

Water Resources Department
Municipal Water Management and Conservation Plan Outline
(OAR Chapter 690, Division 086 – 2002)

OAR 690-086-0140 – Water Supplier Description	
<i>Note: The description of the system provides much of the information needed to evaluate future water supply needs, available supply options, and the role that conservation can play in meeting future needs. When updating a Water System Master Plan, the supplier should consider developing a Water Management and Conservation Plan as some of the same information will be needed for both plans.</i>	
(1) A description of the supplier's source(s) of water; including diversion, storage and regulation facilities; exchange agreements; intergovernmental cooperation agreements; and water supply or delivery contracts;	The plan should describe all sources of water currently available to the supplier. The list of sources available to the supplier should include those provided through contracts for stored water and agreements with other suppliers through which water is obtained.
(2) A delineation of the current service areas and an estimate of the population served and a description of the methodology(ies) used to make the estimate;	The description of the service area should identify the general location of the supplier's customers and specify any incorporated cities within which service is provided. Population estimates should be consistent with any applicable land use plans for the jurisdictions in the service area.
(3) An assessment of the adequacy and reliability of the existing water supply considering potential limitations on continued or expanded use under existing water rights resulting from existing and potential future restrictions on the community's water supply;	The plan should include an evaluation of the extent to which the supplier's water rights can meet existing and future needs. For example, a supplier may have water rights for 10 million gallons per day, but only be using 2 million gallons per day or summer streamflows may only be sufficient for diversion of 2 million gallons a day. Issues such as Endangered Species Act listings, drawdown conditions on wells and water quality concerns may affect the supplier's ability to fully exercise existing rights. Given these questions, an evaluation of the effects of new limitations on the community's water supply is advisable.
(4) A quantification of the water delivered by the water supplier that identifies current and available historic average annual water use, peak seasonal use, and average and peak day use;	The supplier's annual water use reporting forms (OAR Chapter 690, Division 85) should provide historical information on monthly and annual water use. Daily demand logs can help a supplier determine peak day demand if all diversions and interconnections are metered, or peak demands can be estimated. Information on the source of the water use data should be included in the plan.

(5) A tabular list of water rights held by the municipal water supplier that includes the following information:	
(a) Application, permit, transfer, and certificate numbers (as applicable);	A water rights held by the municipal supplier should be listed and the critical information related to the exercise of the rights should be provided. Any streamflow-dependent fish or wildlife species in the source that have been listed as sensitive, threatened or endangered, must be identified. In addition, any designations of the water source authorized under the right as water quality limited or as a critical ground water area must be identified.
(b) Priority date(s);	
(c) Source(s) of water;	
(d) Type(s) of beneficial uses specified in the right;	
(e) Maximum instantaneous and annual quantity of water allowed under each right;	
(f) Maximum instantaneous and annual quantity of water diverted under each right to date;	
(g) Average monthly and daily diversions under each right for the previous year, and if available for the previous five years;	
(h) Currently authorized date for completion of development under each right; and	
(i) Identification of any streamflow-dependent species listed by a state or federal agency as sensitive, threatened or endangered that are present in the source, any listing of the source as water quality limited and the water quality parameters for which the source was listed, and any designation of the source as being in a critical ground water area.	

<p>(6) A description of customers served including other water suppliers and the estimated numbers; general water use characteristics of residences, commercial and industrial facilities, and any other uses; and a comparison of the quantities of water used in each sector with the quantities reported in the water supplier's previously submitted water management and conservation plan and progress reports;</p>	<p>An understanding of the nature of water uses is essential in projecting future water needs and evaluating conservation alternatives. Different types of water use (commercial, domestic, industrial) have different use patterns that can fluctuate daily, seasonally, or annually. Knowledge and understanding of these patterns can be utilized to target conservation activities. The water use characteristics of each customer class must be compared with those reported in any previous plans or progress reports. Possible sources of this information for the supplier's own use and for comparison purposes include the following:</p> <ul style="list-style-type: none"> • Oregon Community Profiles: http://www.econ.state.or.us/COMPROF.HTM • Oregon Blue Book: http://bluebook.state.or.us/local/local.htm • Local Comprehensive Land Use Plans • Center For Population Research & Census: http://www.upa.pdx.edu/CPRC/ • US Census Bureau: http://www.census.gov/datamap/www/41.html • Water System Master Plan
<p>(7) Identification and description of interconnections with other municipal supply systems;</p>	<p>If the supplier has an interconnection with another supply, review the intergovernmental agreement (IGA) that allows this interconnection to function and describe in plan.</p>
<p>(8) A schematic of the system that shows the sources of water, storage facilities, treatment facilities, major transmission and distribution lines, pump stations, interconnections with other municipal supply systems, and the existing and planned future service area; and</p>	<p>This schematic may be taken directly from any Water System Master Plan or Cross Connection Plan. Future activities such as looping of lines may be effectively described through the schematic as well. Make sure that all of the required elements are included in the schematic.</p>
<p>(9) A quantification and description of system leakage that includes any available information regarding the locations of significant losses.</p>	<p>Quantify the amount of leakage and provide any available information on the locations of the leaks. Do not confuse system leakage with unaccounted for water. Leakage does not include certain frequently unmetered water uses such as park irrigation, back washing at the treatment plant, and hydrant testing. These uses should be estimated, if not measured. <i>OAR 690-86-0030 (8): "System leakage" means all water that is lost from a municipal water supply system, not including major breaks that are expeditiously repaired, and un-metered authorized or unauthorized uses.</i></p>

OAR 690-086-0150 – Water Conservation Element	
(1) A progress report on the conservation measures scheduled for implementation in a water management and conservation plan previously approved by the Department, if any;	<p>If the supplier has a previously approved plan, identify:</p> <ol style="list-style-type: none"> 1) Which measures in the plan have been implemented, 2) Which measures were not implemented, and 3) Why was the supplier unable to implement those measures. <p>A progress report on the conservation measures scheduled for implementation is only required if the supplier is working on a plan update or on a work plan schedule.</p>
(2) A description of the water supplier's water use measurement and reporting program and a statement that the program complies with the measurement standards in OAR Chapter 690, Division 85, that a time extension or waiver has been granted, or that the standards are not applicable;	<p>A statement of compliance with OAR 690, Division 85 is required, along with a description of the water use measurement and reporting program. If there are any diversions lacking continuous recorder, describe water use estimating methodologies used for those diversions. Does the supplier's measurement program meet the 15 percent accuracy requirements? For more information on Division 85, contact the Water Use Measurement Program at 503-378-8455, ext. 245.</p>
(3) A description of other conservation measures, if any, currently implemented by the water supplier, including any measures required under water supply contracts;	<p>What is the supplier currently doing to promote water conservation? This provides an opportunity for the supplier to take credit for all efforts. Some examples of supplier's programs may include: Web sites, mailings, leak repair, curtailment, elimination of dead end systems, alternative water uses, cooling towers, price incentives, monthly billing, television and radio education efforts, and so on.</p>
(4) A description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following conservation measures that are required of all municipal water suppliers:	
(a) An annual water audit that includes a systematic and documented methodology for estimating any un-metered authorized and unauthorized uses;	<p>The supplier must have and provide a description of a program to annually compare the quantity of water diverted and/or pumped into the system with water used as metered and delivered to customers and/or estimated for any other uses. Full metering is a must in performing an accurate water audit.</p> <p><i>OAR 690-86-0030 (9): "Water audit" means an analysis of a water system that includes a thorough accounting of all water into and out of the system to identify system leakage and metered or estimated use for authorized and unauthorized water uses. The audit also includes an analysis of the water supplier's own water use.</i></p>

<p>(b) If the system is not fully metered, a program to install meters on all un-metered water service connections. The program shall start immediately after the plan is approved and shall identify the number of meters to be installed each year with full metering completed within five years of approval of the water management and conservation plan;</p>	<p>The supplier must include a statement that all service connections are metered, or provide a schedule for installing meters on all service connections. The schedule must identify the number of meters to be installed each year with complete metering accomplished within five years. The supplier should not wait until the fifth year to begin. <i>OAR 690-86-0030 (5): "Metering" means using water meters or other continuous recording devices to measure and to maintain a record of all water diverted and delivered.</i></p>
<p>(c) A meter testing and maintenance program;</p>	<p>The supplier must have and describe a program to periodically test and repair or replace water meters. The absence of a meter testing program likely means that the supplier is losing revenue and transferring costs to those customers with accurate meters. Inaccurate water meters also will incorrectly suggest high leakage during the annual water audit. Errors from poorly maintained meters can make an efficient system look bad. If the system has meters more than ten years old that have not at least been sampled by zone, it is very likely that the water audit will not be accurate. The AWWA suggests testing and/ or replacing meters every twelve years.</p>
<p>(d) A rate structure under which customers' bills are based, at least in part, on the quantity of water metered at the service connections;</p>	<p>The supplier must have and describe a rate structure under which a portion of the charges to customers is based on the quantity of water used. This does not preclude a base account charge or require increasing block rates.</p>
<p>(e) If the annual water audit indicates that system leakage exceeds 10 percent, a regularly scheduled and systematic program to detect leaks in the transmission and distribution system using methods and technology appropriate to the size and capabilities of the municipal water supplier; and</p>	<p>The supplier must have and describe a program to detect and repair leaks in the transmission and distribution system if the annual water audit shows leakage in excess of 10 percent. Generally, all mainlines and secondary lines should be tested at least once per five year period. Feeder lines should be tested for leaks on a regular basis. The plan should include a description of how the testing is prioritized. Priority should be considered for lines which have histories of leaking, are more than 15 years old, are comprised of different materials, have been damaged by mechanical or chemical problems, are on steep slopes, carry high pressures, or are under high traffic areas.</p>

<p>(f) A public education program to encourage efficient water use and the use of low water use landscaping that includes regular communication of the supplier's water conservation activities and schedule to customers;</p>	<p>The supplier must have and describe a public information program. The description should identify the objectives, frequency, media used, and target audience of public information provided by the supplier. Public information programs can include billing mailers, brochures distributed through local businesses, or public service announcements. Many utilities provide comparisons of current use with the previous year's use on customers' bills. In some residential applications, a comparison of the individual's average with the system average can be an incentive</p>
<p>(5) If the supplier proposes to expand or initiate diversion of water under an extended permit for which resource issues have been identified under OAR 690-086-0140(5)(i), a description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of:</p> <p><i>The following requirement applies only to suppliers proposing to expand the use of water under a permit for which a Division 315 permit extension has been issued.</i></p>	
<p>(a) A system-wide leak repair or line replacement program to reduce system leakage to no more than 15 percent or sufficient information to demonstrate that system leakage currently is no more than 15 percent.</p>	<p>The supplier must have and describe a program to reduce leakage to no more than 15 percent.</p>
<p>(6) If the supplier serves a population greater than 1,000 and proposes to expand or initiate diversion of water under an extended permit for which resource issues have been identified under OAR 690-086-0140(5)(i), or if the supplier serves a population greater than 7,500, a description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following measures; or documentation showing that implementation of the measures is neither feasible nor appropriate for ensuring the efficient use of water and the prevention of waste:</p> <p><i>The following requirements do not apply to suppliers with populations under 1,000, or 7,500 if no expansion of use is proposed under a permit for which a Division 315 extension has been issued. If the analyses are required, the plan must identify and characterize alternative programs that could potentially be appropriate in the community, estimate the costs and benefits for each of the programs, and document the supplier's evaluation of the feasibility and appropriateness of the measure. For additional guidance, see the definition of waste at OAR 690-400-010 (16). Statements such as "We can't afford to do it" must be justified.</i></p>	
<p>(a) A system-wide leak repair program or line replacement to reduce system leakage to 15 percent, and if the reduction of system leakage to 15 percent is found to be feasible and appropriate, to reduce system leakage to 10 percent;</p>	<p>If the supplier's system leakage exceeds 15 percent, then the supplier must estimate the costs and benefits of reducing leakage to 15 percent. If a reduction of leakage to 15 percent is found to be feasible, then the supplier must also estimate the costs and benefits of reducing leakage to 10 percent. The AWWA committee on leak detection has settled on a standard of 10 percent as a reasonable rate of leakage.</p>

<p>(b) Technical and financial assistance programs to encourage and aid residential, commercial and industrial customers in implementation of conservation measures;</p>	<p>Possible programs include:</p> <ol style="list-style-type: none"> 1) Rebates for the costs of replacement of lawns with alternative landscaping; 2) Rebates for the installation of drip irrigation systems; and 3) Rebates for installation of front loading washing machines. <p>An example is the Oregon Department of Energy (503/378-4040) and the City of Dayton's joint program on low interest loans for high efficiency washers and dryers.</p>
<p>(c) Supplier financed retrofitting or replacement of existing inefficient water using fixtures, including distribution of residential conservation kits and rebates for customer investments in water conservation;</p>	<p>Possible alternative programs include:</p> <ol style="list-style-type: none"> 1) Partnerships with local energy utilities to distribute free low-flow shower heads; 2) Distribute free low flush toilets to customers; 3) Rebates for installation of low flush toilets; 4) Increased enforcement of state plumbing code requirements; and 5) Retrofitting public facilities. <p>The state building code requires installation of efficient plumbing fixtures during remodeling and reconstruction if the existing fixtures are to be replaced. An estimate of the number of existing plumbing fixtures installed before 1996 when the current standards went into effect will aid in assessing the possible water savings of fixture retrofit programs. The State Standards are under ORS Chapter 447 and are available at http://www.leg.state.or.us/ors/447.html.</p>

<p>(d) Adoption of rate structures, billing schedules, and other associated programs that support and encourage water conservation;</p>	<p>Possible alternative rate structures include:</p> <ol style="list-style-type: none"> 1) Adoption of increasing block rates; 2) Rate structures with higher summer time rates; and 3) Reduction or elimination of reduced rates for large water users. <p>Measures as simple as monthly billing instead of annual bills can be very helpful. Flat rates and declining block rates will not yield the same conservation savings as increasing block rates. However, community values, economics, and when the last rate change occurred must be considered when dealing with this aspect of the plan. Contractual obligations with major industries and public interest uses of water (such as parks, swimming pools, and school facilities) must be identified. The Rural Communities Assistance Corporation has a rate setting training available; see http://www.rcac.org/States/Oregon.htm for contact information.</p>
<p>(e) Water reuse, recycling, and non-potable water opportunities; and</p>	<p>Possible programs include:</p> <ol style="list-style-type: none"> 1) Providing reclaimed water for a golf course or other public landscaping; 2) Requiring recycling of cooling water; 3) Requiring back washing filters with untreated water instead of finished water; 4) Discontinuation of the use of potable water at the sewage treatment plant; and 5) Irrigation with treated water in non-contact areas. <p>Examples of reuse programs include the “Oregon Gardens” in Silverton and the municipal golf course in Prineville.</p>

<p>(f) Any other conservation measures identified by the water supplier that would improve water use efficiency.</p>	<p>Possibilities for other conservation measures include:</p> <ol style="list-style-type: none"> 1) Identification and reduction of high pressure zones to decrease wasted water in the high pressure account areas. 2) Identification of zones that could be looped to eliminate flushing requirements. 3) Retrofit system to have settling tanks for backwash water. Often backwash water is too turbid or high in bacteria to be returned to the system; analysis of a way to modify or cure these problems may make more water available, especially during peak season use. 4) Reuse of backwash water from public facilities such as swimming pools for other uses such as irrigation. 5) Analysis of cost effectiveness of metering individual hydrants or flushing valves. <p>Participation in the Environmental Protection Agency’s Water Alliances for Voluntary Efficiency (WAVE) program. http://es.epa.gov/partners/wave/wave.html.</p>
<p>OAR 690-086-0160 – Municipal Water Curtailment Element <i>OAR 690-086-0030 (10): “Water curtailment element” means a program to accomplish a specific reduction in the amount of water used or lost within a specific time in response to an emergency or other short-term shortage.</i></p>	
<p>(1) A description of the type, frequency and magnitude of supply deficiencies within the past 10 years and current capacity limitation. The description shall include an assessment of the ability of the water supplier to maintain delivery during long-term drought or other source shortages caused by a natural disaster, source contamination, legal restrictions on water use, or other circumstances;</p>	<p>The water curtailment element is fundamentally an emergency contingency plan. Public works staff who have been confronted with shortages have uniformly described the period of an actual shortage as the absolutely worst time to be developing the plan. The development of a description of past supply deficiencies should aid in assessing the risks of loss of one or more elements of the water supply system to water shortages, facilities breakdowns, and contamination.</p>

<p>(2) A list of three or more stages of alert for potential shortage or water service difficulties. The stages shall range from a potential or mild alert, increasing through a serious situation to a critical emergency;</p>	<p>The development of a staged approach to curtailment is intended to allow a measured response to a supply shortage. The Department has a model ordinance if an example of a water curtailment element is needed. The model ordinance can be adapted by the inclusion of other ways of addressing the supply emergency situation which are appropriate in the community. These could be a description of the media alert, web page features, signs, and/ or even messages on cable access TV. The Drought Mitigation rules (OAR 690-019-0070) provide for a preference of use for human consumption and livestock use. If a water provider believes that it may want to use this provision then the water curtailment plan should include a level of alert whereby water is only used for the purposes of drinking, cooking, sanitation and livestock use.</p>
<p>(3) A description of pre-determined levels of severity of shortage or water service difficulties that will trigger the curtailment actions under each stage of alert to provide the greatest assurance of maintaining potable supplies for human consumption; and</p>	<p>Determining in advance the trigger points at which a supply shortage will be declared by local authorities and the extent to which curtailment of water use will be necessary provides staff guidance on how to respond to the crisis. Nobody wants to declare a shortage. Everybody has a tendency to hope that the next day will bring resolution of the problem. Pre-determined triggers help to ensure that the necessary actions are taken early in the crisis.</p>
<p>(4) A list of specific standby water use curtailment actions for each stage of alert ranging from notice to the public of a potential alert, increasing through limiting nonessential water use, to rationing and/or loss of service at the critical alert stage.</p>	<p>The curtailment actions should be sufficient to address the contingencies. A severe water shortage may result in damage to landscaping, close businesses, or even the inability of citizens to meet basic sanitary needs. The decisions about who will not get water are extremely difficult, even in an environment where the crisis is not impending. One community recently suffered an interruption of its primary water supply, immediately exhausted all of its planned curtailment actions, and was forced to scramble to identify and implement additional, more severe restrictions on water use. A public airing of the alternatives can aid in gaining public acceptance if and when a crisis occurs.</p>

OAR 690-086-0170 – Municipal Water Supply Element	
(1) A delineation of the current and future service areas consistent with state land use law that includes available data on population projections and anticipated development consistent with relevant acknowledged comprehensive land use plans and urban service agreements or other relevant growth projections;	The population projections should be consistent with the Water Master Plan required by the Health Division and the local comprehensive land use plan required by the Division of Land Conservation and Development. If these plans are not consistent, there should be an effort to identify the problem area and correct it.
(2) An estimated schedule that identifies when the water supplier expects to fully exercise each of the water rights and water use permits currently held by the supplier;	The plan must indicate when the supplier expects to be using the full quantity of water allowed under each permit and describe the methodology used to determine that date.
(3) Based on the information in (1), an estimate of the water supplier's water demand projections for 10 and 20 years, and at the option of the municipal water supplier, longer periods;	The supplier must provide projections of water demands in 10 and 20 years. The supplier may also provide projections for longer timeframes if it is helpful to the community's planning process.
(4) A comparison of the projected water needs and the sources of water currently available to the municipal water supplier and to any other suppliers to be served considering the reliability of existing sources;	The projected water needs should be compared to the existing resources identified in the Water Supplier Description.
(5) If any expansion or initial diversion of water allocated under existing permits is necessary to meet the needs shown in (3), an analysis of alternative sources of water that considers availability, reliability, feasibility and likely environmental impacts. The analysis shall consider the extent to which the projected water needs can be satisfied through:	
(a) Implementation of conservation measures identified under OAR 690-086-0150;	Any water savings that can be achieved through conservation measures to be implemented should be quantified and compared to future water needs.
(b) Interconnection with other municipal supply systems and cooperative regional water management; and	The quantities of water that could be obtained through cooperation with other suppliers should be identified.
(c) Any other conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources.	Any other conservation measures that would yield water at a unit cost less than those of expansion of use under the permit must be included in the plan.
(6) If any expansion or initial diversion of water allocated under existing permits is necessary to meet the needs shown in (3), a quantification of the maximum rate and monthly volume of water to be diverted under each of the permits;	If the supplier is requesting authorization to expand use under a permit, the amount of additional water must be quantified. This information will be used by the Department to authorize the additional use.
(7) For any expansion or initial diversion of water under existing permits, a description of mitigation actions the water supplier is taking to comply with legal requirements including but not limited to the Endangered Species Act, Clean Water Act, Safe Drinking Water Act; and	The plan must include a description of any mitigation actions the supplier is taking to comply with the Endangered Species Act or other legal requirements associated with the supplier's diversion of water.

(8) If acquisition of new water rights will be necessary within the next 20 years to meet the needs shown in (3), an analysis of alternative sources of the additional water that considers availability, reliability, feasibility and likely environmental impacts and a schedule for development of the new sources of water. The analysis shall consider the extent to which the need for new water rights can be eliminated through:	
(a) Implementation of conservation measures identified under OAR 690-086-0150;	Any water savings that can be achieved through conservation measures to be implemented should be quantified and compared to future water needs.
(b) Interconnection with other municipal supply systems and cooperative regional water management; and	The quantities of water that could be obtained through cooperation with other suppliers should be identified.
(c) Any other conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources.	Any other conservation measures that would yield water at a unit cost less than that of expansion of use under the permit must be considered and documented in the plan.
OAR 690-086-0125 – Additional Requirements	
(5) A list of the affected local governments to whom the draft plan was made available pursuant to 0120(6) and a copy of any comments on the plan provided by the local governments;	The draft plan must be provided to affected local governments at least 30 days prior to submitting the plan to the Department.
(6) A proposed date for submittal of an updated plan within no more than 10 years based on the proposed schedule for implementation of conservation measures, any relevant schedules for other community planning activities, and the rate of growth or other changes expected by the water supplier; or an explanation of why submittal of an updated plan is unnecessary and should not be required by the Department; and	Generally, a five-year update schedule is appropriate. However, the rules provide the flexibility needed to conform future updates of the water management and conservation plan with other planning activities such as updates of the Water System Master Plan and Periodic Review of the comprehensive land use plan.
(7) If the municipal water supplier is requesting additional time to implement metering as required under OAR 690-086-0150(4)(b) or a benchmark established in a previously approved plan, documentation showing additional time is necessary to avoid unreasonable and excessive costs.	If the supplier needs additional time to implement metering or other activities scheduled in a previous plan, justification for the need for the additional time must be included.