

**Exhibit U309**

**Supplemental Technical Memorandum to**  
*Infiltration Potential of Precipitation Falling on Developed Lands*  
*and the Fate of Applied Groundwater within UWCD*  
*(September 2013)*

**United Water Conservation District**

**May 2014**

*This Supplemental Technical Memorandum is preliminary and is subject to modification based on future analysis and evaluation. This document has been prepared for the use of the Board of Directors of United Water Conservation District.*

## Supplemental Technical Memorandum to

### *Infiltration Potential of Precipitation Falling on Developed Lands and the Fate of Applied Groundwater within UWCD*

The United Water Conservation District (UWCD or District) Board of Directors is authorized to establish groundwater extraction fees (dollars/acre-foot of pumped groundwater) in conjunction with the annual budget review and approval process. Per Water Code Section 75594, the ratio between municipal and industrial (M&I) to agricultural (AG) extraction rates can vary from 3:1 to 5:1 at the discretion of the Board of Directors.

The September 2013 Technical Memorandum, *Infiltration Potential of Precipitation Falling on Developed Lands and the Fate of Applied Groundwater within UWCD* assessed the infiltration potential of precipitation falling on developed lands, and the fate of applied groundwater used for beneficial uses both in urban environments and on agricultural lands (UWCD, 2013). Soil infiltration capacity, land use (agricultural vs. urban), groundwater basin setting (unconfined vs. confined), and UWCD infrastructure operations are considered in the analyses. The memorandum was prepared to provide the UWCD Board of Directors with additional planning information to be considered during the ratio selection process for the fiscal year 2013-2014 budget. It was also prepared to provide justification for rates (ratios) adopted by United's Board in the recent years prior to the fiscal year 2013-2014 budget.

This May 2014 Technical Memorandum is supplemental to the September 2013 Technical Memorandum. It supports the analyses and conclusions offered in the September 2013 Technical Memorandum as being valid for consideration by the District's Board of Directors for planning purposes including establishing rates for the fiscal year 2014-2015 budget. Key criteria used to evaluate the continuing validity of the September 2013 Technical Memorandum included:

- ✓ *Is the precipitation record used in the September 2013 Technical Memorandum suitable for evaluation of future years and specifically fiscal year 2014-2015?*
- ✓ *Have land use patterns changed significantly since the September 2013 Technical Memorandum was prepared?*
- ✓ *Have UWCD infrastructure operations changed since the September 2013 Technical Memorandum was prepared?*

Each of these criteria is discussed in the following sections.

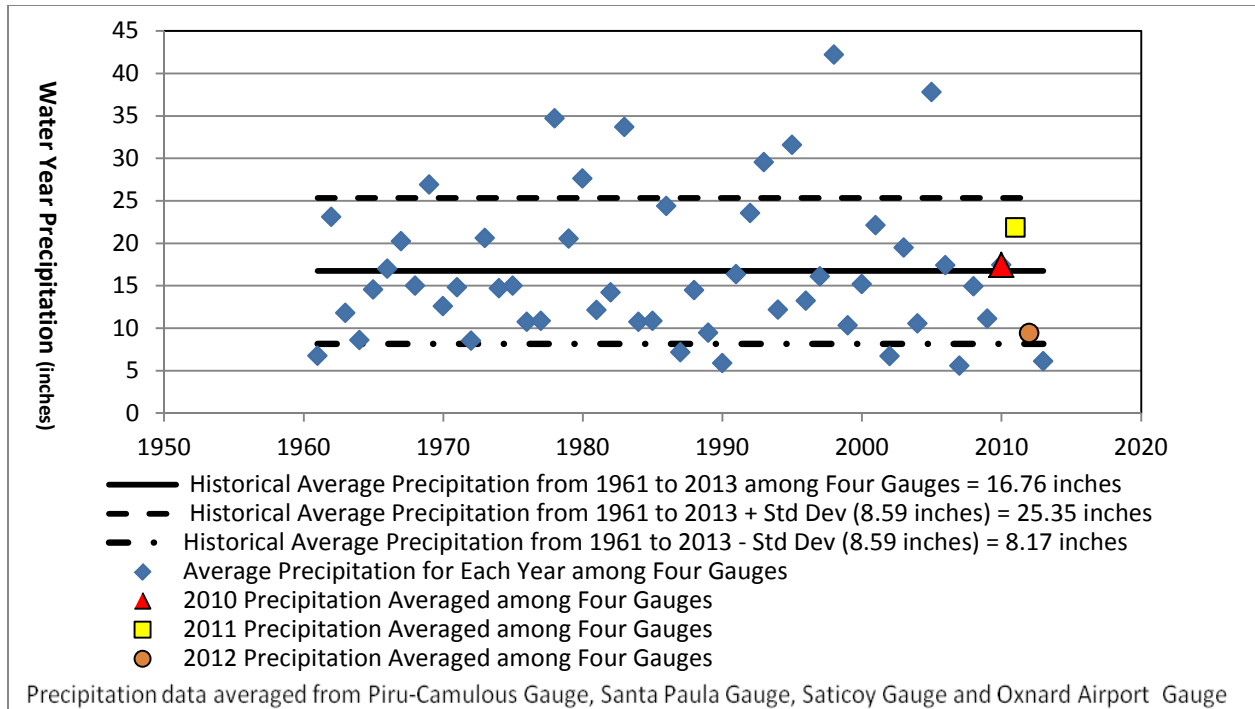
**Precipitation:** The precipitation data shown in Figure 1 were derived by averaging annual water-year precipitation totals from the four precipitation gauges which were evaluated for the precipitation infiltration analysis in the September 2013 Technical Memorandum. Three of the

four gauges have historically had more than one location. The periods of record for each gauge are shown in Table 1. The data from the years 1961 to 2013, which were inclusive to all four gauges, were averaged.

Figure 1 shows the annual precipitation for the years 2010, 2011 and 2012. It shows that 2010 precipitation was near the long-term average, that 2011 was a wet year with precipitation above the long-term average, and that 2012 was a dry year with precipitation below the long-term average. It also shows that the average precipitation for the years 2010, 2011 and 2012 is 16.24 inches which closely approximates the long-term average precipitation of 16.76 inches. These three years evaluated in the 2013 Technical Memorandum can therefore be considered precipitation years that represent average, wet and dry conditions within the historical long-term precipitation record. These three years represent a range of precipitation that is not extreme, but does encompass a large range of the historical precipitation record and are representative of precipitation amounts that could reasonably be expected to fall within any given year.

**Table1. Precipitation Gauges, Period of Record (VCWPD, 2014)**

<b>Gauge Name</b>	<b>Groundwater Basin</b>	<b>Station Number</b>	<b>Historical Record</b>
Piru Camulos	Piru	101	1929-1974
Piru Camulos	Piru	101A	1975-2013
Santa Paula	Santa Paula	245	1961-1986
Santa Paula	Santa Paula	245A	1987-2010
Santa Paula	Santa Paula	245B	2011-2013
Saticoy	Oxnard Forebay	175	1957-2008
Saticoy	Oxnard Forebay	175A	2009-2013
Oxnard Airport	Oxnard Plain	168	1957 -2013



**Figure 1. Annual Precipitation Data from 1961 to 2013**

**Operations:** It is also appropriate that the 2013 Technical Memorandum evaluated recent years that reflect current operational practices at the Freeman Diversion. Since 2008, UWCD has been more aggressive in its diversion practices by initiating diversions earlier in the storm when flows are higher and water remains very turbid. Prior to 2008 this sediment-laden river water was not diverted at the Freeman Diversion. However, new regulatory requirements for fish passage and migration opportunities have forced United to operate differently than in the past. The 2013 Technical Memorandum considered United’s actual diversions during each storm in 2010, 2011 and 2012. It would be inappropriate to use diversion records from earlier years as United’s operations have changed and hypothetical operations would have to be used instead of actual records of United’s past operations. Likewise, it is not anticipated that these operational parameters would change in FY2014-2015 and probably not until the completion and acceptance of a Multispecies Habitat Conservation Plan (MSHCP) by National Marine Fisheries Service (NMFS). The HCP is currently under development.

**Land Use:** The years 2010, 2011, and 2012 evaluated in the 2013 Technical Memorandum are concurrent with the latest available land use data sets. Detailed urban land use mapping for Ventura County was last updated by the Southern California Association of Governments in 2008. A revision to those records is under development but it is not yet available. Areas of agricultural land use were determined using the Ventura County Agricultural Commissioner’s CropsNow mapping for 2013, which maps active orchard and crop production areas (instead of the entire area of the parcel as does SCAG). The pace of urban development in southern

Ventura County has been modest in recent years, and United considers the mapping used in the 2013 Technical Memorandum to be the best available detailed land use mapping, and reasonably representative of current conditions within the District.

**Summary:** The analyses of potential groundwater recharge in the September 2013 Technical Memorandum, *Infiltration Potential of Precipitation Falling on Developed Lands and the Fate of Applied Groundwater within UWCD*, evaluated climatic conditions that existed during the years 2010, 2011 and 2012. The climatic conditions which existed in 2010 (an average precipitation year), 2011 (a non-extreme wet precipitation year) and 2012 (a non-extreme dry precipitation year) represent a range of precipitation that could reasonably be expected to occur in any given year. United's current operational practices at the Freeman Diversion remain the same as they were in those years, and land use has not changed significantly. Therefore it is Staff's opinion that the analyses and conclusions offered in the September 2013 Technical Memorandum remain valid for consideration by the District's Board of Directors for establishing rates for the fiscal year 2014-2015 budget. The conclusions offered in the Technical Memorandum are important input variables used by UWCD's cost-of-service and rate consultants in their analyses of UWCD's proposed groundwater extraction rates.

**References:**

United Water Conservation District, 2013, *Infiltration Potential of Precipitation Falling on Developed Lands and the Fate of Applied Groundwater within UWCD*, Technical Memorandum, September 2013.

Ventura County Watershed Protection District, 2014, Precipitation records from the District's website: [http://www.vcwatershed.net/hydrodata/php/getstations.php?dataset=rain\\_day](http://www.vcwatershed.net/hydrodata/php/getstations.php?dataset=rain_day)