Sterling Ranch Precipitation Harvesting Pilot Project

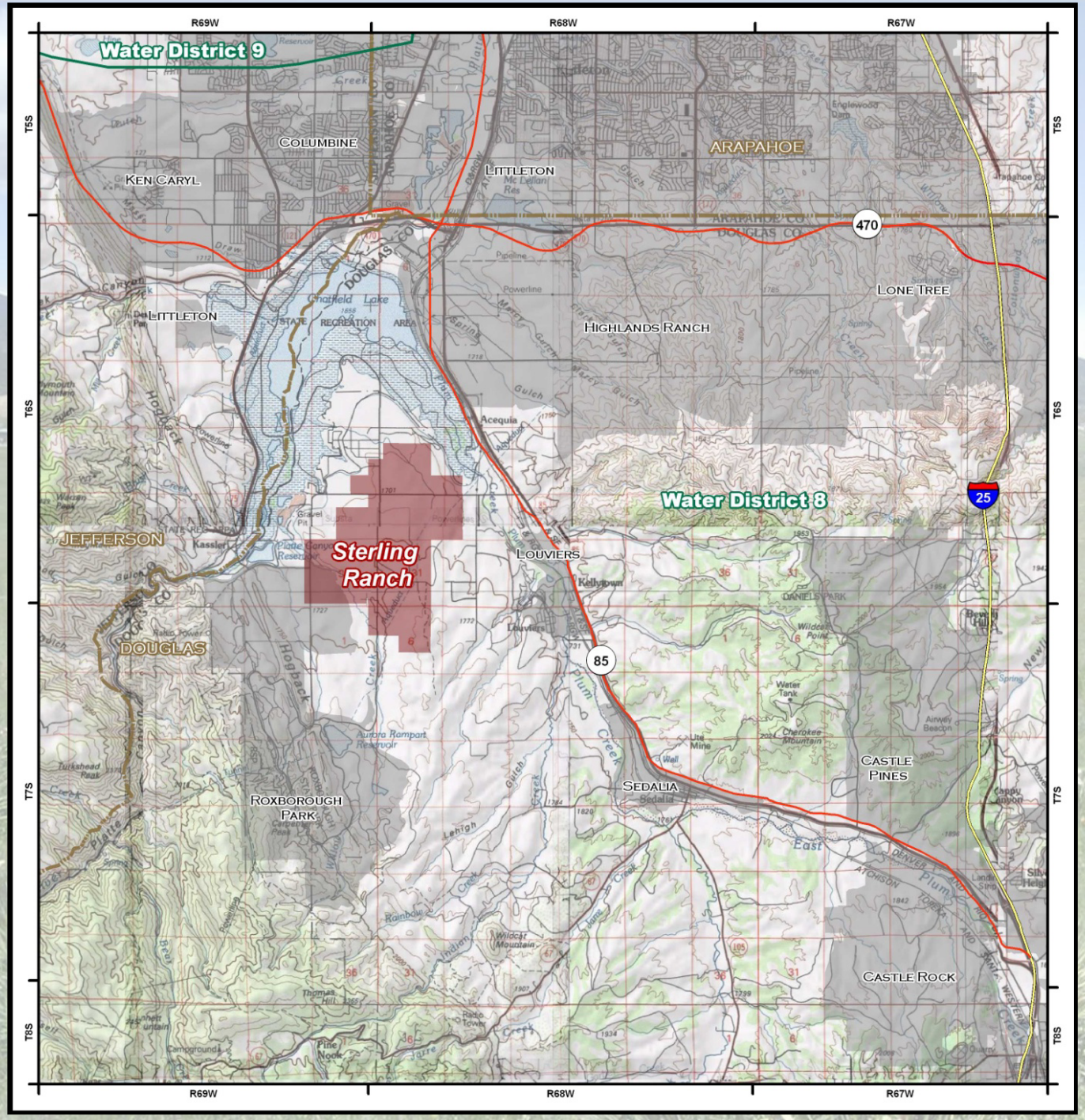
Introduction

Sterling Ranch is a Colorado family owned 3,400-acre Planned Urban Development (PUD) designed to set a new standard for sustainability for present and future generations.

Vision and Commitment

- Setting a future standard for sustainability by establishing new water use standards in a holistic and commercially viable manner
- Integrating resource planning that encourages and incentivizes the wise use of a limited and costly supply of water
- To be an example of developing a new sustainable source of supplemental water supply (PRECIPITATION) that can be repeated by others

General Location




CBS4 Video Library
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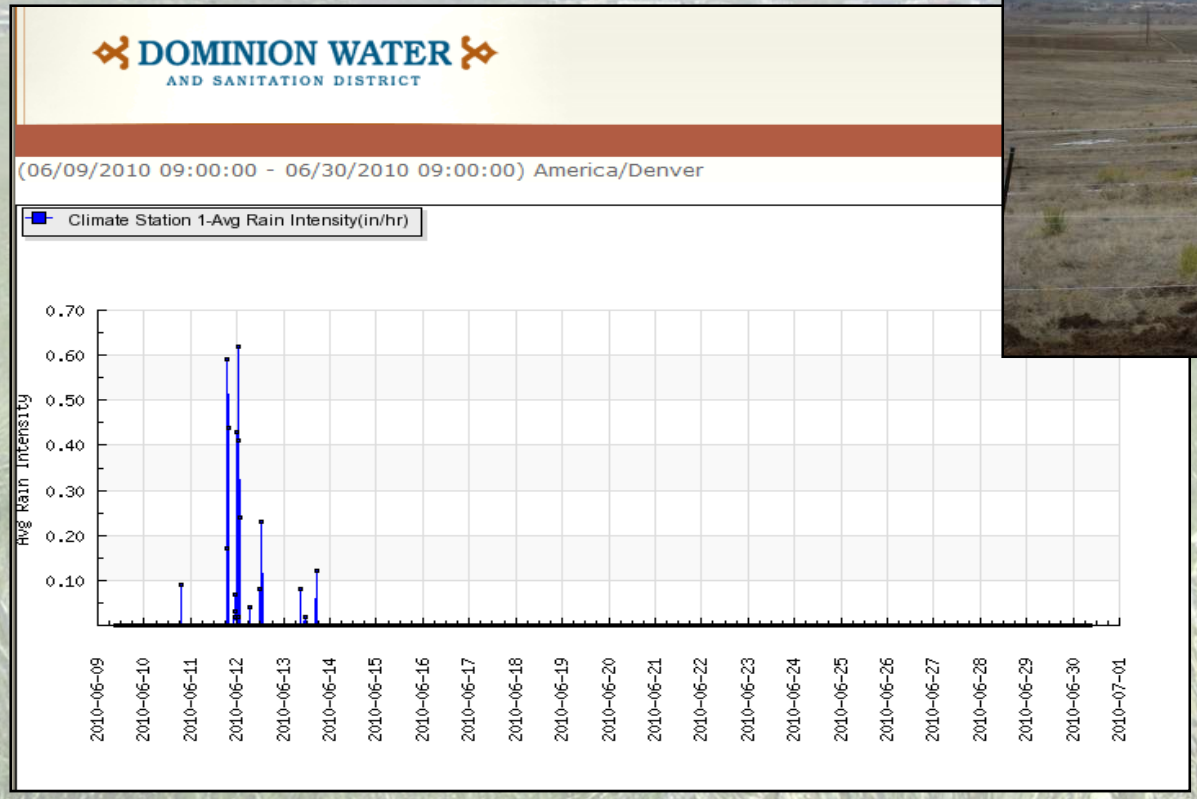
Progression

- Investigated and visited existing successful water-wise communities around U.S.
- **Holistic Approach to Sustainable Water Management in Northwest Douglas County** – March, 2007
  - CWCB grant funded project
- Zoning Application Submittal – Feb, 2009
  - Includes Water Conservation Plan as part of Water Supply Plan
- Appeal to Douglas County Water Requirements requesting reduced water demands from progressive water conservation – Dec, 2009
  - Established in Water Conservation Plan
- Supported HB-09-1129, signed June, 2009
- Submitted application for Precipitation Harvesting Pilot Project – March, 2010
- ***Installed on-site climate data collection and Implementing demonstration site - Beginning 2010 to Present***

Sterling Ranch Climate Station Data

Rain intensity data from the climate station for June



Integrating Water Conservation

"Most providers indicated that they would be more likely to acquire additional agricultural water rights than to implement aggressive levels of water conservation."

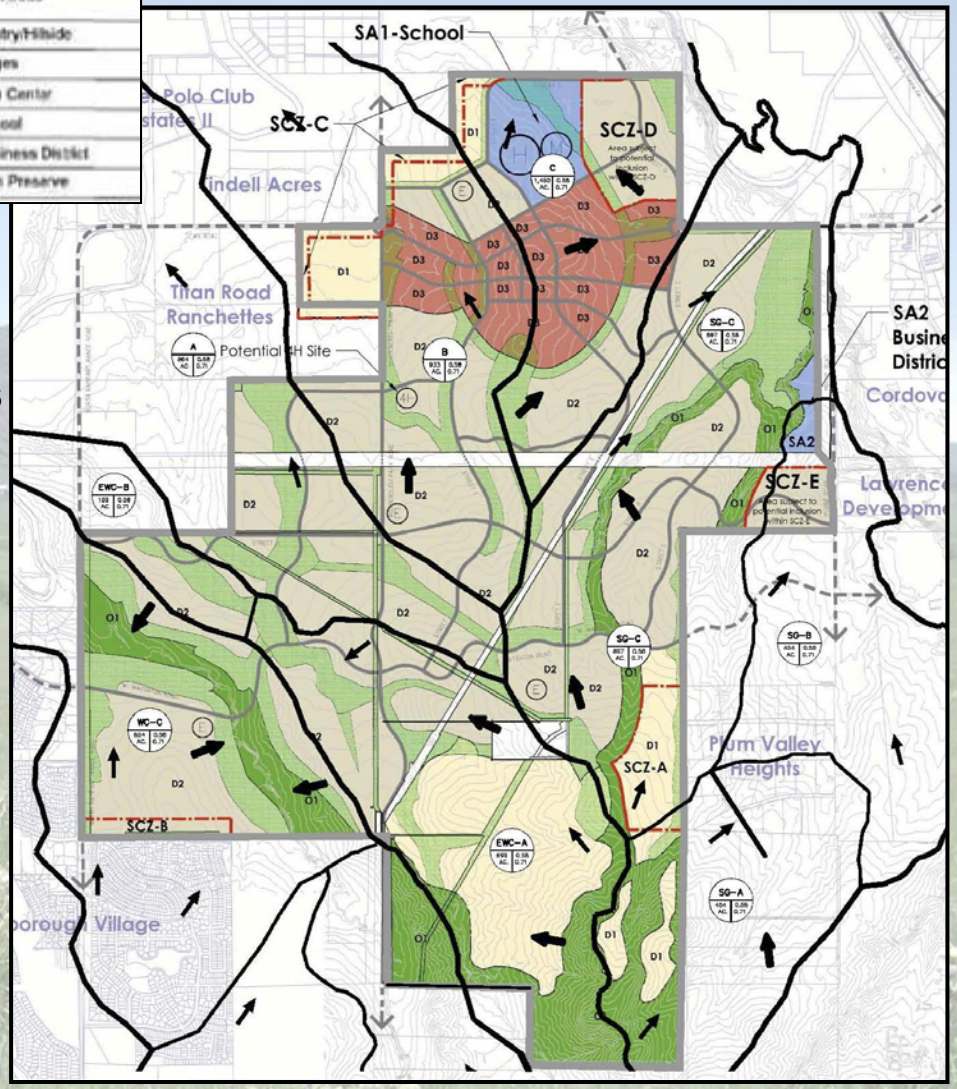
2004 SWSI

Who is responsible/accountable for fundamental changes in land/water use? Who will lead?

- Sterling Ranch is integrating land and water use planning to result in new water use standards.
- Local Government must integrate land use with water conservation.

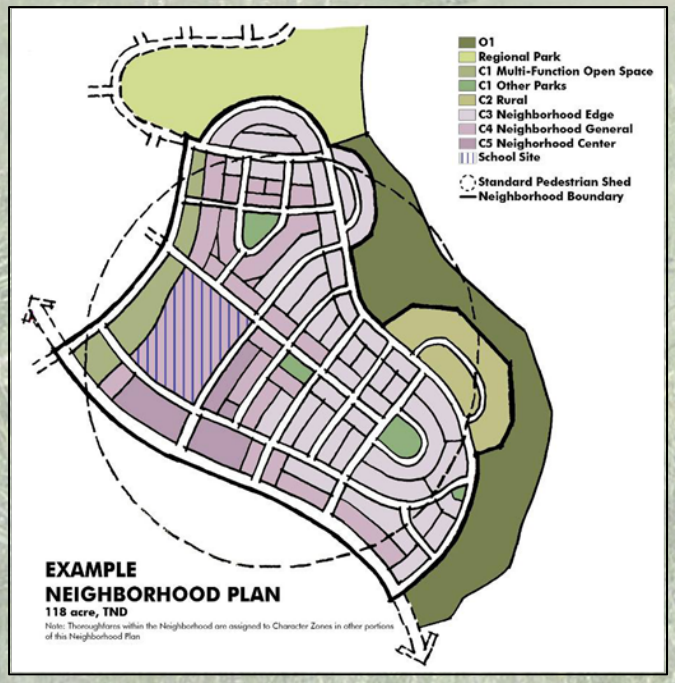
Sterling Ranch PUD

Designed to Promote
Water Conservation



Water Conservation Plan Components

- Water-Wise Home Certification
- Landscape and Irrigation System Regulations
- Individual Water Budgets with Inclining Block Rates
- Dual Metering
- Waste of Water Regulation
- Monitoring, Reporting and Education



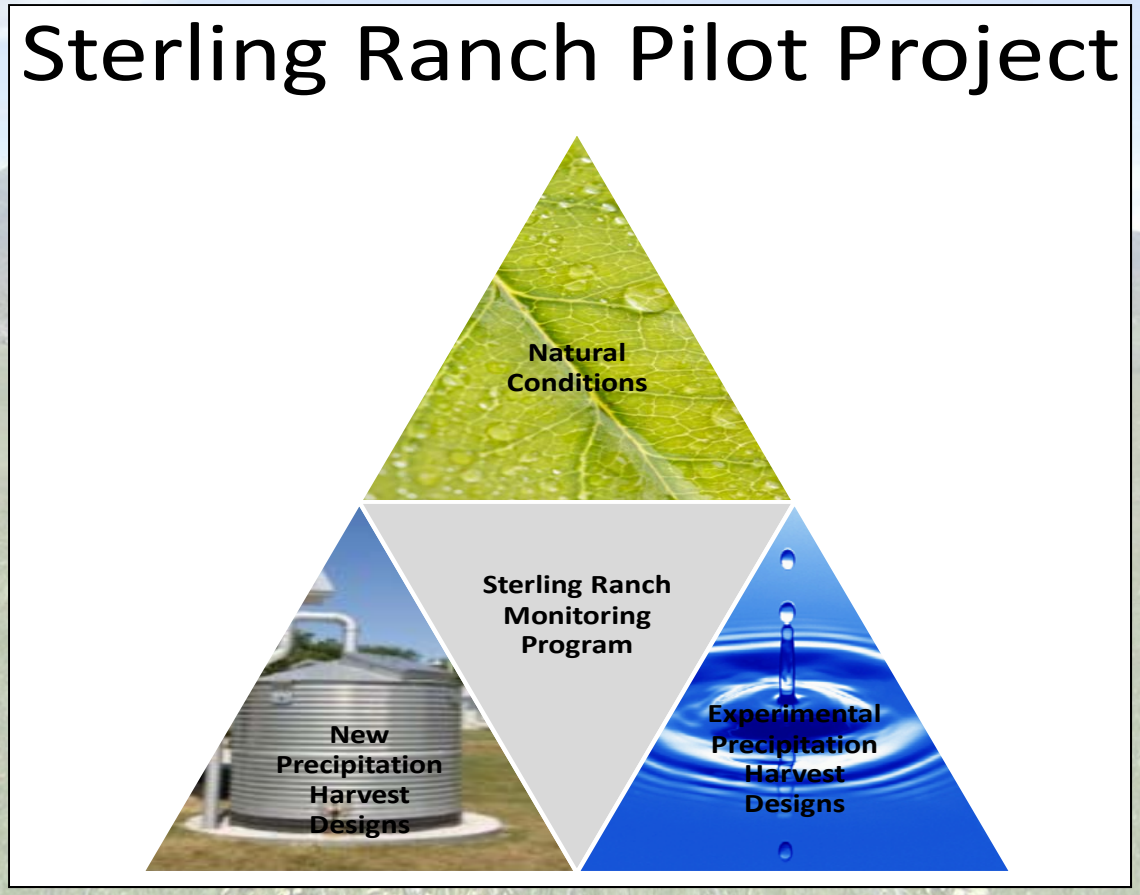
Typical Village Design

Estimated Water Savings

from Water Conservation Plan and Pairing with Precipitation Harvesting

One Single Family Residential Equivalent (SFE)					
Demand Scenario	Irrigation Demand (Acre-Feet)	Cistern Supply (Acre-Feet)	Supplemental Irrigation Supply (Acre-Feet)	Supply From Precipitation (%)	Savings From Traditional (%)
Traditional Landscaping	0.35	0.00	0.35	0%	---
Traditional Landscaping & Cisterns	0.35	0.04	0.31	12%	12%
Moderate Conservation	0.16	0.00	0.16	0%	53%
Moderate Conservation & Cisterns	0.16	0.04	0.12	26%	65%
Water Wise	0.08	0.00	0.08	0%	76%
Water Wise & Cisterns	0.08	0.04	0.04	49%	88%

How we will meet the Criteria



Upon application approval, the SR Project can leverage their diversity and early stage of development to establish a strong baseline of native conditions and to experiment with best implementation strategies prior to beginning the final phase of the pilot project.

Monitoring Plan

Includes Climate, Precipitation, Evapotranspiration, Surface Water and Ground Water Monitoring Programs for all Phases of Pilot Project

The purpose:

- calibrate models with empirical data
- reduce future monitoring requirements
- support transferability to future water users

Background for the Pilot Project

Phase 1: Natural Conditions

- Install precipitation/climate station – DONE!
- Install streamflow and ground water gaging stations – ready to install!
- Design and install lysimeters to evaluate infiltration, evapotranspiration and surface/ground water return flows
- Develop water balance evaluation methods with established and well known Models

Phase 2: Experimental Precipitation Harvesting Designs

- On SB 80 approved sites or monitoring only
- Event based rooftop runoff and capture efficiencies
- Water-wise landscaping water demands and total irrigation delivery (precipitation + supplemental)
- Supplemental water supply needed to meet water-wise landscaping demands
- Various manufactures and designs
- Develop database and evaluation methodologies
- Builder and home buyers education

Pilot Project

Phase 3: New Precipitation Harvesting Designs

- Based on results from Phase 2
- To take place on new construction under an approved SWSP
- Measure precipitation collection, efficiency and application
- Measure water-wise landscape water demands, total irrigation delivery and efficiency, and supplemental water delivery
- Develop transferable methodologies to quantify water supply and augmentation requirements

Reflects the beginning of the Criteria's minimum two year requirement and the requirement of an approved SWSP.

Outcome of Sterling Ranch Pilot Project

- Provide a defensible supplemental water supply for Sterling Ranch
  - Demonstrate no impact to senior water users
  - Demonstrate successful pairing of precipitation harvesting with conservation methods
- Extend life of the non-tributary ground water aquifer
- Reduce storm water runoff nutrient loading and sediment to streams
- Reduce water treatment demands
- Reduce overall irrigation demand for Sterling Ranch
- Provide a process for others to follow

Sterling Ranch Precipitation Harvesting Pilot Project

Please support our continued commitment to the success of both conservation and precipitation harvesting