From: David Koller [dkoller@cvwd.org]
Sent: Monday, April 26, 2010 11:59 AM
To: Water Use Efficiency – Urban eNews
Cc: Raul Aguirre
Subject: Issue Paper Review, Dave Koller, Coachella Valley WaterDistrict

Attachments: SBx7-7 Issue Papers Final Dave Koller.docx

SBx7-7 Issue
apers Final Dave

Here is my review of SBx 7-7 issue paper.

SBx7-7 Urban Technical Methodologies

SBx7-7, enacted in November of 2009, includes provisions on water conservation, measurement, and reporting activities for urban retail water suppliers. The Department is coordinating with the California Urban Water Conservation Council (CUWCC) and this Urban Stakeholder Committee to develop methodologies that suppliers will use to develop baseline water use, set targets for future water use, and measure progress towards meeting the identified target. The legislation (California Water Code §10608.20) specifically states:

(h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

The Department has developed and compiled a set of five Issue Papers (Papers) to assist this Committee in its methodology discussions. Each Paper addresses the water use classifications listed above in the cited text from the California Water Code (CWC) by summarizing the relevant provisions that refer to the methodology, and discusses key issues related to how the methodology might be defined, computed, and implemented. These issues include comments and suggestions received at the two March 2010 listening sessions, plus ideas developed in subsequent discussions among Department and CUWCC staff. In addition, the Papers may include other background information or methodology options that the Committee may find helpful for reference. The five Issue Papers are:

Issue Paper 1: Methods and Issues in Determining Gross Water Use …… Pg 2

Issue Paper 2: Methods and Issues in Determining Service Area Population…… Pg 5

Issue Paper 3: Base and Compliance Daily Per Capita Use ……..…Pg 9

Issue Paper 4: Method 2 Criteria and Methodologies …….…….... Pg 11

Sub-Issue 4a: Baseline Commercial, Industrial and Institutional…….. Pg 11

Sub-Issue 4b: Indoor Residential Use……Pg 12

Sub-Issue 4c: Landscape Area Water Use ……Pg 14

Issue Paper 5: Criteria for Compliance Year Adjustments……. ……..Pg 17

Issue Paper 1: Methods and Issues in Determining Gross Water Use

Overview

Gross water use is defined in the legislation cited below. Gross water use divided by service area population divided by 365 days per year determines a water agency's base daily per capita use.

Deleted: agencies

Key paragraphs in SBx7-7 pertaining to determining gross water use

From CWC §10608.12

(g) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

(2) The net volume of water that the urban retail water supplier places into long-term storage.

(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier

(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

(l) "Process water" means water used for producing a product or product content or water used for research and development, including, but not limited to, continuous manufacturing processes, water used for testing and maintaining equipment used in producing a product or product content, and water used in combined heat and power facilities used in producing a product or product content. Process water does not mean incidental water uses not related to the production of a product or product content, including, but not limited to, water used for restrooms, landscaping, air conditioning, heating, kitchens, and laundry.

(m) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050, that is used to offset potable demand, including recycled water supplied for direct use and indirect potable reuse, that meets the following requirements, where applicable:

(1) For groundwater recharge, including recharge through spreading basins, water supplies that are all of the following:

(A) Metered.

(B) Developed through planned investment by the urban water supplier or a wastewater treatment agency.

(C) Treated to a minimum tertiary level.

(D) Delivered within the service area of an urban retail water supplier or its urban wholesale water supplier that helps an urban retail water supplier meet its urban water use target.

(2) For reservoir augmentation, water supplies that meet the criteria of paragraph (1) and are conveyed through a distribution system constructed specifically for recycled water.

From CWC §10608.20

(h).(1) The department through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

> *(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.*

(i).(1) The department shall adopt regulations for implementation of the provisions relating to ***process water*** *in accordance with subdivision (l) of Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.*

From CWC §10608.24

(e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial percentage of industrial water use in its service area, may exclude ***process water*** *from the calculation of* ***gross water use*** *to avoid a disproportionate burden on another customer sector.*

(f).(1) An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining gross water use. An urban retail water supplier that includes agricultural water use in determining gross water use and develops its urban water use target pursuant to paragraph (2) of subdivision (b) of Section 10608.20 shall use a water efficient standard for agricultural irrigation of 100 percent of reference evapotranspiration multiplied by the crop coefficient for irrigated acres.

(2) An urban retail water supplier, that is also an agricultural water supplier, is not subject to the requirements of Chapter 4 (commencing with Section 10608.48), if the agricultural water use is incorporated into its urban water use target pursuant to paragraph (1).

DWR staff understanding of the legislation

Gross water use is the total amount of water entering a retail water supplier's distribution system, excluding the net volume of water placed in long-term storage, and conveyed through the distribution system to:

- A retail customer
- Another water supplier,
- An agricultural user,
- and recycled water.

At its discretion, a retail water supplier can choose to include agricultural water deliveries in the calculation of gross water use. Doing so requires that the retail supplier also factor

agricultural water use into its calculation of its interim and 2020 water use targets and compliance daily water use.

A water supplier with a substantial percentage of industrial water use may consider excluding process water use from the calculation of gross water use. The legislation directs the Department to adopt regulations for implementing provisions of the law relating to process water use. The legislation does not exclude distribution system water loss and other unaccounted water from the gross water use calculation.

Issues to be considered

The following key issues have been identified from the legislation and the listening sessions:

1) What determines the beginning of a retail urban water supplier's distribution system? Are there standard industry definitions to distinguish the portions of the distribution system related to storage versus transmission?

2) What constitutes long-term storage?

   a. Is water used for groundwater recharge counted as long-term storage? yes

   b. Must water placed in or taken from long-term storage meet a minimum residency time?

3) What adjustments should be made to gross water use calculations to account for changes in service area boundary (e.g. service area consolidation, acquisition, annexation):

   a. During the 10 to 15 year base period?

   b. Between the end of the identified base period and target years?

4) How should average gross water use be calculated if a water supplier does not have 10 years of water use data for its service area (e.g. if service area created less than 10 years ago, or if service area merged with one or more other areas less than 10 years ago). Use the years for which data is available, that it will be compared to in the future.

5) Regulations for implementing provisions relating to process water will need to address, among other things:

   a. Meaning of "substantial percentage" of industrial water use in a service area

   b. Procedures for estimating process water use within the broader category of industrial water use

c. Should the "process water" exclusion be limited to CII customers where process water is sub-metered, and the customer does not draw water from a private well? yes

Issue Paper 2: Methods and Issues in Determining Service Area Population

Overview

Service area population is needed to calculate a retail water supplier's base daily water per capita use, base daily CII water use, and compliance daily per capita water use. These metrics, in turn, are used for determination of and compliance with interim and 2020 urban water use targets. Since the SBx7-7 urban water use targets are based on per capita reduction, service area population is a critical component of many of the methodologies, calculations and targets.

Key paragraphs pertaining to determining service area population

The sections of SBx7-7 most relevant to determination of service area population are:

> *From CWC § 10608.20*
>
> *(f) When calculating per capita values for the purposes of this chapter,* ***an urban retail water supplier shall determine population using federal, state, and local population reports and projections****.*
>
> *(h).(1) The department through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:*
>
> *(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use,* ***service area population****, indoor residential water use, and landscaped area water use.*

DWR staff understanding of the legislation

The legislation requires an urban retail water supplier to use federal, state, and local population reports and projections when determining its service area population. Beyond this, however, the legislation is not specific. It gives the Department authority to develop consistent methodologies and criteria for determining service area population.

Issues to be considered

The following key issues have been identified from the legislation and the listening sessions:

1) How should service area population be determined when:

    a. Service area boundary does not match up with political boundaries used by federal, state, and local population reports and projections (used supportable

estimates)

b. A retail supplier serves large transient population (e.g. college, seasonal homeowners, vacation rentals) (As long as the same procedure is used for both the baseline and the target calculations, it shouldn't matter.)

c. A supplier's service area boundary changes between base period and target periods (e.g. service area consolidation, acquisition, annexation) (incorporate the boundary changes as well as the water use, since they are both used to calculate gpcd)

d. A supplier does not have 10 or more years of historical population data needed to determine historical GPCD. (use those years for which data is available)

2) What are acceptable methods for using federal, state, and local population estimates to interpolate service area population?

a. Can retail suppliers develop and use person-per-connection multipliers? (yes, as long as the same method is used for both the baseline and the target calculations)

b. How should suppliers employ census block/tract population data?

c. Can suppliers use GIS methods that rely on proportioning population by area? (yes, as long as the same method is used for both the baseline and the target calculations)

d. Can suppliers use methods adopted by other regulatory agencies for reporting service area population (e.g. CIWMB for AB 939, UWMPA – see below)? (yes, as long as the same method is used for both the baseline and the target calculations)

3) Can suppliers use different methods and/or data sources to determine base period and target period service area population? (Only if there is supporting information that the two methods are comparable)

4) How much discretion will suppliers have in determining service area population? The following is a range of possible options, from very prescriptive to not very prescriptive: (Any of these should be allowed. There are so many different scenarios in this gigantic state, that a one size fits all is impractical. The most important issue would be that the water supplier use the same method for both the base period and the target period.)

a. Require suppliers to use a Department-approved prescriptive methodology(s).

b. Allow suppliers to determine service area population provided estimates

satisfy very basic data and methodological requirements to be determined by the Department.

c. Allow suppliers to determine service area population and place burden of proof on supplier that the method and data satisfy SBx7-7 requirements.

d. Allow suppliers to determine service area population provided estimates are based on federal, state, or local population reports and projections (note: this is the approach taken by the UWMPA).

Examples of service area population definitions and standards used in other regulatory settings

Following are some examples of service area population definitions and estimation standards used in other regulatory settings. These examples are presented for informational and illustrative purposes only. Their inclusion in this paper does not imply endorsement or recommendation.

California Integrated Waste Management Board (CIWMB) Population Definition:

The CIWMB employs the following definition of service area population for the purpose of determining per capita solid waste loads and reduction targets:

> *Population: The January 1 estimate of the number of inhabitants occupying a jurisdiction as prepared by the California Department of Finance (DOF) for each non-Census year (calendar year ending with a digit other than zero). "Population" also means the April 1 U.S. Census count for each Census year (calendar year ending with the digit zero).*
>
> - *Population includes each person at the place where the person lives and sleeps most of the time. This place is not necessarily the same as the person's voting residence or legal residence.*
> - *Noncitizens that are living in the United States are included, regardless of their immigration status.*
> - *Persons are included regardless of characteristics such as: college student, commuter worker, domestic worker or live-in nanny, foreign national, homeless, hospital or nursing home patient, prisoner, intermittent resident or "snow-bird," military member, tourist or undocumented worker.*
> - *The fundamental goal is to count each person once, only once, and in the correct "usual residence" location according to U.S. Census residence rules.*
>
> *Population is used in the adjustment method because it strongly influences residential waste generation. Every ten years the U.S. Census Bureau counts the number of people living in each California city and county. The most recent census count was done in 2000. The California Department of Finance (DOF) estimates city and county January 1st population for the years between Census counts, e.g., 1991-1999 and 2001-2009. The Board's Electronic Annual Report (EAR) uses population data from DOF's E-4 Population Estimates for Cities, Counties and the State, 2001-2005, with 2000 DRU Benchmark, released in May each year. For 1990-1999 population data, see Revised Historical City, County and State Population Estimates, 1991-2000, with 1990 and 2000 Census Counts. Jurisdictions may use either jurisdiction- or county-level population when estimating waste generation tons, then a diversion rate.*

Urban Water Management Planning Act Service Area Population Requirement:

The UWMPA has minimal requirements for determining service area population. Section 10631 states that:

> *A plan shall be adopted in accordance with this chapter and shall do all of the following:*
>
> *(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning.* ***The projected population estimates shall be based upon data from the state, regional, or (and??) local service agency population*** *(the SB x 7-7 legislation states "using federal, state, and local population reports* ***and*** *projections." The fact that SB x 7-7 uses the word "and" not "or" is that critical?)*
>
> ***projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.***

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Southwest Florida Water Management District

Section D of Southwest Florida Water Management District Water Use Permit User Manual provides an example of a very prescriptive and rigorous methodology for calculating service area population.

http://www.swfwmd.state.fl.us/data/demographics/estimating-population.php

http://www.swfwmd.state.fl.us/files/database/site_file_sets/14/WUP_Complete_Manual_as_of_110209_2009042_SB2080.pdf

Issue Paper 3: Methods and Issues in Estimating Base Daily per Capita Water Use and Compliance Daily per Capita Water Use

Overview

Base daily per capita use is calculated for the agency's baseline period. Compliance daily per capita use is calculated for the two compliance years, 2015 and 2020. Both Compliance and Base Daily per capita use are calculated using gross water use and service area population. Gross water use and service area population are the subject of Issue Papers 1 and 2. The period of time over which the base is calculated will vary depending on the target method used and other factors.

Key paragraphs pertaining to baseline daily per capita water use

Base daily per capita water use is defined as follows:

> *10608.12.(b) "Base daily per capita water use" means any of the following:*
>
> *(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.*
>
> *(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.*
>
> *(3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.*

DWR staff understanding of the legislation

The supplier should calculate the base daily per capita water use separately for each year in the chosen baseline period, and then take the simple average of these single-year calculations.

Issue to be considered

In order to qualify for the longer base period (sub-paragraph 2), the urban supplier must meet "*at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier*". Clarification is needed about whether the intent is that the supplier must generate and deliver enough recycled water to any urban supplier (including itself) or wholesale

supplier to equal or exceed 10 percent of its 2008 retail water demand. Or, whether, the urban supplier must actually deliver that amount of recycled water within its service area to qualify for the longer base period.

Issue Paper 4: Method 2 Criteria and Methodologies

Overview

Of the three components (CII, Indoor Residential, and Landscaped Area) for setting the Method 2 urban water use target, only the CII component is defined as a reduction relative to a baseline. Both the landscaped area water use component and the indoor residential use component are defined as GPCD standards, that are not relative to a baseline GPCD. Agencies choosing to use Method 2 do not calculate a 2020 numerical target in 2010, but calculate the 2020 target in 2020 based on the population and landscape area at that time and include a 10% reduction in CII from the 2010 baseline.

The three components are not considered three independent targets, but are added together to determine a single cumulative urban water use target. This provides flexibility in how urban water agencies can achieve their target.

Issues to be considered

1.) How are interim targets set using Method 2?

Sub-Issue 4a: Baseline Commercial, Industrial, and Institutional (CII) Water Use

Overview

Baseline CII use is needed for target Method 2 (along with the indoor residential and landscape uses). It also affects the adjustment factors that agencies may consider in the compliance years by allowing them to make adjustments based on "substantial changes" in CII relative to base CII use.

Key paragraphs pertaining to CII baseline use

CII definitions include:

> *From CWC §10608.12*
>
> *(c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.*
> *(d) "Commercial water user" means a water user that provides or distributes a product or service.*
> *(h) "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.*
> *(i) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.*

From section 10608.20

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.
(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

From CWC §10608.24

(d) (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:
(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.
(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.
(e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial percentage of industrial water use in its service area, may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.

DWR staff understanding of the legislation

The legislative definitions indicate that CII use is to be calculated on a per-capita basis. The overall target in Method 2 is derived in part by assuming a 10 percent drop in base per-capita CII use

Issues to be considered

1) Many agencies include multi-family accounts in the CII category. What should these agencies do? (Use a methodology to factor them out, using the same methodology for both the base and the target calculations)

2) Some CII customers may draw water from private wells as well as from a municipal source. Should the "process water" exclusion be limited to CII customers where process water is sub-metered, and the customer does not draw water from a private well?

Sub-Issue 4b: Indoor Residential Use

Overview

The SBx7-7 legislation sets a provisional standard for efficient indoor use of 55 GPCD that agencies using Method 2 must use to set the 2020 urban water use target. However, they are not required to demonstrate that this indoor residential target has actually been met; only the overall target, including additional components for landscaped area water use and CII water use, must be met. The legislation asks the Department to assess whether the provisional indoor standard of 55 GPCD is reasonable by 2020. A negative answer to this

question would affect agencies that adopt Method 2 for setting their targets. Apart from this, agencies are not required by SBx7-7 to calculate indoor usage.

Key paragraphs pertaining to indoor residential GPCD

For the indoor residential use component of target Method 2, the legislation states:

> *From CWC §10608.20 (b) (2)*
>
> *(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.*

The above section specifically references the following review and report to the legislature:

> *From CWC §10608.42*
>
> *The department shall review the 2015 urban water management plans and report to the Legislature by December 31, 2016, on progress towards achieving a 20-percent reduction in urban water use by December 31, 2020. The report shall include recommendations on changes to water efficiency standards or urban water use targets in order to achieve the 20-percent reduction and to reflect updated efficiency information and technology changes.*

DWR staff understanding of the legislation

The legislation specifically asks for a review and a 2016 report with recommendations on water use efficiency standards. Such a requirement could imply that indoor residential water use should be tracked in order to evaluate whether the 2020 indoor goal of 55 GPCD appears reasonable. Per the paragraphs cited above, the assessment could include two elements:

> (1) Examination of data from California agencies that have historically pursued aggressive conservation programs to assess whether they are on track to reach the indoor 55 GPCD requirement by 2020 (whether these aggressive conservers opt for Method 2 or not is irrelevant since the purpose is to ascertain whether achieving the 55 GPCD indoor goal is feasible or not).
>
> (2) Literature review about best practices being used elsewhere (possibly outside California, outside US) with respect to indoor conservation, including results from new end-use studies and evaluations that may become available, or may be commissioned by the Department.

Issues to be considered

1) Should the Department ask agencies to estimate and report their indoor residential GPCD, or should it defer this task to a separate study to be commissioned

later?(separate study later; we have no way of accurately assessing indoor water use, except by recycled water production. Nevertheless, even that can be misleading.)

2) For a later study, agencies could still be asked to report some basic information, but the reporting burden would be a lot lower than asking them to estimate indoor GPCD. Data that could be collected through the standardized reporting form include:

   a. monthly use by customer class during the base period and 2015
   b. whether sewer flow data are available as an alternative for tracking indoor use
   c. percent of single-family homes with dedicated irrigation meters
   d. whether data about multifamily usage and multifamily population are available
   e. whether the issue of transient populations is a serious one for the agency

These data could then be used to identify a sample of agencies for detailed study. The study could also perform a literature review to update "efficiency information and technology changes."(CVWD could possibly gather some of this information based on a small percentage of residential that has separate landscape meters.)

Sub-Issue 4c: Methods and Issues in Estimating Landscaped Area Water Use

Overview

Landscaped area water use is specifically identified as a component of Method 2 for estimating an urban water use target. The calculation of landscaped area water use further relies on three key component methodologies that this Committee will assist the Department in developing: landscaped area, the landscape water use per unit area (based on evapotranspiration, or ET), and service area population (because the targets are defined on a per capita basis). Service area population estimation is the subject of Issue Paper 5, so this paper will discuss only the first two.

Recommendations on landscaped area water use methodology could affect two other provisions related to urban landscape water use. They are the urban water use target Method 4 and the calculation of ET for compliance year adjustments. Method 4 is to be developed separately, and compliance ET adjustments are discussed in Issue Paper 5.

Key paragraphs pertaining to Landscaped Area Water Use

For the landscaped area component of target Method 2, the legislation states:

From CWC §10608.20 (b) (2) (B)

For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

DWR staff understanding of the legislation

The SBx7-7 definition of landscape area , "landscape area irrigated through dedicated or residential meters and connections", requires agencies in measuring their landscape area to discriminate between landscape areas that meet the definition and other landscape found in CII accounts and other non residential areas. CII landscape irrigated through a dedicated meter would be included in the SBx7-7 definition of landscape area.

Issues to be considered

1) Measurement issues in estimating the extent of landscaped area within service area include:

   a) The legislation lists some ways to estimate landscaped area. Are these acceptable ways of estimating landscape area? Will the Department set a single standard or allow flexibility? (must allow flexibility because of highly variable conditions)

   b) How should suppliers distinguish irrigated from non-irrigated areas. For example, some suppliers have lands that remote sensing could indicate as irrigated but in fact are drawing from natural channels or groundwater.

   c) Can remote sensing distinguish landscape canopy from actual irrigated area? (insignificant in overall landscape water use)Does this distinction matter much given other estimation errors?

Other Reference Information for Landscaped Area Water Use

The Model Landscape Ordinance contains the following definitions and calculations:

"Landscape area" means all the planting areas, turf areas, and water features in a landscape. "Irrigation efficiency" (IE) means the measurement of the amount of water beneficially used divided by the amount of water applied. 0.71 is the default unless demonstrated higher. "ET adjustment factor" (ETAF) means a factor of 0.7 applied to reference ET (Kc of 0.5 and IE of 0.71 = ETAF of 0.70).

Max Ann. Water Allowance = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]

Maximum Applied Water Allowance (MAWA) is in gallons per year

ETo = Reference Evapotranspiration (inches per year)

0.62 = Conversion Factor (from inches/yr to gallons/sqft/yr)

0.7 = ET Adjustment Factor (ETAF), includes crop coeff. and irrig. efficiency

LA = Landscape Area including SLA (square feet)

0.3 = Additional Water Allowance for SLA
SLA = Special Landscape Area (square feet)
Or, may adjust for effective precipitation, Eppt:

MAWA= (ETo - Eppt) (0.62) [(0.7 x LA) + (0.3 x SLA)].

Total Water Use calculated for all hydrozones shall not exceed MAWA.

ETWU= (ETo)(0.62)[(PF xHA)/IE + SLA]

Where:

ETWU = Estimated Total Water Use per year (gallons)
ETo = Reference Evapotranspiration (inches)
PF = Plant Factor from WUCOLS (see Section 491)
HA = Hydrozone Area [high, medium, and low water use areas] (square feet)
SLA = Special Landscape Area (square feet)
0.62 = Conversion Factor
IE = Irrigation Efficiency (minimum 0.71)

Issue Paper 5: Criteria for Compliance Year Adjustments

Overview

The SBx7-7 legislation allows agencies to take several factors into account in determining compliance with their GPCD targets. These include weather, substantial changes to commercial or industrial water use, and substantial changes in institutional water use resulting from extraordinary events.

Key paragraphs pertaining to compliance year adjustments

From CWC §10608.24

(a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.

(b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

(c) An urban retail water supplier's compliance daily per capita water use shall be the measure of progress toward achievement of its urban water use target.

(d) (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:

(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.

(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.

(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

(e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial percentage of industrial water use in its service area, may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.

DWR staff understanding of the legislation

Three adjustment factors are specifically mentioned: weather (evapotranspiration and rainfall), substantial changes to commercial and industrial use due to economic development, and substantial changes to institutional use.

The Department is directed to adopt a standard weather-normalization method that takes into account differences between base period and compliance year evapotranspiration and rainfall.

Agencies using Method 2 to set their targets can test compliance either by weather-normalizing their compliance-year usage to compare against the projected targets, or by comparing actual usage in the compliance years to targets based upon actual realized reference ETo in the compliance years (see also Issue Paper 4c: Landscaped Area Water Use).

Issues to be considered

1. How should "substantial" be defined?

2. What reporting requirements should be established to document a **substantial** change in per-capita CII water use, or change in use resulting from extraordinary events?

3. How would weather normalization work when agencies annex or consolidate their service areas between the base and compliance periods?

4. Given that estimates of gross water use and population are subject to uncertainty, should GPCD compliance be tested on the basis of a binary (yes/no) scale, or a sliding scale depending upon deviation between compliance-year usage and the target?