



**COLORADO**  
Division of State Property  
Department of Personnel & Administration

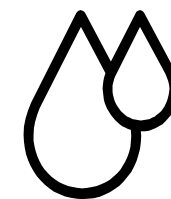
# FY 2024 Water Management Plan Template Instructions + Training

Office of the State Architect

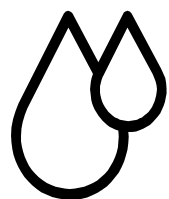
Presented by: Bailey Vigil, Buildings GHG Emissions Analyst

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**We cannot monitor what  
we do not measure.**



# Introduction – Executive Order D 2022 016

Per the Governor’s [Executive Order \(EO\) D 2022 016](#), **agencies/state executive departments** have been directed to reduce **potable water** consumption by at least 2% by the end of FY 2024-25 (June 2025) over the FY 2014-15 baseline

JARED POLIS  
GOVERNOR



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**D 2022 016**

**EXECUTIVE ORDER**

**Amending and Restating Executive Order D 2019 016  
Concerning the Greening of State Government**

Pursuant to the authority vested in the Governor of the State of Colorado and, in particular, Article IV, Section 2 of the Colorado Constitution, I, Jared Polis, Governor of the State of Colorado, issue this Executive Order amending and restating Executive Order D 2019 016 to establish new goals to reflect the State’s continued commitment to efficient and sustainable government operations and to meet and surpass the State’s goals for reducing greenhouse gas emissions, improving indoor air quality, and reducing local pollution across Colorado.

# Introduction – Last FY Findings

Potable water generally comes from the local city supply

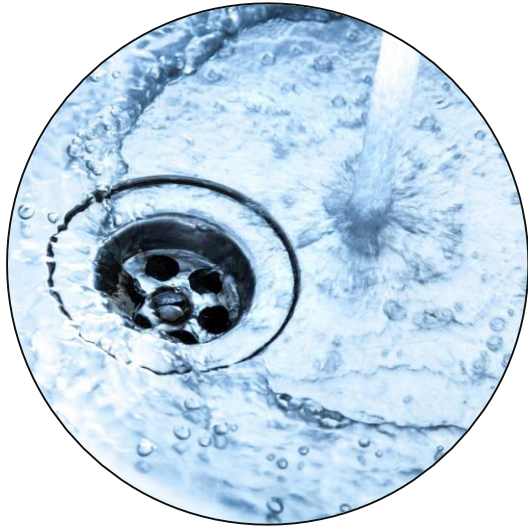
- Typically 1 meter measuring total supply
- Few submeters exist to separate the building and landscape usage

Non-potable water used for irrigation is not typically submetered

- Water rights play a role here
- Most non-potable wells do not have a separate meter

Some agencies/IHE do not monitor water usage outside of monthly bills

# Introduction – Last FY Findings



# 54,313,815 Kgals water consumed

Kgals = 1000 gallons

93% potable water

7% non-potable water

# Introduction – Current FY Findings

To achieve this goal:

- Review all water sources and usage
- Set reduction goals
- Determine necessary improvements
- Create agency-specific water management plan

It is up to each agency to work to reduce its usage by implementing

- Submeters
- Leak Detection
- Improved Irrigation Systems
- Xeriscaping
- Other Water Efficiency Measures

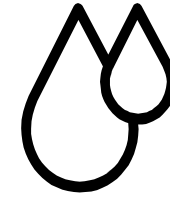
# Current FY Request

Goal: **Agencies/state executive departments** have been directed to reduce **potable water** consumption by at least 2% by the end of FY 2024-25 (June 2025) over the FY 2014-15 baseline

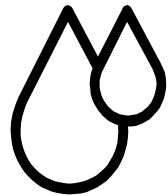
Timeline:

- Fill out and submit the Water Management Plan to OSA by **February 29, 2024**
- The water management plan implementation shall start on **May 1, 2024**
  - Implementation includes actual work and requesting the funds (CM projects)
- Submit any CM/CR requests through the annual capital request process





# Template Instructions



# Water Management Plan Template

The Water Management Plan Template represents a comprehensive approach to water reduction, both inside a building, the adjoining landscape, or separate irrigated fields

## Instructions:

- Template is broken up into multiple sections with MULTIPLE steps
- Please complete each section and provide notes/comments with as much detail as possible
- Non-irrigated land is not required to be included unless there are plans to add facilities or other water consuming improvements on the land
- Refer and adhere to the submittal timeline previously mentioned

# Water Management Plan Template

AGENCY SPECIFIC INFORMATION	
Agency Name:	
Agency Delegate Name:	
Agency Delegate Email:	

## 2024 WATER MANAGEMENT PLAN PREPARATION - EMPLOYEE ENGAGEMENT

Discuss how your agency is engaging employees in water reduction strategies. Include employee education and communication including emails, newsletters, or any other strategies used to engage employees. Complete the following actions and enter notes/comments.

	Notes/Comments
Discuss your agency's approach to engaging employees in reducing water use.	
Discuss agency policies that support water reduction including flextime or teleworking.	
Discuss your agency's approach to educating employees in reducing water use while teleworking.	
Discuss your agency's approach to engaging with the Greening Government goals and initiatives. List the Greening Government Leadership Council (GGLC) representative from your agency.	
Discuss resource needs or barriers to greater employee engagement.	
Provide any other information about employee engagement in your agency.	
Next, build a water management team. Your water management team will assist as you conduct the site surveys, design your plan, and ensure proper implementation. Water management teams are typically composed of key members of your facility, device operators and managers, water treatment representatives, and in-house designers or outside vendors. Plan to include the GGLC representative from your agency in the water management team.	

## 2024 WATER MANAGEMENT PLAN PREPARATION - SITE SURVEY

Before creating a water management plan, a site survey should be conducted of each of your facilities and water systems. Complete the following actions and mark the date when each task is/was completed. This information is meant to prepare agencies to create a water management plan and reduce water usage across the State.

	Date Complete
Review current sanitary fixtures and equipment. Determine if there is a need to replace old fixtures and equipment with WaterSense labeled models.	
Determine if your agency has a water meter system monitoring at least 80% of indoor fixtures and fittings.	
Review current commercial equipment. Determine if there is a need to replace old equipment with ENERGY STAR qualified models.	
Review mechanical systems water usage. Determine if there are opportunities to improve the current system by eliminating single-pass cooling, maximizing the cycles of concentration, controlling chemical feed and blowdown based on conductivity, removing dirt and scale buildup, or regular maintenance of boilers, steam lines, and steam traps.	
Review domestic hot water supply, boilers, other process water, and reclaimed water systems. Determine if these applications currently have water meters.	
Consider all buildings with utility rights (state-owned buildings, excluding leased buildings). Determine if these buildings have a current water metering system, no metering system, or need a water metering system implemented.	
If applicable, review all water meter locations across campus and determine the primary usage for each. Determine if the current metering system utilizes conventional water meters or advanced water meters.	
Read all water meters across campus and record the monthly water usage for each. Review cost data associated with each month's usage.	

## 2024 WATER MANAGEMENT PLAN PREPARATION - SITE SURVEY

Before creating a water management plan, a site survey should be conducted of each of your facilities and water systems. Complete the following actions and mark the date when each task is/was completed. This information is meant to prepare agencies to create a water management plan and reduce water usage across the State.

	Date Complete
Determine if additional meters or submeters may be needed based on current meter location and usage. If no meters are currently being used to measure the irrigation water usage, major water-using equipment, systems, or processes then submeters should be installed.	
Review current irrigation methods. Determine if improved irrigation could be implemented (such as drip irrigation). Determine if WaterSense labeled weather-based irrigation controllers or irrigation controllers with rain or soil moisture sensors could be installed. Determine if there is a need to have an irrigation professional conduct an irrigation audit.	
Review the position and location of spray heads to ensure that they are working properly and water is not being directed onto non-landscaped areas, such as sidewalks.	
Determine if there are any leaks in the system. Determine if the leaks can be repaired and consider the time frame for repair.	
Review current landscape plans. Determine how your agency could implement native plant species and other xeriscape practices. Determine if the current irrigation schedule is appropriate for the climate, soil conditions, plant materials, grading, and season.	
Review information in current codes, standards, and voluntary programs for water efficiency and determine how to utilize that information to reduce water usage within your agency.	

**2024 WATER MANAGEMENT PLAN PREPARATION - USAGE ANALYSIS**

After creating the water management team and conducting the site survey, it is important to identify applications or buildings that are most at risk. While every water system should be analyzed and monitored, some buildings and applications will have greater risks associated with them. These should be your primary targets for your water management plan. Review the total agency potable water consumed and current metering system(s). Consider opportunities for improvement and enter notes/comments. (1000 gallons = 1 Kgal)

	Notes/Comments
<b>Total FY 2022-23 Potable Water Consumed</b> (Kgals as reported in EnergyCAP):	
<b>Total FY 2014-15 Potable Water Consumed</b> (Kgals as reported in EnergyCAP):	
If FY 2014-15 information is not available, describe your agency's plan to obtain this information:	
<b>Calculate the percent increase/decrease in water consumed (FY 2022-23) over the baseline value (FY 2014-15):</b> $[(FY23consumed - FY15consumed) / FY15consumed] * 100\%$	
<b>Explain FY 2022-2023 strategies and/or issues that influenced the current water usage values.</b>	
<b>How was the FY 2022-2023 water used?</b> (Mechanical systems, occupant use, landscaping, etc.)	
<b>Which water applications on campus currently utilize the MOST water?</b> (Mechanical systems, cooling towers, pools, occupants, landscaping, etc.) <b>List the amount of water used for each application.</b> (Ex. Landscaping used 50 Kgal, Cooling Towers used 20 Kgal, etc.)	
<b>List all buildings with utility rights</b> (state-owned buildings, excluding leased buildings):	

## 2024 WATER MANAGEMENT PLAN PREPARATION - USAGE ANALYSIS

After creating the water management team and conducting the site survey, it is important to identify applications or buildings that are most at risk. While every water system should be analyzed and monitored, some buildings and applications will have greater risks associated with them. These should be your primary targets for your water management plan. Review the total agency potable water consumed and current metering system(s). Consider opportunities for improvement and enter notes/comments. (1000 gallons = 1 Kgal)

	Notes/Comments
List buildings/properties with water rights:	
List the TOTAL BUILDING square footage:	
List the TOTAL IRRIGATED LANDSCAPE square footage:	
<p><b>Calculate the amount of water needed for irrigation.</b>  <i>To cover the agency lawn with one inch of water, it takes about 0.623 gallons of water per square foot. To calculate the amount of water needed, multiply the width (W) times the length (L) of your yard in feet to get the number of square feet of area. Then, multiply that figure by 0.623 to determine the number of gallons needed.</i></p> <p><b>Irrigation Needed (gals) = L*W*0.623</b></p>	
<p><b>Determine if any submeters are currently serving at least 80% of the irrigated landscaped area. Calculate the percentage of irrigated landscape area served as the total metered irrigated landscape area divided by the total non-metered irrigated landscape area.</b> Landscape areas fully covered with xeriscaping or native vegetation that require no routine irrigation may be excluded from this calculation.</p>	



**2024 WATER MANAGEMENT PLAN PREPARATION - USAGE ANALYSIS**

After creating the water management team and conducting the site survey, it is important to identify applications or buildings that are most at risk. While every water system should be analyzed and monitored, some buildings and applications will have greater risks associated with them. These should be your primary targets for your water management plan. Review the total agency potable water consumed and current metering system(s). Consider opportunities for improvement and enter notes/comments. (1000 gallons = 1 Kgal)

	Notes/Comments
<b>Determine if your agency utilizes separate water meters (or submeters) for each water application</b> (building use, wastewater, mechanical systems, irrigation, etc.). <b>List all water applications that are submetered.</b>	
<b>Indicate whether each submeter utilizes a conventional water metering system or an advanced water metering system. If no submeters exist, determine which applications should have water meters installed.</b>	
<b>Consider the location of each water meter on campus. Is the current metering system mapped? Does the current meter location allow for reading and repair? If the answer is no, considering relocating the meters in a new accessible location. Determine if there is a need to create a map indicating the location of all water supply meters and submeters to be included in the facility water management plan.</b>	

**2024 WATER MANAGEMENT PLAN - GOAL IDENTIFICATION**

**With your water management team, review the site survey and current water usage across campus. Determine buildings/applications that need to be prioritized for water reductions. Set water reduction goals that will help your agency achieve water efficiency improvements. Indicate if there are no plans to improve current systems.**

	Notes/Comments
<b>List any major risks that your campus/buildings would experience in the case of a water shortage. List drivers for improved water efficiency measures.</b>	
<b>List the top buildings / applications currently utilizing the most water.</b>	
<b>Identify if any of your buildings/applications recently underwent a formal water audit or if any are planned. If applicable, list the buildings/applications.</b>	
<b>List opportunities to reduce water usage inside the facilities (reduced occupant usage, mechanical systems, etc.).</b>	
<b>Review all current water leaks and determine if there is a need to implement a leak detection and repair system.</b>	
<b>Determine if your agency currently monitors its water meters/submeters. Determine how frequently this information is monitored.</b>	
<b>If 80% of indoor plumbing fixtures and fittings are not currently metered, what is your agency's plan to accomplish this?</b>	
<b>If 80% of domestic hot water systems and other process water systems are not currently metered, what is your agency's plan to accomplish this?</b>	

**2024 WATER MANAGEMENT PLAN - GOAL IDENTIFICATION**

**With your water management team, review the site survey and current water usage across campus. Determine buildings/applications that need to be prioritized for water reductions. Set water reduction goals that will help your agency achieve water efficiency improvements. Indicate if there are no plans to improve current systems.**

	<b>Notes/Comments</b>
<b>If there are no submeters installed for boilers and reclaimed water systems, what is your agency's plan to accomplish this?</b>	
<b>If 80% of the irrigated landscaped area is not currently metered, what is your agency's plan to accomplish this?</b>	
<b>List planned FY 2024 water efficiency improvements and anticipated water savings. List funded controlled maintenance or capital renewal projects and the benefits to water efficiency (as applicable).</b>	
<b>List prioritized but unfunded water efficiency improvements and anticipated water savings. List any related projects on the agency's 5 year controlled maintenance plan or capital renewal/capital construction plan as submitted to OSA.</b>	
<b>List resources needed to ensure that water efficiency improvements are part of the strategy to reduce water usage in your agency.</b>	
<b>Describe your agency's goals for future water use. Include numerical goals (ex. We plan to reduce water usage by 3% each year).</b>	
<b>Describe your agency's strategy for transitioning to non-potable water for irrigation (if applicable).</b>	

## 2024 WATER MANAGEMENT PLAN - DEVELOPMENT

Once you've identified areas to improve and know what buildings/applications hold the biggest opportunity for safety and efficiency gains, it's time to develop the actual plan. This will involve strategies and operational improvements to better your water efficiency, as well as determining your monitoring points. You will want to build your water management plan around projects with targeted end uses, projected dates for installing efficiency and safety measures, projected annual water use, and potential capital and funding resources. Consider the prompts below and create a unique water management plan around your agency's needs.

	Notes/Comments
List action areas that your agency will focus on to reduce water usage across campus. Explain the risks associated with not making the improvements.	
List buildings/applications targeted for water reductions. If available, list the current usage for each building/application.	
List opportunities for improved metering and submetering within campus buildings. Indicate whether the updates will involve a conventional metering system or an advanced metering system.	
List opportunities to improve irrigation metering across campus (exterior). Identify locations and usage that can be submetered for better monitoring and reporting.	
List legislative/code requirements that will impact/assist with water efficiency improvements.	
Estimate/predict the decrease in water use that can be accomplished with the planned updates (usage estimate or percent estimate).	

**2024 WATER MANAGEMENT PLAN - MONITOR RESULTS AND MEASURE PROGRESS**

**Water management plans are part of a long-term commitment to better water quality and require ongoing efforts from each agency. You should monitor and report on water use and efficiencies, as well as regularly conduct legionella screening and test for microbial deposits. Everything should stay within approved ranges that you determine when developing your water management plan. If any value falls outside of your acceptable range, you should conduct the proper remediation procedures. Consider including water emergency and drought contingency plans as well as what to do in the case of an outbreak of Legionnaires' disease.**

	Notes/Comments
<b>Ensure that current water usage and planned improvements can be monitored and measured. Describe how your agency will accomplish this goal.</b>	
<b>Regularly review water meter usage both inside and outside of the building. Describe how your agency will accomplish this goal.</b>	
<b>Regularly review if there are any leaks in the system or opportunities for improved efficiency. Describe how your agency will accomplish this goal.</b>	
<b>Record and store water usage data for reporting. Describe how your agency will accomplish this goal.</b>	

# Water Management Plan Template

2024 WATER MANAGEMENT PLAN - <u>GENERAL COMMENTS</u>	
	Notes/Comments
Please provide any other comments or feedback related to your agency's efforts.	

# Conclusion

Goal: **Agencies/state executive departments** have been directed to reduce **potable water** consumption by at least 2% by the end of FY 2024-25 (June 2025) over the FY 2014-15 baseline

Timeline:

- Fill out and submit the Water Management Plan to OSA by **February 29, 2024**
- The water management plan implementation shall start on **May 1, 2024**
  - Implementation is both actual work and requesting funds (CM projects)
- Submit any eligible CM/CR requests through the annual OSA/CDHE capital request process

# Agency Best Practices & Questions

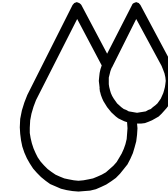
Colorado Department of Corrections (CDOC) - Joan Chavez

Department of Natural Resources (DNR) – Kevin Reidy

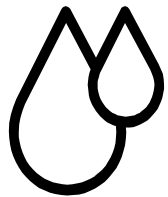
CSU Extension website: <https://extension.colostate.edu/>



# Questions



**Thank you! Are there any questions?**



**For additional questions, contact:**

[Bailey.vigil@state.co.us](mailto:Bailey.vigil@state.co.us)

# Glossary

- **Climate-adapted, appropriate, or water-wise landscapes:** Living vegetation (ground cover and plants), including native and nonnative grasses and plants that can be maintained with minimal supplemental irrigation. There are other grass covers, native and other, such as Tahoma 31, blue grama, buffalo grass, and Dog Tuff™ Grass, that may provide similar benefits as traditional turf grass while requiring much less supplemental irrigation. Also referred to as “well-adapted,” “sustainable,” “resilient,” “ColoradoScaping,” or “regionally adapted landscapes”
- **Evapotranspiration Rates (ET):** The United States Geological Survey defines evapotranspiration as the sum of all processes by which water moves from the land surface to the atmosphere via evaporation and transpiration (through plant material).
- **Gallons Per Capita Per Day (gpcd):** The amount of water used per person per day. Currently there is not a Colorado standard for calculating gpcd, leading to potential data discrepancies.
- **Hydrozones:** A hydrozone is a portion of the landscape area where plants with similar water needs are grouped. Hydrozone-based design encourages intelligent grouping of compatible plants; factoring water needs, soil characteristics, and microclimate to provide an optimal setting for successful establishment and long-term vigor.
- **Landscape Water Budget:** A landscape water budget calculates the amount of water a landscape needs based on factors such as precipitation, evapotranspiration (ET), area size, and plant type. It identifies a percentage of irrigation water demand that should be the maximum amount of water applied to a landscape for the growing season.

# Glossary

- **Municipal water use:** Municipal water use, often referred to as M&I water use, is water served by a municipal water provider and used by Coloradans in their homes, yards, businesses, and industry as well as by government for emergency services, public spaces (parks), etc.
- **Nonfunctional turf:** A more detailed definition recommendation can be found on page 9, but generally refers to the location and vegetation type together (i.e. turf in medians is nonfunctional, and climate-adapted landscapes in medians are functional). Examples of nonfunctional turf in HB 22-1151 include medians, areas adjacent to open spaces or transportation corridors, areas sloped with more than a 25% grade, stormwater drainage and detention bases, commercial, industrial, or industrial properties (including local government, schools, and businesses), common elements in a common interest community, and portions of residential yards.
- **Tap Fees:** Tap fees are the fees water providers apply to new water lines and meters (or taps) added to the system. These fees help offset the utility's costs to make the connection (the true tap fee). They also include higher costs for the demand placed on the system as it grows and ongoing capital improvement costs to maintain the system, treat water, etc. The latter is often referred to as plant investment fees, and other charges may be associated with a new tap. The term "tap fees" is being used throughout this report to broadly refer to these fees collectively.
- **Tiered Rate Structures:** A water pricing mechanism using an increasing block rate structure where higher prices are assessed for increased water use as determined by set volumetric tiers or blocks of water usage (e.g. tier/block 1, 2, 3, etc).

# Glossary

- **Transformative Landscape Change:** A movement coined in the 2023 Colorado Water Plan that focuses on the need for redesigning our landscapes using a variety of policy and design tools to reflect Colorado’s climate. The idea has deep roots in Colorado, dating back to 1981 when Denver Water coined the term “xeriscape.” Today, this type of landscape development, focused on native, low-water, and climate- adapted vegetation, is often referred to as “ColoradoScape,” a term coined by the Town of Castle Rock, which is gaining traction as the term of art for the unique landscape aesthetic that suits Colorado’s varied climate and water conditions.
- **Turf/Turf grass:** High-water use, cool-season, or non-native ground cover that requires a high amount of supplemental irrigation to be maintained. Kentucky bluegrass is the most commonly used turf in Colorado. Also referred to as “water-intensive landscapes.”
- **Turf removal and replacement:** The removal of vegetation requiring high amounts of water to maintain. Replacement materials should consist of living, water-wise vegetation that requires less supplemental irrigation to maintain. Also referred to as “turf removal.”
- **Water Budget Based Rates:** The United States Environmental Protection Agency defines Water Budget Based Rates as a rate structure where households are given a water budget based on the anticipated needs of that household either by the number of people living in the house and/or property size.
- **Xeriscape:** The concept created by Denver Water is based on seven principles, including planning and design, soil improvement, efficient irrigation, plant zones, mulches, turf alternatives, and maintenance. For more information, see Denver Water Xeriscape Principles.

# Resources

- <https://osa.colorado.gov/>
- <https://extension.colostate.edu/>
- [Urban Landscape Conservation Task Force Final Report](#)