WATER EFFICIENT

LANDSCAPING

IMPLEMENTATION GUIDELINES

(IMPLEMENTING ORDINANCE NO. 45)

CITY OF WILDOMAR

ADOPTED FEBRUARY 24, 2010

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The Appendices are located at the back of the Guidelines.

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I. PURPOSE

The primary purpose of these Guidelines is to provide procedural and design guidance for applicants proposing new landscape or landscape rehabilitation projects that are subject to Chapter 17.276 of the City of Wildomar Municipal Code. These Guidelines, in conjunction with the provisions of the Water Efficient Irrigation Ordinance, shall be used to prepare and review the plans and specification contained in the Landscape Documentation Package.

II. SUBMITTAL REQUIREMENTS FOR NEW LANDSCAPE INSTALLATIONS OR LANDSCAPE REHABILITATION PROJECTS

The key implementation tool for the requirements of Chapter 17.276 is the Landscape Document Package described in these Guidelines. Landscape Documentation Package is required to be submitted by the applicant for review and approval by the City prior to the issuance of any building permit or landscape construction/ installation permits (prior to the start of construction).

A. Unless otherwise directed by the City, the Landscape Documentation Package must, at a minimum, include the following elements either on plan sheets or supplemental pages:

1. Date;

2. Project name;

3. Project address, assessors parcel number(s), and City project case number (if applicable);

4. Total landscaped area (in square feet) and rehabilitated landscaped area (as applicable);

5. Project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed);

6. Water supply type (e.g., potable, recycled, or well) and identification of the local retail water purveyor if the project applicant is not served by a private well;

7. Checklist or index of all documents included in the Landscape Documentation Package;

8. Project contacts, including contact information for the project applicant and property owner;

9. Certification of Design in accordance with Exhibit A of these Guidelines that includes a landscape architect's professional stamp, as applicable, signature, contact information (including email and telephone number), license number, and date, certifying the statement that "The design of this project complies with the requirements of the City's Water Efficient Landscape Ordinance" and shall bear the signature of the landscape architect as required by law; and

10. Other information requested by the Planning Director needed to determine whether the landscape project complies with the Water Efficient Landscape Ordinance and these Guidelines.

B. Maximum Applied Water Allowance (MAWA) and Estimated Applied Water Use (EAWU) expressed as annual totals including, but not limited to, the following and further described in Section III of these Guidelines:

1. A Water Efficient Landscape Worksheet for the landscape project;

2. Water budget calculations for the landscape project; and

3. Hydrozone information table for the landscape project.

C. A Soil Management Report or specifications, or specification provision requiring soil testing and amendment recommendations and implementation to be accomplished during construction of the landscape project and further described in Section IV of these Guidelines.

D. A Landscape Design Plan for the landscape project and further described in Section V of these Guidelines.

E. An Irrigation Design Plan for the landscape project and further described in Section VI of these Guidelines.

F. A Grading Design Plan, unless grading information is included in the landscape design plan for the landscape project or unless the landscape project is limited to replacement planting and/or irrigation to rehabilitate an existing landscaped area and further described in Section VII of these Guidelines.

III. WATER EFFICIENT LANDSCAPE CALCULATIONS AND ALTERNATIVES

A. The applicant must provide the calculated Maximum Applied Water Allowance (MAWA) and Estimated Applied Water Use (EAWU) for the landscaped area as part of the Landscape Documentation Package submittal to the City. The MAWA and EAWU must be calculated based upon the Water Efficient Landscape Worksheets (in accordance with the sample worksheets in Appendix B).

B. The EAWU allowable for the landscaped area may not exceed the MAWA. The MAWA must be calculated using an Evapotranspiration Adjustment Factor (ETAF) of 0.7 except for the portion of the MAWA applicable to any special landscaped areas within the landscape project, which must be calculated using an ETAF of 1.0. Where the design of the landscaped area can otherwise be shown to be equivalently water-efficient, the applicant may submit alternative or abbreviated information supporting the demonstration that the annual EAWU is less than the MAWA, at the discretion of and for the review and approval of the City.

C. Water budget calculations must adhere to the following requirements:

1. The MAWA must be calculated using the Water Efficient Landscape Worksheets and equation presented in Appendix B. Example calculations are located in Appendix E.

2. The EAWU must be calculated using the Water Efficient Landscape Worksheets and equation presented in Appendix B. (Example calculations are located in Appendix E.)

3. For the calculation of the MAWA and EAWU, a project applicant must use the ETo values (in inches) described below.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2.1	2.8	3.9	4.4	5.9	7.1	7.9	7.0	5.8	3.9	2.6	1.9	55.0

4. For calculation of the EAWU, the plant water use factor must be determined as appropriate to the project location from the Water Use Efficiency of Landscape Species (WUCOLS) Species Evaluation List. The plant factor is 0.1 for very low water use plants, 0.2 to 0.3 for low water use plants, 0.4 to 0.6 for moderate water use plants, and 0.7 to 1.0 for high water use plants.

5. For calculating the EAWU, the plant water use factor must be determined for each valve hydrozone based on the highest-water-use plant species within the zone. The plant factor for each hydrozone may be required to be further refined as a “landscape coefficient,” according to protocols defined in detail in

the WUCOLS document, to reflect planting density and microclimate effects on water need at the option of the applicant or the City.

6. For calculation of the EAWU, the area of a water feature is defined as a high water use hydrozone with a plant factor of 1.0.

7. For calculation of the EAWU, a temporarily irrigated hydrozone area, such as an area of highly drought-tolerant native plants that are not intended to be irrigated after they are fully established, is defined as a very low water use hydrozone with a plant factor of 0.1.

8. For calculation of the MAWA, the ETAF for special landscaped areas is set at 1.0. For calculation of the EAWU, the ETAF for special landscaped areas is calculated as the special landscaped area (SLA) plant factor divided by the SLA irrigation efficiency factor.

9. In calculating the Maximum Applied Water Allowance the effective precipitation (25% of annual precipitation) may be used to track water use and may use the following equation to calculate Maximum Applied Water Allowance: MAWA= (ETo - Eppt) (0.62) [(0.7 x LA) + (0.3 x SLA)].

10. The average irrigation efficiency for each project should be 0.71. Irrigation systems shall be designed, maintained, and managed to meet or exceed an average landscape irrigation efficiency of 0.71.

11. Irrigation efficiency must be calculated using the worksheet and equation presented in Appendix B.

12. The Maximum Applied Water Allowance must be calculated using the equation presented in Appendix B.

IV. SOIL MANAGEMENT REPORT

In order to reduce runoff and encourage healthy plant growth, a soil management report must be completed by the applicant, or his/her designee, as follows:

A. Submit soil samples to a certified agronomic soils laboratory for analysis and recommendations.

1. Soil sampling must be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.

2. If significant mass grading is planned, the soil analysis report must be prepared after the mass grading.

3. The soil analysis should include:

    a. Soil texture;

    b. Infiltration rate determined by laboratory test or soil texture infiltration rate table;

    c. pH;

    d. Total soluble salts;

    e. Sodium;

    f. Percent organic matter;

    g. Recommendations (including the micro-nutrients and macro-nutrients);

B. The applicant, or their designee, must submit documentation verifying implementation of soil analysis report recommendations to the planning department with the Certification of Landscape Design.

V. LANDSCAPE DESIGN PLAN

For the efficient use of water, a landscape must be carefully designed and planned for the intended function of the project.

A. The landscape design plan, at a minimum, must include the following:

1. Delineate and label each hydrozone by number, letter, or other method;

2. Identify each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscaping must be included in the low water use hydrozone for the water budget calculation;

3. Identify recreational areas;

4. Identify areas permanently and solely dedicated to edible plants;

5. Identify areas irrigated with recycled water;

6. Identify type of mulch and application depth;

7. Identify soil amendments, type, and quantity;

8. Identify type and surface area of water features;

9. Identify hardscape areas (pervious and non-pervious) and the location of the utilities;

10. Identify location and installation details of any applicable storm water best management practices that encourage on-site retention and infiltration of storm water. Storm water best management practices are encouraged in the landscape design plan and examples include, but are not limited to:

    a. Infiltration beds, swales, and basins that allow water to collect and soak into the ground.

    b. Constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants.

    c. Pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.

11. Identify any applicable rain harvesting or catchment technologies (e.g., rain gardens, cisterns, etc.); and

12. Bear the signature of a California-licensed landscape architect and contain the following statement: "I have complied with the criteria of the City of Wildomar Water Efficient Landscape Ordinance (Wildomar Municipal Code Chapter 17.276) and applied them for the efficient use of water in the landscape design plan."

B. Each hydrozone must have plant materials with similar water use, with the exception of hydrozones with plants of mixed water use, as specified in Section VI.B of these Guidelines.

C. Plants must be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. To encourage the efficient use of water, the following is highly recommended for inclusion in the landscape design plan:

1. Use the Sunset Western Climate Zone System which takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate (or other professional references which provide pertinent information regarding water usage and plant communities that landscape architects would find more useful and complementary);

2. Recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure (e.g., buildings, sidewalks, and power lines);

3. In the plant legend the designer must designate the plant symbol, botanical name, common name, quantity of plants, container size, on center spacing, hydrozone designation, and special notes.

4. Consider the solar orientation for plant placement to maximize summer shade and winter solar gain;

5. The use of non-invasive water-conserving plant species and water-conserving turf is strongly encouraged;

6. Any plant may be selected for the landscaped area provided the EAWU in the landscaped area does not exceed the MAWA;

7. The use of invasive plant species and/or noxious plant species is strongly discouraged; and

8. Turf is discouraged on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape without transitional level areas.

D. A landscape design plan for projects in fire-prone areas and fuel modification zones shall comply with requirements of the fire department, where applicable. When conflicts between water conservation and fire safety design elements exist, the fire safety requirements have priority.

E. Water Features

1. Recirculating water systems must be used for water features when feasible.

2. Where available and consistent with public health guidelines, recycled water must be used as a source for decorative water features.

3. The surface area of a water feature must be included in the high water use hydrozone area of the water budget calculation.

4. Pool and spa covers are highly recommended.

F. Mulch and Soil Amendments

Based upon the recommendations contained in the Soil Management Report, the landscape plan specifications must comply with the following mulch and soil amendment requirements.

1. For shrubs and trees a minimum three to four inch layer of mulch and must be applied on all exposed soil surfaces of planting areas except in turf areas.

2. Ground covers installed from flats require a minimum two inch layer of mulch and must be applied on all exposed soil surfaces of planting areas except in turf areas.

3. Stabilizing mulching products must be used on slopes. Approved bark-based mulch, 3 to 4 inches deep is recommended.

4. The mulching portion of the seed/mulch slurry in hydro-seeded applications must meet the application requirements.

5. Soil amendments must be incorporated according to the recommendations from the soils management report and based upon the needs of the selected plant species.

6. All fertilizers should be organic-based or slow released formulated.

G. Planting Material

Unless required by other ordinances, programs, or project conditions of approval, all installed plant materials should comply with the following minimum container sizes.

1. For perennial and non-flatted ground cover species - 1 gallon.

2. For all other shrubs - 5 gallon.

3. For trees within the project site - 15 gallon

4. For trees along the road right of way – 24-inch box.

H. A landscape maintenance schedule shall include the following items.

1. Irrigation System. Check, adjust, and repair irrigation equipment, repair irrigation equipment with originally specified equipment or as approved by the City, and reset automatic controller as required.

2. Soils and Mulches. Aerate and de-thatch turf areas, and the replenishment of mulch(es).

3. Plant Materials. Fertilization, pruning, weeding, disease and pest control, dead plant replacement and replacement, the cleaning of debris and trash, other special requirements unique to the project design. This should include the length of maintenance period by installing landscape contractor, the warranted materials, and length of warranty.

VI. IRRIGATION DESIGN PLAN

The irrigation system and its related components must be planned and designed to allow for proper installation, management, and maintenance. For the efficient use of water, an irrigation system must meet all the requirements listed in this section and the manufacturer's recommendations.

A. The irrigation design plan, at a minimum, must contain the following information:

1. The location and size of dedicated water meters for landscape;

2. The location, type, and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain shut off device, quick couplers, pressure regulators, and backflow prevention devices;

3. Static water pressure at the point of connection to the public water supply;

4. Flow rate (in gallons per minute or gallons per hour), application rate (inches per hour), and design operating pressure (pressure per square inch) for each station;

5. Irrigation schedule parameters necessary to program smart timers specified in the landscape design; and

6. On the landscape design plan and irrigation design plan, hydrozone areas must 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.

B. Hydrozone

1. Each valve should irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.

2. Sprinkler heads and other emission devices must be selected based on what is appropriate for the plant type within that hydrozone.

3. Where feasible, trees must be placed on separate valves from shrubs, groundcovers, and turf.

4. Individual hydrozones that mix plants of moderate and low water use or moderate and high water use may be allowed if:

a. For hydrozones using drip irrigation devices, the plant factor calculation may be based on the proportions of the respective plant water uses and their respective plant factors;

b. For hydrozones using spray-type irrigation devices, the plant factor of the higher water using plant is used for the calculations.

C. System Design Guidance

1. Dedicated landscape water meters are required on landscaped areas larger than 5,000 square feet to facilitate water management (except that dedicated landscape water meters for single family residences are not required by these Guidelines).

2. Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data are required for irrigation scheduling in all irrigation systems.

3. The irrigation system must be designed to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance. A friction factor calculation to determine residual pressure must be included with the calculations.

4. 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 must be installed to meet the required dynamic pressure of the irrigation system.

5. Static water pressure, dynamic or operating pressure, and flow reading of the water supply must be measured at the point of connection. These pressure and flow measurements must be conducted at the design stage. The measurements must be verified at installation.

6. The design of irrigation systems should allow for use of recycled water when it becomes available.

7. Sensors (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions are required on all irrigation systems, as appropriate for local climatic conditions. Irrigation should be avoided during windy or freezing weather or during rain.

8. Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) are required as close as possible to the point of connection of the water supply to minimize water loss in case of an emergency (such as a main line break) or routine repair.

9. Backflow prevention devices are required to protect the water supply from contamination by the irrigation system. A project applicant must refer to the applicable City code (i.e., public health) for additional backflow prevention requirements.

10. High flow sensors that detect and report high flow conditions created by system damage or malfunction are recommended.

11. The irrigation system must 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.

12. Relevant information from the soil management plan, such as soil type and infiltration rate, must be utilized when designing irrigation systems.

13. The design of the irrigation system must conform to the hydrozones of the landscape design plan.

14. Unless otherwise indicated by the irrigation equipment manufacturer's specifications or demonstrated by the project applicant, the irrigation efficiency of the irrigation heads used within each hydrozone shall be assumed to be:

    - Pop-up stream rotator heads = 75%
    - Stream rotor heads = 75%
    - Microspray = 75%
    - Bubbler = 80%
    - Drip emitter = 85%
    - Subsurface irrigation = 90%

15. In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.

16. Sprinkler heads and other emission devices must have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.

17. Head to head coverage is required. However, sprinkler spacing must be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.

18. Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to high traffic areas.

19. Check valves or anti-drain valves are required for all irrigation systems.

20. Narrow or irregularly shaped areas, less than eight (8) feet in width in any direction, must be irrigated with subsurface irrigation or other appropriate low volume irrigation methods.

21. Slopes greater than 25% should 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 of the landscape project specifies an alternative design or technology, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation audit.

VII. GRADING DESIGN PLAN

For the efficient use of water, grading of a landscape project site must be designed to minimize soil erosion, runoff, and water waste. To prevent excessive erosion and runoff, it is highly recommended that the project applicant:

- Grade so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscape;
- Avoid disruption of natural drainage patterns and undisturbed soil; and
- Avoid soil compaction in landscaped areas.

A. The finished grading configuration of the landscaped area, including pads, slopes, drainage, post-construction erosion control, and stormwater control best management practices, as applicable, must be shown on the Landscape Plan unless this information is included on separate grading plans, or unless the project is limited to replacement planting and/or irrigation to rehabilitate an existing landscaped area.

B. If separate landscape grading plans are provided, the Grading Plan must bear the signature of the landscape professional and contain the following statement: “I have complied with the criteria of the Wildomar Water Efficient Landscape Ordinance (Wildomar Municipal Code Chapter 17.276) and applied them accordingly for the efficient use of water in the grading design plan.”

VIII. CERTIFICATION OF COMPLETION

A. Landscape project installation may not proceed until the plans and specifications contained in the Landscape Documentation Package have been approved by the City.

B. A Certification of Completion for the landscape project must be provided to the Planning Department prior to final inspection of the installed landscaping. The Certificate of Completion must contain the following information:

1. A Landscape Installation Certificate of Completion in the form included as Appendix D of these Guidelines, which must include: (i) certification by ~~a~~ the project landscape architect that the landscape project has been installed per the approved Landscape Documentation Package; and (ii) the following statement: "The landscaping has been installed in substantial conformance to the design plans, and complies with the provisions of the Water Efficient Landscape Ordinance for the efficient use of water in the landscape."

2. Documentation of the irrigation scheduling parameters used to set the controller(s);

3. An irrigation audit to confirm that the installed irrigation system is operating properly.

IX. POST-INSTALLATION IRRIGATION SCHEDULING

For the efficient use of water, all irrigation schedules must be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health. Irrigation schedules must be regulated by automatic irrigation controllers and scheduled to minimize water waste and maximize conservation. The operation of the irrigation system outside the normal watering window is allowed for system auditing and maintenance.

It is highly recommended that the project applicant or local agency inquire with the local water purveyor about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system. The City will work with the Elsinore Valley Municipal Water District to monitor compliance with the Maximum Allowable Water Allowance requirements.

X. PUBLIC EDUCATION

Public education is a key component to promote the efficient use of water in landscapes. Educational materials on the design, installation, management, and maintenance of water efficient landscaping will be included with the information to the buyers of new homes. In addition, all new model homes that are landscaped will use signs and provide other written information to demonstrate the principles of water efficient landscapes.

Appendix A

CERTIFICATION OF LANDSCAPE DESIGN

I hereby certify that:

(1) I am a licensed landscape architect in the State of California to provide professional landscape design services.

(2) The landscape project for the property located at _____

_____

(provide street address or parcel number(s)) was designed by me or under my supervision.

(3) The landscape design and water use calculations for the identified property comply with the requirements of the City of Wildomar Water Efficient Landscape Ordinance and any adopted Implementation Guidelines for the efficient use of water in the landscape.

(4) The information I have provided in this Certificate of Landscape Design is true and correct and is hereby submitted in compliance with the City of Wildomar Guidelines for Implementation of the City of Wildomar Water Efficient Landscape Ordinance.

_____ _____

Print Name Date

_____ _____

Signature License Number

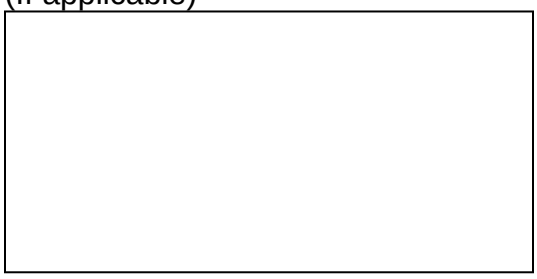
_____

Address

_____ _____

Telephone E-mail Address

Landscape Design Professional's Stamp
(If applicable)



Appendix B

WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the *project applicant* for each Point of Connection. Please complete all sections of the worksheet.

Point of Connection #____

Maximum Applied Water Allowance (MAWA)

Total *MAWA* = (ETo x 0.7 x LA in Sq. Ft. x *0.62*) + (ETo x 1.0 x *SLA* in Sq. Ft. x *0.62*) = Gallons per year for LA+*SLA*

where:

MAWA = *Maximum Applied Water Allowance* (gallons per year)
ETo = *Reference Evapotranspiration* (inches per year)
0.7 = *Evapotranspiration Adjustment Factor* (ETAF)
1.0 = ETAF for *Special Landscaped Area*
LA = *Landscaped Area* (square feet)
0.62 = Conversion factor (to gallons per square foot)
SLA = *Special Landscaped Area* (square feet)

MAWA Calculation:

	ETo		ETAF		LA or *SLA* (ft^2)		Conversion		*MAWA (*Gallons Per Year)
MAWA for LA =		x	0.7	x		x	*0.62*	=	
MAWA for *SLA* =		x	1.0	x		x	*0.62*	=	
Total *MAWA* =									

Estimated Applied Water Use

EAWU = ETo x K_L x LA x *0.62* ÷ *IE* = Gallons per year

where:

EAWU = Estimated Applied Water Use (gallons per year)
ETo = Reference Evapotranspiration (inches per year)
K_L = *Landscape Coefficient*
LA = *Landscaped Area* (square feet)
0.62 = Conversion factor (to gallons per square foot)
IE = Irrigation Efficiency = IME x DU
IME = Irrigation Management Efficiency (90%)
DU = Distribution Uniformity of irrigation head

$K_L = K_s \times K_d \times K_{mc}$

K_s = species factor (range = 0.1-0.9) (see *WUCOLS* list for values)
K_d = density factor (range = 0.5-1.3) (see *WUCOLS* for density value ranges)
K_{mc} = *microclimate* factor (range = 0.5-1.4) (see *WUCOLS*)

WUCOLS – ***www.owue.water.ca.gov/docs/wucols00.pdf***

EAWU Calculation:

	ETo		K_L		LA		Conversion		*IE*		*EAWU (*Gallons Per Year)
Special Landscaped Area		x		x		x	*0.62*	÷		=	
Cool Season Turf		x		x		x	*0.62*	÷		=	
Warm Season Turf		x		x		x	*0.62*	÷		=	
High Water Using Shrub		x		x		x	*0.62*	÷		=	
Medium Water Using Shrub		x		x		x	*0.62*	÷		=	
Low Water Using Shrub		x		x		x	*0.62*	÷		=	
Very Low Water Using Shrubs		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
		x		x		x	*0.62*	÷		=	
Other		x		x		x	*0.62*	÷		=	
Total *EAWU* =											

List sprinkler heads, microspray, and drip emitters here along with average precipitation rate and Distribution Uniformity of Irrigation Head.

***Sprinkler Head* Types**	**Average *Precipitation Rate***	***Distribution Uniformity of Irrigation Head***
Drip		
Microspray		
Bubbler		
Low precipitation rotating nozzles		
Stream rotors		

Appendix C

LANDSCAPE INSTALLATION
CERTIFICATE OF COMPLETION

I hereby certify that:

(1) I am a landscape contractor holding a C-27 license in the State of California to provide professional landscape installation services.

(2) The landscape project for the property located at _____

_____

(provide street address or parcel number(s)) was installed by me or under my supervision.

(3) The landscaping for the identified property has been installed in substantial conformance with the approved Landscape Documentation Package and complies with the requirements of the City of Wildomar Water Efficient Landscape Ordinance and any adopted Implementation Guidelines for the efficient use of water in the landscape.

(4) The information I have provided in this Landscape Installation Certificate of Completion is true and correct and is hereby submitted in compliance with the City of Wildomar Guidelines for Implementation of the City of Wildomar Water Efficient Landscape Ordinance.

_____ _____

Print Name Date

_____ _____

Signature License Number

_____

Address

_____ _____

Telephone E-mail Address

Appendix D

Definitions

The terms used in these Guidelines have the meaning set forth below:

"**Backflow prevention device**" means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

"**Conversion factor**" means the number that converts acre-inches per acre per year to gallons per square foot per year.

"**Check valve**" or "**anti-drain valve**" means 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.

"**Certified landscape irrigation auditor**" means 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.

"**Certification of Landscape Design**" means the certification included as Appendix C of these Guidelines that must be included in the Landscape Documentation Package.

"**Common interest developments**" means community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code Section 1351

"**Distribution Uniformity**" or "**DU**" is a measure of how uniformly an irrigation head applies water to a specific target area and theoretically ranges form zero to 100 percent.

"**Drip irrigation**" means 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.

"**Emitter**" means a drip irrigation emission device that delivers water slowly from the system to the soil.

"**Evapotranspiration rate**" means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

"**Flow rate**" means 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.

"**Infiltration rate**" means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

"**Invasive plants species**" or "**noxious species**" means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive plant species may be regulated by county agricultural agencies as noxious species.

"**Irrigation audit**" means 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 Management Efficiency**" (IME) means the measurement used to calculate the irrigation efficiency of the irrigation system for a landscaped project. A 90% IME can be achieved by using evapotranspiration controllers, soil moisture sensors, and other methods that will adjust irrigation run times to meet plant water needs.

"**Landscaped area**" (LA) means all the planting areas, turf areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance and Estimated Applied Water Use calculations. The landscaped area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscape, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

"**Landscape coefficient**"(KL) is the product of a plant factor multiplied by a density factor and a microclimate factor. The landscape coefficient is derived to estimate water loss from irrigated landscaped areas and special landscaped areas.

"**Landscape Installation Certificate of Completion**" means the certificate included as Appendix C of these Guidelines.

"**Lateral line**" means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

"**Low volume irrigation**" means 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**" means the pressurized pipeline that delivers water from the water source to the valve or outlet.

"**Maximum Applied Water Allowance**" or "MAWA" means the upper limit of annual applied water for the established landscaped area, as specified in Section 2 of these

Guidelines. It is based upon the area's reference evapotranspiration, the ETAF, and the size of the landscaped area. The Estimated Applied Water Use shall not exceed the Maximum Applied Water Allowance.

"**Mulch**" means any organic material such as leaves, bark, straw or compost, or inorganic mineral materials such as rocks, gravel, or 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.

"**Operating pressure**" means the pressure at which the parts of an irrigation system of sprinklers are designed to operate at by the manufacturer

"**Overspray**" means the irrigation water which is delivered beyond the target area.

"**Precipitation rate**" means the rate of application of water measured in inches per hour.

"**Recycled water**" or "**reclaimed water**" means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and water features. This water is not intended for human consumption.

"**Runoff**" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscaped 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.

"**Special Landscape Area**" (SLA) means an area of the landscape dedicated solely to edible plants, areas irrigated with recycled water, 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.

"**Sprinkler head**" means a device which delivers water through a nozzle.

"**Static water pressure**" means the pipeline or municipal water supply pressure when water is not flowing.

"**Station**" means an area served by one valve or by a set of valves that operate simultaneously.

"**Swing joint**" means 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.

"**Water Efficient Landscape Worksheets**" means the worksheets included in Appendix B hereof.

"**Watering window**" means the time of day irrigation is allowed.

"**WUCOLS**" means the Water Use Classification of Landscape published by the University of California Cooperative Extension, the Department of Water Resources, and the Bureau of Reclamation, 2000.

Appendix E

EXAMPLE WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the *project applicant* for each Point of Connection. Please complete all sections of the worksheet.

Point of Connection # 1

Maximum Applied Water Allowance (MAWA)

Total *MAWA* = (ETo x 0.7 x LA in Sq. Ft. x *0.62*) + (ETo x 1.0 x *SLA* in Sq. Ft. x *0.62*) = Gallons per year for LA+*SLA*

where:
MAWA = Maximum Applied Water Allowance (gallons per year)
ETo = Reference Evapotranspiration (inches per year)
0.7 = *Evapotranspiration Adjustment Factor (ETAF)*
1.0 = ETAF for *Special Landscaped Area*
LA = *Landscaped Area* (square feet)
0.62 = Conversion factor (to gallons per square foot)
SLA = Special Landscaped Area (square feet)

Example Calculation: a hypothetical landscape project for Santa Ana, CA with an irrigated landscaped area of 40,000 square feet with 10,000 square feet of Special Landscaped Area. To calculate MAWA, the annual reference evapotranspiration value for Santa Ana is 48.2 inches as listed in the Reference Evapotranspiration Table in the State's Model Code.

	ETo		ETAF		LA or *SLA* (ft^2)		Conversion		*MAWA (*Gallons Per Year)
MAWA for LA =	48.2	x	0.7	x	40,000	x	*0.62*	=	836,752
MAWA for *SLA* =	48.2	x	1.0	x	10,000	x	*0.62*	=	298,840
Total *MAWA* =					50,000				1,135,592 Gallons per year for LA+*SLA*

Estimated Applied Water Use

EAWU = ETo x K_L x LA x *0.62* ÷ *IE* = Gallons per year

where:

EAWU = Estimated Applied Water Use (gallons per year)
ETo = Reference Evapotranspiration **Appendix C** (inches per year)
K_L = *Landscape Coefficient*
LA = *Landscaped Area* (square feet)
0.62 = Conversion factor (to gallons per square foot)
IE = Irrigation Efficiency = IME x DU (See definition in Appendix E for example IE percentages)
IME = Irrigation Management Efficiency (90%)
DU = Distribution Uniformity of irrigation head

K_L = K_s x K_d x K_{mc}

K_s = species factor (range = 0.1-0.9) (see *WUCOLS* list for values)
K_d = density factor (range = 0.5-1.3) (see *WUCOLS* for density value ranges)
K_{mc} = *microclimate* factor (range = 0.5-1.4) (see *WUCOLS*)

WUCOLS – ***www.owue.water.ca.gov/docs/wucols00.pdf***

Example Calculation:

	ETo		K_L		LA		Conversion		*IE*		*EAWU (Gallons per year)*
Special Landscaped Area	48.2	x	1.00	x	10,000	x	*0.62*	÷	0.75	=	398,453
Cool Season Turf	48.2	x	1.00	x	0	x	*0.62*	÷	0.71	=	0
Warm Season Turf	48.2	x	0.65	x	0	x	*0.62*	÷	0.71	=	0
High Water Using Shrub	48.2	x	0.70	x	0	x	*0.62*	÷	0.71	=	0
Medium Water Using Shrub	48.2	x	0.50	x	15,000	x	*0.62*	÷	0.65	=	344,815
Low Water Using Shrub	48.2	x	0.30	x	25,000	x	*0.62*	÷	0.75	=	298,840
Very Low Water Using Shrub	48.2	x	0.20	x	0	x	*0.62*	÷	0.71	=	0
Other	48.2	x	0.50	x	0	x	*0.62*	÷	0.71	=	0
Other	48.2	x	0.50	x	0	x	*0.62*	÷	0.71	=	0
Total *EAWU* =					50,000						1,042,109 Gallons per year

Compare *EAWU* with *MAWA*.
The *EAWU* (1,042,109 gallons per year) is less than *MAWA* (1,135,592 gallons per year). For this example, the water budget complies with the *MAWA*.

List *sprinkler heads*, microspray, and drip *emitters* here along with average *precipitation rate* and *Distribution Uniformity of Irrigation Head*.

***Sprinkler Head* Types**	**Average *Precipitation Rate***	***Distribution Uniformity of Irrigation Head***
Drip		
Microspray		
Bubbler		
Low precipitation rotating nozzles		
Stream rotors		