CHINO BASIN
RECYCLED WATER GROUNDWATER RECHARGE PROGRAM

START-UP PERIOD REPORT FOR RP3 BASIN

December 15, 2010

Inland Empire Utilities Agency
P.O. Box 9020
Chino Hills, CA 91708
909.993.1740

Chino Basin Watermaster
9641 San Bernardino Road
Rancho Cucamonga, CA 91730
909.484.3888

December 15, 2010

Regional Water Quality Control Board, Santa Ana Region
Attention: Mr. Gary Stewart
3737 Main Street, Suite 500
Riverside, California 92501-3348

Subject: Transmittal of the Start-Up Report for RP3 Basin Chino Basin Recycled Water Groundwater Recharge Program

Dear Mr. Stewart:

The Inland Empire Utilities Agency (IEUA) and the Chino Basin Watermaster (CBWM) hereby submit the *Start-Up Report for RP3 Basin* for the *Recycled Water Groundwater Recharge Program* being implemented by IEUA and CBWM. This document is submitted pursuant to requirements in the following documents:

- California Regional Water Quality Control Board, Santa Ana Region, Order No. R8-2007-0039 Water Recycling Requirements for Inland Empire Utilities Agency and Chino Basin Watermaster, Chino Basin Recycled Water Groundwater Recharge Program, Phase I and Phase II Projects, June 29, 2007,
- California Regional Water Quality Control Board, Santa Ana Region, Monitoring and Reporting Program No. R8-2007-0039 for Inland Empire Utilities Agency and Chino Basin Watermaster Chino Basin Recycled Water Groundwater Recharge Program Phase I and Phase II Projects San Bernardino County,
- California Regional Water Quality Control Board, Santa Ana Region, Order No. R8-2009-0057, Amending Order No. R8-2007-0039, Water Recycling Requirements For Inland Empire Utilities Agency and Chino Basin Watermaster Chino Basin Recycled Water Groundwater Recharge Program Phase I and Phase II Projects, San Bernardino County, October 23, 2009, and
- IEUA and CBWM, 2009, Start-Up Protocol Plan for RP3 Basin, April 4, 2009.

The following items highlight the Start-Up Report findings of the RP3 Basin:

- The start-up period for RP3 Basin was June 2009 through June 2010 and was extended beyond 180 days to allow for subsurface travel time estimation using EC of storm water recharged during the 2009/10 winter rains.
- RP3 Basin consists of four recharge cells. The start-up period was conducted in cell 1.
- Measured infiltration rates for the RP3 Basin range from 1.0 and 4.0 feet per day and depend on the area and depth of water.

Inland Empire Utilities Agency
P.O. Box 9020
Chino Hills, CA 91708
909.993.1740

Chino Basin Watermaster
9641 San Bernardino Road
Rancho Cucamonga, CA 91730
909.484.3888

- Electrical conductivity (EC) is an effective tracer of recycled water in samples collected from the lysimeters, and is useful for estimating travel times to various depths.
- Recharged recycled water was observed at all lysimeters depths at RP3 Basin. Recharge water moves downward through the soil over a period of approximately 30 days to the 25-foot deep lysimeter then slowing to 75 days for the 35-foot deep lysimeter. Travel time to groundwater at monitoring well RP3-1 is approximately 100 days.
- Soil-Aquifer Treatment (SAT) was very effective at removing total organic carbon (TOC) in the upper 35 feet of sediment at RP3 Basin and this depth is recommended as the compliance sampling point for the initial year of monitoring.
- Increased TOC removal with each sampled depth indicates that further reduction in TOC may occur with depth beyond 35 feet. RP3 Basin achieved 88% SAT efficiency for TOC removal by a depth of 35 feet.
- Based on 1.0 mg/L of TOC for the 20-sample rolling average at the 35-foot lysimeter, a maximum Recycled Water Contribution (RWC) limit of 50% as defined by the equation in the recharge program's permit, RWC limit = RWC average / 0.5 mg/L.
- SAT is effective at removing total nitrogen (TN) in the upper 35 feet of sediment at RP3 Basin. The observed SAT efficiency for TN removal was 31%. Low initial surface water TN (average 2.9 mg/L) is the reason the SAT efficiency for TN is lower than that for TOC. All measured surface water TN values where within the TN compliance limit of 5.0 mg/L without SAT.
- While recharged recycled water does occur at all lysimeter depths and while SAT is most effective at TOC removal by the 35-foot depth, an alternative monitoring plan is proposed for RP3 Basin due to the 75 day travel time to 35 feet.
- Due to the long travel time to 35 feet, the proposed alternative monitoring plan includes monthly monitoring of the 35-foot deep lysimeter for TOC, TN, and EC rather than weekly sampling. The monitoring schedule would be conducted during the initial year of recycled water recharge at the RP3 Basin. If sufficient SAT is demonstrated in this initial year, the alternative monitoring plan proposes compliance monitoring from samples collected from the recycled water distribution pipeline and applying a performance-based TOC correction factor determined from past lysimeter monitoring.
- The Start-Up Period Report includes an RWC Management Plan to forecast the next 120 months of recharge with recycled water recharge to maintain compliance with a 50% RWC limit. All RWC Management Plans are updated annually with current data and presented in the Annual Report of the Recycled Water Groundwater Recharge Program.

If you have any questions, please do not hesitate to call us.

Best regards,

Patrick O. Sheilcs
Executive Manager of Operations

Kenneth R. Manning
Chief Executive Officer

Inland Empire Utilities Agency
P.O. Box 9020 9641
Chino Hills, CA 91709
909.993.1740

Chino Basin Watermaster
San Bernardino Road
Rancho Cucamonga, CA 91730
909.484.3888

Table of Contents

List of Appendices

LIST OF TABLES

LIST OF FIGURES

1. Introduction

Inland Empire Utilities Agency (IEUA) and Chino Basin Watermaster (CBWM) are co-permit holders for the Chino Basin Recycled Water Groundwater Recharge Program. IEUA and CBWM maintain and operate the program's recharge facilities together with Chino Basin Water Conservation District and San Bernardino County Flood Control District. The recharge program is an integral part of CBWM's Optimum Basin Management Plan goals of enhancing water supply reliability and improving groundwater quality in the Chino Basin. These goals are to be met by increasing the recharge of stormwater, imported water, and recycled water.

IEUA initiates groundwater recharge using recycled water at permitted recharge sites by following and reporting on a minimum 6-month long start-up period of recycled water delivery and intensive water quality testing. The locations of Recycled Water Recharge Program basins including RP3 Basin are shown on Figure 1-1. The RP3 Basin was constructed under the Chino Basin Facilities Improvement Project following the release of the Chino Basin Phase I Recycled Water Recharge Project Title 22 Engineering Report (CH2MHill, 2003).

The RP3 Basin Start-Up Period was conducted in accordance with the protocols approved by California Department of Public Health (CDPH) [formerly California Department Health Services (CDHS)] and set forth in the Start-Up Protocol Plan for RP3 Basin (IEUA 2009). This report documents the testing results, the soil-aquifer treatment (SAT) efficiencies at RP3 Basin for the removal of total organic carbon (TOC) and total nitrogen (TN), and the subsequent determination of the maximum recycled water contribution (RWC) limit associated with the reduced TOC concentrations at a chosen compliance point (e.g. a lysimeter or monitoring well).

1.1 Requirements of Order No. R8-2007-0039

The Chino Basin Recycled Water Groundwater Recharge Program is subject to the following requirements set forth by the Regional Water Quality Control Board Santa Ana Region:

- Order No. R8-2007-0039 Water Recycling Requirements for Inland Empire Utilities Agency and Chino Basin Watermaster, Chino Basin Recycled Water Groundwater Recharge Program, Phase I and Phase II Projects, June 29, 2007,
- Monitoring and Reporting Program No. R8-2007-0039 for Inland Empire Utilities Agency and Chino Basin Watermaster Chino Basin Recycled Water Groundwater Recharge Program Phase I and Phase II Projects, June 29, 2007, and
- California Regional Water Quality Control Board, Santa Ana Region, Order No. R8-2009-0057, Amending Order No. R8-2007-0039, Water Recycling Requirements for Inland Empire Utilities Agency and Chino Basin Watermaster Chino Basin Recycled Water Groundwater Recharge Program Phase I and Phase II Projects, San Bernardino County, October 23, 2009.

Recharge using recycled water at the RP3 Basin was originally permitted under Order No. R8-2005-0033, which covered Phase I recharge sites and subsequently under Order No. R8-2007-0039, which covers both Phase I and Phase II recharge sites. Order No. R8-2007-0039 Section F.4 describes the requirements for the Start-Up Period Report:

> The Start-Up Period report shall include: site specific determinations of percolation rates, soil aquifer treatment efficiency and optimum depths and locations of lysimeters to obtain representative compliance samples of recycled water after soil aquifer treatment. The report shall specify the date that the Start-Up Period ended. The report shall make recommendations for final compliance lysimeter placement and the monitoring plan to be employed during the initial year of operation, the initial year maximum average RWC and corresponding TOC limit, and generalized method that will be used to track recharge water in the vadose zone. The analytical results from weekly lysimeter samples shall be evaluated and reported along with conclusions regarding soil aquifer treatment (SAT) performance. This report is subject to approval by the CDHS [sic, now CDPH] and the Regional Board Executive Officer. The report recommendations shall be implemented upon approval.

Order No. R8-2009-0057 amended R8-2007-0039 to extend the previously 60-month volume-based RWC compliance calculation to 120 months and to allow that RWC calculation to include groundwater underflow as diluent water.

1.2 Organization of the Start-Up Report

Section 2 of this report describes the installation of the lysimeters and monitoring well. Section 3 details the recharge operations during the start-up period. Sections 4 and 5 discuss the lysimeter sampling and monitoring results and the SAT efficiency in terms of TOC and TN removal. Section 6 describes the determination of the start-up period and recommendation of the compliance point. Section 7 discusses the determination of the basin's maximum RWC limit and a RWC Management Plan to ensure that the RWC limit is not exceeded in the future. Section 8 is a proposed water quality monitoring plan for the first year after the start-up period, and Section 9 lists cited references.

2. Lysimeter and Well Installation

Figure 2-1 shows the location of the lysimeter cluster and nested monitoring well used to collect water samples during the RP3 Basin start-up period. Also shown on Figure 2-1 are the four cells making up the RP3 Basin, the rubber dam storm water diversion from Declez Channel, the internal distribution channel and piping used to route water at RP3 Basin, and the pipeline used to deliver water pumped from Jurupa Basin.

In January 2009, a cluster of five lysimeters were installed along the south side bottom of RP3 Basin cell 1 at a ground elevation of approximately 947 feet above Mean Sea Level. The lysimeter cluster is comprised of individual lysimeters at depths of 5, 10, 15, 25, and 35 feet. The lysimeter construction drawings are included in Appendix A. The RP3 Basin lysimeter construction process is summarized in the *Start-Up Protocol Plan for RP3 Basin (*IEUA, 2009). Throughout the report text, tables, and figures, water samples from the lysimeters are referred to as RP3-xx, where xx equals the nominal depth of the porous tip of the lysimeter below ground surface (bgs). Depending on context, the surface water samples collected at each lysimeter are referred to as a 0-depth sample or surface water sample. These samples represent grab samples of surface water collected from the basin near the lysimeter installation. During the start-up period, surface water depth in RP3 Basin cell 1 varied from about 1 to 4 feet.

Monitoring well RP3-1 was constructed in July 2007 and is located in Hemlock Avenue directly west of RP3 Basin cell 1. The monitoring well consists of two casings which are named RP3-1/1 for casing 1 (screened from 242 to 262 feet) and RP3-1/2 for casing 2 (screened from 290 to 310 feet). The top of the well casings are both approximately 950 feet above Mean Sea Level. At the time of construction, depth to water was approximately 240 feet below the top of both the RP3-1/1 screen.

3. Recharge Operations

3.1 Volume of Historical Diluent Water Recharged

Recharge in RP3 Basin was estimated from field observations and recorded water depths from storm water activities and from periodic stream gauging of dry weather flows. Table 3-1 lists the historical diluent water recharge volumes at RP3 Basin (cells 1 through 4 combined) for July 2005 through June 2010. Diluent water is all water recharged that is not recycled water, that is imported water and locally originating water (dry weather and stormwater flows).

The RP3 Basin site was developed as part of the CPFIP basin improvements and prior to 2005 was not operated as a groundwater recharge facility. For the first few years of operation, the RP3 Basin diluent water recharge ranged from 237 to 767 acre-feet per year. Beginning in February 2009, diversions of stormwater to Jurupa Basin were allowed by San Bernardino County Flood Control District with the subsequently pumping of these diversions to RP3 Basin. In one season of storm water pumping from Jurupa Basin, diluent water recharge at RP3 Basin was increased to 1,906 acre-feet (fiscal year 2009/10).

Although not tabulated as in-basin recharge in Table 3-1, groundwater underflow will be credited as diluent water in the 120-month running average RWC calculation (discussed in Section 7). For RP3 Basin, groundwater underflow is estimated at 10,845 acre-feet per year (904 acre-feet per month) using an approved methodology (NWRI, 2010). RP3 Basin groundwater underflow is also eventually underflow to the downgradient Declez Basin and will thus be shared with Declez Basin in RWC calculations once recycled water is recharged at both basins. Direct recharge of diluent and recycled water and at RP3 Basin will only be included in the RWC calculations for the RP3 Basin and not for Declez basin.

3.2 Recharge Operations during the Start-Up Period

Water delivered to RP3 Basin during the start-up period included recycled water, local runoff and stormwater from San Sevaine Channel (to cell 1)), and stormwater and local runoff from Declez Channel (to cells 1, 2, 3, and 4). A conveyance pipeline and distribution channel are used at the RP3 Basin to route water flows by gravity between cells. Recycled water is delivered to RP3 Basin from discharges to the San Sevaine Channel via the Jurupa Basin pump station and pipeline. Stormwater recharge was estimated using observed increases in water depth correlated with the depth-to-volume relationship of the basin's stage-storage curve. A correction for infiltration during storms was applied using the basin's measured infiltration rates and the storm duration. Stormwater capture pumped from Jurupa Basin was metered. Table 3-2 lists daily water deliveries to RP3 Basin during the start-up period. Table 3-3 lists the monthly deliveries during the start-up period and the 120-month running average of percent recycled water to the total recharge, as will ultimately be required for the maximum RWC limit compliance. Groundwater underflow is included as a diluent water source in the RWC calculation in Table3-3 beginning October 2009 as this is the month the recharge permit was amended to allow such use (RWQCB, 2009).

3.3 Estimated Infiltration Rates

Infiltration rates of RP3 Basin cells were measured and generally range from 1.0 to 4.0 feet per day. Table 3-4 contains observed infiltration rates and data used to make these estimates. Rates labeled as RP3-1A&B were calculated with cell 1A (west half) and cell 1B (east half) in hydraulic connection (flow gate open between cells). Infiltration rates can vary by individual cell due to water depth and seasonal impacts. For instance, deeper water can contact higher infiltration rate soils not yet adversely impacted by fine-grained sediment introduced by storm water and thereby periodically have higher rates. Rates in Table 3-4 are measured during periods without water inflow.

4. Surface Water and Lysimeter Sampling Results

4.1 Surface Water Lysimeter, and Monitoring Well Sampling Results

The monitoring schedule from the CDPH-approved *Start-Up Protocol Plan for RP3 Basin* (IEUA, 2009) included weekly sampling for surface water and lysimeter water, and analyses for:

- Electrical Conductivity (EC),
- TOC,
- Nitrate as Nitrogen (NO_3-N), Nitrite as Nitrogen (NO_2-N), Ammonia as Nitrogen (NH_3-N), and Total Kjeldahl Nitrogen (TKN), and
- TN, calculated as the sum of NO_3-N, NO_2-N and TKN.

Monitoring well RP3-1 was also monitored approximately every two weeks for these same water quality parameters. These lysimeter and monitoring well data are summarized in Tables 4-1 through 4-4. While time-series graphs and tabularized data are presented in this section, they are interpreted and discussed in Section 5 (Soil-Aquifer Treatment Efficiency) and Section 6 (Start-Up Period).

All non-detect results for nitrogen speciation are summed for TN at half the species detection limit. TN results that are non-detect (<0.6 mg/L) are graphed and averaged at half the detection limit. If not all nitrogen species results are non-detect and the sum of their concentrations is less than 0.6 mg/L and greater than 0.3 mg/L, then TN is reported as <0.6 mg/L but graphed and averaged with the summed value. If there is insufficient sample to analyze for TKN, then NH_3-N is substituted for TKN into the calculation of TN. This is done as the other components of TKN (e.g. organic nitrogen and NH_4-N) are typically removed during the wastewater treatment process. If there is insufficient sample to analyze for NO_3-N, TKN, or NH_3, then TN is not calculated.

Time series graphs of EC from RP3 Basin lysimeters and monitoring well are presented on Figure 4-1a and Figure 4-1b, respectively. Time series graphs of TOC from RP3 Basin are presented on Figure 4-2a and Figure 4-2b. Time series graphs of TN from RP3 Basin are presented on Figure 4-3a and Figure 4-3b. In the upper part of all of the time-series graphs, horizontal series denote periods when various sources of water were routed into RP3 Basin.

Changes in source waters recharged at RP3 basin were detected at each of the lysimeters based on comparing the measured EC values at the lysimeters with measured EC values of the source waters. Table 4-2a includes the calculated percentage of recycled water for each of the samples from the 25-foot lysimeter. The percent recycled water in the samples was calculated (as discussed in Section 5.1) by comparing the EC values of diluent water and recycled water delivered to the basin. The percent recycled water at the 35-foot lysimeter while present was not calculated because the EC of the delivered recycled water fluctuated quicker than the EC at the 35-foot lysimeter. The 35-foot lysimeter EC shows a less instantaneous and a more gradual blending of recharge water sources over the 75 day travel time to this depth as is discussed further in the following subsection.

4.2 Recharge Travel Times

The travel time for recharge water to reach the various sample depths is critical to the evaluation of the start-up period data and development of future monitoring protocols. Surface water travel times to the lysimeters were evaluated to identify offset times for the pairing of surface and lysimeter data. Travel time data are also important for the development of monitoring plans such that the collected lysimeter or monitoring well samples can be referenced to a prior surface water sample. Travel times along recharge flow paths were estimated by comparison of EC time-series variations of surface water and of water at the lysimeter and monitoring well.

Exact matching of water parameter concentrations is not always possible due to many reasons, including but not limited to the following:

- Daily recharge volumes over the study period are not constant, resulting in variations in surface water depth and percent water saturation of underlying soils.
- Recharge waters blend with water already in the soil which mute chemical changes with depth from those observed in the surface water.
- Seasonal water quality changes (such as in EC) in background groundwater at monitoring wells can be more significant than changes observed in the vadose zone using the overlying lysimeters.

The initial arrival or indication of a parameter with increased depth can represent the quickest travel time, but the peak arrival may be delayed and be more suitable for purposes of sample comparison. While intrinsic parameters such as EC can be used to estimate travel times because it is relatively conservative, the parameters TOC and TN are not suitable tracers, because their concentrations change through SAT.

4.2.1 Lysimeter Monitoring

Recharge travel times from the basin to the various depth lysimeters can typically be estimated by observation of delays in transition from lower EC diluent water to higher EC recycled water. Unfortunately, prior to the delivery of recycled water to the RP3 Basin, diluent water was not available. Thus accurate travel times could not be observed until the onset of regular storm events in December 2009 that lasted through April 2010. Following discussions with CDPH, the start-up period duration was thus extended to allow for measuring travel times of the lower EC stormwater diluent through the various lysimeter depths. The travel time estimates can however vary throughout the start-up period depending on changes in basin operation and the blends of various sources in the surface water. Evaluation of the lysimeter EC data shows that all of the lysimeters responded to changes in source water EC as recharged in the RP3 Basin.

From the correlation of EC changes, the general travel times to the 5, 10, 15, 25, and 35-foot lysimeters are estimated to be approximately 10, 14, 24, 30, and 75 days, respectively. Travel times to the 5-, 10-, 15- and 25-foot lysimeters are best evaluated by tracking the pulses of lower EC water recharged during the 2009-10 storm season, as can be observed on Figure 4-1a. Estimating travel time of individual storms to the 35-foot lysimeter could not be done as the peaks of higher EC recycled water and the and troughs of lower EC stormwater are all blended together by this depth and produce one generally continuous lowering and then increasing of EC during the storms season. Near the initiation of the start-up period, EC at the 25-foot and 35-foot lysimeters shows a rise and then stabilization of EC which can be used to estimate the travel time from 25 to 35 feet. Comparison of these trends indicates approximately 45 days to travel from 25 to 35 feet. A travel time of 75 days to the 35-foot deep lysimeter is generally consistent with tracking the lowest value of EC at 35 feet with the lowest value of EC at the shallower lysimeters during the 2009/10 storms. The slower vertical travel time from 25 to 35 feet deep may be due to increased lateral flow of recharge due to increased saturation or lower hydraulic properties of the sediments.

4.2.2 Well Monitoring

Monitoring well RP3-1 is located immediately west of RP3 cell 1. Its two casings, RP3-1/1 and RP3-1/2, are screened from 242 to 262 feet and 290 to 310 feet bgs, respectively. Travel time to a monitoring well can often be characterized by changes in water levels and/or intrinsic water quality parameters of the recharge water, such as EC.

Figure 4-1b is a time series graph of EC in both well casings, but also shows for comparison the EC of contemporary RP3 Basin surface water and of the 25-foot and 35-foot deep lysimeters. The EC of groundwater at monitoring well RP3-1 prior to the start of recycled water recharge ranged from 1,000 to 1,400 µmhos/cm. Recycled water delivered to RP3 Basin generally ranged from 700 to 800 µmhos/cm. On July 17, 2009, the EC of groundwater at well RP3-1/1 began to show a reduction towards that of the recharged surface water (42 days after initiation of recharge). However, this change is too early to correlate with the travel times observed at the lysimeters and may be seasonal in nature. Well RP3-1/2 began a similar EC reduction trend on September 9, 2009 (99 days after initiation of recharge) which correlates well with the initiation of gradual water level rise in both casings. Although there is no causal relationship implied, the EC at both monitoring well casings increased to over 1,200 µmhos/cm at the onset of storm water recharge. The groundwater EC does not appear to correlate directly with the EC of water recharged at RP3 Basin. This implies that recharge water entering the well screen may be influenced by other factors such as mixing with higher EC groundwater or purging of salts from the overlying unsaturated sediments.

As presented in the 2009 Annual Report for the Recycled Water Groundwater Recharge Program (IEUA and CBWM, 2010), water elevations for the two well casings showed no significant change (a 2 feet increase) and suggested that the recharge water may move more laterally away from the RP3 Basin site (rather than mounding) prior to physically reaching the monitoring well screens. The slight water elevation increase in water level which began in 2009 did however continue through July 2010. The Figure 4-4 hydrograph displays an 8-foot increase (from initial conditions) in water elevation (decrease in depth to water) that began approximately 98 days into the RP-3 start-up period. A preferred lateral movement of the recharge mound is also evidenced by the similarity of the water levels in both casings (RP3-1/1 and RP3-1/2), which indicates little to no vertical hydraulic gradient at the site.

Other than the gradual increase, no water level fluctuations were observed that could be attributed to nearby pumping or seasonal/regional recharge. These observations could be interpreted as occurring due to relatively high transmissive sediments where the impacts of groundwater production and regional recharge are significantly dampened. They are also consistent with the well location being hydraulically isolated from regional recharge and groundwater production. The proximity of the RP3 Basin to the crystalline bedrock forming the boundaries of the Chino groundwater basin could help explain a local hydraulic isolation through structural complexities.

Groundwater TOC at well RP3-1/1 shows a generally consistent decrease that begins with the initiation of the start-up period (Figure 4-2b). This initially high groundwater TOC is unrelated to recycled water recharge as the TOC at the lysimeters are less than that observed at the well casings, and the fact that the peak TOC at the well casings occurred prior to the initiation of recycled water recharge at RP3 Basin. While recharge travel time to this depth (minimum 98 days) precludes relating the entire magnitude of the observed groundwater TOC decrease, TOC concentrations in the well casings have remained flow after the initiation of recharge and have not returned to the pre-start up period high of 6 mg/L (RP3-1/1).

TN monitoring at well RP3-1 shows a 60-mg/L seasonal variation of TN in the regional groundwater. TN in the well casings however were as high as 40 mg/L prior to initiation of recycled water and varied from 10 to 30 mg/L prior to the storms of early 2010. In the months following the storm season, TN in the well casings increased dramatically to nearly 70 mg/L. Conversely, the 35-foot lysimeter had a background soil TN of about 20 mg/L prior to recycled water recharge, which decreased as the start-up period progressed. The TN of water in RP3 cell 1 was typically less than 5 mg/L during testing. After 6 months of recharge, the TN at 35 feet was consistently less than 2.5 mg/L (Figure 4-3a and 4-3b).

5. Soil-Aquifer Treatment Efficiency: TOC & TN Removal

SAT is a natural biodegradation process occurring beneath a recharge basin as recharge water flows though shallow soil where TOC and TN concentrations are reduced. As allowed in Order R8-2007-0039, demonstrated SAT reduction of TOC concentration can be a significant influence on the RWC limit based on the formula:

$$TOC_{average} = \frac{0.5mg/L}{RWC_{average}}$$

Figure 5-1 is a graph of the average TOC and TN concentrations as a function of increasing depth at RP3 Basin. Data for this graph come from Table 4-2a and Table 4-4a. The surface water grab sample is represented by the 0-foot depth, while the other depths correspond to the lysimeter depths, in feet. The TOC values plotted correspond to the data after June 30, 2009 when recycled water was first detected at the 35-foot lysimeter though June 30, 2010 the last day of the start-up period. The average TN values exclude the early time data prior to flushing of initially higher background TN in both the 25-foot and 35-foot lysimeters.

At RP3 Basin, SAT removal of TOC and TN continues over time and generates fairly consistent concentrations with depth despite TOC and TN concentration variations in the surface water. Figure 5-1 shows a noticeable decrease in average TOC concentration with increased depth and suggests that while SAT reduction of TOC continues to at least 35 feet bgs, it may continue with greater depth through the unsaturated zone. Depth to groundwater at RP3 Basin during the start-up period was approximately 237 feet bgs. Figure 5-1 also shows a small decrease in the average TN with depth with the exception of at the 25-foot and 35-foot depths which both averaged 2.1 mg/L. The TN values from the lysimeters were consistently less than the 5-mg/L compliance limit during continued operation with recycled water. The TN of both the 25-foot and 35-foot lysimeters (pre-start-up period) initially ranged from 6 to 20 mg/L. However, as will be discussed in the following paragraphs, TN at the 25- and 35-foot depths are consistently less than 5 mg/L after the first 3 months of the start-up period and continuous recycled water recharge.

Figure 4-2a is a time-series graph of TOC from the RP3 Basin surface water and lysimeter samples. Data for this figure are found in Table 4-2a. In the upper part of all the time series graphs presented in this report, horizontal bars denote periods when various sources of water were diverted into RP3 Basin. Note that with each successive depth and over the passage of time, TOC concentrations are generally lower.

SAT efficiency for TOC and TN removal were estimated using the 35-foot lysimeter for the period prior to the storm season when the percent of recycled water delivered daily to the basin was approximately 80% or higher. Long travel times (about 75 days) to the 35-foot depth and the highly variable nature of the surface water EC make individual data point pairing comparisons inappropriate for estimating SAT efficiencies. Instead, the average TOC and TN value from the lysimeter was used for the period when recycled water was known to predominate based on EC. Corresponding average surface water TOC and TN were used for comparison, but with the data range offset backwards 75 days for the travel time to the 35-foot lysimeter. As shown in upper half of Table 5-1, **the SAT efficiencies for TOC removal during this period averaged 88% for the 35-foot lysimeter.**

Figure 4-3a is a time-series graph of TN from the RP3 Basin surface water and lysimeter samples. Data for this figure are found in Table 4-4a. TN concentrations decrease with depth as and recycled water recharge progresses. While TN concentration reduction by SAT does not increase the volume of recycled water that can be recharged under Order R8-2007-0039, it does assist in consistently meeting the TN compliance limit of 5 mg/L. The highest surface water TN during the RP3 start-up period was 4.3 mg/L and thus all surface water TN values where within the TN compliance limit of 5 mg/L without SAT. Surface water TN concentrations were generally much lower averaging 2.9 mg/L.

The pre-start-up period (background) TN of the water within the basin soils (at both the 25- and 35-foot depths) was generally 15-mg/L greater than the TN of the delivered recycled water. Due to initial soil water TN being above that of the delivered recycled water, a shorter period of comparison was used for estimating SAT efficiency for TN removal. Data were only used after the initially higher TN was purged from the soil by recharge recycled water as indicated by the lysimeter TN data being less than or equal the surface water TN. Average TN was calculated from that time until the onset of the storm season. As shown in the lower half of Table 5-1, **the SAT efficiencies for TN removal during this period averaged 31% for the RP3 35-foot lysimeter**. The SAT efficiency for TN is lower than that for TOC predominately due to the already low TN of the surface water.

6. Start-Up Period

6.1 Determination of the Start-Up Period

Order R8-2007-0039 establishes a start-up period for each recharge basin in the Chino Basin Recycled Water Groundwater Recharge Program (Finding 11, page 4):

> . . . a Start-Up Period will be used at the outset of recycled water recharge operations. The purposes of each Start-Up Period are to establish site characteristics, including percolation rates, the physical characteristics of the vadose zone and soil aquifer treatment efficiency, and to establish a sampling regime, based on these characteristics, that is representative of recycled water following soil aquifer treatment. The length of the Start-Up Period at each basin will be contingent on site characteristics, including percolation rates and recycled water transit time in the subsurface. The Start-up Period shall last up to 180 days following commencement of recharge of recycled water to each basin, except if recharge of recycled water at that basin is significantly interrupted, for example due to storm event(s). . . . This Order requires IEUA to submit for CDHS [sic, now CDPH] and Regional Board approval a proposed Start-Up Period protocol at least two weeks prior to beginning each Start-Up Period. A Start–Up Period report will be prepared at the close of each Start-Up Period and will include recommendations for the optimum depths and locations for placement of lysimeters that will be used to measure compliance, and for a compliance-monitoring program. The report will also include recommendations for the maximum running monthly average Recycled Water Contribution and maximum running average Total Organic Carbon (TOC) limit for the initial year of recharge operations following the Start-Up Period.

The start-up period for each basin will be long enough to demonstrate effective TOC removal. As long as TOC concentrations continue to decline over time, the basin is still deemed to be in the start-up period, up to 180 days unless interrupted.

Recycled water start-up period for the RP3 Basin began on June 2, 2009 and ended June 30, 2010. After the initial 180 days (through November 29, 2009), the first rains of the storm season began December 1, 2009 and provided an opportunity to evaluate travel times to the various lysimeter depths. Diluent water was not available prior to the start-up period, which would have allowed such estimates at the beginning of the start-up period. Following discussion with the CDPH, the start-up period was extended through the storm season and then to allow sufficient time to observe recycled water at the lysimeters. The start-up period was thus allowed to continue and ended June 30, 2010.

6.2 Compliance Point Selection

As demonstrated by EC using Figure 4-1a, all lysimeters at RP3 Basin received water representative of recharged water and fluctuate following changes in recharge water EC. There appears to be no geologic features that would cause anomalous results. Travel time does increase with depth. At the 35-foot depth, the lysimeter samples are a blend represented by a few weeks of recharge rather than a distinct recharge volume delivered over days. As discussed previously in Section 5, SAT is quite effective at RP3 Basin and additional reduction of TOC is observed with increasing depth. Therefore, **the 35-foot bgs lysimeter was selected to be the compliance point lysimeter.**

6.3 Alternative Monitoring Plan

Section B.6 of Order R8-2007-00039 allows either lysimeter monitoring or an "alternative-monitoring plan" be used to demonstrate both SAT performance and compliance with requirements of the order. The compliance point may be any point prior to groundwater that is predominately recycled water. Order R8-2007-0039 states in Section B6:

> . . . An alternative-monitoring plan may be approved upon submission of sampling results that demonstrate that an equal level of public health protection is achieved. (See also Provision G.8 and G.9.) Upon development of a soil-aquifer treatment factor using recharge demonstration studies, lysimeter based compliance monitoring may be replaced with recycled water measurements leaving the treatment plant and the application of the treatment factor with prior approval by the CDHS[sic] and the Regional Board Executive Officer.

The need for an alternate monitoring plan at RP3 occurs due to the 75-day travel time between the delivery of water to the RP3 Basin and percolation to the 35-foot deep lysimeter. IEUA and CBWM therefore propose an alternative sampling plan for monitoring recycled water recharge at RP3 Basin. As discussed in Section 5, the SAT is quite effective to the observed depth of 35 feet and likely continues as recharge water migrates downward to groundwater at depths of 240 feet below the RP3 Basin. For the alternative monitoring plan a longer sampling interval than the typical weekly frequency is proposed due to the 75-day travel time to 35 feet. **As an alternate monitoring plan, IEUA and CBWM are recommending that the 35-foot lysimeter be sampled monthly when recycled water has been recharged at RP3 Basin in the past 3 months.** Monthly sampling will occur within 1 week of the 15th of each month as described in Section 8, Initial Year Monitoring Plan.

6.4 Maximum RWC Determination

The maximum RWC is determined as specified within Order R8-2007-0039. Finding 12 of the Order states:

> This Order does not establish maximum average recycled water contributions (RWC) at each basin, but requires the users to determine the maximum average RWC through the Start-Up Period for each recharge basin. The determined RWC must be approved by CDHS [sic, now CDPH] and the Regional Board.

Recycled Water Quality Specification Section A.10 states,

> At each recharge basin, the monthly average TOC concentration of the recycled water prior to reaching the regional groundwater table shall not exceed the average TOC value calculated from the following formula:
>
> TOCaverage = 0.5 mg/L ÷ RWCaverage

Section B.6 of Order R8-2007-0039 states:

> Compliance with average TOC concentration limits specified in Recycled Water Quality Specifications A.11., above, shall be determined based on a lysimeter-based monitoring program performed at each individual recharge basin and allowing for recycled water percolation to the lysimeters to demonstrate soil aquifer treatment efficiency, unless recycled water TOC compliance can be demonstrated prior to recharge. Compliance shall be based on the running average of the most recent 20 lysimeter sample test results representative of recycled water samples.

The 20-sample rolling average TOC concentrations for the 35-foot lysimeter was calculated with the sample data up to the time that stormwater began to influence EC (between September 9, 2009 and February 9, 2010). As shown in Table 5-1, **the 20-sample rolling average TOC**

concentration is 1.0 mg/L. The maximum RWC limit is thus calculated as 50% for the RP3 Basin for monitoring at the 35-foot deep lysimeter. California Draft Groundwater Recharge Regulations and Order R8-2007-0039 limit maximum RWC to 50% for recycled water produced by tertiary treatment.

7. RWC Management Plan

RWC management is needed to keep a basin's volume-based RWC within the maximum RWC limited determined by the 20-sample rolling average TOC. A basin's volume-based RWC is determined by a 120-month rolling average ratio of recycled water volume to total recharge volume. Total recharge volume is the combined recharge volume from all sources including stormwater, local runoff, groundwater underflow, imported water, and recycled water. Per Order R8-2009-0057, during the start-up period and up to 120-months after initiation of recycled water recharge, the volume-based RWC may exceed the maximum RWC limit, but must be within the limit by month 120.

Order R8-2009-0057, Section F.20

> The Discharger shall submit a RWC Management Plan to the CDPH and the Regional Board that includes estimates of future average RWCs based on anticipated recharge operations over the first 120 months of recycled water recharge at each recharge site. The RWC Management Plan shall be submitted with the Start-Up Period Report and updated with IEUA's annual report to the Regional Board during the first 120-months and shall clearly identify the plan to achieve compliance with the maximum recycled water contribution by the 120th month at each recharge site. IEUA shall update the basin-specific RWC plans annually to reflect the estimated diluent water and recycled water contributions for the upcoming year. For the purpose of the diluent water projections, implementation of a weighted averaging should be considered when it is known that imported water supplies will not be available for purposes of recharging the aquifer. The underflow of the Chino Basin aquifer may be used as a source of diluent water. CDPH may consider crediting a fraction of the flow as diluent water, which would be dependent on the accuracy of the method used to measure the flow, its distribution, and the ability to meet the other diluent water criteria in the draft regulation.

An RWC Management Plan is developed for a recharge site by preparing a history of past recharge and then determining future recharge that will keep the volume-based RWC within the maximum RWC limit. Future recharge must be estimated. Future diluent water is estimated based on past availability of the various sources of diluent water and is expressed as monthly averages for the recharge sites historical recharge. Recycled water recharge is then added to the plan at regular intervals to keep the RWC in compliance. The RWC generally has five distinct time periods: 1) Historical Diluent, 2) Start-Up Period, 3) Short-Term Compliance, 4) Start-Up Period Roll Off, and 5) Long-Term Stability.

Historical Diluent Recharge is that period of diluent water recharge prior to initiation of recharge using recycled water. Start-Up Period Recharge is the approximately 6 months of predominately recycled water recharge during the start-up period when a rapid rise in the volume-based RWC may occur. Short-Term Compliance (Interval 3) is the period when the volume-based RWC is brought to within the RWC compliance limit by month 120. Start-Up Period Roll Off (Interval 4) is an approximately 6-month long period when the recharge for the start-up period drops off from the rolling-average RWC and is characterized by a potentially rapid decrease in the volume-based RWC. Long-Term Stability (Interval 5) is the period after the first 120 months of recharge using recycled water when a long-term average diluent water history is available and recycled water deliveries can be regularly scheduled to maintain RWC limit compliance. Intervals 3, 4, and 5 had the potential for more rapid changes in RWC and until the 2009 permit amendment (RWQCB, 2009) allowing underflow as diluent water and a 120-month RWC calculation.

The initial RWC Management Plan for RP3 Basin is presented in Table 7-1 and graphed on Figure 7-1. The first 60 months of historical data are shown on Figure 7-1 as solid lines while the following 120 months of planned deliveries are shown as dashed lines. The RP3 Basin RWC Management Plan will be updated with each annual report of the Recycled Water Groundwater Recharge Program to show current actual recharge and revised planned deliveries.

Of note in the RP3 Basin RWC Management Plan is the incorporation of groundwater underflow as diluent water. Underflow was first used in October 2009 when the recharge permit was amended to allow its use. The groundwater underflow of RP3 Basin is also the underflow for the downgradient Declez Basin. It is estimated that total groundwater underflow to RP3 Basin is 10,845 acre-feet per year (904 acre-feet per month). As shown in Table 7-1 and Figure 7-1, all of the groundwater underflow volume is used in the RP3 RWC actual calculation through mid 2012. At that time, it is presumed that the groundwater underflow will be shared with Declez Basin when recycled water recharge at Declez Basin is initiated in mid 2012. Despite the planned underflow being shown here as 50% for each basin, once recycled water is initiated at Declez Basin, the percent shares for Declez and RP3 Basins will be determined.

8. Initial Year Monitoring Plan

The start-up period reporting requirements include an initial year monitoring plan. As discussed in the prior sections and as shown in the tables and graphs included in this report, recycled water TN compliance criteria are met consistently at all lysimeters and TOC is reduced 88% by SAT at a 35-foot depth. **Due to these outstanding results and trends seen in the lysimeter data, it is recommended that the first year monitoring plan consist of monthly sampling of TOC, TN, and EC from the 35-foot lysimeter. Following confirmation of SAT performance during the initial year of monitoring, it is recommended that the lysimeter monitoring be replaced with monitoring of recycled water from the delivery pipeline. Pipeline monitoring would occur during active delivery of recycled water to RP3 Basin and compliance would be determined by applying SAT correction factors to both the TOC and TN results.**

The SAT correction factor portion of the plan is consistent with the existing alternative monitoring plans for Turner and Ely Basins wherein TN and TOC correction factors are applied to pipeline samples based on SAT efficiency observed during their respective start-up periods. The first year of operation is defined herein to be the 365 days beginning with the recycled water recharge following submission of the Start-Up Period Report. The future pipeline sampling location will be the sampling port on the recycled water pipeline turnout at the RRI Energy (formerly Reliant Energy) cooling water storage pond immediately north of IEUA's Regional Plant No. 4 (RP-4) in Rancho Cucamonga. This is the same sampling point that is used for quarterly and annual sampling. It is the preferred sampling location as it is a common central location for sampling that is already used for compliance monitoring of the Turner and Ely Basins. The delivery pipeline at the RRI sample location generally has daily recycled water flow and typically contains a blend of recycled water from both IEUA's Regional Plant 1 and Regional Plant 4.

9. References

California Regional Water Quality Control Board, Santa Ana Region. 2005. Order No. R8-2005-0033, Water Recycling Requirements for Inland Empire Utilities Agency and Chino Basin Watermaster, Phase 1 Chino Basin Recycled Water Groundwater Recharge Project, San Bernardino County, April 15, 2005.

California Regional Water Quality Control Board, Santa Ana Region, 2007a, Order No. R8-2007-0039, Water Recycling Requirements for Inland Empire Utilities Agency and Chino Basin Watermaster, Chino Basin Recycled Water Groundwater Recharge Program, Phase I and Phase II Projects, June 29, 2007.

California Regional Water Quality Control Board, Santa Ana Region, 2007b, Monitoring and Reporting Program No. R8-2007-0039 for Inland Empire Utilities Agency and Chino Basin Watermaster Chino Basin Recycled Water Groundwater Recharge Program Phase I and Phase II Projects San Bernardino County.

California Regional Water Quality Control Board, Santa Ana Region, 2009, Order No. R8-2009-0057, Amending Order No. R8-2007-0039, Water Recycling Requirements for Inland Empire Utilities Agency and Chino Basin Watermaster Chino Basin Recycled Water Groundwater Recharge Program Phase I and Phase II Projects, San Bernardino County, October 23, 2009.

CH2MHill, 2003, Phase I Chino Basin Recycled Water Groundwater Recharge Project Title 22 Engineering Report, November 2003.

IEUA, 2009, Start-Up Protocol Plan for RP3 Basin, April 4, 2009.

IEUA and CBWM, 2010, Chino Basin Recycled Water Groundwater Recharge Program, 2009 Annual Report, May 1, 2010.

National Water Resources Institute, 2010, Final Report of the February 8-9, 2010, Meeting of the Independent Advisory Panel, for the Inland Empire Utilities Agency's Groundwater Recharge Permit Amendment, April 14, 2010.

Wildermuth Environmental, Inc., 1999, Chino Basin Optimum Basin Management Program, Phase 1 Report, Prepared for the Chino Basin Watermaster, 1999.

TABLES

Table 3-1
RP3 Basin
Historical Diluent Water Recharge
(acre-feet)

Fiscal Year	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
2005/06	31	31	60	78	60	60	33	64	161	127	37	25	767
2006/07	15	36	35	33	36	26	22	19	7	4	2	2	237
2007/08	0	3	3	9	47	108	165	130	5	3	34	4	511
2008/09	9	16	16	13	27	156	12	273	47	18	6	20	613
2009/10	22	30	36	126	100	373	526	370	104	128	49	42	1,906

Notes:
1) Table 3-1 does not list the groundwater underflow volume credited for diluent water.
2) Table 7-1 contains a breakdown of diluent water recharge including stormwater, imported water, and groundwater underflow.

Table 3-2
RP3 Basin
RP3 Basin Daily Water Deliveries During the Start-Up Period

Date	Diluent Water (AF)			Recycled Water
	Import	Local	Total	(AF)
06/01/09	0.0	1.2	1.2	0.0
06/02/09	0.0	1.2	1.2	3.4
06/03/09	0.0	0.9	0.9	1.9
06/04/09	0.0	0.7	0.7	0.0
06/05/09	0.0	0.7	0.7	0.0
06/06/09	0.0	0.7	0.7	0.0
06/07/09	0.0	0.7	0.7	0.0
06/08/09	0.0	0.7	0.7	0.2
06/09/09	0.0	0.7	0.7	6.5
06/10/09	0.0	0.7	0.7	7.7
06/11/09	0.0	0.7	0.7	3.5
06/12/09	0.0	0.7	0.7	7.9
06/13/09	0.0	0.0	0.0	0.0
06/14/09	0.0	0.0	0.0	0.0
06/15/09	0.0	0.2	0.2	0.0
06/16/09	0.0	0.3	0.3	4.0
06/17/09	0.0	0.7	0.7	5.6
06/18/09	0.0	0.7	0.7	8.3
06/19/09	0.0	0.7	0.7	9.1
06/20/09	0.0	0.7	0.7	9.4
06/21/09	0.0	0.7	0.7	7.6
06/22/09	0.0	0.7	0.7	0.7
06/23/09	0.0	0.0	0.0	0.0
06/24/09	0.0	0.2	0.2	0.0
06/25/09	0.0	0.9	0.9	3.6
06/26/09	0.0	1.2	1.2	4.4
06/27/09	0.0	1.2	1.2	11.2
06/28/09	0.0	1.2	1.2	0.6
06/29/09	0.0	1.2	1.2	10.5
06/30/09	0.0	0.8	0.8	0.0
07/01/09	0.0	0.1	0.1	0.0
07/02/09	0.0	1.6	1.6	7.5
07/03/09	0.0	0.0	0.0	0.0
07/04/09	0.0	0.0	0.0	0.0
07/05/09	0.0	0.0	0.0	0.0
07/06/09	0.0	0.1	0.1	0.0
07/07/09	0.0	1.6	1.6	5.9
07/08/09	0.0	1.6	1.6	7.1
07/09/09	0.0	1.6	1.6	6.2
07/10/09	0.0	0.1	0.1	0.0
07/11/09	0.0	0.1	0.1	0.0
07/12/09	0.0	0.1	0.1	0.0
07/13/09	0.0	1.6	1.6	0.9
07/14/09	0.0	0.1	0.1	0.0
07/15/09	0.0	0.1	0.1	0.0
07/16/09	0.0	0.1	0.1	0.0
07/17/09	0.0	1.6	1.6	11.5
07/18/09	0.0	0.1	0.1	0.0
07/19/09	0.0	1.6	1.6	8.8
07/20/09	0.0	1.6	1.6	7.2
07/21/09	0.0	1.6	1.6	9.3
07/22/09	0.0	1.6	1.6	6.5
07/23/09	0.0	1.5	1.5	5.1
07/24/09	0.0	1.5	1.5	5.0
07/25/09	0.0	0.0	0.0	0.0
07/26/09	0.0	0.0	0.0	0.0
07/27/09	0.0	1.5	1.5	3.0
07/28/09	0.0	0.0	0.0	0.0
07/29/09	0.0	0.0	0.0	0.0
07/30/09	0.0	0.0	0.0	0.0
07/31/09	0.0	0.0	0.0	0.0
08/01/09	0.0	0.0	0.0	0.0
08/02/09	0.0	0.0	0.0	0.0
08/03/09	0.0	0.0	0.0	0.0
08/04/09	0.0	0.0	0.0	0.0
08/05/09	0.0	1.1	1.1	8.6
08/06/09	0.0	1.1	1.1	6.4
08/07/09	0.0	1.1	1.1	8.6
08/08/09	0.0	1.1	1.1	0.0
08/09/09	0.0	1.1	1.1	0.0
08/10/09	0.0	1.1	1.1	8.1
08/11/09	0.0	1.1	1.1	9.0
08/12/09	0.0	1.1	1.1	10.3
08/13/09	0.0	1.1	1.1	12.8
08/14/09	0.0	1.1	1.1	4.0
08/15/09	0.0	1.1	1.1	0.0

Table 3-2
RP3 Basin
RP3 Basin Daily Water Deliveries During the Start-Up Period

Date	Diluent Water (AF)			Recycled Water
	Import	Local	Total	(AF)
08/16/09	0.0	1.1	1.1	0.0
08/17/09	0.0	1.1	1.1	8.3
08/18/09	0.0	1.1	1.1	8.5
08/19/09	0.0	1.1	1.1	9.2
08/20/09	0.0	1.1	1.1	9.1
08/21/09	0.0	1.1	1.1	2.9
08/22/09	0.0	1.1	1.1	0.0
08/23/09	0.0	1.1	1.1	0.0
08/24/09	0.0	1.1	1.1	8.4
08/25/09	0.0	1.1	1.1	12.4
08/26/09	0.0	1.1	1.1	9.4
08/27/09	0.0	1.1	1.1	4.9
08/28/09	0.0	1.1	1.1	3.8
08/29/09	0.0	1.1	1.1	0.0
08/30/09	0.0	1.1	1.1	0.0
08/31/09	0.0	1.1	1.1	3.7
09/01/09	0.0	1.3	1.3	5.2
09/02/09	0.0	1.3	1.3	9.9
09/03/09	0.0	1.3	1.3	7.1
09/04/09	0.0	1.0	1.0	0.0
09/05/09	0.0	0.6	0.6	0.0
09/06/09	0.0	0.6	0.6	0.0
09/07/09	0.0	0.6	0.6	0.0
09/08/09	0.0	1.0	1.0	9.8
09/09/09	0.0	1.3	1.3	10.0
09/10/09	0.0	1.3	1.3	9.6
09/11/09	0.0	1.3	1.3	5.2
09/12/09	0.0	1.3	1.3	0.0
09/13/09	0.0	1.3	1.3	0.0
09/14/09	0.0	1.3	1.3	10.0
09/15/09	0.0	1.3	1.3	8.4
09/16/09	0.0	1.3	1.3	12.2
09/17/09	0.0	1.3	1.3	13.1
09/18/09	0.0	1.3	1.3	13.4
09/19/09	0.0	1.3	1.3	8.3
09/20/09	0.0	1.3	1.3	2.6
09/21/09	0.0	1.3	1.3	9.3
09/22/09	0.0	1.3	1.3	11.3
09/23/09	0.0	1.3	1.3	12.1
09/24/09	0.0	1.3	1.3	12.6
09/25/09	0.0	1.3	1.3	11.6
09/26/09	0.0	1.3	1.3	2.4
09/27/09	0.0	1.3	1.3	2.4
09/28/09	0.0	1.3	1.3	9.6
09/29/09	0.0	1.3	1.3	13.4
09/30/09	0.0	1.3	1.3	10.4
10/01/09	1.2	1.3	2.5	8.0
10/02/09	0.0	1.3	1.3	5.3
10/03/09	0.0	1.3	1.3	0.0
10/04/09	0.0	1.3	1.3	0.0
10/05/09	0.0	1.3	1.3	5.9
10/06/09	0.0	1.3	1.3	1.8
10/07/09	0.0	1.3	1.3	6.6
10/08/09	0.0	1.3	1.3	6.6
10/09/09	0.0	1.3	1.3	4.7
10/10/09	0.0	1.3	1.3	0.0
10/11/09	0.0	1.3	1.3	3.5
10/12/09	0.0	1.3	1.3	9.3
10/13/09	0.0	1.3	1.3	4.3
10/14/09	0.0	83.3	83.3	0.0
10/15/09	0.0	1.3	1.3	8.0
10/16/09	0.0	1.3	1.3	6.1
10/17/09	0.0	1.3	1.3	0.0
10/18/09	0.0	1.3	1.3	3.2
10/19/09	0.0	1.3	1.3	10.8
10/20/09	0.0	1.3	1.3	10.9
10/21/09	0.0	1.3	1.3	10.7
10/22/09	0.0	1.3	1.3	10.1
10/23/09	0.0	1.3	1.3	10.4
10/24/09	0.0	1.3	1.3	8.6
10/25/09	0.0	1.3	1.3	8.4
10/26/09	0.0	1.3	1.3	8.4
10/27/09	0.0	1.3	1.3	10.8
10/28/09	0.0	1.3	1.3	12.1
10/29/09	0.0	0.8	0.8	9.9
10/30/09	0.0	1.3	1.3	10.4
10/31/09	0.0	1.3	1.3	7.9

Table 3-2
RP3 Basin
RP3 Basin Daily Water Deliveries During the Start-Up Period

Date	Diluent Water (AF)			Recycled Water
	Import	Local	Total	(AF)
11/01/09	0.0	1.3	1.3	1.4
11/02/09	0.0	1.3	1.3	4.8
11/03/09	0.0	1.3	1.3	11.7
11/04/09	0.0	1.3	1.3	11.5
11/05/09	0.0	1.3	1.3	11.3
11/06/09	0.0	1.3	1.3	12.0
11/07/09	0.0	1.1	1.1	7.4
11/08/09	0.0	1.3	1.3	11.5
11/09/09	0.0	1.3	1.3	9.2
11/10/09	0.0	1.3	1.3	6.4
11/11/09	0.0	1.3	1.3	10.5
11/12/09	0.0	1.3	1.3	12.2
11/13/09	0.0	46.0	46.0	4.8
11/14/09	0.0	1.3	1.3	11.5
11/15/09	0.0	1.3	1.3	11.5
11/16/09	0.0	1.3	1.3	11.7
11/17/09	0.0	1.3	1.3	11.3
11/18/09	0.0	1.3	1.3	11.2
11/19/09	0.0	1.3	1.3	11.1
11/20/09	0.0	1.3	1.3	11.2
11/21/09	0.0	1.3	1.3	11.0
11/22/09	0.0	1.3	1.3	11.1
11/23/09	0.0	1.3	1.3	10.9
11/24/09	0.0	1.3	1.3	9.6
11/25/09	0.0	1.3	1.3	8.3
11/26/09	0.0	1.3	1.3	9.4
11/27/09	0.0	1.3	1.3	9.7
11/28/09	0.0	17.9	17.9	0.7
11/29/09	0.0	1.3	1.3	11.1
11/30/09	0.0	1.3	1.3	11.2
12/01/09	0.0	2.3	2.3	10.1
12/02/09	0.0	2.3	2.3	9.9
12/03/09	0.0	2.3	2.3	12.1
12/04/09	0.0	2.3	2.3	6.4
12/05/09	0.0	0.3	0.3	0.0
12/06/09	0.0	0.3	0.3	0.0
12/07/09	0.0	123.0	123.0	0.0
12/08/09	0.0	0.1	0.1	0.0
12/09/09	0.0	0.2	0.2	0.0
12/10/09	0.0	0.3	0.3	0.0
12/11/09	0.0	54.5	54.5	0.0
12/12/09	0.0	98.2	98.2	0.0
12/13/09	0.0	27.1	27.1	0.0
12/14/09	0.0	0.0	0.0	0.0
12/15/09	0.0	0.2	0.2	1.8
12/16/09	0.0	0.0	0.0	0.0
12/17/09	0.0	0.0	0.0	0.0
12/18/09	0.0	0.0	0.0	0.0
12/19/09	0.0	0.0	0.0	0.0
12/20/09	0.0	0.0	0.0	0.0
12/21/09	0.0	0.1	0.1	0.0
12/22/09	0.0	40.0	40.0	0.0
12/23/09	0.0	1.3	1.3	4.0
12/24/09	0.0	2.3	2.3	9.6
12/25/09	0.0	2.3	2.3	8.9
12/26/09	0.0	2.3	2.3	6.3
12/27/09	0.0	2.3	2.3	8.4
12/28/09	0.0	2.3	2.3	8.4
12/29/09	0.0	2.3	2.3	8.5
12/30/09	0.0	2.3	2.3	3.5
12/31/09	0.0	2.3	2.3	5.4
01/01/10	0.0	5.2	5.2	8.5
01/02/10	0.0	0.3	0.3	8.6
01/03/10	0.0	0.3	0.3	8.4
01/04/10	0.0	0.3	0.3	6.4
01/05/10	0.0	0.3	0.3	0.0
01/06/10	0.0	0.3	0.3	0.0
01/07/10	0.0	0.3	0.3	0.0
01/08/10	0.0	0.3	0.3	0.0
01/09/10	0.0	0.3	0.3	0.0
01/10/10	0.0	0.3	0.3	0.0
01/11/10	0.0	0.3	0.3	0.0
01/12/10	0.0	5.4	5.4	0.0
01/13/10	0.0	17.1	17.1	7.2
01/14/10	0.0	10.1	10.1	5.7
01/15/10	0.0	11.4	11.4	13.3

Table 3-2
RP3 Basin
RP3 Basin Daily Water Deliveries During the Start-Up Period

Date	Diluent Water (AF)			Recycled Water
	Import	Local	Total	(AF)
01/16/10	0.0	0.0	0.0	13.2
01/17/10	0.0	0.0	0.0	4.8
01/18/10	0.0	57.3	57.3	0.0
01/19/10	0.0	72.9	72.9	0.0
01/20/10	0.0	70.5	70.5	0.0
01/21/10	0.0	96.2	96.2	0.0
01/22/10	0.0	99.1	99.1	0.0
01/23/10	0.0	28.3	28.3	0.0
01/24/10	0.0	19.0	19.0	0.0
01/25/10	0.0	0.0	0.0	0.0
01/26/10	0.0	22.9	22.9	0.0
01/27/10	0.0	0.6	0.6	0.0
01/28/10	0.0	4.1	4.1	0.0
01/29/10	0.0	0.6	0.6	0.0
01/30/10	0.0	0.6	0.6	0.0
01/31/10	0.0	2.1	2.1	0.0
02/01/10	0.0	0.6	0.6	7.2
02/02/10	0.0	0.6	0.6	13.2
02/03/10	0.0	0.6	0.6	13.3
02/04/10	0.0	0.6	0.6	11.8
02/05/10	0.0	0.6	0.6	0.0
02/06/10	0.0	88.6	88.6	0.0
02/07/10	0.0	6.3	6.3	0.0
02/08/10	0.0	12.4	12.4	0.0
02/09/10	0.0	47.6	47.6	0.0
02/10/10	0.0	6.6	6.6	0.0
02/11/10	0.0	4.2	4.2	0.0
02/12/10	0.0	1.8	1.8	6.8
02/13/10	0.0	1.4	1.4	13.2
02/14/10	0.0	1.2	1.2	13.3
02/15/10	0.0	1.2	1.2	13.2
02/16/10	0.0	1.2	1.2	13.2
02/17/10	0.0	1.4	1.4	7.7
02/18/10	0.0	1.8	1.8	0.0
02/19/10	0.0	1.2	1.2	0.0
02/20/10	0.0	0.6	0.6	0.0
02/21/10	0.0	45.8	45.8	0.0
02/22/10	0.0	6.2	6.2	0.0
02/23/10	0.0	2.6	2.6	0.0
02/24/10	0.0	5.7	5.7	0.0
02/25/10	0.0	8.7	8.7	0.0
02/26/10	0.0	4.2	4.2	0.0
02/27/10	0.0	98.9	98.9	0.0
02/28/10	0.0	17.1	17.1	0.0
03/01/10	0.0	7.5	7.5	0.0
03/02/10	0.0	0.6	0.6	0.7
03/03/10	0.0	1.8	1.8	7.8
03/04/10	0.0	22.3	22.3	6.3
03/05/10	0.0	1.8	1.8	3.5
03/06/10	0.0	23.9	23.9	0.0
03/07/10	0.0	6.6	6.6	1.1
03/08/10	0.0	1.8	1.8	8.8
03/09/10	0.0	1.8	1.8	13.3
03/10/10	0.0	1.8	1.8	13.2
03/11/10	0.0	1.8	1.8	13.5
03/12/10	0.0	1.8	1.8	13.3
03/13/10	0.0	1.8	1.8	13.3
03/14/10	0.0	1.8	1.8	13.3
03/15/10	0.0	1.8	1.8	11.0
03/16/10	0.0	1.8	1.8	8.9
03/17/10	0.0	1.8	1.8	8.7
03/18/10	0.0	1.8	1.8	9.1
03/19/10	0.0	1.8	1.8	9.4
03/20/10	0.0	1.8	1.8	9.3
03/21/10	0.0	1.8	1.8	6.7
03/22/10	0.0	1.8	1.8	5.6
03/23/10	0.0	1.8	1.8	9.3
03/24/10	0.0	1.8	1.8	9.1
03/25/10	0.0	1.8	1.8	8.9
03/26/10	0.0	1.8	1.8	8.4
03/27/10	0.0	1.8	1.8	0.0
03/28/10	0.0	1.2	1.2	0.0
03/29/10	0.0	0.6	0.6	0.0
03/30/10	0.0	0.6	0.6	0.0
03/31/10	0.0	0.6	0.6	0.0

Table 3-2
RP3 Basin
RP3 Basin Daily Water Deliveries During the Start-Up Period

Date	Diluent Water (AF)			Recycled Water
	Import	Local	Total	(AF)
04/01/10	0.0	0.4	0.4	0.0
04/02/10	0.0	0.4	0.4	0.0
04/03/10	0.0	0.4	0.4	0.0
04/04/10	0.0	0.4	0.4	0.0
04/05/10	0.0	39.6	39.6	0.0
04/06/10	0.0	0.4	0.4	0.9
04/07/10	0.0	0.4	0.4	0.0
04/08/10	0.0	0.4	0.4	0.0
04/09/10	0.0	0.4	0.4	0.0
04/10/10	0.0	0.4	0.4	0.0
04/11/10	0.0	0.4	0.4	0.0
04/12/10	0.0	27.9	27.9	0.0
04/13/10	0.0	0.4	0.4	0.0
04/14/10	0.0	0.4	0.4	0.0
04/15/10	0.0	0.4	0.4	0.0
04/16/10	0.0	0.4	0.4	0.0
04/17/10	0.0	0.4	0.4	0.0
04/18/10	0.0	0.4	0.4	0.0
04/19/10	0.0	0.4	0.4	0.0
04/20/10	0.0	3.5	3.5	0.0
04/21/10	0.0	20.9	20.9	2.1
04/22/10	0.0	16.3	16.3	3.5
04/23/10	0.0	1.6	1.6	8.6
04/24/10	0.0	1.6	1.6	8.9
04/25/10	0.0	1.6	1.6	9.0
04/26/10	0.0	2.0	2.0	8.7
04/27/10	0.0	1.6	1.6	6.6
04/28/10	0.0	1.6	1.6	4.9
04/29/10	0.0	1.6	1.6	8.9
04/30/10	0.0	1.6	1.6	8.4
05/01/10	0.0	1.6	1.6	8.7
05/02/10	0.0	1.6	1.6	8.7
05/03/10	0.0	1.6	1.6	8.8
05/04/10	0.0	1.6	1.6	8.8
05/05/10	0.0	1.6	1.6	9.0
05/06/10	0.0	1.6	1.6	9.1
05/07/10	0.0	1.6	1.6	9.1
05/08/10	0.0	1.6	1.6	8.8
05/09/10	0.0	1.5	1.5	8.8
05/10/10	0.0	1.2	1.2	8.8
05/11/10	0.0	1.4	1.4	8.9
05/12/10	0.0	1.6	1.6	6.0
05/13/10	0.0	1.6	1.6	8.8
05/14/10	0.0	1.6	1.6	8.8
05/15/10	0.0	1.6	1.6	8.9
05/16/10	0.0	1.6	1.6	8.8
05/17/10	0.0	1.6	1.6	8.9
05/18/10	0.0	1.6	1.6	9.0
05/19/10	0.0	1.6	1.6	9.0
05/20/10	0.0	1.6	1.6	8.8
05/21/10	0.0	1.6	1.6	8.8
05/22/10	0.0	1.6	1.6	8.8
05/23/10	0.0	1.6	1.6	8.9
05/24/10	0.0	1.6	1.6	7.7
05/25/10	0.0	1.6	1.6	9.1
05/26/10	0.0	1.6	1.6	9.3
05/27/10	0.0	1.6	1.6	8.9
05/28/10	0.0	1.6	1.6	9.1
05/29/10	0.0	1.6	1.6	8.9
05/30/10	0.0	1.6	1.6	8.9
05/31/10	0.0	1.6	1.6	9.2
06/01/10	0.0	1.5	1.5	4.5
06/02/10	0.0	1.5	1.5	6.9
06/03/10	0.0	1.5	1.5	9.2
06/04/10	0.0	1.5	1.5	9.2
06/05/10	0.0	1.5	1.5	9.1
06/06/10	0.0	1.5	1.5	9.2
06/07/10	0.0	1.5	1.5	9.1
06/08/10	0.0	1.5	1.5	9.0
06/09/10	0.0	1.5	1.5	9.0
06/10/10	0.0	1.5	1.5	9.0
06/11/10	0.0	1.5	1.5	9.2
06/12/10	0.0	1.5	1.5	9.2
06/13/10	0.0	1.5	1.5	9.3
06/14/10	0.0	1.5	1.5	8.9
06/15/10	0.0	1.5	1.5	8.9

Table 3-2
RP3 Basin
RP3 Basin Daily Water Deliveries During the Start-Up Period

Date	Diluent Water (AF)			Recycled Water
	Import	Local	Total	(AF)
06/16/10	0.0	1.6	1.6	9.0
06/17/10	0.0	1.4	1.4	9.1
06/18/10	0.0	1.2	1.2	9.3
06/19/10	0.0	1.2	1.2	9.1
06/20/10	0.0	1.2	1.2	8.9
06/21/10	0.0	1.2	1.2	9.0
06/22/10	0.0	1.2	1.2	9.1
06/23/10	0.0	1.2	1.2	8.9
06/24/10	0.0	1.2	1.2	3.4
06/25/10	0.0	1.2	1.2	9.3
06/26/10	0.0	1.2	1.2	9.4
06/27/10	0.0	1.2	1.2	9.2
06/28/10	0.0	1.2	1.2	9.3
06/29/10	0.0	1.4	1.4	9.1
06/30/10	0.0	1.6	1.6	9.3

Table 3-3
RP3 Basin Historical Monthly Water Deliveries and RWC

Date		No. Mos. Since Initial RW Delivery	SW (AF)	MWD (AF)	Underflow (AF)	DW Total (AF)	DW 120-Month Total (AF)	RW (AF)	RW 120-Month Total (AF)	DW + RW 120-Month Total (AF)	RWC	Source
2005/06	Jul '05	-47	31.	0.		31.	31.	0.	0.	31.	0%	
	Aug '05	-46	31.	0.		31.	62.	0.	0.	62.	0%	
	Sep '05	-45	60.	0.		60.	122.	0.	0.	122.	0%	
	Oct '05	-44	78.	0.		78.	200.	0.	0.	200.	0%	
	Nov '05	-43	60.	0.		60.	260.	0.	0.	260.	0%	
	Dec '05	-42	60.	0.		60.	320.	0.	0.	320.	0%	
	Jan '06	-41	33.	0.		33.	353.	0.	0.	353.	0%	
	Feb '06	-40	64.	0.		64.	417.	0.	0.	417.	0%	
	Mar '06	-39	161.	0.		161.	578.	0.	0.	578.	0%	
	Apr '06	-38	127.	0.		127.	705.	0.	0.	705.	0%	
	May '06	-37	37.	0.		37.	742.	0.	0.	742.	0%	
	Jun '06	-36	25.	0.		25.	767.	0.	0.	767.	0%	
2006/07	Jul '06	-35	15.	0.		15.	782.	0.	0.	782.	0%	
	Aug '06	-34	36.	0.		36.	818.	0.	0.	818.	0%	
	Sep '06	-33	35.	0.		35.	853.	0.	0.	853.	0%	
	Oct '06	-32	33.	0.		33.	886.	0.	0.	886.	0%	
	Nov '06	-31	36.	0.		36.	922.	0.	0.	922.	0%	
	Dec '06	-30	26.	0.		26.	947.	0.	0.	947.	0%	
	Jan '07	-29	22.	0.		22.	969.	0.	0.	969.	0%	
	Feb '07	-28	19.	0.		19.	988.	0.	0.	988.	0%	
	Mar '07	-27	7.	0.		7.	996.	0.	0.	996.	0%	
	Apr '07	-26	4.	0.		4.	1,000.	0.	0.	1,000.	0%	
	May '07	-25	2.	0.		2.	1,002.	0.	0.	1,002.	0%	
	Jun '07	-24	2.	0.		2.	1,004.	0.	0.	1,004.	0%	
2007/08	Jul '07	-23	0.	0.		0.	1,004.	0.	0.	1,004.	0%	
	Aug '07	-22	3.	0.		3.	1,007.	0.	0.	1,007.	0%	HISTORICAL
	Sep '07	-21	3.	0.		3.	1,010.	0.	0.	1,010.	0%	
	Oct '07	-20	9.	0.		9.	1,019.	0.	0.	1,019.	0%	
	Nov '07	-19	47.	0.		47.	1,066.	0.	0.	1,066.	0%	
	Dec '07	-18	108.	0.		108.	1,174.	0.	0.	1,174.	0%	
	Jan '08	-17	165.	0.		165.	1,339.	0.	0.	1,339.	0%	
	Feb '08	-16	130.	0.		130.	1,469.	0.	0.	1,469.	0%	
	Mar '08	-15	5.	0.		5.	1,474.	0.	0.	1,474.	0%	
	Apr '08	-14	3.	0.		3.	1,477.	0.	0.	1,477.	0%	
	May '08	-13	34.	0.		34.	1,511.	0.	0.	1,511.	0%	
	Jun '08	-12	4.	0.		4.	1,515.	0.	0.	1,515.	0%	
2008/09	Jul '08	-11	0.	0.		0.	1,515.	0.	0.	1,515.	0%	
	Aug '08	-10	16.	0.		16.	1,531.	0.	0.	1,531.	0%	
	Sep '08	-9	16.	0.		16.	1,547.	0.	0.	1,547.	0%	
	Oct '08	-8	13.	0.		13.	1,560.	0.	0.	1,560.	0%	
	Nov '08	-7	27.	0.		27.	1,587.	0.	0.	1,587.	0%	
	Dec '08	-6	156.	0.		156.	1,743.	0.	0.	1,743.	0%	
	Jan '09	-5	12.	0.		12.	1,755.	0.	0.	1,755.	0%	
	Feb '09	-4	273.	0.		273.	2,028.	0.	0.	2,028.	0%	
	Mar '09	-3	47.	0.		47.	2,075.	0.	0.	2,075.	0%	
	Apr '09	-2	18.	0.		18.	2,093.	0.	0.	2,093.	0%	
	May '09	-1	6.	0.		6.	2,099.	0.	0.	2,099.	0%	
	Jun '09	1	0.	0.		0.	2,099.	106.	106.	2,205.	5%	
2009/10	Jul '09	2	22.	0.		22.	2,121.	84.	190.	2,311.	8%	
	Aug '09	3	30.	0.		30.	2,151.	148.	338.	2,489.	14%	START-UP
	Sep '09	4	36.	0.		36.	2,187.	220.	558.	2,745.	20%	
	Oct '09	5	122.	0.	904.	1,026.	3,212.	203.	761.	3,973.	19%	
	Nov '09	6	100.	0.	904.	1,004.	4,216.	287.	1,048.	5,264.	20%	
	Dec '09	7	373.	0.	904.	1,277.	5,493.	103.	1,151.	6,644.	17%	
	Jan '10	8	526.	0.	904.	1,430.	6,923.	76.	1,227.	8,150.	15%	
	Feb '10	9	370.	0.	904.	1,274.	8,196.	113.	1,340.	9,536.	14%	
	Mar '10	10	104.	0.	904.	1,008.	9,204.	213.	1,553.	10,757.	14%	
	Apr '10	11	128.	0.	904.	1,032.	10,236.	71.	1,624.	11,860.	14%	
	May '10	12	49.	0.	904.	953.	11,189.	272.	1,896.	13,085.	14%	
	Jun '10	13	42.	0.	904.	946.	12,134.	261.	2,157.	14,291.	15%	
2010/11	Jul '10	14	23.	0.	904.	927.	13,061.	229.	2,386.	15,447.	15%	
	Aug '10	15	22.	0.	904.	926.	13,987.	181.	2,567.	16,554.	16%	
	Sep '10	16	19.	0.	904.	923.	14,910.	48.	2,615.	17,525.	15%	
	Oct '10	17	70.	0.	904.	974.	15,883.	23.	2,638.	18,521.	14%	

Notes:

DW = Diluent Water; Total DW is the sum of Stormwater & Local Runoff (SW), Imported Water from the State Water Project (MWD), and groundwater underflow.

RW = Recycled Water

Underflow is first included in the RWC calculation in October 2009 when the recharge permit was amended to allow it.

RWC = 120-month running total of recycled water / 120-month running total of all diluent and recycled water.

RWC maximum = 0.5 mg/L / the Running Average of Total Organic Carbon (TOC) determined from a recharge site's start-up period

Table 3-4
RP3 Basin: Infiltration Rate Measurements

Basin	Start Date/Time, T	Water Depth, H (feet)	End Date/Time	Water Depth, H (feet)	dT (days)	dH (feet)	Infiltration Rate (feet/day)
RP3 Cell 1A	06/12/09 07:44	2.62	06/12/09 20:07	0.80	0.52	1.82	3.53
RP3 Cell 1A	06/21/09 16:46	2.92	06/22/09 07:29	0.86	0.61	2.06	3.36
RP3 Cell 1A	06/29/09 19:31	2.54	06/30/09 07:31	0.79	0.50	1.75	3.50
RP3 Cell 1A	07/24/09 04:56	2.66	07/24/09 16:57	0.78	0.50	1.88	3.75
RP3 Cell 1A	08/14/09 07:27	2.19	08/14/09 16:27	0.76	0.38	1.43	3.81
RP3 Cell 1A	10/08/09 05:09	1.99	10/08/09 13:09	0.96	0.33	1.03	3.09
RP3 Cell 1A	10/13/09 04:10	2.55	10/13/09 13:11	1.39	0.38	1.16	3.09
RP3 Cell 1A	10/21/09 13:14	2.80	10/22/09 00:15	1.43	0.46	1.37	2.98
RP3 Cell 1A	11/01/09 04:17	2.86	11/02/09 05:17	0.72	1.04	2.14	2.05
RP3 Cell 1A	11/18/09 07:10	4.04	11/18/09 17:10	2.88	0.42	1.16	2.78
RP3 Cell 1A	01/15/10 01:12	3.25	01/15/10 08:12	2.61	0.29	0.64	2.19
RP3 Cell 1A	05/31/10 23:29	2.01	06/01/10 08:00	1.62	0.35	0.39	1.10
RP3 Cell 1A	09/10/10 03:01	1.30	09/13/10 05:52	0.86	3.12	0.44	0.14
RP3 Cell 1B	04/28/10 21:40	3.73	04/29/10 04:27	3.00	0.28	0.73	2.58
RP3 Cell 1B	04/29/10 04:27	3.00	04/29/10 08:40	2.59	0.18	0.41	2.33
RP3 Cell 1A&B	08/26/09 22:30	2.01	08/27/09 08:10	0.64	0.40	1.37	3.40
RP3 Cell 1A&B	09/03/09 20:16	1.53	09/04/09 01:16	0.65	0.21	0.88	4.22
RP3 Cell 1A&B	09/11/09 18:24	1.87	09/12/09 02:23	0.61	0.33	1.26	3.79
RP3 Cell 1A&B	12/13/09 14:47	5.76	12/15/09 15:59	2.45	2.05	3.31	1.61
RP3 Cell 1A&B	01/27/10 05:07	4.28	01/28/10 17:29	1.83	1.52	2.45	1.62
RP3 Cell 1A&B	02/06/10 13:52	4.99	02/07/10 18:13	2.95	1.18	2.04	1.73
RP3 Cell 1A&B	02/18/10 14:31	3.31	02/21/10 01:31	1.08	2.46	2.23	0.91
RP3 Cell 1A&B	03/05/10 11:30	2.72	03/06/10 19:30	1.77	1.33	0.95	0.71
RP3 Cell 1A&B	03/07/10 04:30	4.03	03/08/10 01:30	3.15	0.88	0.88	1.01
RP3 Cell 1A&B	03/27/10 03:36	3.28	03/27/10 23:51	2.46	0.84	0.82	0.97
RP3 Cell 1A&B	03/27/10 23:51	2.46	03/29/10 21:16	1.51	1.89	0.95	0.50
RP3 Cell 1A&B	04/25/10 13:57	2.80	04/26/10 06:57	1.62	0.71	1.18	1.67
RP3 Cell 2	01/23/10 02:06	5.96	01/23/10 18:39	4.60	0.69	1.36	1.97
RP3 Cell 2	02/27/10 21:35	1.37	02/28/10 02:35	1.01	0.21	0.36	1.73
RP3 Cell 2	02/28/10 02:35	1.01	02/28/10 10:43	0.28	0.34	0.73	2.15
RP3 Cell 3	02/28/06 22:54	3.97	03/01/06 22:59	2.23	1.00	1.74	1.73
RP3 Cell 3	02/22/10 04:31	4.51	02/22/10 16:31	3.47	0.50	1.04	2.08
RP3 Cell 3	02/22/10 16:31	3.47	02/23/10 08:32	2.47	0.67	1.00	1.50
RP3 Cell 3	02/23/10 08:32	2.47	02/24/10 09:32	1.51	1.04	0.96	0.92
RP3 Cell 3	02/27/10 21:35	8.29	02/28/10 04:36	7.47	0.29	0.82	2.80
RP3 Cell 3	02/28/10 04:36	7.47	02/28/10 12:43	6.61	0.34	0.86	2.54
RP3 Cell 3	03/07/10 08:30	2.03	03/08/10 06:30	1.36	0.92	0.67	0.73
RP3 Cell 3A	02/06/10 19:52	11.99	02/06/10 23:52	11.49	0.17	0.50	3.00
RP3 Cell 3A	02/06/10 23:52	11.49	02/07/10 03:52	10.96	0.17	0.53	3.18
RP3 Cell 3A	02/07/10 03:52	10.96	02/07/10 07:52	10.46	0.17	0.50	3.00
RP3 Cell 3A	02/07/10 07:52	10.46	02/07/10 11:52	9.98	0.17	0.48	2.88
RP3 Cell 3A	02/07/10 11:52	9.98	02/07/10 16:13	9.49	0.18	0.49	2.70
RP3 Cell 3A	02/07/10 16:13	9.49	02/07/10 20:13	9.04	0.17	0.45	2.70
RP3 Cell 3A	02/07/10 20:13	9.04	02/08/10 01:13	8.50	0.21	0.54	2.59
RP3 Cell 3A	02/08/10 01:13	8.50	02/08/10 06:13	7.96	0.21	0.54	2.59
RP3 Cell 3A	05/31/10 22:29	4.51	06/01/10 05:40	4.02	0.30	0.49	1.64
RP3 Cell 3B	02/06/10 20:52	7.03	02/07/10 01:52	6.52	0.21	0.51	2.45
RP3 Cell 3B	02/07/10 01:52	6.52	02/07/10 06:52	6.05	0.21	0.47	2.26
RP3 Cell 3B	02/07/10 06:52	6.05	02/07/10 13:12	5.48	0.26	0.57	2.16
RP3 Cell 3B	02/07/10 13:12	5.48	02/07/10 19:13	4.97	0.25	0.51	2.03
RP3 Cell 3B	02/07/10 19:13	4.97	02/08/10 01:13	4.48	0.25	0.49	1.96
RP3 Cell 3B	02/08/10 01:13	4.48	02/08/10 07:13	4.00	0.25	0.48	1.92
RP3 Cell 4	03/01/06 22:59	2.23	03/02/06 22:44	1.14	0.99	1.09	1.10
RP3 Cell 4	02/10/10 04:01	4.34	02/10/10 08:01	3.96	0.17	0.38	2.28
RP3 Cell 4	02/10/10 08:01	3.96	02/10/10 20:01	2.98	0.50	0.98	1.96
RP3 Cell 4	02/10/10 20:01	2.98	02/11/10 13:02	2.00	0.71	0.98	1.38
RP3 Cell 4	02/11/10 13:02	2.00	02/12/10 14:02	1.00	1.04	1.00	0.96
RP3 Cell 4	03/07/10 08:30	2.68	03/08/10 06:30	1.83	0.92	0.85	0.93

Table 4-1a
RP3 Basin: Surface Water and Lysimeter Results
Electrical Conductivity
(μmhos/cm)

Date	Surface Water	Lysimeter Depth (ft bgs)				
	0	5	10	15	25	35
02/19/09	120	95	310	340	500	720
02/24/09	200	205	390	255	420	615
03/03/09		365		330	365	600
04/21/09		580	640	420	410	605
04/28/09		730	700	430	420	580
05/05/09	680	770	830	465	410	550
05/12/09		860	895	565	415	545
05/19/09		880	875	630	440	530
05/27/09		890	875	670	470	525
06/02/09		890	870	680	490	510
06/09/09	720	840	870	695	520	510
06/16/09		770	840	690	490	510
06/23/09		755	790	755	595	505
06/30/09	800	850	860	795	710	525
07/08/09	790	970	950	830	780	565
07/14/09		780	870	875	800	580
07/21/09	770	775	835	900	815	590
07/28/09	800	820	820	880	815	615
08/04/09	800	920	875	890	835	625
08/11/09	720	785	820	915	775	650
08/18/09	620	740	780	910	780	675
08/26/09	710	670	695	865	795	690
09/01/09	660	725	780	820	770	710
09/09/09	760	745	755	825	765	705
09/15/09	700	755	800	830	770	715
09/22/09	705	705	750	760	765	710
09/29/09	690	730	750	770	740	710
10/06/09	730	770	750	755	710	700
10/13/09	725	760	775	770	725	705
10/20/09	735	645	750	760	750	705
10/27/09	760	730	730	745	655	700
11/03/09	810	770	750	750	690	700
11/10/09	740	755	760	770	730	695
11/17/09	760	600	635	770	760	705
11/24/09	765	780	760	700	680	705
12/01/09	680	795	755	730	705	700
12/09/09	165	780	780	730	720	705
12/15/09	89	240	335	705	705	695
12/22/09	135	235	470	715	730	700
12/31/09	725	505	350	605	680	690
01/05/10	690	755	655	460	570	670
01/12/10	705		740	505	485	655
02/09/10	79	415	475	305	355	620
02/17/10	590	525	390	345	295	570
02/23/10	160	605	455	330	305	530
03/02/10	155	445	535	325	355	500
03/09/10	295	320	410	445	405	485
03/16/10	675	430	330	430	390	460
03/24/10	670	665	620	365	345	450
03/30/10	645	745	680	510	420	440
04/06/10	290		785	490	450	435
04/13/10	155		845	660	460	445
04/29/10	360		550	675	605	460
05/04/10	685		550	575	560	470
05/11/10	660				540	475
05/18/10	690		740	605	555	485
05/25/10	685		760	660	590	495
06/02/10	690		795	730	625	515
06/08/10	700		835	770	660	520
06/15/10	695		820	775	665	540
06/22/10	690		805	790	670	550
06/29/10	715		805	780	705	580

Notes (blank) Insufficient sample from lysimeter result in parameter not being analyzed

Table 4-1b
RP3 Basin: Monitoring Well Results
Electrical Conductivity
(μmhos/cm)

Date	RP3-1/1	RP3-1/2
01/13/09	1080	970
02/18/09	1020	940
04/15/09	1440	950
06/02/09	1420	970
06/16/09	1350	970
07/08/09	1340	990
07/14/09	1260	975
07/22/09	1170	990
07/28/09	1120	990
08/11/09	1050	990
08/25/09	1030	1000
09/08/09	980	960
09/22/09	995	950
10/07/09	1020	915
10/19/09	1020	880
11/02/09	960	775
12/01/09	975	760
12/09/09	610	760
01/05/10	850	750
01/07/10	825	740
03/02/10	1160	970
04/06/10	1230	1170
04/14/10	1290	1190
06/02/10	1370	1280
07/12/10	1350	1270

Table 4-2a
RP3 Basin: Surface Water and Lysimeter Results
Total Organic Carbon
(mg/L)

Date	Surface Water	Lysimeter Depth (ft bgs)					% RW at 25 ft bgs Lysimeter
	0	5	10	15	25	35	
02/19/09	3.74	3.12	2.54	2.34	1.16	1.12	0%
02/24/09	4.32	3.24		2.09	0.98	0.82	0%
03/03/09		2.53		2.85	0.95	0.81	0%
04/21/09		10.40	7.15	4.14	1.46	1.11	0%
04/28/09		5.96	5.84	3.53	1.15	1.29	0%
05/05/09	8.51	4.21	4.34	3.92	0.98	0.82	0%
05/12/09		3.77	3.62	3.63	1.61	1.19	0%
05/19/09		4.20	3.25	3.81	1.37	1.14	0%
05/27/09		4.34	3.18	3.58	1.35	0.84	0%
06/02/09		4.56	3.39	3.83	1.66	1.19	0%
06/09/09	8.35	4.62	3.95	3.61	1.34	1.14	0%
06/16/09		3.18	3.60	3.55	1.33	1.17	0%
06/23/09		3.45	3.21	2.75	1.45	0.92	0%
06/30/09	7.21	3.36	3.07	2.22	1.77	0.96	0%
07/08/09	7.49	2.98	3.02	2.31	1.65	0.99	98%
07/14/09		2.60	2.92	2.40	1.48	0.90	102%
07/21/09	6.90	2.97	2.69	1.95	1.37	0.83	104%
07/28/09	8.14	3.06	2.64	2.21	1.59	0.98	104%
08/04/09	13.50	2.52	3.19	2.63	2.35	1.63	108%
08/11/09	8.60	2.87	2.63	1.67	1.32	0.85	97%
08/18/09	11.98	2.72	2.91	1.96	1.38	0.96	98%
08/26/09	6.68	4.25	3.49	2.00	1.34	0.89	101%
09/01/09	13.40	2.95	2.53	1.77	1.30	0.86	110%
09/09/09	8.73	3.02	2.26	1.76	1.28	0.82	109%
09/15/09	7.88	2.80	2.54	1.82	1.25	0.91	110%
09/22/09	7.95	2.73	2.61	2.09	1.36	0.86	109%
09/29/09	10.06	2.87	2.40	2.13	1.31	0.89	100%
10/06/09	11.75	2.82	2.33	1.97	1.51	1.22	94%
10/13/09	7.03	2.69	2.74	1.89	1.47	1.12	101%
10/20/09	6.70	8.66	6.12	2.83	1.43	0.82	106%
10/27/09	5.92	2.86	3.56	3.50	3.44	0.89	88%
11/03/09	6.88	2.46	2.94	3.03	2.47	0.99	91%
11/10/09	5.52	2.55	2.81	2.68	1.79	1.01	98%
11/17/09	5.84	6.07	5.88	2.40	1.63	1.08	103%
11/24/09	5.30	2.62	3.04	2.86	2.15	0.95	91%
12/01/09	7.24	2.51	3.53	2.59	1.96	0.97	91%
12/09/09	8.93	2.32	2.49	2.98	2.03	0.74	93%
12/15/09	6.27	4.20	3.84	3.00	2.31	1.10	91%
12/22/09	7.94	3.34	3.14	2.88	1.89	1.11	95%
12/31/09	4.99	2.14	2.48	2.39	2.21	1.15	90%
01/05/10	4.80	2.16	1.84	2.36	1.95	1.11	73%
01/12/10	8.73		2.19	2.57	1.88	1.19	62%
02/09/10	2.84	2.15	2.02	2.08	1.44	1.06	42%
02/17/10	3.84	1.63	1.30	1.55	1.29	0.92	33%
02/23/10	5.04	1.62	1.46	1.53	1.18	1.19	0%
03/02/10	4.45		2.11	1.86	1.45	1.13	0%
03/09/10	1.43	1.99	1.39	1.23	1.19	1.05	56%
03/16/10	5.67	1.62	1.44	1.69	1.24	1.02	53%
03/24/10	6.88	2.20	1.92	1.66	1.23	0.92	45%
03/30/10	10.48	1.91	1.76	1.66	1.20	1.12	56%
04/06/10	18.67		1.49	1.45	1.39	1.05	61%
04/13/10	10.08		1.65	1.44	1.32	0.99	63%
04/29/10	13.6		2.93	1.74	1.15	0.82	87%
05/04/10	5.63		3.06	2.18	1.85	1.01	79%
05/11/10	6.2				1.84	0.97	76%
05/18/10	6.39		2.42	2.19	1.57	1.46	79%
05/25/10	8.78		1.73	1.65	1.5	0.99	84%
06/02/10	6.73		1.8	1.8	1.7	1.04	90%
06/08/10	6.54		1.74	1.52	1.43	0.99	96%
06/15/10	6.05		1.76	1.57	1.61	1.37	97%
06/22/10	5.76		1.77	1.62	1.32	0.97	98%
06/29/10	5.52		1.83	1.46	1.4	0.98	101%

Table 4-2b
RP3 Basin: Monitoring Well Results
Total Organic Carbon
(mg/L)

Date	RP3-1/1	RP3-1/2
01/13/09	1.46	1.97
02/18/09	1.31	1.79
04/15/09	7.32	0.80
06/02/09	7.32	2.02
06/16/09	7.35	2.21
07/08/09	6.59	2.06
07/14/09	6.45	2.47
07/22/09	5.02	1.48
07/28/09	5.25	1.57
08/11/09	4.10	1.49
08/25/09	3.70	1.50
09/08/09	3.37	1.40
09/22/09	3.23	1.67
10/07/09	2.83	1.58
10/19/09	2.53	1.55
11/02/09	3.52	3.18
12/01/09	2.30	3.21
12/09/09	4.07	2.37
01/05/10	1.34	2.51
01/07/10	1.56	2.33
03/02/10	0.94	1.42
04/06/10	0.68	1.00
04/14/10	0.67	1.11
06/02/10	1.03	1.07

Table 4-3a
RP3 Basin: Surface Water and Lysimeter Results
Nitrogen Speciation
(mg/L)

Date	Surface Water					Lysimeter Depth (ft bgs)																								
	0					5					10					15					25					35				
	NH_3-N	NO_3-N	NO_2-N	TKN	TN	NH_3-N	NO_3-N	NO_2-N	TKN	TN	NH_3-N	NO_3-N	NO_2-N	TKN	TN	NH_3-N	NO_3-N	NO_2-N	TKN	TN	NH_3-N	NO_3-N	NO_2-N	TKN	TN	NH_3-N	NO_3-N	NO_2-N	TKN	TN
02/19/09	<0.1	0.3	0.01	<0.5	<0.6	0.2	0.3	<0.01	<0.5	<0.6	<0.1	2.9	<0.01	<0.5	3.2	0.1	4.8	<0.01	<0.5	5.0	0.2	11.8	<0.01	<0.5	12.1	0.53	18.5	0.02	1.31	19.8
02/24/09	<0.1	<0.1	<0.01	0.9	1.0	0.1	1.3	0.02	<0.5	1.5		3.5	<0.01			0.1	2.3	<0.01	0.64	2.9	<0.1	7.9	<0.01	<0.5	8.2	<0.1	18.3	<0.01	<0.5	18.5
03/03/09						<0.1	6.5	0.34	<0.5	7.1						<0.1	3.1	0.08	<0.5	3.4	<0.1	5.0	0.08	<0.5	5.3	<0.1	18.2	0.04	<0.5	18.5
04/21/09						<0.1	2.1	<0.01	0.7	2.8	<0.1	1.7	<0.01	0.60	2.3	<0.1	1.3	<0.01	<0.5	1.6	<0.1	2.5	<0.01	<0.5	2.8	<0.1	19.2	<0.01	<0.5	19.5
04/28/09	0.2	0.2	0.12	<0.5	<0.6	<0.1	0.7	0.13	1.2	2.0	<0.1	2.2	0.19	0.92	3.3	<0.1	1.7	0.18	<0.5	2.1	<0.1	2.1	0.18	<0.5	2.6	<0.1	19.3	0.08	<0.5	19.7
05/05/09						0.4	1.2	<0.01	0.6	1.8	<0.1	1.1	<0.01	0.65	1.7	<0.1	2.5	0.18	<0.5	2.9	<0.1	2.2	0.18	<0.5	2.7	<0.1	17.8	0.09	<0.5	18.2
05/12/09						<0.1	2.5	0.02	<0.5	2.7	<0.1	1.6	0.02	<0.5	1.9	<0.1	2.5	0.05	0.72	3.3	<0.1	2.9	0.10	<0.5	3.3	<0.1	16.3	0.05	<0.5	16.6
05/19/09						0.1	4.6	0.09	<0.5	4.9	<0.1	1.8	0.10	0.66	2.6	<0.1	2.4	0.10	<0.5	2.8	<0.1	3.0	0.15	1.58	4.7	<0.1	13.7	0.05	<0.5	14.0
05/27/09						<0.1	7.5	0.09	<0.5	7.9	<0.1	2.1	0.10	0.80	3.0	<0.1	2.9	0.10	<0.5	3.3	<0.1	3.6	0.13	3.80	7.6	<0.1	13.2	0.06	<0.5	13.5
06/02/09	0.1	0.1	0.05	1.5	1.6	<0.1	9.8	0.09	0.8	10.7	<0.1	2.4	0.11	<0.5	2.8	<0.1	3.2	0.12	0.60	3.9	<0.1	4.5	0.15	<0.5	4.9	<0.1	12.7	0.07	0.8	13.5
06/09/09						<0.1	1.3	0.08	1.3	2.7	<0.1	2.9	0.10	0.77	3.7	<0.1	2.9	0.12	1.27	4.3	<0.1	4.8	0.14	2.19	7.1	<0.1	12.1	0.05	<0.5	12.5
06/16/09						<0.1	3.8	0.07	2.0	5.8	<0.1	2.5	0.09	0.99	3.5	<0.1	3.0	0.11	1.30	4.4	<0.1	3.4	0.13	<0.5	3.7	<0.1	11.0	0.06	<0.5	11.3
06/23/09	0.1	5.1	0.57	2.7	8.4	<0.1	3.9	0.07	1.2	5.1	<0.1	3.8	0.08	0.99	4.8	<0.1	3.1	0.10	<0.5	3.4	<0.1	3.6	0.13	0.88	4.6	<0.1	8.9	0.07	<0.5	9.2
06/30/09	0.3	1.1	0.19	2.1	3.4	1.6	5.8	0.06	10.2	16.1	<0.1	4.7	0.07	0.68	5.5	<0.1	3.8	0.08	0.59	4.5	<0.1	4.3	0.08	<0.5	4.6	<0.1	7.7	0.06	<0.5	8.0
07/08/09						<0.1	6.7	0.07	1.4	8.2	<0.1	6.3	0.06	1.09	7.5	<0.1	4.0	0.07	0.62	4.7	<0.1	4.6	0.07	0.25	4.7	<0.1	7.1	0.06	<0.5	7.2
07/14/09	0.1	0.4	0.09	0.3	0.7	<0.1	2.4	0.04	0.6	3.1	<0.1	3.1	0.06	<0.5	3.4	<0.1	5.39	0.07	0.65	6.1	<0.1	5.5	0.07	1.97	7.5	<0.1	7.3	0.06	0.9	8.2
07/21/09	0.1	0.1	0.11	<2.5	2.5	<0.1	1.4	0.05	2.0	3.5	<0.1	2.1	0.05	0.63	2.8	<0.1	3.9	0.06	0.72	4.7	<0.1	5.7	0.04	<0.5	5.8	<0.1	6.5	0.04	<0.5	6.5
07/28/09	<1.1	<0.1	0.07	4.0	4.0	<0.1	2.3	0.08	1.0	3.3	<0.1	1.8	0.07	<0.5	2.1	<0.1	2.5	0.08	<0.5	2.8	<0.1	4.2	0.06	<0.5	4.3	<0.1	6.0	0.05	<0.5	6.5
08/04/09	0.2	<0.1	0.14	1.5	2.1	<0.1	4.1	0.07	1.3	5.5	<0.1	2.9	0.06	0.76	3.7	<0.1	2.2	0.07	<0.5	2.5	<0.1	3.4	0.06	<0.5	3.5	<0.1	6.3	0.06	<0.5	6.4
08/11/09	0.2	0.2	0.11	2.1	2.5	<0.1	2.4	0.07	0.5	3.0	<0.1	2.6	0.07	<0.5	2.9	<0.1	2.0	0.07	<0.5	2.3	<0.1	2.3	0.06	<0.5	2.4	<0.1	5.3	0.06	<0.5	5.3
08/18/09	0.1	0.4	0.09	1.9	2.4	<0.1	2.5	0.06	0.8	3.4	<0.1	2.1	0.05	<0.5	2.4	<0.1	2.5	0.05	<0.5	2.8	<0.1	2.4	0.05	<0.5	2.4	<0.1	4.8	0.05	<0.5	4.9
08/26/09	0.1	0.1	0.04	3.0	3.1	<0.1	0.9	0.12	0.7	1.7	<0.1	1.3	0.06	1.21	2.5	0.42	2.2	0.08	0.94	3.2	<0.1	2.5	0.06	<0.5	2.6	<0.1	4.8	0.06	<0.5	4.8
09/01/09	<1.1	<1.1	0.21	1.7	2.4						<0.1	1.6	<0.01	<0.5	1.8	<0.1	1.8	0.06	<0.5	2.1	<0.1	2.2	0.04	<0.5	2.2	<0.1	4.6	0.04	<0.5	4.6
09/09/09	0.2	0.5	0.04	1.4	1.9		2.0	0.06			<0.1	1.8	0.05	<0.5	2.1	<0.1	1.7	<0.01	<0.5	1.9	<0.1	2.0	<0.01	<0.5	2.0	0.2	4.4	0.03	0.5	5.0
09/15/09	0.3	0.1	0.02	2.4	2.5						<0.1	2.4	<0.01	<0.5	2.6	<0.1	1.8	<0.01	<0.5	2.1	<0.1	1.8	<0.01	<0.5	1.8	<0.1	4.0	<0.01	<0.5	4.0
09/22/09	0.2	0.3	0.08	3.2	3.6	<0.1	1.7	<0.01	1.2	3.0	<0.1	2.4	<0.01	0.9	3.3	<0.1	2.0	<0.01	1.0	3.1	<0.1	2.1	<0.01	0.6	2.8	<0.1	3.8	<0.01	0.6	4.4
09/29/09	0.5	0.4	0.12	2.7	3.2						<0.1	2.4	<0.01	1.2	3.6	<0.1	1.8	<0.01	0.9	2.7	<0.1	2.0	<0.01	0.8	2.9	<0.1	3.5	0.03	0.9	4.5
10/06/09	0.3	0.9	0.12	2.1	3.1						<0.1	2.1	0.04	0.7	2.8	<0.1	1.7	0.07	<0.5	2.0	<0.1	1.8	0.06	0.6	2.4	<0.1	3.5	0.06	<0.5	3.6
10/13/09	0.4	1.1	0.08	1.8	3.1						<0.1	1.8	0.04	<0.5	2.1	<0.1	1.7	0.04	<0.5	2.0	<0.1	1.6	0.04	<0.5	1.7	<0.1	3.3	0.05	<0.5	3.3
10/20/09	0.5	1.7	0.13	1.1	2.9	<0.1	0.2	<0.01	0.9	1.1	<0.1	2.4	<0.01	2.1	4.5	<0.1	1.9	<0.01	<0.5	2.1	<0.1	2.0	<0.01	<0.5	2.0	<0.1	3.0	0.04	<0.5	3.1
10/27/09	0.5	1.7	0.10	2.5	4.3	<0.1	2.2	<0.01	1.0	3.1	<0.1	2.1	<0.01	0.5	2.6	<0.1	2.0	<0.01	<0.5	2.3	<0.1	1.5	<0.01	<0.5	1.5	<0.1	2.6	<0.01	<0.5	2.6
11/03/09	0.2	1.5	0.12	1.0	2.6	<0.1	2.8	<0.01	<0.5	3.1	<0.1	2.8	<0.01	0.6	3.4	<0.1	2.1	<0.01	<0.5	2.4	<0.1	1.8	<0.01	<0.5	1.8	<0.1	2.3	<0.01	<0.5	2.3
11/10/09	0.2	1.6	0.08	1.1	2.7	<0.1	1.6	<0.01	<0.5	1.8	<0.1	1.9	<0.01	<0.5	2.1	<0.1	2.1	<0.01	<0.5	2.3	<0.1	2.4	<0.01	<0.5	2.4	<0.1	2.3	<0.01	<0.5	2.3
11/17/09	0.1	2.6	0.06	1.0	3.6	<0.1	0.5	<0.01	<0.5	0.8	<0.1	1.1	<0.01	<0.5	1.3	<0.1	1.9	<0.01	<0.5	2.1	<0.1	2.4	<0.01	<0.5	2.4	<0.1	2.2	<0.01	<0.5	2.2
11/24/09	<0.1	2.3	0.03	0.9	3.2	<0.1	1.9	<0.01	<0.5	2.2	<0.1	2.0	0.03	<0.5	2.3	<0.1	3.2	0.05	<0.5	3.5	<0.1	2.5	<0.01	<0.5	2.5	<0.1	2.2	<0.01	<0.5	2.2
12/01/09	0.2	2.3	0.03	0.9	3.2	<0.1	1.7	<0.01	<0.5	1.9	<0.1	1.8	<0.01	<0.5	2.0	<0.1	1.9	0.03	<0.5	2.1	<0.1	2.5	<0.01	<0.5	2.5	<0.1	2.1	<0.01	<0.5	2.1
12/09/09	0.3	0.6	0.07	1.8	2.5	<0.1	2.5	<0.01	<0.5	2.8	<0.1	2.6	<0.01	0.5	3.1	<0.1	1.7	0.07	<0.5	2.0	<0.1	2.5	<0.01	<0.5	2.5	<0.1	2.0	<0.01	<0.5	2.0
12/15/09	0.4	0.4	0.08	1.0	1.5	<0.1	0.5	0.06	<0.5	0.8	<0.1	0.8	0.04	0.9	1.7	<0.1	1.9	0.04	<0.5	2.2	<0.1	2.4	<0.01	<0.5	2.4	<0.1	1.8	<0.01	<0.5	1.8
12/22/09	1.0	0.1	0.07	2.0	2.2	<0.1	1.0	0.08		1.1	<0.1	1.7	0.02	<0.5	2.0	<0.1	2.6	<0.01	<0.5	2.9	<0.1	2.6	<0.01	<0.5	2.6	<0.1	2.0	<0.01	<0.5	2.0
12/31/09	0.1	0.6	<0.01	0.6	1.3	<0.1	0.9	<0.01	<0.5	1.2	<0.1	1.6	0.06	<0.5	1.9	<0.1	1.9	<0.01	<0.5	2.2	<0.1	2.4	<0.01	<0.5	2.4	<0.1	1.9	0.02	<0.5	1.9
01/05/10	0.1	0.2	0.01	1.7	1.8	<0.1			0.8		<0.1	1.0	<0.01	<0.5	1.3	<0.1	1.8	<0.01	<0.5	2.1	<0.1	2.3	<0.01	<0.5	2.3	<0.1	2.1	0.02	<0.5	2.2
01/12/10	<0.1	0.5	0.05	0.3	0.8						<0.1	1.2	<0.01	<0.5	1.4	<0.1	1.4	<0.01	<0.5	1.7	<0.1	2.2	0.01	<0.5	2.2	<0.1	2.1	0.03	<0.5	2.2
02/09/10	0.1	2.3	0.01	<1.5	3.0	<0.1	1.0	<0.01	<0.5	1.2	<0.1	1.3	<0.01	0.9	2.2	<0.1	0.8	<0.01	<0.5	1.1	<0.1	1.2	<0.01	<0.5	1.2	<0.1	2.0	0.06	<0.5	2.0
02/17/10	<0.1	0.7	0.07	0.8	1.6	<0.1	2.4	<0.01	<0.5	2.7	<0.1	1.6	<0.01	<0.5	1.8	<0.1	1.4	<0.01	<0.5	1.6	<0.1	1.5	<0.01	<0.5	1.5	<0.1	2.2	0.02	<0.5	2.2
02/23/10	0.1	0.4	0.01	0.3	0.7	<0.1	2.0	<0.01	<0.5	2.3	<0.1	1.5	<0.01	<0.5	1.8	<0.1	1.3	<0.01	<0.5	1.6	<0.1	1.5	<0.01	<0.5	1.5	<0.1	2.3	<0.01	<0.5	2.3
03/02/10	<0.1	1.2	<0.01	1.3	2.6	<0.1	2.2	<0.01	<0.5	2.5	0.1	1.4	<0.01	<0.5	1.7	<0.1	1.4	<0.01	<0.5	1.6	<0.1	1.6	<0.01	<0.5	1.6	<0.1	2.4	<0.01	<0.5	2.4
03/09/10	<0.1	1.6	<0.01	0.9	2.5	<0.1	1.3	<0.01		1.3	<0.1	1.3	<0.01	<0.5	1.6	<0.1	1.7	<0.01	<0.5	1.9	<0.1	1.7	<0.01	<0.5	1.7	<0.1	2.5	<0.01	<0.5	2.5
03/16/10	<0.1	1.3	<0.01	0.7	2.0		1.7	<0.01			<0.1	1.1	<0.01	<0.5	1.4	<0.1	1.4	<0.01	<0.5	1.6	<0.1	1.6	<0.01	<0.5	1.6	<0.1	2.3	<0.01	<0.5	2.3
03/24/10	<0.1	0.3	<0.01	1.2	1.5		1.7	<0.01			<0.1	1.2	<0.01	<0.5	1.5	<0.1	1.2	<0.01	<0.5	1.5	<0.1	1.3	<0.01	<0.5	1.3	<0.1	2.2	<0.01	<0.5	2.2
03/30/10	0.2	0.7	0.09	2.0	2.8		2.0	<0.01			0.1	1.3	<0.01	<0.5	1.5	<0.1	1.4	<0.01	<0.5	1.7	<0.1	1.5	<0.01	<0.5	1.5	<0.1	2.1	<0.01	<0.5	2.1
04/06/10	0.1	0.2	0.01	0.8	1.0						<0.1	1.6	<0.01	<0.5	1.9	<0.1	1.3	<0.01	<0.5	1.6	<0.1	1.4	<0.01	0.5	2.0	<0.1	2.0	<0.01	<0.5	2.0
04/13/10	0.2	1.2	0.11	1.4	2.7						<0.1	1.9	<0.01	<0.5	2.2	<0.1	1.3	<0.01	<0.5	1.5	0.2	1.6	<0.01	<0.5	1.6	<0.1	1.9	0.02	<0.5	1.9
04/29/10	<0.1	2.9	<0.01	1.2	4.1						0.1	2.3	0.09	<0.5	2.6	<0.1	2.5	0.08	<0.5	2.8	<0.1	1.5	0.04	<0.5	1.5	<0.1	1.9	0.11	<0.5	2.0
05/04/10	0.1	1.2	0.10	0.9	2.2						<0.1	1.1	<0.01	<0.5	1.1	<0.1	2.6	<0.01	<0.5	2.6	<0.1	1.8	<0.01	<0.5	1.8	<0.1	1.9	<0.01	0.48	2.4
05/11/10	0.3	2.1	0.11	1.1	3.3																<0.1	1.8	<0.01	<0.5	1.8	2.2	0.1	0.05	<0.5	<0.6
05/18/10	0.1	1.0	0.09	1.3	2.4						0.06	2.5	0.05	<0.5	2.6	<0.1	2.1	0.06	<0.5	2.2	<0.1	1.7	0.06	0.53	2.3	<0.1	2.4	0.12	<0.5	2.5
05/25/10	0.2	1.5	0.26	1.7	3.4						<0.1	2.1	0.06	<0.5	2.2	<0.1	1.8	0.06	<0.5	1.9	<0.1	1.8	0.07	<0.5	1.9	<0.1	2.2	0.11	0.47	2.7
06/02/10	0.3	0.7	0.26	0.9	1.8						<0.1	2.2	0.27	<0.5	2.5	<0.1	1.5	0.23	<0.5	1.7	<0.1	2.2	0.22	<0.5	2.4	<0.1	2.3	0.25	<0.5	2.5
06/08/10	0.2	1.0	0.19	<0.5	1.2						<0.1	2.2	0.29	<0.5	2.5	<0.1	1.4	0.23	<0.5	1.7	<0.1	2.1	0.21	<0.5	2.3	<0.1	2.2	0.22	<0.5	2.5
06/15/10	<0.1	1.0	0.22	0.9	2.1						<0.1	2.3	0.24	<0.5	2.5	<0.1	2.1	0.22	<0.5	2.3	<0.1	1.8	0.19	0.59	2.6	<0.1	2.1	0.20	<0.5	2.3
06/22/10	<0.1	0.5	0.15	1.0	1.7						<0.1	2.3	0.26	<0.5	2.5	<0.1	1.8	0.23	<0.5	2.0	<0.1	1.4	0.22	<0.5	1.6	<0.1	1.9	0.23	<0.5	2.1
06/29/10	<0.1	0.5	0.15	1.0	1.7						<0.1	2.4	0.39	<0.5	2.8	<0.1	1.6	0.36	<0.5	1.9	<0.1	1.4	0.33	0.74	2.5	<0.1	1.9	0.06	<0.5	1.9

Table 4-3b
RP3 Basin: Monitoring Well Results
Nitrogen Speciation

Date	RP3-1/1					RP3-1/2				
	NH_3-N mg/L	NO_3-N mg/L	NO_2-N mg/L	TKN mg/L	TN mg/L	NH_3-N mg/L	NO_3-N mg/L	NO_2-N mg/L	TKN mg/L	TN mg/L
01/13/09	<0.1	41.7	0.13	0.9	42.7	<0.1	22.7	0.11	2.3	25.1
02/18/09	<0.1	36.5	0.14	<0.5	36.7	<0.1	22.1	0.09	<0.5	22.1
04/15/09	<0.1	19.3	1.86	0.7	21.9	<0.1	21.5	0.08	<0.5	21.5
06/02/09	<0.1	13.0	0.32	0.9	14.3	<0.1	24.3	0.33	<0.5	24.6
06/16/09	0.2	12.7	0.23	0.8	13.7	<0.1	25.5	0.33	<0.5	25.9
07/08/09	<0.1	11.7	0.19	0.7	12.6	<0.1	26.0	0.07	<0.5	26.1
07/14/09	<0.1	11.5	0.23	<0.5	11.7	<0.1	26.2	0.21	<0.5	26.4
07/22/09	<0.1	11.5	0.26	<0.5	11.8	<0.1	26.3	0.24	<0.5	26.5
07/28/09	<0.1	11.6	0.28	1.6	13.5	<0.1	13.3	0.14	<0.5	13.5
08/11/09	<0.1	12.8	0.04	0.8	13.6	<0.1	27.5	0.29	<0.5	27.8
08/25/09	<0.1	15.1	0.19	<0.5	15.3	<0.1	29.5	0.29	<0.5	29.8
09/08/09	<0.1	19.8	0.40	<0.5	20.2	<0.1	28.0	0.28	<0.5	28.2
09/22/09	<0.1	25.7	0.04	0.9	26.6	<0.1	26.1	0.13	0.6	26.9
10/07/09	<0.1	29.8	0.24	<0.5	30.0	<0.1	24.1	0.22	<0.5	24.3
10/19/09	<0.1	27.2	0.49	<0.5	27.7	<0.1	18.8	0.46	<0.5	19.3
11/02/09	0.2	6.1	0.39	<0.5	6.5	<0.1	0.8	0.24	<0.5	1.0
12/01/09	<0.1	22.3	0.81	<0.5	23.1	<0.1	3.8	0.32	<0.5	4.1
12/09/09	0.2	11.5	0.38	1.0	12.8	<0.1	4.6	0.85	<0.5	5.5
01/05/10	<0.1	17.8	0.38	<0.1	18.2	<0.1	6.6	1.13	<0.5	7.8
01/07/10	<0.1	16.0	0.46	<0.1	16.5	<0.1	6.5	1.05	<0.5	7.6
03/02/10	<0.1	56.3	<0.01	<0.1	56.3	<0.1	41.4	0.52	<0.5	42.0
04/06/10	<0.1	65.4	<0.01	<0.1	65.4	<0.1	54.4	0.44	<0.5	54.8
04/14/10	<0.1	69.1	<0.01	<0.1	69.1	<0.1	59.3	0.67	<0.5	60.0
06/02/10	<0.1	63.9	1.20	<0.1	65.1	<0.1	59.7	1.41	<0.5	61.1

Table 4-4a
RP3 Basin: Surface Water and Lysimeter Results
Total Nitrogen
(mg/L)

Date	Surface Water	Lysimeter Depth (ft bgs)					% RW at 25 ft bgs Lysimeter
	0	5	10	15	25	35	
02/19/09	0.6	0.6	3.2	5.0	12.1	19.8	0%
02/24/09	1.0	1.5		2.9	8.2	18.5	0%
03/03/09		7.1		3.4	5.3	18.5	0%
04/21/09		2.8	2.3	1.6	2.8	19.5	0%
04/28/09		2.0	3.3	2.1	2.6	19.7	0%
05/05/09	0.5	1.8	1.7	2.9	2.7	18.2	0%
05/12/09		2.7	1.9	3.3	3.3	16.6	0%
05/19/09		4.9	2.6	2.8	4.7	14.0	0%
05/27/09		7.9	3.0	3.3	7.6	13.5	0%
06/02/09		10.7	2.8	3.9	4.9	13.5	0%
06/09/09	1.6	2.7	3.7	4.3	7.1	12.5	0%
06/16/09		5.8	3.5	4.4	3.7	11.3	0%
06/23/09		5.1	4.8	3.4	4.6	9.2	0%
06/30/09	8.4	16.1	5.5	4.5	4.6	8.0	0%
07/08/09	3.4	8.2	7.5	4.7	4.7	7.2	97%
07/14/09		3.1	3.4	6.1	7.5	8.2	100%
07/21/09	0.7	3.5	2.8	4.7	5.8	6.5	103%
07/28/09	2.5	3.3	2.1	2.8	4.3	6.5	103%
08/04/09	4.0	5.5	3.7	2.5	3.5	6.4	106%
08/11/09	2.1	3.0	2.9	2.3	2.4	5.3	96%
08/18/09	2.5	3.4	2.4	2.8	2.4	4.9	97%
08/26/09	2.4	1.7	2.5	3.2	2.6	4.8	99%
09/01/09	3.1		1.8	2.1	2.2	4.6	110%
09/09/09	2.4		2.1	1.9	2.0	5.0	109%
09/15/09	1.9		2.6	2.1	1.8	4.0	110%
09/22/09	2.5	3.0	3.3	3.1	2.8	4.4	109%
09/29/09	3.6		3.6	2.7	2.9	4.5	100%
10/06/09	3.2		2.8	2.0	2.4	3.6	94%
10/13/09	3.1		2.1	2.0	1.7	3.3	101%
10/20/09	3.1	1.1	4.5	2.1	2.0	3.1	106%
10/27/09	2.9	3.1	2.6	2.3	1.5	2.6	88%
11/03/09	4.3	3.1	3.4	2.4	1.8	2.3	91%
11/10/09	2.6	1.8	2.1	2.3	2.4	2.3	98%
11/17/09	2.7	0.8	1.3	2.1	2.4	2.2	103%
11/24/09	3.6	2.2	2.3	3.5	2.5	2.2	91%
12/01/09	3.2	1.9	2.0	2.1	2.5	2.1	91%
12/09/09	2.5	2.8	3.1	2.0	2.5	2.0	93%
12/15/09	1.5	0.8	1.7	2.2	2.4	1.8	91%
12/22/09	2.2	1.1	2.0	2.9	2.6	2.0	95%
12/31/09	1.3	1.2	1.9	2.2	2.4	1.9	90%
01/05/10			1.3	2.1	2.3	2.2	73%
01/12/10	1.8		1.4	1.7	2.2	2.2	62%
02/09/10	0.6	1.2	2.2	1.1	1.2	2.0	42%
02/17/10	3.0	2.7	1.8	1.6	1.5	2.2	33%
02/23/10	1.6	2.3	1.8	1.6	1.5	2.3	0%
03/02/10	0.4	2.5	1.7	1.6	1.6	2.4	0%
03/09/10	2.6	1.3	1.6	1.9	1.7	2.5	56%
03/16/10	2.5		1.4	1.6	1.6	2.3	53%
03/24/10	2.0		1.5	1.5	1.3	2.2	45%
03/30/10	1.5		1.5	1.7	1.5	2.1	56%
04/06/10	2.8		1.9	1.6	2.0	2.0	61%
04/13/10	1.0		2.2	1.5	1.6	1.9	63%
04/29/10	2.7		2.6	2.8	1.5	2.0	87%
05/04/10	4.1		1.1	2.6	1.8	2.4	79%
05/11/10	2.2				1.8	0.2	76%
05/18/10	3.3		2.6	2.2	2.3	2.5	79%
05/25/10	2.4		2.2	1.9	1.9	2.7	84%
06/02/10	3.4		2.5	1.7	2.4	2.5	90%
06/08/10	1.8		2.5	1.7	2.3	2.5	96%
06/15/10	1.2		2.5	2.3	2.6	2.3	97%
06/22/10	2.1		2.5	2.0	1.6	2.1	98%
06/29/10	1.7		2.8	1.9	2.5	1.9	101%

Notes (blank) Insufficient sample from lysimeter result in parameter not being analyzed

Table 5-1
RP3 Basin: SAT Removal Efficiencies for TOC and TN

SAT Removal Efficiency for TOC			
Event	Initial Date	75-day date offset to 35-foot Lysimeter	
Start RW Recharge	06/02/09	08/16/09	
Start of Storms	12/01/09	02/14/10	
	Surface Water	35-foot Lysimeter	
26 samples	TOC (mg/L)	TOC (mg/L)	SAT Eff. (%)
Minimum	5.30	0.74	86%
Maximum	13.50	1.63	88%
Average	8.22	0.98	88%

20-Sample Rolling Average TOC for the 35-foot Lysimeter			
From:	09/09/09	1.00	(mg/L)

SAT Removal Efficiency for TN			
Event	Initial Date	TN at 35-ft Lysimeter <= Surface Water TN	
Start RW Recharge	06/02/09		
75 -day offset back	08/06/09	10/20/09	
Start of Storms	12/01/09	02/14/10	
	Surface Water	35-foot Lysimeter	
19 samples	TN (mg/L)	TN (mg/L)	SAT Eff. (%)
Minimum	1.9	1.8	6%
Maximum	4.3	2.2	49%
Average	2.9	2.0	31%

Table 5-1
RP3 Basin: SAT Removal Efficiencies for TOC and TN

SAT Removal Efficiency for TOC			
Surface Water	Data Ranges	75-day offset to 35-foot Lysimeter	
Start RW Recharge	06/02/09	08/16/09	
Start of Storms	12/01/09	02/14/10	
	Surface Water	35-foot Lysimeter	
26 samples	TOC (mg/L)	TOC (mg/L)	SAT Eff. (%)
Minimum	5.30	0.74	86%
Maximum	13.50	1.63	88%
Average	8.22	0.98	88%

20-Sample Rolling Average TOC for the 35-foot Lysimeter			
From:	09/09/09	1.00	(mg/L)

SAT Removal Efficiency for TN			
Data Ranges	Surface Water	TN at 35-ft Lysimeter <= Surface Water TN	
Start RW Recharge	06/02/09		
75 -day offset back	08/06/09	10/20/09	
Start of Storms	12/01/09	02/14/10	
	Surface Water	35-foot Lysimeter	
19 samples	TN (mg/L)	TN (mg/L)	SAT Eff. (%)
Minimum	1.9	1.8	6%
Maximum	4.3	2.2	49%
Average	2.9	2.0	31%

Table 7-1
RP3 Basin: Recycled Water Management Plan
From Historical Diluent Water (DW) and Recycled Water (RW) Deliveries

Date		No. Mos. Since Initial RW Delivery	SW (AF)	MWD (AF)	Underflow (AF)	DW Total (AF)	DW 120-Month Total (AF)	RW (AF)	RW 120-Month Total (AF)	DW + RW 120-Month Total (AF)	RWC	Source
2005/06	Jul '05	-47	31.	0.		31.	31.	0.	0.	31.	0%	HISTORICAL
	Aug '05	-46	31.	0.		31.	62.	0.	0.	62.	0%	
	Sep '05	-45	60.	0.		60.	122.	0.	0.	122.	0%	
	Oct '05	-44	78.	0.		78.	200.	0.	0.	200.	0%	
	Nov '05	-43	60.	0.		60.	260.	0.	0.	260.	0%	
	Dec '05	-42	60.	0.		60.	320.	0.	0.	320.	0%	
	Jan '06	-41	33.	0.		33.	353.	0.	0.	353.	0%	
	Feb '06	-40	64.	0.		64.	417.	0.	0.	417.	0%	
	Mar '06	-39	161.	0.		161.	578.	0.	0.	578.	0%	
	Apr '06	-38	127.	0.		127.	705.	0.	0.	705.	0%	
	May '06	-37	37.	0.		37.	742.	0.	0.	742.	0%	
	Jun '06	-36	25.	0.		25.	767.	0.	0.	767.	0%	
2006/07	Jul '06	-35	15.	0.		15.	782.	0.	0.	782.	0%	HISTORICAL
	Aug '06	-34	36.	0.		36.	818.	0.	0.	818.	0%	
	Sep '06	-33	35.	0.		35.	853.	0.	0.	853.	0%	
	Oct '06	-32	33.	0.		33.	886.	0.	0.	886.	0%	
	Nov '06	-31	36.	0.		36.	922.	0.	0.	922.	0%	
	Dec '06	-30	26.	0.		26.	947.	0.	0.	947.	0%	
	Jan '07	-29	22.	0.		22.	969.	0.	0.	969.	0%	
	Feb '07	-28	19.	0.		19.	988.	0.	0.	988.	0%	
	Mar '07	-27	7.	0.		7.	996.	0.	0.	996.	0%	
	Apr '07	-26	4.	0.		4.	1,000.	0.	0.	1,000.	0%	
	May '07	-25	2.	0.		2.	1,002.	0.	0.	1,002.	0%	
	Jun '07	-24	2.	0.		2.	1,004.	0.	0.	1,004.	0%	
2007/08	Jul '07	-23	0.	0.		0.	1,004.	0.	0.	1,004.	0%	HISTORICAL
	Aug '07	-22	3.	0.		3.	1,007.	0.	0.	1,007.	0%	
	Sep '07	-21	3.	0.		3.	1,010.	0.	0.	1,010.	0%	
	Oct '07	-20	9.	0.		9.	1,019.	0.	0.	1,019.	0%	
	Nov '07	-19	47.	0.		47.	1,066.	0.	0.	1,066.	0%	
	Dec '07	-18	108.	0.		108.	1,174.	0.	0.	1,174.	0%	
	Jan '08	-17	165.	0.		165.	1,339.	0.	0.	1,339.	0%	
	Feb '08	-16	130.	0.		130.	1,469.	0.	0.	1,469.	0%	
	Mar '08	-15	5.	0.		5.	1,474.	0.	0.	1,474.	0%	
	Apr '08	-14	3.	0.		3.	1,477.	0.	0.	1,477.	0%	
	May '08	-13	34.	0.		34.	1,511.	0.	0.	1,511.	0%	
	Jun '08	-12	4.	0.		4.	1,515.	0.	0.	1,515.	0%	
2008/09	Jul '08	-11	0.	0.		0.	1,515.	0.	0.	1,515.	0%	HISTORICAL
	Aug '08	-10	16.	0.		16.	1,531.	0.	0.	1,531.	0%	
	Sep '08	-9	16.	0.		16.	1,547.	0.	0.	1,547.	0%	
	Oct '08	-8	13.	0.		13.	1,560.	0.	0.	1,560.	0%	
	Nov '08	-7	27.	0.		27.	1,587.	0.	0.	1,587.	0%	
	Dec '08	-6	156.	0.		156.	1,743.	0.	0.	1,743.	0%	
	Jan '09	-5	12.	0.		12.	1,755.	0.	0.	1,755.	0%	
	Feb '09	-4	273.	0.		273.	2,028.	0.	0.	2,028.	0%	
	Mar '09	-3	47.	0.		47.	2,075.	0.	0.	2,075.	0%	
	Apr '09	-2	18.	0.		18.	2,093.	0.	0.	2,093.	0%	
	May '09	-1	6.	0.		6.	2,099.	0.	0.	2,099.	0%	
	Jun '09	1	0.	0.		0.	2,099.	106.	106.	2,205.	5%	
2009/10	Jul '09	2	22.	0.		22.	2,121.	84.	190.	2,311.	8%	START-UP
	Aug '09	3	30.	0.		30.	2,151.	148.	338.	2,489.	14%	
	Sep '09	4	36.	0.		36.	2,187.	220.	558.	2,745.	20%	
	Oct '09	5	122.	0.	904.	1,026.	3,212.	203.	761.	3,973.	19%	
	Nov '09	6	100.	0.	904.	1,004.	4,216.	287.	1,048.	5,264.	20%	
	Dec '09	7	373.	0.	904.	1,277.	5,493.	103.	1,151.	6,644.	17%	
	Jan '10	8	526.	0.	904.	1,430.	6,923.	76.	1,227.	8,150.	15%	
	Feb '10	9	370.	0.	904.	1,274.	8,196.	113.	1,340.	9,536.	14%	
	Mar '10	10	104.	0.	904.	1,008.	9,204.	213.	1,553.	10,757.	14%	
	Apr '10	11	128.	0.	904.	1,032.	10,236.	71.	1,624.	11,860.	14%	
	May '10	12	49.	0.	904.	953.	11,189.	272.	1,896.	13,085.	14%	
	Jun '10	13	42.	0.	904.	946.	12,134.	261.	2,157.	14,291.	15%	
2010/11	Jul '10	14	23.	0.	904.	927.	13,061.	229.	2,386.	15,447.	15%	
	Aug '10	15	22.	0.	904.	926.	13,987.	181.	2,567.	16,554.	16%	
	Sep '10	16	19.	0.	904.	923.	14,910.	48.	2,615.	17,525.	15%	
	Oct '10	17	70.	0.	904.	974.	15,883.	23.	2,638.	18,521.	14%	
	Nov '10	18	54.	0.	904.	958.	16,841.	240.	2,878.	19,719.	15%	PLANNED
	Dec '10	19	145.	0.	904.	1,049.	17,890.	240.	3,118.	21,008.	15%	
	Jan '11	20	152.	0.	904.	1,056.	18,946.	240.	3,358.	22,304.	15%	
	Feb '11	21	171.	0.	904.	1,075.	20,020.	240.	3,598.	23,618.	15%	
	Mar '11	22	65.	0.	904.	969.	20,989.	240.	3,838.	24,827.	15%	
	Apr '11	23	56.	0.	904.	960.	21,949.	240.	4,078.	26,027.	16%	
	May '11	24	26.	0.	904.	930.	22,879.	240.	4,318.	27,197.	16%	
	Jun '11	25	15.	0.	904.	919.	23,798.	0.	4,318.	28,116.	15%	

Table 7-1
RP3 Basin: Recycled Water Management Plan
From Historical Diluent Water (DW) and Recycled Water (RW) Deliveries

Date		No. Mos. Since Initial RW Delivery	SW (AF)	MWD (AF)	Underflow (AF)	DW Total (AF)	DW 120-Month Total (AF)	RW (AF)	RW 120-Month Total (AF)	DW + RW 120-Month Total (AF)	RWC	Source
2011/12	Jul '11	26	15.	0.	904.	919.	24,716.	229.	4,547.	29,263.	16%	
	Aug '11	27	23.	0.	904.	927.	25,643.	181.	4,728.	30,371.	16%	
	Sep '11	28	28.	0.	904.	932.	26,575.	48.	4,776.	31,351.	15%	
	Oct '11	29	54.	0.	904.	958.	27,533.	23.	4,799.	32,332.	15%	
	Nov '11	30	54.	0.	904.	958.	28,490.	240.	5,039.	33,529.	15%	
	Dec '11	31	145.	0.	904.	1,049.	29,539.	240.	5,279.	34,818.	15%	
	Jan '12	32	152.	0.	904.	1,056.	30,595.	240.	5,519.	36,114.	15%	
	Feb '12	33	171.	0.	904.	1,075.	31,670.	240.	5,759.	37,429.	15%	
	Mar '12	34	65.	0.	904.	969.	32,638.	240.	5,999.	38,637.	16%	
	Apr '12	35	56.	0.	904.	960.	33,598.	240.	6,239.	39,837.	16%	
	May '12	36	26.	0.	904.	930.	34,528.	240.	6,479.	41,007.	16%	
	Jun '12	37	15.	0.	904.	919.	35,447.	0.	6,479.	41,926.	15%	
2012/13	Jul '12	38	15.	0.	452.	467.	35,913.	229.	6,708.	42,621.	16%	
	Aug '12	39	23.	0.	452.	475.	36,388.	181.	6,889.	43,277.	16%	
	Sep '12	40	28.	0.	452.	480.	36,868.	48.	6,937.	43,805.	16%	
	Oct '12	41	54.	0.	452.	506.	37,374.	23.	6,960.	44,334.	16%	
	Nov '12	42	54.	0.	452.	506.	37,880.	240.	7,200.	45,080.	16%	
	Dec '12	43	145.	0.	452.	597.	38,477.	240.	7,440.	45,917.	16%	PLANNED
	Jan '13	44	152.	0.	452.	604.	39,081.	240.	7,680.	46,761.	16%	
	Feb '13	45	171.	0.	452.	623.	39,704.	240.	7,920.	47,624.	17%	
	Mar '13	46	65.	0.	452.	517.	40,220.	240.	8,160.	48,380.	17%	
	Apr '13	47	56.	0.	452.	508.	40,728.	240.	8,400.	49,128.	17%	
	May '13	48	26.	0.	452.	478.	41,206.	240.	8,640.	49,846.	17%	
	Jun '13	49	15.	0.	452.	467.	41,673.	0.	8,640.	50,313.	17%	
2013/14	Jul '13	50	15.	0.	452.	467.	42,140.	229.	8,869.	51,009.	17%	
	Aug '13	51	23.	0.	452.	475.	42,615.	181.	9,050.	51,665.	18%	
	Sep '13	52	28.	0.	452.	480.	43,095.	48.	9,098.	52,193.	17%	
	Oct '13	53	54.	0.	452.	506.	43,601.	23.	9,121.	52,722.	17%	
	Nov '13	54	54.	0.	452.	506.	44,106.	240.	9,361.	53,467.	18%	
	Dec '13	55	145.	0.	452.	597.	44,703.	240.	9,601.	54,304.	18%	
	Jan '14	56	152.	0.	452.	604.	45,307.	240.	9,841.	55,148.	18%	
	Feb '14	57	171.	0.	452.	623.	45,930.	240.	10,081.	56,011.	18%	
	Mar '14	58	65.	0.	452.	517.	46,447.	240.	10,321.	56,768.	18%	
	Apr '14	59	56.	0.	452.	508.	46,955.	240.	10,561.	57,516.	18%	
	May '14	60	26.	0.	452.	478.	47,433.	240.	10,801.	58,234.	19%	
	Jun '14	61	15.	0.	452.	467.	47,900.	0.	10,801.	58,701.	18%	
2014/15	Jul '14	62	15.	0.	452.	467.	48,367.	229.	11,030.	59,397.	19%	
	Aug '14	63	23.	0.	452.	475.	48,841.	181.	11,211.	60,052.	19%	
	Sep '14	64	28.	0.	452.	480.	49,321.	48.	11,259.	60,580.	19%	
	Oct '14	65	54.	0.	452.	506.	49,827.	23.	11,282.	61,109.	18%	
	Nov '14	66	54.	0.	452.	506.	50,333.	240.	11,522.	61,855.	19%	
	Dec '14	67	145.	0.	452.	597.	50,930.	240.	11,762.	62,692.	19%	PLANNED
	Jan '15	68	152.	0.	452.	604.	51,534.	240.	12,002.	63,536.	19%	
	Feb '15	69	171.	0.	452.	623.	52,157.	240.	12,242.	64,399.	19%	
	Mar '15	70	65.	0.	452.	517.	52,674.	240.	12,482.	65,156.	19%	
	Apr '15	71	56.	0.	452.	508.	53,181.	240.	12,722.	65,903.	19%	
	May '15	72	26.	0.	452.	478.	53,659.	240.	12,962.	66,621.	19%	
	Jun '15	73	15.	0.	452.	467.	54,126.	0.	12,962.	67,088.	19%	
2015/16	Jul '15	74	15.	0.	452.	467.	54,562.	229.	13,191.	67,753.	19%	
	Aug '15	75	23.	0.	452.	475.	55,006.	181.	13,372.	68,378.	20%	
	Sep '15	76	28.	0.	452.	480.	55,426.	48.	13,420.	68,846.	19%	
	Oct '15	77	54.	0.	452.	506.	55,854.	23.	13,443.	69,297.	19%	
	Nov '15	78	54.	0.	452.	506.	56,300.	240.	13,683.	69,983.	20%	
	Dec '15	79	145.	0.	452.	597.	56,836.	240.	13,923.	70,759.	20%	
	Jan '16	80	152.	0.	452.	604.	57,408.	240.	14,163.	71,571.	20%	
	Feb '16	81	171.	0.	452.	623.	57,966.	240.	14,403.	72,369.	20%	
	Mar '16	82	65.	0.	452.	517.	58,322.	240.	14,643.	72,965.	20%	
	Apr '16	83	56.	0.	452.	508.	58,703.	240.	14,883.	73,586.	20%	
	May '16	84	26.	0.	452.	478.	59,144.	240.	15,123.	74,267.	20%	
	Jun '16	85	15.	0.	452.	467.	59,586.	0.	15,123.	74,709.	20%	
2016/17	Jul '16	86	15.	0.	452.	467.	60,038.	229.	15,352.	75,390.	20%	
	Aug '16	87	23.	0.	452.	475.	60,477.	181.	15,533.	76,010.	20%	
	Sep '16	88	28.	0.	452.	480.	60,922.	48.	15,581.	76,503.	20%	
	Oct '16	89	54.	0.	452.	506.	61,395.	23.	15,604.	76,999.	20%	
	Nov '16	90	54.	0.	452.	506.	61,865.	240.	15,844.	77,709.	20%	
	Dec '16	91	145.	0.	452.	597.	62,436.	240.	16,084.	78,520.	20%	
	Jan '17	92	152.	0.	452.	604.	63,018.	240.	16,324.	79,342.	21%	
	Feb '17	93	171.	0.	452.	623.	63,621.	240.	16,564.	80,185.	21%	
	Mar '17	94	65.	0.	452.	517.	64,131.	240.	16,804.	80,935.	21%	
	Apr '17	95	56.	0.	452.	508.	64,635.	240.	17,044.	81,679.	21%	
	May '17	96	26.	0.	452.	478.	65,111.	240.	17,284.	82,395.	21%	
	Jun '17	97	15.	0.	452.	467.	65,576.	0.	17,284.	82,860.	21%	

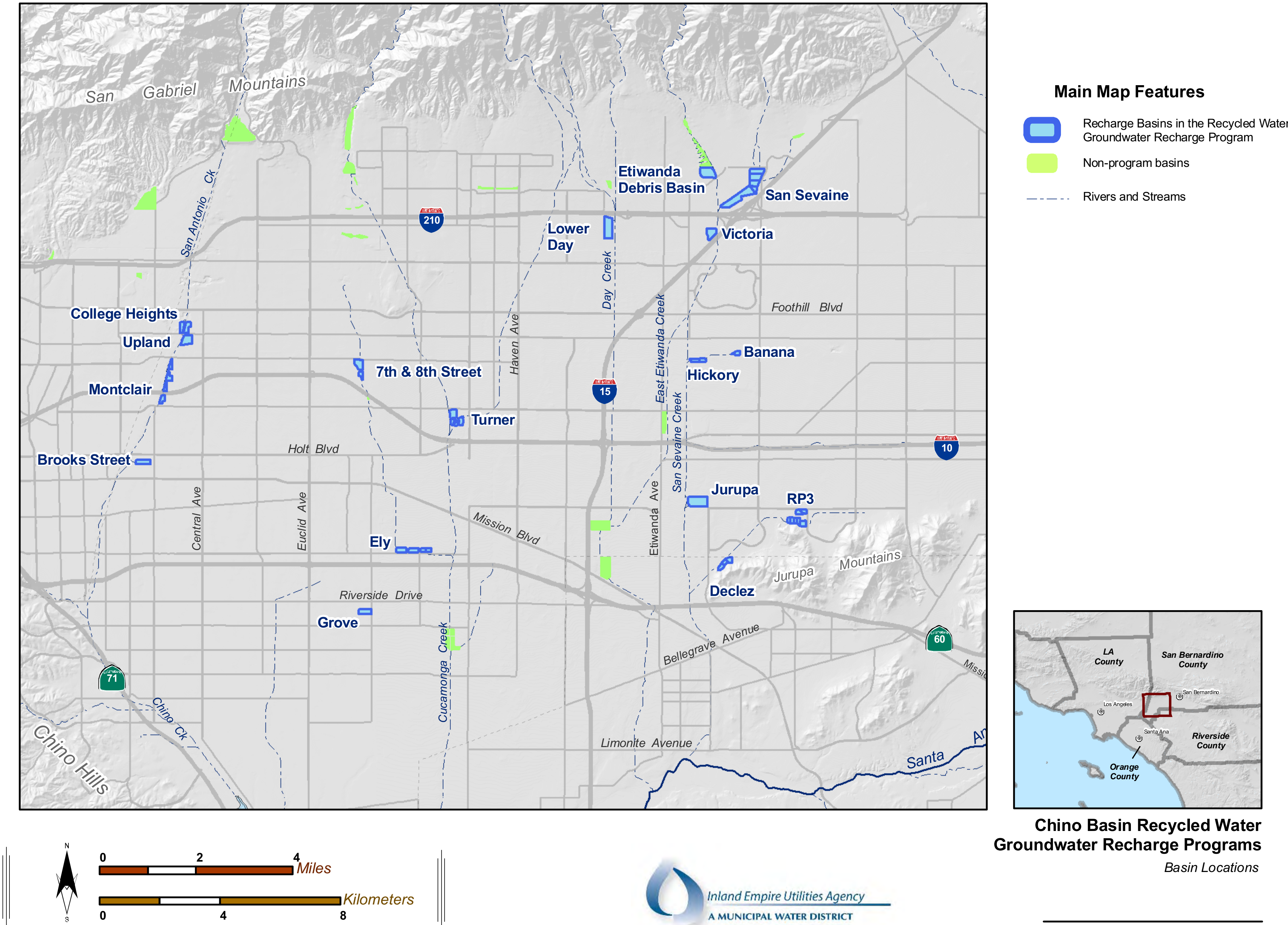
Table 7-1
RP3 Basin: Recycled Water Management Plan
From Historical Diluent Water (DW) and Recycled Water (RW) Deliveries

Date		No. Mos. Since Initial RW Delivery	SW (AF)	MWD (AF)	Underflow (AF)	DW Total (AF)	DW 120-Month Total (AF)	RW (AF)	RW 120-Month Total (AF)	DW + RW 120-Month Total (AF)	RWC	Source
2017/18	Jul '17	98	15.	0.	452.	467.	66,042.	229.	17,513.	83,555.	21%	PLANNED
	Aug '17	99	23.	0.	452.	475.	66,514.	181.	17,694.	84,208.	21%	
	Sep '17	100	28.	0.	452.	480.	66,991.	48.	17,742.	84,733.	21%	
	Oct '17	101	54.	0.	452.	506.	67,488.	23.	17,765.	85,253.	21%	
	Nov '17	102	54.	0.	452.	506.	67,947.	240.	18,005.	85,952.	21%	
	Dec '17	103	145.	0.	452.	597.	68,436.	240.	18,245.	86,681.	21%	
	Jan '18	104	152.	0.	452.	604.	68,875.	240.	18,485.	87,360.	21%	
	Feb '18	105	171.	0.	452.	623.	69,368.	240.	18,725.	88,093.	21%	
	Mar '18	106	65.	0.	452.	517.	69,879.	240.	18,965.	88,844.	21%	
	Apr '18	107	56.	0.	452.	508.	70,384.	240.	19,205.	89,589.	21%	
	May '18	108	26.	0.	452.	478.	70,828.	240.	19,445.	90,273.	22%	
	Jun '18	109	15.	0.	452.	467.	71,291.	0.	19,445.	90,736.	21%	
2018/19	Jul '18	110	15.	0.	452.	467.	71,758.	229.	19,674.	91,432.	22%	
	Aug '18	111	23.	0.	452.	475.	72,217.	181.	19,855.	92,072.	22%	
	Sep '18	112	28.	0.	452.	480.	72,681.	48.	19,903.	92,584.	21%	
	Oct '18	113	54.	0.	452.	506.	73,174.	23.	19,926.	93,100.	21%	
	Nov '18	114	54.	0.	452.	506.	73,652.	240.	20,166.	93,818.	21%	
	Dec '18	115	145.	0.	452.	597.	74,093.	240.	20,406.	94,499.	22%	
	Jan '19	116	152.	0.	452.	604.	74,685.	240.	20,646.	95,331.	22%	
	Feb '19	117	171.	0.	452.	623.	75,035.	240.	20,886.	95,921.	22%	
	Mar '19	118	65.	0.	452.	517.	75,505.	240.	21,126.	96,631.	22%	
	Apr '19	119	56.	0.	452.	508.	75,995.	240.	21,366.	97,361.	22%	
	May '19	120	26.	0.	452.	478.	76,467.	240.	21,606.	98,073.	22%	
	Jun '19	121	15.	0.	452.	467.	76,934.	0.	21,500.	98,434.	22%	
2019/20	Jul '19	122	15.	0.	452.	467.	77,379.	229.	21,645.	99,024.	22%	
	Aug '19	123	23.	0.	452.	475.	77,823.	181.	21,678.	99,501.	22%	
	Sep '19	124	28.	0.	452.	480.	78,267.	48.	21,506.	99,773.	22%	
	Oct '19	125	54.	0.	452.	506.	77,747.	23.	21,326.	99,073.	22%	
	Nov '19	126	54.	0.	452.	506.	77,250.	240.	21,279.	98,529.	22%	
	Dec '19	127	145.	0.	452.	597.	76,570.	240.	21,416.	97,986.	22%	
	Jan '20	128	152.	0.	452.	604.	75,744.	240.	21,580.	97,324.	22%	
	Feb '20	129	171.	0.	452.	623.	75,093.	240.	21,707.	96,800.	22%	
	Mar '20	130	65.	0.	452.	517.	74,602.	240.	21,734.	96,336.	23%	
	Apr '20	131	56.	0.	452.	508.	74,078.	240.	21,903.	95,981.	23%	
	May '20	132	26.	0.	452.	478.	73,603.	240.	21,871.	95,474.	23%	
	Jun '20	133	15.	0.	452.	467.	73,124.	0.	21,610.	94,734.	23%	
2020/21	Jul '20	134	15.	0.	452.	467.	72,664.	229.	21,610.	94,274.	23%	
	Aug '20	135	23.	0.	452.	475.	72,214.	181.	21,610.	93,824.	23%	
	Sep '20	136	28.	0.	452.	480.	71,771.	48.	21,610.	93,381.	23%	
	Oct '20	137	54.	0.	452.	506.	71,303.	23.	21,610.	92,913.	23%	
	Nov '20	138	54.	0.	452.	506.	70,851.	240.	21,610.	92,461.	23%	
	Dec '20	139	145.	0.	452.	597.	70,399.	240.	21,610.	92,009.	23%	
	Jan '21	140	152.	0.	452.	604.	69,947.	240.	21,610.	91,557.	24%	
	Feb '21	141	171.	0.	452.	623.	69,495.	240.	21,610.	91,105.	24%	
	Mar '21	142	65.	0.	452.	517.	69,043.	240.	21,610.	90,653.	24%	
	Apr '21	143	56.	0.	452.	508.	68,592.	240.	21,610.	90,202.	24%	
	May '21	144	26.	0.	452.	478.	68,140.	240.	21,610.	89,750.	24%	
	Jun '21	145	15.	0.	452.	467.	67,688.	0.	21,610.	89,298.	24%	
2021/22	Jul '21	146	15.	0.	452.	467.	67,236.	229.	21,610.	88,846.	24%	
	Aug '21	147	23.	0.	452.	475.	66,784.	181.	21,610.	88,394.	24%	
	Sep '21	148	28.	0.	452.	480.	66,332.	48.	21,610.	87,942.	25%	
	Oct '21	149	54.	0.	452.	506.	65,880.	23.	21,610.	87,490.	25%	
	Nov '21	150	54.	0.	452.	506.	65,428.	240.	21,610.	87,038.	25%	
	Dec '21	151	145.	0.	452.	597.	64,977.	240.	21,610.	86,587.	25%	
	Jan '22	152	152.	0.	452.	604.	64,525.	240.	21,610.	86,135.	25%	
	Feb '22	153	171.	0.	452.	623.	64,073.	240.	21,610.	85,683.	25%	
	Mar '22	154	65.	0.	452.	517.	63,621.	240.	21,610.	85,231.	25%	
	Apr '22	155	56.	0.	452.	508.	63,169.	240.	21,610.	84,779.	25%	
	May '22	156	26.	0.	452.	478.	62,717.	240.	21,610.	84,327.	26%	
	Jun '22	157	15.	0.	452.	467.	62,265.	0.	21,610.	83,875.	26%	

Notes:

DW = Diluent Water; Total DW is the sum of Stormwater & Local Runoff (SW), Imported Water from the State Water Project (MWD), and groundwater underflow.
RW = Recycled Water
Underflow is first included in the RWC calculation in October 2009 when the recharge permit was amended to allow it.
Upon initiation of recycled water recharge at Declez Basin (estimated for 2012), underflow coincidental to both RP3 and Declez Basins will be shared between them.
RWC = 120-month running total of recycled water / 120-month running total of all diluent and recycled water.
RWC maximum = 0.5 mg/L / the Running Average of Total Organic Carbon (TOC) determined from a recharge site's start-up period

FIGURES



Chino Basin Recycled Water Groundwater Recharge Programs

Basin Locations

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Figure 1-1

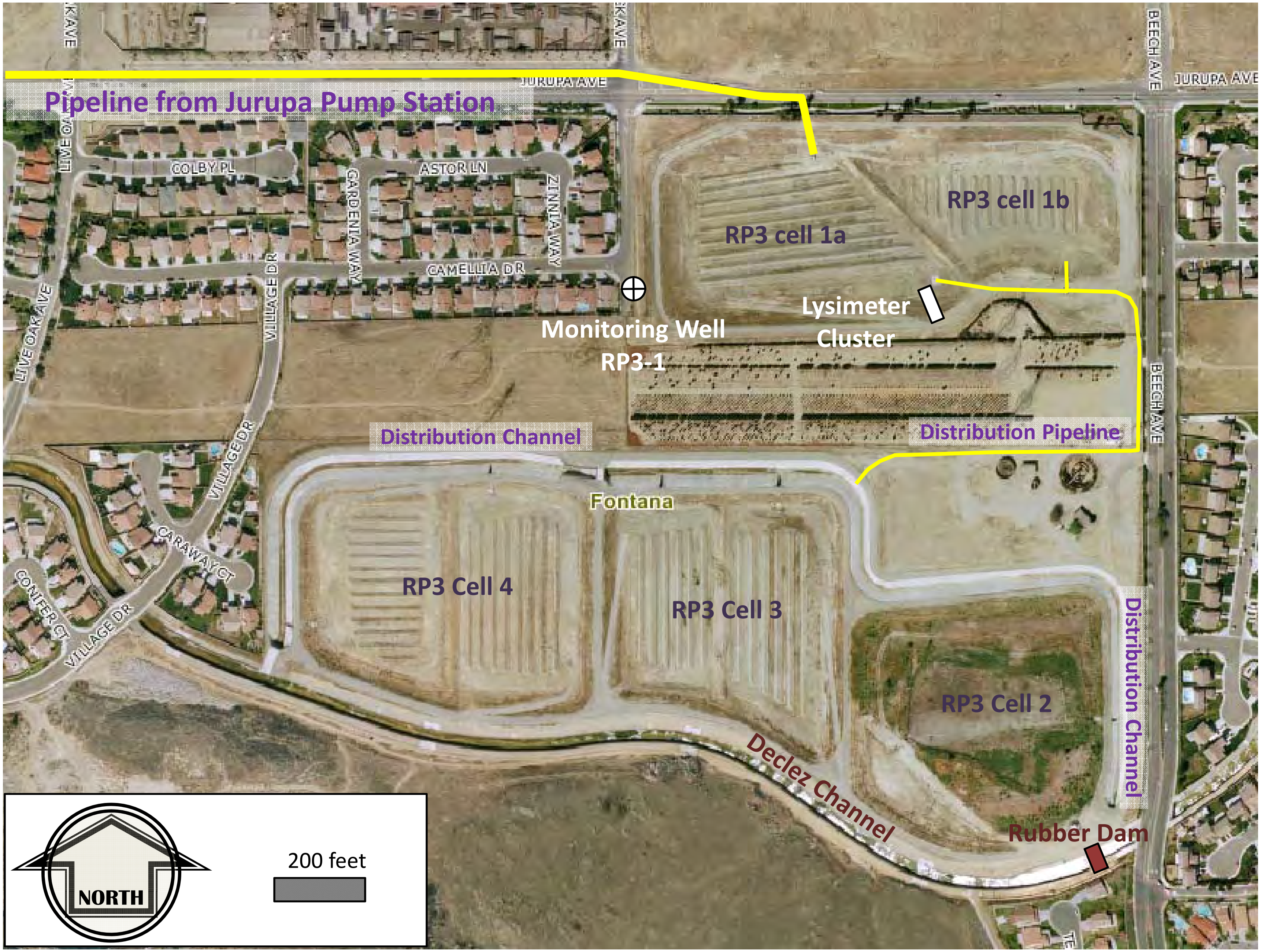


Figure 2-1
Location of Facilities at RP3 Basin

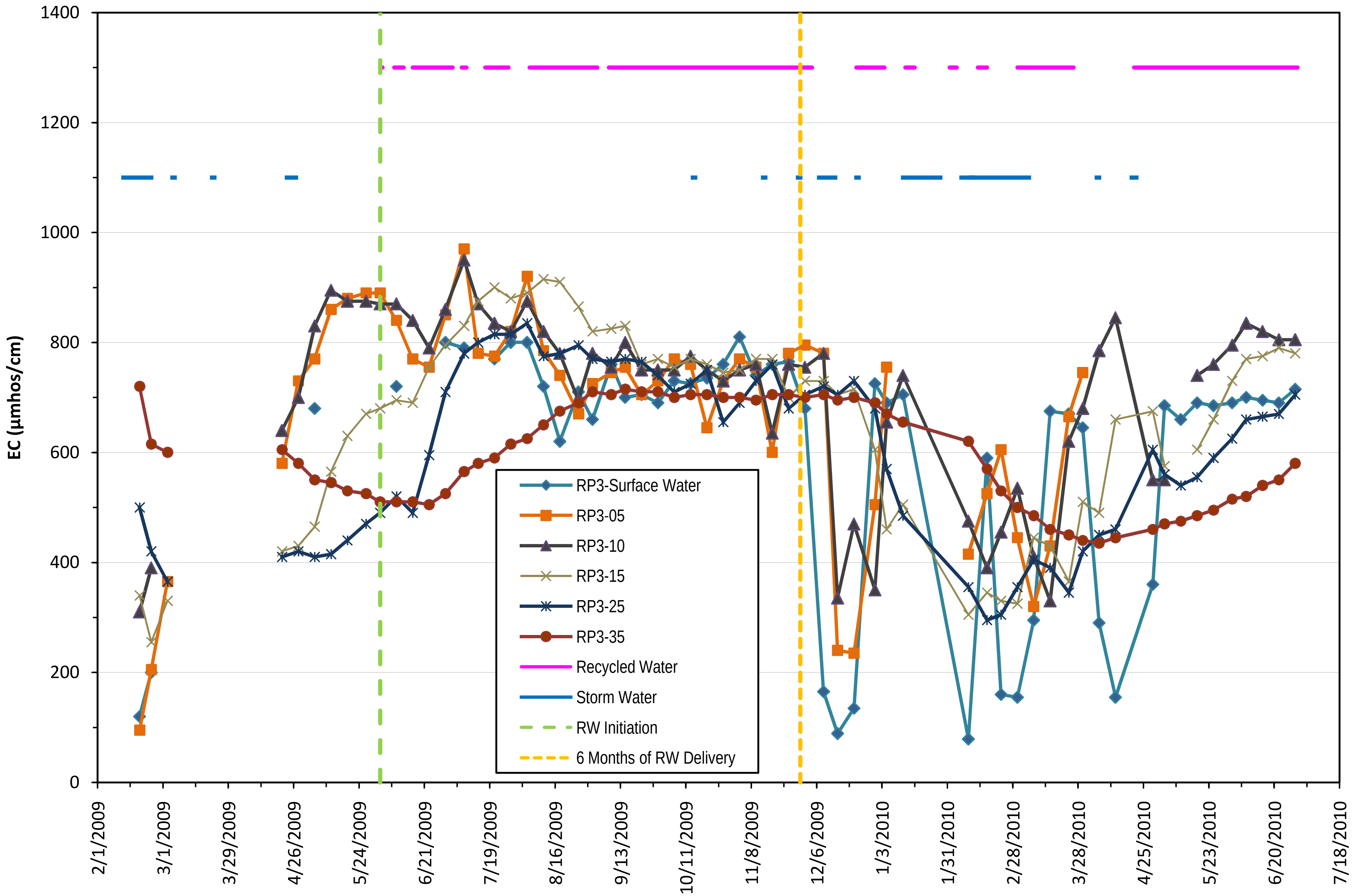


FIGURE 4-1a
RP3 BASIN: LYSIMETERS
ELECTRICAL CONDUCTIVITY TIME SERIES

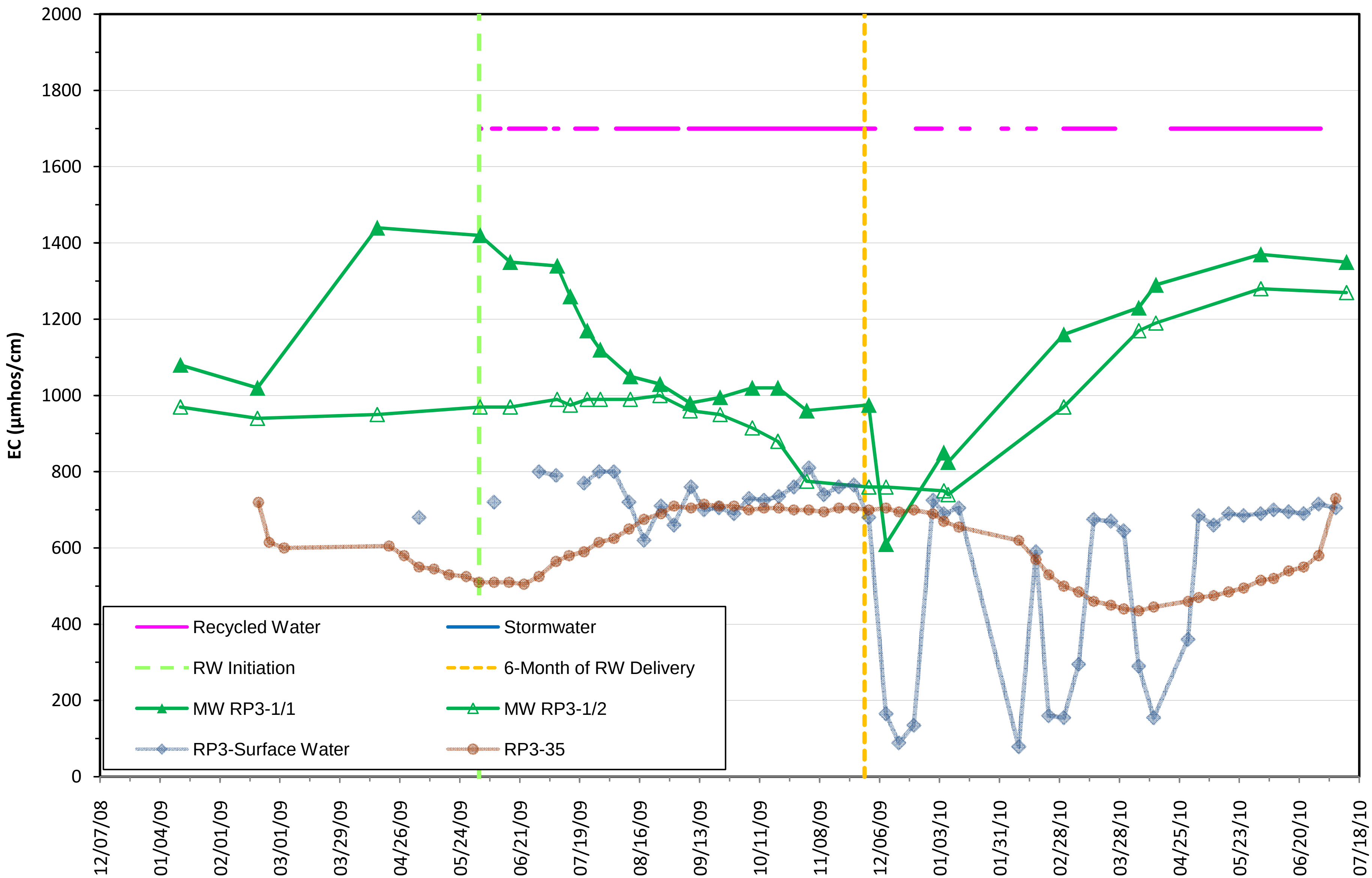


FIGURE 4-1b
RP3 BASIN: MONITORING WELL
ELECTRICAL CONDUCTIVITY TIME SERIES

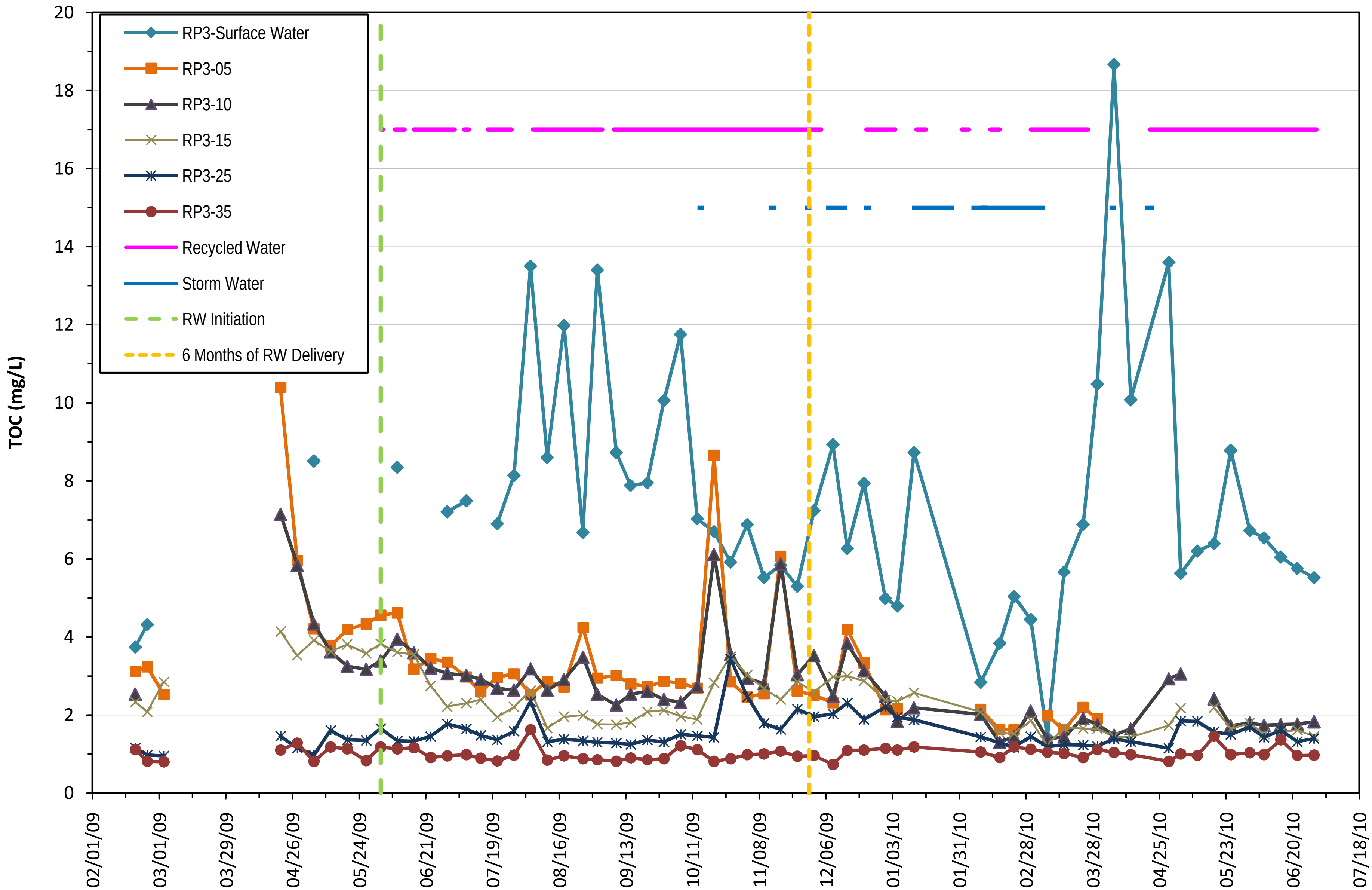


FIGURE 4-2a
RP3 BASIN: LYSIMETERS
TOTAL ORGANIC CARBON TIME SERIES

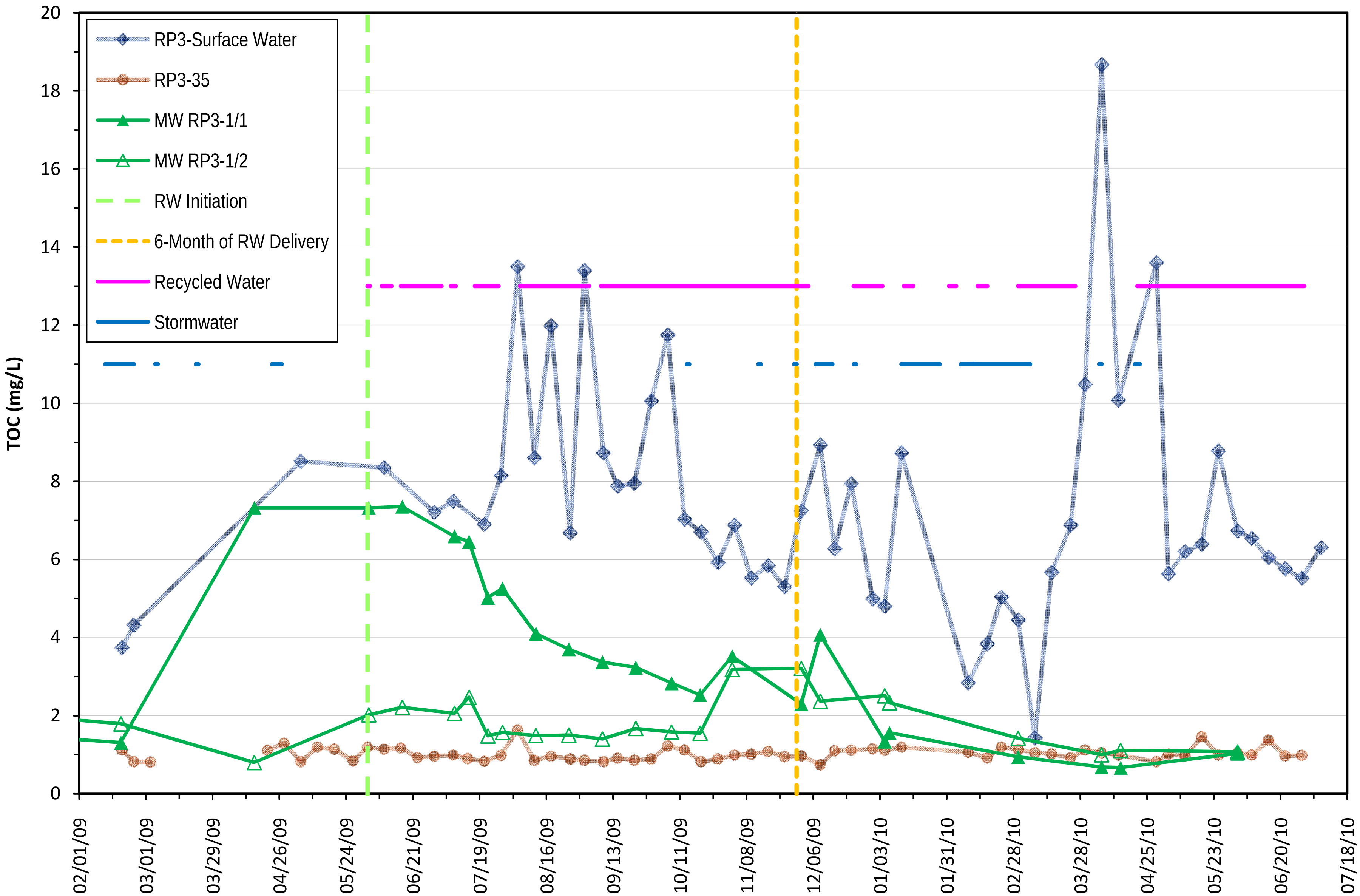


FIGURE 4-2b
RP3 BASIN: MONITORING WELL
TOTAL ORGANIC CARBON TIME SERIES

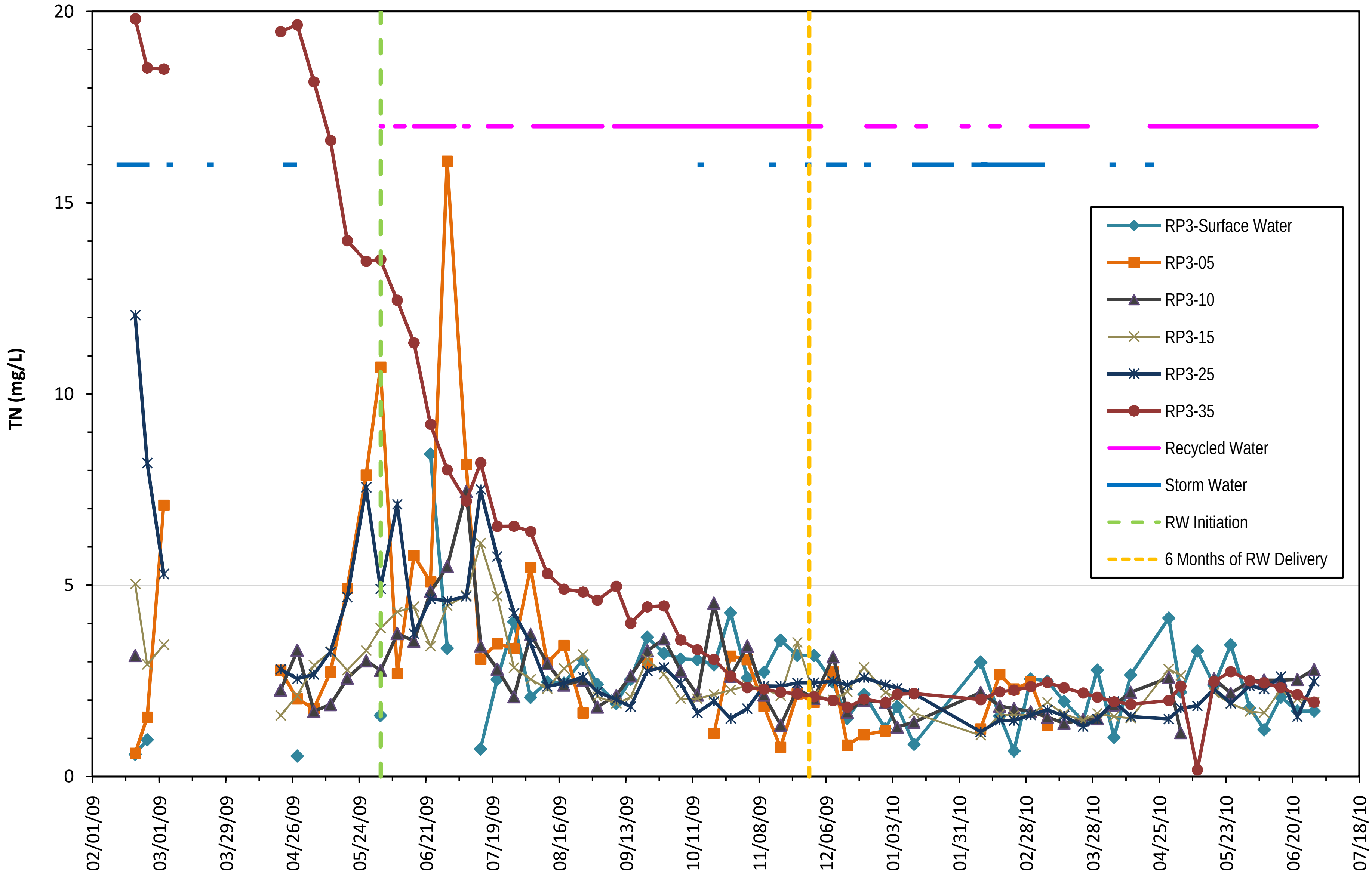


FIGURE 4-3a
RP3 BASIN: LYSIMETERS
TOTAL NITROGEN TIME SERIES

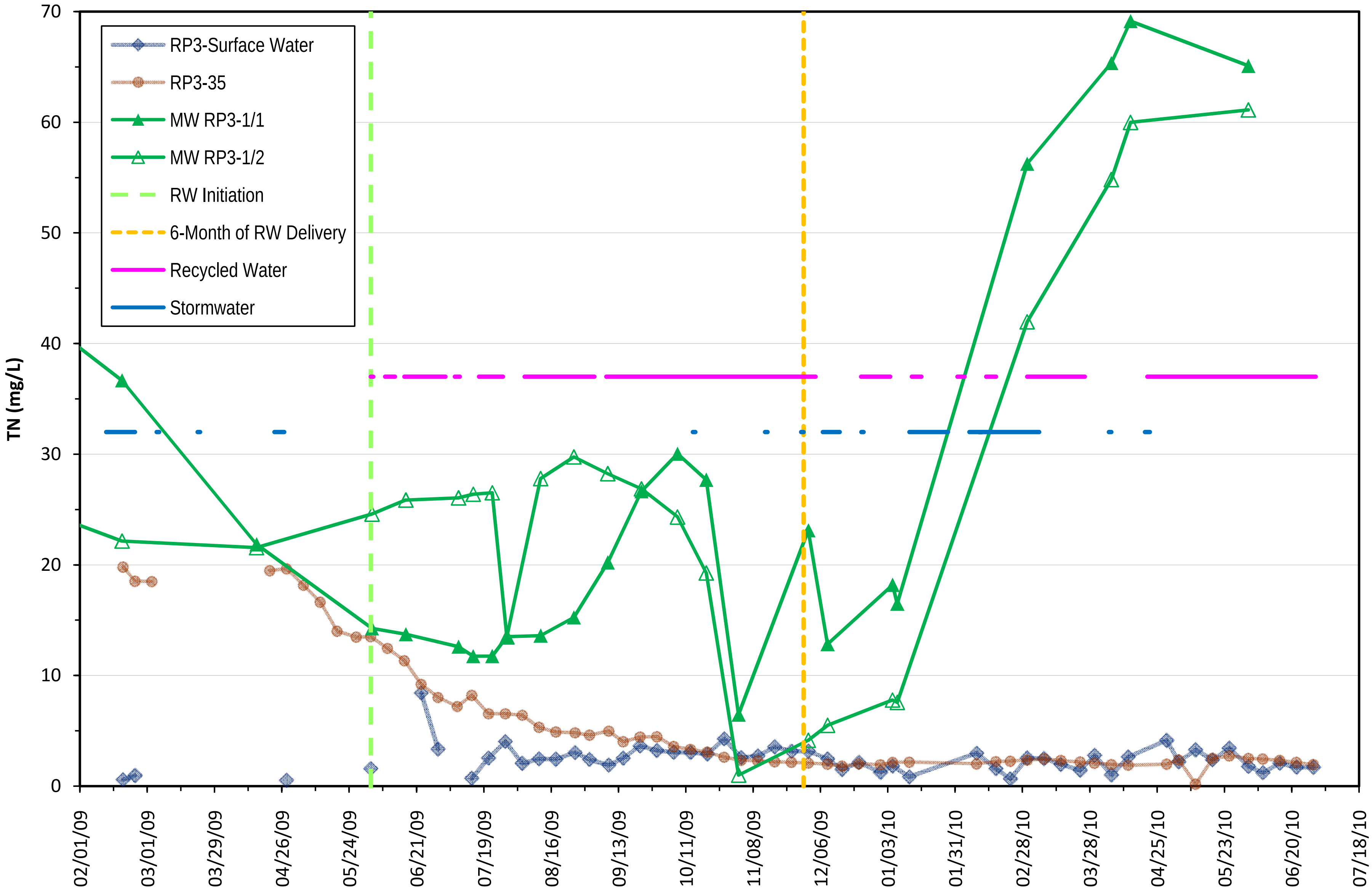


FIGURE 4-3b
RP3 BASIN: MONITORING WELL
TOTAL NITROGEN TIME SERIES

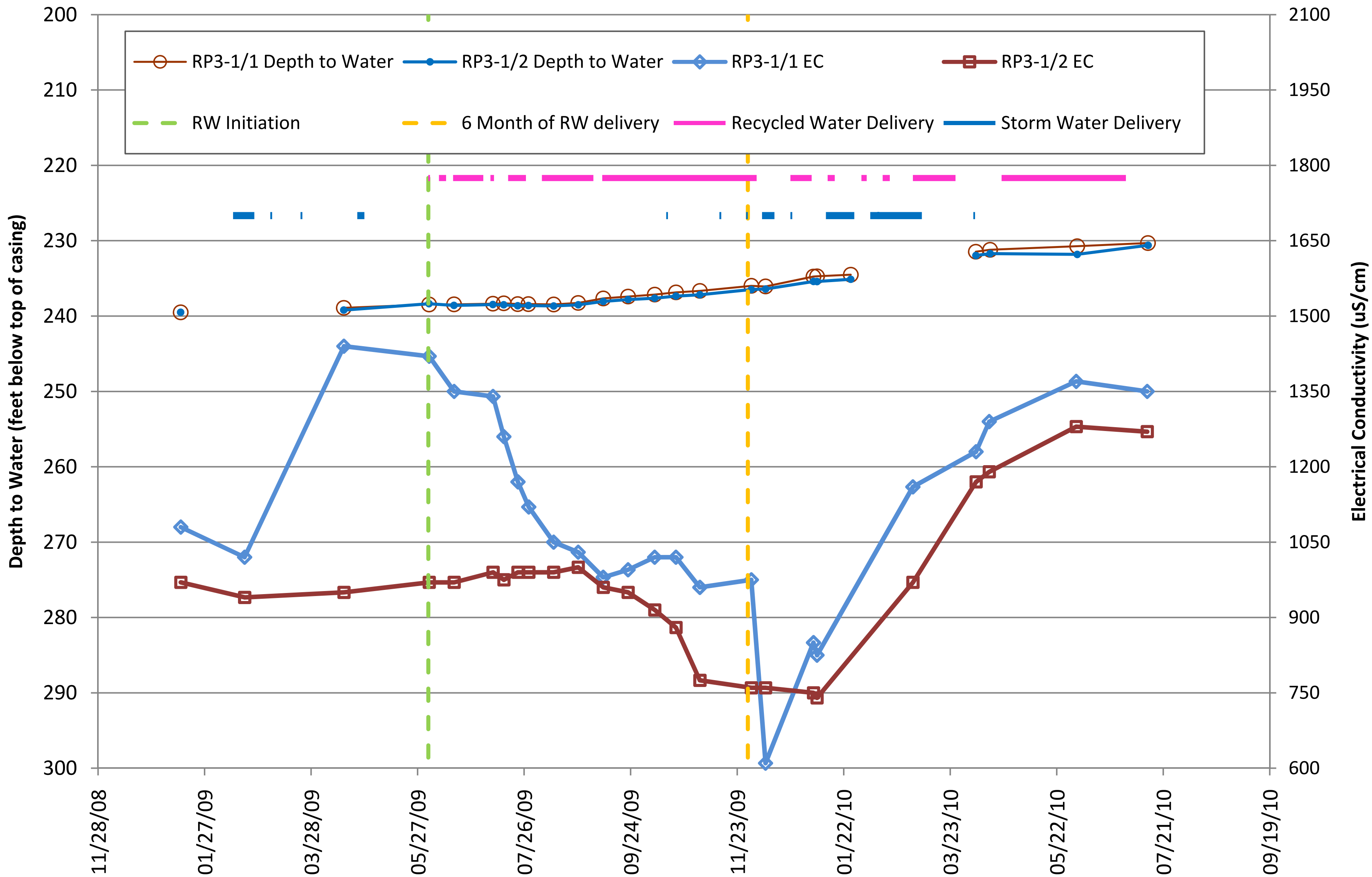


FIGURE 4-4
RP3 BASIN: MONITORING WELLS
WATER LEVEL AND EC TIME SERIES

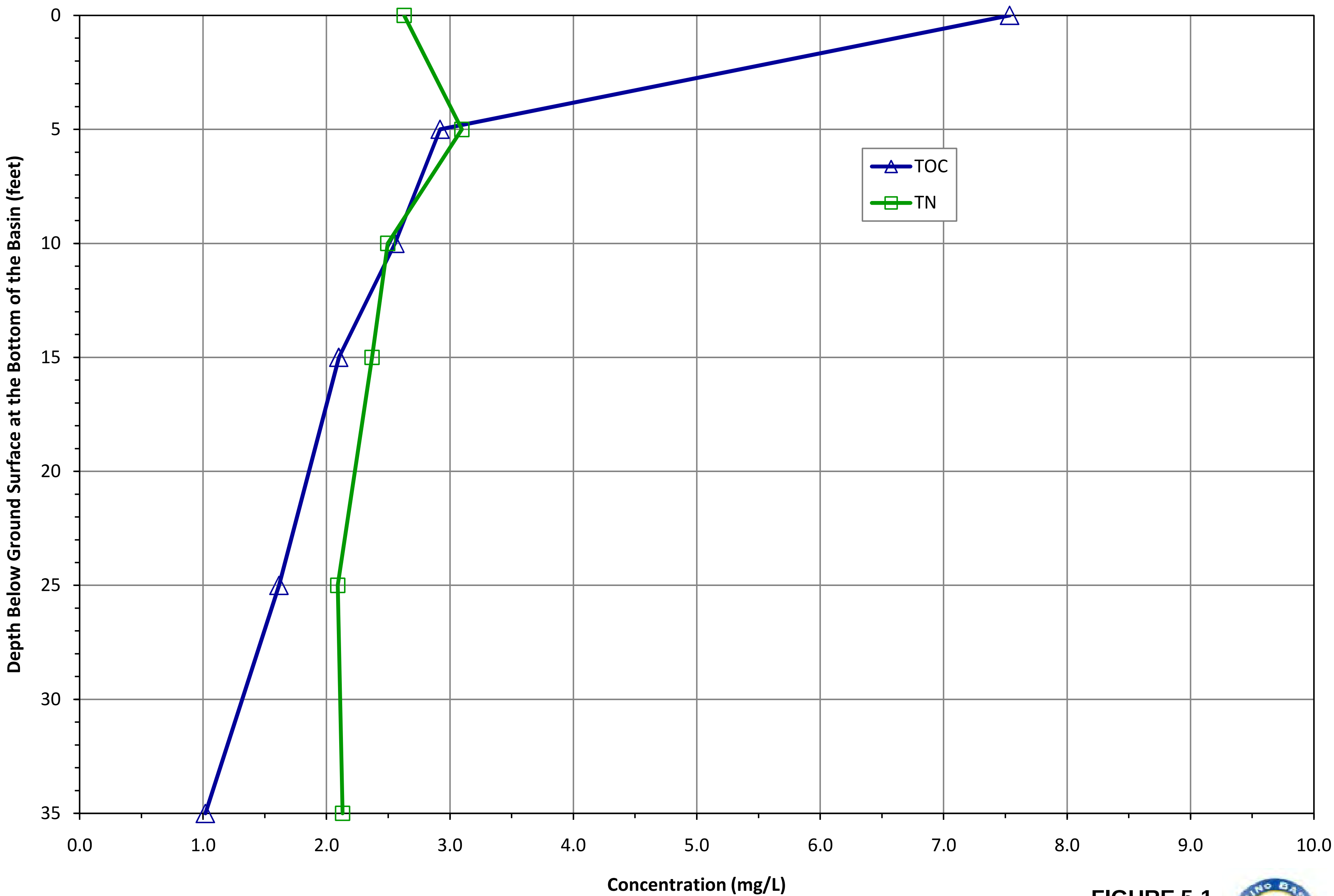


FIGURE 5-1
RP3 BASIN
DEPTH PROFILE OF AVERAGE TOC AND TN

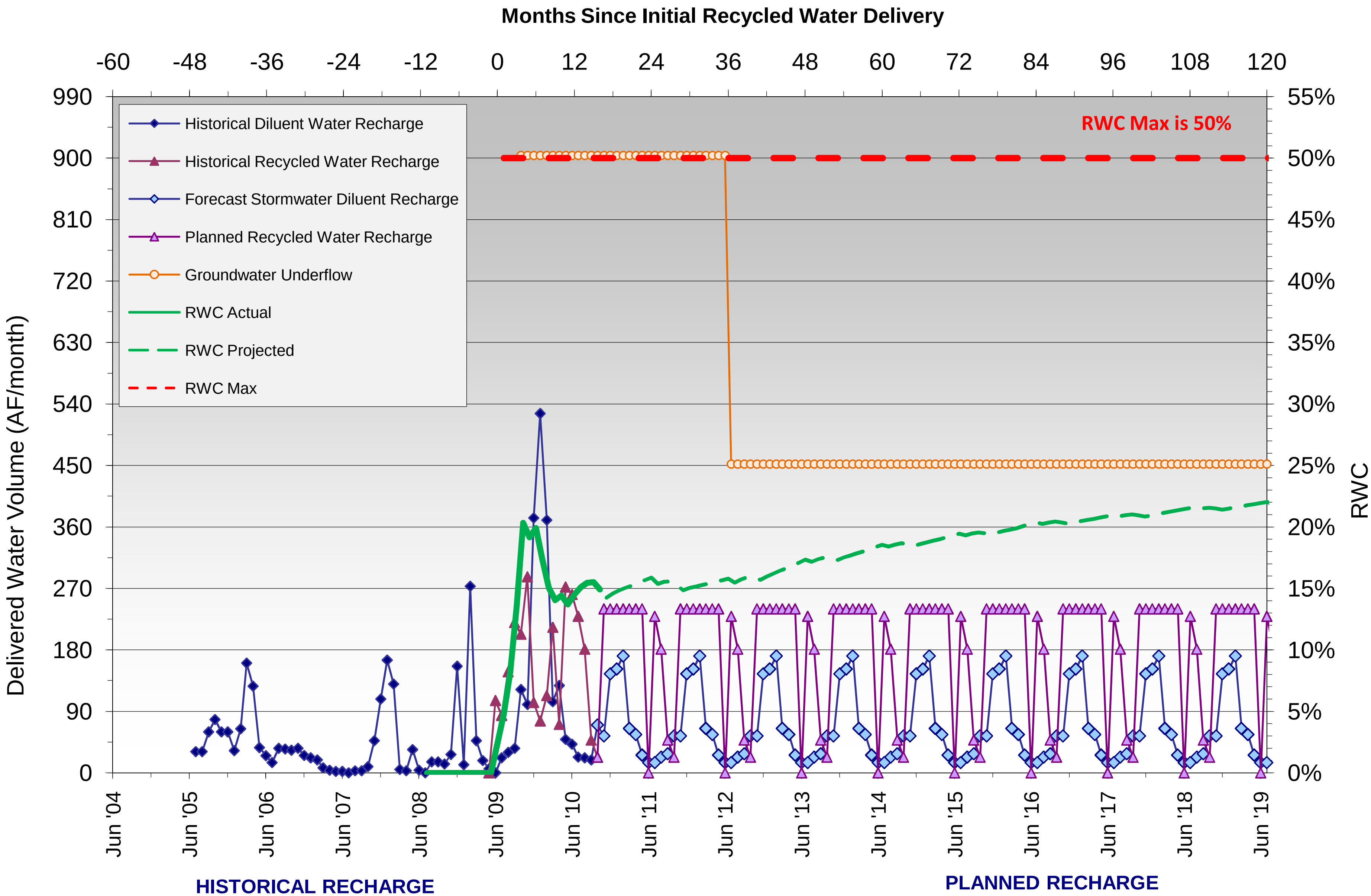


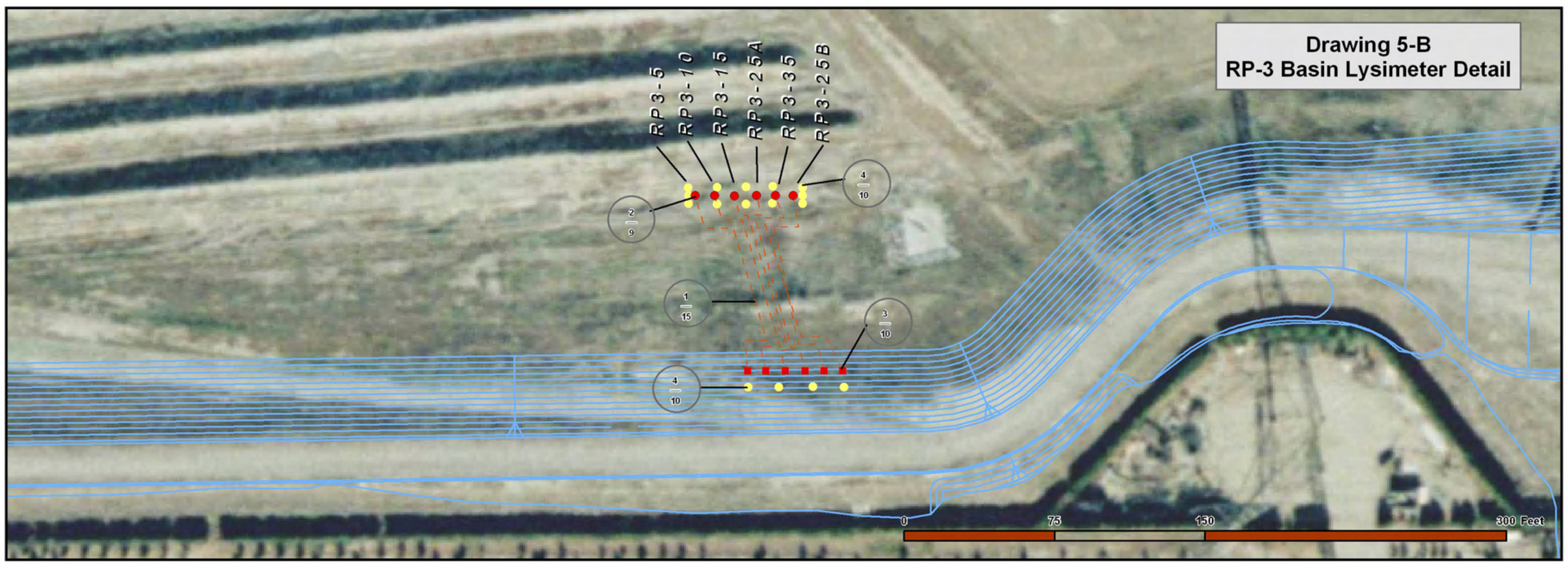
FIGURE 7-1
RP3 BASIN
RECYCLED WATER MANAGEMENT PLAN

APPENDIX A

LYSIMETER AND MONITORING WELL CONSTRUCTION DRAWINGS

117°28'0"W

117°28'0"W



Main Features

- Lysimeter (RP3 = Location, 35 = depth)
- Lysimeter Head
- Lysimeter Tubing (buried)
- Bollard (Crash Post)

Other Features

- Elevation Contours

Produced by:
WILDERMUTH™ ENVIRONMENTAL INC.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wildermuthenvironmental.com

Author: WEL/TCR
Date: 20080122
File: 20080122_BRKS.mxd

DIGALERT 811

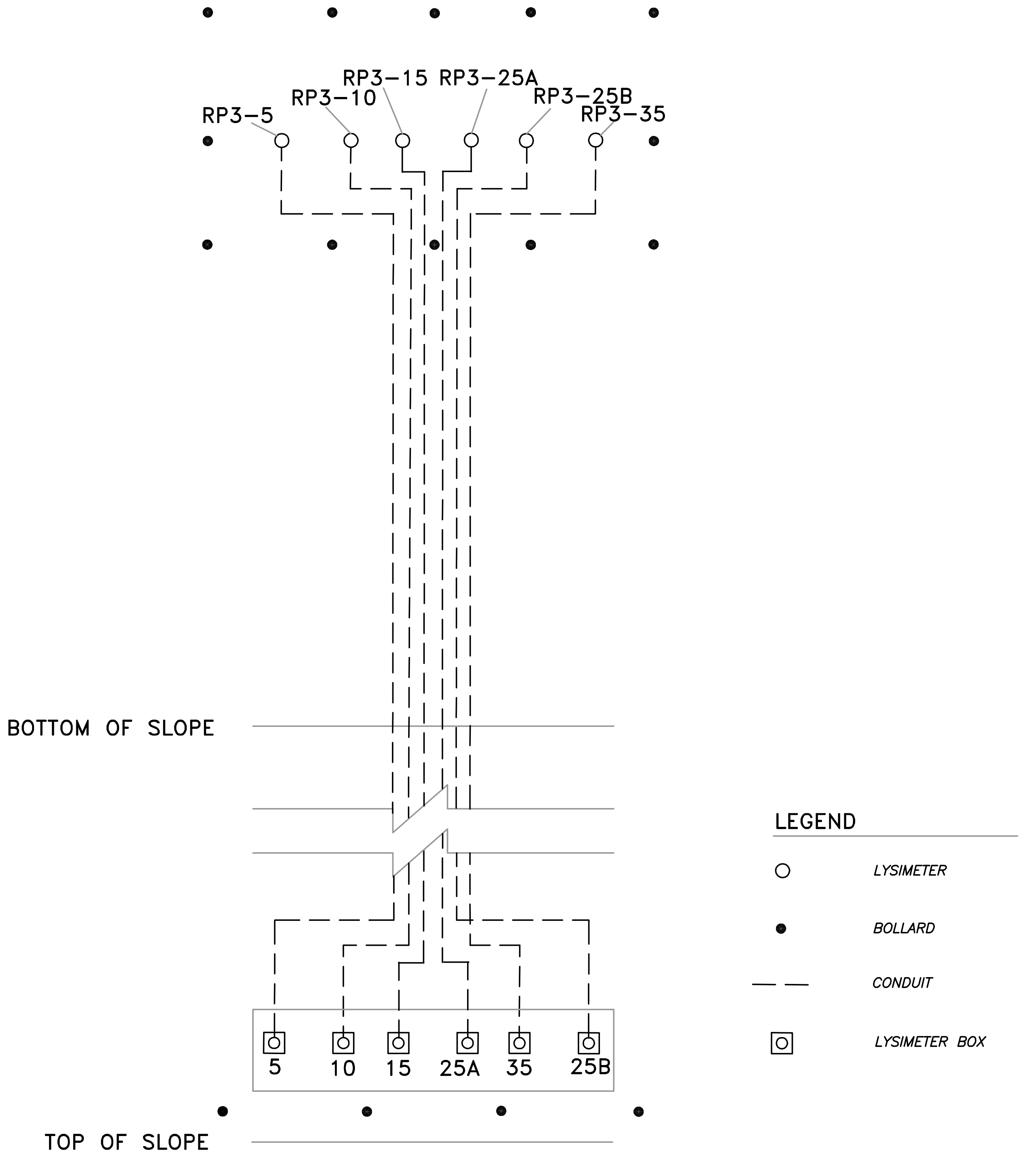
Inland Empire UTILITIES AGENCY

CHINO BASIN WATERMASTER

007-004
057

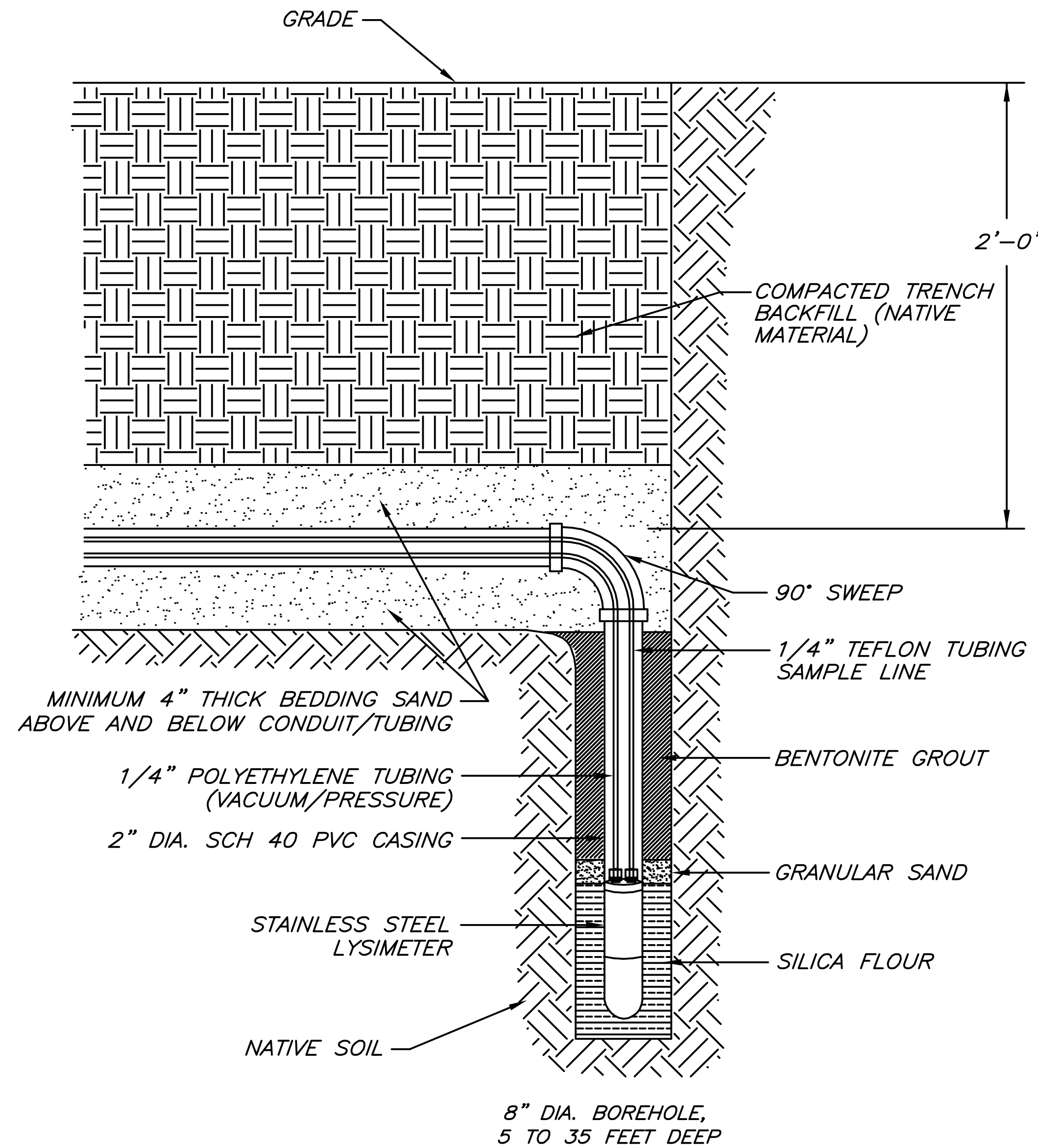
RP-3 Basin Lysimeters
Recycled Water Groundwater Recharge Program

Drawing 5
Sheet 5 of 15



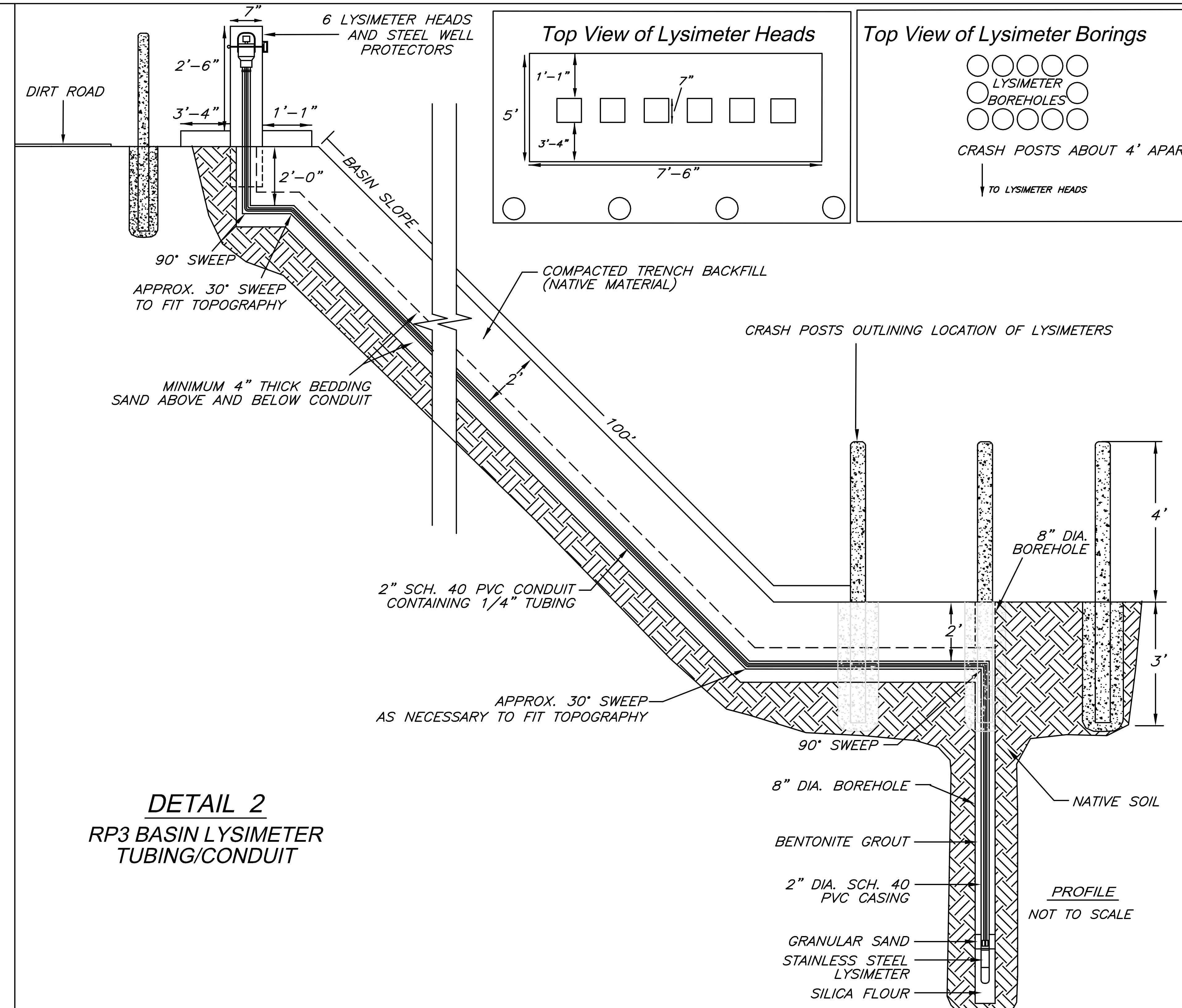
NOT TO SCALE

DRAWING 15
RP3 LYSIMETER AS-BUILT
CHINO BASIN OPTIMUM BASIN MANAGEMENT PLAN
Recycled Water Groundwater Recharge Program



DETAIL 1
TYPICAL LYSIMETER

PROFILE
NOT TO SCALE



6 SEPARATE 8" DIA. BOREHOLES
5 FEET, 10 FEET, 15 FEET, TWO AT 25 FEET, AND 35 FEET DEEP

DETAIL 2
RP3 BASIN LYSIMETER TUBING/CONDUIT

DIGALERT 811

REVISIONS

NO.	DATE	INITIAL	DESCRIPTION:	APPROVED/DATE
1	04/30/07	TCR	UPDATED FOR 2007 CONTRACT	WEL
2	12/17/07	STJ	UPDATED FOR 2007 AS BUILT	TCR

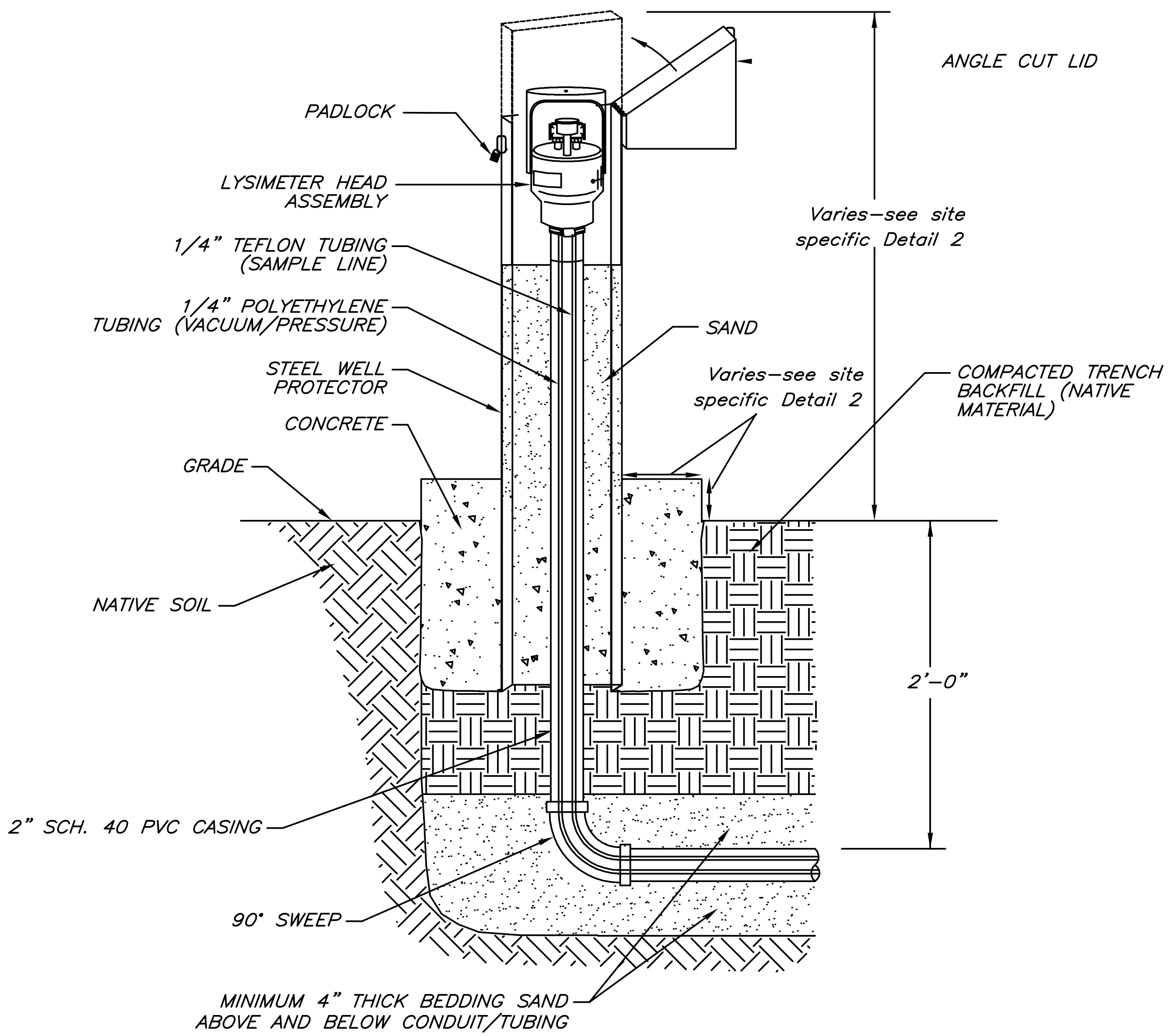
WILDERMUTH ENVIRONMENTAL INC.

Inland Empire Utilities Agency

REVIEWED BY:	DRAWN BY:	DATE:	DRAWING NO.
WEL	TCR	1/22/2008	9

AS-BUILT DETAILS 1 AND 2
RP3 LYSIMETER
INSTALLATION SCHEMATIC

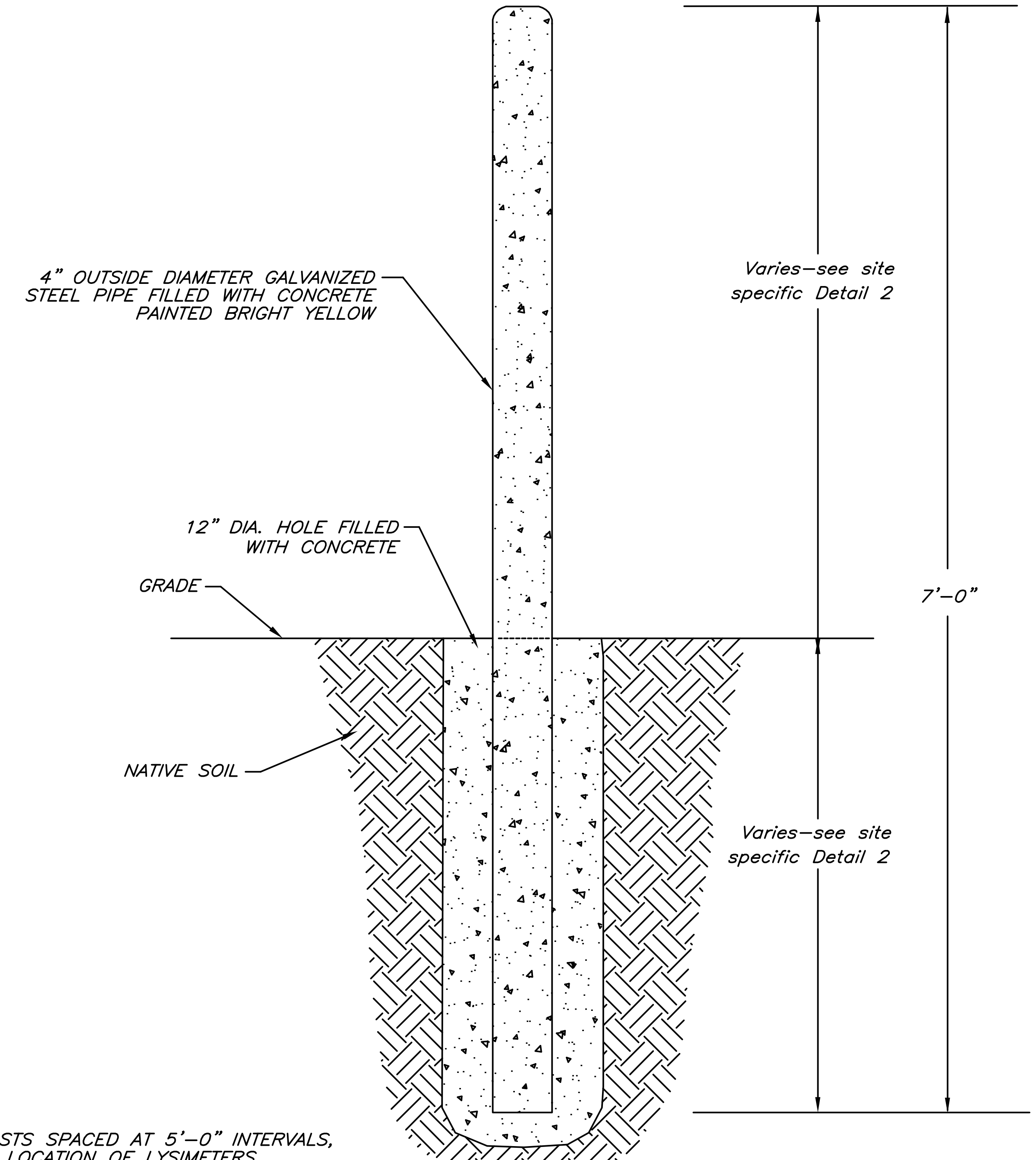
SHEET NO.
9 OF 11



PROFILE
NOT TO SCALE

DETAIL 3

TYPICAL STEEL WELL PROTECTOR AND LYSIMETER HEAD ASSEMBLY



NOTES:
CRASH POSTS SPACED AT 5'–0" INTERVALS, OUTLINING LOCATION OF LYSIMETERS.

PROFILE
NOT TO SCALE

DETAIL 4

TYPICAL CRASH POST

DIGALERT 811

REVISIONS

NO.	DATE	INITIAL	DESCRIPTION:	APPROVED/DATE
1	04/30/2007	TCR	UPDATED FOR 2007	WEL
2	12/21/2007	STJ	UPDATED FOR 2007	WEL 1/25/2008

WILDERMUTH ENVIRONMENTAL INC.
Inland Empire UTILITIES AGENCY

REVIEWED BY:	DRAWN BY:	START DATE:	DRAWING NO.
WEL	TCR	01/22/08	10

AS-BUILT DETAILS 3 AND 4
LYSIMETER HEAD SCHEMATIC

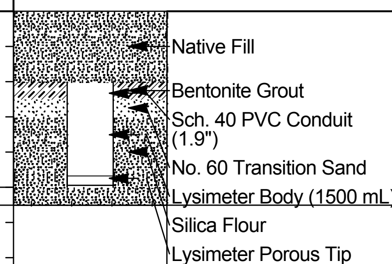
SHEET NO.
10 OF 15

Project Name:	**Phase I RWR**
Project Location:	**Chino Basin, CA**
Project Number:	**007-004-057**
Client:	**IEUA**

LYSIMETER: RP3-5

Date Started	**6/11/07**	Date Finished	**6/11/07**	Borehole Depth	**5.5 feet**	Drilling Contractor	**Layne Environmental**
Lat.	**34° 2' 48.15"**	Long.	**117° 28' 20.91"**	Drill Bit Size/Type	**8" Hollow Stem Auger**	Driller	**Alvaro Gutierrez**
Ground Surface Elevation	**958.0 feet**			Porous Interval	**4.5'-5' bgs**	Drill Rig Type	**CME**
Top of Casing Elevation	**NA**			Depth to Groundwater	**Not Encountered**	Drilling Method	**Hollow Stem Auger**
Logged By	**T. Rolfe**			Reviewed By	**B. Leever, PG**	Sampling Method	**Split Spoon**

Elev., feet-msl	Depth, feet-bgs	Sample	Graphic	MATERIAL DESCRIPTION	LYSIMETER SCHEMATIC AND CONSTRUCTION DETAILS	FIELD NOTES
	0			Well Graded SAND (SW): olive brown (2.5Y, 4/3), moist, trace of fine gravel.		
	5					
950						
	10					
	15					
940						
	20					
	25					
930						
	30					
	35					

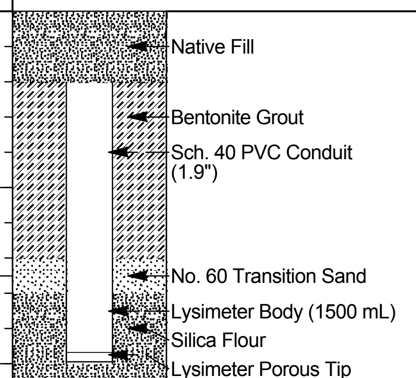


Project Name:	**Phase I RWR**
Project Location:	**Chino Basin, CA**
Project Number:	**007-004-057**
Client:	**IEUA**

LYSIMETER: RP3-10

Date Started	**6/11/07**	Date Finished	**6/11/07**	Borehole Depth	**10.5 feet**	Drilling Contractor	**Layne Environmental**
Lat.	**34° 2' 48.15"**	Long.	**117° 28' 20.91"**	Drill Bit Size/Type	**8" Hollow Stem Auger**	Driller	**Alvaro Gutierrez**
Ground Surface Elevation	**958.0 feet**			Porous Interval	**9.5'-10' bgs**	Drill Rig Type	**CME**
Top of Casing Elevation	**NA**			Depth to Groundwater	**Not Encountered**	Drilling Method	**Hollow Stem Auger**
Logged By	**T. Rolfe**			Reviewed By	**B. Leever, PG**	Sampling Method	**Split Spoon**

Elev., feet-msl	Depth, feet-bgs	Sample	Graphic	MATERIAL DESCRIPTION	LYSIMETER SCHEMATIC AND CONSTRUCTION DETAILS	FIELD NOTES
	0			Well Graded SAND (SW): olive brown (2.5Y, 4/3), moist, trace of fine gravel.		
	5					
950				Well Graded SAND (SW): light olive brown (2.5Y, 5/3), moist, trace of fat clay balls and fine gravel.		
	10					
	15					
940						
	20					
	25					
930						
	30					
	35					

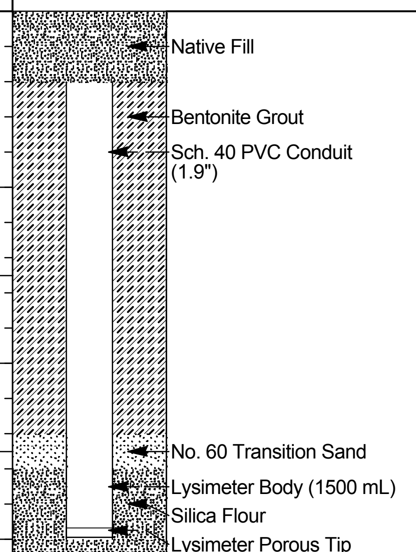


Project Name: Phase I RWR
Project Location: Chino Basin, CA
Project Number: 007-004-057
Client: IEUA

LYSIMETER: RP3-15

Date Started	**6/11/07**	Date Finished	**6/11/07**	Borehole Depth	**15.5 feet**	Drilling Contractor	**Layne Environmental**
Lat.	**34° 2' 48.15"**	Long.	**117° 28' 20.91"**	Drill Bit Size/Type	**8" Hollow Stem Auger**	Driller	**Alvaro Gutierrez**
Ground Surface Elevation	**958.0 feet**			Porous Interval	**14.5'-15' bgs**	Drill Rig Type	**CME**
Top of Casing Elevation	**NA**			Depth to Groundwater	**Not Encountered**	Drilling Method	**Hollow Stem Auger**
Logged By	**T. Rolfe**			Reviewed By	**B. Leever, PG**	Sampling Method	**Split Spoon**

Elev., feet-msl	Depth, feet-bgs	Sample	Graphic	MATERIAL DESCRIPTION	LYSIMETER SCHEMATIC AND CONSTRUCTION DETAILS	FIELD NOTES
	0			Well Graded SAND (SW): olive brown (2.5Y, 4/3), moist, trace of fine gravel.	Native Fill	
					Bentonite Grout	
					Sch. 40 PVC Conduit (1.9")	
	5					
950				Well Graded SAND (SW): light olive brown (2.5Y, 5/3), moist, trace of fat clay balls and fine gravel.		
	10					
				Poorly Graded SAND with Clay (SP): olive brown (2.5Y, 4/4), moist, fine sand with clay.	No. 60 Transition Sand	
					Lysimeter Body (1500 mL)	
					Silica Flour	
	15				Lysimeter Porous Tip	
940						
	20					
	25					
930						
	30					
	35					



Project Name:	**Phase I RWR**
Project Location:	**Chino Basin, CA**
Project Number:	**007-004-057**
Client:	**IEUA**

LYSIMETER: RP3-25A

Date Started	**6/11/07**	Date Finished	**6/11/07**	Borehole Depth	**25.5 feet**	Drilling Contractor	**Layne Environmental**
Lat.	**34° 2' 48.15"**	Long.	**117° 28' 20.91"**	Drill Bit Size/Type	**8" Hollow Stem Auger**	Driller	**Alvaro Gutierrez**
Ground Surface Elevation	**958.0 feet**			Porous Interval	**24.5'-25' bgs**	Drill Rig Type	**CME**
Top of Casing Elevation	**NA**			Depth to Groundwater	**Not Encountered**	Drilling Method	**Hollow Stem Auger**
Logged By	**T. Rolfe**			Reviewed By	**B. Leever, PG**	Sampling Method	**Split Spoon**

Elev., feet-msl	Depth, feet-bgs	Sample	Graphic	MATERIAL DESCRIPTION	LYSIMETER SCHEMATIC AND CONSTRUCTION DETAILS	FIELD NOTES
	0			Well Graded SAND (SW): olive brown (2.5Y, 4/3), moist, trace of fine gravel.	Native Fill; Bentonite Grout; Sch. 40 PVC Conduit (1.9")	
	5					
950				Well Graded SAND (SW): light olive brown (2.5Y, 5/3), moist, trace of fat clay balls and fine gravel.		
	10					
				Poorly Graded SAND with Clay (SP): olive brown (2.5Y, 4/4), moist, fine sand with clay.		
	15					
940				Poorly Graded SAND with Silt (SW): light olive brown (2.5Y, 5/4), moist, medium to fine sand with silt.		
	20					
				Poorly Graded SAND with Clay (SP): dark grayish brown (2.5Y, 4/2), medium to fine sand with clay.	No. 60 Transition Sand; Lysimeter Body (1500 mL); Silica Flour; Lysimeter Porous Tip	
	25					
930						
	30					
	35					

Project Name:	**Phase I RWR**		**LYSIMETER: RP3-25B**
Project Location:	**Chino Basin, CA**		
Project Number:	**007-004-057**		Sheet 1 of 1
Client:	**IEUA**		

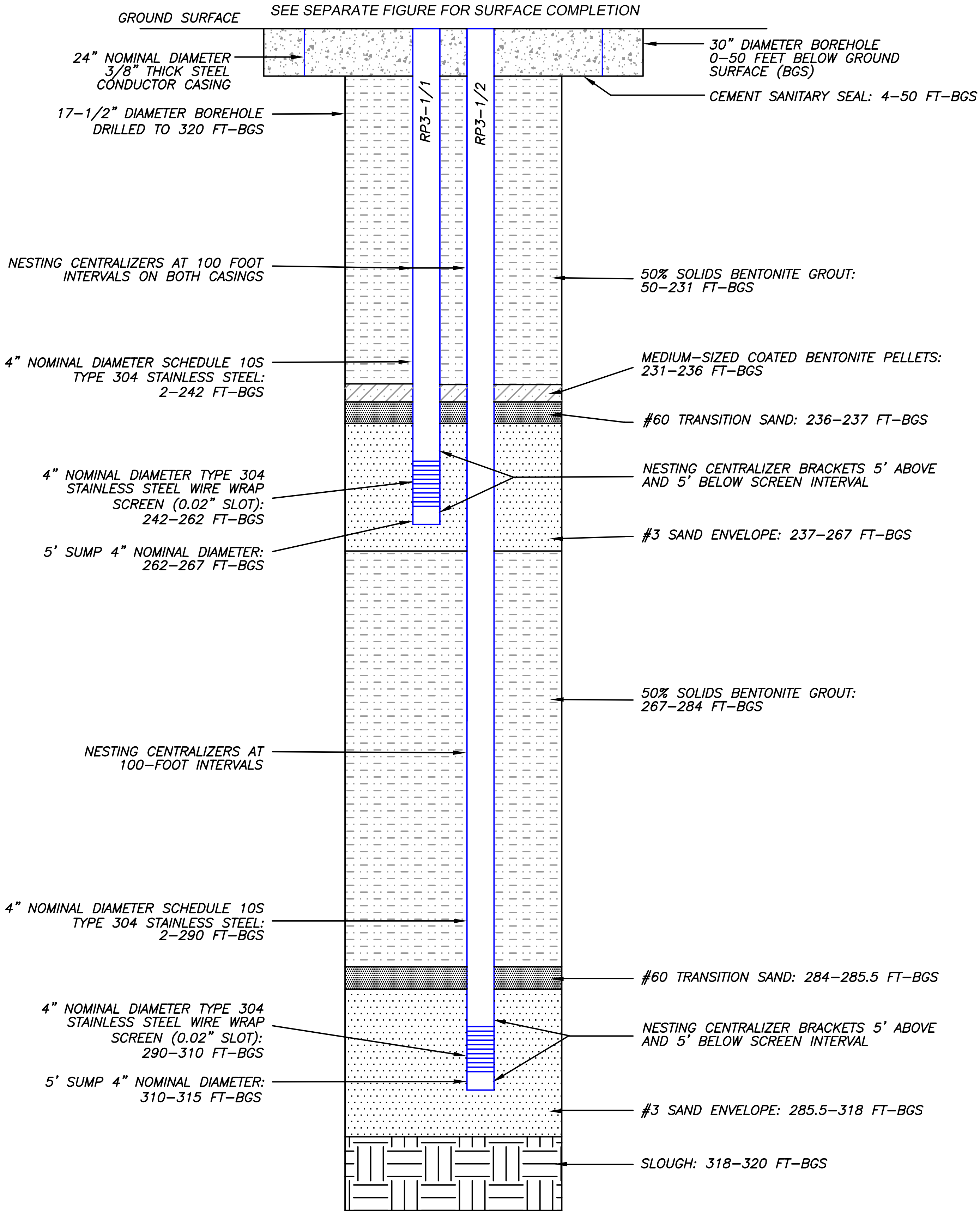
Date Started	**6/11/07**	Date Finished	**6/12/07**	Borehole Depth	**25.5 feet**	Drilling Contractor	**Layne Environmental**
Lat.	**34° 2' 48.15"**	Long.	**117° 28' 20.91"**	Drill Bit Size/Type	**8" Hollow Stem Auger**	Driller	**Alvaro Gutierrez**
Ground Surface Elevation	**958.0 feet**			Porous Interval	**24.5'-25' bgs**	Drill Rig Type	**CME**
Top of Casing Elevation	**NA**			Depth to Groundwater	**Not Encountered**	Drilling Method	**Hollow Stem Auger**
Logged By	**T. Rolfe**			Reviewed By	**B. Leever, PG**	Sampling Method	**Split Spoon**

Elev., feet-msl	Depth, feet-bgs	Sample	Graphic	MATERIAL DESCRIPTION	LYSIMETER SCHEMATIC AND CONSTRUCTION DETAILS	FIELD NOTES
	0			Well Graded SAND (SW): olive brown (2.5Y, 4/3), moist, trace of fine gravel.	Native Fill; Bentonite Grout; Sch. 40 PVC Conduit (1.9")	
	5					
950				Well Graded SAND (SW): light olive brown (2.5Y, 5/3), moist, trace of fat clay balls and fine gravel.		
	10					
				Poorly Graded SAND with Clay (SP): olive brown (2.5Y, 4/4), moist, fine sand with clay.		
	15					
940				Poorly Graded SAND with Silt (SW): light olive brown (2.5Y, 5/4), moist, medium to fine sand with silt.		
	20					
				Poorly Graded SAND with Clay (SP): dark grayish brown (2.5Y, 4/2), medium to fine sand with clay.	No. 60 Transition Sand; Lysimeter Body (1500 mL); Silica Flour; Lysimeter Porous Tip	
	25					
930						
	30					
	35					

Project Name:	**Phase I RWR**	**LYSIMETER: RP3-35**
Project Location:	**Chino Basin, CA**	
Project Number:	**007-004-057**	Sheet 1 of 1
Client:	**IEUA**	

Date Started **6/11/07**	Date Finished **6/12/07**	Borehole Depth	**35.5 feet**	Drilling Contractor	**Layne Environmental**
Lat. **34° 2' 48.15"**	Long. **117° 28' 20.91"**	Drill Bit Size/Type	**8" Hollow Stem Auger**	Driller	**Alvaro Gutierrez**
Ground Surface Elevation **958.0 feet**		Porous Interval	**34.5'-35' bgs**	Drill Rig Type	**CME**
Top of Casing Elevation **NA**		Depth to Groundwater	**Not Encountered**	Drilling Method	**Hollow Stem Auger**
Logged By **T. Rolfe**		Reviewed By	**B. Leever, PG**	Sampling Method	**Split Spoon**

Elev., feet-msl	Depth, feet-bgs	MATERIAL DESCRIPTION	LYSIMETER SCHEMATIC AND CONSTRUCTION DETAILS	FIELD NOTES
	0	Well Graded SAND (SW): olive brown (2.5Y, 4/3), moist, trace of fine gravel.	Native Fill	
			Bentonite Grout	
			Sch. 40 PVC Conduit (1.9")	
	5			
950		Well Graded SAND (SW): light olive brown (2.5Y, 5/3), moist, trace of fat clay balls and fine gravel.		
	10			
		Poorly Graded SAND with Clay (SP): olive brown (2.5Y, 4/4), moist, fine sand with clay.		
	15			
940		Poorly Graded SAND with Silt (SW): light olive brown (2.5Y, 5/4), moist, medium to fine sand with silt.		
	20			
		Poorly Graded SAND with Clay (SP): dark grayish brown (2.5Y, 4/2), medium to fine sand with clay.		
	25			
930				
	30			
			No. 60 Transition Sand	
			Lysimeter Body (1500 mL)	
			Silica Flour	
	35		Lysimeter Porous Tip	



NOT TO SCALE

CHINO BASIN WATERMASTER — Partners in Basin Management

Inland Empire UTILITIES AGENCY

WELL COMPLETION AS BUILT
RP3-1 WELL

OPTIMUM BASIN MANAGEMENT PROGRAM

8/17/07

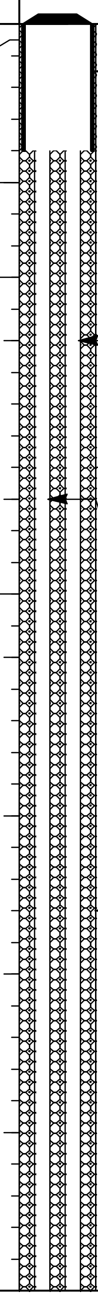
FN:20070817_RP3–1_AsBuilt.dwg

Project Name:	**Recycled Water Recharge Monitoring Program**		**Boring Log / RP3-1**
Project Location:	**Fontana,Ca**		Sheet 1 of 7
Project Number:	**007-004-058**		
Client:	**IEUA**		

Date Started	**6/28/07**	Date Finished	**7/2/07**	Borehole Depth	**320.0 feet**	Drilling Contractor	**Best Drilling and Pump, Inc.**
Lat.	**117° 28' 31"**	Long.	**34° 2' 46"**	Drill Bit Size/Type	**17.5" Tri-cone**	Driller	**Chris Gomez, Cody Kennedy**
Ground Surface Elevation	**954.0 feet**			Screened Interval(s)	**242-262 ft-bgs; 290-310 ft-bgs**	Drill Rig Type	**Jed-A**
Top of Casing Elevation	**950.0 feet**			Depth to Groundwater	**1/1 - 238 feet, 1/2 - 238 feet**	Drilling Method	**Flooded Reverse**
Logged By	**A. Ligutom**			Reviewed By	**B. Leever, PG**	Sampling Method	**Interval collection by splitter box**

Elevation, feet-msl	Depth, feet-bgs	Sample Time	MATERIAL DESCRIPTION
	0		Asphalt.
			Silty SAND, olive brown.
950	5	08:16	Clayey Silty SAND, light green.
		08:21	Sandy Gravel, medium gray.
	10		
940	15	08:27	
		08:32	Red clayey sand.
	20		
930	25	08:40	
		08:44	
	30		
920	35	08:55	
	40		

WELL SCHEMATIC AND CONSTRUCTION DETAILS



FIELD NOTES

WILDERMUTH ENVIRONMENTAL INC.

Project Name:	**Recycled Water Recharge Monitoring Program**	**Boring Log / RP3-1**
Project Location:	**Fontana,Ca**	Sheet 2 of 7
Project Number:	**007-004-058**	
Client:	**IEUA**	

Elevation, feet-msl	Depth, feet-bgs	Sample Time	MATERIAL DESCRIPTION	WELL SCHEMATIC AND CONSTRUCTION DETAILS	FIELD NOTES
	40	09:02			
	45			Cement inside conductor casing (4-50 ft-bgs)	
900					
	50	14:09	Poorly Graded GRAVEL with Sand (GP): gray (10YR, 5/1), Angular to sub-angular gravel, shale, granite, epidote, quartz. Medium to quartz sand.		6/28/2007
		14:47	Well Graded SAND (SW): dark gray (10YR, 4/1), 20% very coarse sand, 40% coarse sand, 40% medium sand. Gravel; 1-3 cm, angular to sub-angular, quartz and epidote.		
	55	15:02			
		15:13	Well Graded SAND (SW): strong brown (7.5YR, 5/8), 60% coarse sand, 40% medium sand, Gravel; 1-4 cm, angular to sub-angular.		
890		15:28			
	60	15:38			
		15:46			
		16:55	Well Graded SAND (SW): brown (7.5YR, 5/6), medium to fine sand.		
	65	16:00			
880		16:05			
	70	16:48	Sandy Lean CLAY (CL): brown (7.5YR, 4/4), 20% fine sand, 80% clay.	50% Benseal Grout/50%Sand (No.3) (50-475 ft bgs)	
		16:55			
	75	17:01	Clayey SAND (SC): dark yellowish brown (10YR, 4/4), 35% coarse sand, 35% medium sand, 10% fine sand, 20% clay.		
		17:13	Well Graded SAND (SW): dark yellowish brown (10YR, 3/4), 60% coarse sand, 40% medium sand.		
870		17:26			
	80	17:33			
		17:43	Well Graded SAND (SW): dark yellowish brown (10YR, 4/6), 40% medium sand, 60% coarse sand.		
	85				
		09:00	Well Graded SAND with Gravel (SW): brown (10YR, 5/4), 50%		6/29/2007

Elevation, feet-msl	Depth, feet-bgs	Sample Time	MATERIAL DESCRIPTION	WELL SCHEMATIC AND CONSTRUCTION DETAILS	FIELD NOTES
860		09:04	coarse sand, 35% medium sand, 15% gravel. Gravel; 1-2cm, angular to sub-rounded, quartz, shale and epidote.		
	90	09:08			
		09:12			
	95	09:15			
850		09:19	Poorly Graded SAND (SP): grayish brown (10YR, 5/2), 5% gravel, 10% medium sand, 80% fine sand, 5% clay.		
		09:32	Well Graded GRAVEL with Sand (GW): grayish brown (10YR, 5/2), 60% gravel, 40% sand, gravel is 1-3 cm, angular to sub-angular. Quartz, epidote and granite fragments.		
	100	09:28	Clayey SAND (SC): strong brown (7.5YR, 4/6), 70% fine to medium sand, 30% clay.	50% Benseal Grout/50%Sand (No.3) (50-475 ft bgs)	
		09:33			
	105	09:39			
840		10:13			
		10:16	Poorly Graded SAND (SP): dark yellowish brown (10YR, 4/6), 95% sand, 5% clay, trace amount of gravel.		
	110	10:19			
		10:24			
	115	10:26	Well Graded SAND with Gravel (SW): grayish brown (10YR, 5/2), 20% gravel, 50% coarse sand, 30% medium sand. Gravel; 1-4 cm, angular to sub-rounded, quartz, granite and epidote fragments.		
830		10:29			
		10:32			
	120	10:36			
		10:39	Poorly Graded SAND (SP): yellowish brown (10YR, 5/4), 95% medium sand, 5% fine sand.		
	125	10:43	Well Graded SAND with Gravel (SW): grayish brown (10YR, 5/2), 20% gravel, 50% coarse sand, 30% medium sand. Gravel; 1-3 cm, angular to sub-rounded, quartz, granite and slate fragments.		
820		11:04			
		11:08	Well Graded SAND (SW): yellowish brown (10YR, 5/4), 10% gravel, 35% coarse sand, 55% medium sand.		
	130		Well Graded SAND with Gravel (SW): grayish brown (10YR, 5/2), 20% gravel, 50% coarse sand, 30% medium sand. Gravel; 1-2 cm, angular to sub-angular.		
		11:14			

Elevation, feet-msl	Depth, feet-bgs	Sample Time	MATERIAL DESCRIPTION	WELL SCHEMATIC AND CONSTRUCTION DETAILS	FIELD NOTES
	135	11:17			
810		11:21			
		11:23			
	140	11:27	Poorly Graded SAND (SP): yellowish brown (10YR, 5/6), 5% gravel, 20% coarse sand, 75% medium sand.		
		11:32	Poorly Graded SAND (SP): yellowish brown (10YR, 5/6), 5% gravel, 85% medium sand, 10% fine sand, .		
	145	11:36	Clayey SAND (SC): yellowish brown (10YR, 5/8), 60% fine to medium sand, 40% clay.		
800			Well Graded SAND (SW): yellowish brown (10YR, 5/6), 25% coarse sand, 75% medium sand.		
	150				
		13:02	Clayey SAND (SC): yellowish brown (10YR, 5/8), 20% coarse sand, 40% medium sand, 40% clay.		
	155	13:10	Well Graded SAND with Gravel (SW): grayish brown (10YR, 5/2), 15% gravel, 50% coarse sand, 35% medium sand. Gravel; 1cm, angular fragments of quartz, epidote and feldspar.	50% Benseal Grout/50%Sand (No.3) (50-475 ft bgs)	
790		13:17			
		13:32	Well Graded SAND with Gravel (SW): very dark gray (10YR, 3/1), 30% gravel, 45% coarse sand, 25% medium sand.		
	160	13:40	Well Graded SAND (SW): dark grayish brown (10YR, 4/2), 10% gravel, 55% coarse sand, 15% medium sand, 20% fine sand.		
		13:44			
	165	13:47	Well Graded SAND with Gravel (SW): dark grayish brown (10YR, 4/2), 20% gravel, 50% coarse sand, 30% medium sand. Gravel; 1-2 cm, angular to sub-angular quartz and shale fragments.		
780		14:23			
		14:17	Clayey SAND (SC): yellowish brown (10YR, 5/6), 35% medium sand, 50% fine sand, 15% clay.		
	170	14:19			
		14:22	Sandy Lean CLAY (CL): yellowish brown (10YR, 5/8), 20% sand, 80% clay.		
	175	14:26			
770		14:30			
		14:35	Clayey SAND (SC): dark yellowish brown (10YR, 3/6), 30% coarse sand, 50% medium sand, 20% clay.		
	180				

Elevation, feet-msl	Depth, feet-bgs	Sample Interval	Sample Time	Graphic Log	MATERIAL DESCRIPTION	WELL SCHEMATIC AND CONSTRUCTION DETAILS	FIELD NOTES
	180		14:39		Sandy Lean CLAY (CL): yellowish brown (10YR, 5/6), 20% fine to medium sand, 80% clay.		
			14:40				
	185		14:48				
760			15:10				
			15:13				
	190		15:18		Clayey SAND (SC): strong brown (7.5YR, 4/6), 20% coarse sand, 40% medium sand, 40% clay, white quartz sand.		
			15:22				
	195		15:26				
750			15:31				
			15:37				
	200		15:41			50% Benseal Grout/50%Sand (No.3) (50-475 ft bgs)	
			15:46		Poorly Graded SAND (SP): strong brown (7.5YR, 5/6), 5% fine sand, 90% medium sand, 5% clay.		
	205		15:49				
740			16:13		Well Graded SAND (SW): yellowish brown (10YR, 5/8), 10% gravel, 30% medium sand, 60% coarse sand.		
			16:17				
	210		16:21				
			16:26				
	215		15:30				
730			16:34		Poorly Graded SAND (SP): yellowish brown (10YR, 5/8), 10% coarse sand, 90% medium sand.		
			16:40		Poorly Graded SAND (SP): brown (10YR, 5/3), 10% coarse sand, 90% medium sand.		
	220		16:42				
			16:45		Clayey SAND (SC): brownish yellow (10YR, 6/6), 80% fine sand, 20% clay.		
	225		16:52				
			08:44		Clayey SAND (SC): brownish yellow (10YR, 6/8), 80% fine to		7/2/2007

Elevation, feet-msl	Depth, feet-bgs	Sample Time	MATERIAL DESCRIPTION	WELL SCHEMATIC AND CONSTRUCTION DETAILS	FIELD NOTES
720			medium sand, 20% clay.		
		08:50	Well Graded SAND with Clay and Gravel (SW-SC): yellowish brown (10YR, 5/8), 20% gravel, 30% coarse sand, 30% medium sand, 10% fine sand, 10% clay. Gravel: 1-3 cm, angular to sub-angular quartz and feldspar fragments.	50% Benseal Grout/50%Sand (No.3) (50-475 ft bgs)	
	230		Well Graded SAND (SW): brownish yellow (10YR, 6/8), 5% gravel, 40% coarse sand, 55% medium sand.		
		09:00		Medium size coated bentonite pellets (475-479 ft-bgs)	
	235	09:05		No. 60 Transition Sand (231-236 ft bgs)	
710		09:10			
		09:17	Sandy Lean CLAY (SC): brown (7.5YR, 5/3), 40% fine sand, 60% clay.		
	240	09:25			
		09:40	Well Graded SAND (SW): yellowish brown (10YR, 5/6), 40% coarse sand, 60% medium sand.		
	245			Filter Sand (237-237 ft bgs)	
700		09:42	Well Graded SAND (SW): yellowish brown (10YR, 5/6), 55% coarse sand, 40% medium sand, 5% clay.	0.02" wire wrapped screen (490-530 ft bgs)	
		10:48			
	250	10:55	Poorly Graded SAND (SP): yellowish brown (10YR, 5/6), 10% gravel, 70% coarse sand, 20% medium sand. Gravel; 1-2cm, angular to sub-angular.		
		11:01			
	255	11:11			
690		11:24			
		11:38			
	260	11:52			
		12:00	Well Graded SAND (SW): yellowish brown (10YR, 5/8), 5% gravel, 55% coarse sand, 40% medium sand.	Silt Trap (262-267 ft-bgs)	
	265				
680		13:12	Poorly Graded SAND with Gravel (SP): grayish brown (10YR, 5/2), 15% gravel, 55% coarse sand, 30% medium sand, trace amount of clay. Gravel; 1-3 cm angular to sub-angular.		
	270	13:27	Well Graded SAND (SW): brownish yellow (10YR, 6/8), 60% coarse sand, 40% medium sand, trace amount of clay.	50% Benseal Grout/50%Sand (No.3) (267-284 ft bgs)	
		13:45			

Project Name:	**Recycled Water Recharge Monitoring Program**
Project Location:	**Fontana,Ca**
Project Number:	**007-004-058**
Client:	**IEUA**

Boring Log / RP3-1

Elevation, feet-msl	Depth, feet-bgs	Sample Time	MATERIAL DESCRIPTION	WELL SCHEMATIC AND CONSTRUCTION DETAILS	FIELD NOTES
	275	13:55		50% Benseal Grout/50%Sand (No.3) (267-284 ft bgs)	
670		13:57	Clayey SAND (SC): yellowish brown (10YR, 5/8), 25% coarse sand, 45% medium sand, 30% clay.		
		14:02	Fat CLAY (CH): strong brown (7.5YR, 5/6), 10% fine sand, 90% clay.		
	280	14:10	Sandy Lean CLAY (CL): yellowish brown (10YR, 5/8), 25% medium sand, 75% clay, trace amount of silt.		
		14:25 14:35 15:05 15:22 15:23	Well Graded SAND with Clay (SW-SC): brownish yellow (10YR, 6/6), 10% gravel, 30% coarse sand, 20% medium sand, 30% fine sand, 10% clay.		
	285			No. 60 Transition Sand (284-285 ft bgs)	
660	290				
		15:27	Well Graded SAND (SW): brownish yellow (10YR, 6/6), 5% gravel, 35% coarse sand, 35% medium sand, 20% fine sand, 5% clay. Quartz fragments.		
	295	15:31 15:35 15:38	Sandy Lean CLAY (CL): brown (7.5YR, 4/4), 20% fine to medium sand, 80% clay.	Filter Sand (290-310 ft bgs)	
650					
	300	15:45 15:52 15:55	Well Graded SAND (SW): brownish yellow (10YR, 6/8), 5% gravel, 50% coarse sand, 40% medium sand, 5% clay.	0.02" wire wrapped screen (290-310 ft bgs)	
	305	16:00 16:18	Sandy Lean CLAY (SC): yellowish brown (10YR, 5/6), 20% fine to medium sand, 80% clay.		
640					
	310	16:20 16:32	Well Graded SAND with Clay (SW-SC): yellowish brown (10YR, 5/6), 50% coarse sand, 20% medium sand, 20% fine sand, 10% clay.		
	315	16:38 16:41 16:44	Sandy Lean CLAY (SC): brownish yellow (10YR, 6/8), 5% gravel, 15% fine to coarse sand, 80% clay.	Silt Trap (310-315 ft-bgs)	
630					
	320	16:46	Clayey SAND (SC): yellowish brown (10YR, 5/6), 20% coarse sand, 60% medium sand, 20% fine sand, 20% clay.	Slough (318-320 ft-bgs)	

WILDERMUTH™ ENVIRONMENTAL INC.