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June 30, 2013

Ms. Rebecca Mitchell
Colorado Water Conservation Board
1313 Sherman Street, Suite 721
Denver, CO 80203

Mr. Kevin Rein
Colorado Division of Water Resources
1313 Sherman Street, Suite 818
Denver, CO 80203

RE: 2013 Sterling Ranch Precipitation Harvesting Pilot Study Annual Report

Dear Ms. Mitchell and Mr. Rein,

The enclosed letter report is the third annual report submitted by Leonard Rice Engineers, Inc. on behalf of the Sterling Ranch Development for the Precipitation Harvesting Pilot Study.

The 2013 Sterling Ranch Precipitation Harvesting Pilot Study Annual Report documents the progress that was made in the 2012/2013 study year, including the data that has been collected, the planned tasks for next year, and the variances to the application that was submitted on May 1, 2010.

Tasks accomplished this year for the Pilot Project include:

- Climate data was collected from June 2012 to May 2013 showing several significant rainfall events.
- Continued monitoring and collecting data from the surface water station located on Upper Sterling Gulch. Several small surface water events were observed.
- Continued use of trail cameras on Sterling Gulch to document hydrologic events in real-time.
- Continued water level data collection at the ground water monitoring wells, located within Sterling Gulch.

- Continued our partnership with Denver Botanic Gardens (DBG) using the Demonstration Site as part of the Sterling Ranch education campaign on efficient water use and rainwater collection.

Significant progress was made during the 2012-2013 project year on the Sterling Ranch Precipitation Harvesting Pilot Study. We are excited to embark on the next phase of the project, integrating water conservation and rainwater harvesting into a reliable water supply system. Through preliminary designs and investigations, we are beginning to understand how precipitation harvesting can provide regional benefits beyond water supply, including water quality, stormwater management, and reduced impacts on other natural resources including energy. We look forward to sharing this information and working together in the upcoming project phases. Thank you for your continued support in these ongoing efforts.

Best Regards,

Mary Kay Provaznik
DWSD & Sterling Ranch Utilities Director

cc: Harold R. Smethills, Jr.
Jack N. Hoagland
Diane Smethills
Beorn Courtney
Greg Roush

Encl: 2013 Sterling Ranch Precipitation Harvesting Pilot Study Annual Report

July 1, 2013

Ms. Rebecca Mitchell
Colorado Water Conservation Board
1313 Sherman Street, Suite 721
Denver, CO 80203

Mr. Kevin Rein
Colorado Division of Water Resources
1313 Sherman Street, Suite 818
Denver, CO 80203

RE: 2013 Sterling Ranch Precipitation Harvesting Pilot Study Annual Report

Dear Ms. Mitchell and Mr. Rein,

This is the third annual report addressing the Precipitation Harvesting Pilot Study to be submitted by Leonard Rice Engineers, Inc. on behalf of Sterling Ranch Development.

Introduction

The proponents of the Sterling Ranch Development continue to work passionately towards a vision for the land that is in harmony with the area, the community, and the State, and that meets a significant need for housing and infrastructure in Douglas County. Sterling Ranch's participation in the Colorado Water Conservation Board's (CWCB) Rainwater Harvesting Pilot Project Program (Program) is a reflection of their goals for establishing sustainable, defensible, non-potable water supplies for their development, as well as to be a positive example of conservation and efficient resource management.

Generally, the Sterling Ranch Precipitation Harvesting Pilot Study (Pilot Project) has proceeded on schedule. However, there have been some delays in the installation of monitoring equipment and implementation of experimental and new precipitation harvesting designs. The variances to the Pilot Project, including the proposed schedule, are described herein.

Summary of Pilot Project Progress

The following tasks were accomplished during the 2012-2013 monitoring season:

- Climate data collection from the Sterling Ranch Climate Station
- Surface water data collection
- Trail camera data collection
- Data collection from two ground water monitoring wells and one shallow (Datum) well

These tasks, associated costs, and variances to the overall Pilot Project are further discussed in this Annual Report.

CWCB Program and Reporting Requirements

On March 1, 2010, Sterling Ranch provided the "Sterling Ranch Precipitation Harvesting Pilot Study Application" (Application) based on the criteria and guidelines outlined by the CWCB established under House Bill 09-1129. The aim of the Program is to use field verification to evaluate precipitation harvesting in Colorado as a water conservation enhancement when paired with advanced outdoor water demand management and as a legally obtainable water supply.

The Application described the conceptual Sterling Ranch planning policies and requirements, including their current water conservation plan and the Pilot Project strategies to be implemented to assist in the overall precipitation harvesting design.

The Pilot Project is split into three phases; 1) Natural Conditions, 2) Experimental Precipitation Harvest Designs, and 3) New Precipitation Harvest Designs.

Annual Reporting Requirements

One of the requirements of the Pilot Project Program is to submit an annual progress report (Report) by July 1st of every year that the Pilot Project is in operation. In accordance with Section 37-60-115(6)(a), C.R.S., the Report summarizes each component of the Pilot Project and indicates how the data and findings address Program goals. The CWCB Annual Report Requirements serve as an outline for this report and are included in **Attachment A**. The information required includes:

1. A **description of variances** from the Application including information on any data quality issues that may magnify if results are extrapolated to a larger scale project.

2. **Precipitation harvesting performance metrics**.

3. Pilot Project **implementation plan and estimated water conservation** achieved through pairing precipitation harvesting with advanced outdoor water management.

4. A **description of the climate and hydrologic data collected** to characterize the pre-existing, natural vegetation conditions.

Sterling Ranch Precipitation Harvesting Pilot Project - Progress and Variances

Four objectives were established in the Application that are designed to meet the guidelines and criteria provided by CWCB. They are:

1. Evaluate natural conditions (climate, hydrology, and ET) to quantify the amount of precipitation physically and legally available as a water supply.
2. Evaluate a variety of precipitation collection designs.
3. Evaluate precipitation harvesting paired with advanced outdoor water demand management as a water conservation practice.
4. Create a baseline set of data to support;
    a) An engineering report for a water court application for an augmentation plan to use harvested precipitation, and define a defensible water supply.
    b) Develop sound, transferable, and scalable methodologies for use at other locations in the State of Colorado.

In 2010, the Pilot Project began with the installation of the measuring devices for the natural conditions, collecting associated data, and implementation of an educational campaign. These efforts are further discussed in the sections below.

Phase 1: Natural Conditions

Two study basins were proposed to evaluate natural conditions of Sterling Ranch as part of a comprehensive monitoring plan. The integrated monitoring plan includes measuring climate, precipitation, surface runoff, native ET, and deep percolation to ground water to provide the foundation for defining physical yield characteristics and return flow obligations.

Figure 1 shows the location of the two watersheds and the location of the implemented and proposed monitoring stations within the Sterling Ranch boundary. The study basins are being used to quantify the site-specific amount of precipitation that, under pre-existing natural vegetation conditions, accrues to the natural stream system via surface and ground water return flows. The sections below summarize the progress, variation, and data collected to date for each of the monitoring programs that were designed to characterize the return flows. Note during the 2012-2013 project year there was no new equipment installed under the Natural Conditions monitoring program.

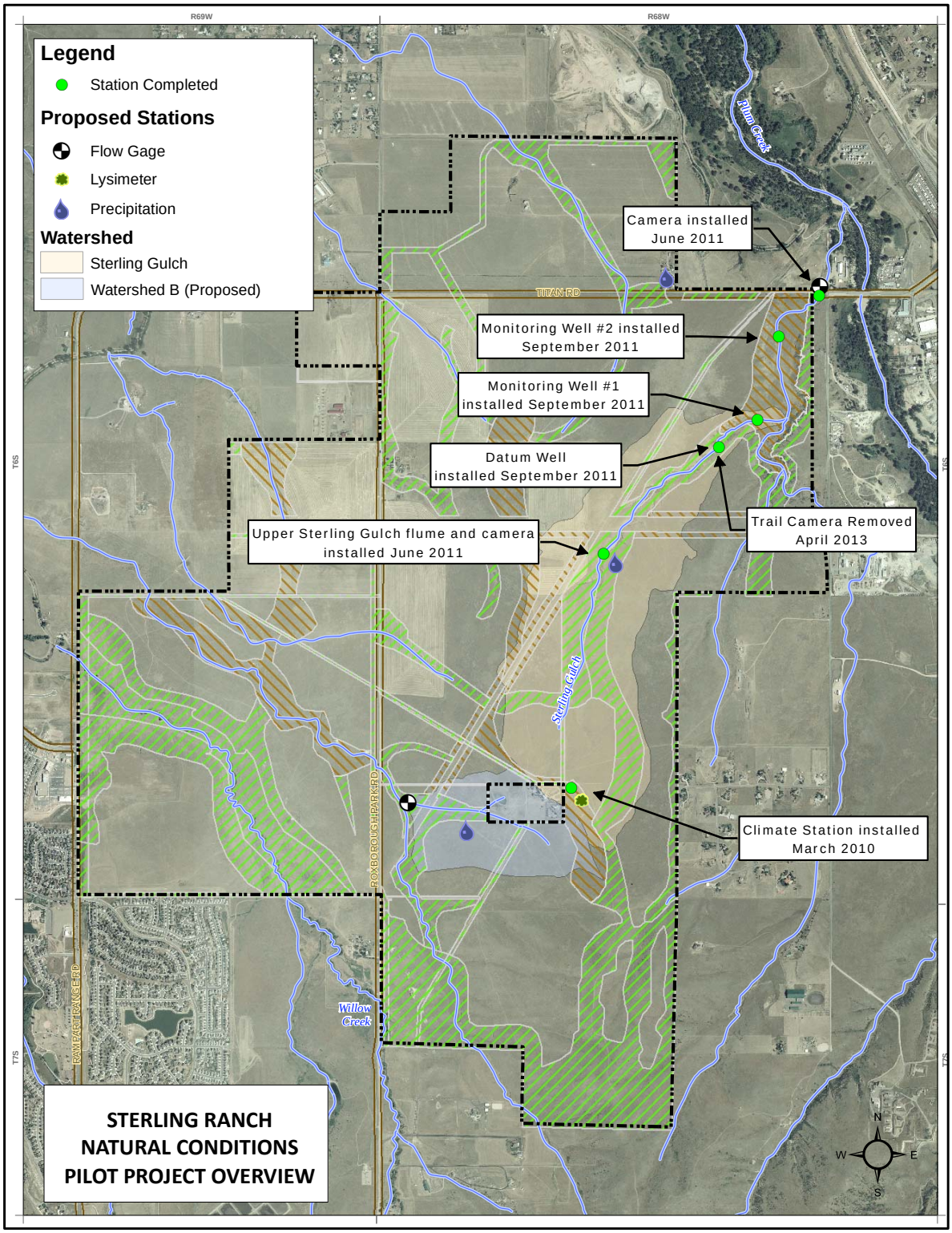

Figure 1- Proposed Study Basins Map

Climate Monitoring Program

2012-2013 Variance from Application: None

The Sterling Ranch Climate Station was installed on March 29, 2010. The station continues to collect data used to characterize local weather patterns, and will be used for the future estimates of native ET. The data collected at the Sterling Ranch site includes net solar radiation, air temperature, wind velocity and direction, relative humidity, barometric pressure, and soil temperature at varying depths. Most data is recorded in 15-minute intervals, transmitted to the Sterling Ranch website, and archived in a centralized database. **Table 1** is a monthly summary of the data collected to date from the Sterling Ranch Climate Station.

Figure 2 - Sterling Ranch Climate Station

Table 1 –Sterling Ranch Climate Station Monthly Summary

Year	2012							2013				
Month	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Temperature (F)												
Average Temperature	74.27	75.18	73.19	64.86	49.44	45.46	32.77	32.92	30.64	39.2	42.1	56.4
Max Temperature	102	97	95	92	82	74	70	64	62	71	76	85
Min Temperature	44	57	49	45	23	18	3	-3	10	3	1	20
Temp Range	58	40	46	47	59	56	67	67	52	68	75	65
Soil Temp (5 cm) (F)												
Average Temperature	77.36	79.79	78.50	68.33	50.33	41.09	33.48	29.22	32.17	39.42	46.66	60.36
Max Temperature	104	105	101	94	73	56	49	46	42	62	71	85
Min Temperature	59	64	63	51	35	30	25	15	28	32	34	39
Temp Range	45	41	38	43	38	26	24	31	14	30	37	46
Soil Temp (15 cm) (F)												
Average Temperature	74.63	77.99	76.91	68.52	51.76	42.48	35.25	30.15	33.05	39.25	46.32	58.89
Max Temperature	87	88	85	82	65	50	45	40	37	52	60	71
Min Temperature	64	69	68	56	39	35	29	22	32	33	37	44
Temp Range	23	19	17	26	26	15	16	18	5	19	23	27
Wind (mph)												
Average Velocity	7.44	6.44	6.46	5.67	5.98	6.07	6.27	6.00	5.84	6.23	6.85	6.74
Max Velocity	37.00	32.84	35.88	27.75	36.01	36.67	33.87	28.23	29.26	37.94	37.53	35.86
Average Direction (Deg N)	174.21	174.91	182.10	173.18	184.78	189.12	190.06	179.84	189.03	195.75	188.10	194.72
Solar Radiation (MJ/m2 h)												
Average Radiation	1.10	0.98	0.88	0.78	0.58	0.42	0.34	0.42	0.52	0.73	0.82	0.98
Max Radiation	4.24	4.34	4.67	3.87	3.13	2.84	2.27	2.32	2.97	3.69	4.30	4.42
Barometric Pressure (mbar)												
Average BP	820.46	825.47	825.40	826.16	821.96	822.82	816.96	820.40	818.33	820.36	818.85	821.38
Max BP	829.14	831.89	830.83	835.51	832.09	833.65	829.63	832.70	829.25	830.02	827.95	838.81
Min BP	807.48	817.92	817.99	819.03	809.30	803.08	805.29	799.21	805.67	806.09	802.94	808.48
Humidity (%)												
Average Humidity	29.39	41.53	34.14	38.31	46.74	36.03	46.41	40.54	54.13	50.28	53.80	45.43
Max Humidity	94.08	95.77	84.84	95.28	99.22	97.59	96.90	98.27	98.53	99.24	98.37	99.58
Min Humidity	5.22	8.83	7.69	8.09	7.05	90.80	8.88	3.00	6.14	5.64	10.09	6.58

Precipitation Monitoring Program

2012-2013 Variance from Application: None

The OTT Pluvio[2] weighing precipitation gage was installed on the site and began collecting data on March 29, 2010 (see **Figure 3**). The precipitation gage is located at the same site as the Sterling Ranch Climate Station and reports data in 15-minute intervals. The data collected at the site includes total accumulation and maximum rainfall intensity. This is the first of many proposed precipitation stations for the Pilot Project (see **Figure 1**). The physical measurement of precipitation is important in characterizing the native water supply, native water demand, and other hydrologic processes. **Table 2** is a summary of the data collected from the Sterling Ranch precipitation station. During the 2012-2013 monitoring season there was a total of 13.35 inches of precipitation accumulated with the max intensity of 3.30 in/hr on September 26, 2012.

Figure 3 – OTT Pluvio[2]

Table 2 - Sterling Ranch Precipitation Station Summary

Year	2012							2013				
Month	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Precipitation (in)												
Monthly Total	1.04	1.77	0.24	2.53	1.27	0.09	0.39	0.39	1.12	0.73	1.19	2.59
Max Intensity (in/hr)	2.30	2.24	0.74	3.30	3.11	0.27	0.00	0.00	0.51	1.70	0.32	2.99

*Maximum intensity using precipitation measured over 15-minute intervals

Surface Water Monitoring Program

2012-2013 Variance from Application: None

- *To document surface water events in real-time, trail cameras have been added to the plan at the surface monitoring sites within the Sterling Gulch basin.*

A surface water monitoring program was continued during the 2012-2013 monitoring season to quantify the site-specific stream flow that accrues to the natural stream system through surface water flows. One of the three proposed surface water measurement stations has been installed (see **Figure 1**).

The surface water station located on upper Sterling Gulch was completed in June 2011. This station includes a 9-inch Parshall Flume, shaft encoder level sensor, data logger, and a time-lapse camera for visual checks during precipitation events. The trail camera at the culverts at Titan Road continues to collect photos and the trail camera near the Datum well site was removed due to inconclusive photos being collected at the site. Each of the cameras take a photo every 15 minutes documenting hydrologic events in real-time.

Recorded Surface Water Events

The 2012-2013 monitoring season was fairly dry with only a few minor rainfall events occurring. **Figure 4** is the daily hydrograph for the 2012-2013 project year. In total there were three days with measurable surface water events recorded at the Upper Sterling Gulch flume. Although these events were measured at the Upper Sterling Gulch flume, there was no surface water shown leaving Sterling Gulch at Titan Road trail camera.

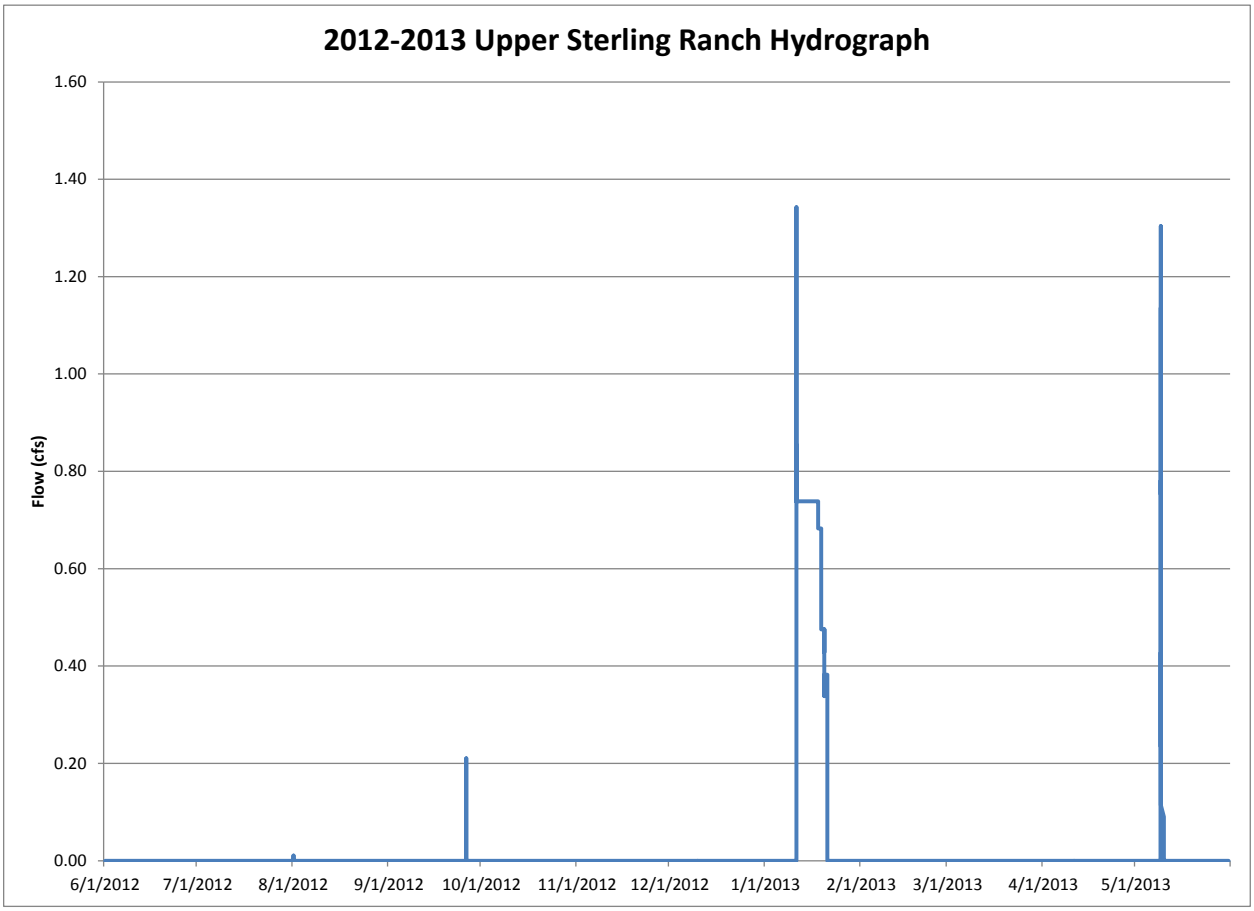

Figure 4 – 2012-2013 Upper Sterling Gulch Hydrograph

The first measurable surface water event was September 26th, 2012 lasting approximately two hours with a peak 15-minute average flow of 0.21 cfs. **Figure 5** is a trail camera picture of the event showing measurable flow through the flume. The photo is poor quality, but does show flow in the flume during this event at the bottom center of the photo. Note that photo time may not directly correspond with measured peak discharge.

Figure 5 - September 26, 2012

The second measurable surface water event occurred on January 11th, 2013 and was not precipitation related. During the 2012-2013 monitoring season, a pipe break occurred in a Denver Water pipeline southwest of the surface water station on January 11, 2013. Water from the pipeline break arrived at the flume around 7:45 AM on the morning of January 11th resulting in measurable flow through the flume with a peak 15-minute average flow of 1.34 cfs. Flow continued until approximately 11:00 PM at which time the water froze in the stilling well resulting in errant measurements for the remainder of the event. During the winter months the trail cameras are not maintained therefore no trail camera photos of this event are available. **Figure 6** is a picture taken by Sterling Ranch staff showing the January 11th event related to the pipe break.

Figure 6 – January 11, 2013
Upper Sterling Gulch Flume

The third measurable surface water event occurred on May 9th, 2013 lasting approximately twelve hours with a peak 15-minute average flow of 1.30 cfs. A malfunctioning trail camera did not capture pictures of this event.

Native Vegetation (ET) Monitoring Program

2012-2013 Variance from Application: None

Lysimeters are proposed specifically to collect data regarding two important aspects of the pilot study; the actual native vegetation ET and the amount of precipitation that percolates through the soil root zone to the ground water table known as ground water recharge or deep percolation. The lysimeters may also provide some insight on site-specific soil moisture storage and surface runoff.

This monitoring program is still in the proposal/planning phase and has not yet been implemented.

Ground Water Monitoring Program

2012-2013 Variance from Application: None

Understanding pre-existing ground water interactions on Sterling Ranch is another important component of the water budget. Quantifying the amount, timing, and location of ground water return flows that accrue to the local alluvial aquifer from precipitation events is important when defining augmentation requirements to local streams. The installation of two monitoring wells and one shallow (Datum) well located within Sterling Gulch was completed in September 2011 (see **Figure 1**). **Table 3** below summarizes the ground water level data collected at each of the monitoring wells.

Table 3 – Sterling Gulch Monitoring Well Recorded Depth to Ground Water

Year	2012				2013			
Date	Depth (ft)	6/8/2012	8/1/2012	10/14/2012	1/18/2013	3/6/2013	4/26/2013	6/5/2013
Recorded Depth of Ground Water (ft)								
Datum Well	6.25	Dry	Dry	Dry	2.85**	2.8**	Dry	Dry
MW-1	15.30	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW-2	17.96	Dry	Dry*	Dry*	Dry*	Dry*	Dry*	Dry*

* Moisture detected but immeasurable
** Ice obstruction in monitoring well

During the 2012-2013 ground water monitoring season shown above, there was no naturally occurring alluvial ground water table recorded in Sterling Gulch. Beginning in August of 2012, some moisture was detected at the bottom of MW-2, but was immeasurable. The moisture detected is attributed to condensation collected at the bottom of the well. This does not represent the groundwater level. Note that an ice obstruction was detected at the Datum Well on January 18th and March 6th 2013. The ice obstruction may have been an indication of the artificial alluvial

ground water table created from the Denver Water Pipeline break. The obstruction was detected at approximately 2.8 feet reflecting approximately 3.45 feet of head at the Datum well.

Monitoring Program Maintenance Plan

The design of the monitoring plan is modular, and the maintenance requirement of each monitoring program element is different. Once installed, routine physical inspections of all instrumentation were conducted. Real-time sensors were remotely monitored to verify that they are operating correctly. The data-logging sensors were checked and maintained every time that the data was retrieved.

OneRain is the contractor responsible for maintaining the Sterling Ranch climate station and reporting any issues. OneRain has made two maintenance visits to the climate station over the last year, in October and March. The goal of the maintenance visits is to detect failure before it occurs. When servicing a climate station, the inspections are broken down into the following areas: power, telemetry, data logger, and sensors.

In addition in March 2013, OneRain accompanied Leonard Rice Engineers and completed a site visit inspecting the surface water site located on Upper Sterling Gulch. OneRain confirmed the instrumentation, data logger, and flume were operating correctly.

Beginning in July 2011, Leonard Rice Engineers, Inc. has been responsible for the data collection and maintenance of the Upper Sterling Gulch flume, trail cameras, and monitoring wells. The site has been visited a total of seven times over the 2012-2013 monitoring season with maintenance and data collection occurring each time. Each trail camera requires all photos to be downloaded and cleared from the memory card, a fresh set of batteries, and review of settings to make sure the time-lapse mode is operating correctly. At each of the monitoring wells water level data is collected manually using an M-scope.

Natural Consumptive Use, Return Flows to the River, Water Budgets, and Models

There is nothing to report on these sections for the 2012-2013 project year.

Subsequent Phases

Sterling Ranch plans to collect information about different types of precipitation harvesting designs, equipment, and materials and to implement new precipitation harvesting designs in subsequent phases of the pilot project. Recent zoning approval and acquisition of sufficient water supplies marks the beginning of development of Sterling Ranch with the anticipated construction beginning in early 2014. The construction and implementation of planned new precipitation harvesting designs is anticipated to begin as early as winter 2014.

Overall Pilot Project Schedule

2012-2013 Variance from Application:

- The first surface water monitoring site was installed in June 2011 and is collecting data. *Ahead of schedule = 6 months*
- Ground water monitoring started in September 2011. *Ahead of schedule = 1 year*
- Lysimeters for measuring ET and deep percolation of return flows are still in the proposal/planning phase. *Delay = approx. 2.5 years*
- Residential Experimental Site. Delay = approx. 2 years
- Commercial experimental monitoring site is currently in the proposal phase. *Delay = approx. 2 years*
- Regional observation site is currently in the proposal phase. *Delay = approx. 1.5 years*
- All New Precipitation Harvesting Designs are planned to begin next year. *Delay = approx. 2 year*
- The proposed Administration plan originally included a preliminary administration reporting developed for the Demonstration Site as a test for the development of the new sites. Planning and development of Administration is not planned to begin until next year. *Delay = approx. 3 years*

Figure 7 shows the timeline proposed with the adjustments made due to the extended schedule as described above. As shown, the climate and precipitation monitoring programs were implemented and began monitoring in 2010. In 2012-2013 data collection has resumed with no new monitoring equipment installed at site. Sterling Ranch is currently in the proposal phase for the commercial monitoring site and regional observation site. New construction and implementation of planned new precipitation harvesting designs is anticipated to begin within the next year with the focus on regional capture designs.

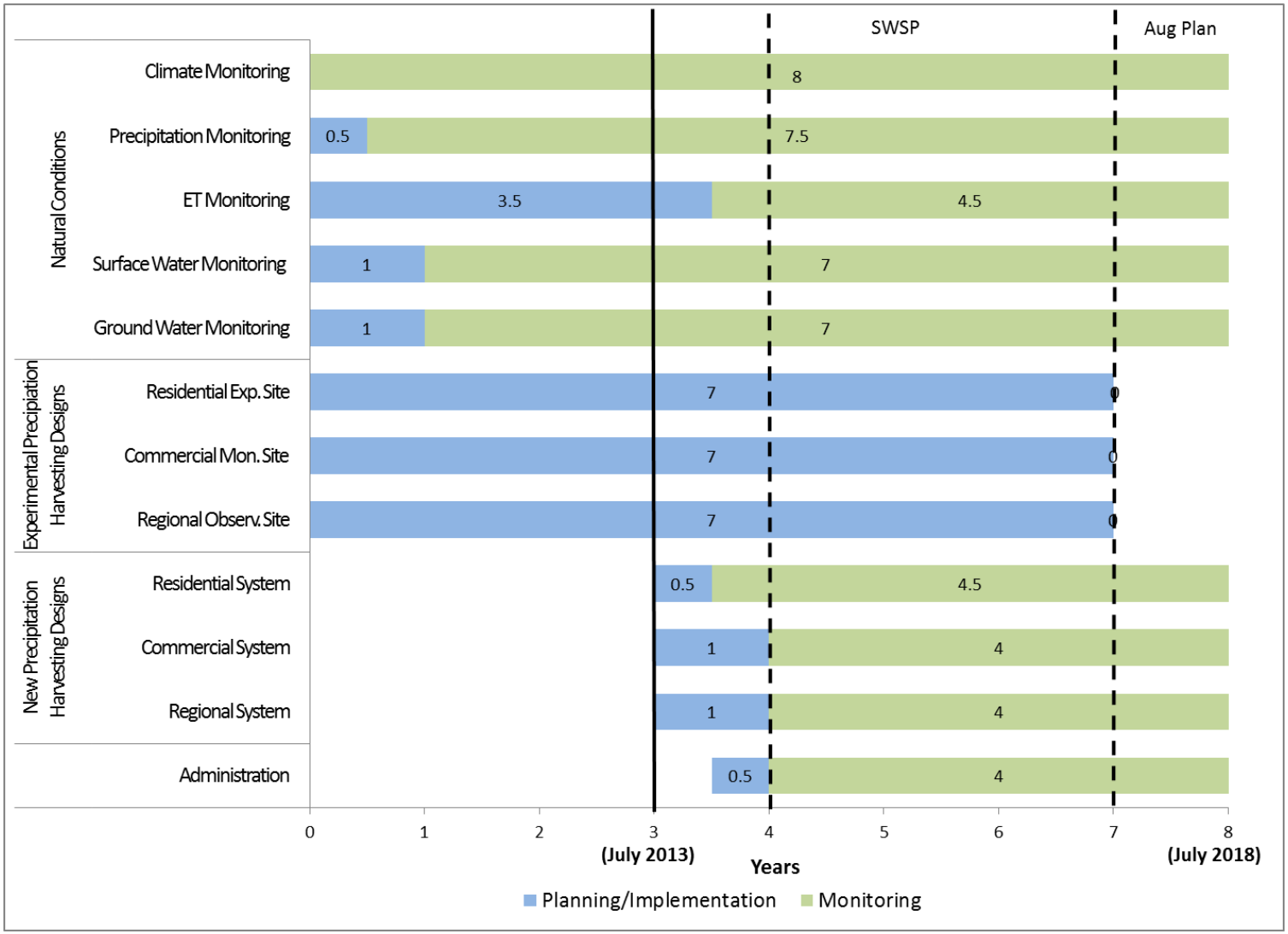

Figure 8 – Updated Pilot Project Schedule

Augmentation Requirements

The Augmentation Requirements that will be met under an approved Substitute Water Supply Plan are expected to begin with Phase 3.

Implementation

Collection and irrigation system design have not currently been finalized or implemented, therefore, no data is yet available for describing operation and maintenance or for estimating collection efficiencies.

Estimated Water Savings, Landscape Plans, Metered Water Use, Consumptive Use and Estimated Water Conservation, Estimated Unit Cost for Rainwater

Currently there is no new information to provide on the estimated water savings, landscape plans, metered water use, consumptive use, estimated water conservation, and estimate unit cost for rainwater capture and use.

Costs to date

Costs for the Pilot Project have occurred primarily in the efforts for the monitoring of natural conditions and for the Demonstration Site. These are summarized below:

Natural Conditions

In 2012-2013; station maintenance, data collection, data management and reporting were the primary costs. These costs were:

- Data Management/Analysis/Reporting - $7,730
- Maintenance and Labor - $3,920

Partnerships and the Sharing of Information

Educational efforts continue to be made during this phase of the Pilot Project to help the community understand the concept of what Sterling Ranch is doing in terms of water conservation and rainwater harvesting. Current education material is provided through the Sterling Ranch website, media articles, and interviews. The Sterling Ranch website, located at http://sterlingranchcolorado.com/, goes into a significant amount of detail about the project overview that includes a description of the lifestyle, housing, and conservation that will be built into the development. The website includes articles that have been published about Sterling Ranch, which is kept current by Sterling Ranch staff. Additional education efforts will be necessary as the project progresses and more programs are implemented.

During this phase, the Allis Ranch Demonstration site is the primary educational tool utilized by Sterling Ranch to educate the community, establish partnerships, and to communicate with home builders. Through a partnership with the Denver Botanic Gardens, the Demonstration Site was completed to incorporate water-smart landscapes and edible gardens to show how low water use landscaping will be implemented throughout Sterling Ranch. The low water use landscapes were paired with innovative irrigation products, including a weather-based irrigation system controller, to maximize the efficiency of water use. A residential-style precipitation capture system was installed and provides an opportunity to evaluate the effects of coupling precipitation capture systems with water-smart landscaping and efficient irrigation systems.

In July of 2012, fifty elected officials, engineers, and water managers visited the Allis Ranch Demonstration site to learn about the project and how it applies to local water issues. As part of their public outreach program, Sterling Ranch has been presenting key findings to a variety of interested parties. The partnership with Denver Botanic Gardens continues to be important in providing guidance in developing landscape designs and plantings, and has been an educational resource and a key partner in the water conservation community.

Closing

This letter report describes the third year of the Sterling Ranch Precipitation Harvesting Pilot Study. If you have any questions, please feel free to call at 303-455-9589.

Sincerely,

LEONARD RICE ENGINEERS, INC.

Mark Mitisek

Mark Mitisek, P.H.
Project Hydrologist

R. Gregory Roush

Greg Roush, P.E.
Chief Operating Officer

Sterling Ranch, Attachment A - CWCB Requirements for Annual Report

1. A description of variances from the Pilot Project application including information on any data quality issues that may magnify if results are extrapolated to a larger scale project.

2. Precipitation harvesting performance metrics, including:
    a) Description of final collection system design with plans and specifications of all system components.
    b) Operation and maintenance plans and any issues encountered.
    c) Meter data of water flowing into the precipitation collection device and estimated capture efficiency.

3. Pilot project implementation plan and estimated water conservation achieved through pairing precipitation harvesting with advanced outdoor water management, including:
    a) A description of the applied method used to capture precipitation and any potable water supply with plans and specifications for all system components including any technology utilized (system programmers, ET controllers, etc.).
    b) Landscaping plans including measured irrigated acres, plan descriptions, theoretical irrigation water requirement methods, results, and water budgets reflecting application efficiencies.
    c) Metered water use from precipitation collection system. Water use will be categorized by use if application varies.
    d) Metered water use from other potable water supplies if the precipitation collection is supplemented. Water use will be categorized by use if application varies.
    e) Comparison of actual consumptive use by category of use to estimated water budgets. Estimate amount of water conserved as a result of the precipitation harvesting.
    f) A landscape maintenance assessment of quality of the landscapes, maintenance issues encountered, and any necessary replacement of plantings. The results of the irrigation system audit and corresponding actions.
    g) Cost to date including design, infrastructure, operations, and maintenance costs. Estimated costs to implement precipitation harvesting system per acre-foot of water saved; and comparison of original projected and actual costs from implementing the precipitation harvesting systems. The cost comparison will include institutional, legal, technical/design, infrastructure, and augmentation water supplies.

4. A description of the climate and hydrologic data collected to characterize the preexisting, natural vegetation conditions including:
    a) A description of the methodology and analysis results toward providing information about the technical ability to reasonably quantify the site-specific amount of precipitation that, under preexisting natural conditions, accrues to the natural stream system via surface and ground water return flows.
    b) A description of the baseline set of data and sound, transferrable methodologies used for measuring local weather and precipitation patterns that account for variations in hydrology and precipitation event intensity, frequency, and duration.
    c) Descriptions of the methodology and analysis results quantifying preexisting natural vegetation consumption; measuring precipitation return flow amounts; identifying surface versus ground water return flow splits; and identifying delayed ground water return flow timing to receiving streams.

d) Quantification of the amount of precipitation that must be augmented to prevent injury to decreed water rights.
e) Description of the location and methods used to collect climate data measurements, with a summary of data including, at a minimum, temperature and precipitation