Tualatin River Watershed, Oregon

Clean Water Services Integrated Municipal Permit

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Permit Type:
Integrated municipal permit (integration of NPDES permits for four advanced wastewater treatment facilities, two industrial storm water permits, and permit for Municipal Separate Storm Sewer System)

Permit Information:
www.deq.state.or.us/wq/wqpermit/cwspermit.htm

Pollutants of Concern in Watershed:
Temperature, bacteria, low dissolved oxygen (DO), chlorophyll a, toxics (arsenic, iron, and manganese), biological criteria, and low pH

Pollutants Addressed in Permit:
Temperature, bacteria, DO, ammonia, and phosphorus

Permit Issued: February 26, 2004
Modified: July 27. 2005

Watershed: Tualatin River, Oregon

Key Water Quality Concerns: Temperature, bacteria, low DO, chlorophyll a, arsenic, iron, manganese, low pH, and biological criteria

Stakeholder Involvement Techniques:

- Permittee and permitting authority motivated by opportunities to protect the river while streamlining requirements through integrated permitting
- Public notice and public meetings
- General public outreach on water quality trading
- Outreach to stakeholders regarding participation in water quality trading

Case Study Issues of Interest

Type of Point Sources	POTW Discharges	✔
	Industrial Process/Nonprocess Wastewater Discharges	
	Concentrated Animal Feeding Operations	
	Municipal Separate Storm Sewer System Discharges	✔
	Construction Site Stormwater Discharges	
	Industrial Facility Stormwater Discharges	✔
	Combined Sewer Overflows	
Highlighted Approach(es)	Statewide Watershed Approach	
	Implementation of Water Quality Standards	✔
	Implementation of Total Maximum Daily Loads or Other Watershed Pollutant Reduction Goals	✔
	Permit Coordination/Synchronization	✔
	Integrated Municipal Requirements	✔
	Point Source – Point Source Water Quality Trading	✔
	Point Source – Nonpoint Source Water Quality Trading	✔
	Discharger Association	
	Coordinated Watershed Monitoring	

Overview

Clean Water Services (CWS) is a public utility (special services district) that operates four municipal wastewater treatment facilities, each with its own permit under the National Pollutant Discharge Elimination System (NPDES). CWS also has two industrial stormwater permits and is a co-permittee on a Municipal Separate Storm Sewer System (MS4) permit. The Tualatin River is the receiving stream for each of these permitted discharges. Oregon's Department of Environmental Quality (OR DEQ) issued total maximum daily loads (TMDLs) for the Tualatin River for ammonia, phosphorus, temperature, bacteria, and tributary dissolved oxygen (DO). In February 2004, OR DEQ issued a single watershed-based, integrated municipal permit to CWS. This permit incorporates the NPDES requirements for all four of CWS's advanced wastewater treatment facilities, its two industrial storm water permits, and its MS4 permit. A significant feature of the integrated permit is its inclusion of provisions for water quality credit trading involving temperature (thermal load), biochemical oxygen demand (BOD), and ammonia.

The watershed-based permit has resulted in various benefits to CWS, the permitting authority (OR DEQ), and the environment. For both CWS and OR DEQ, one permit is easier to administer and implement. The integrated permit provides economies of scale for both CWS and OR DEQ

in terms of resource use. Both organizations are now better able to focus their resources on the most critical resource problems, and the integrated permit provides greater protections for the environment than what might have been realized under the previous array of permits. Since the integrated watershed based permit was issued, CWS has planted nearly 10 miles of riparian shading, preventing 101 million kilocalories (Kcal) per day of thermal energy from impacting the Tualatin River.

This case study focuses on the components of the watershed-based permit issued to CWS. It also summarizes key components of CWS's thermal load trading program.

Permitting Background

CWS operates four municipal wastewater treatment facilities that provide advanced wastewater treatment for the cities of Banks, Beaverton, Cornelius, Forest Grove, Gaston, Hillsboro, North Plains, Tigard, Sherwood and Tualatin, the communities of Durham and King City, and some unincorporated areas of Clackamas, Multnomah, and Washington Counties. Prior to issuance of the integrated watershed-based permit, CWS had four individual NPDES permits for these facilities. It also had two general industrial NPDES stormwater permits for its Durham and Rock Creek advanced wastewater treatment facilities (AWTF) and was a co-permittee on an NPDES permit for a MS4 with Washington County Department of Land Use and Transportation (DLUT) and the Oregon Department of Transportation (ODOT) covering the urbanized area of Washington County.

The Tualatin River subbasin has stream segments listed on Oregon's 1998 Clean Water Act section 303(d) list for temperature, bacteria, dissolved oxygen, chlorophyll a, arsenic, iron, manganese, biological criteria, and low pH. The state established TMDLs in 1988 for ammonia and phosphorus to address low dissolved oxygen and elevated pH and chlorophyll a in the mainstem. OR DEQ later revised the TMDLs for ammonia and phosphorus and established new TMDLs for temperature, bacteria and tributary dissolved oxygen. EPA approved the state's TMDL Water Quality Management Plan for the Tualatin River in August 2001.

Permit Strategy

For years, CWS had been very interested in implementing a watershed-based approach to managing the water resources within the Tualatin River basin. Beginning in 2000, several events occurred that allowed CWS to pursue development of a single integrated municipal NPDES permit. The individual NPDES permits for its four wastewater facilities expired in 1995 and were administratively extended pending the development of the revised Tualatin TMDL, the original of which was issued in 1988. CWS's MS4 permit, under which it was a co-permittee, expired in early 2001. These circumstances, along with the release of guidance documents and encouragement from EPA regarding the watershed-based permitting approach, allowed CWS to propose the development of an integrated municipal permit to OR DEQ. At the time, OR DEQ had a large permit reissuance backlog. Therefore, the state was open to the approach of consolidating permits for CWS's five discharges (four wastewater treatment plants, including its stormwater discharges, and the MS4) into a single permit.

CWS was in a position to benefit from an integrated water resources management approach. It is the only major discharger in the Tualatin River watershed; it owns one quarter of the stored water in the basin, which is released for instream flow management; it has a significant amount of facility and ambient data; and it has long been responsible for managing surface water and stormwater in the basin.

CWS was issued a Clean Water Act section 104(b)(3) grant to begin developing the framework for an integrated municipal NPDES permit and a stakeholder outreach and education program. The intent of the outreach program was to build stakeholder support and understanding of CWS's integrated water resources management approach. CWS viewed the outreach as critical, especially because the Tualatin basin is home to a number of organisms that are listed as species of concern under the Endangered Species Act (ESA).

OR DEQ revised and expanded the TMDL for the Tualatin River to include temperature and bacteria in August 2001. In February 2004, OR DEQ issued a single watershed-based, integrated municipal permit to CWS covering all four advanced wastewater treatment facilities, the two industrial storm water permits for the Rock Creek and Durham AWTFs, and the MS4 for the urbanized areas of Washington County. OR DEQ included a unique feature in the permit. It included provisions for CWS to engage in water quality credit trading involving temperature (thermal load), biochemical oxygen demand (BOD), and ammonia.

OR DEQ noted in the permit fact sheet that the single watershed-based, integrated municipal permit does not reduce any of the requirements that had previously been contained in the separate permits. Instead, it provides a number of advantages and efficiencies for both the OR DEQ and CWS, including:

- Enhanced opportunities for environmental results
- Targeted and maximized use of resources to achieve greatest environmental results
- Administrative efficiencies
- Opportunities for more effective watershed-wide monitoring programs
- Opportunities for water quality trading programs

- Achieving water quality goals in a more cost-effective and efficient manner.

In addition, an Intergovernmental Cooperative Agreement was drafted between CWS and the OR DEQ in order to "provide for the continuation of the development and implementation of a watershed based regulatory framework in the Tualatin River watershed." The agreement outlines pending issues and commits the parties to continue to work on them.

Permit Highlights

The TMDL temperature standard states that no measurable increase in water temperature is allowed from dischargers. (See highlight box below for further details.) Using methods outlined in the TMDL, the permit (Provision 10 of Schedule D) includes the thermal load each of CWS's two AWTFs must offset. The loads specified are as follows: 2.0×10^8 kcal/day (Durham AWTF) and 7.2×10^8 kcal/day (Rock Creek AWTF). The permit authorizes CWS to implement mitigation measures from its Temperature Management Plan (TMP) and engage in riparian shade trading (i.e., planting vegetation to shade stream) to meet these offsets. The offset period is May 1–October 31 each year; however, the critical period for the offsets is July–August. The flow CWS releases during this latter time period defines the shade goals CWS must meet during the offset season (May 1–October 31). The permit states that if CWS achieves the thermal load offset goals for July–August (the critical period), OR DEQ will deem CWS to be in compliance with its thermal load requirements for the entire season (May 1–October 31).

Temperature Management Plan (TMP)

CWS submitted a revised Temperature Management Plan to OR DEQ on February 25, 2005. In the plan, CWS proposes three methods for reducing stream temperatures. These include wastewater reuse, flow augmentation, and the creation of stream shade. CWS is currently developing a Reclaimed Water Master Plan, which will address future reuse needs and opportunities for expansion.

Augmenting flow and increasing stream shading will allow CWS to obtain tradable thermal load credits. CWS notes in its TMP that augmenting flow and providing stream shading will eliminate the need for the organization to employ more burdensome alternatives, such as the installation of refrigeration equipment at its wastewater treatment facilities or piping treatment facility effluent to another river basin. CWS estimated that it would cost the organization $60–$150 million to install the necessary refrigeration equipment at both AWTFs , and the electricity necessary would increase air pollution and contribute to global warming. CWS further estimated that its yearly costs to operate the refrigeration equipment or pipe treated effluent to another river basin would be between $2.5 and $6 million.

Tualatin TMDL Temperature Standard (2001)

The applicable temperature standard for the Tualatin River and tributaries, set to protect salmonid fish rearing, is "no measurable surface water temperature increase resulting from anthropogenic activities." The treatment facilities wasteload allocations are based on achieving "no measurable increase" in stream temperature at the edge of the mixing zones. OR DEQ defines a measurable increase as greater than a 0.25 degrees Fahrenheit (°F) increase at the edge of the mixing zone using the applicable stream temperature standard. Additionally, the discharges may not cause the receiving water within the mixing zone to exceed 77 °F at any time. Temperatures above 77 °F are considered acutely harmful to salmonids. Based on this standard, the CWS wastewater treatment plants were given wasteload allocations that are less than 10% of their current heat load. The magnitude of the difference between their current heat load and the waste load allocation in the TMDL report provides significant impetus for trading. This allocation, modified as allowed by the TMDL document has been included in the watershed-based permit as a thermal load to be offset (www.deq.state.or.us/WQ/tmdls/docs/willamettebasin/tualatin/tmdlwqmp.pdf). The integrated permit also requires CWS to develop a Temperature Management Plan. The plan is to indicate how CWS will address temperature concerns at its wastewater treatment facilities.

Riparian Shading Trading

According to the TMP, solar radiation (sunlight) accounts for about 40 percent of the thermal energy input to the Tualatin River during the summer months. Since sunlight is easily blocked by vegetation, CWS argued in its TMP that if the watershed's streams were better shaded, total thermal energy inputs would be smaller and the streams would be cooler.

The number of thermal credits that CWS is required to achieve via stream shading is based on the amount of thermal reductions CWS could achieve via other means (e.g., with refrigeration equipment). OR DEQ has limited the duration of each credit to 20 years, which is approximately equal to the useful life of mechanical refrigeration equipment. The magnitude of each credit will depend on the amount of shaded stream surface that CWS is able to achieve. The amount of energy that is blocked by shade along a particular stream is a function of stream width, tree height, and vegetation density.

CWS took all of these factors for determining shade credit into consideration when developing its TMP. To account for the fact that shade can take a significant amount of time to establish, CWS proposed that a trading ratio of 0.5 be applied when determining the shade credit associated with a particular project. Using this trading ratio means that, in

20 years, CWS will have offset twice as much heat through shading as the excess thermal load its treatment plants add to the Tualatin. This reduction is significantly larger than what would be accomplished using other methods, such as refrigeration equipment. In other words, OR DEQ is allowing CWS to not entirely offset its excess heat load within 5 years, in exchange for the fact that over 20 years it will offset twice its excess heat load.

Vegetation planted during a single permit term (5 years) will not by itself be of a sufficient height or maturity to offset CWS's excess thermal load. The integrated watershed-based permit allows CWS to undertake other activities to offset its thermal load. In order to determine CWS's energy inputs and credits from thermal load offset activities, the TMP includes a process for developing a thermal energy budget. The procedures to create the thermal energy budget, which accounts for all thermal inputs to the river from CWS activities, and how to determine the thermal credits generated via flow augmentation and riparian restoration/protection projects are detailed in Appendix B of the TMP.

The thermal energy budget submitted in Appendix B estimates that CWS's annual thermal load after flow augmentation is about 330 million kcal/day. To offset this load, about 35 miles of riparian restoration/protection is required over the five-year permit period This is the Shade Credit Goal.

The integrated permit requires CWS to annually calculate and report a thermal energy budget (using flow augmentation, shade credits, and other OR DEQ projects) to the state. The permit also requires CWS to annually report on its progress toward achieving the thermal offset requirements. OR DEQ will use the thermal load budget calculated in the fifth year of the permit term to determine CWS's compliance with the permit's temperature requirements. If flow augmentation, the cumulative total of shade created, and all other DEQ-approved temperature management measures combine to offset the excess thermal load, CWS will have met its permitted temperature requirements. Prior to the five-year mark, OR DEQ will determine CWS compliance on the basis of the milestones CWS achieves in its approved TMP.

To remain consistent with the basic principles of trading, credits for creating shade will be generated only for those activities that go beyond regulatory requirements, such as the Forest Practices Act, local water quality management rules developed by the Oregon Department of Agriculture (also known as SB 1010), and CWS's own Design and Construction Standards. Therefore, re-vegetation projects implemented for creating shade credits will need to exceed the minimum requirements established in these regulations.

CWS will develop and implement "shade programs" aimed at increasing riparian shade. Programs intended primarily for use on private lands will be incentive based. Most projects on public lands will be conducted under CWS's Urban Stream Enhancement Program. CWS will rely on various stream restoration partners—the U.S. Department of Agriculture (USDA), Oregon Department of Forestry (ODF), and Soil and Water Conservation Districts (SWCDs)—in order to meet the temperature requirements in its permit. CWS will set up the planting programs, help with the funding, and make sure that its partners perform in accordance with individual project contract requirements. The TMP includes a detailed "shade implementation plan," which describes how planting, maintenance, and monitoring will be accomplished for each project undertaken.

CWS will calculate shade credit for each project using a computer model developed by OR DEQ. To run the model, site-specific data must first be collected, including the size of the site, width of the stream, orientation of the site to the sun, and the estimated canopy height and density 20 years after planting. The model uses these data to determine the effective shade produced by the project. "Effective shade" is a measure of the amount of sunlight blocked by shade. The blocked sunlight is then converted to kilocalories per square foot of stream surface.

More information on the Clean Water Services and water quality trading in Oregon may be found at:

www.deq.state.or.us/WQ/trading/faqs.htm

Permit Components

Effluent Limits

Schedule A of the CWS watershed-based permit contains all effluent limitations for the facilities covered under the permit for the following parameters: carbonaceous biochemical oxygen demand (CBOD), pH, total suspended solids (TSS), bacteria, residual chlorine, temperature, ammonia, and phosphorus. The outfall-specific limits are based on the approved TMDLs for the Tualatin River basin, technology-based effluent limitations (TBELs), the maximum extent practicable (MEP) standard for the MS4 covered, and pollutant benchmarks for industrial storm water discharged under the permit. Schedule A also contains a methodology for CWS to use for trading oxygen- demanding parameters (CBOD and ammonia) between the Durham and Rock Creek advanced wastewater treatment facilities. OR DEQ based the methodology on a combined Rock Creek and Durham oxygen demand load limitation expressed at Oswego Dam.

The effluent temperature limitations, the temperature monitoring requirements (in Schedule B), CWS's Temperature Management Plan (TMP), including a Thermal Load Credit Trading Plan (TLCTP), (in Schedule C), and the thermal load to offset and water quality trading provisions (in Schedule D) constitute the primary elements of the approved surface

water TMP. The permittee is deemed to be in compliance with in-stream water quality standards and is not deemed to be causing or contributing to a violation of the Tualatin Basin temperature TMDL or water quality standards for temperature if the permittee is in compliance with this approved surface water temperature management plan.

Monitoring and Reporting Requirements

Schedule B of the permit includes a requirement for CWS to develop a watershed monitoring plan. The plan is to be designed as "a comprehensive and integrated approach to watershed assessment, to address CWS's long-term progress towards achieving the goals of the Clean Water Act and, where appropriate, the Endangered Species Act." CWS is responsible for all end-of-pipe monitoring activities covering the wastewater treatment facilities, the MS4, and industrial storm water facilities. CWS is also responsible for evaluating and assessing the MS4 stormwater management plan (SWMP). Schedule B also includes a schedule and description of the various reports and deadlines for all facilities covered under the watershed-based permit.

Special Conditions

The permit contains special conditions under Schedules C and D. Schedule C contains compliance conditions and schedules, while Schedule D contains trading and other special conditions.

Compliance Conditions and Schedules

This section includes the requirements for the MS4 SWMP, facility-specific stormwater pollution control plans (SWPCPs), and the required components of the TMP and the Thermal Load Credit Trading Plan.

Schedule C.1 outlines the elements required in the TMP. The TMP is to describe and explain how CWS will manage and implement measures to offset the thermal load from its various wastewater treatment facilities to the Tualatin River. The required elements of the TMP include the following:

(1) A description of the cooling benefits of flow augmentation.

(2) A description of CWS's long range plans for increasing in-stream water supply within the watershed.

(3) An explanation of how an increase in stream shade that will result from riparian revegetation will offset thermal load discharges from CWS's facilities.

(4) A description of how CWS will protect and use stream shade in existing high quality riparian areas to offset thermal load discharges from its facilities.

(5) An explanation of how and when CWS will accomplish stream surface area shading via riparian revegetation. OR DEQ will use this information to form the basis for compliance with the permit during the time it takes for shade to become established.

(6) A methodology for prioritizing areas throughout the Tualatin Basin where riparian revegetation/protection could take place in order to maximize the benefits of the proposed projects for the protection of the most sensitive beneficial uses. OR DEQ notes that the *receipt of credit for riparian re-vegetation/protection will not be affected by whether these actions occur in priority areas.*

(7) CWS's criteria for plant selection and a copy of the plant list. The plants on the list must be appropriate given the native plant communities found in the Tualatin Basin.

(8) CWS's approach for working with potential growers and contractors involved in riparian restoration so that adequate plant materials will be available and that contractors will have adequate time to mobilize resources.

(9) A description of the kinds of approaches CWS will use to reach the target increase in stream shade.

(10) A copy of CWS's planting plan. The plan should include expected plant survival rates and justification for planting densities, and should reflect natural succession.

(11) A monitoring plan to assess plant survival.

(12) A monitoring plan to assess the amount of shade that is created.

(13) A maintenance plan that will promote plant survival and reduce the impact of invasive species.

Schedule C.2. of the permit outlines the requirements of the TLCTP, which are to be included in the TMP. The TLCTP is to describe the mechanisms through which CWS will use water quality trading to offset the thermal loads from the treatment facilities. In particular, this plan is to include details of how CWS will create thermal credits through river flow augmentation and stream surface shading and include the methodologies CWS will use for calculating these credits. The elements to be included in the TLCTP include the following:

(1) A description of the thermal load to be offset based on Schedule D.10 of the permit. Any reuse of reclaimed water will directly reduce the thermal load discharged by the facilities. The TLCTP will specify a baseline for thermal credit trading.

(2) A discussion of how CWS will create, purchase, or otherwise arrange for thermal credits generated by the following types of actions, activities, and projects:

(a) Thermal loadings relative to applicable baselines

(b) Flow augmentation resulting from CWS's voluntary purchase and release of stored water to the Tualatin Basin

(c) Stream surface area shading.

(3) The methodology for calculating the amount of thermal credits generated by flow augmentation that can be applied to offset the thermal load.

(4) The methodology for calculating the amount of thermal credit that will be generated by stream surface water shading through riparian re-vegetation and high quality area protection that can be applied to offset the thermal load.

(5) Other thermal credit trading options proposed by CWS for consideration by OR DEQ, along with a technical justification for how much thermal credit should be granted for such actions.

(6) Reporting requirements for thermal load trading credits.

Trading and other special conditions

Schedule D outlines all of the additional special conditions included in the watershed-based permit. Provision 7 describes the fundamental requirements of any water quality trading plans implemented under the watershed-based permit, such as:

- General authority.
- Authorized parameters for trading (oxygen demanding parameters such as CBOD5 and ammonia-nitrogen, temperature, and other parameters approved by OR DEQ)
- Trading baselines for both authorized parameters (temperature and oxygen-demanding materials)
- Definition of a *water quality credit* and how to apply credits for compliance purposes
- Requirements for Thermal Credit Trading Agreements between CWS and a conservation entity (defined as a "reputable land or water conservation organization or governmental entity") charged with implementing a component of the TMP to include:
  - A commitment by the Conservation Entity to fully implement the Trading Agreement in accordance with its terms, including terms for initial planting and long-term maintenance, monitoring, and reporting
  - A provision that the Credit Trading Agreement is enforceable by CWS and the OR DEQ and any successor agency. A breach of the Credit Trading Agreement by the Conservation Entity is not deemed a violation of the permit by CWS. In the event of a breach, CWS will be required to update its Clean Water Services Temperature Management Plan to demonstrate it still will be able to offset the thermal load.
- Conditions of compliance and enforcement provisions.
- Reporting and evaluation requirements.

Permit Effectiveness

Environmental Benefits

The TMP establishes benchmarks against which CWS will demonstrate its progress toward meeting the Shade Credit Goal. Each benchmark will apply to the collective group of shade programs, rather than individually. This approach will allow CWS to meet the benchmark using whatever combination of shade programs is optimal. The TMP describes a benchmark as the annual increase in the percentage of the average excess thermal load that is offset by shade after accounting for flow augmentation and any other OR DEQ-approved temperature management measure. OR DEQ will evaluate CWS's progress toward achieving the benchmarks annually. Benchmarks are a means of measuring progress but are not requirements.

In the event the shade credit created in any year is less than 50 percent of the benchmark for that year, CWS must prepare and submit to OR DEQ a written memorandum that contains a list of measures that will be undertaken to meet benchmarks in subsequent years.

As of March 2006, CWS has met Year Two's goals by having planted more than 9.5 miles of streams. CWS has a contract in place with the Natural Resource Conservation Service (NRCS) to register landowners for incentive programs developed by CWS. According to project contact, Charles Logue, the permit, with its provision for water quality trading, has significantly increased the pace and quantity of riparian area restoration in the Tualatin Basin. The additional miles of stream planted will result in the prevention of 101 million/Kcal/day from reaching the Tualatin River tributaries that would otherwise result in additional increases in water temperature. Also, CWS has adjusted the release of stored water to develop temperature credits in the July-August time frame while continuing to release stored water in the fall to ensure assimilative capacity for oxygen demand in that time period.

Mr. Logue believes that the integration of the stormwater permits into the watershed-based wastewater discharge permit, has increased the public's awareness of stormwater

related impacts and activities on the overall water quality in the basin.

No trades of oxygen-demanding parameters have occurred to date. CWS's Operations staff is continuing to evaluate operating scenarios that would take advantage of this element of the permit. CWS currently is updating its Facilities Plan. A key element of this update is to make use of a "systems" approach to future operations of the CWS facilities to take full advantage of the water quality trading elements for biochemical oxygen demand and ammonia to optimize the wastewater treatment facilities.

Benefits to the Permittee

CWS' Mr. Logue believes that one of the primary benefits of the watershed-based permit is that is has allowed CWS to spend resources where the greatest environmental benefit is realized. CWS has restored riparian areas and improved channel morphology, through utilizing "sanitary user fees" in areas outside the service boundaries, through the nexus created in an integrated watershed-based permit. The new watershed-based permit extends the purview of CWS to stormwater discharges that occur outside of the service area but that are within the urban growth boundary of Washington County. Also, the integrated permit has enabled CWS to redirect capital funds from traditional concrete and steel engineered solutions to more natural solutions (stream plantings), which provide significantly greater environmental benefit without increasing the sewer or stormwater user fee rate structure. By applying the capital savings from averting a construction-based solution to thermal load reduction, CWS has directed its capital funding towards stream restoration projects, which results in far greater benefits to the basic ecosystem services of the basin.

Since issuance of the integrated permit, CWS has reorganized to centralize its various regulatory affairs related activities into one department. According to the CWS contact, Mr. Logue, this action was a direct result of the integrated, watershed-based approach and heightened awareness of watershed issues within the District. The single watershed-based permit has also streamlined CWS's annual reporting requirements, thereby saving staff time and resources.

The success of the CWS water quality trading program has led to the formation of other watershed based approaches in Oregon. For example, the Willamette Partnership, a coalition of conservation, city, county, business, farm, and scientific leaders formed to protect the Willamette Basin. The goal of the Willamette Partnership is to accelerate and expand restoration of the Willamette River Basin through water quality and conservation trading. EPA is helping fund this effort with a matching grant of nearly $800,000. By using conservation credits as a form of environmental currency, the Willamette Partnership intends to create an Ecosystem Marketplace that will focus public and private ecological investments across the entire Willamette River Basin to improve water quality, restore fish and wildlife habitat, and protect endangered species (www.willamettepartnership.org).

Benefits to the Permitting Authority

Sonja Biorn-Hansen, OR DEQ Environmental Engineer, stated that this permitting effort "was truly about achieving environmental gain instead of just dotting I's and crossing T's." Issuing the watershed-based permit to CWS was very time and resource intensive for the permitting authority, however. The permit writer, Lyle Christensen, believes that future iterations will be much easier to issue in a timely manner and that working with one permit, rather than multiple permits, will save time and resources as well.

After the permit with Clean Water Services was negotiated, Oregon DEQ used the experience gained to develop an Internal Management Directive to guide future trading efforts in the state. This document may be found at: www.deq.state.or.us/wq/pubs/imds/wqtrading.pdf

Lessons Learned

The project contact, Mr. Charles Logue, was asked a number of questions to ascertain "lessons learned" from the CWS's watershed-based permitting project. The questions asked and Mr. Logue's responses to them are reported below.

- What has been the most challenging part of the project?

  The most challenging part of the project has been the lack of other similar work to build upon. At the same time, this has been the greatest asset of the project in that the development was not impeded or restricted by work precedents done elsewhere. CWS continues to advocate this approach across the country so as to gain from others' experience. An issue that continues is the development of the permitting accounting and tracking systems which were not designed to accommodate integrated NPDES permits. While issued as a "single" permit, the permit numbers are still administratively being tracked individually in the OR DEQ system. An additional problematic issue is the traditional enforcement response matrix accounting mechanism for permit violations. Many potential candidates for an integrated permit are concerned with the potential for accelerated movement through a regulatory agency enforcement response matrix with multiple facilities/outfalls covered under a single permit. In the CWS case, the individual facilities are still treated as individual discharges from an enforcement response perspective.

Another challenge is combining the different individual permit approaches, language, requirements, reporting elements and schedules into a more comprehensive single format. In the CWS permit, there was not time to fully develop true "integrated" permit language and schedules. This is the major work to be accomplished in the renewal process.

- What could have been done differently to resolve the challenges more easily?

  I am not sure that the process could have moved any faster. For an innovative permitting action, the process went very fast. Both the state and federal agencies were highly supportive and willing to make this happen.

- Would this approach be applicable to other watersheds? What characteristics would define other candidate watersheds?

  Absolutely, this approach is applicable to other watersheds. There are numerous other instances where one jurisdiction or utility with multiple facilities are the major dischargers to a stream or river segment. These are the obvious candidates for an integrated permit.

- If the approach were to be applied in another area, what changes should be made?

  I am not sure that there need to be any changes, if the same situation occurs elsewhere. If you have the same level of system understanding, same degree of data available, same willingness by the parties, the approach should work anywhere.

Resources

Clean Water Services. 2005. *Revised Temperature Management Plan*. February 18, 2005.
www.deq.state.or.us/wq/wqpermit/cwspermit.htm

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Oregon Department of Environmental Quality. 2005. *Water Quality Trading Internal Management Directive.* January 13, 2005.
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Oregon Department of Environmental Quality. "Water Quality Credit Trading in Oregon: A Case Study Report". Report submitted to USEPA Region 10 documenting results of the OPEI grant project entitled: Effluent Trading in Oregon - #CP-970211-01.
www.deq.state.or.us/wq/trading/docs/wqtradingcasestudy.pdf

Note: All Web references current as of July 6, 2007.