Internal Management Directive

Compliance Schedules in NPDES Permits

State of Oregon
Department of
Environmental
Quality

Water
Quality
Division

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Neil Mullane, Administrator June 25, 2010
DEQ Water Quality Division

Disclaimer

This internal management directive represents the Department of Environmental Quality's current directions to staff on how to implement OAR 340-041-0061(16), the rule giving DEQ the authority to include compliance schedules in NPDES permits, as long as the compliance schedule complies with 40 C.F.R. 122.47. This IMD is not final agency action and does not create any rights, duties, obligations, or defenses, implied or otherwise, in any third parties. This directive should not be construed as rule, although some of it describes existing state and federal laws. The recommendations contained in this directive should not be construed as a requirement of rule or statute. DEQ anticipates revising this document from time to time as conditions warrant.

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1.0 Introduction

1.1 Background

The Clean Water Act requires that state-issued individual NPDES permits include effluent limits as stringent as necessary to meet water quality standards. Sometimes a permittee cannot immediately comply with new or newly applied water quality-based effluent limits upon the effective date of the permit because the permittee needs time to perform substantial modifications to their facility or processes in order to meet the new limits. Depending upon the circumstances, NPDES permits may include a series of required steps and deadlines (*i.e.*, a compliance schedule), which upon completion, enables the permittee to meet the permit's water quality-based effluent limits (see 40 CFR § 122.47 and OAR 340-041-0061(16)). Interim effluent permit limits may also be included in certain circumstances.

1.2 Purpose

The purpose of this IMD is to promote consistent application of the compliance schedule rule across DEQ and to ensure that compliance schedules are used only when legally permissible, that they are as short as possible, and that they are fully enforceable. To this end, this IMD provides guidance to staff on information to request from permit holders, on the development of schedules that are as short as possible, and on the development of interim permit limits that will apply until the final water quality-based permit limits can be met.

1.3 Applicability

This IMD is intended to apply to staff work on individual NPDES permits.

As of the date of issuance of this IMD, all draft permits with compliance schedules that are three years or longer and their draft permit evaluation reports/fact sheets will be submitted to DEQ Headquarters for review before they are placed on public notice and resubmitted after the public notice if the conditions of the compliance schedule change as the result of comments received during the public notice. After one year, DEQ may choose to discontinue this practice, and instead designate one or more compliance schedule specialists from elsewhere in the Department to conduct such reviews.

2.0 Existing Laws Pertaining to Compliance Schedules

2.1 Eligible Permittees

Overview of Applicable Regulations

The primary federal and state regulations pertaining to compliance schedules for water quality-based effluent limitations are 40 C.F.R. § 122.47 and OAR 340-041-0061(16). A compliance schedule generally means a schedule of remedial measures, including an enforceable sequence of interim requirements (e.g. actions, operations, or milestone events) leading to compliance with a WQBEL. *See, e.g.,* Clean Water Act, Section 502(17)(definition of schedule of compliance); 40 C.F.R. § 122.2 (definition of schedule of compliance).

When appropriate, NPDES permits may include a compliance schedule leading to compliance with the Clean Water Act (CWA) and federal and state regulations as soon as possible. Any compliance schedule in an NPDES permit must include an

enforceable final effluent limitation and a date for its achievement. (EPA issued a memorandum, known as the Hanlon Memo, that provides a framework for the development of permits consistent with the CWA and for this IMD. That memo may be found at:
http://www.epa.gov/npdes/pubs/memo_complianceschedules_may07.pdf.)

EXISTING SOURCES AND DISCHARGERS

DEQ may include a compliance schedule in NPDES permits for existing sources only when DEQ staff have made a reasonable finding, adequately supported by the administrative record and described in the permit fact sheet, that the discharger cannot immediately comply with a permit's water quality-based effluent limit (WQBEL) upon the effective date of the permit, AND the permit's WQBEL meets one or more of the following requirements:

- It is more stringent than the applicable WQBEL limitation previously imposed,
- It is for a parameter for which there was no permit limit in prior permits or
- It implements a new, revised or newly interpreted water quality standard. (This means a narrative objective or criterion that, when interpreted during NPDES permit development, results in a permit limitation more stringent than the limit in the prior permit.)

NEW SOURCES AND DISCHARGERS

DEQ may issue compliance schedules for new sources or new dischargers that are under construction and have not begun discharging if all of the following are true:

- This is the first NPDES permit to be issued for the source,
- A new, revised or newly interpreted water quality standard was issued less than three years before commencement of the relevant discharge (see 40 CFR § 122.47(a)(2)), *and*
- The new, revised or newly interpreted standard was issued or revised after commencement of construction.

RECOMMENCING DISCHARGERS

A compliance schedule for a WQBEL is available only when necessary to attain compliance with requirements issued or revised less than three years before recommencement of discharge.

2.2 When compliance schedules are not allowed

DEQ staff should not include compliance schedules in NPDES permits under any of the following circumstances:

- The permittee would like time to achieve compliance with existing permit limits.
- The permittee would like time to achieve compliance with a limit developed from federal technology-based standards.
- A use attainability analysis or a site-specific criterion is being developed, and the permittee would like a compliance schedule while this process is underway. **Monitoring/study requirements should go in Schedule B, "Minimum Monitoring and Reporting Requirements."**

- A Total Maximum Daily Load (TMDL) is being developed, and the permittee would like a compliance schedule while the TMDL is being developed and finalized.

- DEQ finds that immediate protection of beneficial uses of waters of the state is in the best interest of the people of the state. In such an event, DEQ staff should make a finding in the permit evaluation report or fact sheet stating the beneficial uses and specific interests of the people of the state that are being protected or promoted.

(Federal rules prohibit the use of a compliance schedule for a WQBEL based on water quality standards adopted before July 1, 1977. All of DEQ's water quality standards were amended or adopted after that date, so this prohibition does not affect Oregon NPDES permits.)

3.0 Steps for Granting a Compliance Schedule

3.1 Establishing the need for a compliance schedule

Process

Once the permit writer has established the need for 1) a WQBEL that is more stringent than in the preceding permit, or 2) a WQBEL for a new parameter, the permit writer will convey this information to the permittee. The permit writer should encourage the permittee to evaluate this information and to determine if it is possible to meet the new WQBEL(s) with the existing facility and pollution control technology. If the permittee finds that significant modification to the facility or existing treatment processes will be necessary in order to meet the new effluent limit(s) and that these changes cannot be made to ensure immediate compliance with the WQBEL upon the effective date of the permit, the permittee should notify DEQ in writing and request that DEQ include a compliance schedule in the NPDES permit.

In order to grant a compliance schedule in a NPDES permit, the permit writer must make a reasonable finding, adequately supported by the administrative record including information submitted by the permittee and described in the permit fact sheet, that the permittee cannot immediately comply with new or newly applied effluent limits upon the effective date of the proposed permit.

Upon receipt of a written request for a compliance schedule from the permittee, the permit writer should send a written request to the permittee seeking additional information, which the permit writer will evaluate in establishing interim requirements, timeframes, interim permit limits and a date for achievement of compliance with the final WQBEL. The permit writer should request the information described in Appendix A, "Permit Writer's Checklist for Information Establishing Need for and Terms of a Compliance Schedule" and should include the completed checklist in the permit file. The Checklist may be sent to the permittee.

The information requested by the permit writer should include the following:

- Information showing that there is a need for substantial modifications to treatment facilities, operations or measures to meet the new permit limits and detailed information and explanations about why the modifications cannot be made immediately. This includes existing effluent data and/or analysis demonstrating compliance with new permit limits is not immediately possible upon the effective date of the permit.

- A proposed critical path schedule, with a minimum of annual reporting requirements, detailing the steps needed to modify or install treatment facilities, operations or other measures (e.g., pretreatment measures) for coming into compliance with the new permit limits (including the time reasonably required to obtain the necessary financing).
- If there is the potential for a compliance schedule to extend beyond one year, information about interim requirements (e.g. sequence of actions or operations leading to compliance with the WQBEL) and associated dates for their achievement. The permit writer should anticipate possible Milestones as discussed in the IMD, Part 4.2, and request the appropriate information from the permittee to develop such milestones.
- If there is the potential for a compliance schedule, the permit writer should anticipate the types of information relevant to the particular situation and which might be needed to determine the length of any compliance schedule. For example, the permit writer should request information relevant to elements in this IMD, Part 4.4.
- Results of studies, modeling, and/or pilot studies aimed at quantifying pollutant levels in the discharge and the sources of those pollutants in the waste system.
- Documentation of source control efforts currently underway or completed, including implementation status and compliance status with any pollution prevention programs or industrial pretreatment programs that have been established.
- A proposed critical path schedule for additional source control measures or waste treatment.
- The highest discharge quality (e.g. concentrations, mass loadings, etc.) that is technically and economically achievable on a consistent basis until final WQBEL compliance is attained.
- A demonstration that the proposed schedule of compliance is as short as technically possible. Section 3.2 contains information relevant to determining timeframes.
- Additional information and analyses, to be determined by the permit writer on a case-by-case basis.

In addition to the information submitted by the permittee, the permit writer should also consider other relevant information and data derived from other reliable sources in determining whether a compliance schedule is appropriate.

If the permit writer finds that the information submitted demonstrates the need for a compliance schedule, the permit writer will include that finding and explain the basis for this finding in the permit evaluation sheet or permit fact sheet.

3.2 Establishing the length of a compliance schedule

The permit writer must ensure that the compliance schedule is a short as possible. The permit writer should not assume that a compliance schedule may be based on the maximum time period allowed by any applicable state authorization. Factors relevant to the determination of "as soon as possible" include: consideration of the steps needed to modify or install treatment facilities, operations, or other measures and the time that those steps would take. The permit writer may also take into account the following:

- The type of facilities being constructed or programs being implemented and the times associated with those steps (including the time reasonably required to obtain necessary financing), and

- Industry experience with the time typically required to construct similar facilities or implement similar facilities or implement similar programs recognizing that some past experiences and related timeframes may not have been based on the "as soon as possible" requirement.

Appendix B provides typical timeframes associated with POTW upgrades in Oregon. Permit writers should consider these timeframes but also recognize that these timeframes might include project timeframes that may have not been based on the "as soon as possible" requirement. Appendix C lists possible treatment technologies available for different pollutant categories. The type of treatment technology will greatly influence the amount of time necessary for the compliance schedule. As experience with various types of treatment technologies grows, this chart will be updated to provide more reference materials.

Alternative Compliance Options: In the written request for a compliance schedule, the permittee should describe the treatment technology it intends to use to comply with a new or more stringent permit limit. When there is a **range of options** available to a permittee to come into compliance, the permittee should explain the basis for its preferred option (i.e., explain the pros and cons of each option). When DEQ reviews a renewal application to determine whether the permittee-preferred option qualifies for a compliance schedule, DEQ needs to consider the relative cost and time required to implement the other options. If another option is financially feasible and can be implemented in a significantly shorter period, DEQ should not approve a compliance schedule for the permittee-preferred option unless its benefits clearly outweigh those of the faster option. DEQ may consider other environmental or societal benefits associated with a particular option, as long as the implementation periods are not significantly longer. It is best if implementation periods do not exceed the term of the permit.

If the permittee is uncertain which option it prefers after a diligent consideration of the available options, the permit writer may consider drafting a compliance schedule with alternative compliance options. Such a compliance schedule may allow a limited trial period (e.g., six months to a year) for an unproven treatment method. The compliance schedule would have Compliance Schedule I setting forth milestones for trying the unknown treatment method, a date by which the permittee must notify DEQ of its preferred option, and what the final compliance date is if Option I is selected. Such a permit would also include Compliance Schedule II, which would begin once the compliance option is selected and would include a compliance deadline applicable if a different treatment option is chosen. The final permit limit will be the same regardless of which compliance option is chosen; only the final compliance date would vary. Once the compliance method has been chosen, the permit writer should initiate a permit modification for the purpose of removing the inapplicable requirements associated with the compliance option not chosen.

4.0 Incorporating Compliance Schedules into permits

4.1 Overview

The entire compliance schedule will be included as enforceable terms of the permit, whether or not the final compliance date is within the term of the permit. Permit writers must ensure that compliance schedules contain:

- Milestones and dates for their achievement
- Interim permit limits, as appropriate (see Section 4.3)
- Final permit limits and dates for their achievement/compliance
- "Re-opener" language: "This permit may be re-opened and modified to be consistent with conditions or mitigation measures imposed as a result of EPA's Endangered Species Act consultation with NMFS and USFW on DEQ's rule authorizing the use of this compliance schedule. If such a re-opener is necessary, DEQ will commence modification of this permit by notifying the permittee and

seeking public comment on the proposed modifications within two years after the later of (1) the date EPA's re-approval of Oregon's compliance schedules rule becomes final or (2) the date DEQ completes any required implementation of EPA re-approval, unless the date for completion of implementation exceeds two years from the date of EPA's action, in which case the modifications must commence within a period of four years from the date of EPA's re-approval."

The contents of a compliance schedule must be explained and justified in the permit evaluation report. Additional explanation is provided below.

4.2 Milestones

Compliance schedules lasting longer than a year must include milestones along with dates for their achievement, with not more than one year between dates. (See 40 CFR 122.47(3)(ii).) These milestones will be considered to be interim requirements, and may relate to the purchase and installation of new equipment, the modification of existing facilities and the construction of new facilities or in some cases, the development of new programs. These milestones must be concrete, verifiable and fully enforceable commitments (i.e., must consist of an enforceable sequence of actions or operations) leading to compliance with the WQBELs. Failure to achieve these commitments will constitute a permit violation enforceable by DEQ, the U.S. Environmental Protection Agency (EPA) or third parties.

The compliance schedule must state that no later than 14 days following each milestone, the discharger must notify DEQ in writing of its compliance or noncompliance with the interim requirements.

Pretreatment Requirements: Note that any municipality seeking a compliance schedule for pollutants (other than temperature) produced by indirect dischargers within the municipality's service territory, including geographic areas where influent is collected by another municipal entity that has contracted with the permittee to treat its wastes, will be required to implement at least one of the following programs:

a. Adopt effective local limits to address the pollutant parameters that pass through the system untreated or interfere with the treatment works.

b. Develop and implement a pollutant reduction program as part of the compliance schedule.

Examples of the types of milestones that may be included in compliance schedules as interim requirements are provided below.

A. For the purchase and installation of new equipment:
   1) Date by which plans for the purchase and installation of new equipment will be submitted to DEQ for review and approval.
   2) Date by which a purchase order will be issued for the purchase of new equipment.
   3) Date(s) by which the installation of new equipment will be initiated and completed. If there are numerous integral equipment installations, the permit writer should consider separate individualized deadlines for major equipment units.
   4) Date by which equipment will be fully operational.

B. For the modification of existing facilities or construction of new facilities:
   1) Date by which plans for modification of existing facilities or the construction of new facilities will be submitted to DEQ for review and approval.
   2) Date by which a contract will be issued for construction of required modifications or facilities.
   3) Date by which construction will begin.
   4) Date by which construction will be halfway complete.
   5) Date by which construction will be complete.

6) Date by which newly constructed facilities will be fully operational.

C. For the development of a new program:
   1) Date by which the program will be designed and a plan submitted to DEQ. The plan should contain a critical path schedule for the program's initiation and implementation.
   2) Date by which staff will be hired.
   3) Date for completion of program evaluation.

If the compliance schedule is proposed to extend three years or longer, the permit writer must send the draft permit and draft permit evaluation report to Headquarters for review before providing it to the permit applicant. For further explanation, please see Appendix D, "Consistency Review of Draft Permits Containing Compliance Schedules."

Note that Section 6 describes the requirement that DEQ track the permittee's compliance with the milestones in the permit.

4.3 Interim permit limits

If the compliance schedule exceeds one year for a new or newly applied WQBEL, the permit writer should establish interim numeric limitations for that pollutant. Numeric interim limitations for the pollutant must, at a minimum, be based on current treatment facility performance or on existing permit limitations, whichever is more stringent. The permit writer may also impose interim requirements to control pollutants, such as pollutant minimization and source control measures. The permit writer should ensure that such efforts constitute an enforceable sequence of actions leading to compliance with the final WQBEL and that such demonstrations are addressed with findings in the permit evaluation report and fact sheet. The permit writer must consider information about the highest discharge quality that can reasonably be achieved during the term of the compliance schedule. It may be appropriate to include initial interim effluent limits reflecting reductions that are immediately feasible, and/or requirements for implementation of additional measures that will achieve reductions as the permittee progresses toward full compliance with the final WQBEL.

When the permit limit is for a parameter that has not been monitored and reported on previously, the establishment of interim limits may come from best professional judgment. Often this can come from an engineering study or knowledge of similar facilities elsewhere. The permit writer needs to work with the plan review engineer to come up with reasonable interim limits that are appropriate for that facility.

If the permit holder is not in compliance with existing permit limitations, then noncompliance with the existing permit must be addressed through appropriate enforcement action.

4.4 Information needed to determine length of Compliance Schedule

Compliance schedules will require a permittee to meet effluent limits as soon as possible. To determine "as soon as possible," the permit writer needs to consider relevant information including the data gathering needs, planning, engineering, the time it will reasonably take to obtain necessary financing, and physical demands of upgrading the facility to meet effluent limits. In determining the amount of time necessary for the permittee to meet new, more stringent permit limits, the permit writer will need to consider information from the permittee, including but not limited to:

1. A construction schedule which takes into account the various steps necessary to successfully complete construction. These steps may include but are not limited to:
   a. Completion of design as well as any necessary environmental studies and reviews.
   b. Time reasonably necessary to obtain necessary financing.
   c. Purchase of property needed for construction.

   d. Obtaining any permits necessary to undertake construction such as building permits or construction stormwater permits.
   e. Construction of any necessary facilities.
   f. Purchase and installation of any necessary equipment.
   g. Testing or troubleshooting new facilities or equipment to confirm satisfactory performance.
2. A schedule for implementing a new or significantly expanded program which may include but is not limited to:
   a. Program design.
   b. Development of necessary ordinances.
   c. Hiring of staff.
   d. Public outreach.
   e. Program evaluation and modification.
   f. Permit writers may request additional information and analyses on a case-by-case basis.

5.0 Procedure

5.1 Purpose

In order to justify the inclusion of the compliance schedule in the permit, the permit writer must include information in the permit evaluation report sufficient to demonstrate that the compliance schedule is needed (i.e. appropriate), that it is as short as possible and that interim effluent limits, if applicable, are as stringent as practicable.

5.2 Contents

The permit evaluation report must include at least the following:

- A discussion of the proposed permit limits relative to the current permit limits, along with explanation of how the new permit limits are more stringent than the current limits,
- An analysis of DMR data relative to the proposed permit limits and other relevant information about the existing facilities that demonstrates that the proposed permit limits cannot be met with existing facilities and existing treatment units, even with minor upgrades,
- A description of the modifications that are necessary for compliance with the proposed permit limits,
- Information used to determine the length of the construction schedule, and
- To the extent not already addressed above, reasonable findings, adequately explained and supported by the administrative record showing: (1) the permittee cannot immediately comply with the WQBEL upon the effective date of the permit; (2) a compliance schedule is appropriate and will lead to compliance with the WQBEL to meet water quality standards by the end of the compliance schedule; and (3) compliance with the final WQBEL is required as soon as possible.

If the compliance schedule is proposed to extend three years or longer, the permit writer must send the draft permit and draft permit evaluation report to Headquarters for review. See Appendix D, "Internal Consistency Review of Draft Permits with Compliance Schedules."

6.0 After the Permit is Issued: Tracking Compliance

6.1 Purpose

As with any other permit, upon issuance of a new permit containing a compliance schedule, the permit writer will enter the permit into DEQ's Permit Repository Database. Operations and Information Services (OIS) will convey information regarding milestones and due dates into the Compliance Schedule

and MAO Tracking System, located in SharePoint at http://deqshpnt/sites/WQ/WQ_Permitting/Lists/Compliance%20Schedules/Inspector%20View.aspx. The Compliance Tracking System will generate an automatic reminder email to alert the permit writer of an upcoming due date for a milestone. Permit writers or compliance staff are responsible for tracking whether the permittee has complied with the requirements of the Compliance Schedule and for updating the Tracking System accordingly on SharePoint. The SharePoint site for permit writers will contain step-by-step instructions for entering and tracking compliance with milestones. Staff responsible for enforcement should refer to the Enforcement Guidance at http://deq05/intranet/OD/enforcement/Index.htm to determine the appropriate type of enforcement response.

Appendix A: Permit Writer's Checklist

Information establishing need for and terms of a Compliance Schedule

A permittee requesting a compliance schedule to meet new or more stringent permit limits must provide the following for the permit writer to use in determining whether a compliance schedule is appropriate and if so, what the length and terms should be.

- ☐ Results of studies, modeling, and/or pilot studies aimed at quantifying pollutant levels in the discharge and the sources of those pollutants in the waste stream.

- ☐ Information showing that there is a need for substantial modifications to treatment facilities, operations or measures to meet the new permit limits. [For example, existing effluent data and/or analysis that shows compliance with new permit limits is not immediately possible upon the effective date of the permit; or documentation about what type of upgrades will be necessary and how long such upgrades are likely to take.]

- ☐ Detailed information and explanation about why the modifications cannot be made before the new permit limits take effect. [For example, an email or letter from the permittee explaining what steps will be necessary to obtaining financing, conduct assessment and planning, design facilities, procure a contractor, time for construction and start-up.]

- ☐ Proposed critical path schedule, detailing the steps needed to modify or install treatment **facilities**, operations or other measures (e.g., pretreatment measures) for coming into compliance with the new permit limits. The steps in the schedule may include but are not limited to:
  a) Completion of design as well as any necessary environmental studies and reviews.
  b) Time reasonably necessary to obtain required financing.
  c) Purchase of property needed for construction.
  d) Obtaining any permits necessary to undertake construction such as building permits or construction stormwater permits.
  e) Construction of any necessary facilities.
  f) Purchase and installation of any necessary equipment.
  g) Testing or troubleshooting new facilities or equipment to confirm satisfactory performance.

  A schedule for implementing a new or significantly expanded **program** may include but is not limited to:
  a) Program design.
  b) Development of necessary ordinances.
  c) Hiring of staff.
  d) Public outreach.
  e) Program evaluation and modification.

- ☐ If the compliance schedule is expected to extend beyond one year, information to establish interim requirements. [For example, sequence of actions or operations leading to compliance with the WQBEL proposed by the permittee and associated dates for their achievement. This information will be used to determine the **milestones** in the compliance schedule, as discussed in Part 4.2 of this IMD.]

- ☐ Documentation of source control efforts currently underway or completed, including implementation status and compliance status with any pollution prevention programs or industrial pretreatment programs that have been established.

- ☐ A proposed critical path schedule for additional source control measures or waste treatment.

- ☐ The highest discharge quality (e.g. concentrations, mass loadings, etc.) that is technically and economically achievable on a consistent basis until final WQBEL compliance is attained.

- ☐ A demonstration that the proposed schedule of compliance is as short as technically possible. Section 3.2 contains information relevant to determining timeframes.

- ☐ Additional information and analyses, to be determined by the permit writer on a case-by-case basis.

Appendix B Typical Construction Schedule for Major Plant Upgrades

Overview

1. The information below is based on projects that have been completed in Oregon, and is provided to guide the development of construction schedules. DEQ recognizes that not all projects will fit within the timeframes shown below. Permit writers should consider these timeframes but also recognize that these timeframes might include project timeframes that may have not been based on the "as soon as possible" requirement. The permit writer needs to devise a tailor-made, site-specific solution for each permit, based on a determination of what is "appropriate" and "as soon as possible" for each permit.
2. The information below does not apply to minor upgrades or to minor repair and replacement projects. For minor upgrades such as the addition of a dechlorination facility, 1 to 2 years should be sufficient for the design and construction of the new facilities. Minor repair and replacement projects such as the replacement of a flow meter should be conducted within the context of routine operation and maintenance activities and do not warrant compliance schedules.

Subtasks	Project Size	Timeframe
Development of facilities plan Additional time may be necessary if the plan indicates that Infiltration/Inflow (I/I) is excessive. In this case, additional collection system work and studies need to be conducted.	Less than $5M	6 months to 1 year
	$5M to $50M	1 year
	Over $50M	1 to 2 years
Investigation and reduction of I/I problems If facilities planning indicates that I/I levels are not excessive, this step will not be necessary.	Less than $5M	1 to 2 years
	$5M to $50M	1 to 2 years
	Over $50M	1 to 2 years
Development of pre-design report The pre-design report develops the basis of design of unit processes for the final plans.	Less than $5M	6 months
	$5M to $50M	6 months to 1 year
	Over $50M	6 months to 1 year
Development of final plans	Less than $5M	1 year
	$5M to $50M	1 year
	Over $50M	1 year or more

Construction of new treatment plant	Less than $5M	1 to 2 years
These schedules allows time for the following (not all of which will be necessary for every project): • Demolition of old facilities when needed to make space for new facilities • Completion of tasks that cannot take place during winter months. • Time to pre-load soils that are potentially unstable and that could otherwise result in settling of new facilities upon their completion. • Decommissioning of old facilities.	$5M to $50M	2 to 3 years
	Over $50M	2 to 4 years

Schedules for other types of treatment upgrades:

1. Environmental restoration projects. Permittees who elect to meet a permit requirement through environmental restoration projects approved by DEQ will be given compliance schedules consistent with the amount of time needed for such projects. Such projects may include but are not limited to constructed wetlands, floodplain restoration or tree-planting. DEQs Water Quality Trading IMD provides information on the circumstances under which such projects may take place (include link).

Appendix C – Determining Time Necessary to Make Upgrades, Part I

Pollutant Removal Capability of Various Types of Treatment Technology, page 1 of 4

<table>
<tr><th>Types of Treatment Technology</th><th>Conventional Pollutants (BOD/TSS)</th><th>Nutrients</th><th>Toxics (Arsenic and Mercury)</th><th>Comments</th></tr>
<tr><td>Conventional Technologies</td><td></td><td></td><td rowspan="7">"The removal of most toxic pollutants from wastewaters by POTWs is largely incidental to the treatment of conventional pollutants and should be considered in terms of partitioning among alternative pathways; pollutants may be shifted from one medium to another (to the air through volatilization or adsorbed to sludge), as well as removed through biodegradation."

-National Pretreatment Program Report to Congress, 1991. This report may be accessed at: http://www.epa.gov/npdes/pubs/owm0244.pdf</td><td rowspan="7">Based on the information in the SAIC report, it appears that there is very little information available to evaluate the performance of conventional technologies with respect to the specific toxics of concern in Oregon.

The second document listed at the left has a chapter entitled:

"Co-removal of Emerging Contaminants" that has some information on the subject.</td></tr>
<tr><td>Lagoon</td><td rowspan="4">Able to meet secondary treatment standards</td><td rowspan="4">See the following EPA reference:
Municipal Nutrient Removal Technologies Reference Document
http://www.epa.gov/owm/mtb/mnrt-volume1.pdf</td></tr>
<tr><td>Trickling filter</td></tr>
<tr><td>RBC</td></tr>
<tr><td>Activated sludge</td></tr>
<tr><td>Sequencing Batch Reactor</td><td></td><td></td></tr>
<tr><td>Nutrient Removal Technologies</td><td></td><td></td></tr>
<tr><td>Nitrification</td><td rowspan="2">N/A</td><td rowspan="2">See the following EPA reference:
Nutrient Control Design Manual
State of Technology Review Report
http://www.epa.gov/nrmrl/pubs/600r09012/600r09012.pdf</td></tr>
<tr><td>Phosphorus removal</td></tr>
<tr><td colspan="4">Advanced Treatment Technologies for removal of toxics</td><td></td></tr>
</table>

Types of Treatment Technology	Conventional Pollutants (BOD/TSS)	Nutrients	Toxics (Arsenic and Mercury)	Comments
Reverse Osmosis	N/A	N/A	Inorganics (e.g., arsenic and mercury), radium, pesticides, and microbial contaminants	Pretreatment (e.g., microfiltration) to prevent fouling; may need multiple units in series to achieve low effluent levels.
Selective Sorbents	N/A	See right.	Metals (e.g., arsenic and mercury), nitrate and radionuclides	System would have to be optimized for removal of a specific pollutant to achieve low effluent levels.
Chemical Precipitation	N/A	See right.	Metals (e.g., arsenic and mercury) and phosphorus	Preoxidation likely necessary to achieve low effluent levels; removal rates may be highly dependent on pH and other wastewater characteristics.
Granular Activated Carbon	N/A	N/A	Refractory organics (DDT, BHC, dioxin), and volatile organics (bis(2-ethylhexyl)phthalate)	Pretreatment to remove solids and prevent fouling; disposal of spent media could be costly.
Advanced Oxidation Processes	N/A	N/A	Refractory organics (e.g., DDT, BHC, and dioxin)	Destroys pollutants so that residuals management is not an issue; may result in formation of harmful byproducts.
UV Oxidation	N/A	N/A		
Sonochemical degradation	N/A	N/A		

Appendix C, Part II – Estimating Time Necessary to Achieve Various Levels of Effluent Quality, p. 3 of 4

The chart below is a first step in how to determine how long it would take to upgrade in order to achieve various levels of effluent quality. The first table shows what kind of technology can achieve different concentrations. The second table regarding cost is as yet unpopulated but will be updated as information becomes available. Constraints impacting the current availability of data to populate the charts are:

- There is great variability in treatment plant situations, both in terms of the starting point and the ending point. Plants vary in size from <0.1 mgd to 50 mgd, and projects to improve treatment capability can vary from minor modifications to complete replacement.
- There is no consolidated information on installed cost and actual treatment capability for various types and sizes of plants. The chart that follows will be populated as data on treatment capabilities and cost becomes available.

Pollutant Levels Achieved with Various Types of POTWs (all units in mg/l)

Type of Treatment Plant	BOD	TSS	Total Ammonia as N	Nitrate+Nitrite as N	Total P	Diss. OP
Lagoon	30-50	30-50	15	?	8-12	?
Aerated lagoon	?	?	15?	?	?	?
Trickling filter	20	20	10-15?	?	8-12	?
Sequencing batch reactor	5-10	5-10	5?	?	3-8	?
Activated sludge	20	20	10-15?	5	8-12	?
Activated sludge with nitrification/denitrification	20	20	5-10?	2?	8-12	?
Activated sludge w. both N+ P removal	15	15	5-10?	2?	?	?
Membrane bioreactor	?	?		1?	?	?

Cost to Build Various Types of Treatment Plants (assumption = cost impacts time to construct)

Type	<0.1 mgd	0.5 mgd	1 mgd	5 mgd	10 mgd	25 mgd	50 mgd
Lagoon			n/a	n/a	n/a	n/a	n/a
Aerated lagoon			n/a	n/a	n/a	n/a	n/a
Trickling filter			n/a	n/a	n/a	n/a	n/a
Package plant(?)			n/a	n/a	n/a	n/a	n/a
Rotating biological contactor	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sequencing batch reactor							
Activated sludge							
Activated sludge with nitrification/denitrification							
Membrane bioreactor							

The above tables may provide a useful reference for upgrades that do not involve replacing the entire plant. Examples of such upgrades could include but are not limited to:

- Chlorine disinfection replaced with UV disinfection.
- Modify activated sludge plant to nitrify/denitrify
- Add filters to remove nutrients
- Install chemical addition to remove nutrients

Appendix D: Internal Consistency Review of Draft Permits with Compliance Schedules

In order to help ensure we are consistent in implementing this IMD, WQ staff at Headquarters will review certain draft permits with compliance schedules. Before the draft permit goes to the permittee or EPA for comment. Please send draft permits containing a compliance schedule proposed to extend for three years or longer to Jane Hickman (senior legal policy analyst at HQ, phone 503-229-5555). Please include the draft Permit Evaluation Report. The Report will explain the information used in determining the appropriateness and terms of the compliance schedule. Jane Hickman and Sonja Biorn-Hansen will review these draft permits.

The purpose of these internal reviews is to ensure: (1) consistent application of the compliance schedule rule across the agency and its regional offices; (2) the proposed compliance schedules are consistent with the Compliance Schedule IMD; and (3) that compliance schedules are used only when necessary, for the shortest practicable timeframes and are fully enforceable. DEQ has agreed as part of the compliance schedule litigation settlement to document the results of all of these reviews and include them in the public fact sheets for public review and comment. Please allow two to three weeks for HQ review to take place before releasing the draft permit to the permittee and EPA.

After the first year this IMD is in effect, DEQ has the option of designating compliance schedule "specialists" from the regional offices to continue to perform this review.