temperature adjusted k1 rate for proposed scenario [K1p=k1*1.047^(Ctp-20)]	K1p	0.09	
49				
50	Estimate Reaeration Coefficients and Ultimate BOD			
51	calculate reaeration rate, per day @ 20 deg C [k2=3.3*(v/(h^1.33))]	k2	0.31	
52	calculate temperature adjusted k2 rate for existing scenario [k2e=k2*1.015^(Cte-20)]	k2e	0.30	
53	calculate temperature adjusted k2 rate for proposed scenario [k2p=k2*1.015^(Ctp-20)]	k2p	0.30	
54				
55	Step 4 - Streeter-Phelps - Estimate Dissolved Oxygen Deficits, Time & Distance to Minimum DO			
56	Estimate Ultimate Biochemical Oxygen Demand, existing scenario [L0e=Cbe/(1-10^(-5*k1))]	L0e	5.5	
57	Estimate Ultimate Biochemical Oxygen Demand, proposed scenario [L0p=Cbp/(1-10^(-5*k1))]	L0p	6.0	
58				
59	Calculate Initial Dissolved Oxygen Deficits			
60	calculate Dissolved Oxygen Saturation for the facility's altitude at temp cte [Ide=(14.62-(0.3898*Cte)+(0.006969*Cte^2)-(0.00005897*(Cte^3)))*(1-0.00000697*a)^5.167]	Ide	8.0	mg/L
61	calculate Dissolved Oxygen Saturation for the facility's altitude at temp ctp [Idp = (14.62-(0.3898*ctp)+(0.006969*(ctp^2)-(0.00005897*(ctp^3)))*(1-0.00000697*a)^5.167]	Idp	8.0	mg/L
62	calculate Initial Dissolved Oxygen Deficit for existing scenario [De=Ide-cde]	De	0.1	mg/L
63	calculate Initial Dissolved Oxygen Deficit for proposed scenario [Dp=Idp-cdp]	Dp	0.2	mg/L
64				
65	Calculate Time of Travel to Minimum DO Sag			
66	Calculate time of travel to minimum DO of sag curve for existing scenario [te=(1/(k2e-k1e))*(log(((k2e/k1e)*(1-(De*(k2e-K1e))/(k1e*L0e)))))]	te	2.4	days
67	Calculate time of travel to minimum DO of sag curve for proposed scenario [tp=(1/(k2p-k1p))*(log(((k2p/k1p)*(1-(Dp*(k2p-K1p))/(k1p*L0p)))))]	tp	2.4	days
68				
69	Calculate Distance Downstream to Minimum DO Sag			
70	calculate distance downstream to minimum DO sag existing scenario [Me=(te*v*86400 seconds per day)/5280 feet per mile]	Me	23.5	miles
71	calculate distance downstream to minimum DO sag proposed scenario [Mp=(tp*v*86400 seconds per day)/5280 feet per mile]	Mp	23.1	miles
72				
73	Step 4 - Streeter-Phelps - Estimate Dissolved Oxygen Deficits at Critical Time			
74	Calculate DO Deficit at Critical Time			
75	calculate DO deficit at critical time (te) for existing scenario [Dde=((k1e*L0e)/(K2e-L1e))*(10^(-K1e*te)-10^(-K2e*te))+(De*10^(-K2e*te))]	Dde	1.0	mg/L
76	calculate DO deficit at critical time (tp) for proposed scenario [Ddp=((K1p*L0p)/(C48-K1p))*(10^(-K1p*tp)-10^(-k2p*tp))+(Dp*10^(-k2p*tp))]	Ddp	1.1	mg/L
77				
78	Calculate Minimum DO			
79	calculate minimum DO, existing scenario [DOe=Ide-Dde]	DOe	7.00	mg/L
80	calculate minimum DO, proposed scenario [DOp=Idp-Ddp]	DOp	6.91	mg/L

	A	B	C	D
81				
82	WARNING #1	Proceed with model		
83	If min. D.O. (DOe) is < water quality criterion, model is predicting a water quality impairment under existing conditions, no assimilative capacity is present, If D.O. is > or = criterion proceed with model.			
84	WARNING #2	Proceed with model		
85	If min. D.O. (DOp) is < water quality criterion, model is predicting a water quality impairment under proposed conditions, no assimilative capacity is present, If D.O. is > or = criterion proceed with model.			
86	Step 5 - Determine Available Pollutant Assimilative Capacity with the Discharge at Existing & Proposed Design Flows			
87	calculate the change in minimum DO resulting from the proposed discharge, [DOc=DOe-DOp]	DOp	0.10	mg/L
88	calculate remaining assimilative capacity, (existing scenario) [ACe=-(WQ-DOe)]	ACe	2.00	mg/L
89				
90	Step 6 - Determine if proposed new or added discharge is <i>de minimis</i> or if a full antidegradation review will be required. Antideg review is required if the new discharge will consume greater than 10% of the remaining assimilative capacity. Discharges that consume 10% or less of the remaining assimilative capacity will be considered "<i>de minimis</i>" and do not require a full antidegradation review.			
91	calculate 10% of remaining assimilative capacity, [Ar=ACe*0.1]	Ar	0.200	mg/L
92				
93	Determine if Antideg review is required or if new discharge is <i>de "minimis"</i>		de minimis	
94	If DOp > Ar then Antideg review required, if DOp < or = Ar then the discharge is de minimis			

Calculation of Dissolved Oxygen Solubility Corrected to Elevation and Salinity

Prepared by NMED-SWQB using references from USGS-WRD Colo. Dist.

		Temperature (deg C)	Elevation above Sea Level (feet)	Specific Conductance (uS/cm)	Dissolved Oxygen Solubility corrected to local Elevation and Salinity
Instructions: Enter Information on Local Water Quality Conditions in Yellow Boxes on the "Assimilative Capacity - BOD" worksheet of this workbook. Blue shaded boxes will automatically calculate.	Scenario 1 (existing)	17.1	5000	500	8.0 mg/l
	Scenario 2 (proposed)	17.1	5000	500	8.0 mg/l
Intermediate Operations	Value Scenario 1	Value Scenario 2	Formula		
Calculate Salinity in 0/00 using Specific Conductance (Salinity)	0.28	0.28	Salinity=((0.0005572*Conductivity)+(0.0000000202*(Conductivity^2)))		
Calculate natural log of DO Solubility at sea level in ml/l using salinity derived above (lnDO)	1.91	1.91	lnDO = - 173.4292+249.6339*(100/(273.15+Temp))+143.3483*LN((273.15+Temp)/100)-21.8492*((Temp+273.15)/100)+Salinity*(- 0.033096+0.014259*((Temp+273.15)/100)- 0.0017*((Temp+273.15)/100)^2)		
Calculate the DO (ml/l) from the natural log of DO (DOml)	6.73	6.73	DOml=EXP(lnDO)		
Convert DO ml/l to mg/l (DOmg)	9.61	9.61	DOmg=DOml*1.4276		
Calculate log of vapor pressure in mm Hg (log_v_press)	1.16	1.16	log_v_press=8.10765-(1750.286/(235+Temp))		
Calculate vapor pressure from log_v_press (vapor pressure)	14.58	14.59	vap_press=10^log_v_press		
Calculate D.O. Solubility (mg/l) at local altitude and specific conductance (DO')	8.0	8.0	DO'=DOmg*(((760-2.5*(Elevation/100))-vapour_press)/(760-vapour_press))		