WATER EFFICIENCY AND CONSERVATION

Water-related GHG emissions are mainly caused by energy use required to pump, transport, heat, cool and treat water and wastewater. In a dry climate, water demand and resulting emissions are magnified due to a relative shortage of water sources including decreased Sierra snowpack which affects water levels in Folsom Lake. Therefore, water conservation strategies have a double benefit of reducing energy demand and managing a limited resource. About 6.3% of the Citrus Heights' communitywide emissions are related to water use.

The City will work with water purveyors (Citrus Heights Water District, California American Water Company, and Sacramento Suburban Water District) to identify community actions that can reduce potable water demand, minimize wastewater generation, explore viable alternative sources of water, manage stormwater runoff, and help to maintain a healthy balance in the local aquatic ecosystem.

WATER EFFICIENCY AND CONSERVATION: SOURCE REDUCTION

Measure 5-1.A: Work with the water agencies to develop plans to implement SB 7 to achieve a 20% reduction in urban water demand by 2020.

The California legislature adopted SB 7 in 2009, requiring the Department of Water Resources (DWR) to reduce statewide per capita water use by 20% by 2020. Over the next decade, DWR will be working with water agencies throughout the state to establish water conservation targets and provide guidance to meet urban water per capita reductions of 10% by 2015 and 20% by 2020.

Citrus Heights residents and businesses receive water from three different entities, Citrus Heights Water District, California American Water Company, and Sacramento Suburban Water District. The City will collaborate with the three water providers to identify specific water conservation measures for their urban water management plans to meet the SB 7 reduction goal. Implementation strategies will include demand management programs, installation of high-efficiency plumbing fixtures, and alternatives to potable water sources.

GHG Reduction Potential:

4,030 MT CO_2e/yr

Community Co-Benefits:

Reduced energy demand

Cost to City

Very Low

Cost to resident/ business owner

NA

Savings to resident/ business owner

NA

Reduce potable water demand and waste.

Did you know?
COOL TIP

It takes a lot of energy to heat water. By installing a low flow showerhead 350 pounds of carbon dioxide can be saved per year and by washing your clothes in cold or warm water another 500 pounds of emissions can be avoided per year.

- globalwarming-facts.info/50-tips.html

Actions	Implementation Target	Responsible Party
A. Coordinate with water agencies to conduct focused public outreach that promotes water conservation practices required for a Stage 2 Water Alert scenario.	Before December 31, 2012	General Services
B. Encourage water districts to provide rebates in partnership with the Sacramento Metropolitan Utility District (SMUD) (Ultra-low Flush toilets program, High-efficiency Clothes Washer Program) to residents and businesses as an incentive to upgrade their water appliances with higher-efficiency features.	Ongoing	General Services
C. Promote availability of water-efficient products and fixtures at local stores.	Before December 31, 2011	General Services; Community and Economic Development

Notes and References

This is the primary measure within the Water Efficiency and Conservation strategy. Other measures within this strategy are supporting measures and have not been quantified individually. All of the recommended water conservation measures will collectively contribute to meeting the State's 2020 water conservation goal.

Related General Plan policies: Policy 4.5, Policy 37.2, Policy 55.1, Policy 62.1, Policy 62.4

WATER EFFICIENCY AND CONSERVATION : SOURCE REDUCTION

Measure 5-1.B: Continue to provide a free irrigation review program for residential and commercial buildings and implement a monitoring plan to evaluate if program users are effectively using the irrigation review report to reduce water demand by 20%.

Landscape irrigation is one of the biggest uses of potable water in the City. Citrus Heights consists mostly of low-density residential uses with relatively large landscaped areas. Therefore, it is important for the City to influence plant choices and maintenance practices within these areas. Using low-water and low-maintenance plants in landscaped areas can reduce irrigation water demand.

Citrus Heights Water District already provides free irrigation review for its customers. The City will work proactively with the other water service providers to provide similar irrigation review services to their customers. The irrigation review audits a customer's current irrigation practices and provides recommendations on ways to reduce water demand. Since most customers in the City have water meters, following these recommendations can also reduce water bills.

Expanding the free irrigation review program to all Citrus Heights residents and businesses can also help the water districts meet their SB 7 reduction goals by 2020.

GHG Reduction Potential:

(Included in Water Efficiency and Conservation Measure 5-1.A)

Community Co-Benefits:

Reduced energy demand, improved public spaces

Cost to City

Low

Cost to resident/ business owner

NA

Savings to resident/ business owner

Very Low

(recurring savings)

Drip irrigation systems use less water than spray systems.

Did you know?
COOL TIP

A good rule of thumb for deciding on an appropriate watering system is that the larger the water drop delivered, and the closer to the ground, the better it is. Studies show hand-held hose watering methods use almost 33% less water than average household automated sprinkler systems.

- *www.landscapingstory.com/ Landscaping-Water-Efficiency*

Actions	Implementation Target	Responsible Party
A. Partner with the water districts to develop and promote free irrigation review programs.	Before December 31, 2013	Community and Economic Development; General Services
B. Work with water districts to develop a monitoring and reporting plan as part of the irrigation review program to evaluate successful implementation of audit recommendations.	Before December 31, 2013	Community and Economic Development
C. Work with water districts to expand the irrigation review program to commercial building owners.	Before December 31, 2013	Community and Economic Development
D. Work with water districts to create a water waste patrol program to allow residents and businesses to report misuse and waste of irrigation water (such as watering during rains, water spilling outside landscaped areas, etc.)	Before December 31, 2012	Community and Economic Development
E. Create a communitywide policy to reduce turf installation.	Before December 31, 2012	Community and Economic Development

Related General Plan policies: Policy 37.1, Policy 37.2, Policy 37.3

WATER EFFICIENCY AND CONSERVATION : SOURCE REDUCTION

Measure 5-1.C: Adopt a landscape ordinance for new development, consistent with Department of Water Resources guidance.

In 2006, the California legislature adopted AB 1881, requiring the Department of Water Resources (DWR) to develop a model landscape ordinance for local jurisdictions to achieve water use reductions in outdoor irrigation. DWR completed the model landscape ordinance in 2009. In 2010, California local jurisdictions were required to either adopt DWR's model ordinance or a locally adapted version that is at least as effective. Citrus Heights is adopting a landscape ordinance that complies with Department of Water Resources guidelines.

Consistent with AB 1881 requirements, Citrus Heights' landscape ordinance will require the following for both public and private landscaping:

- Low water plant choices
- Grouping compatible plants into hydrozones
- Irrigation water budgets
- Use of efficient irrigation systems, including sensors and automatic controllers
- Soil assessment and soil management
- Post-installation inspection and maintenance
- Preparation of landscape documentation packages, as appropriate
- Limited exemptions

GHG Reduction Potential:

(Included in Water Efficiency and Conservation Measure 5-1.A)

Community Co-Benefits:

Improved pub*lic spaces*

Cost to City

Very Low

Cost to resident/ business owner

NA

Savings to resident/ business owner

NA

Choosing water-conserving landscaping for front yards and public rights-of-way reduces communitywide water demand.

Did you know?
COOL FACT

CIMIS is an integrated network of 121 computerized weather stations located in many areas of California, like Davis, Fresno, and Red Bluff that provides weather information needed to calculate water budgets and improve landscape water efficiency.

Actions	Implementation Target	Responsible Party
A. Conduct outreach to home and business owners to join the computerized California Irrigation Management Information System (CIMIS) for irrigation schedule analysis.	Before December 31, 2012	Water providers; Community and Economic Development
B. Develop a climate-appropriate native plant list to encourage residents and businesses to use low-water and low-maintenance plants in their yards.	Before December 31, 2011	Community and Economic Development
C. Promote availability of water efficient and climate appropriate plants at local nurseries and home improvement stores.	Ongoing	Community and Economic Development

Notes and References

The real challenge in implementing the landscape ordinance is to enforce guidelines in existing development. It is anticipated that Citrus Heights will have limited new development in future. However, majority of the existing development landscapes do not comply with the AB1881 requirements. The City will need to proactively partner with water agencies to conduct public outreach to promote water conserving and low-maintenance landscapes in order to have a meaningful impact in relation to overall community irrigation use. This is necessary to meet the water conservation goals of SB 7.

Related General Plan policies: Policy 34.2, Policy 62.4

WATER EFFICIENCY AND CONSERVATION: ALTERNATIVE SOURCES

Measure 5-2.A: Work with the water agencies to investigate potential for a gray water and rainwater collection program to encourage use of systems in new residential and commercial uses.

The Sacramento region has faced drought conditions in each of the past three years. As our climate changes, it is anticipated that the region may receive variable precipitation resulting in extended droughts or more frequent intense storms. This pattern will directly affect the water sources in the region. Therefore, as an adaptation strategy, Citrus Heights will evaluate the potential use of rainwater and graywater as alternative water sources.

Rainwater collection is popularly accepted in the state. Building rain gardens in residential backyards can help to collect the first showers and delay site runoff by allowing on-site infiltration and ground water recharge. Rain gardens built using native landscape plants and materials can also provide a natural household amenity and habitat area attracting native birds and insects.

Graywater is composed of all the non-toilet wastewater generated in an average household from bathtubs, showers, sinks (except from garbage disposal), washing machines and dishwashers. Typically, water generated from these sources can be easily treated and reused for flushing or irrigation purposes. Since graywater requires basic treatment before reuse, it has still not become widely accepted. However, with increasingly limited water resources, the City may investigate the potential of graywater reuse in new residential and commercial properties.

GHG Reduction Potential:

Supporting measure

Community Co-Benefits:

Habitat restoration, improved public spaces

Cost to City

Very Low

Cost to resident/ business owner

NA

Savings to resident/ business owner

NA

Having a rainwater garden in the backyard can improve water quality.

Did you know?
COOL FACT

A 2006 study showed that graywater constitutes 50% of the total wastewater generated within a household. At an average of 90 gallons produced each day, it is sufficient to irrigate about one-half the yard of a 2,500 sq.ft home on quarter-acre lot if xeriscaping is used.

- www.urbanwater.colostate.edu

Actions	Implementation Target	Responsible Party
A. Seek grants to provide financial incentives and technological assistance to encourage homeowners to build rain gardens.	Ongoing	Community and Economic Development
B. Revise the Zoning and Building codes to allow and promote use of rainwater collection consistent with state law.	Before December 31, 2013	Community and Economic Development
C. Work with adjacent cities and water providers to promote statewide and communitywide acceptance of graywater as an alternative water source.	Before December 31, 2014	Community and Economic Development

Related General Plan policies: Policy 55.1, Policy 62.7

WATER EFFICIENCY AND CONSERVATION: ALTERNATIVE SOURCES

Measure 5-2.B: Develop an outreach program to educate residents and business owners on ways to minimize wastewater generation and reuse techniques.

The City will conduct focused workshops with residents and businesses to guide them on how to minimize wastewater generation in their facilities. All the wastewater generated within the City is treated at the Sacramento Regional Wastewater Treatment Plant. Currently, there is enough capacity at the plant to treat all of the community's wastewater. However, as the City explores a comprehensive water management plan, one of the goals will be to partner with Sacramento County Sanitation District (SCRSD) to minimize wastewater generation. Energy used to treat wastewater creates GHG emissions. Minimizing the community's wastewater generation, can effectively reduce Citrus Heights' contributions to GHG emissions.

Using public outreach methods to educate residents and business will help to achieve the intent of this measure.

GHG Reduction Potential:

(Included in Water Efficiency and Conservation Measure 5-1.A)

Community Co-Benefits:

Reduced energy demand, increased funding options

Cost to City

Low

Cost to resident/ business owner

NA

Savings to resident/ business owner

NA

"Purple pipe" reclaimed water can be used for household purposes that do not require drinking water quality.

Did you know?

COOL TIP

Top 5 water coservation actions at home:

1. Stop leaks that can account for 10% water loss indoors and up to 75% water loss outdoors.
2. Replace toilets installed before 1992, or using 1.6 gallons of water per flush.
3. Upgrade old washing machines to Energy Star appliances.
4. Use low-water landscape plants.
5. Water only when your plants need.

- *http://www.h2ouse.net/*

Actions	Implementation Target	Responsible Party
A. Partner with SCRSD to develop focused workshops for large wastewater generators, such as multi-family and commercial uses and provide education about ways to reduce wastewater generation and reuse water.	Before December 31, 2012	General Services
B. Partner with SCRSD to provide technical assistance to community members regarding installation of fixtures that reuse wastewater.	Ongoing	General Services

Related General Plan policies: Policy 62.4, Policy 62.6, Policy 62.7

WATER EFFICIENCY AND CONSERVATION: ALTERNATIVE SOURCES

Measure 5-2.C: Develop water-sensitive urban design guidelines for new construction and retrofit of existing urban environment.

Water Sensitive Urban Design (WSUD) goes beyond typical low impact development (LID) strategies that largely focus on stormwater. WSUD integrates practices that relate to the complete water cycle in urban areas. The three primary principles of a WSUD strategy include:

- Potable water demand management
- Wastewater source reduction
- Stormwater management

By developing WSUD guidelines specific to Citrus Heights, the City can guide new development and redevelopment during the early design stages to integrate design features that enhance overall water quality. Integrating natural water retention, reuse and infiltration within project sites will help to reduce infrastructure costs related to water, sewer and stormwater pipe sizes. As a co-benefit, community water quality will also be improved by eliminating polluted urban water flows into natural drainages and habitat areas.

GHG Reduction Potential:

Supporting measure

Community Co-Benefits:

Habitat restoration, improved public spaces

Cost to City

Low

Cost to resident/ business owner

Medium – High

Savings to resident/ business owner

NA

Installing parking medians with low-water plants provides important water quality benefits.

Did you know?
COOL TIP

Where to locate a rain garden at home:
- At least 10 feet away from the house so infiltrating water doesn't seep into the foundation;
- Away from septic tanks, underground wells and utilities;
-In full or partial sun avoiding complete shade under big trees;
-Not in a part of the yard that already ponds as it will slow infiltration.

Actions	Implementation Target	Responsible Party
A. Amend the Zoning Code to require new projects and substantial renovations to implement site designs that promote infiltration, reuse, and evapotranspiration of rainfall from impervious areas.	Before December 31, 2012	Community and Economic Development
B. Incorporate vegetated swales and/or bioretention swales in public rights-of way (e.g., traffic islands, centers of cul-de-sacs, landscaped strips along sidewalks, bulb-outs, parking separators).	Ongoing	Community and Economic Development; General Services
C. Modify City codes and ordinances to minimize impervious surfaces throughout the City.	Before December 31, 2012	General Services

Notes and References

WSUD concepts and practices originated in Australia. However, the concept of whole water cycle management is becoming more popular in the United States as communities strive to adapt to the changing climate that affects natural water resources. WSUD strategies are especially effective in drought-prone areas or areas with intense seasonal storms that may cause flooding. Through a whole-systems approach, WSUD guidelines help to maintain water balance and aquatic health.

Related General Plan policies: Policy 34.1, Policy 37.1, Policy 37.3, Policy 49.1

WATER EFFICIENCY AND CONSERVATION: MUNICIPAL

Measure 5-4.A: Reduce municipal landscape irrigation water consumption by 50% by 2020.

Landscape irrigation water consumption can burden the City's operations and maintenance costs.

In partnership with the water providers, the City will audit the baseline annual water consumption related to irrigation of city-owned facilities. Following the audit, the City will develop a plan to reduce irrigation water consumption by 50% through various measures including low-water planting, climate-appropriate irrigation scheduling and replacing old inefficient irrigators with new high-efficiency systems.

GHG Reduction Potential:

< 1 MT CO_2e/ yr

Community Co-Benefits:

Improved public spaces

Cost to City

High

Cost to resident/ business owner

NA

Savings to resident/ business owner

NA

A water-conserving landscape in front of the City's Police Service Center.

Did you know?
COOL FACT

According to US Environmental Protection Agency, typical office water use consists of:
- 40% for sanitary uses;
- 26% for heating and cooling;
- **22% for irrigation**;
- 1% for single pass cooling;
- 1% for kitchen uses;
- and remaining for other miscellaneous use.

Actions	Implementation Target	Responsible Party
A. Conduct an irrigation review for all municipal facilities, in partnership with CHWD.	Before December 31, 2012	General Services; Water providers
B. Develop and implement a water conservation plan for all municipal facilities based on the irrigation audit findings.	Before July 31, 2013	General Services

Related General Plan policies: Policy 55.1, Policy 62.1

WATER EFFICIENCY AND CONSERVATION: MUNICIPAL

Measure 5-4.B: Reduce municipal potable water consumption by 40% by 2020.

Citrus Heights has few public buildings, but they all use potable water. City Hall completed a water audit in 2004. However, other City facilities have not been audited.

The City will conduct a water audit of its facilities to determine a baseline municipal water consumption rate. While some public buildings, such as the Community Center, have been recently built, it is also important to create an inventory of the types of plumbing fixtures being used in older facilities. Over the last decade, plumbing fixtures have increasingly become more efficient. By replacing old systems with new high-efficiency systems, the City can reduce its potable water consumption.

Following the audit, the City will develop a water conservation plan designed to achieve a 40% reduction in potable water consumption from 2007 levels by 2020.

GHG Reduction Potential:

(Included in Water Efficiency and Conservation Measure 5-4.A)

Community Co-Benefits:

Reduced energy demand

Cost to City

High

Cost to resident/ business owner

NA

Savings to resident/ business owner

NA

Upgrading to new efficient plumbing fixtures helps reduce water consumption.

Did you know?
COOL FACT

A low-flow toilet uses 1.6 gallons of water per flush as compared to a high-efficiency toilet (HET) using only 1.2 gallons of water per flush.Using a high efficiency unit can save up to 8,760 gallons of water each year for a family of four with average daily flushes of six each. This allows for a 20% reduction in water use from low-flow toilets.

Actions	Implementation Target	Responsible Party
A. Conduct a water audit for all municipal buildings and operations, in partnership with CHWD.	Before December 31, 2012	General Services; Citrus Heights Water District
B. Develop and implement a water conservation plan for all municipal facilities based on the water audit findings.	Before June 30, 2013	General Services

Related General Plan policies: Policy 55.1, Policy 62.1

WATER EFFICIENCY AND CONSERVATION: MUNICIPAL

Measure 5-4.C: Convert 25% of impervious parking surfaces on City-owned properties to permeable parking surfaces.

Impervious parking surfaces are abundant in Citrus Heights. The City will identify total impervious parking surfaces on City-owned properties and convert 25% of them to permeable surfaces by 2020. This will demonstrate the City's commitment to enhance both water quality and the built environment within the community.

Impervious surfaces, such as asphalt parking areas, do not allow water to infiltrate into the ground and create increased stormwater runoff. Runoff from parking sites is usually polluted by vehicle oil spills. Polluted runoff is ultimately carried to the City's creeks and natural drainage systems. By supporting permeable paving on City-owned properties, the City will promote the benefits of permeable paving as a Best Management Practice to reduce runoff and control water pollution.

Depending on the amount of water collected through the permeable parking surfaces, this strategy can also reduce the City's non-potable water demand if the collected water can be reused for other activities such as landscape irrigation, or cleaning City vehicles.

GHG Reduction Potential:

Supporting measure

Community Co-Benefits:

Reduced urban heat island effect,
improved public spaces

Cost to City

High

Cost to resident/ business owner

NA

Savings to resident/ business owner

NA

Permeable surfaces allow for groundwater recharge and reduce stormwater runoff.

Did you know?
COOL FACT

Based on research in the City of Olympia,Washington, parking lots typically account for 53% of impervious area in commercial sites and 15% on multi-family sites. Therefore, careful design can go a long way to protect community water resources.

Actions	Implementation Target	Responsible Party
A. Develop a plan to convert 25% of total parking surfaces on City-owned properties to permeable paving surfaces.	Before June 30, 2014	General Services

Related General Plan policies: Policy 55.1, Policy 62.1