

Draft Water Energy Guidance

For Voluntary Reporting in 2015 Urban Water Management Plans

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Climate Change Program



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Draft Water Energy Guidance

- Guidance Development Process
- Methodology and Definitions
- Reporting Format (spreadsheets)

Senate Bill 1036

CWC 10631.2(a) In addition to the requirements of Section 10631, an urban water management plan may, but is not required to, include any of the following information:

- (1) An estimate of the amount of energy used to extract or divert water supplies.*
- (2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.*
- (3) An estimate of the amount of energy used to treat water supplies.*
- (4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.*
- (5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.*
- (6) An estimate of the amount of energy used to place water into or withdraw from storage.*
- (7) Any other energy-related information the urban water supplier deems appropriate.*

CWC 10631.2 (b)

The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems.

The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

Goals

- Maximize urban water supplier participation
- Minimize level of effort required to report
- Accessible to suppliers of varying capacity
- Uniform methodology
- Useful to urban water suppliers
- Useful for filling in statewide information gaps

Benefits to Urban Water Suppliers

- Identify energy savings opportunities
- Calculate energy savings associated with water conservation programs.
- Potential energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies
- Benchmarking of energy use and the ability to compare energy use among similar agencies.

Guidance Development Process

- DWR Greenhouse Gas Reporting to TCR
- Water Plan 2013 Water-Energy Content
- Met with 10+ agencies that previously evaluated energy consumption of water operations.
 - Challenges
 - Unusual water management processes
 - Interest in voluntary reporting
 - Methodology used for energy intensity calculations

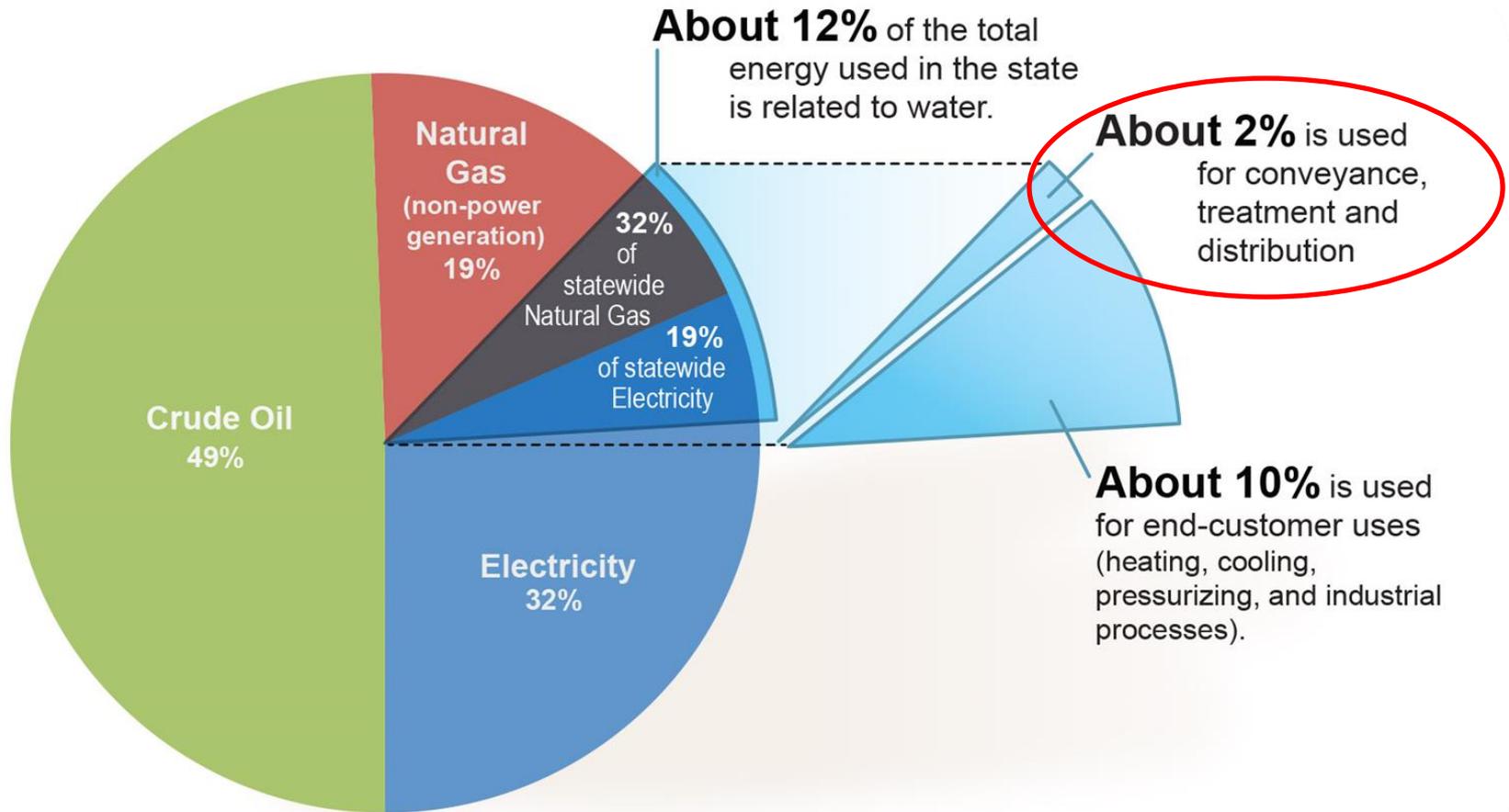
Resources

- Independent Technical Panel (ITP) February 2014 UWMP Report (Recommendation #5)
- SB 1036 Legislation
- CPUC Studies 1, 2 & 3 (2010-2011)
- CPUC Water Energy Cost Effectiveness Calculator (in progress)
- CEC Integrated Energy Policy Report (2005)
- Wilkinson UCSB Study (2000)

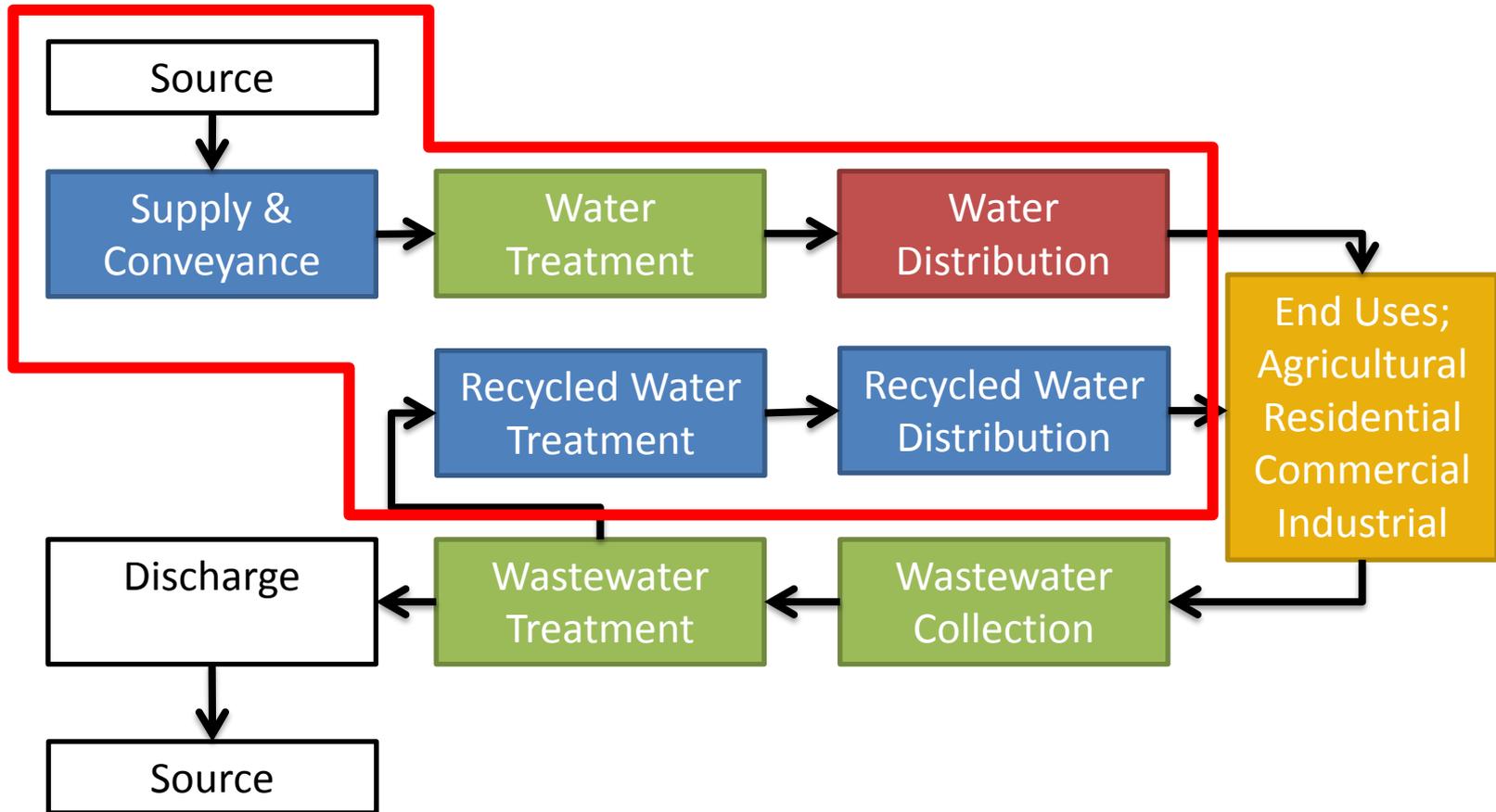
Energy Intensity Definition

Energy intensity is a measure of the amount of energy needed to take a unit volume of water from a starting location through all necessary steps to its point of use. Energy intensity is calculated by dividing the quantity of energy consumed (kWh) by the volume of water entering the distribution system (AF).

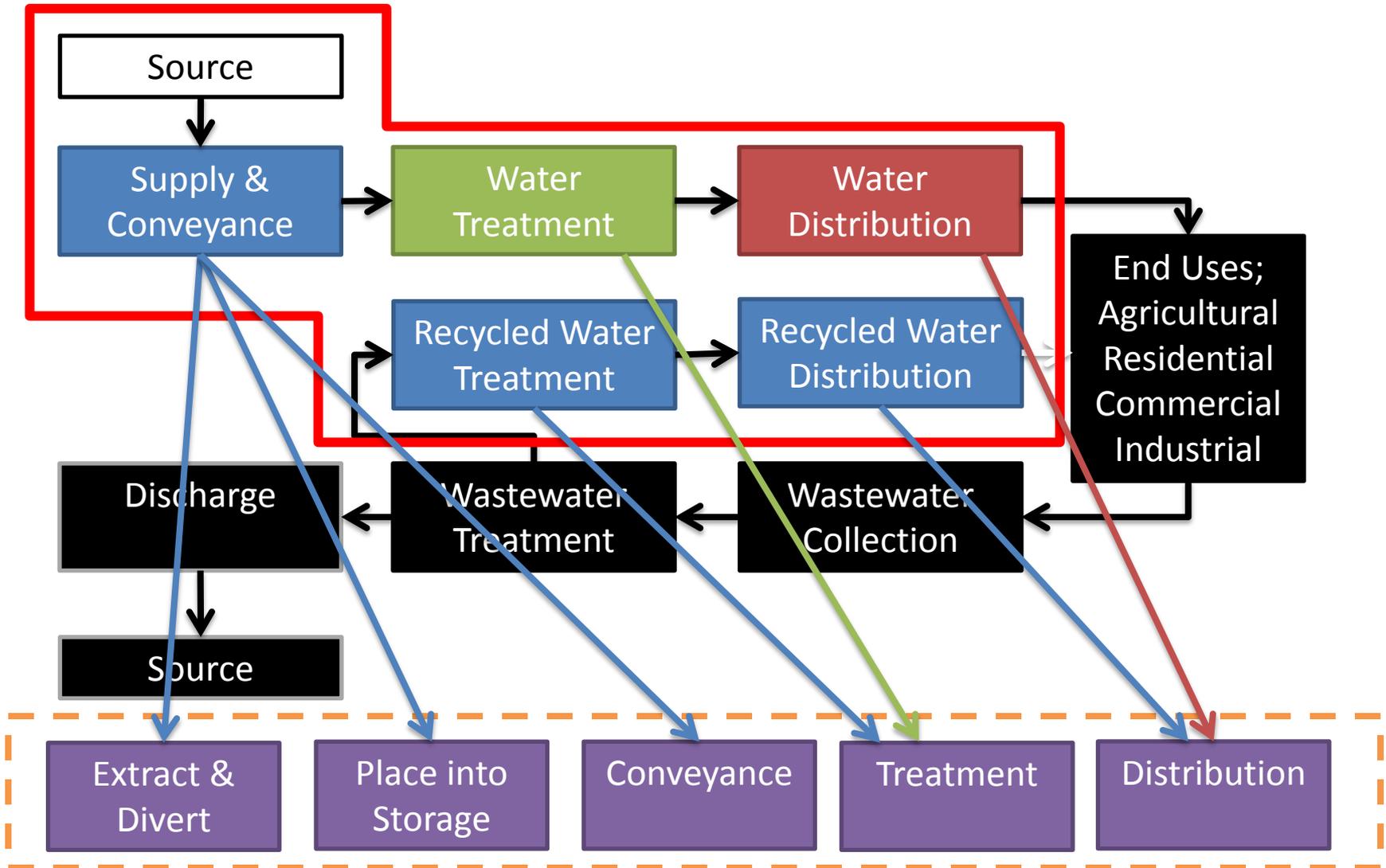
Water – Energy Nexus



Water – Energy Nexus



Water – Energy Nexus



Reporting Period

- One year reporting period.
- Ideally reporting period matches period used for 2015 data provided by the urban water supplier in SBX7-7 Table 4A and UWMP Table 6-8.
- If energy consumption data is not available for the 2015 time period, urban water suppliers can select an alternate one year reporting period.
- Urban water suppliers wishing to report multiple years of energy intensity data can do so by filling out tables O-1 and O-2 for multiple one year periods.

Water Supplies

Water supplies imported from Table 6-8

- Comparing energy intensity by water supply
- Inclusion of embedded energy from wholesale
- Treated vs. Untreated comparison

Table 6-8 Water				
		2015		
<i>Drop down menu - May use each category multiple times.</i>	Detail	Actual Volume	Level of Treatment	Total Right or Capacity
Purchased Water	<i>Name of Supplying Agency</i>		Drop Down	
Groundwater	<i>Name of Basin or Area</i>		Raw or Potable	
Surface water				
Recycled Water	<i>Name of Supplying Agency</i>			
Desalinated Water				
Stormwater Use				
Transfers	<i>Name of Supplying Agency</i>			
Exchanges	<i>Name of Supplying Agency</i>			
Other				
Total				0

Volume of Water Entering Distribution

Energy intensity calculations use volume of water entering the distribution system from SBX7-7 Table 4A in Acre-Feet for 2015 or selected reporting period.

SBX7-7 Table 4-A: Volume Entering the Distribution System(s) <i>This table may be expandable to allow for more than one distribution system</i>									
Year	Agency's Own Water Sources				Purchased Water Sources				Total Water into Distribution System
	Name of Source	Volume from Own Sources	Meter Error Adjustment* <i>Optional</i>	Corrected Volume from Own Sources	Name of Source	Volume from Purchased Sources	Meter Error Adjustment* <i>Optional</i>	Corrected Volume from Purchased Sources	
2015 Compliance Year - Water into Distribution System									
2015				Column D +/- Column E				Column H +/- Column I	(Column F) + (Column J)

Volume of Water Entering Distribution

Table O-1A: Voluntary Energy Intensity (kWh)				
Enter Start Date for Reporting Period		1/1/2015	Fraction of Water Supply (%)	Volume Entering the Distribution System (AF)
End Date		12/31/2015		
<i>Water Supply Category</i>	<i>Supplying Agency / Basin</i>	<i>Level of Treatment</i>		
Purchased Water	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Groundwater	<i>Name of Basin or Area</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Surface water		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Recycled Water	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Desalinated Water		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Stormwater Use		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Transfers	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Exchanges	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Other		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Total			<i>Calculated = 100% (Sum Column)</i>	<i>2015: SBX7-7 Table 4-A (Cell K:58)</i>

Operational Control

Operational Control: Authority over normal business operations at the operational level. This would not include other systems from which the urban water supplier purchases water.

Volume Entering the Distribution System (AF)	Urban Water Supplier Operational Control					
	Extract and Divert (kWh)	Place into Storage (kWh)	Convey (kWh)	Treatment (kWh)	Distribution (kWh)	Total (kWh)
Calculated						
Calculated						
Calculated						
Calculated						
Calculated						
Calculated						
Calculated						
Calculated						
2015: SBX7-7 Table 4-A (CellK:58)	manual input	manual input	manual input	manual input	manual input	Calculated

Extract & Divert

Place into Storage

Conveyance

Treatment

Distribution

Embedded Energy

Embedded Energy

Embedded Energy in Wholesale Supplies (kWh/AF): Energy that has been applied to a water supply by all upstream wholesalers. This includes a summation of energy applied for extract and divert, place into storage, conveyance, treatment, and distribution.

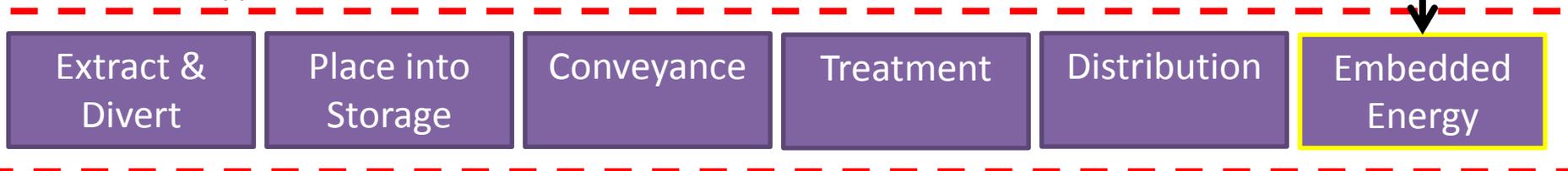
Wholesaler #1



Wholesaler #2

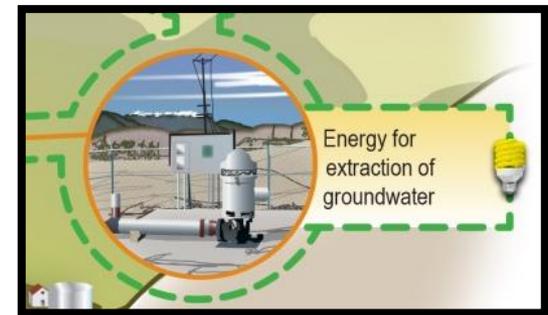


Urban Water Supplier



Extract and Divert

Extract and Divert (kWh): Amount of energy consumed within an urban water supplier's *operational control* to remove water from a channel, pipeline, stream, or aquifer less *consequential hydropower generation*.



Extract &
Divert

Place into
Storage

Conveyance

Treatment

Distribution

Embedded
Energy

Place into Storage

Place into Storage (kWh): Amount of energy consumed within an urban water supplier's *operational control* to place water into a long term storage reservoir or groundwater bank less any *consequential hydropower generation*.



Extract &
Divert

Place into
Storage

Conveyance

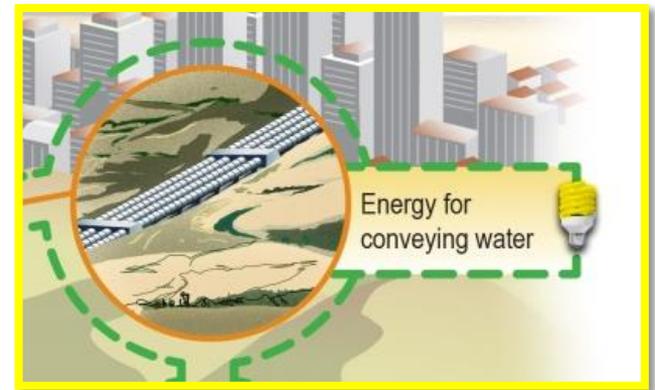
Treatment

Distribution

Embedded
Energy

Conveyance

Conveyance (kWh): Energy consumed within an UWMP's *operational control* to transport water from point of diversion to point of treatment less any *consequential hydropower generation*.



Extract &
Divert

Place into
Storage

Conveyance

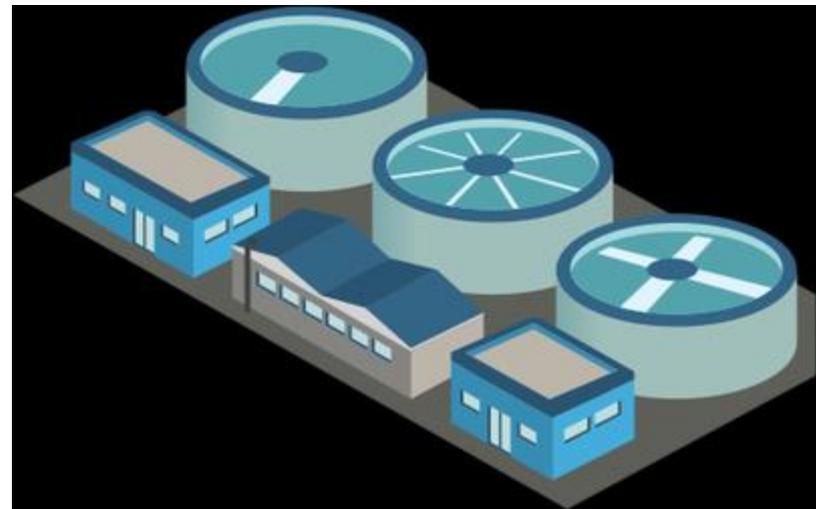
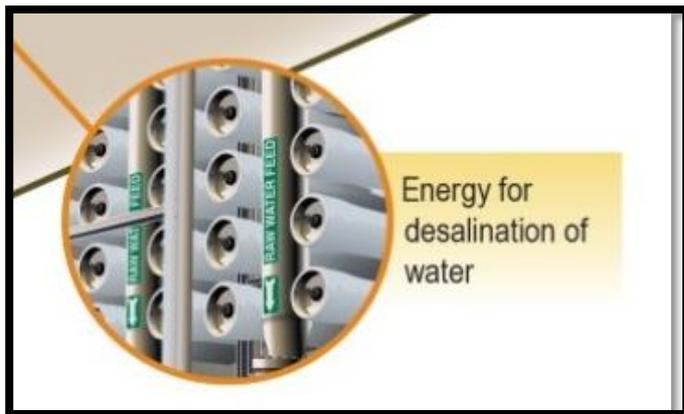
Treatment

Distribution

Embedded
Energy

Water Treatment

Treatment (kWh): Energy consumed within an urban water supplier's *operational control* to treat water to potable quality.



Extract &
Divert

Place into
Storage

Conveyance

Treatment

Distribution

Embedded
Energy

Recycled Water Treatment

The incremental amount of energy needed to treat wastewater effluent beyond the amount of energy that otherwise would have been required to treat the wastewater effluent to a quality acceptable for discharge.



Extract &
Divert

Place into
Storage

Conveyance

Treatment

Distribution

Embedded
Energy

Distribution

Distribution (kWh): Energy expended within an urban water supplier's *operational control* to transport water from the treatment plant or wellhead disinfection point to the point of delivery.

Extract &
Divert

Place into
Storage

Conveyance

Treatment

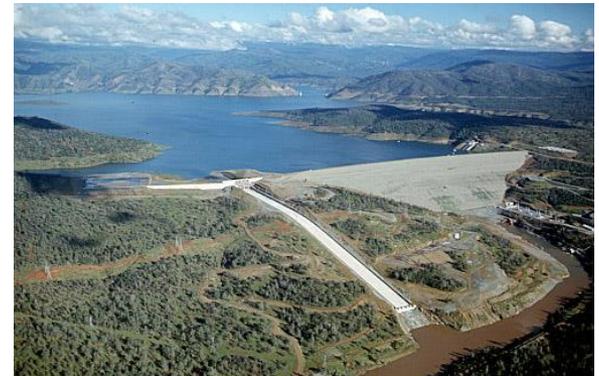
Distribution

Embedded
Energy

Hydropower

Non-Consequential Hydropower Generation:

Energy generated from falling water where the energy generation is not a direct consequence of water delivery. Water that has generated electricity is released to natural channels and may or may not end up being delivered to an end user the generation should be considered non-consequential hydropower generation.



Extract &
Divert

Place into
Storage

Conveyance

Treatment

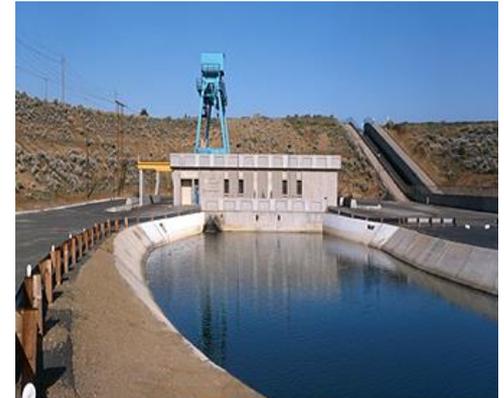
Distribution

Embedded
Energy

Hydropower

Consequential Hydropower Generation (kWh):

Energy generated using turbines or other generation devices to generate electricity from falling water where the energy generation is a direct consequence of water delivery. Water passing through the energy generation devices must be delivered to users.



Alamo Powerplant

Extract &
Divert

Place into
Storage

Conveyance

Treatment

Distribution

Embedded
Energy

Hydropower

Why Non-Consequential Hydropower is not included:

- Released to natural channels and may or may not end up being delivered to an end user
- No clear way to partition to users:
 - Volumetric percentage of water delivered by agency operating reservoir?
 - Volumetric percentage of water released from reservoir?
 - Portion of energy purchased or consumed for conveyance?

Renewable Energy

Renewable Energy Sources: Unless renewable energy generation is a direct result of water delivery (Consequential Hydropower Generation), renewable energy generation should not be netted from energy consumed or included in energy intensity calculations.



Extract &
Divert

Place into
Storage

Conveyance

Treatment

Distribution

Embedded
Energy

Water Storage

Inter-annual storage: Urban water suppliers with inter-annual (multiyear) storage, the volume of water passing through each water management process in a given year can vary significantly.

Extract &
Divert

Place into
Storage

Conveyance

Treatment

Distribution

Embedded
Energy

Water Storage

Groundwater Banking: Guidance does not address how to incorporate the energy intensity from groundwater banking operations. It is possible to include the energy intensity from ground water banking in the Place into Storage or Embedded Energy in Wholesale Water Supplies categories



Extract &
Divert

Place into
Storage

Conveyance

Treatment

Distribution

Embedded
Energy

Water Energy Guidance Overview

- Reporting Methods
 - Complete Method (A)
 - Intermediate Method (B)
 - Simple Method (C)
 - Manual Entry Method (X)
- Additional Information
 - Optional Renewable Energy Sources and GHG emissions:

Complete Method (A)

Enter Start Date for Reporting Period		1/1/2015		Fraction of Water Supply (%)	Volume Entering the Distribution System (AF)	Urban Water Supplier Operational Control					Total (kWh)
End Date		12/31/2015				Extract and Divert (kWh)	Place into Storage (kWh)	Convey (kWh)	Treatment (kWh)	Distribution (kWh)	
Water Supply Category	Supplying Agency / Basin	Level of Treatment									
Purchased Water	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	manual input	manual input	manual input	manual input		Calculated
Groundwater	Name of Basin or Area	tbi 6-8		Calculated	Calculated	manual input	manual input	manual input	manual input		Calculated
Surface water		tbi 6-8		Calculated	Calculated	manual input	manual input	manual input	manual input		Calculated
Recycled Water	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	manual input	manual input	manual input	manual input		Calculated
Desalinated Water		tbi 6-8		Calculated	Calculated	manual input	manual input	manual input	manual input		Calculated
Stormwater Use		tbi 6-8		Calculated	Calculated	manual input	manual input	manual input	manual input		Calculated
Transfers	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	manual input	manual input	manual input	manual input		Calculated
Exchanges	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	manual input	manual input	manual input	manual input		Calculated
Other		tbi 6-8		Calculated	Calculated	manual input	manual input	manual input	manual input		Calculated
Total				Calculated = 100% (Sum Column)	2015: SBX7-7 Table 4-A (Cell K-58)	Calculated	Calculated	Calculated	Calculated	manual input	Calculated

Start Date		1/1/2015		Volume Entering the Distribution System (AF)	Urban Water Supplier Operational Control						Optional	
End Date		12/31/2015			Extract and Divert (kWh/AF)	Place into Storage (kWh/AF)	Convey (kWh/AF)	Treatment (kWh/AF)	Distribution (kWh/AF)	Total (kWh/AF)	Embedded Energy in Wholesale Supplies (kWh/AF)	Total EI for Water Supply (kWh/AF)
Water Supply Category	Supplying Agency / Basin	Level of Treatment										
Purchased Water	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Groundwater	Name of Basin or Area	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Surface water		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Recycled Water	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Desalinated Water		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Stormwater Use		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Transfers	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Exchanges	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Other		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Average						Calculated	Calculated	Calculated	Calculated	Calculated		Calculated

Data Quality (Estimate, Metered Data, Combination of Estimates and Metered Data)
 dropdown menu

Narrative:

Complete Method (A)

Table O-1A: Voluntary Energy Intensity (kWh)				
Enter Start Date for Reporting Period		1/1/2015	Fraction of Water Supply (%)	Volume Entering the Distribution System (AF)
End Date		12/31/2015		
<i>Water Supply Category</i>	<i>Supplying Agency / Basin</i>	<i>Level of Treatment</i>		
Purchased Water	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Groundwater	<i>Name of Basin or Area</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Surface water		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Recycled Water	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Desalinated Water		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Stormwater Use		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Transfers	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Exchanges	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Other		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Total			<i>Calculated = 100% (Sum Column)</i>	<i>2015: SBX7-7 Table 4-A (CellK:58)</i>

Complete Method (A)

Water Supply Category	Urban Water Supplier Operational Control					
	Extract and Divert (kWh)	Place into Storage (kWh)	Convey (kWh)	Treatment (kWh)	Distribution (kWh)	Total (kWh)
Purchased Water	manual input	manual input	manual input	manual input		Calculated
Groundwater	manual input	manual input	manual input	manual input		Calculated
Surface water	manual input	manual input	manual input	manual input		Calculated
Recycled Water	manual input	manual input	manual input	manual input		Calculated
Desalinated Water	manual input	manual input	manual input	manual input		Calculated
Stormwater Use	manual input	manual input	manual input	manual input		Calculated
Transfers	manual input	manual input	manual input	manual input		Calculated
Exchanges	manual input	manual input	manual input	manual input		Calculated
Other	manual input	manual input	manual input	manual input		Calculated
Total	Calculated	Calculated	Calculated	Calculated	manual input	Calculated

Water Supply Category	Urban Water Supplier Operational Control						Optional	
	Extract and Divert (kWh/AF)	Place into Storage (kWh/AF)	Convey (kWh/AF)	Treatment (kWh/AF)	Distribution (kWh/AF)	Total (kWh/AF)	Embedded Energy in Wholesale Supplies (kWh/AF)	Total EI for Water Supply (kWh/AF)
Purchased Water	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Groundwater	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Surface water	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Recycled Water	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Desalinated Water	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Stormwater Use	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Transfers	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Exchanges	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Other	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Total	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated		Calculated

Embedded Energy

Wholesaler #1

Table O-2A: Energy Intensity (kWh/AF)										
Start Date		1/1/2015		Volume Entering the Distribution System (AF)	Urban Water Supplier Operational Control					Total (kWh/AF)
End Date		12/31/2015			Extract and Divert (kWh/AF)	Place into Storage (kWh/AF)	Convey (kWh/AF)	Treatment (kWh/AF)	Distribution (kWh/AF)	
Water Supply Category	Supplying Agency / Basin	Level of Treatment								
Purchased Water	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated
Groundwater	Name of Basin or Area	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated
Surface water		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated
Recycled Water	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated
Desalinated Water		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated
Stormwater Use		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated
Transfers	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated
Exchanges	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated
Other		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated
Average					Calculated	Calculated	Calculated	Calculated	Calculated	Calculated

Wholesaler #2

Table O-2A: Energy Intensity (kWh/AF)												
Start Date		1/1/2015		Volume Entering the Distribution System (AF)	Urban Water Supplier Operational Control					Optional		
End Date		12/31/2015			Extract and Divert (kWh/AF)	Place into Storage (kWh/AF)	Convey (kWh/AF)	Treatment (kWh/AF)	Distribution (kWh/AF)	Total (kWh/AF)	Embedded Energy in Wholesale Supplies (kWh/AF)	Total EI for Water Supply (kWh/AF)
Water Supply Category	Supplying Agency / Basin	Level of Treatment										
Purchased Water	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Groundwater	Name of Basin or Area	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Surface water		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Recycled Water	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Desalinated Water		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Stormwater Use		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Transfers	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Exchanges	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Other		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Average					Calculated	Calculated	Calculated	Calculated	Calculated	Calculated		Calculated

Urban Water Supplier

Table O-2A: Energy Intensity (kWh/AF)												
Start Date		1/1/2015		Volume Entering the Distribution System (AF)	Urban Water Supplier Operational Control					Optional		
End Date		12/31/2015			Extract and Divert (kWh/AF)	Place into Storage (kWh/AF)	Convey (kWh/AF)	Treatment (kWh/AF)	Distribution (kWh/AF)	Total (kWh/AF)	Embedded Energy in Wholesale Supplies (kWh/AF)	Total EI for Water Supply (kWh/AF)
Water Supply Category	Supplying Agency / Basin	Level of Treatment										
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Groundwater	Name of Basin or Area	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Surface water		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Recycled Water	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Desalinated Water		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Stormwater Use		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Transfers	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Exchanges	Name of Supplying Agency	tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Other		tbi 6-8		Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	optional manual input	Calculated
Average					Calculated	Calculated	Calculated	Calculated	Calculated	Calculated		Calculated

Intermediate Method (B)

Enter Start Date for Reporting Period		1/1/2015		Fraction of Water Supply (%)	Volume Entering the Distribution System (AF)	Urban Water Supplier Operational Control					Total (kWh)
End Date		12/31/2015				Extract and Divert (kWh)	Place into Storage (kWh)	Convey (kWh)	Treatment (kWh)	Distribution (kWh)	
Water Supply Category	Supplying Agency / Basin	Level of Treatment									
Purchased Water	Name of Supplying Agency	tbl 6-8		manual input	Calculated						
Groundwater	Name of Basin or Area	tbl 6-8		manual input	Calculated						
Surface water		tbl 6-8		manual input	Calculated						
Recycled Water	Name of Supplying Agency	tbl 6-8		manual input	Calculated						
Desalinated Water		tbl 6-8		manual input	Calculated						
Stormwater Use		tbl 6-8		manual input	Calculated						
Transfers	Name of Supplying Agency	tbl 6-8		manual input	Calculated						
Exchanges	Name of Supplying Agency	tbl 6-8		manual input	Calculated						
Other		tbl 6-8		manual input	Calculated						
Total				Calculated = 100% (Sum Column)	2015: SBX7-7 Table 4-A (Cell K.5B)	manual input	manual input	manual input	manual input	manual input	Calculated

Start Date		1/1/2015		Volume Entering the Distribution System (AF)	Urban Water Supplier Operational Control						Optional	
End Date		12/31/2015			Extract and Divert (kWh/AF)	Place into Storage (kWh/AF)	Convey (kWh/AF)	Treatment (kWh/AF)	Distribution (kWh/AF)	Total (kWh/AF)	Embedded Energy in Wholesale Supplies (kWh/AF)	Total EI for Water Supply (kWh/AF)
Water Supply Category	Supplying Agency / Basin	Level of Treatment										
Purchased Water	Name of Supplying Agency	tbl 6-8		Calculated							optional manual input	
Groundwater	Name of Basin or Area	tbl 6-8		Calculated							optional manual input	
Surface water		tbl 6-8		Calculated							optional manual input	
Recycled Water	Name of Supplying Agency	tbl 6-8		Calculated							optional manual input	
Desalinated Water		tbl 6-8		Calculated							optional manual input	
Stormwater Use		tbl 6-8		Calculated							optional manual input	
Transfers	Name of Supplying Agency	tbl 6-8		Calculated							optional manual input	
Exchanges	Name of Supplying Agency	tbl 6-8		Calculated							optional manual input	
Other		tbl 6-8		Calculated							optional manual input	
Average					Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	

Data Quality (Estimate, Metered Data, Combination of Estimates and Metered Data)

dropdown menu

Narrative:

Intermediate Method (B)

Table O-1B: Voluntary Energy Intensity (kWh)				
Enter Start Date for Reporting Period		1/1/2015	Fraction of Water Supply (%)	Volume Entering the Distribution System (AF)
End Date		12/31/2015		
<i>Water Supply Category</i>	<i>Supplying Agency / Basin</i>	<i>Level of Treatment</i>		
Purchased Water	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Groundwater	<i>Name of Basin or Area</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Surface water		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Recycled Water	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Desalinated Water		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Stormwater Use		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Transfers	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Exchanges	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Other		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Total			<i>Calculated = 100% (Sum Column)</i>	<i>2015: SBX7-7 Table 4-A (CellK:58)</i>

Intermediate Method (B)

Water Supply Category	Urban Water Supplier Operational Control					
	Extract and Divert	Place into Storage	Convey	Treatment	Distribution	Total
	(kWh)	(kWh)	(kWh)	(kWh)	(kWh)	(kWh)
Purchased Water						
Groundwater						
Surface water						
Recycled Water						
Desalinated Water						
Stormwater Use						
Transfers						
Exchanges						
Other						
Total	<i>manual input</i>	<i>manual input</i>	<i>manual input</i>	<i>manual input</i>	<i>manual input</i>	<i>Calculated</i>

Water Supply Category	Urban Water Supplier Operational Control						Optional	
	Extract and Divert	Place into Storage	Convey	Treatment	Distribution	Total	Embedded Energy in Wholesale Supplies	Total EI for Water Supply
	(kWh/AF)	(kWh/AF)	(kWh/AF)	(kWh/AF)	(kWh/AF)	(kWh/AF)	(kWh/AF)	(kWh/AF)
Purchased Water							<i>optional manual input</i>	
Groundwater							<i>optional manual input</i>	
Surface water							<i>optional manual input</i>	
Recycled Water							<i>optional manual input</i>	
Desalinated Water							<i>optional manual input</i>	
Stormwater Use							<i>optional manual input</i>	
Transfers							<i>optional manual input</i>	
Exchanges							<i>optional manual input</i>	
Other							<i>optional manual input</i>	
Total	<i>Calculated</i>	<i>Calculated</i>	<i>Calculated</i>	<i>Calculated</i>	<i>Calculated</i>	<i>Calculated</i>		<i>Calculated</i>

Simple Method (C)

Enter Start Date for Reporting Period		1/1/2015	Level of Treatment	Fraction of Water Supply (%)	Volume Entering the Distribution System (AF)	Urban Water Supplier Operational Control					
End Date		12/31/2015				Extract and Divert (kWh)	Place into Storage (kWh)	Convey (kWh)	Treatment (kWh)	Distribution (kWh)	Total UWMP (kWh)
Water Supply Category	Supplying Agency / Basin										
Purchased Water	Name of Supplying Agency	tbl 6-8	manual input	Calculated							
Groundwater	Name of Basin or Area	tbl 6-8	manual input	Calculated							
Surface water		tbl 6-8	manual input	Calculated							
Recycled Water	Name of Supplying Agency	tbl 6-8	manual input	Calculated							
Desalinated Water		tbl 6-8	manual input	Calculated							
Stormwater Use		tbl 6-8	manual input	Calculated							
Transfers	Name of Supplying Agency	tbl 6-8	manual input	Calculated							
Exchanges	Name of Supplying Agency	tbl 6-8	manual input	Calculated							
Other		tbl 6-8	manual input	Calculated							
Total				Calculated = 100% (Sum Column)	2015: SBX7-7 Table 4-A (Cell K:58)					manual input	

Start Date		1/1/2015	Level of Treatment	Volume Entering the Distribution System (AF)	Urban Water Supplier Operational Control Operational Control						Optional	
End Date		12/31/2015			Extract and Divert (kWh/AF)	Place into Storage (kWh/AF)	Convey (kWh/AF)	Treatment (kWh/AF)	Distribution (kWh/AF)	Total UWMP (kWh/AF)	Embedded Energy in Wholesale Supplies (kWh/AF)	Total EI for Water Supply (kWh/AF)
Water Supply Category	Supplying Agency / Basin											
Purchased Water	Name of Supplying Agency	tbl 6-8	Calculated							optional manual input		
Groundwater	Name of Basin or Area	tbl 6-8	Calculated							optional manual input		
Surface water		tbl 6-8	Calculated							optional manual input		
Recycled Water	Name of Supplying Agency	tbl 6-8	Calculated							optional manual input		
Desalinated Water		tbl 6-8	Calculated							optional manual input		
Stormwater Use		tbl 6-8	Calculated							optional manual input		
Transfers	Name of Supplying Agency	tbl 6-8	Calculated							optional manual input		
Exchanges	Name of Supplying Agency	tbl 6-8	Calculated							optional manual input		
Other		tbl 6-8	Calculated							optional manual input		
Average								Calculated		Calculated		

Simple Method (C)

Table O-1C: Voluntary Energy Intensity (kWh)

Enter Start Date for Reporting Period		1/1/2015	Fraction of Water Supply (%)	Volume Entering the Distribution System (AF)
End Date		12/31/2015		
<i>Water Supply Category</i>	<i>Supplying Agency / Basin</i>	<i>Level of Treatment</i>		
Purchased Water	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Groundwater	<i>Name of Basin or Area</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Surface water		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Recycled Water	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Desalinated Water		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Stormwater Use		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Transfers	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Exchanges	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Other		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Total			<i>Calculated = 100% (Sum Column)</i>	<i>2015: SBX7-7 Table 4-A (CellK:58)</i>

Simple Method (C)

Water Supply Category	Urban Water Supplier Operational Control					
	Extract and Divert <i>(kWh)</i>	Place into Storage <i>(kWh)</i>	Convey <i>(kWh)</i>	Treatment <i>(kWh)</i>	Distribution <i>(kWh)</i>	Total UWMP <i>(kWh)</i>
Purchased Water						
Groundwater						
Surface water						
Recycled Water						
Desalinated Water						
Stormwater Use						
Transfers						
Exchanges						
Other						
Total						<i>manual input</i>

Water Supply Category	Urban Water Supplier Operational Control Operational Control						Optional	
	Extract and Divert <i>(kWh/AF)</i>	Place into Storage <i>(kWh/AF)</i>	Convey <i>(kWh/AF)</i>	Treatment <i>(kWh/AF)</i>	Distribution <i>(kWh/AF)</i>	Total UWMP <i>(kWh/AF)</i>	Embedded Energy in Wholesale Supplies <i>(kWh/AF)</i>	Total EI for Water Supply <i>(kWh/AF)</i>
Purchased Water							<i>optional manual input</i>	
Groundwater							<i>optional manual input</i>	
Surface water							<i>optional manual input</i>	
Recycled Water							<i>optional manual input</i>	
Desalinated Water							<i>optional manual input</i>	
Stormwater Use							<i>optional manual input</i>	
Transfers							<i>optional manual input</i>	
Exchanges							<i>optional manual input</i>	
Other							<i>optional manual input</i>	
Total						<i>Calculated</i>		<i>Calculated</i>

Manual Entry Method (X)

Table O-2X: Energy Intensity (kWh/AF)												
Enter Start Date for Reporting Period		1/1/2015		Fraction of Water Supply (%)	Volume Entering the Distribution System (AF)	Urban Water Supplier Operational Control					Optional	
End Date		12/31/2015				Extract and Divert (kWh/AF)	Place into Storage (kWh/AF)	Convey (kWh/AF)	Treatment (kWh/AF)	Distribution (kWh/AF)	Total (kWh/AF)	Embedded Energy in Wholesale Supplies (kWh/AF)
Water Supply Category	Supplying Agency / Basin	Level of Treatment										
Purchased Water	Name of Supplying Agency	tbl 6-8		manual input	Calculated	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Groundwater	Name of Basin or Area	tbl 6-8		manual input	Calculated	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Surface water		tbl 6-8		manual input	Calculated	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Recycled Water	Name of Supplying Agency	tbl 6-8		manual input	Calculated	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Desalinated Water		tbl 6-8		manual input	Calculated	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Stormwater Use		tbl 6-8		manual input	Calculated	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Transfers	Name of Supplying Agency	tbl 6-8		manual input	Calculated	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Exchanges	Name of Supplying Agency	tbl 6-8		manual input	Calculated	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Other		tbl 6-8		manual input	Calculated	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Total				Calculated = 100% (Sum Column)	2015: SBK7-7 Table 4-A (ColIK-58)	manual input	manual input	manual input	manual input	manual input		manual input

Data Quality (Estimate, Metered Data, Combination of Estimates and Metered Data)
 dropdown menu

Narrative:

Manual Entry Method (X)

Enter Start Date for Reporting Period	1/1/2015		Fraction of Water Supply (%)	Volume Entering the Distribution System (AF)
End Date	12/31/2015			
<i>Water Supply Category</i>	<i>Supplying Agency / Basin</i>	<i>Level of Treatment</i>		
Purchased Water	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Groundwater	<i>Name of Basin or Area</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Surface water		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Recycled Water	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Desalinated Water		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Stormwater Use		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Transfers	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Exchanges	<i>Name of Supplying Agency</i>	<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Other		<i>tbl 6-8</i>	<i>manual input</i>	<i>Calculated</i>
Total			Calculated = 100% (Sum Column)	2015: SBX7-7 Table 4-A (CellK:58)

Manual Entry Method (X)

Water Supply Category	Urban Water Supplier Operational Control						Optional	
	Extract and Divert (kWh/AF)	Place into Storage (kWh/AF)	Convey (kWh/AF)	Treatment (kWh/AF)	Distribution (kWh/AF)	Total (kWh/AF)	Embedded Energy in Wholesale Supplies (kWh/AF)	Total EI for Water Supply (kWh/AF)
Purchased Water	manual input	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Groundwater	manual input	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Surface water	manual input	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Recycled Water	manual input	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Desalinated Water	manual input	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Stormwater Use	manual input	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Transfers	manual input	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Exchanges	manual input	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Other	manual input	manual input	manual input	manual input	manual input	manual input	manual input	manual input
Total	manual input	manual input	manual input	manual input	manual input	manual input		manual input

Renewable Energy Reporting

Table O-3

Optional table provided for urban water suppliers that wish to report additional information regarding renewable energy supplies and greenhouse gas emissions.

Hydropower Generation

Facility Name	Operational Control (Yes/No)	Consequential? (Consequential / Non-Consequential)	MWh of Generation per Year	Type of Generation Reservoir/Inconduit	Is 100% of water passing through generation turbine used for water supply? yes/no	Please describe where in your system this generation occurs
	drop down menu	drop down menu		drop down menu	drop down menu	

Non-Hydropower Renewable Power Usage

Facility Name	Type (Solar, Wind, Geothermal, Tidal, Biomass, Other)	MWh of Generation per Year
	drop down menu	

GHGs

Urban Water Suppliers Total GHG Emissions		MtCO ₂ e
Water Operations Only		MtCO ₂ e / AF

Discussion