DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WATER RESOURCES

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To: Veva DeHeza, Section Chief, Office of Water Conservation & Drought Planning, CWCB
From: Kevin G. Rein, Assistant State Engineer *Kevin G. Rein*
Subject: Sterling Ranch Precipitation Harvesting Pilot Project Application

I have reviewed the March 1, 2010 application from Sterling Ranch ("Applicant") for consideration as a precipitation harvesting pilot project as allowed by HB09-1129. My review included a general review of the entire application and a more detailed review of the application document's **Section 6.0 Pilot Project**. My objective in reviewing Section 6.0 was to evaluate whether the applicant had met Eligibility Requirements 8 and 9 in the *Criteria and Guidelines for the Rainwater Harvesting Pilot Project Program.* For convenience, I have summarized those two requirements below.

The application must include:

8. A description of how the rainwater harvesting pilot project will meet the purposes of the rainwater harvesting pilot program per Section 37-60-115(6)(a), C.R.S. Data collection, reporting, and analysis methods may include but not be limited to:
   a. Determining local weather and precipitation patterns that account for variations in hydrology and precipitation event intensity, frequency, and duration.
   b. Quantifying preexisting, natural vegetation consumption.
   c. Measuring precipitation return flow amounts.
   d. Identifying surface water versus ground water return flow splits.
   e. Identifying delayed ground water return flow timing to receiving streams.
   f. Quantifying the amount of precipitation that must be augmented to prevent injury to decreed water rights.
9. A summary of an SWSP application that demonstrates the applicant can meet the requirements of the *General Guidelines for Substitute Water Supply Plans Submitted to the State Engineer Pursuant to Section 37-92-308, C.R.S. (2003).* The summary shall contain, at a minimum, an explanation of how the applicant will engage resources necessary to determine 1) the maximum amount of precipitation that will be captured during the year, 2) the timing with which that entire amount of precipitation would accrue to the stream system through overland flow and deep percolation, 3) the potential sources of

replacement water that will be available to replace those depletions at the appropriate locations, and 4) how the plan will be operated. The CWCB will not consider a pilot project for selection if, in consultation with the State Engineer, it determines that the applicant does not have the resources to develop a viable SWSP for approval.

These eligibility requirements were written with due appreciation for the sequence of a potential pilot project's development in that the requirements do not require, for example, an approved SWSP rather an explanation of how an applicant plans to engage the appropriate resources to ensure an SWSP will be submitted that can be approved. It is also in that context that I reviewed the application.

The Applicant describes a plan to conduct monitoring of Natural Conditions at the Pilot Project location, Experimental Precipitation Harvesting Designs, and New Precipitation Harvesting Designs. For monitoring the Natural Conditions, the Applicant has identified two study basins within the Pilot Project area where a phased implementation for monitoring climate, precipitation, evapotranspiration, surface water, and ground water would be used.

To accomplish climate monitoring, the Applicant will install a climate monitoring station at the Sterling Ranch site. The station may collect data regarding solar radiation, air temperature, wind speed, relative humidity/vapor pressure, and precipitation. This data will allow characterization of local weather patterns and estimates of native evapotranspiration. For direct evapotranspiration motoring, the Applicant proposes a lysimeter to be located near the climate monitoring station. To accomplish precipitation monitoring, the Applicant proposes a series of rain gauges throughout the Pilot Project site and to accomplish surface flow monitoring, the Applicant proposes three surface water monitoring stations in the two study basins. The ground water monitoring approach is not as certain according to the application, relying on data from existing wells, the lysimeter, or possibly new monitoring wells for various components of the ground water flow characteristics.

The monitoring programs, therefore, show a well-contemplated approach to meeting the expectations in Eligibility Requirement 8.

Eligibility Requirement 9 identifies the expectations of an application in regard to the substitute water supply plan ("SWSP") that will be a necessary component of any pilot project. **Section 7.0 Appendix**, presents the Applicant's summary of an SWSP to the extent described in Eligibility Requirement 9. All of the monitoring components, with the exception of evapotranspiration monitoring, will be necessary for the initial SWSP. Beyond that, the important factors for a viable SWSP are a plan for operation developed using experience in hydrology/engineering, experience with the water administration requirements that must be addressed in an SWSP, and a source of replacement water. Inherent in the experience requirement is the understanding that the components of precipitation harvesting used in the Pilot Project and the measurement, analysis, and results are combined to result in an SWSP that accurately identifies the amount of water diverted out of priority, the timing and location with which that water would have become a part of the surface water system, and a means to replace that water with reliable sources. The Applicant presented a summary of an SWSP approach that shows an understanding of these key components and, at least to this point, has contracted with a

consultant known to be experienced in water rights, water administration, hydrology/water resource engineering, and SWSP development.

Therefore, based on my review of the application, I can state that the Applicant has satisfied Eligibility Requirements 8 and 9. Pending confirmation of the Applicant having satisfied other Eligibility Requirements, I recommend approving Sterling Ranch's application to be considered as a precipitation harvesting pilot project.