2.0 OVERVIEW OF WATER EFFICIENCY PLANNING

As the population continues to increase in the State and the scarcity and cost of water supplies are increasing, it is important for water providers to anticipate future water demands and conduct the level of water supply planning necessary to ensure that the future needs of their customers are met. Water efficiency planning is an important tool in meeting long-term water supply needs while maintaining quality of life standards. Therefore, water efficiency planning is a necessary component to a water provider's future water supply planning efforts.

2.1 What is Water Efficiency?

Water efficiency may be thought of as doing more with less. It includes the practices, techniques, and technologies that extend water supplies and other resources (e.g. energy) by either saving water or through substituting with alternative supplies such as reuse. This, in turn, frees up water supplies for other uses, such as new development, stored drought reserves, agricultural leases, and environmental uses (e.g. instream flows).

Although water efficiency is an important tool, water efficiency must operate within the context of Colorado water law which specifies that each water right must be used for beneficial use for decreed purposes without waste. While water efficiency may be used to directly address waste, it should not be construed as a means to reduce the beneficial use of a provider's water rights.

2.2 What is Effective Water Efficiency Planning?

The quality and success of water efficiency planning depends on the combined effects of the following:

- Development of goals that reflect water supply system needs.
- Selection of implementable water efficiency activities that address the goals and can be monitored to track progress.
- Involvement of public and community group input and participation.
- Routine monitoring of demands and effectiveness of water efficiency activities.
- Ability to make effective adjustments to the water efficiency program to improve performance.

2.3 Water Efficiency Planning and Water Supply and Drought Planning

Water efficiency planning, drought planning and water supply and reliability planning are interrelated and should be conducted in an integrated manner. For example, the severity of a water shortage during a drought is highly dependent on the reliability of water supplies. Water efficiency can be an integral component to a provider's water supply reliability planning by reducing customer demands. Effective water resource planning, as shown in Figure 2,

recognizes the link between each of these processes and the need to coordinate all three planning efforts.

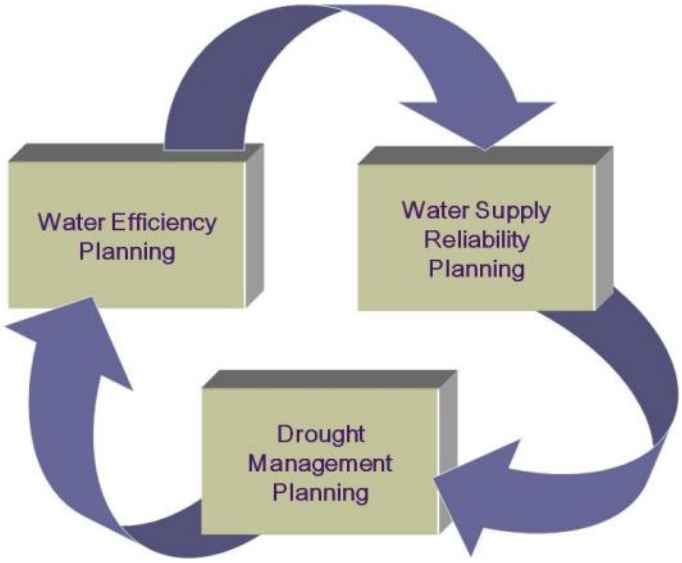

Figure 2 Integrated Approach to Water Resources Planning

This integrated approach can help water providers identify where future planning efforts need to be focused. Providers should examine the effect of water efficiency on future water supply and demand and estimate how water efficiency may affect (e.g. reduce) the need for and the costs of new water supplies and other investments. Section 4.3.1 provides additional information on the benefits of water efficiency planning within the context of water supply and reliability planning.

2.3.1 Water Efficiency and Drought Management Planning

One of the main objectives of a water efficiency plan is to achieve lasting, long-term improvements in water efficiency while reducing overall water demands. In contrast, a drought management plan focuses on mitigation and response strategies that can provide temporary and immediate relief from drought-related water supply shortages. Drought response measures often achieve temporary savings through changes in customer behavior during a drought. This may involve mandatory water restrictions for certain types of water use on a temporary basis. Drought mitigation applies to measures taken prior to a drought to avoid or reduce impacts during a drought.

Water efficiency activities that result in ongoing reductions in water demands can provide long-term drought mitigation benefits. For example, irrigation audits for parks, which are often employed as a water efficiency activity, can identify changes that will reduce the park's water demands on a permanent basis. This can consequently reduce impacts during a drought related water shortage only if some of the supplies saved as a result of the audit are retained to improve the reliability of the overall water system rather than committed to a new use elsewhere.

In contrast to mitigation, water saving measures reserved for temporarily reducing water demand during droughts are considered to be short-term drought response strategies and not long-term water efficiency activities. Whether a particular strategy is intended for water efficiency,

drought mitigation, drought response, or a combination of any of these depends on the timing of the strategy, how the strategy is implemented by the provider, and the permanency of the change in water use.

Table 1 lists examples of water efficiency activities that may be implemented for long-term drought mitigation or solely as a temporary voluntary or mandatory drought response strategy. Water efficiency planning and drought management planning are linked together. Strategies used on a long-term basis for drought mitigation (in advance of a drought) can provide long-term water efficiency benefits. These particular drought mitigation strategies should be incorporated into the water efficiency plan. Water Efficiency Activities and Drought Strategies

Table 1 Water Efficiency Activities and Drought Strategies

Water Efficiency Activities	Drought Strategies	
	Long-term Mitigation	Short-term Response Strategy
Irrigation audits for parks and open spaces	X	X
Install water saving fixtures, toilets, and/or appliances	X	
Limit landscape irrigation to certain days of week during drought		X
Limit landscape irrigation to certain days of week to manage peak flows	X	
Reduce irrigation on parks and landscaping	X	X
Replace turf with xeriscape landscape	X	
Limit outdoor watering to specific times of the day	X	X
Set time limit for watering (5:00 pm to 8:00 am)	X	X
Prohibit watering from November to March	X	X
Conversion of sprinkler to low volume irrigation where appropriate	X	
Identify high water use customers and develop water saving targets	X	X

2.3.2 Water Efficiency and Demand Hardening

Demand hardening is a concept described by the following:

> "By saving water, long-term conservation can also reduce the water saving potential for short-term demand management strategies during water shortages."[5]

For example, if the amount of irrigated turf is reduced in advance of a drought through conservation measures, the amount of "water savings potential" through outdoor irrigation savings available during times of drought could be reduced.

Whether this "water savings potential" is greater prior to the advent of water efficiency efforts than with ongoing water efficiency efforts, largely depends on how the saved water is used during normal and wet years. If saved water is stored in a reservoir as drought reserves or temporarily leased for agricultural use, the saved water would be available during times of

[5] Flory, J.E., and T. Panella, 1994.

drought. Consequently, if the water saved through water efficiency is used to supply new growth, the savings may not be available during drought periods.

The intricacies of how certain water efficiency efforts affect the reliability of a provider's water supply during a time of drought are complex.[6] The effects of demand hardening will vary widely among providers. It is not the intent of this document to define how providers perceive and experience demand hardening within their water supply systems, but rather to introduce the concept. Providers may need to address this issue while developing their drought management and water efficiency plans.

[6] Additional information on demand hardening is provided in a memo authored by Peter Mayer and David Little titled *System Reliability and Demand Hardening*, prepared for: SWSI Conservation & Efficiency TRT M&I Question 1 Sub-group, March 14, 2006.