



**Honorable Mayor and
Members of the City Council
Banks, Oregon**

**Council Letter 2016-04
Agenda of January 12, 2016**

Agenda Item:

Shall the City Council adopt Resolution No. 2016-01, amending the City of Banks Water Curtailment Plan?

Background:

The City of Banks adopted the Banks Water Management and Conservation Plan in October 2010. This plan is reviewed periodically. With the upgrades with the Water System, we need to amend the Curtailment Section.

City of Banks owns and operates a public drinking water system that serves all properties within the City's corporate limits and some that are outside the city's limits, but this water system is subject to periodic and seasonal water shortages, which requires the ability to implement water use curtailment measures during water shortages.

It is recommended that the City Council adopt Resolution No. 2016-01, amending the City of Banks Water Curtailment Plan

Council Alternatives:

1. City Council adopt Resolution No. 2016-01, amending the City of Banks Water Curtailment Plan.
2. Decline to City Council adopt Resolution No. 2016-01, amending the City of Banks Water Curtailment Plan.

Jolynn Becker
City Manager



RESOLUTION 2016-01

A Resolution Amending the City of Banks Water Curtailment Plan

WHEREAS, the City of Banks owns and operates a public drinking water system that serves all properties within the City's corporate limits and some that are outside the city's limits, but this water system is subject to periodic and seasonal water shortages, which requires the ability to implement water use curtailment measures during water shortages; and

WHEREAS, the City has adopted a comprehensive set of regulations by which it operates its drinking water utility, codified in Chapter 50 of the Banks Code of Ordinances (BCO), which incorporates by reference the City's adopted Water Curtailment Plan in BCO Section 50.23; and

WHEREAS, the City Council adopted a Water Curtailment Plan, pursuant to this authority, by motion of the Council on October 10, 2010; and

WHEREAS, the City Council considered an amendment to its adopted Water Curtailment Plan at its regular meeting on January 12, 2016, which is attached as Exhibit A and incorporated herein by this reference.

NOW, THEREFORE, the City Council for the City of Banks, Oregon Resolves to amend its adopted Water Curtailment Plan to include the text attached hereto as Exhibit A, which is incorporated herein by this reference.

ADOPTED, APPROVED AND EFFECTIVE this 12th day of January 2016

Peter Edison, Mayor

Attest:

Angie Lanter, City Recorder

EXHIBIT A

The City of Banks Water Management and Conservation Plan was adopted by Banks City Council on October 12, 2010 and the section “Water Curtailment Element” is amend by Banks City Council as of January 12, 2016. This amendment updates the Water Management and Conservation Plan (WMCP) to incorporate the water system infrastructures and management improvements. Since the WMCP was adopted in 2010 the Banks has completed the development of Well 2 and integrated automated monitoring of the water treatment plant, well pumping, and reservoir storage. This amendment replaces Section 4.0 Water Curtailment Element of the 2010 WMCP.

4.0 WATER CURTAILMENT ELEMENT

This Section of the WMCP describes the City’s Water Use Curtailment Plan and demonstrates compliance with the requirements of the applicable Division 86 rules (OAR 690-086-0160). Curtailment planning enables the City to develop and implement proactive measures that reduce water demand while protecting the health and welfare of the community during periods of drought or catastrophic service interruption.

4.1 Curtailment History

Since 1923 the City of Banks has obtained drinking water from Green Mountain Springs, located approximately six miles north of the city in the coast range foothills. This supply was augmented by the completion of the Behrman production well in 1973. The City has experienced short and longer term disruptions in water supply. However, due to the dual spring and well sources of water, the system failures have not resulted in wide-scale loss of service.

Anecdotal information suggests that in 1991, the motor driving the Behrman Well (Well 1) pump failed and was replaced. The entire pump was replaced in 1997, which disrupted water supply from the well for approximately three days. The City of Banks experienced a longer-term loss of water from the Green Mountain Springs in February-March 1996 when a mudslide washed away the old intake structure. The City relied on Well 1 during this period and did not suffer from severe shortages because demands were modest at that time of year. However, the high-zone customers connected directly to the treated surface water transmission main were without City water service for two weeks. Water was provided in tank trucks by the Oregon National Guard through a Federal Emergency Management Agency program until a temporary intake was installed and service was resumed.

The City has experienced additional short-term water supply emergencies due to water line breaks and well system failures. Two interruptions occurred from breaks in the treated water transmission main in October-November 2007 due to a traffic-related incident that sheared off a fire hydrant twice in the two-month period. The Well 1 failed in 2008 due to lightning strike; the system was repaired within 12 hours of the discovered failure. Adequate system storage allowed these failures to be repaired in a timely manner without requiring the implementation of water use curtailment.

Recent curtailment actions have taken place in the summer of 2014 and 2015. The high demand for water caused drawdown in the wells below curtailment trigger levels for the pumping systems. Further evaluation of the water system demands found that the high water demand was the result of both a higher summer time water use and some significant leaks from the Carsten Reservoir and Sellers Road pipeline. The Carsten Reservoir leak was identified and repaired in the fall of 2015. The City is currently seeking funding to replace the Sellers Road pipeline.

4.2 Curtailment Plan

In the event of a water shortage, the City's Water-Use Curtailment Plan (authorized by City Ordinance 50.23) defines the system triggers that initiate actions to address a water shortage emergency and dictates the manner in which water use curtailment is communicated, implemented, and enforced. The curtailment plan may be implemented for rapidly developing emergencies such as those due to natural disasters or infrastructure failure, as well as longer-term water supply reductions due to prolonged drought.

The City balances water demand from customers by capturing water from the springs or pumping water from Wells 1 and 2 and storing the water for distribution in the Carsten Reservoirs. An overview of the water sources, storage, and indicators that may trigger curtailment actions is presented in the following sections.

Water Sources and Storage

The City relies on spring flow and groundwater sources to meet water demand from the City's service area clients. Spring water is captured from the Green Mountain Springs and processed through the Green Mountain Filtration Plant before it is conveyed to the Carsten Reservoirs. Wells 1 and 2 pump groundwater from a basalt aquifer beneath the City directly to the Carsten Reservoirs. In the drier summer months the capacity of the springs is diminished and groundwater becomes the City's primary source of drinking water. Although the demand on the groundwater system is highest in the summer, the City relies on groundwater production from Wells 1 and 2 to keep the Carsten Reservoirs full year-round. Because Wells 1 and 2 tap the same aquifer, the water levels in the primary well, Well 2, are used as the indicator of potential production limitations. Well 1 is kept in reserve as a redundant (back-up) pumping system in the case of a motor/pump failure at Well 2.

The City's primary water storage is in Carsten Reservoirs No.1 and No.2, located on the hills above the City. The Carsten Reservoir system's stored water is used to manage daily fluctuations in water demand, meet seasonal peak demands, and hold a volume of water for emergency firefighting (fire flow storage). The adequacy of the City's water sources and reservoir storage to meet peak summer daily demands is gauged by monitoring the water level fluctuations within the Carsten Reservoirs and the water levels in Well 2 while pumping.

Water System Indicators

The City's updated supervisory control and data acquisition (SCADA) system now continuously monitors water levels, water production, and water storage in the wells and reservoirs. The City uses the SCADA system to operate Wells 1 and 2, the Green Mountain Springs Filtration Plant, and Carsten Reservoirs No. 1 and 2. Based on measured values from the wells and storage, the City staff can evaluate the water demand placed on the system and decide if water demand trends warrant the initiation of the WCP. There are three "indicator" values that best reflect the overall stress on the City's water system, these are:

- ***Well 2 water level while pumping.*** Well 2 must maintain a minimum operational water level while pumping to avoid damage to the pump and motor systems. When Well 2 became operational in 2012, Well 1 was placed in a back-up role to provide the City with much needed redundancy in the case of a pump or motor system failure. Well 1 does not provide additional water production capacity because Wells 1 and 2 tap the same groundwater source. Long-term pumping can draw the groundwater level in the wells below the safe operating requirements of the pumping system. The pump system intake in Well 2 must be submerged by 15 Feet of water for safe operation.
- ***The water level of Carsten Reservoirs No. 1 and 2*** (as measured in Carsten No. 1). The Carsten Reservoirs are interconnected and therefore the two reservoirs equilibrate as they fill or empty. The water level in Carsten Reservoirs is an indication of the status of the overall system. The reservoirs are considered full when the water level in Carsten No. 1 is at 23.5 Feet (Elev. 413.5 Feet). The tanks start to refill when the water level declines to 21.0 Feet (Elev. 411 Feet). If water demand exceeds the water supply available from the wells and springs the water level in the tanks will decline and remain below 21 Feet.
- ***Volume of water delivered from the Carsten Reservoirs to the City's distribution system.*** All sources of water for the City are stored in the Carsten Reservoirs and delivered from storage there to the distribution system. The rate and volume of water exiting the Carsten Reservoirs is measured daily. If the WCP is initiated the previous day's 24-Hour water volume exiting the Carsten Reservoirs will be set as the benchmark to measure the progress of the conservation activities. As an example, The Stage 1 goal is a 15% reduction in water demand from the benchmark measured at start of Stage 1.

The daily volume of water exiting Carsten Reservoirs will be tracked to assess the effectiveness of conservation activities at each stage of the WCP and to determine whether water demand reduction goals stated in the WCP are being met.

The curtailment plan prioritizes the use of limited water supplies to protect public health and safety during an emergency, and provides for gradually increasing levels of voluntary and mandatory curtailment actions to address a water supply shortage. Water use is prioritized in the following manner:

1. Minimum essential indoor residential use and fire protection;
2. Minimum essential indoor uses by nonresidential customers, including schools, commercial establishments and Banks Lumber;
3. Outdoor uses and discretionary indoor uses by all customers; and
4. Service to new customers who are not served at the time the water shortage occurs.

4.2.2 Water Curtailment Stages and Triggers

This WCP manages potential water shortages by developing criteria that identify stress on the source water availability and storage of the water system. There are three stages of water shortage curtailment described as Stage 1- Mild, Stage 2 – Moderate, and Stage 3- Critical. A standalone document containing a table of water shortage stages, triggers and reduction goals and a list of curtailment actions is provided as Attachment 4-1.

Stage 1 -Mild

Water curtailment in Stage 1 may be triggered by either a potential limitation of source water or a limitation of the water available from storage. Stage 1 is triggered by a drawdown of the water level within Well 2 that forecasts a future critical water level that would require Well 2 to shut down. If the Well 2 water level while pumping declines to a water level of 240 Feet bgs (i.e. equivalent to 40 Feet above the sensor or Elevation -8.5 Feet) a low water warning alarm will be set off and a Stage 1 curtailment will be triggered.

Alternatively, if Carsten Reservoirs' water level is draw down below 21 Feet (Elev. 411 Feet) and reservoirs cannot be filled to 23 Feet by available supply within 20 Hours; a Stage 1 curtailment will be triggered.

Either of these conditions will initiate implementation of water-use limits prescribed by Stage 1 of the WCP.

Stage 2 -Moderate

A critical water level draw down in Well 2 will trigger a Stage 2 curtailment. If a decline in Well 2 water levels while pumping reaches 260 Feet bgs (i.e. equivalent to 20 Feet above the sensor or Elevation -28.5 Feet) automatic pump shut down will be imminent. A critical low water alarm will trigger implementation of water-use limits prescribed by the Stage 2 of the WCP.

Alternately, Stage 2 curtailment will occur if the water surface elevation of the Carsten Reservoirs falls below 20 Feet (Elev. 410 Feet) and cannot be restored to above 21 Feet with available supply within 24-Hours.

The water storage volume at this level is approximately 2.2 Days of water supply at an Average Day Demand (ADD) of 152 gpm/d while preserving fire flow storage. The 20 Foot Stage 2 trigger is meant to provide response time for implementing water-use curtailment measures necessary to avoid tank water levels dropping below 17 Feet (Elev. 407 Feet); a 1.4-Day supply of drinking water.

Stage 3-Critical

Stage 3 curtailment conditions are triggered if water levels in the Carsten Reservoirs fall below a tank level of 17 Feet (Elev. 407 Feet). At this level a 1.4-Day supply of water and fire flow storage remains available. Fire flow storage is a conservative allowance for emergency fire suppression use, determined from the Insurance Services Office (ISO) rating for the City and requires a minimum available water volume of approximately 685,000 gallons at all times. With

both tanks in service a tank level of 12 Feet (Elev. 402 Feet) in the Carsten Reservoirs provides a fire flow volume of approximately 702,900 gallons.

Stage 3 curtailment will also be triggered by the loss of the groundwater source due to system failure, or other conditions that prevent the use of the groundwater system for a period of more than 72-Hours when reservoir levels are below 21 Feet.

4.2.3 Curtailment Actions

The three stages of curtailment actions have been developed assuming that shortages are generally going to occur during peak demand periods in the summer. The plan concentrates first on reducing outdoor water use. If equipment failures result in a supply shortage at a time when outdoor water use is relatively low, then the emphasis of the rationing methods will be shifted to non-essential indoor use.

The curtailment actions for each of the shortage conditions are as follows:

Stage 1:

1. Request all commercial and high-volume residential landscape irrigation customers to curtail all outdoor water use by 50%. A high-volume residential customer is defined as any residential customer using more than 1,400 cubic feet of water per month, which is twice the average residential home use in Banks.
2. Establish alternate day irrigation schedules for City Schools, parks, and green spaces.
3. Issue notice to public requesting all users to voluntarily conserve water.

Stage 2:

1. Mandate commercial and high-volume residential landscape irrigation customers to curtail all outdoor water use by 50%.
2. Mandate that other users limit outdoor water use per the following steps:
 - A. Unattended outdoor irrigation of turf and plants limited to the period between 8:00 p.m. and 9:00 a.m.
 - B. Limit the length of time that unattended irrigation can occur in each sprinkler zone to 10 minutes per day.
 - C. Eliminate all irrigating for City School, park, and green spaces.
 - D. Limit residential irrigation by 50%. This may be achieved by reducing irrigation time by 50% or by instituting an every-other-day irrigation schedules.
 - E. Prohibit home washing of cars or hosing down of patios, walkways, and other surfaces.

Stage 3:

1. Order suspension of all outdoor water use and curtail indoor use to limit all customers to uses for public health and preparation of food.

Other Suggested Curtailment Actions

Curtailment requests for reduction of water use will be supported by a public information program aimed at educating the community about water use to help residents and business owners understand how modifying water use habits can conserve water consumption. When issuing a notice to the public, examples of ways to conserve water will be provided. For example, the public notification for a Stage 1 condition will be aimed at limiting outdoor water use by 50 percent or more. These uses can account for a significant proportion of summer residential use and are mostly discretionary in nature.

Specific outdoor use conservation measures that can be recommended in the notice include the following:

1. No landscape irrigation during daylight hours to reduce evaporation;
2. Limit length of time irrigation system is on to reduce waste from runoff and over watering;
3. Limit landscape irrigation to no more than three days per week; and
4. Prohibit home washing of cars or hosing down of patios, walkways, and other surfaces.

CITY OF BANKS
CURTAILMENT STAGES TRIGGERS AND REDUCTION GOALS

<u>Stage</u>	<u>Shortage Condition Trigger</u>	<u>Water Use Reduction Goal</u>
1 "Mild"	<p>A. Well 2 pumping water levels are drawn down to the “40-Feet above sensor” reading on the Well 2 SCADA system (A water level of 240 Feet bgs or Elev. -8 Feet)</p> <p style="text-align: center;">-OR-</p> <p>B. Carsten Reservoirs water level is draw down below 21 Feet (Elev. 411 Feet) and reservoirs cannot be filled by available supply within 24 Hours.</p>	15%
2 "Moderate"	<p>A. Carsten Reservoirs water level is draw down to 20 Feet and cannot be filled by available supply within 24 Hours.</p> <p style="text-align: center;">-OR-</p> <p>B. Well 2 pumping water level is drawn down to the “20 Feet above sensor” reading in Well 2. (A water level of 260 Feet bgs or Elev. -28 Feet)</p> <p style="text-align: center;">-OR-</p> <p>C. Short-term loss of the groundwater source due to a breakdown or other disruption with an anticipated repair/recovery of greater than 48 Hours (2 Days) and a Carsten Reservoir level below 21 Feet for a period of 24 Hours.</p>	30%
3 "Critical"	<p>A. Carsten Reservoirs water level is draw down to 17 Feet and cannot be filled by available supply within 24 Hours.</p> <p style="text-align: center;">-OR-</p> <p>B. Long-term (>3 Day) service disruption of the groundwater source and a Carsten Reservoir level below 21 Feet.</p>	60%

CITY OF BANKS
WATER CURTAILMENT ACTIONS

Stage 1:

1. Request all commercial and high-volume residential landscape irrigation customers to curtail all outdoor water use by 50%. A high-volume residential customer is defined as any residential customer using more than 1400 cubic feet of water per month, which is twice the average residential home use in Banks.
2. Establish alternate day irrigation schedules for City schools, parks and green spaces.
3. Issue notice to public requesting all users to voluntarily conserve water.

Stage 2:

1. Mandate commercial and high-volume residential landscape irrigation customers to curtail all outdoor water use by 50%.
2. Mandate that other users limit outdoor water use per the following steps:
 - A. Unattended outdoor irrigation of turf and plants limited to the period between 8:00 P.M. and 9:00 A.M.
 - B. Limit the length of time that unattended irrigation can occur in each sprinkler zone to 10 minutes per day.
 - C. Eliminate all irrigation for City schools, parks and green spaces
 - D. Limit residential irrigation by 50%. This may be achieved by reducing irrigation times by 50% or by instituting an every-other-day irrigation schedules.
 - E. Prohibit home washing of cars or hosing down of patios, walkways, and other surfaces.

Stage 3:

1. Order suspension of all outdoor water use and curtail indoor use to limit all customers to uses for public health and preparation of food.