

# **WATER CONSERVATION IN LANDSCAPING RULES, REGULATIONS AND PROCEDURES**

## Purpose

The purpose of these rules, regulations and procedures is to identify the suggested minimum requirements for implementing the provisions of the City of Lakewood Water Conservation in Landscaping Ordinance, Section 8600 et seq. of the Lakewood Municipal Code, as required by California Government Code Section 65591 et seq.

The provisions in these procedures apply to the following:

1. Installation of new and rehabilitated landscaping for industrial, commercial, office and institutional developments; parks and other public recreational areas; multi-family residential; Planned Development (PD) common areas and to road medians and corridors with a landscape area equal to or greater than 2,500 square feet.
2. Installation of new landscaping at single family dwellings, which are developer-installed with a landscape area equal to or greater than 2,500 square feet.
3. Installation of new landscaping at single family dwellings, which are home-owner installed, with a landscape area equal to or greater than 5,000 square feet.

These requirements do not apply to:

1. Any residential project with a lot size of 7,000 square feet or less.
2. Private open space areas in multiple family residential developments.
3. Cemeteries.
4. Registered Historical Sites.
5. Ecological restoration projects that do not require a permanent irrigation system.
6. Mined-land reclamation projects that do not require a permanent irrigation system.
7. Any project utilizing reclaimed water. Projects that plan to use reclaimed/recycled water shall meet with the water purveyor to determine supply availability, proximity to recycled water distribution system, associated costs and operating regulations. Recycled water must meet all state and local regulations. Projects adjacent to a recycled water distribution system must meet the applicable provisions regarding connection as stated in the City of Lakewood Water Conservation Ordinance.

Landscape projects subject to the provisions in the City of Lakewood Water Conservation in Landscaping Ordinance shall prepare a Landscape Plan Application which includes the preparation of a Landscape Documentation Package and Certificate of Completion. Directions for the preparation of the Landscape Documentation Package and Certification of Completion are provided in the Water Conservation in Landscaping Rules, Regulations and Procedures contained herein. A completed Landscape Documentation Package must be submitted to the Community Development Department.

The Landscape Documentation Package will be reviewed to ensure completeness and compliance with the submittal requirements contained herein. The Landscape Documentation Package will be approved, approved with conditions, or denied. Applications receiving conditional approval will be required to revise the Landscape Documentation Package and resubmit to the City.

Upon approval the applicant must obtain all appropriate permits from City of Lakewood Building and Safety Department prior to starting work. The applicant must also forward a copy of the Water Efficient Landscape Worksheet to the local water purveyor: Lakewood Department of Water Resources or Golden State Water Company.

The **Landscape Documentation Package** shall contain:

1. Water Conservation in Landscaping Application Form;
2. Water Efficient Landscape Worksheet;
3. Landscape Plan;
4. Irrigation Plan;
5. Soil Assessment;
6. Grading Design Plan;
7. Stormwater Management Plan if applicable;
8. Annual Irrigation Schedule.

Upon completion of the project the applicant shall submit a **Certificate of Completion** to the City of Lakewood Community Development Department. The Certificate of Completion includes:

1. Certificate of Completion Form;
2. Submittal of As-built Landscape Documentation Package if significant alterations were made to the original plans;
3. Water Audit Results; and
4. Grading Plan if not previously submitted with the Landscape Documentation Package.

# **LANDSCAPE PLAN APPLICATION REQUIRMENTS**

# LANDSCAPE DOCUMENTATION PACKAGE

## LANDSCAPE PLAN PREPARATION

**Landscape Plan and Details.** For the efficient use of water, a landscape should be carefully designed and planned for the intended function of the project. Landscape design plans meeting the following criteria shall be submitted as part of the Landscape Documentation Package:

**I. Plant Materials.** Any plant may be used in the landscape, providing the Estimated Total Water Use (ETWU) in the landscape area does not exceed the Maximum Applied Water Allowance (MAWA). See instructions on page 15 regarding the calculations of Estimated Total Water Use and Maximum Applied Water Allowance.

**A. Hydrozones.** The landscape area shall be divided into hydrozones. Each hydrozone shall be selected and planted appropriately based upon their adaptability to the climate, soil conditions, and site topography. Each hydrozone shall have plant materials with similar water use, with the following exception: hydrozones may mix plants with different water needs provided that individual hydrozones mix plants of moderate and low water use, or moderate and high water use. Hydrozones that mix low and high water use plants shall not be permitted. The water use calculation for mixed hydrozones must be based on one of the following:

1. Plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or
2. Plant factor of the highest water using plant is used for the calculation.

**B. Turf.** Turf is not allowed on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape.

**C. Fire Prone Areas.** A landscape design plan for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is required pursuant to California Public Resource Code Section 4291(a) and (b).

**D. Invasive or Noxious Plant Species.** The use of invasive and/or noxious plant species is discouraged.

**E. Low Water Use Plants.** For architectural guidelines of a common interest development, including community apartment projects, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water plants as a group, pursuant to California Civil Code Section 1353.8.

**II. Water Features.** Water features such as ponds, and waterfalls used in landscaped areas shall meet the following criteria:

- A. Recirculating water systems shall be used for water features;
- B. Water features shall be designed and operated to minimize water loss; and
- C. Water features shall use reclaimed water if available and approved by the State of California Department of Public Health and the Los Angeles County Department of Public Health.
- D. Recreational pools and spas shall be designed to minimize water loss.
- E. All water features shall be included in the project's Estimated Total Water Use. Water features shall be placed in a high water use hydrozone.

**III. Mulch and Amendments.** The Landscape Plan shall include the use of mulch to retain moisture and minimize water runoff.

**A.** The following criteria shall be used for the installation of mulch into the landscape area:

**1. Depth of Mulch.** A minimum depth of three inches (3”) of mulch shall be applied to all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch placement impedes plant growth.

**2. Use of Mulch on Landscape Slopes.** Stabilizing mulch products shall be used on landscape slopes.

**3. Seed/Mulch Slurry.** The mulching portion of the seed/mulch slurry in hydro-seeded applications shall comply with the above mulching standards.

**B. Soil Amendments.** Soil amendments shall be incorporated according to the findings of the soil report and in a manner appropriate for the selected plants.

**IV. Landscape Design Plan Submittal.** The Landscape Design Plan Submittal shall include:

**A. Landscape Design Plan.** The landscape design plan shall be drawn to scale on project base sheets in a clear and legible fashion. The plans shall be drawn to a scale which is appropriate for the size of the project and adequate to clearly identify each component of the plan. The smallest scale that may be used is one inch – 20 feet (1” = 20’).

**B. Elements Required on the Landscape Design Plan.** The following elements shall be detailed on the project plans:

**1. Project Base Sheet Elements.** The project base sheets shall include dimensioned property lines, building footprints, and pervious and non-pervious hardscape areas including parking areas, paving, and sidewalks.

**2. Natural Features and Plantings to Remain in Landscaped Areas.** Landscape plans shall include natural features, including rock out-cropping, streams, existing mature and ornamental trees and shrubs proposed to remain on the subject site.

**3. Hydrozone Delineation.** The landscape plan shall delineate and label each hydrozone by number, letter, or other method. The plan shall identify each hydrozone as low, medium, high water, or mixed water use. Areas that are expected to receive temporary irrigation must be included in the low water use hydrozone for the water budget calculations.

**4. Location of Plants.** The landscape plan shall indicate each species of tree, shrub, groundcover, turf, and vine using a unique symbol for each.

**5. Table of Plants.** The landscape plan shall include a table of plants corresponding to the planting plan. The table shall include the botanical name, common name, container size, spacing, quantity, and the level of water use for each group of plants indicated.

**6. Tree Staking and Soil Preparation Details.** Landscape plan shall include tree staking details, soil preparation details and specifications, planting specifications, and any other applicable details. The landscape plan shall identify the type and quantity of soil amendments.

**7. Recreation Areas.** The landscape plan shall identify recreation areas.

**8. Edible Plants.** Identify areas dedicated permanently and solely to edible plants.

**9. Mulch Application.** The landscape plan shall identify the type of mulch and application depth. A minimum depth of three inches (3") is required.

**10. Water Features.** The landscape plan shall identify type and surface area of water features.

**11. Stormwater Retention and Infiltration Facilities.** The landscape plan shall identify location and installation depths of any applicable stormwater best management practices (BMPs) that encourage on-site retention and infiltration of stormwater. Stormwater BMPs are encouraged in the landscape design plan.

**12. Rain Harvesting Facilities.** The landscape plan shall identify any applicable rain harvesting or catchment technologies.

## IRRIGATION PLAN PREPARATION

**Irrigation Plan and Details.** An irrigation system shall meet all the requirements listed in this section to obtain the most efficient use of water. The applicant shall design the irrigation system using the manufacturers' recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

**I. Irrigation System Design.** The irrigation system must be designed and installed to comply with the Irrigation Efficiency criteria and the Maximum Applied Water Allowance as found on the Water Efficient Landscape Worksheet.

**A. Water Meter.** Each landscape irrigation system for new developments shall be metered for water use separately from domestic and other non-landscape uses except for single family homes or any project with a landscape area of less than 3,000 square feet.

**B. Automatic Irrigation Controllers.** Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data shall be required for all irrigation systems.

**C. Water Pressure.** The irrigation system shall be designed to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.

**1. Measuring Water Pressure.** Static water pressure, dynamic or operating pressure and flow reading of the water supply shall be measured at the point of connection by the applicant during the design stage. If the measurements are not available at the design stage, the measurements shall be conducted upon initial installation of the irrigation system.

**2. Pressure Regulating Devices.** If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices such as inline pressure regulators, booster pumps, or other devices shall be installed to meet the required dynamic pressure of the irrigation system.

**D. Sensors.** Sensors (rain, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate.

**E. Shut Off Valve.** Manual shut-off valves shall be installed as close as possible to the point of connection of the water supply to minimize water loss in the event of a pipeline break or routine repair.

**F. Backflow Prevention Device.** Backflow prevention devices shall be installed to protect the water supply from contamination by the irrigation system. The water purveyor shall approve the location of the backflow device prior to installation. The backflow prevention device shall be tested upon approval of the Certificate of Completion or the commencement of water service whichever comes first. The backflow device shall be tested by a Los Angeles County Department of Public Health certified tester.

**G. Check Valves.** Check valves or anti-drain valves are required for all irrigation systems.

**H. Water Runoff and Overspray.** The irrigation system shall be designed to prevent runoff, low head drainage, overspray or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways or structures.

**I. Soil Management.** Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.

**J. Irrigation Devices.** Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations. The following criteria shall be used in determining the type, and location of irrigation sprinklers and emitters:

**1. Irrigation of Mulched Areas.** In mulched planting areas, the use of low volume irrigation is encouraged to maximize water infiltration into the root zone.

**2. Sprinkler Heads and Emitters.** Sprinkler spacing shall be designed to provide head to head coverage while achieving the highest possible distribution uniformity using the manufacturer's recommendations.

**a) High Traffic Areas.** Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to high traffic areas.

**b) Narrow or Irregularly Shaped Areas.** Narrow or irregularly shaped areas, including turf, less than eight feet in width in any direction shall be irrigated in a manner that precludes overspray.

**c) Slopes.** Slopes greater than 25% shall not be irrigated with an irrigation system with a precipitation rate exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates that no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation audit.

**d) Overhead Irrigation.** Overhead irrigation shall not be permitted within 24 inches of any non-permeable surface unless:

**(1)** The landscape area is adjacent to permeable surfacing and no runoff occurs; or

**(2)** The adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or

**(3)** The irrigation designer specifies an alternative design or technology, as part of the Landscape Documentation Package, that clearly demonstrates how the irrigation system will be designed to prevent runoff, low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways or structures. Prevention of overspray and runoff must be confirmed during the irrigation audit.

**K. Hydrozones.** The design of the irrigation system shall conform to the hydrozones of the landscape design plan.

**1. Installation of a Separate Valve for Each Hydrozone.** Each valve should irrigate a hydrozone with similar site, slope, sun exposure, soil conditions and plant materials with similar water use. On the landscape and irrigation design plans, hydrozone areas shall be designated by number, letter, or other designation. On the irrigation design plan, designate the areas irrigated by each valve, and assign a number to each valve. Use this valve number in the Hydrozone Information Table found on the Water Efficient Landscape Worksheet.

**2. Sprinkler Head/Emitter Selection.** Sprinkler heads and other emission devices shall be selected based on the needs of the plant types within each hydrozone.

3. **Tree Irrigation.** Trees should be placed on separate valves from shrubs, groundcovers, and turf.
4. **Mixed Hydrozones.** Individual hydrozones that mix plants of moderate and low water use, or moderate and high water use, may be allowed if:
  - a) Plant factor calculations are based on the proportions of the respective plant water uses and their plant factor; or
  - b) The plant factor of the higher water using plant is used for calculations.
  - c) Individual hydrozones that mix high and low water use plants shall not be permitted.

II. **Irrigation Plan Submittal.** The Irrigation Design Plan, at a minimum, shall:

**A. Irrigation Design Plan.** The irrigation design plan shall be drawn to scale on project base sheets in a clear and legible fashion. The plans shall be drawn to a scale which is appropriate for the size of the project and adequate to clearly identify each component of the plan. The smallest scale that may be used is one inch – 20 feet (1" = 20').

**B. Elements Required on the Irrigation Design Plan.** The following elements shall be detailed on the project plans:

1. **Water Meter.** Identify the location and size of water meters, which will be connected to the irrigation system;
2. **Irrigation System Components.** Identify the location, type and size of all components of the irrigation system; and
3. **Water Use by Station.** Identify the flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (pressure per square inch) for each station.

## **SOILS ASSESSMENT**

**Soil Management Report.** In order to reduce water runoff and encourage healthy plant growth, a soil management report shall be submitted by the project applicant or his/her designee, as follows:

### **I. Soil Analysis.**

**A. Collection of Soil Samples.** Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.

**B. Certified Soils Laboratory.** Soil samples from the proposed planting areas shall be submitted to a certified soils laboratory for analysis and recommendations.

### **II. Soil Analysis Report Submittal.** The project applicant, or his/her designee, shall comply with one of the following:

**A.** Results of the soils samples shall be submitted with the Landscape Documentation Package, if the project does require significant grading; or

**B.** Results of the soils samples shall be submitted to the City with the Certificate of Completion.

## GRADING PLAN

**Grading Design Plan.** For the efficient use of water, grading of a project site shall be designed to minimize soil erosion, runoff, and water waste. A grading plan shall be submitted as part of the Landscape Documentation Package. A grading plan prepared by a civil engineer for other local agency permits satisfies this requirement.

**I. Grading Plan Detail.** The grading plan shall indicate finished configurations and elevations of the landscape. The grading plan shall be drawn to scale on project base sheets in a clear and legible fashion. The plans shall be drawn to a scale which is appropriate for the size of the project and adequate to clearly identify each component of the plan. The smallest scale that may be used is one inch – 20 feet (1"=20').

**A. Grading Plan Design.** To prevent excessive erosion and runoff, grading plans shall be designed:

1. To a finished grade that eliminate the potential of runoff from irrigation and rainfall, and does not allow drainage to adjacent private properties;
2. To avoid to the extent feasible the disruption of natural drainage patterns and undisturbed soil; and
3. To avoid to the extent feasible soil compaction in landscape areas.

**B. Elements Required on the Grading Plan.** The elements shall be detailed on the project plan:

1. Height of graded slopes;
2. Contour elevations with spacing shown at no greater than five feet (5');
3. Drainage patterns;
4. Pad elevations;
5. Finish grade; and
6. Stormwater retention improvements, if applicable.

## **STORMWATER MANAGEMENT**

**Stormwater Management.** Stormwater management practices are implemented to minimize runoff and increase infiltration which recharges groundwater and improves water quality.

**I. Stormwater Best Management Practices.** The incorporation of stormwater best management practices into the landscape and grading design plans is encouraged. These best management practices are implemented to minimize runoff and to increase on-site retention and infiltration into the groundwater table.

**A. Types of Stormwater Management Elements.**

1. Rain gardens,
2. Cisterns, and
3. Other landscapes features and practices that increase rainwater capture and create opportunities for infiltration and/or onsite water storage.

**B. Stormwater Management Facilities Plan.** The stormwater management facilities plan shall be drawn to scale on project base sheets in a clean and legible fashion. The plans shall be drawn to a scale which is appropriate for the size of the project and adequate to clearly identify each component of the plan. The smallest scale that may be used is one inch – 20 feet (1"=20').

## ANNUAL IRRIGATION SCHEDULE

**Irrigation Schedule.** An irrigation schedule shall be submitted with the Landscape Documentation Package. The irrigation schedule shall provide at a minimum: an annual irrigation program with a minimum four-season water schedule; and run time and frequency (days per week) of irrigation for each station. A copy of the irrigation schedule shall be maintained at the subject site.

**I. Establishing an Irrigation Schedule.** For the efficient use of water, all irrigation schedules shall be developed, managed and evaluated to utilize the minimum amount of water required to maintain plant health.

**A. Irrigation Schedule Criteria.** Irrigation schedules shall meet the following criteria:

**1. Automatic Irrigation Controller.** Irrigation scheduling shall be regulated by automatic irrigation controllers that operate using either evapotranspiration or soil moisture data. Parameters used to set the automatic controller shall be developed and submitted for each of the following:

- a) The plant establishment period;
- b) The established landscape; and
- c) Temporarily irrigated areas.

**2. Schedule for Overhead Irrigation.** Overhead irrigation should be scheduled based on the watering times established in the City of Lakewood Water Conservation Ordinance and the existing water supply stage determined by the Lakewood City Council.

**3. Irrigation Schedule Compliance with Estimated Total Water Use.** The implementation of the irrigation schedule requires consideration of irrigation run times, emission device, flow rate, and current reference evapotranspiration, so that applied water meets the Estimated Total Water Use. Total annual applied water shall be less than or equal to Maximum Applied Water Allowance (MAWA). Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data (e.g., CIMIS) or soil moisture sensor data.

**4. Station Setting Criteria.** Each irrigation schedule shall consider for each station all of the following:

- a) Irrigation interval (days between irrigation) or days to irrigate;
- b) Irrigation run times (hours or minutes per irrigation event.) Run time shall be limited to avoid runoff;
- c) Number of cycle starts required for each irrigation event to avoid runoff;
- d) Amount of applied water scheduled to be applied on a monthly basis;
- e) Application rate setting;
- f) Root depth setting;
- g) Plant type setting;
- h) Soil type;
- i) Slope factor setting;
- j) Shade factor setting; and
- k) Irrigation uniformity or efficiency setting.

## IRRIGATION AUDIT

### Irrigation Audit.

**I. Irrigation Audit Report.** An irrigation audit must be conducted prior to the submittal of the Certificate of Completion. The irrigation audit includes a system test with distribution uniformity and an evaluation of Irrigation Efficiency.

**A. Irrigation Efficiency.** Irrigation Efficiency (IE) is defined as the measurement of the amount of water beneficially used by plants, divided by the amount of water applied. Not all water applied to landscapes is used by plants. Some water is lost due to runoff, wind spray, or deep percolation. IE is derived from the measurements and estimates of irrigation system characteristics and management practices. The minimum acceptable IE for the purposes of these submittal procedures is 0.71. Greater irrigation efficiency may be achieved from irrigations systems that are well designed and that well maintained. For more information on IE, see Chapter 5 of A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California August 2000.

**B. Conducting a Landscape Audit.** All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor. The project applicant shall submit an Irrigation Audit Report with the Certificate of Completion to the Community Development Department.

# CERTIFICATE OF COMPLETION

**Certificate of Completion.** Upon completion of the installation of the landscape, the designer shall certify that the landscape complies with all the requirements of the City of Lakewood Water Conservation in Landscaping Ordinance and the requirements as stated in the Rules, Regulations and Procedures for the Implementation of the ordinance.

**I. Submittal of the Certificate of Completion.** The Certificate of Completion shall be submitted to the City of Lakewood Community Development Department.

**A. Certificate of Completion Supporting Documents.** The certificate and the supporting documents listed below shall be submitted prior to the final approval of the project completion.

- 1. Irrigation Schedule.** Submit irrigation scheduling parameters used to set the controller (may be included with the Irrigation Plan and Details).
- 2. Landscape and Irrigation Maintenance Schedule.**
  - a)** Landscapes shall be maintained to ensure water use efficiency.
  - b)** A regular maintenance schedule shall include, but not be limited to, routine inspection; adjustment and repair of the irrigation system and its components; aerating and dethatching of turf areas; replenishing mulch; fertilizing; pruning; weeding in all landscape areas, and removing obstructions to sprinklers and emitters.
  - c)** Repair of all irrigation equipment shall be done with the originally installed components or their equivalents.
  - d)** Project applicants are encouraged to implement sustainable or environmentally-friendly practices for overall landscape maintenance.
- 3. Soil Management Report.** The results of the soils assessment shall be submitted with the Certificate of Completion, if not initially submitted with the Landscape Documentation Package.
- 4. As-Built Conditions.** If significant changes occurred in the field during construction, a Landscape Documentation Package that reflects the “as-built” conditions must be submitted with the Certificate of Completion for review and approval.

# WATER EFFICIENT LANDSCAPE WORKSHEET INSTRUCTIONS

The Water Efficient Landscape Worksheet is a required element of the Landscape Documentation Package. This worksheet will assist the applicant in determining the Maximum Applied Water Allowance and the Estimated Total Water Use for the proposed landscape project. The Water Efficient Landscape Worksheet is located in the Appendices. Instructions for completing the Water Efficient Landscape Worksheet are shown below. Complete the Hydrozone Information Table. The information obtained from the table shall be used to calculate the Maximum Applied Water Allowance and the Estimated Total Water Use. These forms can be found on the City of Lakewood website at [www.lakewoodcity.org](http://www.lakewoodcity.org).

## STEP 1: Complete the Hydrozone Information Table

Complete the hydrozone information table for each hydrozone. A Hydrozone is a portion of the landscaped area having plants with similar water needs: low; medium; high; or mixed- low and medium, and medium and high. Enter the Plant Water Use Factor for each hydrozone. If you are unsure specifically which Plant Water Use Factor number to cite within a range, use the average number.

Water needs of plants in hydrozone	Plant Factor Range	Plant Factor Average
Low Water Use	0 to 0.3	0.2
Medium Water Use	0.4 to 0.6	0.5
High Water Use	0.7 to 1.0	0.8
Special Landscape Areas	(shall not exceed 1.0)	Varies

Refer to [A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California August 2000](#) published by University of California Cooperative Extension, California Department of Water Resources to determine if a plant's water usage is low, medium, or high. This publication is available at <http://www.water.ca.gov/wateruseefficiency/publications/> or by writing the California Department of Water Resources:

California Department of Water Resources  
Bulletins and Reports  
P. O. Box 942836  
Sacramento, California 94236-0001

Hydrozones that include a mix plants of moderate and low water use, or moderate and high water use, are allowed if:

- 1) plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or
- 2) the plant factor of the highest water using plant is used for the calculation.

Hydrozones that mix low and high water use plants cannot be approved.

Special Landscape Areas (SLA) are areas of the landscape dedicated solely to edible plants, water features using recycled water, and areas dedicated to active play such as parks, sports fields, golf courses and where turf provides a playing surface. The Hydrozone Information Table also requires information on the method of irrigation (such as spray, rotor, bubbler, drip irrigation, etc.) for each hydrozone.

**STEP 2: Calculate the Maximum Applied Water Allowance (MAWA)**

These water calculations apply to certain new and rehabilitation projects, as well as landscapes installed prior to January 1, 2010 and which are over one (1) acre in area (upon written notice to conduct a water audit on the landscape area).

Formula to calculate Maximum Applied Water Allowance (MAWA):

$$\text{MAWA} = (\text{ETo}) \times (\text{CF}) \times ((\text{ETAF} \times \text{LA}) + (0.3 \times \text{SLA}))$$

Formula to calculate Maximum Applied Water Allowance (MAWA) inserting factors:

$$\text{MAWA} = (47.37) \times (0.62) \times ((0.7 \times \text{LA}) + (0.3 \times \text{SLA}))$$

ETo for Lakewood

TERMS			
Abbreviation	Definition	Factor	Comments
<b>MAWA</b>	Maximum Applied Water Allowance		
<b>ETo</b>	Reference Evapotranspiration	47.37	See Appendices
<b>CF</b>	Conversion Factor to gallons	0.62	
<b>ETAF</b>	Evapotranspiration Adjustment Factor	0.7	
<b>LA</b>	Landscape Area	square footage of the landscape project	
<b>SLA</b>	Special Landscape Area	square footage of special landscape areas in project	See step 1 for list
<b>Additional Water Allowance for SLA</b>		0.3	

*Example:*

A landscape project is 48,000 square feet in area includes additional 2,000 square feet of Special Landscape Area (See list in step 1). Using this example, the MAWA is calculated as follows:

$$\text{MAWA} = (47.37) \times (0.62) \times ((0.7 \times 48,000) + (0.3 \times 2,000))$$

$$\text{MAWA} = 987,412 \text{ gallons per year}$$

### STEP 3: Calculate the Estimated Total Water Use (ETWU)

These water calculations apply to certain new and rehabilitation projects, as well as landscapes installed prior to January 1, 2010 and which are over one (1) acre in area (upon written notice to conduct a water audit on the landscape area).

Formula to calculate Estimated Total Water Use (ETWU):

$$\text{ETWU} = (\text{ETo}) \times (\text{CF}) \times ((\text{Sum of (PF X HA)})/\text{IE}) + \text{SLA}$$

Formula to calculate Total Water Use (ETWU) inserting factors:

$$\text{ETWU} = (47.37) \times (0.62) \times ((\text{Sum of (PF X HA)})/\text{IE}) + \text{SLA}$$

ETo for Lakewood

<b>TERMS</b>			
<b>Abbreviation</b>	<b>Definition</b>	<b>Factor</b>	<b>Comments</b>
<b>ETWU</b>	Estimated Total Water Use		
<b>ETo</b>	Reference Evapotranspiration	47.37	See Appendices
<b>CF</b>	Conversion Factor to gallons	0.62	
<b>PF</b>	Plant Factor		
<b>HA</b>	Hydrozone Area	square footage of the landscape project	
<b>IE<sup>1</sup></b>	Irrigation Efficiency	0.71	minimum required
<b>SLA</b>	Special Landscape Area	square footage of special landscape areas in project	See step 1 for list

<sup>1</sup>Irrigation Efficiency (IE) is defined as the measurement of the amount of water beneficially used by plants, divided by the amount of water applied. Not all water applied to landscapes is used by plants. Some water is lost due to runoff, wind spray, or deep percolation. IE is derived from the measurements and estimates of irrigation system characteristics and management practices. The minimum acceptable IE for the purposes of these submittal procedures is 0.71. Greater irrigation efficiency may be achieved from irrigations systems that are well designed and that well maintained. For more information on IE, see Chapter 5 of [A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California August 2000](#).

*Example:*

Calculating for plant factor by hydrozone area is dependent on the number of hydrozones in a landscape project, plant factors, hydrozone square footage, and any Special Landscape Areas. In sample table below the sum of PF x HA is 21,700. SLA is added after the sum of PF x HA is calculated.

**Sample Hydrozone Table: Plant Factor Calculation by Hydrozone Area**

Hydrozone Number	Plant Water Use (Low, Medium, High)	Plant Factor (PF)	Hydrozone Area (HA)	PF x HA
1	High	0.8	7,000	5,600
2	Medium	0.5	9,000	4,500
3	Medium	0.5	15,000	7,500
4	Low	0.3	7,000	2,100
5	Low	0.2	10,000	2,000
<b>Sum of PF x HA:</b>				<b>21,700</b>
6	SLA	1.0	2,000	2,000

Using this sample the ETWU formula appears as:

$$\text{ETWU} = (47.37) \times (0.62) \times ((21,700)/0.71) + 2,000$$

$$\text{ETWU} = 956,367 \text{ gallons per year}$$

**STEP 4: Comparing the Estimated Total Water Use with the Maximum Applied Water Allowance**

Any plant may be used in the landscape, providing the Estimated Total Water Use (ETWU) in the landscape area does not exceed the Maximum Applied Water Allowance (MAWA). Compare the project's Maximum Applied Water Allowance to the Estimated Total Water Use. The plant plan is acceptable, if the Estimated Total Water Use is less than the Maximum Applied Allowance. If the estimated water use is higher than the allowance, then the applicant shall alter the plant plan to lower the estimated total water use.

The example above would meet the Water Conservation in Landscaping Ordinance criteria, because the Estimated Total Water Use of 956,367 gallons per year is 31,045 gallons lower than the Maximum Applied Water Allowance of 987,412 gallons per year.

**FORMS FOR SUBMITTAL OF THE LANDSCAPE DOCUMENT  
PACKAGE & CERTIFICATE OF COMPLETION**

# WATER EFFICIENT LANDSCAPE WORKSHEET

Project Address \_\_\_\_\_ Date \_\_\_\_\_

## Hydrozone Information Table

Hydrozone Plant Factor <sup>1</sup>	Valve/zone Number	Irrigation Method <sup>2</sup>	Landscape Area (Sq. Ft.)	% of Landscape Area
1				
2				
3				
4				
5				
6				
<b>Totals</b>		-		<b>100%</b>

<sup>1</sup>Hydrozone Key

LW = Low Water Use Plants (Plant Water Use Factor range= 0 to 0.3)

MW = Medium Water Use Plants (Plant Water Use Factor range= 0.4 to 0.6)

HW = High Water Use Plants (Plant Water Use Factor range= 0.7 to 1.0)

SLA = Special Landscape Area

If project area contains more than 6 hydrozones, duplicate this table on a separate sheet.

<sup>2</sup>Indicate the method of irrigation (such as spray, rotor, bubbler, drip irrigation, etc.).

## Maximum Applied Water Allowance Calculation

$$MAWA = (47.37) \times (0.62) \times ((0.7 \times LA) + (0.3 \times SLA))$$

Insert your MAWA calculation in the box below:

Maximum Applied Water Allowance: \_\_\_\_\_ gallons per year.

## Estimated Total Water Use Calculation

$$ETWU = (47.37) \times (0.62) \times ((\text{Sum of (PF X HA)/IE}) + SLA)$$

Insert your ETWU calculations in the boxes below (create a larger table if necessary):

Hydrozone Number	Plant Water Use (Low, Med, Hi)	Plant Factor (PF) (varies)	Hydrozone Area (HA)	PF x HA
1				
2				
3				
4				
5				
<b>Sum of PF x HA:</b>				
6	SLA (if applicable)			

Estimated Total Water Use: \_\_\_\_\_ gallons per year.

Difference between Maximum Applied Water Allowance &  
Maximum Applied Water Allowance:

\_\_\_\_\_ gallons per year

**WATER CONSERVATION IN LANDSCAPING  
APPLICATION FORM**

Project Address \_\_\_\_\_ Submittal Date \_\_\_\_\_

Applicant's Name \_\_\_\_\_

Applicant's Address \_\_\_\_\_

Applicant's City/State/Zip Code \_\_\_\_\_

Applicant's Telephone \_\_\_\_\_ E-Mail \_\_\_\_\_

Landscape Architect or Designer's Name \_\_\_\_\_

Designer's Address \_\_\_\_\_

Designer's City/State/Zip Code \_\_\_\_\_

Designer's Telephone \_\_\_\_\_ E-Mail \_\_\_\_\_

Property Owner's Name \_\_\_\_\_

Owner's Address \_\_\_\_\_

Owner's City/State/Zip Code \_\_\_\_\_

Owner's Telephone \_\_\_\_\_ E-Mail \_\_\_\_\_

Total Landscape Area (sq. ft.) \_\_\_\_\_ Landscape Type (check one):  New  Rehabilitated

Land Use Type (check one):

Single Family  Planned Development  Multi-Family  Commercial  other (specify)

Irrigation Water Supply (check one):  Potable  Reclaimed (Recycled)  Well  Gray Water  other (specify)

Water Purveyor (check one):

City of Lakewood Water Resources Department  Golden State Water Company

I agree to comply with the requirements of the water efficient landscape ordinance and that this Landscape Documentation Package is complete. I have complied with the criteria of the water efficient landscape ordinance and applied them for the efficient use of water in the landscape design plan.

\_\_\_\_\_  
Applicant Signature

\_\_\_\_\_  
Date

For City Use Only	
Fee Paid: \$	Planner:
Date:	

**WATER CONSERVATION IN LANDSCAPING  
CERTIFICATE OF COMPLETION**

Project Address \_\_\_\_\_ Project Completion Date \_\_\_\_\_

Applicant's Name \_\_\_\_\_

Applicant's Address \_\_\_\_\_

Applicant's City/State/Zip Code \_\_\_\_\_

Applicant's Telephone \_\_\_\_\_ E-Mail \_\_\_\_\_

Landscape Architect or Designer's Name \_\_\_\_\_

Designer's Address \_\_\_\_\_

Designer's City/State/Zip Code \_\_\_\_\_

Designer's Telephone \_\_\_\_\_ E-Mail \_\_\_\_\_

Property Owner's Name \_\_\_\_\_

Owner's Address \_\_\_\_\_

Owner's City/State/Zip Code \_\_\_\_\_

Owner's Telephone \_\_\_\_\_ E-Mail \_\_\_\_\_

I certify that the landscape project for the above property has been installed per the approved Landscape Documentation Package.

\_\_\_\_\_  
Applicant Signature \_\_\_\_\_ Date \_\_\_\_\_

(check one: \_\_\_Landscape Designer, \_\_\_Irrigation Designer, or \_\_\_Licensed Landscape Contractor)

\_\_\_\_\_  
City Use Only

- \_\_\_ Final landscape inspection
- \_\_\_ Certification of Completion Checklist
- \_\_\_ Approved landscape and irrigation maintenance schedule
- \_\_\_ Irrigation audit report
- \_\_\_ Soil analysis report
- \_\_\_ Send a copy of this approved Certificate of Completion to the water purveyor and the property owner.

\_\_\_\_\_  
Approved - Planner \_\_\_\_\_ Date \_\_\_\_\_

**Appendix 1**  
**City of Lakewood Water Conservation in Landscaping Ordinance**  
**Ordinance 2009-5**

Ordinance 2009-5 (amended Lakewood Municipal Code Section 7511.1) is available from the City Clerk of the City of Lakewood City or on-line at:

<http://weblink.lakewoodcity.org/weblink7/docview.aspx?id=68347>

**Appendix 2**  
**City of Lakewood Water Conservation Ordinance**  
**Ordinance 2009-9**

Ordinance 2009-9 (amended Lakewood Municipal Code Section 8600 et al) is available from the City Clerk of the City of Lakewood City or on-line at:

<http://weblink.lakewoodcity.org/weblink7/docview.aspx?id=151764>

## Appendix 3

### LONG BEACH CIMIS STATION DATA 2008-2009

ET<sub>o</sub> (Reference Evapotranspiration) is based on data provided by the California Department of Water Resources, California Irrigation Management Information System (CIMIS). The Long Beach CIMIS station (station #174) is the station of reference used in Lakewood.

2008-2009 Data for the Long Beach CIMIS Station:

#### Los Angeles Basin - Long Beach - #174

Month Year	Tot ETo (in)	Tot Precip (in)	Avg Sol Rad (Ly/Day)	Avg Vap Pres (mBars)	Avg Max Air Temp (F)	Avg Min Air Temp (F)	Avg Air Temp (F)	Avg Max Rel Hum (%)	Avg Min Rel Hum (%)	Avg Rel Hum (%)	Avg Dew Point (F)	Avg Wind Speed (mph)	Avg Soil Temp (F)
Oct 2008	4.03 K	0.04	400 K	12.9 K	81.0 K	51.9 K	64.7	92	33	62 K	50.3 K	2.5 K	68.0
Nov 2008	2.35 K	2.12	276	12.2	74.4 K	48.6	59.7	92	44	71	49.3	2.2 K	63.0 K
Dec 2008	1.53 K	2.76	205	9.6	63.4 K	41.5	51.3	93 K	47 K	73	42.8	2.3 K	58.4 L
Jan 2009	2.37 K	0.18	268 K	8.6	71.8 K	42.2	55.4 K	88 K	32 K	59	39.9	2.3	-M
Feb 2009	2.25 K	3.70 K	304 K	9.7	65.2 K	42.6 K	53.4	92	46	70	43.2	2.8 K	52.8 K
Mar 2009	3.80 K	0.28	436	10.5 K	66.2 K	45.2	55.4	92	48	70 K	45.4 K	3.0 K	60.7
Apr 2009	4.87 K	0.00	538 K	10.7 K	69.8 K	47.1	58.5 K	90 K	43 K	65 K	45.9 K	3.4 K	63.7
May 2009	4.96	0.00	526	14.8	71.0 K	56.6	62.8	89	61	76	55.1	3.4	69.9
Jun 2009	4.68	0.02	502	15.2	72.0	57.4 K	64.1	90	58	74	55.7	3.3 K	70.8
Jul 2009	6.37	0.00	611	17.4	80.2	60.6 K	69.0	91	50	72	59.4	3.0	75.1
Aug 2009	5.61 K	0.00	531 L	16.6 K	81.4 K	59.8 K	63.7 K	87 K	43 K	70 K	58.7 K	2.8 K	74.4 K
Sep 2009	4.55 K	0.01 K	465 K	17.8 K	82.5 K	60.2 K	69.7 K	92 K	46 K	72 K	60.1 K	2.6 K	74.4 K
Totals/Avgs	47.37	9.11	422	13.0	73.2	51.1	60.6	91	46	69	50.5	2.8	68.5

Source: <http://www.cimis.water.ca.gov/>

## Appendix 4

### GLOSSARY

**ANTI-DRAIN VALVE.** See check valve.

**APPLIED WATER.** The portion of water supplied by the irrigation system to the landscape.

**AUTOMATIC IRRIGATION CONTROLLER.** An automatic timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.

**BACKFLOW PREVENTION DEVICE.** A safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

**CERTIFICATE OF COMPLETION.** The document required under Section 8651 of the Lakewood Municipal Code.

**CERTIFIED IRRIGATION DESIGNER.** A person certified to design irrigation systems by an accredited academic institution a professional trade organization or other program such as the US Environmental Protection Agency's WaterSense irrigation designer certification program and Irrigation Association's Certified Irrigation Designer program.

**CERTIFIED LANDSCAPE IRRIGATION AUDITOR.** A person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other program such as the US Environmental Protection Agency's WaterSense irrigation auditor certification program and Irrigation Association's Certified Landscape Irrigation Auditor program.

**CHECK VALVE or ANTI-DRAIN VALVE.** A valve located under a sprinkler head, or other location in the irrigation system, to hold water in the system to prevent drainage from sprinkler heads when the sprinkler is off.

**COMMON INTEREST DEVELOPMENTS.** Community apartment projects, condominium projects, planned developments, and stock cooperatives per California Civil Code Section 1351.

**CONTOUR.** A line drawn on a plan which connects all points of equal elevation above or below a known or assumed reference point.

**CONTROL VALVE.** A valve in an irrigation system which is manually or automatically actuated using electric or hydraulic controls.

**CONVERSION FACTOR.** The conversion factor is (0.62). This is the number that converts acre-inches per acre per year to gallons per square foot per year.

**CYCLE.** The complete operation of a controller station.

**DESIGNER.** A person qualified to practice landscape architecture and/or irrigation design.

**DIRECTOR.** Director of Community Development for the City of Lakewood.

**DRIP IRRIGATION.** Any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants. The City of Lakewood Water Conservation Ordinance (Appendix 2) requires drip irrigation emitters to supply no more than two (2) gallons per hour.

**ECOLOGICAL RESTORATION PROJECT.** A project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

**EMITTER.** A drip irrigation emission device that delivers water slowly from the system to the soil.

**ESTABLISHED LANDSCAPE.** The point at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth.

**ESTABLISHMENT PERIOD OF THE PLANTS.** The first year after installing the plant in the landscape or the first two years if irrigation will be terminated after establishment. Typically, most plants are established after one or two years of growth.

**ESTIMATED TOTAL WATER USE (ETWU).** The calculation to determine the total water used for the landscaped area including water features. The estimated total water use shall not exceed the maximum applied water allowance. See Section 8608.1 of the Lakewood Municipal Code.

**ET ADJUSTMENT FACTOR (ETAF).** The ET Adjustment factor of 0.7. It is applied to the local evapotranspiration factor to adjust for plant factors and irrigation efficiency, two factors in determining the amount of water required to maintain a landscaped area. A combined plant mix with a site-wide average of 0.5 is the basis of the plant factor portion of this calculation. For purposes of the ETAF, the average irrigation efficiency is 0.71. Therefore, the ET Adjustment Factor is  $(0.7) = (0.5/0.71)$ . ETAF for a Special Landscape Area shall not exceed 1.0. ETAF for existing non-rehabilitated landscapes is 0.8.

**EVAPOTRANSPIRATION RATE.** The quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

**FLOW RATE.** The rate at which water flows through pipes, valves and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.

**GRADING.** Earthwork performed to alter the natural contours of an area to be planted.

**HARDSCAPE.** Any durable material (pervious and non-pervious).

**HOME-OWNER INSTALLED LANDSCAPE.** Any landscaping either installed by a private individual for a single family residence or installed by a licensed contractor hired by a homeowner. A homeowner, for purposes of this ordinance, is a person who occupies the dwelling he or she owns. This excludes speculative homes, which are not owner-occupied dwellings.

**HYDROZONE.** A portion of the landscaped area having plants with similar water needs. A hydrozone may be irrigated or non-irrigated.

**INFILTRATION RATE.** The rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

**INVASIVE or NOXIOUS PLANT SPECIES.** Species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive species may be regulated by county agricultural agencies as noxious species. “Noxious weeds” means any weed designated by the Weed Control Regulations in the Weed Control Act and identified on a Regional District noxious weed control list. Lists of invasive plants are maintained at the California Invasive Plant Inventory and USDA invasive and noxious weeds database.

**IRRIGATION AUDIT.** An in-depth evaluation of the performance of an irrigation system conducted by a Certified Landscape Irrigation Auditor. An irrigation audit includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule.

**IRRIGATION EFFICIENCY (IE).** The measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average irrigation efficiency for purposes of this ordinance is 0.71. Greater irrigation efficiency can be expected from well designed and maintained systems.

**IRRIGATION SYSTEM.** A complete connection of system components, including the water distribution network and the necessary equipment downstream from the backflow prevention device.

**LANDSCAPE ARCHITECT.** A person who holds a license to practice landscape architecture in the state of California Business and Professions Code, Section 5615.

**LANDSCAPE AREA.** All the planting areas, turf areas and water features in a landscape design plan subject to the Maximum Applied Water Allowance calculation. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

**LANDSCAPE CONTRACTOR.** A person licensed by the State of California to construct, maintain, repair, install or subcontract the development of landscape systems.

**LANDSCAPE DOCUMENTATION PACKAGE.** The documents required in the Water Conservation in Landscaping Rules, Regulations and Procedures.

**LANDSCAPE PROJECT.** The total area of landscape in a project as defined in “landscape area” for the purposes of this ordinance, meeting requirements under Section 8601 of the Lakewood Municipal Code.

**LATERAL LINE.** The water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

**LOCAL WATER PURVEYOR.** The City of Lakewood and Golden State Water Company Provide retail water service to Lakewood.

**LOW VOLUME IRRIGATION.** The application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip, drip lines, and bubblers. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

**MAIN LINE.** The pressurized pipeline that delivers water from the water source to the valve or outlet.

**MAXIMUM APPLIED WATER ALLOWANCE.** The annual maximum amount of water that can be applied to a landscaped area. See Section 8608 of the Lakewood Municipal Code. The maximum applied water allowance is based on local evapotranspiration, the ET Adjustment Factor, and the size of the landscape area. The Estimated Total Water Use shall not exceed the Maximum Applied Water Allowance. Special Landscape Areas, including recreation areas, areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens, and areas irrigated with recycled water are subject to the MAWA with an ETAF not to exceed 1.0.

**MICROCLIMATE.** The climate of a small, specific area that may contrast with the climate of the overall landscape area due to factors such as wind, sun exposure, plant density, or proximity to reflective surfaces.

**MINED-LAND RECLAMATION PROJECTS.** Any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

**MULCH.** Any organic material such as leaves, bark, straw, compost, or inorganic mineral materials such as rocks, gravel, and decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.

**NEW CONSTRUCTION.** A new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.

**OPERATING PRESSURE.** The pressure at which the parts of an irrigation system are designed by the manufacturer to operate.

**OVERHEAD SPRINKLER IRRIGATION SYSTEM.** A system that deliver water through the air (e.g., spray heads and rotors).

**OVERSPRAY.** The irrigation water which is delivered beyond the target area.

**PERMIT.** An authorizing document issued by the City of Lakewood for new construction or rehabilitated landscapes.

**PERVIOUS.** Any surface or material that allows the passage of water through the material and into the underlying soil.

**PLANT FACTOR or PLANT WATER USE FACTOR.** The amount of water required to maintain a health plant. Low water use plants have a plant factor between 0 and 0.3, moderate water use plants have a plant factor between 0.4 and 0.6, and high water use plants have a plant factor between 0.7 and 1.0. A factor, when multiplied by  $E_{To}$ , estimates the amount of water needed by plants. Plant factors cited in this ordinance are derived from the Department of Water Resources 2000 publication “Water Use Classification of Landscape Species.”

**PLANTING AREA.** The parcel area less building pad(s), driveway(s), patio(s), deck(s), walkway(s) and parking area(s). Planting area includes water bodies (i.e. fountains, ponds, lakes) and natural areas.

**PLANTING PLAN.** A plan showing the location, spacing, numbers, container sizes of all plant materials including common and botanical names.

**PRECIPITATION RATE.** The rate of application of water measured in inches per hour.

**PROJECT APPLICANT.** The individual or entity submitting a Landscape Plan Application required under Chapter 6 of the Lakewood Municipal Code. A project applicant may be the property owner or his or her designee.

**RAIN SENSOR or RAIN SENSING SHUTOFF DEVICE.** A component which automatically suspends an irrigation event when it rains.

**RECORD DRAWING or AS-BUILTS.** A set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor.

**RECREATIONAL AREA.** Areas dedicated to active play such as parks, sports fields, golf courses and any other area where turf provides a playing surface.

**RECLAIMED WATER.** Treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and water features; not intended for human consumption.

**REFERENCE EVAPOTRANSPIRATION ( $E_{To}$ ).** A standard measurement of environmental parameters which affect the water use of plants.  $E_{To}$  is expressed in inches per day, month, or year as represented in Section 495.1, and is an estimate of the evapotranspiration of a large field of four-to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the Maximum Applied Water Allowance so that regional differences in climate can be accommodated.

**REHABILITATED LANDSCAPE.** Any planting area in which more than 50 percent of the existing landscape material is replaced or modified within a 12-month period in more than 50 percent of the planting area, which is greater than 2,500 square feet and meets the provisions in Section 8601 of the Lakewood Municipal Code.

**RUNOFF.** Water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape area. For example, runoff may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a slope.

**SOIL MOISTURE SENSING DEVICE or SOIL MOISTURE SENSOR.** A device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

**SOIL TEXTURE.** The classification of soil based on its percentage of sand, silt and clay.

**SPECIAL LANDSCAPE AREA.** Any area of the landscape dedicated solely to edible plants, water features using reclaimed water, and areas dedicated to active play such as parks, sports fields, golf courses and any other area where turf provides a playing surface.

**SPRINKLER HEAD.** A device which delivers water through a nozzle.

**STATIC WATER PRESSURE.** The pipeline or municipal water supply pressure when water is not flowing.

**STATION.** An area served by one valve or by a set of valves that operate simultaneously.

**SWING JOINT.** An irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

**TURF.** A ground cover surface of mowed grass.

**VALVE.** A device used to control the flow of water in the irrigation system.

**WATER CONSERVING PLANT SPECIES.** A plant species identified as having a low plant factor.

**WATER FEATURE.** A design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscape area. Constructed wetlands used for on-site wastewater treatment or stormwater best management practices that are not irrigated and used solely for water treatment or stormwater retention are not water features and, therefore, are not subject to the water budget calculation.

**WATERING WINDOW.** The time of day irrigation is allowed.

**WUCOLS or WATER USE CLASSIFICATION OF LANDSCAPE SPECIES.** Water Use Classification of Landscape Species is published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation, 2000.