

# This presentation premiered at WaterSmart Innovations

[watersmartinnovations.com](http://watersmartinnovations.com)



# Army Green: Water Savings at Fort Carson:

## A Net Zero Installation

Frank Kinder  
Wednesday 539

4:25-4:55 p.m.



# Army Green: Water Savings at Fort Carson: A Net Zero Installation

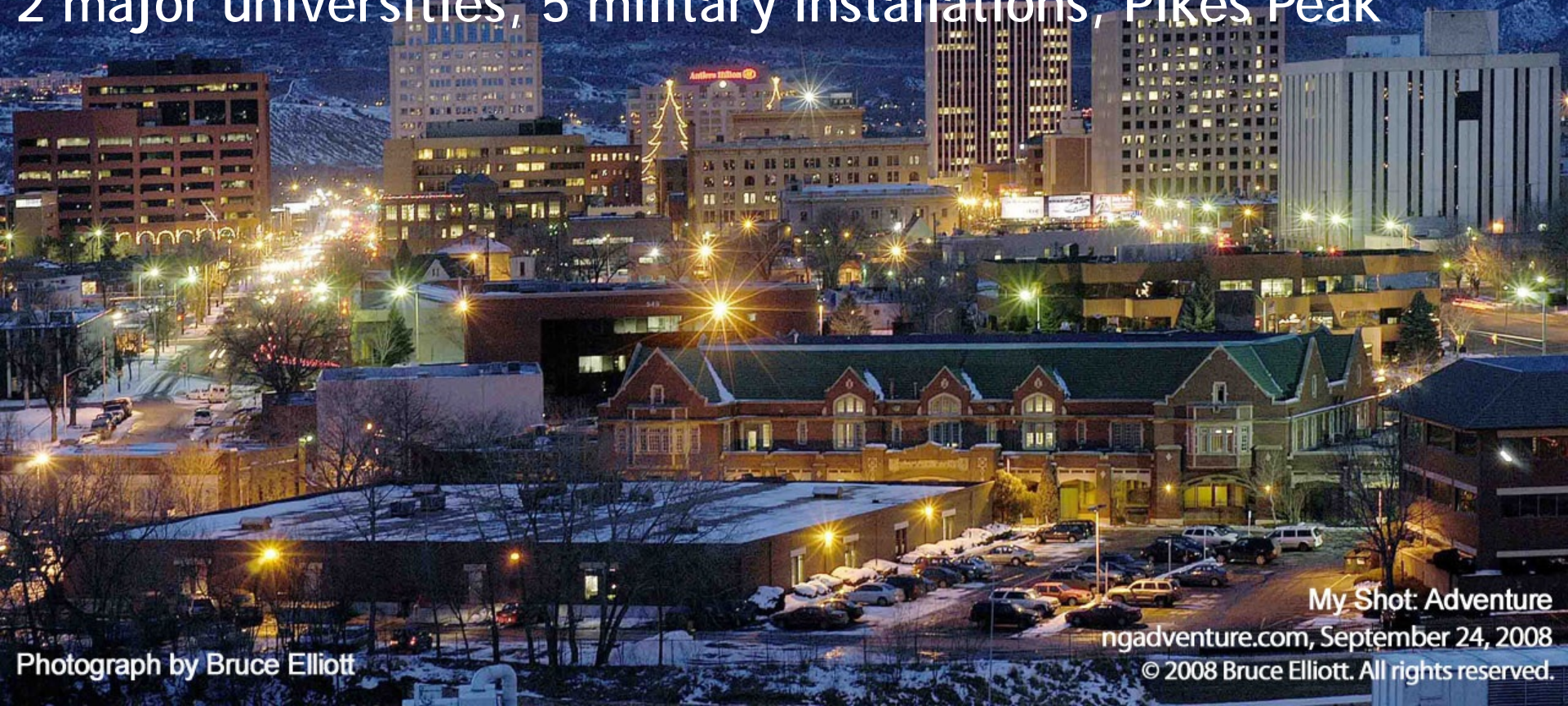
- US Army Post Fort Carson, CO, has achieved significant, continuous water & energy savings
- Policy, Initiatives, Partnerships, Projects
- 2027 Sustainability Plan → culture & capability
- Net Zero: Energy-Water-Waste Installation
- Keys: Vision, Goals, Relationships, coordination
- Shared goals: **Quality of Life, Sustainability.**
- Examples of implementation & success.

# Colorado Springs Utilities



Colorado Springs Utilities  
*It's how we're all connected*

City of Colorado Springs/municipally owned  
Est. 1904 - 4 services: Energy-Gas-Water-Wastewater  
Serving ~500,000 people, 1 hr S of Denver  
Environment: 6,000 ft, High-mountain, arid, desert climate  
2 major universities, 5 military installations, Pikes Peak



My Shot: Adventure

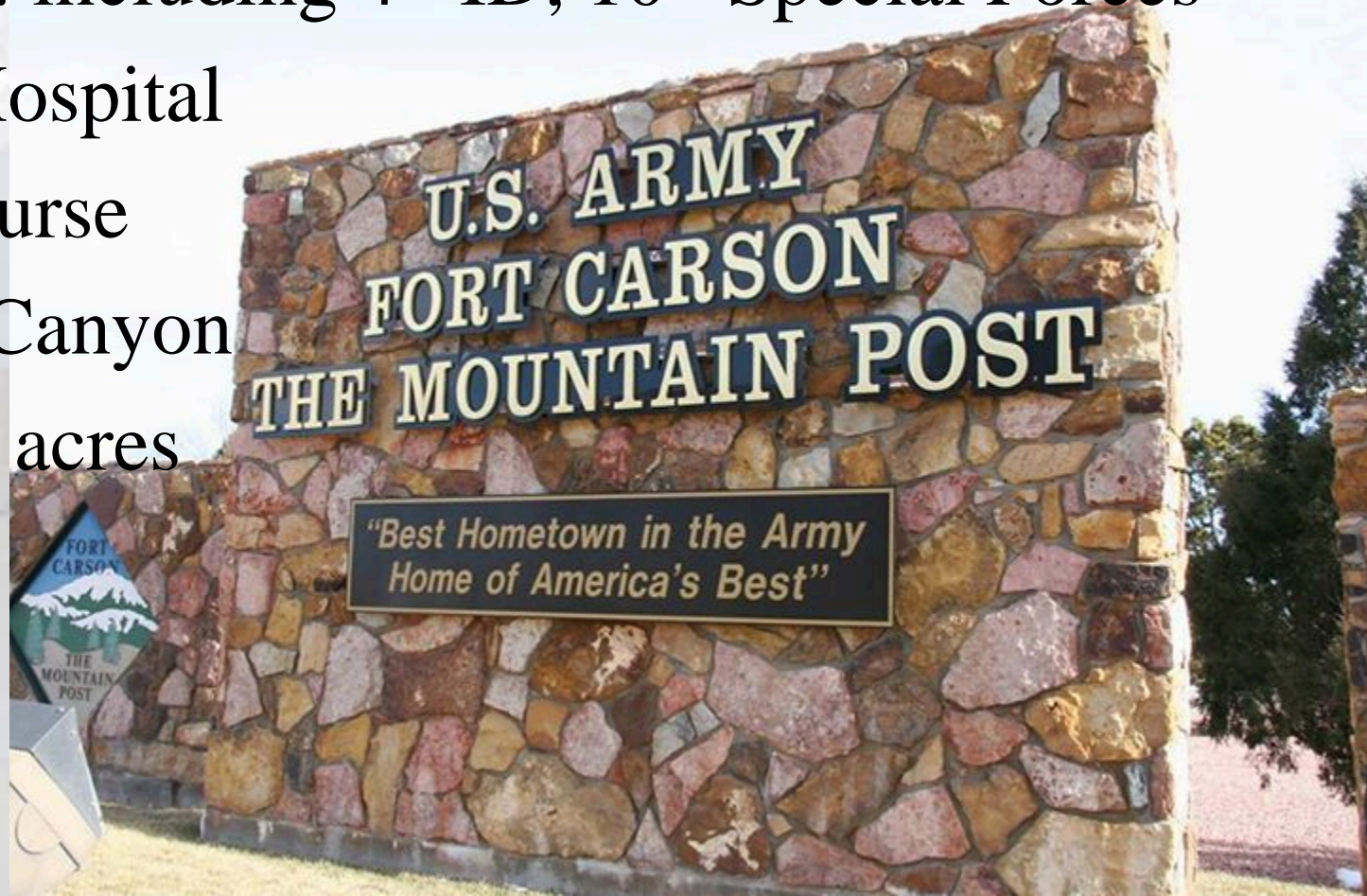
[ngadventure.com](http://ngadventure.com), September 24, 2008

© 2008 Bruce Elliott. All rights reserved.

Photograph by Bruce Elliott

# US Army Post Fort Carson

- 30,000 Soldiers
- 100,000 Families and Support
- 12 units: including 4<sup>th</sup> ID, 10<sup>th</sup> Special Forces
- Evans Hospital
- Golf Course
- Pinyon Canyon
- 220,000 acres



# Military Base Format

- A stand-alone city
- Garrison: City operation: Divisions
- Units: Neighborhoods, Populations, People
- Support: DECA, AAFES, DFMWR, Police, Fire, Parks, Trails, Directorate Public Works
- Wildlife, cultural elements, NEPA, noise, air, stormwater, traffic, history, visitors, training
- Buildings, energy & water use, waste, neighbors



# How we got here:



**2002 – 25 Year Plan**  
**Proactive-inclusive**  
**Sustain all systems**  
**Obligation to today**  
**and the future, now.**

## Goals



Energy & Water Resources



Sustainable Transportation



Air Quality



Sustainable Development



Sustainable Procurement



Zero Waste



Sustainable Training Lands

# How we got here:



**SUSTAINABLE  
FORT CARSON**  
RIGHT ACTIONS. RIGHT NOW!

- 2002 FORT CARSON 25-YEAR SUSTAINABILITY GOAL PLAN ENERGY & **WATER RESOURCES** Goal Statement: Sustain all facility and mobility systems from renewable sources and reduce total water purchased from outside sources by 75% by 2027

<http://www.carson.army.mil/paio/sustainability.html>



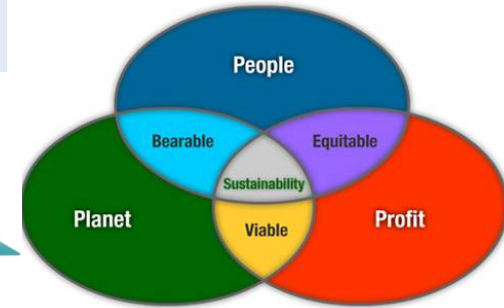
# Sustainability in the Pikes Peak Region



Colorado Springs Utilities  
It's how we're all connected.



**CITY OF COLORADO SPRINGS**



**COLORADO**  
Department of Public  
Health & Environment



**PIKES PEAK**  
COMMUNITY COLLEGE



**COLORADO**  
**COLLEGE**

**UCCS**

University of Colorado  
Colorado Springs



- Private sector companies' plans – CSR – LEED
- Non-profits, major media, research, awareness
- Major momentum; WaterSense, ES, support, etc.

# Additional compounding drivers:

## **Federal Executive Orders: Start: EPACT-1992- EISA-2007**

**2007 - 13423** : Strengthening Federal Environmental, Energy, and Transportation Management

**WATER CONSERVATION:** Reduce water consumption intensity by 2% annually through 2015

**2009 - 13514:** Federal Leadership in Environmental, Energy and Economic Performance

**Water Conservation:** Reduce potable water consumption intensity 26 percent by FY 2020, compared to an FY 2007 baseline. (This extends the water consumption intensity reduction requirement of EO 13423 by five years.) Reduce industrial, landscaping, and agricultural water use 20 percent by FY 2020, compared to an FY 2010 baseline.

# Progress: 2002-2010



Colorado Springs Utilities  
It's how we're all connected.

\$2.5B LEED Silver Construction

## Bioswales



Permeable Pavement Parking Lots

Bioremediation

# Department of Defense

January 2015 OMB Scorecard on  
**Sustainability/Energy**



## SUSTAINABILITY

- Adopts industry related reporting
- Reduction in potable water intensity 21% - on track for 26% by 2020.

Department  
of Defense



### Scope 1 & 2 GHG Emission Reduction Target

For Scope 1 & 2 GHG Reduction Target of 34% by 2020:  
11% reduction in 2014 and behind schedule



Score: **RED**



### Scope 3 GHG Emission Reduction Target

For Scope 3 GHG Reduction Target of 7% by 2020:  
14% reduction in 2014 and on track



Score: **GREEN**



### Reduction in Energy Intensity

Reduction in energy intensity in goal-subject facilities compared with 2003:  
18% and not on track



Score: **RED**



### Use of Renewable Energy

Use of renewable energy as a percent of facility electricity use:  
3.5%



Score: **RED**



### Reduction in Potable Water Intensity

Reduction in potable water intensity compared with 2007:  
21% and on track for 26% in 2020



Score: **GREEN**



### Reduction in Fleet Petroleum Use

Reduction in fleet petroleum use compared to 2005:  
30.2% and on track



Score: **GREEN**



### Green Buildings

Sustainable green buildings:  
0.8% of buildings sustainable



Score: **RED**

# Army Sustainability emphasizes water



Colorado Springs Utilities  
It's how we're all connected.



**AEPI**  
Army Environmental Policy Institute  
*"Connecting Today's Army to Tomorrow's World"*



Focus: **environmental threats to readiness**

Policy – Strategy –  
Mission – Research  
Environment-  
Community -  
Economic Benefit



# Army Sustainability emphasizes water



Colorado Springs Utilities  
It's how we're all connected.

**AEPI**

**Army Environmental Policy Institute**

*"Connecting Today's Army to Tomorrow's World"*

Development: high-efficiency plumbing

SPIRIT

Construction— Pre-Cursor to LEED

Assessment

Integration



ERDC/CERL TR-11-5

Construction Engineering Research Laboratory

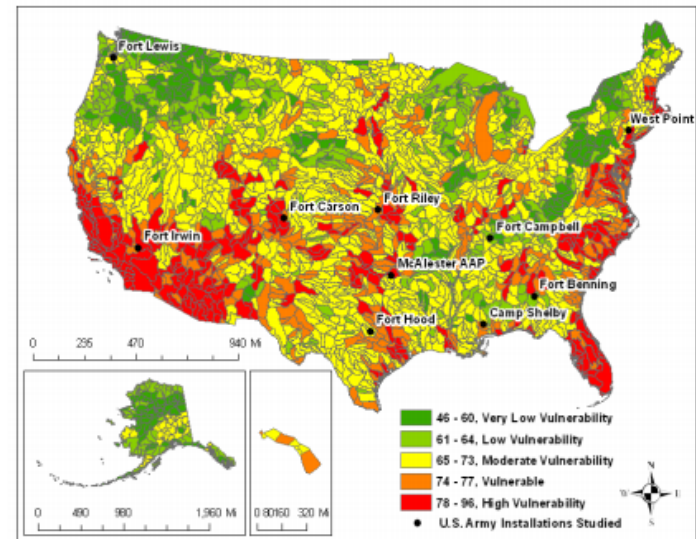


**US Army Corps of Engineers®**  
Engineer Research and Development Center

## Water Sustainability Assessment for Ten Army Installations

Elisabeth M. Jenicek, Rebecca A. Carroll, Laura E. Curvey, MeLena S. Hessel, Ryan M. Holmes, and Elizabeth Pearson

March 2011



# Results: Water in Army Campaign Plan



Colorado Springs Utilities  
It's how we're all connected.

## ARMY WATER SECURITY STRATEGY

December 2011

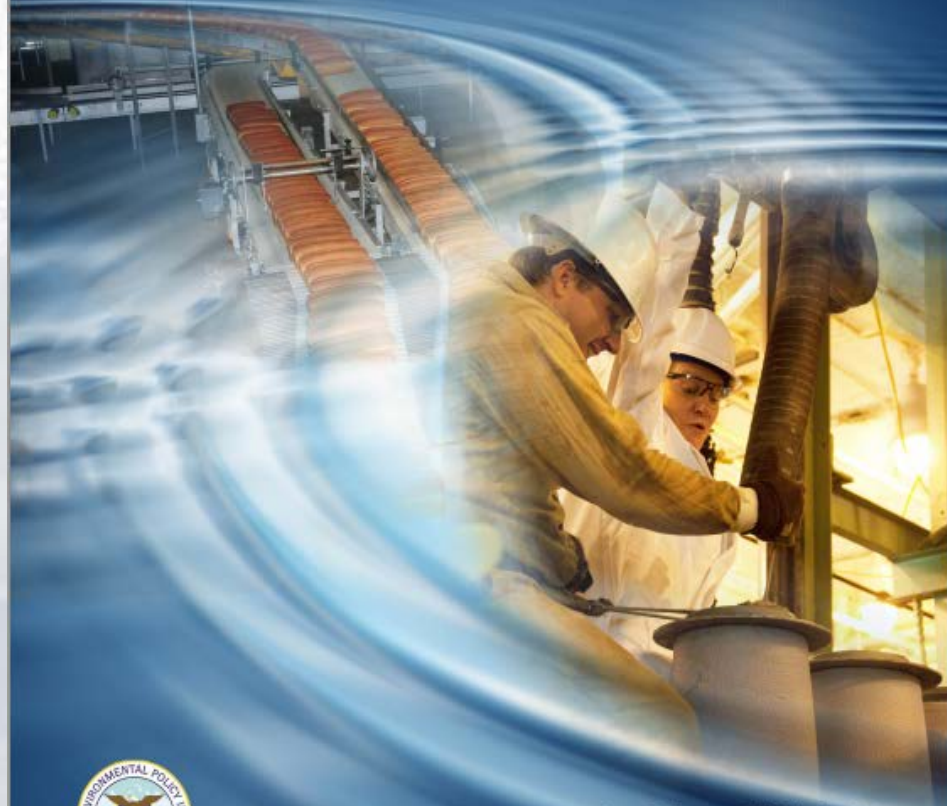
PREPARED FOR

**Army Environmental Policy  
Institute**

Contract Number, W91278-10-D-0041, TO 0004



## QUANTIFYING THE ARMY SUPPLY CHAIN WATER FOOTPRINT



**AEPI Report**

December 2011

**Army Environmental Policy Institute**

9301 Chapek Road, Bldg. 1458

Fort Belvoir, VA 22060-5527

[www.aepi.army.mil](http://www.aepi.army.mil)

Office of the Director

703.697.1337

# 6 factors to achieve Water Security



**Sources:** The quantity and quality of natural, raw water (surface and groundwater) available to the region.

**Supply:** The Army's entitlement and access to the raw water and means of distributing it to Army users.

**Sustainable Practices:** Net Zero water use efficiency concepts

**Survivability:** Treating raw water to Federal drinking water standards and preventing and recovering from water supply disruption or contamination.

**Sponsorship:** Identification and alignment of Army water management responsibilities

**Stakeholders:** Constructive engagement of other regional water users

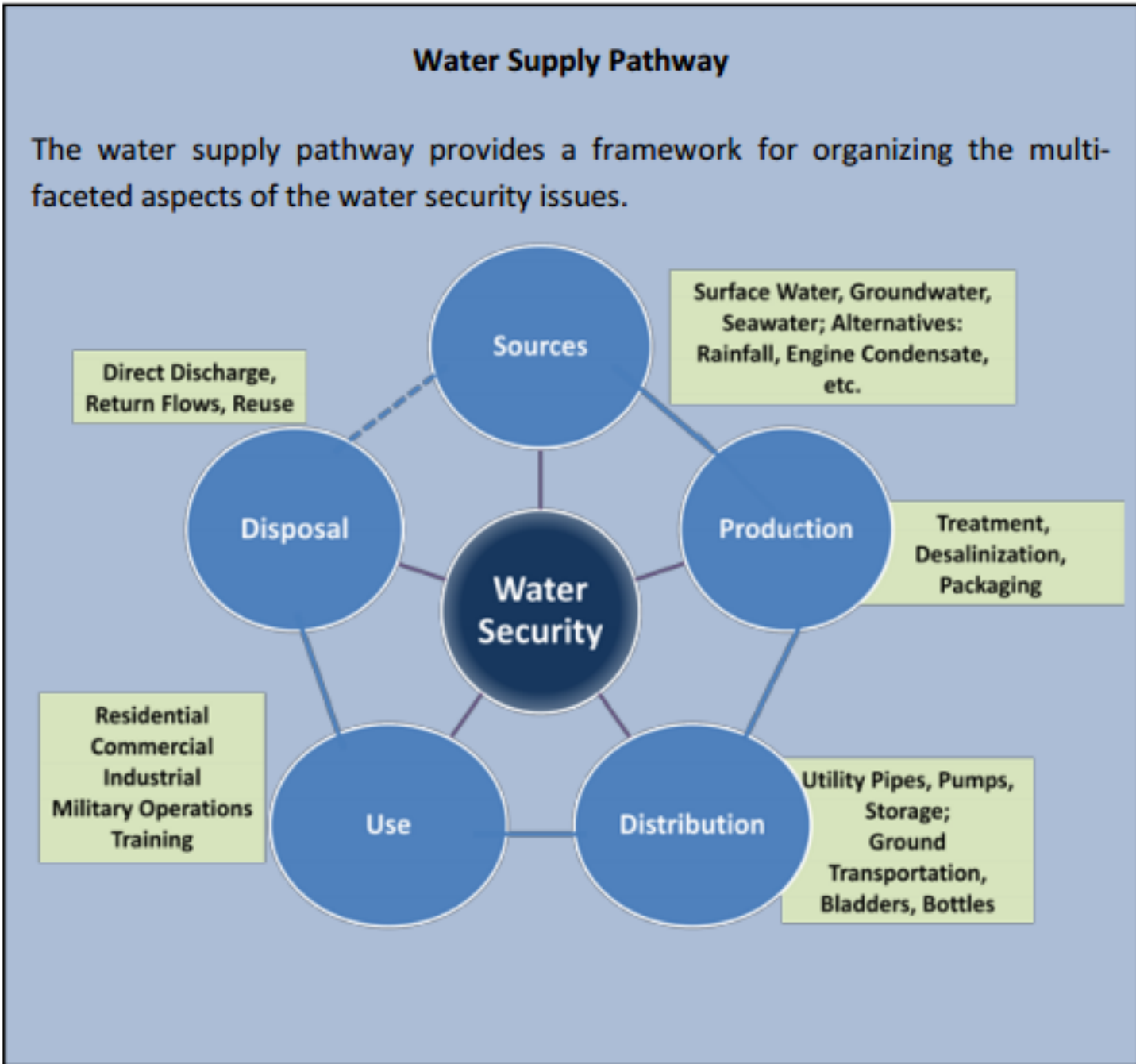


*Figure A-1. Water Supply Pathway*



Address all  
areas of  
water on  
Post.

*This is a big  
Deal!*



# Army Water Security Strategy:

1. Water Resources Sustainability-  
Sources/Rights
- 2. Water Resources Sustainability-Reduce  
Demand**
3. Strategic Investment-Maintain Infrastructure  
Integrity and Security
4. Water Security at Contingency Bases –  
increase self-sufficiency/reduce risks

# Strategy 2: Reduce Demand

- **Reduce Water Withdrawal and Consumption**
- Match Water Quality to Water Use
- Sustain a Culture of Efficiency and Conservation
- Tailor Expectations to differences among Installations
- Mitigate Adverse Consequences of Aggressive Conservation

# But wait!! There's more!!



Colorado Springs Utilities

It's how we're all connected.

# **GINSU**

**ESSENTIALS**

## **10-PIECE GOURMET CUTLERY SET**

**LIFETIME WARRANTY  
THE GINSU EDGE NEVER  
NEEDS SHARPENING**





# Basing – Net Zero Installations



- **A Net Zero ENERGY Installation** produces as much energy on site as it uses, over the course of a year
- **A Net Zero WATER Installation** limits the consumption of freshwater resources and returns water back to the same watershed so not to deplete the groundwater and surface water resources of that region in quantity or quality
- **A Net Zero WASTE Installation** reduces, reuses and recovers waste streams, converting them to resource values with zero solid waste to landfill
- **A Net ZERO INSTALLATION** applies an integrated approach to management of energy, water, and waste to capture and commercialize the resource value and/or enhance the ecological productivity of land, water, and air

Assistant Secretary of the Army (Installations, Energy & Environment)



# Army Energy and Water Management Program



U.S. Department of  
**ENERGY**

## Guidance for the Implementation and Follow-up of Identified Energy and Water Efficiency Measures in Covered Facilities

*(per 42 U.S.C. 8253(f), Use of Energy and Water Efficiency Measures in Federal Buildings)*

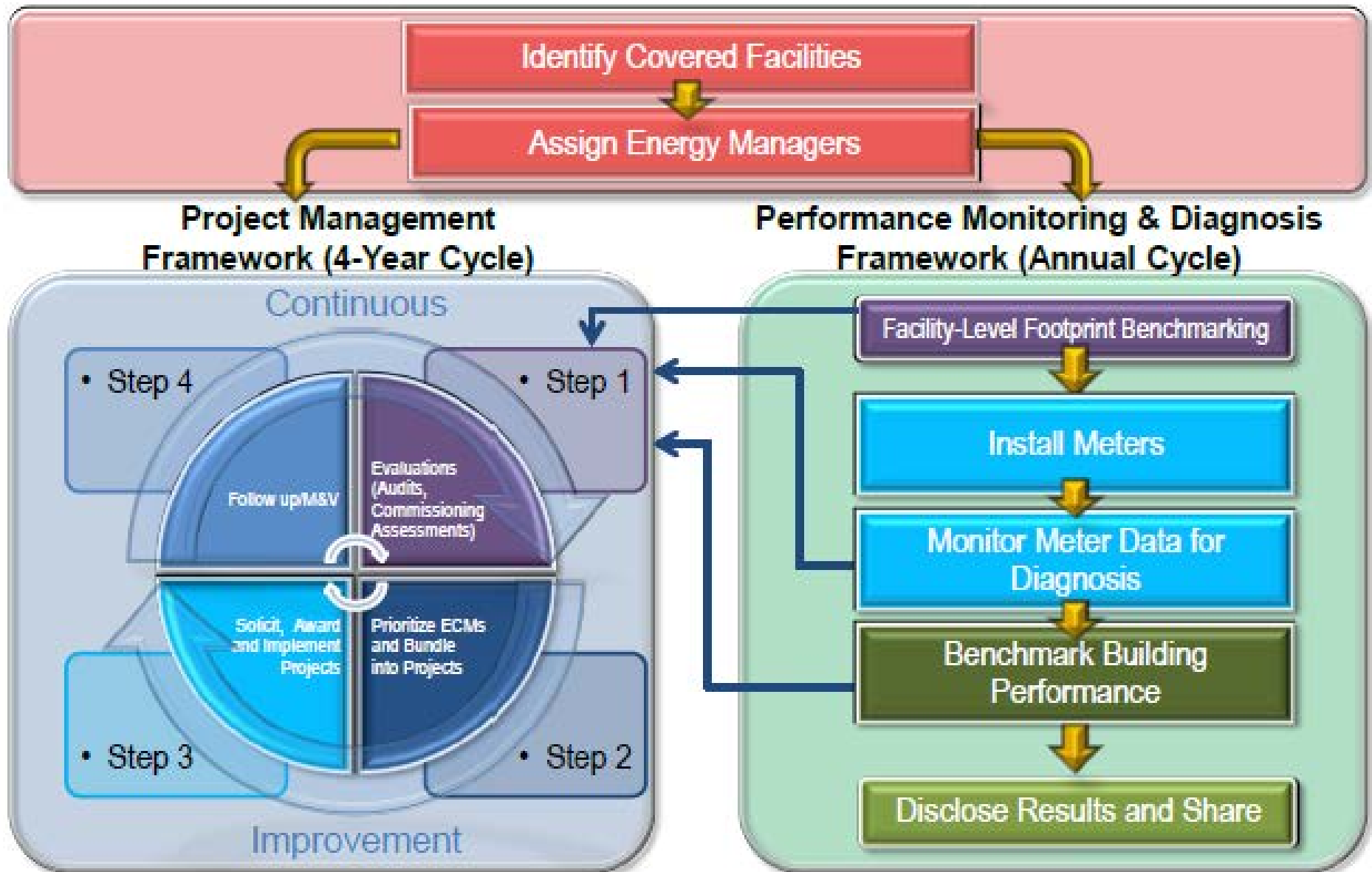
September 2012

United States Department of Energy  
Washington, DC 20585

- Benchmarking
- Determine CMs
- (how do we do that?)
- Funding Sources
  - Direct Funding/ECIP
  - ESPC/UESC
  - EUL/PPA
  - Utility Incentives

**WAIT THAT'S ME!**

# EISA Facility Management Approach



# Determine ECMs....



**ENERGY.GOV**

Office of Energy Efficiency & Renewable Energy

- **Get Started**
- Start increasing water efficiency by following these steps.
- Read [guidance](#) on meeting the requirements of E.O. 13514.
- Develop a [water management plan](#) to meet water use reduction goals.
- Browse water efficiency [best management practices](#) for project ideas.
- Find [training](#) on how to reduce water use in agencies.
- Investigate [alternative water](#) to help offset the use of freshwater.



# More Guidance.....



Colorado Springs Utilities  
How we're all connected

## Implementing Instructions: Federal Agency Implementation of Water Efficiency and Management Provisions of EO 13514

Step 1: Set an Overarching Policy and Goals >

Step 2: Assess Current Water Uses and Costs >

Step 3: Develop a Water Balance >

Step 4: Assess Water Efficiency Opportunities and Economics >

Step 5: Develop an Implementation Plan >

Step 6: Measure Progress >

Step 7: Plan for Contingencies >

July 10, 2013

# FEDERAL ENERGY MANAGEMENT PROGRAM

## BEST MANAGEMENT PRACTICES FOR WATER EFFICIENCY

1. **Water Management Planning**
2. **Information and Education Programs**
3. **Distribution System Audits, Leak Detection, and Repair**
4. **Water-Efficient Landscaping**
5. **Water-Efficient Irrigation**
6. **Toilets and Urinals**
7. **Faucets and Showerheads**
8. **Steam Boiler Systems**
9. **Single-Pass Cooling Equipment**
10. **Cooling Tower Management**
11. **Commercial Kitchen Equipment**
12. **Laboratory and Medical Equipment**
13. **Other Water-Intensive Processes**
14. **Alternative Water Sources**

For additional BMPs, see EPA's **WaterSense at Work** online booklet.

# Enough already, let's do something!



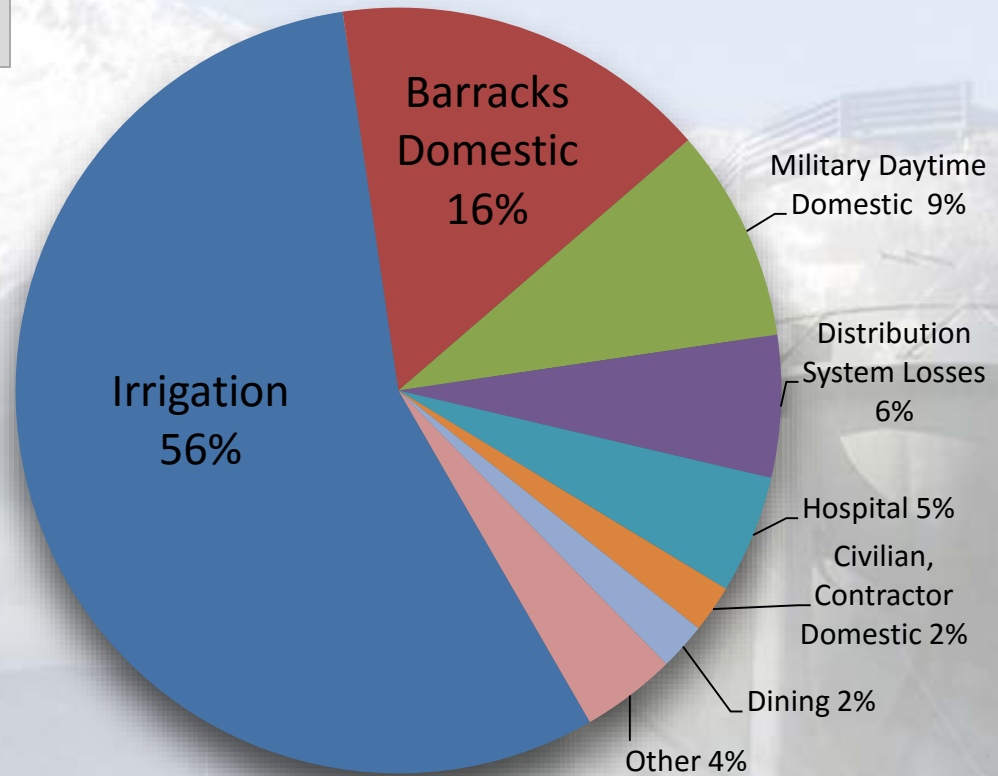
Colorado Springs Utilities  
It's how we're all connected.

- Can we save some water now?
  - \$2B in construction-2006-2012: LEED Silver+
  - WE Credits, Sustainable Sites, LID demo areas
- Assign people, benchmark, research, pilot.
- Army Transformation: waste → recycling, energy → renewables procurement → green
- Training → sand blocks, RCRA, wildlife,
- Transportation → bikes, trails, carpools, etc.
- **Water** → Managed use, retrofits, care/concern.

# ENERGY & WATER

NET 0 WATER

## FORT CARSON WATER USE BREAKOUT EXCLUDING FAMILY HOUSING



“IF WE DO NOT HAVE ENERGY AND WATER WHEN AND WHERE WE NEED IT, IT CAN LEAD TO MISSION FAILURE”

**Honorable Katherine Hammack**, Assistant Secretary of the Army for Installations, Energy and Environment

*Irrigation accounts for approximately 56% of total water use (excluding family housing). Reducing irrigation by using xeriscape will save about 50 million gallons per year at an estimated cost savings of \$300,000.*

## STRATEGIES TOWARD NET ZERO WATER



An “Efficiency First” approach that seeks to reduce or eliminate water use where feasible by most efficient use of existing water sources.

confirmed the viability of future expansion of the **non-potable water** system to Iron Horse Park,

Sports Complex, Pershing Field, Founders Parade Field, and other irrigated areas. The projects will be done in 2 phases during FY13 - 14, and are expected to **reduce total potable water use by 20% for an estimated savings of \$700,000 per year.**

- Reduce potable water consumption.
- Investigate feasibility of storing treated wastewater.
- Explore opportunities for beneficial use of stormwater and grey water.
- **Install water meters.**
- Fund a water rights study and master plan to benefit from and protect current water rights that are “use or lose”.
- Implement North side reservoir improvements to support storm water runoff.
- **Cease building wash racks in new construction; close wash racks in old facilities in favor of Central Vehicle Wash Facility, which saves approximately 60 million gallons per year.**
- **Work with Johnson Controls, Energy Savings Performance Contractor (ESPC) to finance high payback conservation opportunities such as installation of water efficient fixtures with a projected 5% total water reduction.**
- Retrofit water fixtures with low or no-flow alternatives where cost effective.
- Make waterless urinals and other low-flow fixtures standard in new construction.
- Program funding to upgrade sprinkler heads that are 40% more efficient than existing.

A Net Zero water Installation limits the consumption of freshwater resources and returns water back to the same watershed so as not to deplete the region’s groundwater and surface water resources in quantity or quality.

***Fort Carson’s recent designation as a pilot Net Zero Installation accelerates the timeline for Fort Carson to achieve water goals to 2020 from 2027.***

## CHALLENGES TO NET ZERO WATER

- Definition for Net Zero Water continues to be refined.
- State water laws limit opportunities.
- Balancing the desire for healthy turf in some areas with water consumption.

# 2010 Water Savings



## ENERGY & WATER RESOURCES

**Goal: Sustain all facility and mobility systems from renewable sources and reduce total water purchased from outside sources by 75% by 2027.**

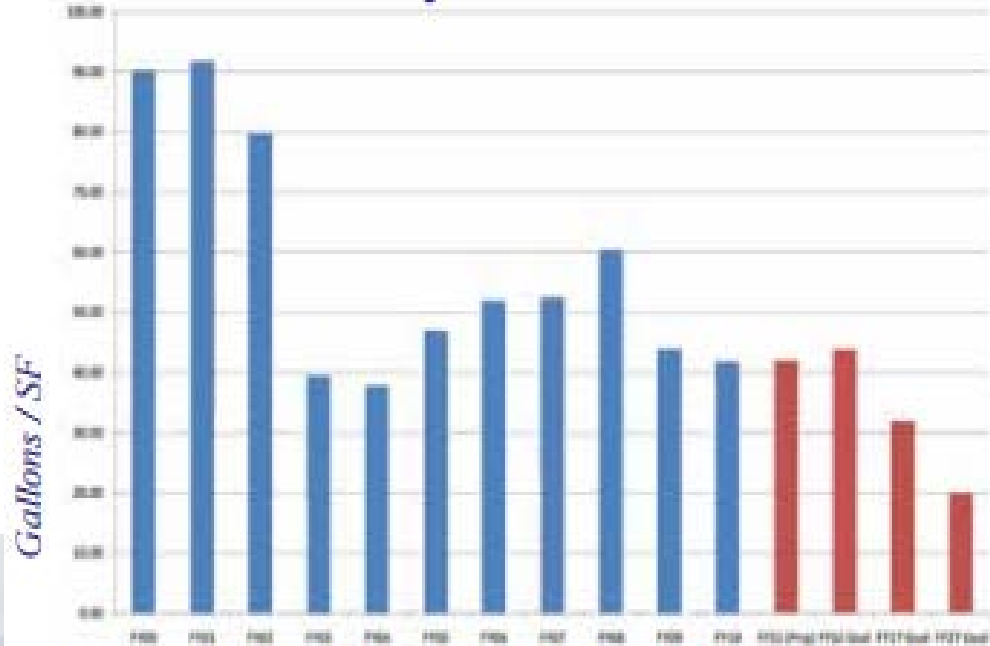
### ***Cheyenne Shadows Golf Course -***

A reduction of approximately 20% of potable water irrigation was realized during the FY10 golfing season. The reduction was due in part from the use of recycled water from the Fort Carson Waste Water Treatment Plant. In addition, mowing and irrigation requirements were reduced by increasing the acreage of native vegetation.

Evaporation-transpiration (ET) monitoring is used to ensure that the amount of water returned to the golf course is equal to the amount of water lost through evaporation and plant transpiration. An aeration fountain was installed at the pond to improve water quality by oxygenation, without the use of chemicals.

All new construction in FY10 included minimal or no exterior irrigation, low-flow fixtures, waterless urinals and eliminated exterior vehicle wash racks. Solar hot water heaters and ground source heat pumps were installed in several facilities.

### ***Water Use Intensity***



*From an established FY02 baseline, water intensity decreased 47.5% by the end of FY10. The federal goal is a reduction of 2% per year from a FY07 baseline. From the federal baseline, Fort Carson has achieved a water intensity reduction of 20.3%.*

# ENERGY & WATER

## FY11 WATER CONSERVATION PROJECTS

- Installed waterless urinals, low flow fixtures, xeriscaping, and low maintenance indoor wash racks in new construction.
- Implemented landscape practices such as winter irrigation, deep aeration, and weather smart controllers.
- Removed several acres of water intensive turf grass and replaced with sustainable landscaping alternatives.
- Completed Comprehensive Energy and Water Master Plan.
- Performed demonstration of Coolerado\* units to evaluate electric cooling vs. water cooling.
- Installed pre-rinse nozzles at dining facilities.



*Reclaimed water is used to irrigate the golf course*

\* Fort Carson in no way implies federal endorsement of the organizations or companies mentioned in this report.

## FY12 WATER CONSERVATION PROJECTS

- Pacific Northwest National Laboratory (PNNL) completed a **Water Balancing Study** which identified strategies and a roadmap to achieve Net Zero Water.
- **Leak detection surveys** were completed for about 20 percent of the post, where the oldest water lines are located. The survey found 57,000 gallons a day were lost due to leaks. Repairs were made at a cost of \$50,000, with savings of water per year totaling \$72,000. A leak reduction strategy was identified and implemented.
- Implemented landscape practices such as winter irrigation, deep aeration, and weather smart controllers.
- Utilized sustainable landscape and xeriscape at newly constructed buildings to reduce watering requirements.
- Installed waterless urinals and low flow fixtures in new construction.
- Worked with the U.S. Army Corp of Engineers to complete a non-potable water expansion study. An Energy Conservation Investment Program (ECIP) project planned for FY13 will expand the system to the Sports Complex.
- Retrofitted toilets, urinals, and showerheads at existing facilities through **Energy Savings Performance Contract (ESPC)** with Johnson Controls in concert with **\$37,500 in incentives from Colorado Springs Utilities.**



*A WeatherTRAK ET System was installed that uses global positioning system technology and weather stations to apply just the right amount of water based on current weather conditions. The system is estimated to save 50 million gallons a year by eliminating water wasted for an expected savings of \$300,000 per year.*

*\* Fort Carson in no way implies federal endorsement of the organizations or companies mentioned in this report.*



# Water Examples and progress

- **Smart Controllers & CSU 2012: \$65k rebate**

- Water Balance Study completed
- Leak Detection Surveys
- \$50k repair saved \$72k water
- Strategy begun
- Winter & Deep Irrigation
- Smart Controllers save 50mgd and \$300k/year
- Retrofit fixtures w ESPC and \$37,500 in CSU rebates, 2013.



WeatherTRAK Controllers in use.

# WATER PROGRESS

Fort Carson made significant strides in reducing water consumption to meet Net Zero water reduction goals and to comply with Stage II water restrictions implemented through CSU, the local utility provider. In FY13, several projects were completed to help meet water goals in conjunction with implemented policies that further enhanced water reduction.

- Used the ESPC to implement water conservation measures by replacing fixtures in 77 facilities, including the installation of pint urinals, 1.28 gallons per-flush toilets, and low-flow shower heads for an anticipated reduction of 54,800 kilogallons per year.
- Received \$37,500 in rebates for WaterSense® bathroom fixtures from Colorado Springs Utilities.
- Partnered with CSU and Balfour Beatty Communities to reduce water use by 30% in response to drought conditions. Fort Carson surpassed the goal of 30% by achieving a 33.4% reduction in water use from April 1 – Oct 31. The Fort Carson Garrison Commander (GC) supported the water restrictions by establishing the 2013 Drought Response Water Policy .
- Finalized the expansion of the non-potable irrigation system to optimize usage of wastewater plant effluent for the golf course, Iron Horse park and the Sports Complex. It is projected to save over 70 MGal/yr of potable water. Execution of the plan is scheduled for FY14.
- Implemented the first full year use of WeatherTrak® ET (enviro-transpiration) system to control landscape irrigation. The system uses global positioning system technology and weather stations to apply the right amount of water based on current weather conditions. Because of drought conditions in FY13, Fort Carson relied heavily on this new system to help dial back the amount of water applied to the turf when significant rainfall was received. This system was a key player in ensuring the 30% percent summer water reductions were met.
- From FY14 to FY17, Fort Carson intends to improve water intensity using funds from programmed Army Energy and Utility Program (QUTM) and Energy Conservation Investment Program (ECIP) projects as well as leveraging the ESPC tool.



# 2014 metrics

## Net Zero Water

The Net Zero water strategy balances water availability and use to preserve a sustainable water supply for years to come.



## Water Efficiency and Reuse



Since 2002 we have reduced our water use per square foot (water intensity) by 55% through improved efficiency

### Water Intensity Down



Compared to 2002 baseline

and conservation. Our 2020 goal to reduce water use by 50% has been achieved!

### Water Efficiency Projects

- Water fixtures such as urinals, toilets and showerheads replaced
- Weather irrigation controllers operated on large turf areas, such as sports fields

### Water Reuse Projects

- Post golf course irrigated with reclaimed, treated wastewater
- Reclaimed water lines added for irrigating other high use turf areas such as Ironhorse Park and Sports Complex



# 2015 WATER METRICS

DoD Goal	Net Zero		FY2014 Status	FY2015/Q3 Status
	Area	Goal		
<b>Potable Water Intensity:</b> Target: 26% by FY2020 Baseline: FY2007	Water	<b>Potable water intensity reduction:</b> Target: 20% by FY2015 50% by FY2020 Baseline: FY07 (52.6 Gal/SF)	31.4% (36.1 Gal/SF)	45.2% Proj (28.8 Gal/SF)
<b>Industrial &amp; Irrigation Water Use: NA</b> Target: 20% by FY2020 Baseline: FY2010	Water	<b>Industrial, Landscaping &amp; Irrigation Water Use:</b> Target: 20% by FY2015 40% by FY2020 Baseline: NA	NA	NA
<b>Reclaimed Water Use:</b> Target:	Water	<b>Reclaimed Water Goal:</b> Target:		

# 2015 actions – ESPC Project 4



Expanding reclaimed water system to Pershing Field, Manhart Field, Founders Field, Gate 1 and a few other areas over the fall and winter.

JCI is doing the project under the Energy Savings Performance Contract. The system currently irrigates the golf course, Ironhorse Park and the Sports Complex.

**Energy Savings Performance Contract**

**Final Proposal for  
Fort Carson, Project 4**

**Contract W912DY-09-D-0017**

1/1/2015

Submitted by:



This proposal or quotation includes only the work and the resources within the Government's control and shall not be dependent, wholly or otherwise, on actions or inaction by any person other than its submitter. The Government is not bound by this proposal or quotation as a contract or as a contract award until it is awarded in writing. The Government shall have the right to require any and all conditions that lead to the award process in this solicitation. This quotation shall not bind the Government's right to use information contained in this proposal or quotation from Johnson Controls without permission. The work subject to this quotation and completion of all phases of the contract.

# 2015 actions - ESPC Project 4

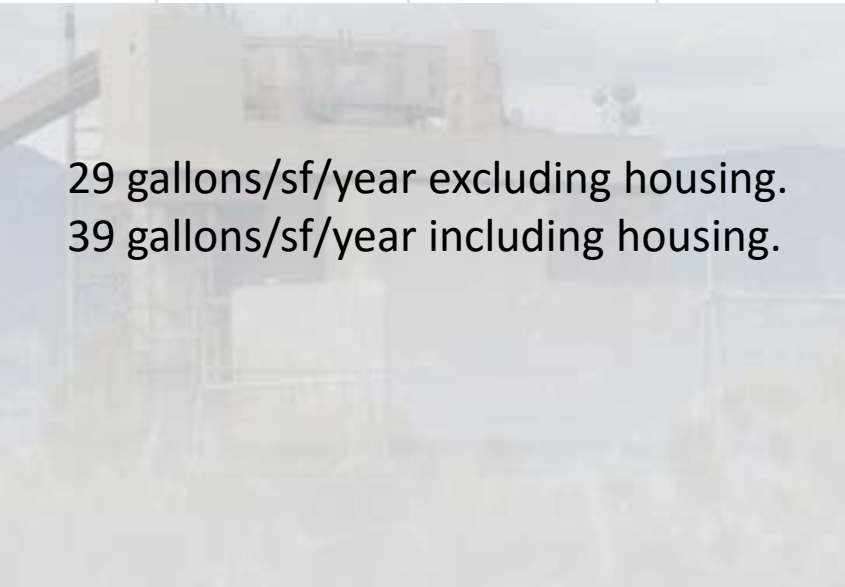
- Indoor- 37 buildings-Currently underway.
- Stalls, Showerheads/Sinks – (1.28/1.0)/1.5/1.5
- Pressure assist-flapperless-tamper resistant
- 362 aerators 186 stalls 68 urinals 372 heads
- *2,444 sink fixtures, 1,413 toilets, 157 urinals*
- *1,358 showerheads, 7 ice machines.*
- *2,785 Shower Tub Spout Dividers*

## Fort Carson Water Intensity (with housing)

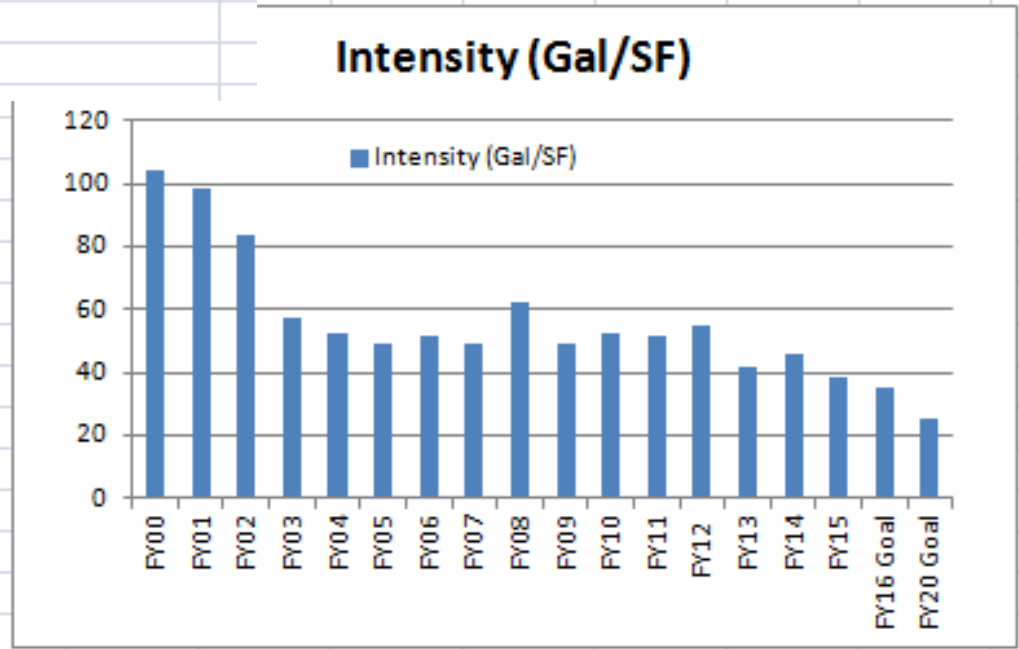
	Intensity (Gal/SF)	FC Usage (KGal)	Square Footage w/housing(KSF)
FY00	104	1,114,439	10,674
FY01	99	1,063,777	10,799
FY02	84	962,366	11,507
FY03	57	676,986	11,829
FY04	52	623,117	11,886
FY05	49	618,454	12,527
FY06	52	652,834	12,635
FY07	49	618,214	12,583
FY08	62	822,068	13,267
FY09	49	758,095	15,357
FY10	53	850,159	16,136
FY11	52	889,131	17,117
FY12	55	978,033	17,833
FY13	41	741,006	17,904
FY14	46	861,347	18,635
FY15	39	745,000	19,258
FY16 Goal	35		
FY20 Goal	25		



Fort Carson participates on the Customer Advisory Groups for CSU's Electric and Water Integrated Resource Plans



29 gallons/sf/year excluding housing.  
39 gallons/sf/year including housing.



# 2015 WATER METRICS



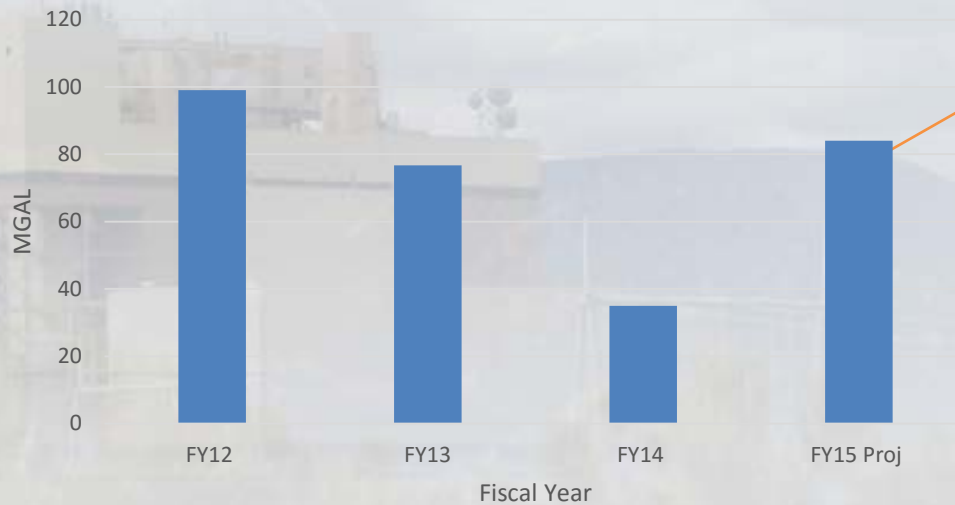
Colorado Springs Utilities  
It's how we're all connected.

### Water Intensity (Gal/SF)



FY15 16% Reduction Glide Path  
(Projected 45.2% reduction)

### Annual Reclaimed Water (MGAL)



Reclaimed water usage (Projecting 15 MGal for Sep 15)



# The future

## What you can do: FEMP Training

1. Managing Water Assessments in Federal Facilities
2. BP for Comprehensive Water Management in Fed Facility
3. FEMP Water Screening Tool
4. GSA Green Proving Ground
- 5....



## FEDERAL REGISTER

Vol. 80

Wednesday,

No. 57

March 25, 2015

Part II

The President

Executive Order 13693—Planning for Federal Sustainability in the Next Decade



Certified Water Efficiency Professional



The Association  
of Energy Engineers

[www.aeecenter.org](http://www.aeecenter.org)