

Best Management Practices for Water Use in California State Government Facilities

Department of General Services (DGS) facilities draw on the following best management practices to design, implement, and evaluate their water conservation efforts.

Best management practices are designed to consider all of the various uses of water and maximize conservation. Best management practices can be categorized to either maximize water efficiency or minimize water use. Following are 14 best management practices as recommended by DGS, and common ways in which DGS facilities accomplish them:

Best Management Practices—General

- Verify that preventative maintenance schedules and work order requests are current for all water-related systems identified in this list (be prepared to report on all deferred activities or outstanding repairs).
- Coordinate water use inspections and maintenance with regular facility inspections/preventative maintenance activities. Accelerate activities only as required to meet the goals of these water use best management practices.
- Coordinate water inspections and maintenance with regular facility inspections and preventative maintenance activities.
- Identify, modify, or establish procedures to minimize or eliminate non-essential water use.
Examples:
 - Turn off water to unused facility areas.
 - Limit building wash-downs, and instead, use wipe-downs.
 - Sweep instead of mopping, wash-downs, or pressure washing.
- Contact local water utility for rebates and assistance on water saving audits and equipment.

Best Management Practice 1—Water Management Planning

- Create a written water management and conservation policy statement addressed to staff that addresses short-term water conservation goals and a commitment to the longer term water management efficiency of the facility.
- Publicize the water management and conservation policy statement to staff and facility occupants.

- Establish procedures to record the facility water meters on a monthly basis or more.

Best Management Practice 2—Information and Education Programs

- In a public place in the facility, post informational graphics and other outreach information about facility water consumption and water conservation goals

Best Management Practice 3—Distribution System Audits, Leak Detection and Repair

- Perform a basic visual/audible leak detection survey of the primary water delivery and distribution systems.
- Identify and repair all leaks.
- Install water leak detection devices and reporting systems that can be integrated into existing building security or automated control systems.
- Establish response protocols for water emergencies.

Best Management Practice 4—Water-Efficient Landscaping

- Identify, modify, or establish procedures to apply mulch regularly around trees and shrubs and in planting areas. Avoid highly flammable mulches. Mulch should be composted wood or other organic products free of toxic or inorganic materials. Mulch should be applied to a depth of at least 2 inches.
- When mowing turf, avoid scalping and keep grass length long to reduce watering needs. Generally, grass should be left about 3 inches long.
- Restrict the use of herbicides and hand-pull weeds regularly to avoid unwanted plants consuming water.
- Use brooms and rakes to sweep hardscapes near landscaped areas instead of spraying with water.
- Provide education for sustainable and environmentally friendly landscape practices.
- Use water moisture probes to a depth of at least 3 inches to determine watering needs or planting areas.

- Establish a soil management plan to reduce runoff, eliminate the need for chemicals, and encourage healthy plant growth. The soil management plan should include an analysis of soil health including biological assays and soil probing to determine compaction.
- Identify, modify, or establish procedures to apply organic fertilizers around the root zone or base of the plant. Fertilizers should be applied only upon individual plant needs or soil test results.
- Identify existing plant types and maintain a log of plant replacement. Use drought-tolerant, fire-resistant, native plants.
- When planting large trees and shrubs, limit individual species to no more than 10 percent of the area total to reduce the risk of catastrophic losses to diseases or pests.
- Implement a regular maintenance schedule that includes regular inspections, adjustments and repairs of irrigation systems and components and replenishing mulch, and removing obstructions to irrigation emission devices.
- Implement storm water management practices to minimize runoff and increase on-site retention and infiltration of water.

Best Management Practice 5—Water-Efficient Irrigation

- Check for leaks in the primary irrigation system valves and distribution lines.
- Identify the location of all leaks and record relative severity (serious or minor).
- Repair all leaks, otherwise cap off or close any temporarily irreparable breaks or significant leaks at the closest location. Irrigate affected landscape areas sparingly with a hose until leak is repaired.
- Inspect sprinkler and drip irrigation head functions. Identify and repair poor performing or broken sprinkler heads. Use replacement irrigation heads that have uniform distribution rates for the same irrigation zones, unless otherwise directed by the manufacturer's specifications.
- Adjust system to minimum specified pressure. Install pressure regulators where required.

- Verify that automatic irrigation controls and timers function correctly. Irrigation watering windows shall meet and not exceed the Department of Water Resources best management practice recommendations.
- Verify irrigation schedules are appropriate for time of day, climate, soil conditions, plant materials, grading, and season.
- Identify, modify, or establish procedures to avoid watering during heavy winds or during rainy seasons.
- Identify, modify, or establish procedures to adjust irrigation times and durations seasonally.
- Post a copy of the irrigation schedule inside irrigation controller box doors.
- Install shut-off nozzles or quick-couplers for all hoses.
- Replace leaking shut-off nozzles, quick couplers, and hoses.
- Install faucet timers for hose or hand irrigation.
- Maintain a monthly log of irrigation water use with account and meter numbers.
- Provide education for the management of landscape irrigation.
- Install irrigation water meters and master valves.
- Upgrade existing irrigation controllers with weather-based irrigation controllers that use on-site weather stations or free weather base evapotranspiration Web data.
- Maintain planting and irrigation record drawings for baseline information and submit a copy to agency/department and landscape architect (these records help identify areas in need of water conservation improvements).
- Identify and modify manually operated irrigation valves to automated valves.
- Identify planter areas that experience runoff and adjust irrigation to prevent runoff. Install check valves or anti-drain valves to hold water in the system to prevent drainage from sprinkler heads when the system is off.
- Turn off water fountains and establish maintenance procedures for existing pumps and equipment.
- Inspect and maintain backflow prevention devices.

Best Management Practice 6—Toilets and Urinals

- Adjust fixtures to use the minimum amount of water required for proper function.
- Replace broken fixtures with low-flow water conserving fixtures.
- Repair leaking toilets.
- Toilets that need to be replaced due to normal wear and tear should be replaced with low-flow models.
- Install toilet tank water displacement devices, such as toilet dams, bags, or weighted bottles.
- Retrofit flushometer (tankless) toilets with water saving diaphragms.
- Replacing toilets with low volume models. Toilets can use as much as 3.5 gallons per flush, while low volume toilets use only 1.28 gallons per flush.
- Set urinals with programmable automatic flush valves to a water saving mode that flushes the urinal after more than one use.
- Install 0.125 gallons per flush or waterless urinals wherever possible.

Best Management Practice 7—Faucets and Showerheads

- Adjust fixtures to use the minimum amount of water required for proper function.
- If replacing broken fixtures, install water conserving devices.
- Repair leaking or dripping faucets or showerheads.
- Showerheads or faucets in need of replacement due to normal wear and tear should be replaced with low volume models.
- Low volume showerheads use only 2 gallons of water per minute, while older models may use as much as 3 gallons per minute (gpm).
- Replace 2.5 gpm kitchen faucets with those that use only 1.5 gpm.
- Replace restroom faucets that use as much as 1.5 gpm with those that use only 0.5 gpm.

- Replace restroom faucets with programmable faucets that use 0.25 gallons per cutoff.

Best Management Practice 8—Boiler/Steam Systems

- Perform a basic visual/audible leak detection survey of the primary steam distribution pipes and steam traps. Develop a steam trap inspection plan.
- Replace faulty steam traps with effective, low maintenance units.
- Identify the location of all leaks and record relative severity (serious or minor).
- Repair all leaks as feasible; otherwise verify that all irreparable leaks are adequately documented in maintenance management logs and databases.
- Inspect piping and main tank insulation and repair or replace as necessary.
- Identify, modify, or establish procedures to reuse steam condensate and boiler blow-down water for other purposes where feasible. Steam condensate shall be returned to the boiler unless volumes are too low to justify condensate return loops; in the latter case, the condensate shall be reused beneficially wherever possible.
- Identify, modify, or establish procedures to avoid once-through/single-pass operations.
- Where water softening is used, regeneration shall be controlled by actual hardness or by a flow volume control that is based on the hardness of the water to be softened. Softeners that use timers for recharging should be eliminated.

Best Management Practice 9—Single Pass Cooling Equipment

- Perform a basic visual/audible leak detection survey of the primary cooling water distribution pipes, as part of a preventive maintenance program.
- Identify the location of all leaks and record relative severity (serious or minor).
- Repair all leaks as feasible; otherwise verify that all irreparable leaks are adequately documented in maintenance management logs and databases.
- Inspect piping, chiller, and storage tank insulation and repair or replace as necessary.

- Condensate from the air conditioner cooling coils should be captured and used for cooling tower makeup or other purposes. Building design that would help facilitate the easy capture of condensate by location of air handling units should be considered.
- Find alternative uses for single-pass effluents such as landscaping, boiler or cooling tower makeup water, or toilet flushing.
- Future systems should specify multi-pass, closed loop, or air cooled equipment options.

Best Management Practice 10—Cooling Tower Management

- Perform a visual/audible leak detection survey of the primary cooling tower water distribution pipes.
- Identify the location of all leaks and record relative severity (serious or minor).
- Repair all leaks as feasible; otherwise verify that all irreparable leaks are adequately documented in maintenance management logs and databases.
- Identify, modify, or establish procedures to eliminate once-through/single-pass cooling, or for reusing water elsewhere in the facility.
- Identify, modify, or establish procedures to use air cooling where feasible.
- Identify, modify, or establish procedures for water treatment to maximize cycles of concentration. Cooling tower chemical contracts must specify the cycles of concentration to be achieved. The cycles of concentration should be set to match local water chemistry but shall exceed at least four cycles unless the blowdown is being reused for landscape irrigation or other water conserving uses.
- Identify, modify, or establish procedures to reuse cooling tower effluent where possible.
- Identify, modify, or establish procedures to reuse treated waste water or other non-potable water sources for cooling tower makeup.
- Cooling tower side stream filtration should be installed when new systems are purchased.

Best Management Practice 11—Commercial Kitchen Equipment

- Perform a visual/audible leak detection survey of all kitchen devices using water.
- Identify the location of all leaks and record relative severity (serious or minor).
- Repair all leaks as feasible; otherwise verify that all irreparable leaks are adequately documented in maintenance management logs and databases.
- Clean or replace high pressure prerinse spray valves.
- Identify, modify, or establish procedures to eliminate wasteful water use.
 - Examples:*
 - Do not use running water to melt ice.
 - Operate dishwashing equipment only when needed.
 - Wash only full loads.
- Identify, modify, or establish procedures to reuse final rinse water for garbage disposal and prewash functions.
- Limit garbage disposal use. Hand-scrape food trays, receptacles, and utensils into garbage containers or equip sinks with strainers or mesh screens to divert food waste from the garbage disposal.

Best Management Practice 12—Laboratory/Medical Equipment

- Perform visual/audible leak detection surveys of all water use or distribution systems.
- Identify the location of all leaks and record relative severity (serious or minor).
- Repair all leaks as feasible; otherwise verify that all irreparable leaks are adequately documented in maintenance management logs and databases.
- Identify, modify, or establish procedures to turn off any equipment not in use.
- Inspect solenoids and automatic shutoff valves for proper function and repair ,or replace as feasible.
- Verify that all equipment is set to minimum manufacturer pressure and flow rates.

Best Management Practice 13—Laundry

- Identify, modify, or establish procedures to evaluate wash cycles and detergent/chemical formulation for maximum efficiency.
- Identify, modify, or establish procedures to avoid excess filter and softener back flush.
- Identify, modify, or establish procedures to restrict use of equipment to only full loads.
- Identify, modify, or establish procedures to minimize use of stand-alone washing machines.

Best Management Practice 14—Vehicle Washing

- Identify, modify, or establish procedures to keep records of water used per vehicle washed.
- Determine the effects of eliminating vehicle washing activities.
- Verify that all solenoids, valves, nozzles, and other equipment are adjusted for minimum manufacturer pressure and flow rates.
- Inspect jets and hose parts and replace as necessary.
- Identify, modify, or establish procedures to reduce foam and the resulting need for rinse water.
- Identify, modify, or establish procedures to use higher pressure rinses instead of flood arches.
- Identify, modify, or establish procedures to use environmentally preferable and chemically compatible washing solutions and waxes to enable recycling.