

Presented below are water quality standards that are in effect for Clean Water Act purposes.

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**ANTIDegradation REVIEW PROCEDURE
FOR DISCHARGE REQUIRING A
PERMIT UNDER 314 CMR 3.03**

I. Applicability

This review process shall apply to all applications for a new or increased discharge to the waters of the Commonwealth under 314 CMR 3.03. These discharges include but are not limited to:

- a) all point source discharges of pollutants to surface waters from publically and privately owned treatment works, including any bypasses or overflows from such works, and from manufacturing, commercial and mining activities and processes, whether treated or untreated; and
- b) Concentrated Aquatic Animal Production Facilities, discharges into Aquaculture Projects, Silvicultural Point Sources, Rock Crushing and Gravel Washing Facilities, Log Sorting and Log Storage Facilities and Concentrated Animal Feeding Operations as defined and explained in the regulation.

The review process is also applied to the renewal, with or without modification, of such a permit that was originally issued as a variance to the antidegradation provisions (a permit approved under 314 CMR 4.04(4)). Any variance granted pursuant to this regulation does not extend beyond the expiration date of the permit, therefore, reissuance of such a permit requires a review.

II. Technology Based Review [314 CMR 4.40(6)]

All discharges shall be provided with a level of treatment equal to or exceeding the requirements of 314 CMR 3.10 (4), (5), (6) and (7). These are the technology based effluent limitations for POTW's and for non POTW's.

Minimum treatment requirements for POTW's consists of secondary treatment plus applicable limitations and standards promulgated by EPA. The technology based review for a POTW is accomplished through the facilities planning process. Title II of the Federal Act sets requirements for this process which include the investigation of alternatives, recycling and reclamation of wastewater and consistency with a plan or plan amendment approved under Section 208 or 303(e) of the Federal Act. The technology based review is satisfied upon completion of the facilities plan, public participation and approval by the Director.

The technology based limits for non POTW's are applied by EPA when a permit is drafted. EPA has categorical standards and limitations for various industry types promulgated in regulations. Existing industrial discharges are required achieve the best conventional pollutant control technology (BCT) for conventional pollutants and the best available technology economically achievable (BAT) for toxic pollutants. New industrial discharges are required to comply with new source performance standards (NSPS) based on best available demonstrated technology. Effluent limits for parameters or industries not covered by the categories are established case-by-case based on Best Professional Judgement (BPJ). The review is complete when the director approves the draft permit or modifies it appropriately using BPJ (in accordance with 314 CMR 3.10(6)(a)).

III. Tier I - Protection of Existing USES [314 CMR 4.04(1)]

In all cases existing uses and the level of quality necessary to protect the existing uses shall be maintained and protected. The review proceeds in three steps:

- a) Identify existing uses - existing uses are those designated uses, and any other uses that do not impair the designated uses, that are actually attained in a waterbody on or after November 28, 1975. Attainment of designated uses is assessed biennially by the Division and the results published in the summary of Water Quality (Section 305b) Report. The Division's first assessment summary was published in 1977 and will serve as the baseline condition for the purposes of this review.

Additional existing uses that are not designated uses may be identified from site-specific information gathered during the MEPA review process, intergovernmental coordination and public participation. These other existing uses shall be protected to the extent that they are consistent with the designated uses. In no case shall assimilation or transport of pollutants be considered an existing use.

(Quantity)
Quality

- b) ~~Quantity~~ ^{Quantity} Impacts - Impacts on existing uses may be the result of lowering of water quality, hydrologic modification, or habitat alternation. Lowering of water quality can be predicted by mathematical modeling of the waterbody. Models require quality and quantity information on both the waterbody and the discharge. The model uses this information to predict impacts at a severe hydrologic condition determined by the Director (314 CMR 4.03(3)) at which water quality criteria must be met. Mathematical modeling may be conducted by the Division as part of the continuing planning process. Where models do not exist or need updating, the Director may require the applicant to supply the necessary information or perform the analysis to determine impacts.

- c) Comparison with Criteria - Predicted impacts are compared with water quality criteria to determine whether existing uses are supported. The Surface Water Quality Standards list water quality criteria specific to each water use class and additional criteria applicable to all waters. For criteria not listed in the regulations and for the interpretation of narrative criteria, the Division shall use information published by EPA pursuant to Section 304(a) of the Federal Act.

Impacts from hydrologic modifications and/or habitat modifications are more difficult to quantify and assess. Models and numeric criteria may not be available. The U.S. Fish and Wildlife has a policy regarding minimum flows and protection of aquatic life ("fisheries"). The Massachusetts Water Resources Commission sets policy regarding to acceptable minimum flows for the state. In addition, there is a narrative criterion in the water quality standards for bottom pollutants or alterations (314 CMR 4.05(5)(b)). Each assessment must be made case-by-case using available guidance and best professional judgement.

If existing uses are not protected the review process stops and the permit is denied. Where it is determined that existing uses are protected the review process proceeds.

IV. Determination of Specific Antidegradation Designations

Certain waters are designated for additional protection under the antidegradation provisions. These are high quality waters (HQW's) other significant resource waters (SRW's) and outstanding resource waters (ORW's). Therefore it is necessary to determine if any of these specific designations apply. The following describes each designation:

- a) High Quality Waters - High quality waters (HWS's) are those water whose quality exceeds minimum levels necessary to support the national goal uses. The national goal uses correspond to the Division's Class B and Class SB designations. Therefore waters that exceed minimum Class B or SB criteria are high quality waters. The determination of a high quality water is made in relation to the particular pollutants in the permit under consideration. The water need not exceed all criteria to be considered high quality. Rather, the water is considered high quality with respect to any given parameter that exceeds minimum criteria for which the permit proposes a discharge of pollutants.

In order to make this determination the existing quality of a waterbody is measured or estimated for each pollutant of concern. For each parameter that exceeds minimum criteria, Tier II review is required. The existing quality of a waterbody is considered the background quality plus the addition of any permitted discharges under the most severe conditions at which water quality criteria must be met (314 CMR 4.03(3)). Existing quality does not include any unpermitted or illegal discharges.

- b) Other Significant Resource Waters - Other significant Resource Waters (SRW's) are waters whose character cannot be adequately described or protected by traditional criteria. These waters include all wetlands, all intermittent streams ("low flow" waters) all lakes and ponds. Case-by-case determinations by the Director may include estuaries and other waterbodies. These waters are given the same level of protection as high quality waters unless they have been additionally designated outstanding resource waters.
- c) Outstanding Resource Waters - Outstanding resource waters (ORW's) are waters that constitute an outstanding resource as determined by their outstanding socio-economic, recreational, ecological and/or aesthetic values. These waters are specifically designated in the regulations (314 CMR 4.06). They include all surface Public Water Supplies and all tributaries to these waterbodies. They also include all state certified vernal pools (314 CMR 4.06(2)). Other ORW's are designated on a site-specific basis. They also include certain areas designated by the Secretary of Environmental Affairs as Areas of Critical Environmental Concern (ACEC's), but not all of these areas. Certain state and federal parks, refuges, and conservation areas may also be designated. Where a river or a lake is specifically designated as an ORW all associated wetlands (bordering vegetated wetlands) are also included in the ORW designation.

Discharges to HQW's and SRW's undergo Tier II review. Discharges to ORW's undergo Tier III review. Discharges to waters that do not have a specific antidegradation designation can be approved after Tier I review.

V. Tier II - Protection of High Quality Waters and Other Significant Resource Waters. [314 CMR 4.04(2)]

Waters designated as HQW's or SRW's are protected and maintained for their existing level of quality. Discharges are permitted to these waters only where there will be no significant lowering of water quality or a variance is granted to allow a lowering of water quality. Tier II review has two steps; 1) determination of significant lowering of water quality; and 2) authorization of a variance.

- a) Significant Lowering of Water Quality - The Director may determine that a discharge is insignificant because it does not have the potential to cause any significant lowering of water quality in the following cases.

1. de minimus discharges - a discharge may be determined to be not significant where:
 - a) The concentration of effluent is or is expected to be less than or equal to 1 percent of the receiving water during the most severe hydrologic condition at which water quality standards must be met;
 - b) The discharge meets or is expected to be in compliance with the conditions of the Divisions "Implementation Policy for the Control of Toxic Pollutants in Surface Waters" February 23, 1990 including the Whole Effluent Toxicity Requirements for NPDES Permits;
 - c) Individual toxic pollutants are not present in concentrations or combinations that cause, have reasonable potential to cause or contribute to excursions of water quality criteria. In these cases the permit does not contain limits for individual toxic pollutants; and
 - d) other relevant factors.
2. Temporary discharges - The Director may determine that a discharge is not significant because it is temporary in nature and that upon completion of the discharge period the existing water uses and water quality will be equal to or better than that which existed prior to the commencement of the discharge.
3. Effluents equal to or better than existing quality - The Director may determine that a discharge does not cause a significant lowering of water quality where the effluent will be of a quality equal to or better than the existing water quality of the receiving water.
4. Repeated/multiple insignificant changes - The Division will consider the cumulative affect of repeated or multiple insignificant discharges on receiving water quality. Each new or increased discharge's affect on water quality well be reviewed in context with all other discharges which commenced since November 28, 1975. A new or increased discharge that would otherwise be considered not significant may be required to seek a variance if the cumulative effect of it and previously approved discharges produce a significant lowering of water quality.

b) ^{Authorizati~~on~~} Variances [314 CMR 4.04(4)] - A ^{Authorizati~~on~~} variance to ~~authorize~~ a discharge in waters designated for protection under Tier II of the regulations may be allowed by the Division where the applicant demonstrates compliance with four provisions [314 CMR 4.04(a) 1-4].

1. Socio/economic importance. The applicant must demonstrate that "the discharge is necessary to accommodate important economic or social development in the area in which the waters are located "(314 CMR 4.04(4)(a) 1.) In order to do this the applicant must first demonstrate that the new or increased discharge is necessary. Then it must be demonstrated that the discharge is linked to either important social or economic development. The word "important" is relative to the area in which the waters are located.

A discharge is eligible for a variance if it is needed to accommodate:

- a) new production by a new discharger;
- b) production which cannot be accommodated by the current treatment facility;

- c) increased loading to a P.O.T.W. because of community growth which cannot be accommodated by the current treatment facility;
- d) other circumstances deemed analogous to be a. through c.

When deciding that the current facilities cannot accommodate production or growth, it must be determined that this is due to the increased loading to the facility and not due to inappropriate treatment or substandard operation and maintenance.

Important social and economic development refers to development that clearly serves a valid public purpose. If the proposed project is a Publicly Owned Treatment Works that is in accordance with plans developed under the provisions of Sections 303e, 208, and 201 of the Federal Act and has been subject to public hearings and approved by the Division, it shall be presumed that this provision has been met.

Requirements for other applicants will be site-specific. Applicants must demonstrate the discharges have benefits to the area economy or the public health, safety or welfare. The Division may require supplemental documentation from the affected local government that the proposed lowering is necessary for important economic and social development. However, the Division may not authorize a lowering of water quality based upon social/economic importance if there is a compelling environmental reason. The Director shall use information collected during the MEPA review of the discharge to help formulate the decision. In some cases the benefits associated with high levels of water quality may outweigh the benefits associated with important development.

2. Alternatives Analysis. The applicant must demonstrate "no less damaging alternative site for the activity, source for disposal, or method of elimination of the discharge is reasonably available or feasible." [314 CMR 4.04(4)(a) 2.] This demonstration may include analysis of the reuse of wastewater, relocation of the activity, land application of wastewater or use of closed systems. Technologically feasible alternatives must be compared in respect to the potential environmental damage. The Division will not authorize a variance for a surface water discharge where a reasonable, less environmentally damaging alternative exists.
3. Mitigation of the discharge. The applicant must demonstrate "to the maximum extent feasible that the discharge and the activity are designed and conducted to minimize adverse impacts on water quality, including the implementation of source reduction practices." [314 CMR 4.04(4)(a) 3.]. Where it is determined that a discharge serves a valid purpose and no reasonable alternatives for eliminating the discharge are available, all efforts to minimize the environmental impacts from the proposed discharge must be made. A special emphasis is placed on source reduction. This includes investigation of in-plant changes in production processes or raw materials that reduce, avoid or eliminate the use of pollutants, including, but not limited to, toxic or hazardous substances, or generation of pollution by-product per unit product, so as to reduce risks overall to the environment. Compliance with M.G.L. Ch. 21 I (the Toxics Use Reduction Act) is required.
4. Compliance with standards. The last demonstration required of the applicant is that the "discharge will not impair existing water uses not result in a level of water quality less than that specified for the Class" [314 CMR 4.04(4)(a) 4.]. The variance process does not exempt an applicant from meeting Tier I requirements and all applicable water quality criteria. Mathematical modeling of a proposed effluent can be used to demonstrate compliance with criteria.

VI. Tier III Protection of Outstanding Resource Waters [314 CMR 4.04(3)]

For the purpose of this policy ORW's can be viewed as a particular subset of "High Quality Waters" that are given increased protection. In HQW's certain degradation can be justified through a variance. In ORW's no degradation is allowed. The variance provision is used to allow those (insignificant) discharges that are "determined by the Director to be for the express purpose and intent of maintaining or enhancing the resource for its designated use." The Director's determination to allow a new or increased discharge shall be made in agreement with the federal, state, local or private entity recognized by the Division as having direct control of the water resource or the governing water use.

Examples of discharges that may qualify for a variance include, but are not limited to: discharges necessary to maintain a public water supply such as a public supply treatment plant effluent; direct chemical application to a waterbody necessary to control weeds or algae for public welfare or otherwise protect public health; discharges necessary to provide access or otherwise maintain these areas (runoff from roads and parking lots, park management buildings, restrooms, reservoir maintenance activities).

Therefore in order to enter the Tier III variance process the Director must make two determinations:

1. The discharge is not significant (using the same criteria as far high quality waters) and;
2. The discharge is "necessary" to the ORW. This determination is made with those in responsible care of the resource.

The Tier III variance process is the same as Tier II except the first provision (socio/economic importance) does not apply.

The ORW provision includes a statement on existing discharges." Any person having an existing discharge to these waters shall cease said discharge and connect to a publically owned treatment works (POTW) unless it is shown by said person that such a connection is not reasonably available or feasible. Existing discharges not connected to a POTW shall be provided with the highest and best practical method of waste treatment determined by the Division as necessary to maintain the 'outstanding resource.'" This means that existing discharges will be connected to POTW's where possible. Where it is not possible, treatment levels higher than those required by the technology-based review may be imposed. The purpose of this higher treatment is to provide the highest water quality possible so that the ORW is at minimal risk of degradation and to insure that water quality remains as close to natural background conditions as possible.

VII. Additional Provisions

- a. Exemptions for Variances. Two types of discharges may be exempted from the antidegradation variance provision (Tier II or III) by the decision of the Director [314 CMR 4.04(4)(d) and (e)]. These are a "discharge exempted from the permit requirement by 314 CMR 3.05(4) (discharge necessary to abate an imminent hazard)" and "a new or increased discharge specifically required as part of an enforcement order issued by the Massachusetts Department of Environmental Protection in order to improve existing water quality or prevent existing water quality from deteriorating." These provisions ensure that the variance procedure does not inhibit a response to an emergency situation or delay important cleanup activities.
- b. Public Participation. The variance procedure is subject to specific public participation procedures [314 CMR 4.04(4)(c)]. When a variance is granted under the procedure, that variance does not extend beyond the

expiration of the permit. In order to reissue the permit, with or without modification the variance procedure provisions are revisited. Changes may have occurred during the life of the permit that would alter the outcome. For example new technologies for treatment may become feasible, alternative of sites for disposal or method of elimination of the discharge may become available.

Permit proceedings requiring public notice under 314 CMR 2.06 shall include the Director's tentative determination to a grant or deny a variance in accordance with the antidegradation provisions. Where a request for a variance under the antidegradation provisions has been filed the Fact Sheet or Basis for Permit shall include a statement providing the basis for the tentative determination in accordance with this policy.

All permits requiring an antidegradation variance determination also require MEPA review. This review will provide intergovernmental coordination and additional information for the Director to make the tentative determination.

c. Control of Eutrophication (314 CMR 4.04(5))

"Eutrophication" refers to the natural or artificial addition of nutrients to bodies of water and the effects of these added nutrients. In a lake or pond these effects include the process whereby a lake ages and eventually fills in. The nutrients responsible for this process are primarily phosphorus and nitrogen. These pollutants may cause the excess growth of weeds or algae that may impair beneficial water uses or otherwise degrade the aesthetics of the waterbody.

Numerical limits for nutrients are not currently available to control eutrophication because the process is far too complex to be reduced to such simple terms. Eutrophication rates may be affected by:

- a) the total mass loading of nutrients;
- b) the nutrient ratio;
- c) nutrient recycling in the waterbody;
- d) local water chemistry including pE, redox potential, and the presence or absence of trace nutrients, etc., and
- e) detection time.

Other factors may also apply. Therefore, the Division uses a narrative provision as the primary control for eutrophication. (314 CMR 4.04(5)).

The provision has four parts:

1. "There shall be no new or increased point source discharge of nutrients, primarily phosphorus and nitrogen, directly to lakes and ponds";
2. "There shall be no new or increased point source discharge to tributaries of lakes or ponds that would encourage cultural eutrophication or the growth of weeds or algae in these lakes or ponds." The words "encourage" and "cultural" refer to the human induced acceleration of the natural eutrophication process;
3. "Any existing point source discharge containing nutrients in concentration that encourage eutrophication or growth of weeds or algae shall be provided with the highest and best practical treatment to remove such nutrients"; and

4. "Activities which result in the nonpoint source discharge of nutrients to lake and ponds shall be provided with all reasonable best management practices for nonpoint source control."

The first two provisions regulate new or increased point sources of nutrients. Phosphorus is often the limiting nutrient or can become the limiting nutrient in fresh waters, thus controlling the rate of eutrophication. The following receiving water concentrations of phosphorus are used in the absence of site-specific information to predict when phosphorus is unduly contributing to the process.

<u>Waterbody</u>	<u>Maximum PO₄-P</u>
1. Lakes	0.03 mg/l
2. Tributaries to Lakes and other sensitive areas	0.05 mg/l
3. Flowing streams and other non-sensitive areas	0.10 mg/l

Site-specific information may result in more or less stringent concentrations.

The third provision regulates existing point source discharges that are causing problems. State-of-the-art phosphate removal process can produce effluents with concentrations ranging from 1.0 to 0.1 mg/l phosphate-phosphorus depending on the process. Two levels of treatment can be categorized as follows:

1. Chemical addition to an existing process. Effluent concentrations should approach 1.0 mg/l for domestic wastewater discharges.
2. Tertiary treatment processes such as chemical coagulation and mechanical sand filtration or biological phosphorus removal and/or carbon absorption. Effluent concentrations should approach 0.1 mg/l.

The first category of treatment or its equivalent will be assumed to be the minimum necessary to satisfy this part of the provision. Subsequent water quality information will be used to confirm this assumption and determine if a higher degree of removal is necessary, and the optimal period of operation.

In marine waters nitrogen often may be the limiting nutrient. Criteria to prevent eutrophication are site-specific. The situation is further complicated by the fact that nitrogen from the atmosphere can be made available for plant growth. Strategies may include limiting nitrogen as well as receding phosphorus inputs until phosphorus becomes limiting.

The fourth provision regulates nonpoint sources of pollution that discharge directly to lakes and ponds. Although concentrations of nutrients in nonpoint sources are often less than those in point sources, the total loading (concentration multiplied by flow) can be substantial and far exceed point source contributions. Nonpoint sources include:

1. shoreline erosion
2. road runoff
3. construction activities
4. agricultural activities
5. silvicultural activities
6. improperly planned or failing septic systems
7. runoff containing detergents or fertilizers
8. contaminated sediments

Lake and stream management focuses on best management practices to control four processes: (1) erosion control, (2) runoff control, (3) nutrient control and (4) pesticide or toxics control. These processes are highly interactive because runoff control, for example, offers benefits for reducing nutrients as well as sediment and pesticide control.

Best management practices have been developed for major land use activities. Many were not developed with water quality protection as a goal but, regardless, are useful in nutrient control. The Division is actively working at better defining best management practices to protect water quality and recommending new practices where appropriate. Further guidance is available from the Division's Nonpoint Source Control Program.

APPLICABILITY
(314 CMR 3.03 PERMIT)

NO

↓ YES

TECH BASED LIMITS

NO

POTW - 2nd Treatment
Non POTW - BCT & BAT or NSPS

↓ YES

TIER I

NO

PROTECTION OF EXISTING USES

QUALITY
QUANTITY
HABITAT

↓ YES

NO

SPECIFIC
AD
DESIGNATION

YES

HQW/SRW

ORW

NO

SIGNIFICANT
LOWERING?

SIGNIFICANT
LOWERING?

YES

DEMINIMUS
TEMPORARY
BACKGROUND
CUMULATIVE

YES

NO

APPROVE
PERMIT

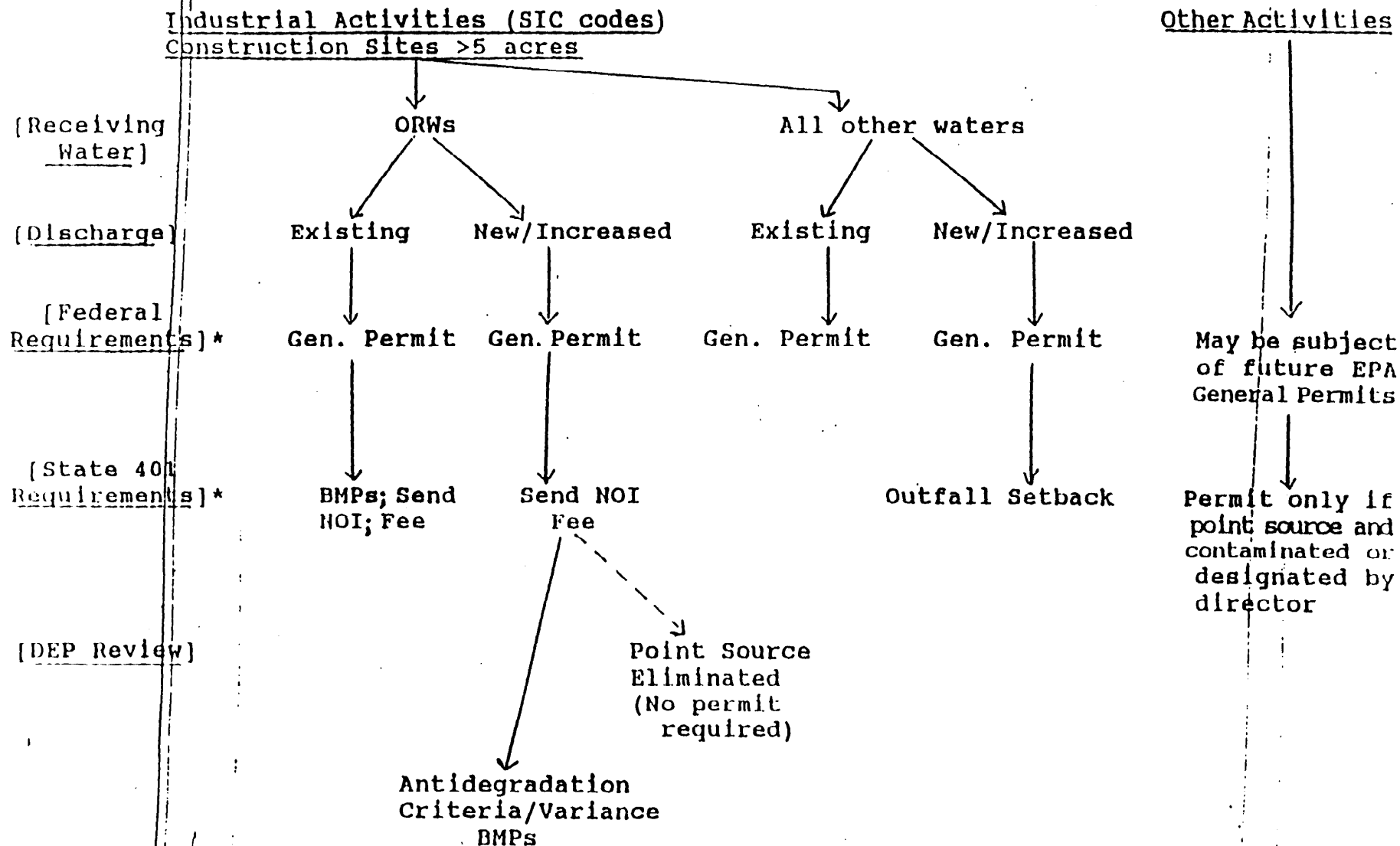
YES

TIER II TIER III
VARIANCE

NO

DENY
PERMIT

Stormwater Regulation



* EPA and/or DEP may require an individual NPDES permit in lieu of the General Permit.
EPA and/or DEP may enforce conditions of the General Permit or individual permits.