

former use as a sedimentation pond. The TDS, nitrate and boron concentrations measured in the mining area ponds that are in direct communication with the upper aquifer are included in the Groundwater Monitoring Program's dataset used to create the upper aquifer concentration maps (*Figure 2.4-14 to Figure 2.4-16*).

2.4 Groundwater Monitoring

This section describes Zone 7's Groundwater Monitoring Program. The Groundwater Monitoring Program is the groundwater data collection portion of the overall Groundwater Management Program and includes the measurement of groundwater levels in monitoring and production wells, and the collection and analyses of groundwater samples. These hydrologic data are needed to assess groundwater supplies (i.e., quantity, quality, and trends) and define management needs to achieve sustainability. The program focuses on the Main Basin, where groundwater is pumped for municipal uses. Other Zone 7 programs utilize the data collected in this program, and the results are used in water resources management planning and decision making. The results of the groundwater elevation and quality portions of the program are presented in Sections 2.4.2 and 2.4.3, respectively. Groundwater storage is presented in Chapter 3, Section 3.1. These data are used in Zone 7's management of water supply and water quality including management tools such as the groundwater model, Salt Management Plan (SMP), and Nutrient Management Plan (NMP) which are described in Chapter 3, Section 3.3.

2.4.1 Program Description

There were a total of 236 wells in the Zone 7 groundwater monitoring program during the 2013 Water Year (October 2012 through September 2013) (shown on *Figure 2.4-1*). Each well in the program was monitored and/or sampled to fulfill one or more specific objectives. *Figure 2.4-2* lists all of the wells in the program, the objective(s) of monitoring each well, and the frequency of monitoring or sampling for each objective. The objectives are summarized below. Well construction details for each of the wells in the program are shown in *Figure 2.4-3*.

Zone 7's Water Level Monitoring – groundwater level measurements are made twice per year during seasonal extremes (i.e., spring highs and fall lows) for storage tracking. Water level measurements are also measured monthly in some wells to monitor subsidence potential, adjust recharge and pumping operations, and identify seasonal peaks when semi-annual water level measurements should be scheduled.

Zone 7's Water Quality Sampling – water quality sampling of groundwater is performed annually, with samples collected from each of the wells in the program. Sampling is performed in some wells more frequently if required for an additional program described below. Also, some of the wells in the program are sampled and tested by an outside entity with the results supplied to Zone 7. The samples are analyzed for general water quality parameters and select metals.

Del Valle Water Rights (WR) – continuous or monthly monitoring of water levels and semi-annual sampling for water quality is required for certain wells to maintain Zone 7's Arroyo Valle water rights.

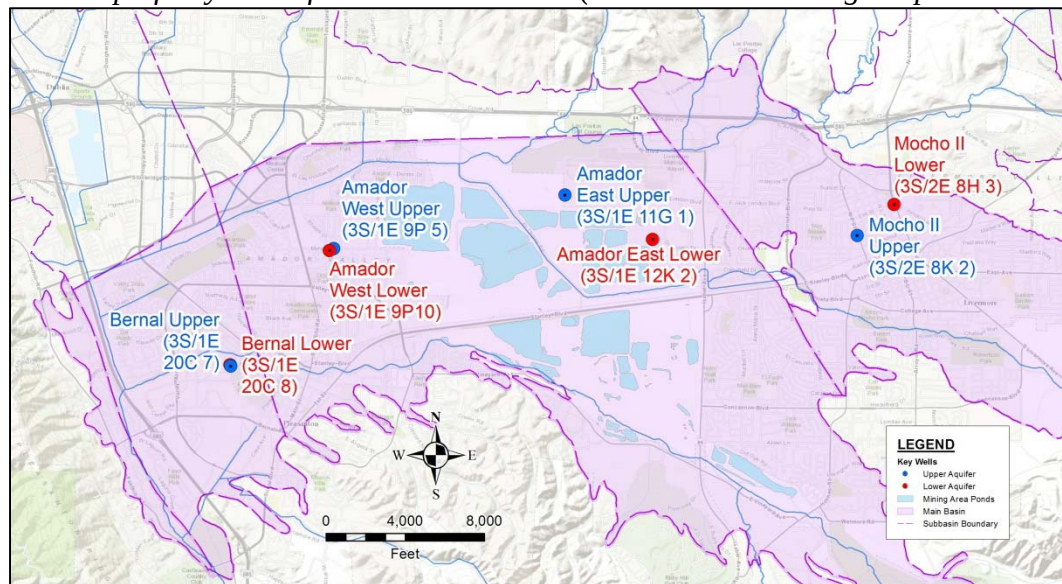
Municipal Supply Well (Mu) – continuous or monthly monitoring of water levels and quarterly or annually sampling for water quality and drinking water operating permit compliance is conducted in the municipal supply wells.

Key Wells (Key) – monthly monitoring of water levels in index wells in three of the largest subbasins of the Main Basin (Bernal, Amador, and Mocho II). Since the Amador Sub-basin is the largest and most significant subbasin, it is split into the Amador West and Amador East Sub-basins. Starting in the 2008 Water Year (October 2007 through September 2008), the objective was expanded to monitor conditions in upper and lower aquifers in each subbasin separately. The following two figures give information about the monitoring wells used for the Key Well Program in the 2013 Water Year (October 2012 through September 2013):

Figure 2.4-A: Table of Key Wells for 2013 Water Year (October 2012 through September 2013)

SubBasin	Key Well Name	Aquifer	Well Number
Bernal	Key_Bern_U	Upper	3S/1E 20C 7
	Key_Bern_L	Lower	3S/1E 20C 8
Amador-West	Key_AmW_U	Upper	3S/1E 9P 5
	Key_AmW_L	Lower	3S/1E 9P10
Amador-East	Key_AmE_U	Upper	3S/1E 11G 1
	Key_AmE_L	Lower	3S/1E 12K 2
Mocho II	Key_Mo2_U	Upper	3S/2E 8K 2
	Key_Mo2_L	Lower	3S/2E 8H 3

Figure 2.4-B: Map of Key Wells for 2013 Water Year (October 2012 through September 2013)



Although water levels are measured monthly and plotted in the Key Well hydrographs, two of the Key Wells have pressure transducers and data recorders installed to collect water levels at 15-minute intervals. In general, these wells are sampled for water quality analyses on an annual basis.

Salt Management Plan (SMP) – mostly semi-annual monitoring of water levels and annual sampling for water quality analyses to identify salt/mineral quantity and migration in groundwater. Information on Zone 7's SMP is provided in Chapter 3, Section 3.3.1.

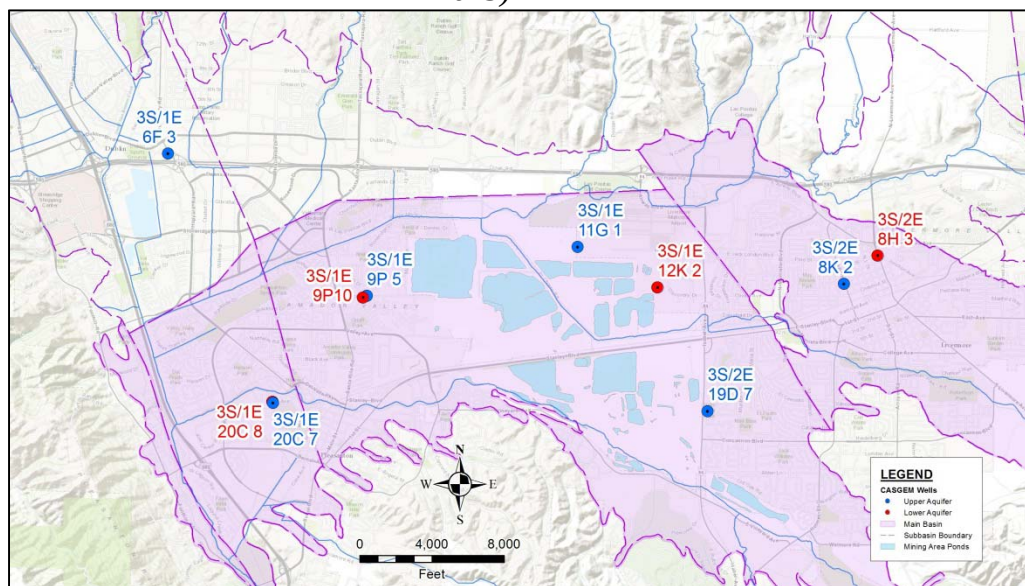
CASGEM – In the 2012 Water Year (October 2011 through September 2012), the California Department of Water Resources (DWR) developed the California Statewide Groundwater Elevation Monitoring (CASGEM) program to track groundwater elevations in California groundwater basins to satisfy the requirements as required by the Water Code (§10920, *et seq.*) The program requires monitoring entities such as Zone 7 to submit groundwater level data semiannually to DWR. Working collaboratively with DWR staff, Zone 7 selected the following ten wells (eight Key Wells plus two others), which are representative of overall groundwater elevations in the groundwater basin, to be included in the program:

- 3S/1E 6F 3 (northern portion of Fringe Basin, upper aquifer)
- 3S/1E 9P 5 (Amador West Upper Key Well)
- 3S/1E 9P10 (Amador West Lower Key Well)
- 3S/1E 11G 1 (Amador East Upper Key Well)
- 3S/1E 12K 2 (Amador East Lower Key Well)
- 3S/1E 20C 7 (Bernal Upper Key Well)

- 3S/1E 20C 8 (Bernal Lower Key Well)
- 3S/2E 8H 3 (Mocho II Lower Key Well)
- 3S/2E 8K 2 (Mocho II Upper Key Well)
- 3S/2E 19D 7 (southern portion of Amador, lower aquifer)

The locations of these wells are shown in the figure below.

Figure 2.4-C: Map of CASGEM Wells for 2013 Water Year (October 2012 through September 2013)



Zone 7 has uploaded all previous semi-annual groundwater level data from these wells to the CASGEM website www.water.ca.gov/groundwater/casgem/.

Zone 7 anticipates claiming the CASGEM “Monitoring Entity” role for the Alameda County portion of the Tracy Groundwater Basin in 2014 to maintain its eligibility for future DWR-administered grants. The claim will likely add two or three wells located in the northeastern part of the county to Zone 7’s existing CASGEM monitoring program.

Historical Lows – “Historical lows” refers to a piezometric surface that was created from a compilation of historical-low groundwater elevations in various wells in the basin. These data are typically from the 1960s, 1977, and 1987-1992 drought periods when groundwater elevations were lowest in the basin. This historical low surface corresponds to an estimated groundwater storage volume of about 128,000 AF; whereas, the historical high water levels correspond to a storage volume of about 254,000 AF. The range from historical low to historical high provides an operational storage of about 126,000 AF (see Section 3.1 for a discussion on operational storage).

In 1987, Zone 7 adopted a Groundwater Management Policy that included maintaining groundwater levels high enough to provide emergency reserves adequate for the worst credible drought. In 2005, Zone 7 adopted mitigation measures for its Well Master Plan (WMP, *Zone 7, 2003*) that requires Zone 7 to maintain groundwater elevations above the historical lows, and to the extent operationally feasible, to reduce pumping or shift it to wells having higher groundwater elevations when groundwater elevations approach the historical lows to reduce the risk for groundwater pumping-induced subsidence (Mitigation Measures 3.3-1b and 3.3-1c). In addition, Zone 7 has a Subsidence Monitoring Program (see Section 2.5). It should be noted that Zone 7 uses static condition water level data from local monitoring wells rather than pumping level data to gauge the height above the historical lows and compliance with the mitigation measure.

The historical low surface used in the WMP and associated Environmental Impact Report (EIR) (*Zone 7, 2005b*) was revised in 2009 and converted to a surface grid (i.e., *ArcGIS* raster image) for comparison with end-of-water-year elevations and spatial analyses. The surface was modified again slightly in January 2014 as additional information became available. The updated piezometric control surface is shown in *Figure 2.4-4*.

The following items have changed from the 2012 Water Year (October 2011 through September 2012) or are items of note for the 2013 Water Year (October 2012 through September 2013):

General Program Changes – Well 3S/1E 2N 2 was destroyed in August 2012 as part of the Staples Ranch Development in Pleasanton and was not replaced. Therefore, the well was dropped from the groundwater monitoring program for the 2013 Water Year (October 2012 through September 2013). Well 3S/1E 10A1, a private well, was also removed from the program because water level probes were frequently getting stuck in the well. Well 3S/1E 13P1 was replaced by the 3S/1E 13P 5to7 nested well set installed in 2010.

Dublin San Ramon Services District (DSRSD) Samples – Zone 7 continued its data sharing agreement with DSRSD to obtain water levels and water quality results from several of DSRSD's wells (listed in table below) installed to monitor the impacts, if any, from their facultative sludge lagoons and sludge disposal operations in Pleasanton.

Figure 2.4-D: Table of DSRSD Wells Included in 2013 Water Year (October 2012 through September 2013) Program

Well Number	DSRSD Well	Aquifer
3S/1E 6N 2	MW-3	Upper
3S/1E 6N 3	MW-4	Upper
3S/1E 6N 6	NE-76	Upper
3S/1E 7D 1	SW-75	Upper
3S/1E 7D 3	SE-70	Upper
3S/1W 1J 1	MW-1	Upper
3S/1W 12A 9	NW-75	Upper

Water levels were monitored by DSRSD and reported to Zone 7. The results are discussed in Section 2.4.2. Groundwater samples from these wells were collected and analyzed by DSRSD, and the results were supplied to Zone 7. During one of these sampling events, DSRSD supplied Zone 7 with split samples for analysis by the Zone 7 laboratory. The results are discussed in Section 2.4.3.

2.4.2 Groundwater Elevations

As is usually the case, 2013 Water Year (October 2012 through September 2013) water levels varied with seasonal recharge and extraction. Typically the highest water levels are found at the end of the rainy season and lowest at the end of the high demand summer/fall seasons. In general, for the first quarter of the 2013 Water Year (October through December 2012), groundwater elevations rose due to rainfall recharge and subsequent reduced water pumping. However, during the second to fourth quarters of the water year, water elevations leveled off and then dropped as rainfall decreased and water demand increased, especially during the summer and fall seasons.

Key Well water levels in the Bernal and Amador Subbasins, from which Zone 7 pumps, ended the year approximately 1 to 9 feet below those observed at the end of the 2012 Water Year (October 2011 through September 2012) (see below). Lower aquifer Key Wells in these subbasins had water levels that were 27 to 105 feet above historical lows during the 2013 Water Year (compared to 34 to 116 feet above historical lows during the 2012 Water Year).

Figure 2.4-E: Change in Groundwater Elevation in Key Wells. Fall 2012 and Fall 2013

Subbasin	Upper Aquifer (ft)	Lower Aquifer (ft)
Bernal	Down 8.1	Down 9.0
Amador West	Down 4.3	Down 1.2
Amador East	Down 2.4	Down 7.6
Mocho II	Up 5.6	Up 24.5

Upper and lower aquifer Key Well water levels in Mocho II Subbasin rose at the end of the water year due to increased artificial stream recharge in the Arroyo Mocho (Section 2.2.2.2) and ended at approximately 5 and 25 feet higher, respectively, than at the end of the 2012 Water Year (October 2011 through September 2012). Water elevations in the Mocho II lower aquifer Key Well were 122 to 148 feet above historical lows during the water year (compared to 119 to 140 feet during the 2012 Water Year).

Figure 2.4-5 contains a tabulation of spring (collected in April 2013) and fall (collected in October 2013) groundwater elevations for all program wells and includes a comparison with water levels of the previous fall. *Figure 2.4-6* shows long-term hydrographs from each of the eight Key Wells. *Figure 2.4-7* shows graphs of groundwater elevations in the Key Wells along with Main Basin inflow/outflow components over the last two years.

2.4.2.1 Upper Aquifer Zone

Figure 2.4-8 and *Figure 2.4-9* show groundwater elevations in the upper aquifer for the Spring 2013 Water Year (collected April 2013) and Fall 2013 Water Year (collected October 2013) water level measurement events, respectively. Both of these figures include water levels from mining area ponds (Section 2.3), located in the central and southern portions of the Amador Subbasin, which are believed to be connected with the upper aquifer. The mining companies are actively pumping into or pumping from some of these ponds, creating a groundwater mound or depression, respectively.

During the 2013 Water Year (October 2012 through September 2013), the groundwater gradient in the Upper Aquifer was generally from east to west towards the Bernal Subbasin, then to the south where groundwater flows out of the Main Basin. The gradient in the upper aquifer generally ranged from 0.005 to 0.025 with isolated areas of flatter or steeper gradients, especially near subbasin boundaries. Upper aquifer water levels in the western portion of the Main Basin (Bernal Subbasin) experienced a drop of up to 10 feet from Fall 2012 to Fall 2013. In the central portion of the upper aquifer (Amador Subbasin) water levels rose (up to 16 feet) or dropped (up to 10 feet) depending on their proximity to mining activities and/or recharging streams, respectively (*Figure 1-2*). Water levels in the eastern portion of the Main Basin (Mocho II Subbasin) stayed relatively constant (-1 to +7.5 feet).

For the entire water year, water levels in wells near the Arroyo De La Laguna in the southwestern portion of the Bernal Subbasin (as indicated primarily by the Bernal Upper Key Well, 3S/1E 20C 7, and Well 3S/1E 29M 4) remained below the elevation at which basin overflow occurs (approximately 295 feet above mean sea level [msl]). Consequently, there was no basin overflow from the upper aquifer into the Arroyo De La Laguna during the 2013 Water Year.

2.4.2.2 Lower Aquifer Zone

Figure 2.4-10 and *Figure 2.4-11* show groundwater elevations in the lower aquifer of the Main Basin for Spring (collected in May 2013) and Fall (collected October 2013) of the 2013 Water Year (October 2012 through September 2013), respectively. These maps show a piezometric depression around several municipal or domestic wells that were pumping around the time of the Spring and Fall measurements. The groundwater gradient within the Mocho II and Amador Subbasins in the Lower Aquifer ranged from 0.001 to 0.05 with groundwater flowing generally westward along the longitudinal axis of the Livermore-Amador Valley. In the Bernal Subbasin, the gradient (typically less than 0.006) was slightly to the north and east towards the Hopyard and Mocho Wellfields. Typically, the lowest elevations correspond to the municipal pumping wellfields in those subbasins.

There are two major subsurface structural features that act as partial barriers to the lateral movement of groundwater in the Lower Aquifer. These features define the sub-basin boundaries between the Mocho II and Amador Subbasins, and between the Dublin and Camp fringe basins and the Main Basin. Groundwater levels are significantly higher on the upgradient sides of these partial barriers, but it is believed that groundwater cascades across these linear features providing some subsurface recharge for the adjacent subbasin.

1. Groundwater elevations in the Mocho II Subbasin were about 105 to 170 feet higher than those across the Livermore Fault in the Amador Subbasin.
2. Groundwater elevations in the Dublin/Camp/Bishop Subbasins were 40 to 60 feet higher than those across the Main Basin Boundary to the south (a.k.a., the Parks Boundary).

Lower aquifer water levels in the western and central portion of the Main Basin (Bernal and Amador Subbasins) generally dropped (up to 56 feet) from Fall 2012 to Fall 2013, especially near municipal pumping wells. Water levels in the eastern portion of the Main Basin (Mocho II Subbasin) generally rose (up to 66 feet) likely due to Zone 7's artificial stream recharge during the water year.

Figure 2.4-12 shows the difference between groundwater elevations measured in the lower aquifer in Fall 2013 and historical lows. Water levels in the vicinity of Zone 7's municipal wells were 38 to 82 feet above historical lows at the end of the water year. In the eastern part of the Amador Subbasin the groundwater elevation in one municipal well (3S/2E 7P 3) was about 20 feet below historical lows. While effort is made to ensure that groundwater elevations have stabilized during measurements, it is possible that the water elevation in this well was measured shortly after the pump in the well was turned off and therefore was not representative of a stabilized groundwater elevation. The water elevation in another municipal well in the same area was about 30 feet above historical lows.

In the south-central portion of the Main Basin water levels were as little as 8 feet above historical lows. This area in the vicinity of the City of Pleasanton's wells had a groundwater depression of about 30 feet, while at the same time its historical low elevations are about 10 feet higher than the surrounding area. Further to the southwest, in the central and southern portions of the Bernal Subbasin, water levels remain at greater than 90 feet above historical lows. Only San Francisco Public Utilities Commission (SFPUC) is using this part of the basin for municipal supply (supplying Castlewood). In the eastern part of the Main Basin (Mocho II Subbasin), where California Water Service (CWS) wells are located, the end of year groundwater levels were 60 to 140 feet above their respective historical lows.

Due to the continuing drought, water levels during the 2014 Water Year (October 2013 through September 2014) are anticipated to continue to approach historical lows.

2.4.3 Groundwater Quality

This section describes the groundwater quality of the Livermore Valley Groundwater Basin, and focuses primarily on the constituents of concern (salts, nitrate, and boron) in the Main Basin.

Zone 7 is currently updating the Salt Management Plan to include nutrients and chemicals of emerging concern. If new issues are identified, the Zone 7's groundwater quality objectives will likely be modified. For now, other than localized contamination from toxic sites (discussed in Chapter 3, Section 3.3.3.2), the main constituents of concern for meeting the Livermore Basin groundwater quality objectives are total dissolved solids (TDS) and nitrate. Whereas the TDS objectives are based on drinking water aesthetics i.e., State secondary Maximum Contaminant Level (MCL) and achieving a sustainable salt balance in the basin, the nitrate objective is based on the State's primary MCL for drinking water, which is human health-based. Boron is another groundwater parameter of interest for the valley's agriculture and golf communities because of its potential for impact on certain irrigated crops and turf. Hardness, which is closely related to TDS levels, is another groundwater parameter that influences Zone 7's ability to meet its delivered water quality target. Although routinely analyzed for, this parameter is not tracked separately from TDS in the groundwater monitoring program because it is generally proportional to the TDS values found in the Main Basin's groundwater and because it is tracked as a blended water quality parameter at the Retailer turnouts.

The following are Zone 7's groundwater quality objectives for the three groundwater constituents of concern:

- TDS (Main Basin): Ambient or 500 milligrams per liter (mg/L), whichever is lower
- TDS (Fringe Basins): Ambient or 1,000 mg/L, whichever is lower
- Nitrate (as NO₃): 45mg/L
- Boron: 1.0 mg/L (an agricultural supply target)

Zone 7 is currently updating the Salt Management Plan to include nutrients and chemicals of emerging concern. If new issues are identified, Zone 7's groundwater quality objectives will likely be modified.

Concentrations and spatial distribution of the tracked constituents are presented in the following figures and tables:

- *Figure 2.4-13* contains groundwater quality data collected from the groundwater monitoring program network wells during the 2013 Water Year (October 2012 through September 2013).
- *Figure 2.4-14* and *Figure 2.4-17* show maps of TDS concentrations for the upper and lower aquifers, respectively.

- *Figure 2.4-15* and *Figure 2.4-18* show maps of nitrate concentrations for the upper and lower aquifers, respectively.
- *Figure 2.4-16* and *Figure 2.4-19* show maps of boron concentrations for the upper and lower aquifers, respectively.
- *Figure 2.4-20* shows historical graphs of TDS concentrations in the Key Wells.
- *Figure 2.4-21* to *Figure 2.4-24* show groundwater hydro-chemographs (with water level, TDS, nitrate, and boron) from wells in each of the major subbasins.

2.4.3.1 Upper Aquifer Zone

TDS

In the upper aquifer, TDS concentrations depend on location relative to a source of recharge water, the water quality of the recharge water, and groundwater depth. Over the last 40 years there has been a general upward trend in TDS concentrations, particularly in the western portion of the Main Basin. Concentrations in the eastern and central portions of the valley, particularly near the high recharge reaches of the Arroyo Mocho and Arroyo del Valle (see Section 2.2.2) have stayed relatively low, especially during times of significant stream recharge.

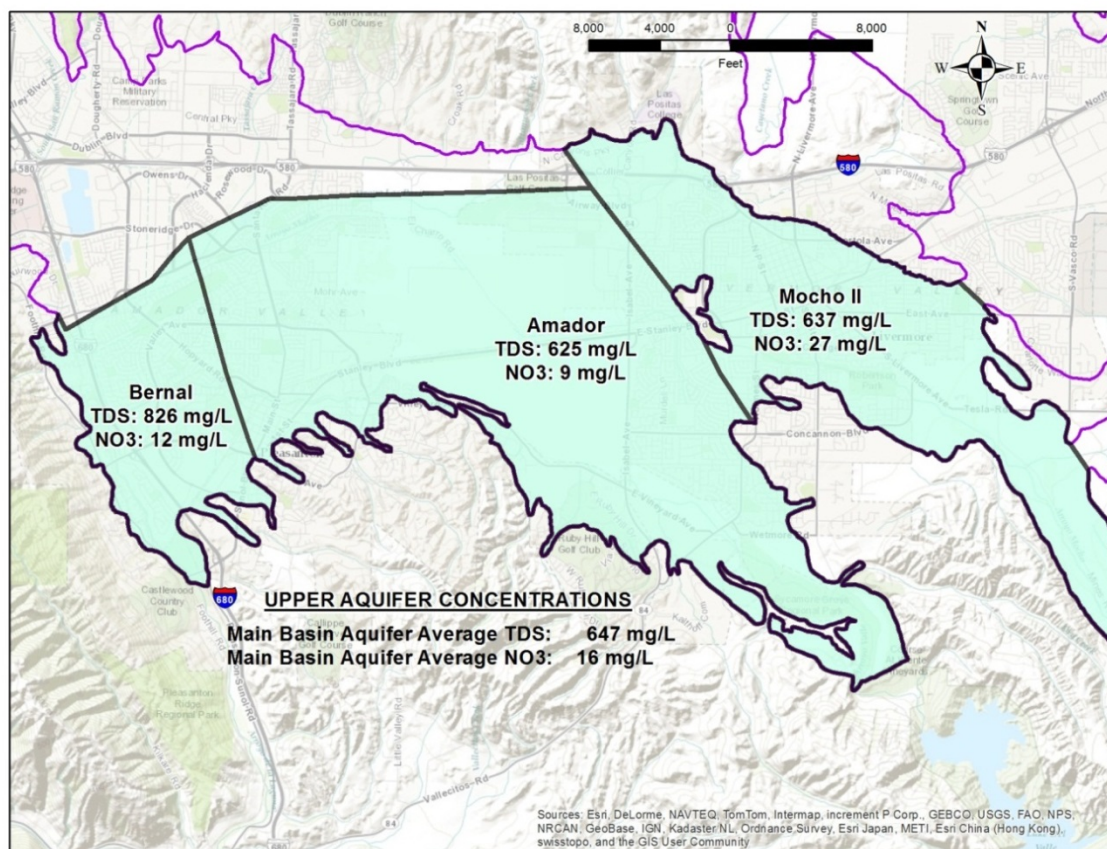
As part of the SMP update, Zone 7 calculated the 2013 salt concentration (measured as TDS) in each subbasin, aquifer, and the Main Basin (see *Figure 2.4-F* below). In the upper aquifer the total average TDS concentration is 647 mg/L, with all subbasins between 625 and 825 mg/L. The overall concentration for the upper and lower aquifers of the Main Basin combined is 585 mg/L.

During the 2013 Water Year (October 2012 through September 2013), the TDS content in groundwater was once again lowest in the areas adjacent to the artificial stream recharge reaches on the Arroyo Valle and Arroyo Mocho, where it is generally less than 500 mg/L of TDS. There are two regions of the Main Basin where TDS concentrations have exceeded 1,000 mg/L (*Figure 2.4-17*):

1. In the southern portion of the Dublin and Camp Subbasins and extending to the northern portion of the Bernal and Amador Subbasins. The western portion of this high TDS area is most likely due to the combination of the concentrating effects of urban irrigation, leaching of buried lacustrine sediments, and historical wastewater and sludge disposal practices. The eastern portion is most likely due to poor quality water from the marine sediments to the east and north recharging along the Arroyo Las Positas. Irrigation, with recycled water is another source of salt loading in this region.
2. In the 2013 Water Year (and occasionally in the past) several wells along the southern boundary of the Main Basin (3S/1E 20Q 2, 3S/1E 29P 2, 3S/2E 33K 1, and this year 3S/2E 24A 1) have detectable TDS concentrations near or above 1,000 mg/L. It is

believed that TDS may be entering the Main Basin as hill-front recharge and/or subsurface inflow from the neighboring Livermore Uplands to the south.

Figure 2.4-F: Upper Aquifer TDS and Nitrate Concentrations by Basin for the 2013 Water Year (October 2012 through September 2013)



The TDS concentration in mining area pond C1 (shown on *Figure 2.4-17*) appears to be slightly higher than those in surrounding ponds. This is due to the salt-concentrating effects of evaporation in combination with low seepage of the surrounding, lower-salt groundwater into the pond.

Nitrate

Nitrate (measured as nitrate ion [NO₃]) is detected in the upper aquifer at concentrations above the Basin Management Objective (BMO) and MCL of 45 mg/L (orange and red areas in *Figure 2.4-15*) in the following locations:

1. There is a plume that extends from the western portion of the Mocho I and eastern portion of the Mocho II Subbasins to the northeastern portion of the Amador Subbasin. Portions of this nitrate plume date back to at least the 1960s; however, over the last few years this plume has developed into several zones with concentrations above the MCL. The most significant of these zones is in the southern portion of the Mocho II Subbasin with concentrations up to 61.56 mg/L. The causes of elevated nitrate levels in these areas are believed to be both natural (i.e., buried native vegetation) and artificial (i.e., existing and historical wastewater disposal, and fertilizer and livestock manure leaching). There are over 100 septic tanks still in use near the proximal end of the plume.
2. Over the past few years there are two areas of high nitrate concentrations in the southern portion of the Mocho I and Mocho II Subbasins south of Tesla Road. Both of these areas are based on single monitoring wells and are believed to be related to historic and/or current overlying agricultural land uses. The one area of high nitrate concentrations located near the corner of Tesla Road and Greenville Road, has had a maximum concentration 163.90 mg/L in the 2001 Water Year and 156.33 mg/L in 2013 Water Year (October 2012 through September 2013). The second area of high nitrate, located along Mines Road, had a maximum concentration of 94.77 mg/L in the 2012 Water Year (October 2011 through September 2012); however for the 2013 Water Year the concentration dropped well below the MCL to 2.39 mg/L. The reason for this drop is unknown; however historically, concentrations of nitrate in this well have fluctuated widely; ranging from non-detected levels to above the MCL between 2007 and 2011.
3. In the May Subbasin near May School Road (a maximum concentration of 189.54 mg/L was detected in the 2013 Water Year). This was the highest nitrate concentration detected in the basin. In the 2008 Water Year (October 2007 through September 2008), as part of a one-time water quality study in this area, Zone 7 sampled and analyzed several domestic wells in the area to determine the extent of nitrate contamination. These results (presented in the 2008 Annual Report for the Groundwater Management Program, *Zone 7, 2009*) suggested that the nitrate appeared to be relatively localized with the highest concentration in the vicinity of 2S/2E 28D 2. The source of high nitrate was not identified; however, it may come from agricultural land use in that area and/or a leaky annular surface well seal.
4. In the Camp Subbasin in the eastern portion of Dublin a maximum concentration of 66.43 mg/L was detected in 2013 Water Year (compared to a concentration of 65.54 mg/L in 2012 Water Year). This may be a remnant of past dairy operations in the area that were discontinued long ago.
5. In monitoring well 3S/1E 22D 2, in the southern portion of the Amador West Subbasin, nitrate concentrations have been hovering around the MCL for the last several years; however, the long term trend indicates that concentrations are declining in this well. The source of elevated nitrate in this well has not been confirmed, but it is possible that it

may be entering the Main Basin as hill-front recharge and/or subsurface inflow from the neighboring Livermore Uplands to the south.

The nitrate loading and assimilative capacity of the Main Basin is currently being studied as part of the Salt Management Plan update (Chapter 3, Section 3.3.1.1). Nitrates are also being studied locally in Happy Valley to evaluate the effectiveness of a septic tank moratorium that has been in place since the 1970s. In 2012, Zone 7 and Alameda County Environmental Health (ACEH) conducted a joint water quality study of the unincorporated area south of Pleasanton known as Happy Valley where a relatively high density of septic tanks (>1 septic tank per 5 acres) have been in use for quite some time. The objectives of the study were to:

- Assess current conditions of the area's drinking water supply, which is mainly groundwater, and
- Evaluate the effectiveness of the County's long-standing septic tank moratorium to manage nitrates in groundwater beneath rural neighborhoods where the density of individual septic tanks is greater than 1 rural residential equivalent per 5 acres.

For this study, ACEH and Zone 7 staff invited Happy Valley residents to have their well water tested, free of charge. Twenty-six property owners accepted the offer and 31 wells were sampled. Seven of the 31 samples contained nitrate concentrations that exceeded the MCL for nitrate (45 mg/L as NO_3) and three samples contained arsenic above its MCL (10 mg/L) but E. Coli bacteria was not detected in any of the 31 samples. In addition, 21 samples were preserved and sent to an outside laboratory for oxygen and nitrogen isotope analysis to identify the source of nitrates in groundwater. The results of this analysis strongly suggest septic tank and/or animal manure origins for the nitrate. A technical report containing all findings and conclusions, and recommendations is currently under development.

Boron

While there is no MCL for boron, it may become a problem for irrigated crops when boron is present at levels above 1 or 2 mg/L, depending on the crop. Boron exists at elevated concentrations (up to 25.1 mg/L) in the upper aquifer in the following areas of the groundwater basin (*Figure 2.4-16*):

1. There is a plume of elevated boron concentrations that extends along the Dublin-Bernal and Camp-Amador boundaries. The highest localized concentration of boron in this area has been relatively stable and was detected near the center of this area in 3S/1E 4J 5 at a concentration of 13 mg/L in the 2013 Water Year (October 2012 through September 2013) (compared to 13.2 mg/L in 2012 Water Year [October 2011 through September 2012]).

2. Boron was also detected in the eastern portion of the valley in the May, Spring, Mocho I, and Mocho II Subbasins. The highest concentration detected was in the northern portion of this area in 2S/2E 27P 2 at 25.1 mg/L in 2013 Water Year (compared to 27 mg/L in 2012 Water Year).

The source of boron is unknown but may be from natural alkali/marine sediments. It should be noted that the boron detected in the western portion of the basin is primarily along the Arroyo Las Positas and lower Arroyo Mocho. It is likely that some of the source of this boron may be from the high-boron groundwater in the eastern portion of the Valley that has discharged into the Arroyo Las Positas in the North Livermore area and flowed downstream to the Arroyo Mocho, recharging into the Amador Subbasin along the way.

2.4.3.2 Lower Aquifer Zone

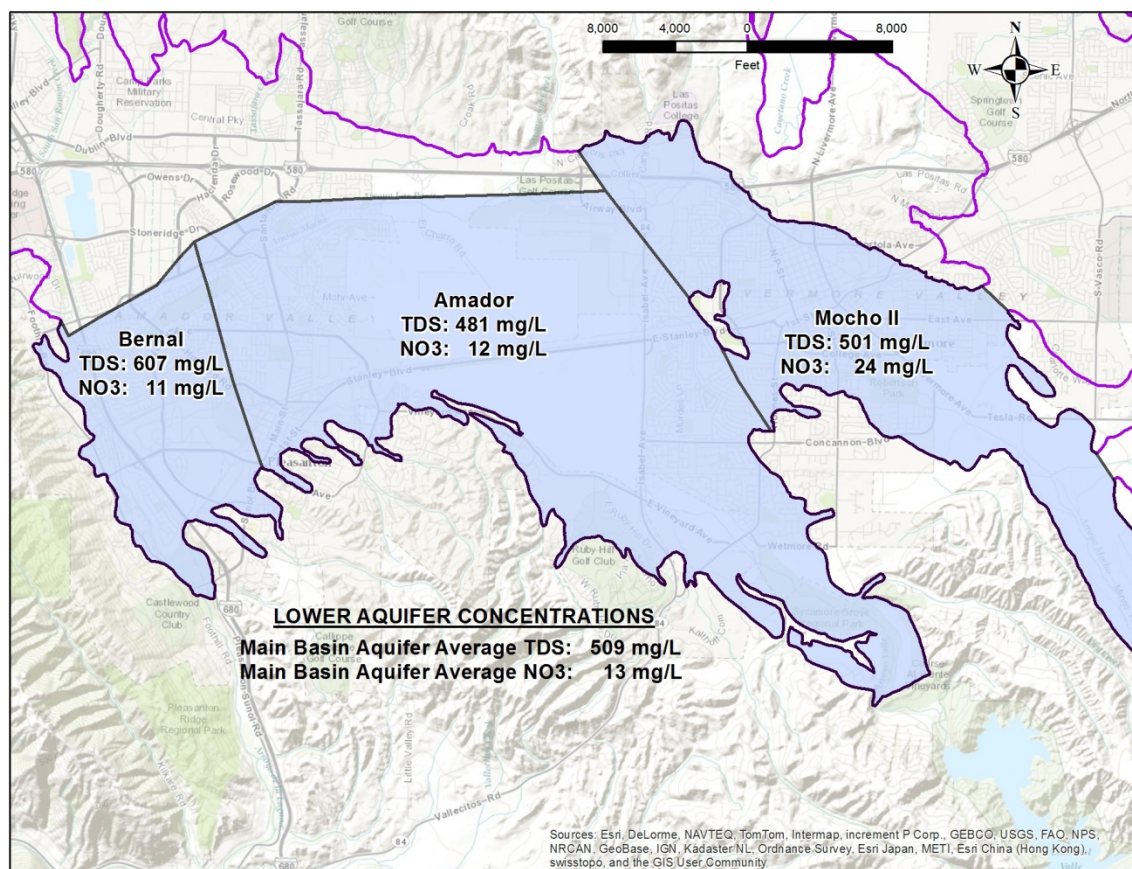
TDS

Water quality in the majority of the lower aquifer of the Main Basin is generally of good quality, containing less than the Basin Management Objective (BMO) of 500 mg/L TDS; however, in the Bernal Subbasin and around the margins of the Amador and Mocho II Subbasins, the lower aquifer contains groundwater with higher TDS concentrations (up to about 854 mg/L in 2013 Water Year compared to a high of 968 mg/L in 2012 Water Year) (see *Figure 2.4-17*). This is most likely due to deep percolation of high TDS water from the upper aquifer and subsurface inflow of high TDS water from the Dublin and Camp fringe subbasins in the north.

As part of the SMP update, Zone 7 calculated the 2013 Water Year salt concentration (measured as TDS) in each subbasin, aquifer, and the Main Basin (see *Figure 2.4-G* below). The average TDS concentration in the lower aquifer is 509 mg/L, with the Amador Subbasin below the BMO (481 mg/L) and the Mocho II right at the BMO (501 mg/L).

Starting in the 2007 Water Year (October 2006 through September 2007), TDS concentrations increased in several deep monitoring wells and the municipal water supply wells in the Mocho Wellfield. In the 2010 Water Year (October 2009 through September 2010), the TDS concentrations began to stabilize or decrease slightly in most wells in the Mocho Wellfield. These trends continued in the following three Water Years with some fluctuations in the concentrations. In 2013, TDS concentrations decreased in all the municipal supply wells except Mocho 4 which increased back to the same level as Water Year 2009 (October 2008 through September 2009). *Figure 2.4-25* shows the average TDS concentrations for the Mocho municipal supply wells over time compared to the vertical groundwater gradient.

Figure 2.4-G: Lower Aquifer TDS and Nitrate Concentrations by Basin for the 2013 Water Year (October 2012 through September 2013)



Zone 7's ongoing investigation efforts include:

- Analyzing drawdown data that is being collected from Upper Aquifer monitoring wells as the Mocho wells are routinely operated;
- Comparing individual characteristic constituents of the water being produced from the Mocho wells with those found in upper aquifer monitoring wells; and
- Preparing detailed stratigraphic cross-sections through the area of interest to identify whether discontinuities exist in the confining layer(s) that is believed to separate the Upper Aquifer Zone from the Lower Aquifer Zones.

The preliminary conclusion is that higher TDS groundwater in the overlying upper aquifer zone, which the Mocho Wells were designed to exclude, is migrating vertically to the Lower Aquifer via one or more potential pathways. This preliminary conclusion is based on the following findings:

- TDS concentrations have trended upwards in all Mocho supply wells since the higher capacity wells, Mocho 3 and Mocho 4, were constructed and pumped regularly. Mocho 3 exhibited the steepest increase and the highest TDS.
- Higher TDS concentrations in the lower aquifer appear to be limited to Mochos 3 and 4, and are not exhibiting a plume-like distribution when the surrounding monitoring wells are considered.
- Historically, there is a good correlation between periods of downward vertical gradient (i.e., when the groundwater elevation in the upper aquifer is higher than the lower aquifer) and periods of increasing or elevated TDS concentrations (*Figure 2.4-25*).

The potential pathways for the vertical migration of the high TDS being considered are:

- Leakage through the semi-confining layer(s) which separate the Upper Aquifer Zone from the Lower Aquifer Zone;
- Conduits caused by unsealed or improperly sealed wells that penetrate both the upper and lower aquifers in the immediate area.

Salt transport through the semi-confining layer existing between the upper and lower aquifers can happen naturally, and occur in either direction depending on the head difference between the aquifers. However, the recent increased pumping from the lower aquifer Mocho wells for salt management has locally increased the gradient between the lower and upper aquifers thus increasing the potential for upper aquifer salts to be transported to the lower aquifer and be produced by the Mocho wells. Likewise, the increased gradient has the potential for increasing flow (and salt transport) through whatever artificial conduits may be present in the intermediate confining layer.

Three unsealed abandoned wells were identified as existing potential conduits in the Mocho Wellfield area. All three of the abandoned wells (3S/1E 8H 3, 3S/1E 8H 4, and 3S/1E 8H14) have been properly destroyed (sealed). The destructions started during the 2012 Water Year and were completed in the 2013 Water Year (October 2012 through September 2013). Staff will continue to closely monitor the water quality and aquifer conditions in the Mocho Wellfield to see if these well destructions make a difference in the Mocho supply wells' TDS concentrations.

Nitrate

Nitrate in the lower aquifer was only detected above the MCL in the eastern portion of the Mocho II Subbasin (*Figure 2.4-18*). While smaller in extent, the general location of this plume underlies the nitrate plume in the upper aquifer, suggesting that some of the nitrate in the upper aquifer has migrated into the lower aquifer. For the 2013 Water Year (October 2012 through September 2013), the highest concentration of nitrate in a lower aquifer well was 55.80 mg/L in 3S/2E 8H 3 (compared to 49.60 mg/L in the 2012 Water Year [October 2011 through September 2012] in the same well).

Boron

In general, boron is not a problem in the lower aquifer where detections are typically less than 1 mg/L. However, boron was detected above 2 mg/L in three lower aquifer wells in the 2013 Water Year (October 2012 through September 2013) as follows (*Figure 2.4-19*):

1. Boron was detected in one well in the eastern portion of the Mocho II Subbasin: 2.2 mg/L in monitoring well 3S/2E 23E 2 (compared to 2.4 mg/L in the 2012 Water Year in the same well).
2. Boron was also detected above 2 mg/L in two monitoring wells near the Hopyard Well No. 9 in the northern portion of the Bernal Basin: 2.21 mg/L in 3S/1E 17D 4 (compared to 2.48 mg/L in the 2012 Water Year) and 2.09 mg/L in 3S/1E 17D11 (compared to 2.32 mg/L in the 2012 Water Year). However, concentrations in Hopyard 9 itself, have always been below 0.6 mg/L.

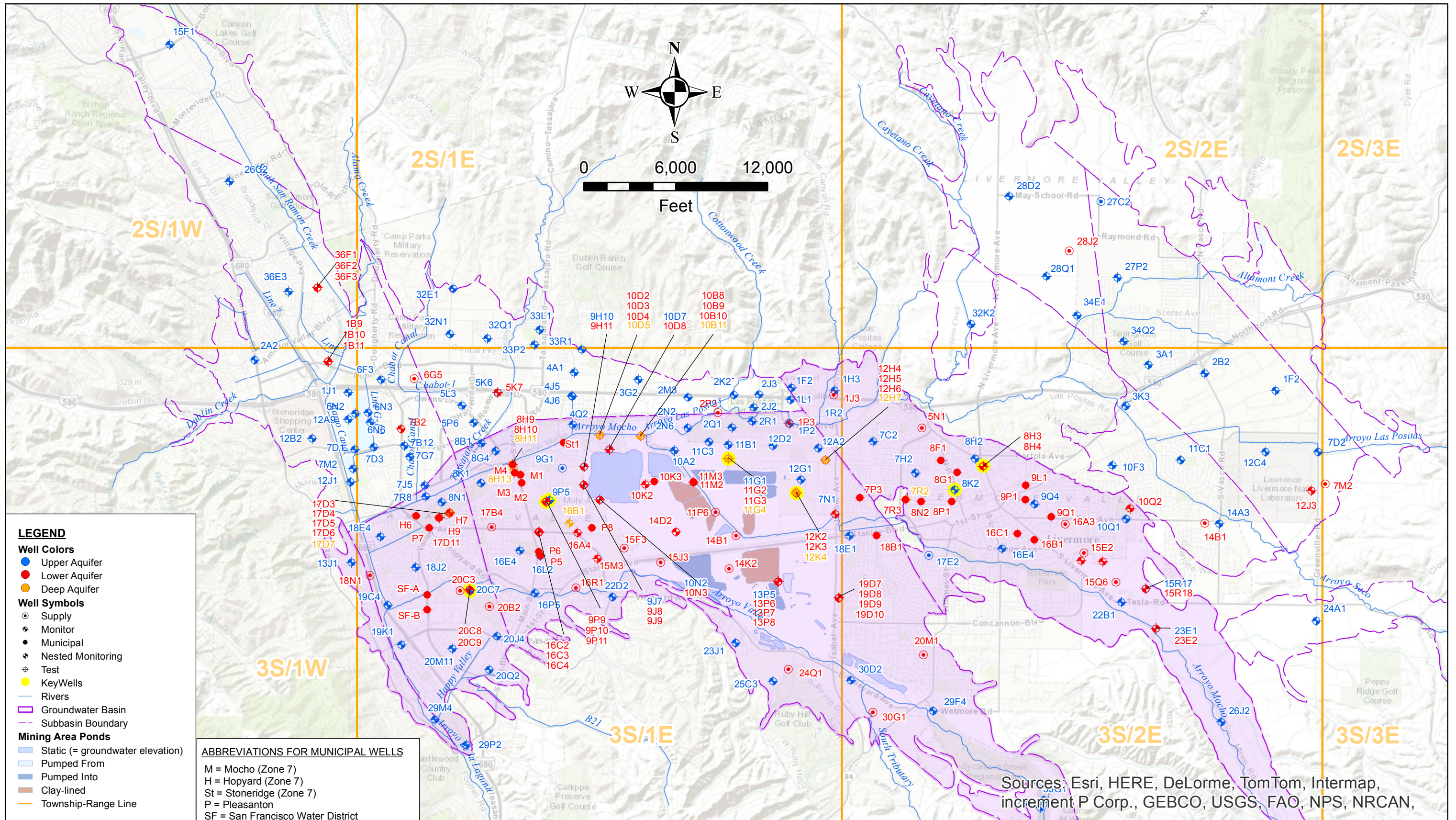
The source of boron is unconfirmed, but may be from localized natural alkali/marine sediments, localized pollutants or may have migrated vertically from a shallower zone during the pumping of the lower aquifers.

2.5 Subsidence Monitoring Program

This section describes the details of Zone 7's subsidence (ground surface elevations) monitoring for the 2013 Water Year (October 2012 through September 2013).

2.5.1 Program Description

The Subsidence Monitoring Program is designed to monitor for changes in surface elevation with respect to changes in groundwater storage, and alert Zone 7 in the event that groundwater withdrawals may be significantly impacting surface elevations. Typically, there are small changes, up and down, in surface elevations that correspond with seasonal and annual changes in groundwater levels. Those that are within the historically observed values, where surface



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR/MG

REVIEWED: CW

FILE: E:\MONITOR\GM\2013WY\AnnualReport2013\Fig2.4-01-MapAllWells13.mxd

SCALE: 1 in = 6,000 ft

DATE: Jul 21, 2014

Figure 2.4-1
Map of Wells in
2013 Groundwater Program
Livermore Valley Groundwater Basin



FIGURE 2.4-2
GROUNDWATER PROGRAM
TABLE OF PROGRAM WELLS WITH MEASUREMENT FREQUENCY
2013 WATER YEAR (Oct 2012 to Sep 2013)

SITE INFORMATION				Measurement Frequency	Other Programs					
State Name	Well Name	Subbasin	Aq		WR	CasG	Mu	Key	SMP	Oth
2S/1E 32E 1	End of Arnold Rd	Camp	U	SA					T-HAC-1	
2S/1E 32N 1	Camp Parks	Camp	U	SA					T-HAC-2	
2S/1E 32Q 1	Summer Glen Dr	Camp	U	SA					32Q1	
2S/1E 33L 1	Gleason Dr @ Tassajara	Camp	U	SA					33L1	
2S/1E 33P 2	Central Pkwy at Emerald Glen	Camp	U	SA					33P2	
2S/1E 33R 1	Central Pkwy @ Grafton	Camp	U	SA					T-DUB-1	
2S/1W 15F 1	BOLLINGER	Bishop	U	SA						
2S/1W 26C 2	PINE VALLEY	Dublin	U	SA						
2S/1W 36E 3	Kolb Park	Dublin	U	SA					36E3	
2S/1W 36F 1	Dublin High shallow	Dublin	L	SA						
2S/1W 36F 2	Dublin High mid	Dublin	L	SA						
2S/1W 36F 3	Dublin High deep	Dublin	L	SA						
2S/2E 27C 2	Dagnino Rd	Spring	U	SA						
2S/2E 27P 2	hartford ave east	Spring	U	SA						
2S/2E 28D 2	May School	May	U	SA					T-MAY-1	
2S/2E 28J 2	FCC Well	May	L	SA						
2S/2E 28Q 1	hartford ave	May	U	SA					T-MAY-2	
2S/2E 32K 2	jenson's N liv. Ave	Cayetano	U	SA						
2S/2E 34E 1	mud city	May	U	SA					T-MAY-3	
2S/2E 34Q 2	Hollyhock & Crocus	Spring	U	SA					T-SPR-2	
3S/1E 1F 2	Constitution Dr	Mocho II	U	SA					T-AIR-1	
3S/1E 1H 3	Collier Canyon g1	Mocho II	U	SA					1H3	
3S/1E 1J 3	Triad Vineyard	Mocho II	L	SA						
3S/1E 1L 1	Kitty Hawk	Camp	U	SA					T-AIR-2	
3S/1E 1P 2	airport gas g5	Amador	U	SA					T-AIR-3	
3S/1E 1P 3	New airport well	Amador	L	SA						
3S/1E 2J 2	Maint. Bldg	Camp	U	SA					T-GLF-2	
3S/1E 2J 3	Doolan Rd East	Camp	U	SA					T-GLF-1	
3S/1E 2K 2	Doolan Rd West	Camp	U	SA					2K2	
3S/1E 2M 3	Friesman Rd North	Camp	U	SA					T-FRI-1	
3S/1E 2N 6	Friesman Rd South	Amador	U	SA					T-FRI-3	
3S/1E 2P 3	Crosswinds Church	Camp	L	SA						
3S/1E 2Q 1	LPGC #1	Amador	U	SA					T-GLF-3	
3S/1E 2R 1	Beebs	Amador	U	SA						
3S/1E 3G 2	fallon rd	Camp	U	SA						
3S/1E 4A 1	SMP-DUB-2	Camp	U	SA					T-DUB-2	
3S/1E 4J 5	Pimlico shallow	Camp	U	SA					T-DUB-3	
3S/1E 4J 6	Pimlico deep	Camp	U	SA					T-DUB-4	
3S/1E 4Q 2	gulfstream	Amador	U	SA						
3S/1E 5K 6	Rosewood shallow	Camp	U	SA						
3S/1E 5K 7	Rosewood deep	Camp	L	SA						
3S/1E 5L 3	Oracle	Camp	U	SA					T-HAC-3	

Aq = Aquifer: U = Upper; L = Lower; D = Deep Frequency: R = Recorder; M = Monthly; Q = Quarterly; SA = Semiannually; A = Annually

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SITE INFORMATION				Measurement Frequency	Other Programs					
State Name	Well Name	Subbasin	Aq		WR	CasG	Mu	Key	SMP	Oth
3S/1E 5P 6	Owens Park	Camp	U	SA					T-HAC-4	
3S/1E 6F 3	Dublin Ct	Dublin	U	SA		√			6F3	
3S/1E 6G 5	Nissan Repair	Dublin	L	SA						
3S/1E 6N 2	DSRSD MW-3	Dublin	U	SA						
3S/1E 6N 3	DSRSD MW-4	Dublin	U	SA						
3S/1E 6N 6	DSRSD NE-76	Dublin	U	SA						
3S/1E 7B 2	Hopyard rd	Dublin	L	SA						
3S/1E 7B12	Hacienda Arch	Dublin	U	SA					T-CHA-1	
3S/1E 7D 1	DSRSD SW-75	Dublin	U	SA						
3S/1E 7D 3	DSRSD SE-70	Dublin	U	SA						
3S/1E 7G 7	Chabot Well	Dublin	U	SA					T-CHA-2	
3S/1E 7J 5	Thomas Hart School	Dublin	U	SA					T-CHA-3	
3S/1E 7M 2	DSRSD Sub	Dublin	U	SA					7M2	
3S/1E 7R 8	Mocho Canal North at Willow	Bernal	U	SA					T-CHA-4	
3S/1E 8B 1	Lizard Well	Amador	U	SA					T-HAC-5	
3S/1E 8G 4	Apache	Amador	U	SA					T-HAC-6	
3S/1E 8H 9	Mocho 4 Nested Shallow	Amador	L	M						
3S/1E 8H10	Mocho 4 Nested Middle	Amador	L	M						
3S/1E 8H11	Mocho 4 Nested deep	Amador	D	M						
3S/1E 8H13	Mocho 3 mon	Amador	D	M						
3S/1E 8H18	Mocho 4	Amador	L	R			√			
3S/1E 8K 1	sutter gate	Amador	U	SA						
3S/1E 8N 1	sports park	Bernal	U	SA						
3S/1E 9B 1	Stoneridge	Amador	L	R			√			
3S/1E 9G 1	3775 trenery - Kamp	Amador	U	SA						
3S/1E 9H10	NW Lake I Shallow	Amador	U	SA						
3S/1E 9H11	NW Lake I Deep	Amador	L	SA						
3S/1E 9J 7	SW Lake I Shallow	Amador	U	SA						
3S/1E 9J 8	SW Lake I Middle	Amador	L	SA						
3S/1E 9J 9	SW Lake I Deep	Amador	L	SA						
3S/1E 9M 2	Mocho 1	Amador	L				√			
3S/1E 9M 3	Mocho 2	Amador	L	M			√			
3S/1E 9M 4	Mocho 3	Amador	L	R			√			
3S/1E 9P 5	Key_AmW_U (Mohr Key)	Amador	U	M		√		√		
3S/1E 9P 9	Mohr Ave Shallow	Amador	L	M						
3S/1E 9P10	Key_AmW_L	Amador	L	M		√		√		
3S/1E 9P11	Mohr Ave Deep	Amador	L	M						
3S/1E 10A 2	El C harro Rd	Amador	U	SA						
3S/1E 10B 8	Kaiser Rd Shallow	Amador	L	SA						
3S/1E 10B 9	Kaiser Rd Middle 1	Amador	L	SA						
3S/1E 10B10	Kaiser Rd Middle 2	Amador	L	SA						
3S/1E 10B11	Kaiser Rd Deep	Amador	D	SA						
3S/1E 10D 2	Stoneridge Shallow	Amador	L	SA						
3S/1E 10D 3	Stoneridge Middle 1	Amador	L	SA						
3S/1E 10D 4	Stoneridge Middle 2	Amador	L	SA						
3S/1E 10D 5	Stoneridge Deep	Amador	D	SA						
3S/1E 10D 7	North Lake I Shallow	Amador	U	SA						
3S/1E 10D 8	North Lake I Cluster 2	Amador	L	SA						

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SITE INFORMATION				Measurement Frequency	Other Programs					
State Name	Well Name	Subbasin	Aq		WR	CasG	Mu	Key	SMP	Oth
3S/1E 10K 2	NorthWest Cope Lake	Amador	L	M						
3S/1E 10K 3	COL 1	Amador	L	M			√			
3S/1E 10N 2	South Lake I Shallow	Amador	U	SA						
3S/1E 10N 3	South Lake I Deep	Amador	L	SA						
3S/1E 11B 1	Airport West	Amador	U	SA					11B1	
3S/1E 11C 3	LAVWMA ROW	Amador	U	SA					T-GLF-4	
3S/1E 11G 1	Key_AmE_U	Amador	U	M		√		√		
3S/1E 11G 2	Rancho Charro Middle 1	Amador	L	M						
3S/1E 11G 3	Rancho Charro Middle 2	Amador	L	M						
3S/1E 11G 4	Rancho Charro Deep	Amador	D	M						
3S/1E 11M 2	COL2 Monitoring	Amador	L	M						
3S/1E 11M 3	COL 2	Amador	L	M			√			
3S/1E 11P 6	New Jamieson Residence	Amador	L	SA						
3S/1E 12A 2	Airport South	Amador	U	SA					12A2	
3S/1E 12D 2	LWRP G6	Amador	U							
3S/1E 12G 1	Oaks Park Shallow	Amador	U	M						
3S/1E 12H 4	LWRP Shallow	Amador	L	SA						
3S/1E 12H 5	LWRP Middle 1	Amador	L	SA						
3S/1E 12H 6	LWRP Middle 2	Amador	L	SA						
3S/1E 12H 7	LWRP Deep	Amador	D	SA						
3S/1E 12K 2	Key_AmE_L	Amador	L	R		√		√		
3S/1E 12K 3	Oaks Park Mid	Amador	L	M						
3S/1E 12K 4	Oaks Park Deep	Amador	D	M						
3S/1E 13P 5	LGA Grant Nested 1	Amador	U	M						
3S/1E 13P 6	LGA Grant Nested 2	Amador	L	M						
3S/1E 13P 7	LGA Grant Nested 3	Amador	L	M						
3S/1E 13P 8	LGA Grant Nested 4	Amador	L	M						
3S/1E 14B 1	Industrial Asphalt	Amador	L	SA						
3S/1E 14D 2	South Cope Lake	Amador	L	SA						
3S/1E 14K 2	lone star ind	Amador	L	SA						
3S/1E 15F 3	kaiser #8	Amador	L	SA						
3S/1E 15J 3	shadow cliff	Amador	L	SA						
3S/1E 15M 3	Bush/Valley South	Amador	L	SA						
3S/1E 16A 2	Pleas 8	AmWest	L	M			√			
3S/1E 16A 4	Bush/Valley Mid	Amador	L	SA						
3S/1E 16B 1	Bush/Valley North	Amador	D	SA						
3S/1E 16C 2	Santa Rita Valley Shallow	Amador	L	SA						
3S/1E 16C 3	Santa Rita Valley Middle	Amador	L	SA						
3S/1E 16C 4	Santa Rita Valley Deep	Amador	L	SA						
3S/1E 16E 4	black ave - cultural	Amador	U	SA						
3S/1E 16L 2	Pleas 4	Amador	U	M						
3S/1E 16L 5	Pleas 5	Amador	L	M			√			
3S/1E 16L 7	Pleas 6	Amador	L	M			√			
3S/1E 16P 5	Vervais Monitor	Amador	U	R	√					
3S/1E 16R 1	Stanley Berry Farm	Amador	L	SA						
3S/1E 17B 4	Casterson	Amador	L	SA						
3S/1E 17D 3	Hopyard Nested Shallow	Bernal	L	M						
3S/1E 17D 4	Hopyard Nested Middle 1	Bernal	L	M						

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* = Groundwater levels only.

SITE INFORMATION				Measurement Frequency	Other Programs					
State Name	Well Name	Subbasin	Aq		WR	CasG	Mu	Key	SMP	Oth
3S/1E 17D 5	Hopyard Nested Middle 2	Bernal	L	M						
3S/1E 17D 6	Hopyard Nested Middle 3	Bernal	L	M						
3S/1E 17D 7	Hopyard Nested Deep	Bernal	D	M						
3S/1E 17D10	Hopyard 7	Bernal	L	SA						
3S/1E 17D11	Hopyard 9 Monitoring Well	Bernal	L	SA						
3S/1E 17D12	Hopyard 9	Bernal	L	R			√			
3S/1E 18A 5	Pleas 7	Bernal	L	M			√			
3S/1E 18A 6	Hopyard 6	Bernal	L	R			√			
3S/1E 18E 4	Valley Trails II	Bernal	U	SA						
3S/1E 18J 2	camino segura	Bernal	U	SA						
3S/1E 18N 1	merritt	Bernal	L	SA						
3S/1E 19A10	SFWD South (B)	Bernal	L				√			
3S/1E 19A11	SFWD North (A)	Bernal	L	SA			√			
3S/1E 19C 4	del valle & laguna	Bernal	U	SA						
3S/1E 19K 1	680/bernal	Bernal	U	SA						
3S/1E 20B 2	Fairgrounds Potable	Bernal	L	SA			√			
3S/1E 20C 3	Fairgrounds Potable Backup	Bernal	L	SA			√			
3S/1E 20C 7	Key_Bern_U	Bernal	U	R	√	√		√		
3S/1E 20C 8	Key_Bern_L	Bernal	L	M		√		√		
3S/1E 20C 9	Fair Nested Deep	Bernal	L	M						
3S/1E 20J 4	civic center	Bernal	U	SA						
3S/1E 20M11	S.F "M"LINE	Bernal	U	SA						
3S/1E 20Q 2	20Q2	Bernal	U	SA					T-PL-3	
3S/1E 22D 2	vineyard trailer	Amador	U	SA					T-BER-3	
3S/1E 23J 1	1627 vineyard trailer	Amador	U	SA						
3S/1E 24Q 1	Ruby Hills	Amador	L	SA						
3S/1E 25C 3	Katz Winery Mansion	Amador	U	SA						
3S/1E 29M 4	f.c. channel	Castle	U	M	√*					
3S/1E 29P 2	castlewood dr	Bernal	U	SA						
3S/1W 1B 9	DSRSD Shallow	Dublin	L	SA						
3S/1W 1B10	DSRSD Middle	Dublin	L	SA						
3S/1W 1B11	DSRSD Deep	Dublin	L	SA					1B11	
3S/1W 1J 1	DSRSD MW-1	Dublin	U	SA						
3S/1W 2A 2	McNamara's	Dublin	U	SA					2A2	
3S/1W 12A 9	DSRSD NW-75	Dublin	U	SA						
3S/1W 12B 2	Stoneridge Mall Rd	Dublin	U	SA						
3S/1W 12J 1	DSRSD South	Dublin	U	SA						
3S/1W 13J 1	muirwood dr	Castle	U	SA						
3S/2E 1F 2	Brisa at Circuit City	Spring	U	SA						
3S/2E 2B 2	south front rd	Spring	U	SA						
3S/2E 3A 1	Bluebell	Spring	U	SA					T-SPR-1	
3S/2E 3K 3	first & S. front rd	Mocho I	U	SA					3K3	
3S/2E 5N 1	1037 portola - trailer	Mocho II	L	SA						
3S/2E 7C 2	york way - jaws - G4	Mocho II	U	SA						
3S/2E 7H 2	dakota	Mocho II	U	SA						
3S/2E 7N 1	kittyhawk south	Amador	U	SA						
3S/2E 7P 3	CWS STA 24	Amador	L	M			√			
3S/2E 7R 2	CWS STA 31 Monitoring	Mocho II	D	M						

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SITE INFORMATION					Measurement Frequency	Other Programs					
State Name	Well Name	Subbasin	Aq	WR		CasG	Mu	Key	SMP	Oth	
3S/2E 7R 3	CWS STA 31	Mocho II	L	M			√				
3S/2E 8F 1	CWS STA 10	Mocho II	L	M			√				
3S/2E 8G 1	CWS STA 19	Mocho II	L	M			√				
3S/2E 8H 2	North k	Mocho II	U	SA							
3S/2E 8H 3	Key_Mo2_L	Mocho II	L	M		√		√			
3S/2E 8H 4	N Liv Ave Deep	Mocho II	L	M							
3S/2E 8K 2	Key_Mo2_U (Livermore Key)	Mocho II	U	R		√		√			
3S/2E 8N 2	CWS STA 14	Mocho II	L	M			√				
3S/2E 8P 1	CWS STA 8	Mocho II	L	M			√				
3S/2E 9L 1	CWS STA 17	Mocho II	L	M							
3S/2E 9P 1	CWS STA 12	Mocho II	L	M			√				
3S/2E 9Q 1	CWS STA 9	Mocho II	L	M			√				
3S/2E 9Q 4	school st	Mocho II	U	SA							
3S/2E 10F 3	hexcel	Mocho I	U	SA							
3S/2E 10Q 1	almond	Mocho II	U	SA							
3S/2E 10Q 2	LLNL W-703	Mocho II	L	SA							
3S/2E 11C 1	joan way	Mocho I	U	SA					11C1		
3S/2E 12C 4	LLNL W-486	Spring	U	SA							
3S/2E 12J 3	LLNL W-017A	Spring	L	SA							
3S/2E 14A 3	S. vasco @east ave	Mocho I	U	SA							
3S/2E 14B 1	5763 east ave	Mocho I	L	SA							
3S/2E 15E 2	Retzlaff Winery	Mocho II	L	SA							
3S/2E 15Q 6	Concannon	Mocho II	L	SA							
3S/2E 15R17	Buena Vista Shallow	Mocho II	U	SA							
3S/2E 15R18	Buena Vista Deep	Mocho II	L	SA							
3S/2E 16A 3	Memory Gardens	Mocho II	L	SA							
3S/2E 16B 1	CWS STA 5	Mocho II	L	M			√				
3S/2E 16C 1	CWS STA 15	Mocho II	L	M			√				
3S/2E 16E 4	pepper tree	Mocho II	U	SA							
3S/2E 17E 2	Mocho Street	Mocho II	U	SA							
3S/2E 18B 1	CWS STA 20	Amador	L	M			√				
3S/2E 18E 1	E. stanley	Amador	U	SA							
3S/2E 19D 7	Isabel Shallow	Amador	U	SA		√					
3S/2E 19D 8	Isabel Middle 1	Amador	L	SA							
3S/2E 19D 9	Isabel Middle 2	Amador	L	SA							
3S/2E 19D10	Isabel Deep	Amador	L	SA							
3S/2E 20M 1	Alden Lane	Amador	L	SA							
3S/2E 22B 1	grapes	Mocho II	U	SA							
3S/2E 23E 1	Mines Nested Shallow	Mocho II	U	SA							
3S/2E 23E 2	Mines Nested Deep	Mocho II	L	SA							
3S/2E 24A 1	S. greenville	Mocho I	U	SA					24A1		
3S/2E 26J 2	mines rd	Mocho II	U	SA							
3S/2E 29F 4	usgs wetmore	Amador	U	M	√						
3S/2E 30D 2	vineyard	Amador	U	R	√*				T-VIN-3		
3S/2E 30G 1	genesis farms	Amador	L	SA							
3S/2E 33G 1	crohare	Amador	U	M	√						
3S/2E 33K 1	VA	Amador	U	Q							
3S/2E 33L 1	VA/CROHARE FENCE	Amador	U	Q							

Aq = Aquifer: U = Upper; L = Lower; D = Deep Frequency: R = Recorder; M = Monthly; Q = Quarterly; SA = Semiannually; A = Annually

ZONE 7 PROGRAM: GWP = Groundwater Program; Lvl's = Groundwater Levels Frequency, Qual = Groundwater Quality Sampling Frequency

OTHER: WR = Water Rights; CasG = CASGEM; Mu = Municipal wells; Key = Key Wells; SMP = Salt Management Plan; Oth = Other

* = Groundwater levels only.

SITE INFORMATION				Measurement		Other Programs					
State Name	Well Name	Subbasin	Aq	Frequency		WR	CasG	Mu	Key	SMP	Oth
3S/3E 7D 2	7D 2	Spring	U	SA							
3S/3E 7M 2	lupin way	Spring	L	SA							
TOTALS:	All Wells: 236	In Program: 236		233	217	6	10	28	8	50	0

Salt Management Plan (SMP) Designations

T-AIR = Airport Transect
T-BER = Bernal Transect
T-CHA = Chabot Transect
T-DUB = East Dublin Transect
T-FRI = Friesman Transect

T-HAC = Hacienda Transect
T-HV = Happy Valley Transect
T-LIV = South Livermore Transect
T-MAY = May Transect
T-PLE = Pleasanton Transect

T-RH = Ruby Hill Transect
T-SPR = Springtown Transect
T-VIN = Vineyard Transect
T-WEN = Wente Transect

Aq = Aquifer: U = Upper; L = Lower; D = Deep	Frequency: R = Recorder; M = Monthly; Q = Quarterly; SA = Semiannually; A = Annually
ZONE 7 PROGRAM: GWP = Groundwater Program; LvlS = Groundwater Levels Frequency, Qual = Groundwater Quality Sampling Frequency	
OTHER: WR = Water Rights; CasG = CASGEM; Mu = Municipal wells; Key = Key Wells; SMP = Salt Management Plan; Oth = Other	
* = Groundwater levels only.	



**FIGURE 2.4-3
GROUNDWATER PROGRAM
WELL CONSTRUCTION DETAILS
2013 WATER YEAR (Oct 2012 to Sep 2013)**

<i>Site</i>	<i>Type</i>	<i>Other Name</i>	<i>Owner</i>	<i>Basin</i>	<i>Aquifer</i>	<i>RP</i>	<i>TD Dia</i>	<i>Perf</i>
2S/1E 32E 1	monitor	End of Arnold Rd	ZONE 7	Camp	Upper	392.56	70 2 55	- 70
2S/1E 32N 1	monitor	Camp Parks	ZONE 7	Camp	Upper	360.79	44 2.5 35	- 41
2S/1E 32Q 1	monitor	Summer Glen Dr	ZONE 7	Camp	Upper	367.55	45 2 30	- 45
2S/1E 33L 1	monitor	Gleason Dr @ Tassajara	ZONE 7	Camp	Upper	389.46	80 2 65	- 80
2S/1E 33P 2	monitor	Central Pkwy at Emerald Glen	ZONE 7	Camp	Upper	370.05	55 2 45	- 55
2S/1E 33R 1	monitor	Central Pkwy @ Grafton	ZONE 7	Camp	Upper	358.5	60 2 40	- 60
2S/1W 15F 1	monitor	BOLLINGER	ZONE 7	Bishop	Upper	439.44	60 2.5 50.3	- 55.3
2S/1W 26C 2	monitor	PINE VALLEY	ZONE 7	Dublin	Upper	406.53	50 2.5 40	- 45
2S/1W 36E 3	monitor	Kolb Park	ZONE 7	Dublin	Upper	346.51	60 2.5 50	- 55
2S/1W 36F 1	nested	Dublin High shallow	DSRSD	Dublin	Lower	342.71	190 2 140	- 180
2S/1W 36F 2	nested	Dublin High mid	DSRSD	Dublin	Lower	342.71	320 2 270	- 310
2S/1W 36F 3	nested	Dublin High deep	DSRSD	Dublin	Lower	342.71	520 2 440	- 510
2S/2E 27C 2	supply	Dagnino Rd	JACK PIECEFIELD	Spring	Upper	542.14	108 8 41	- 56
2S/2E 27P 2	monitor	hartford ave east	ZONE 7	Spring	Upper	505.43	68 4 35	- 63
2S/2E 28D 2	monitor	May School	ZONE 7	May	Upper	555.15	55 2.5 45	- 50
2S/2E 28J 2	supply	FCC Well	FCC	May	Lower	518.84	230 6 50	- 230
2S/2E 28Q 1	monitor	hartford ave	ZONE 7	May	Upper	513.04	28 2.5 17.6	- 22.6
2S/2E 32K 2	monitor	jenson's N liv. Ave	ZONE 7	Cayetano	Upper	507.43	43 2.5 33	- 38
2S/2E 34E 1	monitor	mud city	ZONE 7	May	Upper	499.73	49 2.5 40	- 45
2S/2E 34Q 2	monitor	Hollyhock & Crocus	ZONE 7	Spring	Upper	507.24	50 2 25	- 50
3S/1E 1F 2	monitor	Constitution Dr	ZONE 7	Mocho II	Upper	428.44	40 2 25	- 40
3S/1E 1H 3	monitor	Collier Canyon g1	ZONE 7	Mocho II	Upper	422.8	80 2.5 70	- 75
3S/1E 1J 3	irrigation	Triad Vineyard	TKG INTERNATIONAL	Mocho II	Lower	417.88	300 9 270	- 290
3S/1E 1L 1	monitor	Kitty Hawk	ZONE 7	Camp	Upper	403.04	70 2 60	- 70
3S/1E 1P 2	monitor	airport gas g5	ZONE 7	Amador	Upper	389.64	50 2.5 40	- 45
3S/1E 1P 3	supply	New airport well	CITY OF LIVERMORE	Amador	Lower	394.44	480 12 245	- 460
3S/1E 2J 2	monitor	Maint. Bldg	ZONE 7	Camp	Upper	380.89	41 2 31	- 41
3S/1E 2J 3	monitor	Doolan Rd East	ZONE 7	Camp	Upper	406.35	65 2 55	- 65
3S/1E 2K 2	monitor	Doolan Rd West	ZONE 7	Camp	Upper	397.04	46 2.5 36.5	- 41.5
3S/1E 2M 3	monitor	Friesman Rd North	ZONE 7	Camp	Upper	365.04	50 2 35	- 50
3S/1E 2N 6	monitor	Friesman Rd South	ZONE 7	Amador	Upper	366.14	55 2 40	- 55
3S/1E 2P 3	potable	Crosswinds Church	Crosswinds Church	Camp	Lower	371.73	380 10 340	- 372
3S/1E 2Q 1	monitor	LPGC #1	ZONE 7	Amador	Upper	369.92	45 2 35	- 45
3S/1E 2R 1	monitor	Beebs	ZONE 7	Amador	Upper	376.29	33 2.5 21	- 26
3S/1E 3G 2	monitor	fallon rd	ZONE 7	Camp	Upper	354.24	50 2.5 40	- 45
3S/1E 4A 1	monitor	SMP-DUB-2	ZONE 7	Camp	Upper	350.67	49.5 2 29.5	- 49.5
3S/1E 4J 5	monitor	Pimlico shallow	ZONE 7	Camp	Upper	345.2	47 2 22	- 47
3S/1E 4J 6	monitor	Pimlico deep	ZONE 7	Camp	Upper	345.55	110 2 68	- 110
3S/1E 4Q 2	monitor	gulfstream	ZONE 7	Amador	Upper	345.42	90 2.5 80	- 85
3S/1E 5K 6	monitor	Rosewood shallow	ZONE 7	Camp	Upper	346.05	75 4 40	- 70
3S/1E 5K 7	monitor	Rosewood deep	ZONE 7	Camp	Lower	346.19	150 4 134	- 144
3S/1E 5L 3	monitor	Oracle	ZONE 7	Camp	Upper	339.43	40 2 15	- 40
3S/1E 5P 6	monitor	Owens Park	ZONE 7	Camp	Upper	336.65	35 2 25	- 35
3S/1E 6F 3	monitor	Dublin Ct	ZONE 7	Dublin	Upper	329.82	36 2.5 27	- 32
3S/1E 6G 5	supply	Nissan Repair	VALLEY NISSAN/VOLVO	Dublin	Lower	332.22	200 8 103	- 178

<i>Site</i>	<i>Type</i>	<i>Other Name</i>	<i>Owner</i>	<i>Basin</i>	<i>Aquifer</i>	<i>RP</i>	<i>TD Dia</i>	<i>Perf</i>
3S/1E 6N 2	monitor	DSRSD MW-3	DSRSD	Dublin	Upper	335.2	67 4	42 - 67
3S/1E 6N 3	monitor	DSRSD MW-4	DSRSD	Dublin	Upper	340.74	72	49 - 72
3S/1E 6N 6	monitor	DSRSD NE-76	DSRSD	Dublin	Upper	333.58	75 2	50 - 70
3S/1E 7B 2	monitor	Hopyard rd	ZONE 7	Dublin	Lower	327.77	152 4	143 - 149
3S/1E 7B12	monitor	Hacienda Arch	ZONE 7	Dublin	Upper	327.82	70 2	50 - 70
3S/1E 7D 1	monitor	DSRSD SW-75	DSRSD	Dublin	Upper	330.09	75 2	54 - 74
3S/1E 7D 3	monitor	DSRSD SE-70	DSRSD	Dublin	Upper	332.28	70 2	45 - 65
3S/1E 7G 7	monitor	Chabot Well	ZONE 7	Dublin	Upper	327.33	55 2	35 - 55
3S/1E 7J 5	monitor	Thomas Hart School	ZONE 7	Dublin	Upper	326.78	50 2	30 - 50
3S/1E 7M 2	monitor	DSRSD Sub	ZONE 7	Dublin	Upper	328.4	88 4	70 - 85
3S/1E 7R 8	monitor	Mocho Canal North at Willow	ZONE 7	Bernal	Upper	326.63	52 2	42 - 52
3S/1E 8B 1	monitor	Lizard Well	ZONE 7	Amador	Upper	338.28	148 4	55 - 82
3S/1E 8G 4	monitor	Apache	ZONE 7	Amador	Upper	341.47	85 2	60 - 85
3S/1E 8H 9	nested	Mocho 4 Nested Shallow	DSRSD	Amador	Lower	338.53	240 2	210 - 230
3S/1E 8H10	nested	Mocho 4 Nested Middle	DSRSD	Amador	Lower	339.26	440 2	290 - 430
3S/1E 8H11	nested	Mocho 4 Nested deep	DSRSD	Amador	Deep	339.26	720 2	520 - 720
3S/1E 8H13	monitor	Mocho 3 mon	ZONE 7	Amador	Deep	338.96	800 2	570 - 790
3S/1E 8H18	muni	Mocho 4	ZONE 7	Amador	Lower	341.94	745 20	515 - 730
3S/1E 8K 1	monitor	sutter gate	ZONE 7	Amador	Upper	332.37	99 2.5	89 - 94
3S/1E 8N 1	monitor	sports park	ZONE 7	Bernal	Upper	323.68	72 2.5	62 - 67
3S/1E 9B 1	muni	Stoneridge	ZONE 7	Amador	Lower	349.23	810 20	250 - 800
3S/1E 9G 1	supply	3775 trenery - Kamp	MRS. KAMP	Amador	Upper	352.36	160 9	77 - 149
3S/1E 9H10	nested	NW Lake I Shallow	ZONE 7	Amador	Upper	352.89	145 2	120 - 140
3S/1E 9H11	nested	NW Lake I Deep	ZONE 7	Amador	Lower	353.04	190 2	165 - 185
3S/1E 9J 7	nested	SW Lake I Shallow	ZONE 7	Amador	Upper	357.36	505 2	120 - 140
3S/1E 9J 8	nested	SW Lake I Middle	ZONE 7	Amador	Lower	357.55	305 2	280 - 300
3S/1E 9J 9	nested	SW Lake I Deep	ZONE 7	Amador	Lower	357.68	505 2	480 - 500
3S/1E 9M 2	muni	Mocho 1	ZONE 7	Amador	Lower	343.95	530 16	150 - 510
3S/1E 9M 3	muni	Mocho 2	ZONE 7	Amador	Lower	347.47	575 18	250 - 570
3S/1E 9M 4	muni	Mocho 3	ZONE 7	Amador	Lower	342.89	498 20	315 - 493
3S/1E 9P 5	monitor	Key_AmW_U (Mohr Key)	ZONE 7	Amador	Upper	349.4	105 2.5	95 - 100
3S/1E 9P 9	nested	Mohr Ave Shallow	ZONE 7	Amador	Lower	349.59	210 2	185 - 205
3S/1E 9P10	nested	Key_AmW_L	ZONE 7	Amador	Lower	349.51	310 2	285 - 305
3S/1E 9P11	nested	Mohr Ave Deep	ZONE 7	Amador	Lower	349.44	425 2	405 - 420
3S/1E 10A 2	monitor	El C harro Rd	ZONE 7	Amador	Upper	367.35	88 4	70 - 80
3S/1E 10B 8	nested	Kaiser Rd Shallow	DSRSD	Amador	Lower	353.6	200 2	100 - 190
3S/1E 10B 9	nested	Kaiser Rd Middle 1	DSRSD	Amador	Lower	353.49	294 2	244 - 284
3S/1E 10B10	nested	Kaiser Rd Middle 2	DSRSD	Amador	Lower	353.52	600 2	400 - 590
3S/1E 10B11	nested	Kaiser Rd Deep	DSRSD	Amador	Deep	353.52	810 2	660 - 800
3S/1E 10D 2	nested	Stoneridge Shallow	DSRSD	Amador	Lower	349.32	212 2	182 - 212
3S/1E 10D 3	nested	Stoneridge Middle 1	DSRSD	Amador	Lower	349.28	322 2	262 - 312
3S/1E 10D 4	nested	Stoneridge Middle 2	DSRSD	Amador	Lower	349.3	616 2	366 - 606
3S/1E 10D 5	nested	Stoneridge Deep	DSRSD	Amador	Deep	349.32	790 2	710 - 780
3S/1E 10D 7	nested	North Lake I Shallow	ZONE 7	Amador	Upper	361.06	215 2	118 - 138
3S/1E 10D 8	nested	North Lake I Cluster 2	ZONE 7	Amador	Lower	361.02	215 2	190 - 210
3S/1E 10K 2	monitor	NorthWest Cope Lake	ZONE 7	Amador	Lower	358.68	590.6 4	195.5 - 585.6
3S/1E 10K 3	muni	COL 1	ZONE 7	Amador	Lower	363.79	530 18	205 - 530
3S/1E 10N 2	nested	South Lake I Shallow	ZONE 7	Amador	Upper	360.31	195 2	125 - 145
3S/1E 10N 3	nested	South Lake I Deep	ZONE 7	Amador	Lower	360.18	195 2	170 - 190
3S/1E 11B 1	monitor	Airport West	ZONE 7	Amador	Upper	369.35	43 2.5	33 - 38
3S/1E 11C 3	monitor	LAVWMA ROW	ZONE 7	Amador	Upper	364.82	55 2	35 - 55
3S/1E 11G 1	nested	Key_AmE_U	DSRSD	Amador	Upper	371.62	120 2	100 - 110

<i>Site</i>	<i>Type</i>	<i>Other Name</i>	<i>Owner</i>	<i>Basin</i>	<i>Aquifer</i>	<i>RP</i>	<i>TD Dia</i>	<i>Perf</i>
3S/1E 11G 2	nested	Rancho Charro Middle 1	DSRSD	Amador	Lower	371.61	350 2	230 - 340
3S/1E 11G 3	nested	Rancho Charro Middle 2	DSRSD	Amador	Lower	371.64	590 2	380 - 580
3S/1E 11G 4	nested	Rancho Charro Deep	DSRSD	Amador	Deep	371.68	790 2	620 - 780
3S/1E 11M 2	monitor	COL2 Monitoring	ZONE 7	Amador	Lower	365.96	700 4.5	199 - 699
3S/1E 11M 3	muni	COL 2	ZONE 7	Amador	Lower	369.24	684 18	345 - 684
3S/1E 11P 6	potable	New Jamieson Residence	DOUG JAMIESON	Amador	Lower	376.67	400 5	240 - 380
3S/1E 12A 2	monitor	Airport South	ZONE 7	Amador	Upper	401.35	69 2.5	63.7 - 68.7
3S/1E 12D 2	monitor	LWRP G6	ZONE 7	Amador	Upper	384.45	44.6	36 - 41
3S/1E 12G 1	monitor	Oaks Park Shallow	ZONE 7	Amador	Upper	404.47	73 2.5	63 - 68
3S/1E 12H 4	nested	LWRP Shallow	CITY OF LIVERMORE	Amador	Lower	407.75	270 2	185 - 260
3S/1E 12H 5	nested	LWRP Middle 1	CITY OF LIVERMORE	Amador	Lower	407.78	400 2	360 - 390
3S/1E 12H 6	nested	LWRP Middle 2	CITY OF LIVERMORE	Amador	Lower	407.75	480 2	410 - 468
3S/1E 12H 7	nested	LWRP Deep	CITY OF LIVERMORE	Amador	Deep	407.67	684 2	609 - 674
3S/1E 12K 2	nested	Key_AmE_L	ZONE 7	Amador	Lower	406.29	300 2	210 - 295
3S/1E 12K 3	nested	Oaks Park Mid	ZONE 7	Amador	Lower	406.83	475 2	355 - 470
3S/1E 12K 4	nested	Oaks Park Deep	ZONE 7	Amador	Deep	406.71	575 2	550 - 570
3S/1E 13P 5	nested	LGA Grant Nested 1	ZONE 7	Amador	Upper	380.78	135 2	110 - 130
3S/1E 13P 6	nested	LGA Grant Nested 2	ZONE 7	Amador	Lower	380.76	255 2	230 - 250
3S/1E 13P 7	nested	LGA Grant Nested 3	ZONE 7	Amador	Lower	380.76	375 2	350 - 370
3S/1E 13P 8	nested	LGA Grant Nested 4	ZONE 7	Amador	Lower	380.76	605 2	580 - 600
3S/1E 14B 1	industrial	Industrial Asphalt	VULCAN MATERIALS	Amador	Lower	384.2	435 8	200 - 410
3S/1E 14D 2	monitor	South Cope Lake	ZONE 7	Amador	Lower	371.83	740 16	170 - 740
3S/1E 14K 2	supply	lone star ind	LONESTAR	Amador	Lower	391.73	508 16	120 - 480
3S/1E 15F 3	supply	kaiser #8	KAISER	Amador	Lower	368.99	640 14	195 - 615
3S/1E 15J 3	supply	shadow cliff	EAST BAY REGIONAL PARK	Amador	Lower	344.59	196 8	154 - 184
3S/1E 15M 3	monitor	Bush/Valley South	ZONE 7	Amador	Lower	362.88	600 2	280 - 590
3S/1E 16A 2	muni	Pleas 8	CITY OF PLEASANTON	AmWest	Lower	358.2	510 20	200 - 495
3S/1E 16A 4	monitor	Bush/Valley Mid	ZONE 7	Amador	Lower	359.36	603 2	260 - 580
3S/1E 16B 1	monitor	Bush/Valley North	ZONE 7	Amador	Deep	355.81	805 2	605 - 800
3S/1E 16C 2	nested	Santa Rita Valley Shallow	ZONE 7	Amador	Lower	344.38	190 2	165 - 185
3S/1E 16C 3	nested	Santa Rita Valley Middle	ZONE 7	Amador	Lower	344.27	305 2	280 - 300
3S/1E 16C 4	nested	Santa Rita Valley Deep	ZONE 7	Amador	Lower	344.16	375 2	355 - 370
3S/1E 16E 4	monitor	black ave - cultural	ZONE 7	Amador	Upper	351.69	105 2.5	95 - 100
3S/1E 16L 2	monitor	Pleas 4	CITY OF PLEASANTON	Amador	Upper	355.86	151 12	56 - 136
3S/1E 16L 5	muni	Pleas 5	CITY OF PLEASANTON	Amador	Lower	358.05	685 18	149 - 650
3S/1E 16L 7	muni	Pleas 6	CITY OF PLEASANTON	Amador	Lower	354.47	647 18	165 - 647
3S/1E 16P 5	monitor	Vervais Monitor	ZONE 7	Amador	Upper	354.51	75 2.5	64 - 69
3S/1E 16R 1	supply	Stanley Berry Farm	R.L. IRBY	Amador	Lower	362.5	239 10	70 - 226
3S/1E 17B 4	supply	Casterson	LLOYD HAINES	Amador	Lower	337.69	248 8	0 - 248
3S/1E 17D 3	nested	Hopyard Nested Shallow	ZONE 7	Bernal	Lower	325.13	108 4	92 - 98
3S/1E 17D 4	nested	Hopyard Nested Middle 1	ZONE 7	Bernal	Lower	325.14	236 4	206 - 226
3S/1E 17D 5	nested	Hopyard Nested Middle 2	ZONE 7	Bernal	Lower	325.13	308 4	266 - 286
3S/1E 17D 6	nested	Hopyard Nested Middle 3	ZONE 7	Bernal	Lower	325.12	408 4	378 - 398
3S/1E 17D 7	nested	Hopyard Nested Deep	ZONE 7	Bernal	Deep	325.13	684 4	654 - 674
3S/1E 17D10	monitor	Hopyard 7	ZONE 7	Bernal	Lower	328.13	425 24	185 - 415
3S/1E 17D11	monitor	Hopyard 9 Monitoring Well	ZONE 7	Bernal	Lower	324.84	603 2	340 - 505
3S/1E 17D12	muni	Hopyard 9	ZONE 7	Bernal	Lower	327.9	315 18	235 - 310
3S/1E 18A 5	muni	Pleas 7	CITY OF PLEASANTON	Bernal	Lower	329.05	454 18	120 - 440
3S/1E 18A 6	muni	Hopyard 6	ZONE 7	Bernal	Lower	326.74	500 18	158 - 490
3S/1E 18E 4	monitor	Valley Trails II	ZONE 7	Bernal	Upper	320.21	83 4	69 - 79
3S/1E 18J 2	monitor	camino segura	ZONE 7	Bernal	Upper	323.02	71 2.5	61 - 66
3S/1E 18N 1	supply	merritt	RALPH MERRITT	Bernal	Lower	319.43	708 12	229 - 610

<i>Site</i>	<i>Type</i>	<i>Other Name</i>	<i>Owner</i>	<i>Basin</i>	<i>Aquifer</i>	<i>RP</i>	<i>TD Dia</i>	<i>Perf</i>
3S/1E 19A10	muni	SFWD South (B)	SFWD	Bernal	Lower	337.02	331	189 - 327
3S/1E 19A11	muni	SFWD North (A)	SFWD	Bernal	Lower	334.27	330	18 - 196 - 320
3S/1E 19C 4	monitor	del valle & laguna	ZONE 7	Bernal	Upper	322.23	78	4 - 68 - 73
3S/1E 19K 1	monitor	680/bernal	ZONE 7	Bernal	Upper	321.54	57.6	2.5 - 47.6 - 52.6
3S/1E 20B 2	supply	Fairgrounds Potable	ALAMEDA COUNTY	Bernal	Lower	342.62	500	12 - 218 - 500
3S/1E 20C 3	supply	Fairgrounds Potable Backup	ALAMEDA FAIRGROUNDS	Bernal	Lower	340.31	110	74 - 107
3S/1E 20C 7	monitor	Key_Bern_U	ZONE 7	Bernal	Upper	338.66	153	2 - 65 - 145
3S/1E 20C 8	nested	Key_Bern_L	ZONE 7	Bernal	Lower	338.67	315	2 - 295 - 315
3S/1E 20C 9	nested	Fair Nested Deep	ZONE 7	Bernal	Lower	338.78	515	2 - 495 - 515
3S/1E 20J 4	monitor	civic center	ZONE 7	Bernal	Upper	331.62	72	2.5 - 62 - 67
3S/1E 20M11	monitor	S.F "M"LINE	ZONE 7	Bernal	Upper	325.73	71	2.5 - 61 - 66
3S/1E 20Q 2	monitor	20Q2	CITY OF PLEASANTON	Bernal	Upper	325.82	65	10 - 45 - 53
3S/1E 22D 2	monitor	vineyard trailer	ZONE 7	Amador	Upper	368.05	72	2.5 - 62 - 67
3S/1E 23J 1	monitor	1627 vineyard trailer	D. SAFRENO	Amador	Upper	428.2	120	8 - 0 - 120
3S/1E 24Q 1	supply	Ruby Hills	RUBY HILLS	Amador	Lower	427.5	440	14 - 200 - 400
3S/1E 25C 3	monitor	Katz Winery Mansion	RUBY HILLS	Amador	Upper	454.16	146	2 - 70 - 140
3S/1E 29M 4	monitor	f.c. channel	ZONE 7	Castle	Upper	310.94	57	2.5 - 47 - 52
3S/1E 29P 2	monitor	castlewood dr	ZONE 7	Bernal	Upper	302.82	42	2.5 - 32 - 37
3S/1W 1B 9	nested	DSRSD Shallow	DSRSD	Dublin	Lower	333.56	162	2 - 122 - 152
3S/1W 1B10	nested	DSRSD Middle	DSRSD	Dublin	Lower	333.57	414	2 - 274 - 404
3S/1W 1B11	nested	DSRSD Deep	DSRSD	Dublin	Lower	333.74	560	2 - 480 - 550
3S/1W 1J 1	monitor	DSRSD MW-1	DSRSD	Dublin	Upper	334.36	70	44 - 64
3S/1W 2A 2	monitor	McNamara's	ZONE 7	Dublin	Upper	369.4	47	2.5 - 37 - 42
3S/1W 12A 9	monitor	DSRSD NW-75	DSRSD	Dublin	Upper	332.14	74	2 - 49 - 69
3S/1W 12B 2	monitor	Stoneridge Mall Rd	ZONE 7	Dublin	Upper	342.89	39.5	4 - 20 - 50
3S/1W 12J 1	monitor	DSRSD South	ZONE 7	Dublin	Upper	329.31	62	2.5 - 52 - 57
3S/1W 13J 1	monitor	muirwood dr	ZONE 7	Castle	Upper	343.94	48	2.5 - 39 - 44
3S/2E 1F 2	monitor	Brisa at Circuit City	ZONE 7	Spring	Upper	572.99	68.6	2.5 - 59 - 64
3S/2E 2B 2	monitor	south front rd	ZONE 7	Spring	Upper	539.45	46	2.5 - 36.9 - 41.9
3S/2E 3A 1	monitor	Bluebell	ZONE 7	Spring	Upper	517.63	54	2.5 - 44 - 49
3S/2E 3K 3	monitor	first & S. front rd	ZONE 7	Mocho I	Upper	522.83	60	2.5 - 50 - 55
3S/2E 5N 1	supply	1037 portola - trailer	TRAILER RANCH	Mocho II	Lower	440	210	10 - 0 - 210
3S/2E 7C 2	monitor	york way - jaws - G4	ZONE 7	Mocho II	Upper	420.84	49	2.5 - 39 - 44
3S/2E 7H 2	monitor	dakota	CITY OF LIVERMORE	Mocho II	Upper	442.85	54	2 - 44 - 54
3S/2E 7N 1	monitor	kittyhawk south	ZONE 7	Amador	Upper	421.06	130	4 - 76 - 130
3S/2E 7P 3	muni	CWS STA 24	CAL WATER SERVICE	Amador	Lower	431.46	510	16 - 300 - 490
3S/2E 7R 2	monitor	CWS STA 31 Monitoring	CAL WATER SERVICE	Mocho II	Deep	446	805	2 - 750 - 805
3S/2E 7R 3	muni	CWS STA 31	CAL WATER SERVICE	Mocho II	Lower	446	583	16 - 410 - 528
3S/2E 8F 1	muni	CWS STA 10	CAL WATER SERVICE	Mocho II	Lower	456.24	576	16 - 143 - 433
3S/2E 8G 1	muni	CWS STA 19	CAL WATER SERVICE	Mocho II	Lower	465.05	465	16 - 120 - 455
3S/2E 8H 2	monitor	North k	ZONE 7	Mocho II	Upper	469.61	46	2.5 - 36 - 41
3S/2E 8H 3	nested	Key_Mo2_L	ZONE 7	Mocho II	Lower	477.25	195	2 - 170 - 190
3S/2E 8H 4	nested	N Liv Ave Deep	ZONE 7	Mocho II	Lower	476.97	385	2 - 360 - 380
3S/2E 8K 2	monitor	Key_Mo2_U (Livermore Key)	ZONE 7	Mocho II	Upper	464.78	74	2.5 - 64 - 69
3S/2E 8N 2	muni	CWS STA 14	CAL WATER SERVICE	Mocho II	Lower	453.64	526	10 - 140 - 515
3S/2E 8P 1	muni	CWS STA 8	CAL WATER SERVICE	Mocho II	Lower	468.2	273	10 - 122 - 263
3S/2E 9L 1	muni	CWS STA 17	CAL WATER SERVICE	Mocho II	Lower	499.39	516	16 - 136 - 496
3S/2E 9P 1	muni	CWS STA 12	CAL WATER SERVICE	Mocho II	Lower	501.28	515	16 - 192 - 492
3S/2E 9Q 1	muni	CWS STA 9	CAL WATER SERVICE	Mocho II	Lower	518.15	572	14 - 180 - 492
3S/2E 9Q 4	monitor	school st	ZONE 7	Mocho II	Upper	504.35	80	2.5 - 70 - 75
3S/2E 10F 3	monitor	hexcel	ZONE 7	Mocho I	Upper	534.84	45	2.5 - 35 - 40
3S/2E 10Q 1	monitor	almond	ZONE 7	Mocho II	Upper	555.36	43.5	2.5 - 34 - 39

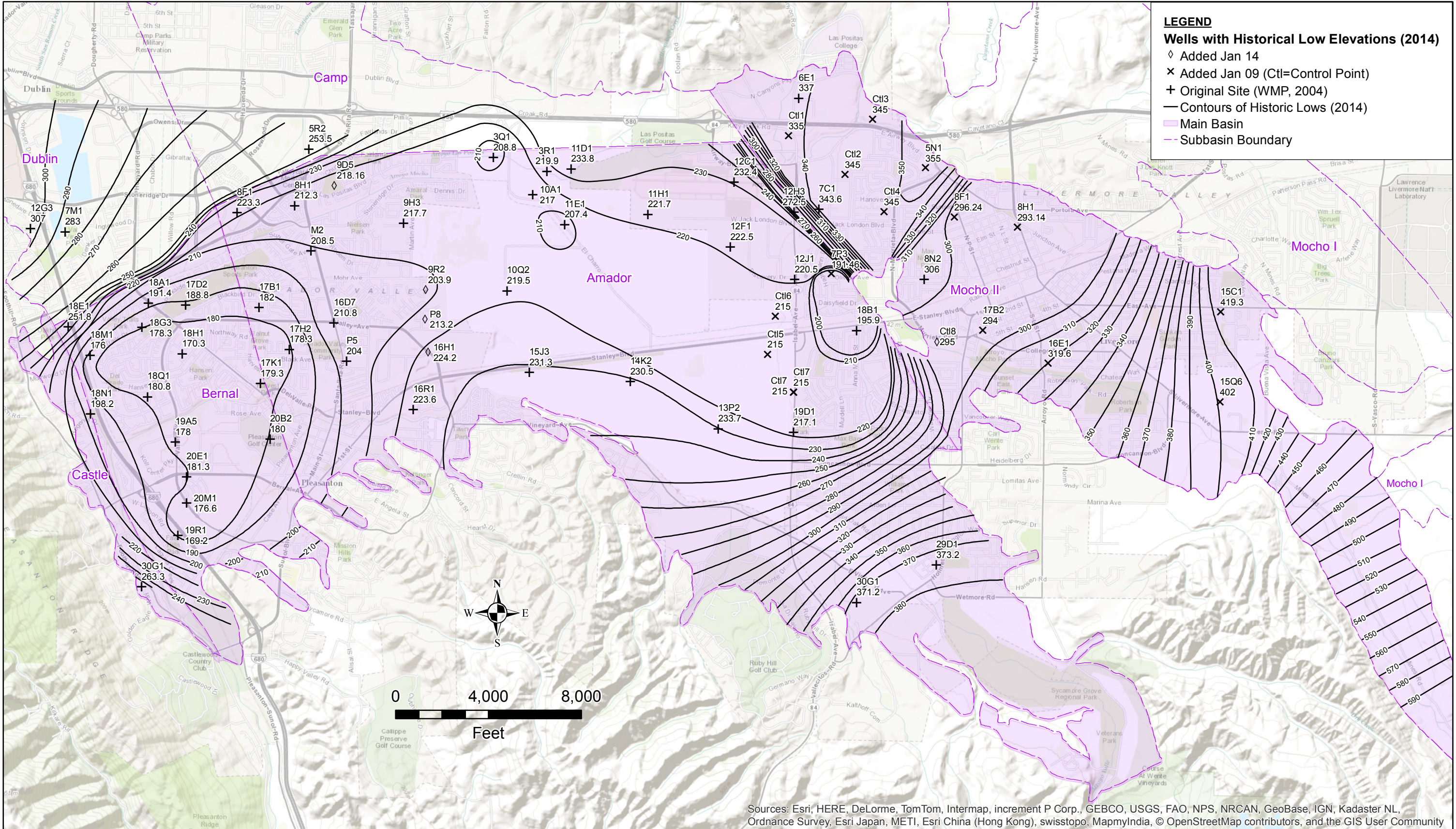
<i>Site</i>	<i>Type</i>	<i>Other Name</i>	<i>Owner</i>	<i>Basin</i>	<i>Aquifer</i>	<i>RP</i>	<i>TD</i>	<i>Dia</i>	<i>Perf</i>
3S/2E 10Q 2	monitor	LLNL W-703	LLNL	Mocho II	Lower	549.33	325	4.5	298 - 325
3S/2E 11C 1	monitor	joan way	ZONE 7	Mocho I	Upper	557.1	66.2	2.5	56.2 - 61.2
3S/2E 12C 4	monitor	LLNL W-486	LLNL	Spring	Upper	591.46	108	4.5	100 - 108
3S/2E 12J 3	monitor	LLNL W-017A	LLNL	Spring	Lower	628.84	160	5	127 - 157
3S/2E 14A 3	monitor	S. vasco @east ave	ZONE 7	Mocho I	Upper	601.87	110	2.5	100 - 105
3S/2E 14B 1	domestic	5763 east ave	LAS POSITAS SWIM CLUB	Mocho I	Lower	593.36	300	9	146 - 234
3S/2E 15E 2	irrigation	Retzlaff Winery	BOB TAYLOR	Mocho II	Lower	549.69	192	8	104 - 189
3S/2E 15Q 6	irrigation	Concannon	CONCANNON	Mocho II	Lower	577.56	301	12	220 - 301
3S/2E 15R17	nested	Buena Vista Shallow	ZONE 7	Mocho II	Upper	592.41	63	2	38 - 58
3S/2E 15R18	nested	Buena Vista Deep	ZONE 7	Mocho II	Lower	592.47	138	2	113 - 133
3S/2E 16A 3	irrigation	Memory Gardens	MEMORY GARDENS	Mocho II	Lower	527.06	240	10	91 - 240
3S/2E 16B 1	muni	CWS STA 5	CAL WATER SERVICE	Mocho II	Lower	520.22	410	14	140 - 390
3S/2E 16C 1	muni	CWS STA 15	CAL WATER SERVICE	Mocho II	Lower	510.97	584	16	150 - 523
3S/2E 16E 4	monitor	pepper tree	ZONE 7	Mocho II	Upper	506.26	45	2.5	35 - 40
3S/2E 17E 2	supply	Mocho Street	JOHN & BARBARA STEIGE	Mocho II	Upper	467.71	94	6	0 - 94
3S/2E 18B 1	muni	CWS STA 20	CAL WATER SERVICE	Amador	Lower	438.56	497	16	190 - 465
3S/2E 18E 1	monitor	E. stanley	ZONE 7	Amador	Upper	423.86	133.8	2.5	123.8 - 128.8
3S/2E 19D 7	nested	Isabel Shallow	ZONE 7	Amador	Upper	415.07	180	2	100 - 180
3S/2E 19D 8	nested	Isabel Middle 1	ZONE 7	Amador	Lower	415.04	260	2	210 - 260
3S/2E 19D 9	nested	Isabel Middle 2	ZONE 7	Amador	Lower	414.98	390	2	280 - 390
3S/2E 19D10	nested	Isabel Deep	ZONE 7	Amador	Lower	414.89	470	2	420 - 470
3S/2E 20M 1	supply	Alden Lane	ALDEN LANE NURSERY	Amador	Lower	478.79	184	12	0 - 184
3S/2E 22B 1	monitor	grapes	ZONE 7	Mocho II	Upper	585.88	31.9	2.5	21.9 - 26.9
3S/2E 23E 1	nested	Mines Nested Shallow	ZONE 7	Mocho II	Upper	613.36	40	2	20 - 35
3S/2E 23E 2	nested	Mines Nested Deep	ZONE 7	Mocho II	Lower	613.23	110	2	95 - 105
3S/2E 24A 1	monitor	S. greenville	ZONE 7	Mocho I	Upper	717.7	46.3	2.5	36.3 - 41.3
3S/2E 26J 2	monitor	mines rd	ZONE 7	Mocho II	Upper	689.92	44	2.5	34 - 39
3S/2E 29F 4	monitor	usgs wetmore	ZONE 7	Amador	Upper	457.5	36	2.5	26 - 31
3S/2E 30D 2	monitor	vineyard	ZONE 7	Amador	Upper	431.6	44	4	24 - 39
3S/2E 30G 1	domestic	genesis farms	GENISIS FARMS	Amador	Lower	453.69	390	12	150 - 370
3S/2E 33G 1	monitor	crohare	ZONE 7	Amador	Upper	511.52	17	2.5	9 - 14
3S/2E 33K 1	monitor	VA	ZONE 7	Amador	Upper	546.83	15	2.5	7 - 12
3S/2E 33L 1	monitor	VA/CROHARE FENCE	ZONE 7	Amador	Upper	557.63	25	2.5	11 - 16
3S/3E 7D 2	monitor	7D 2	ZONE 7	Spring	Upper	622.84	74	2.5	64 - 69
3S/3E 7M 2	supply	lupin way	LEON MOORE	Spring	Lower	628.64	199	6	171 - 188

RP = Reference Point Elevation (in feet above MSL)

TD = Total Depth of well (in feet below ground surface)

Dia = Diameter of well casing (in inches)

Perf = Preferated interval (in feet below ground surface), uppermost - lowermost



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR	SCALE: 1 in = 4,000 ft
REVIEWED: MK	DATE: Jul 21, 2014
FILE: E:\MONITOR\GM\2013WY\AnnualReport2013\Fig2.4-08-MapHLLower13.mxd	

Figure 2.4-4
Map of Historical Lows
Lower Aquifer; (Update Mar 2014)
Livermore Valley Groundwater Basin



FIGURE 2.4-5
TABLE OF SEMIANNUAL GROUNDWATER LEVELS
(Feet above Mean Sea Level, NAVD88)
FALL 2012 TO FALL 2013

Well Number	Well Depth	Aquifer	Sub-Basin	Fall 2012		Spring 2013		Fall 2013		Change in Elevation		
				Depth to Water	GW Elev	Depth to Water	GW Elev	Depth to Water	GW Elev	Seasonal		Annual
										Fall 12 to Spring 13	Spring 13 to Fall 13	
2S/1E 32E 1	70	U	Camp	37.5	355.1	37.0	355.6	38.4	354.2	0.5	-1.4	-0.9
2S/1E 32N 1	44	U	Camp	18.8	342.0	33.7	327.1	19.6	341.2	-14.9	14.1	-0.8
2S/1E 32Q 1	45	U	Camp	26.8	340.8	27.4	340.2	27.9	339.6	-0.6	-0.6	-1.1
2S/1E 33L 1	80	U	Camp	52.7	336.8	53.0	336.5	54.2	335.3	-0.3	-1.2	-1.5
2S/1E 33P 2	55	U	Camp	33.7	336.4	34.0	336.1	34.9	335.2	-0.3	-1.0	-1.2
2S/1E 33R 1	60	U	Camp	22.0	336.5	22.3	336.3	22.5	336.0	-0.3	-0.3	-0.6
2S/1W 15F 1	60	U	Bishop	10.9	428.6	10.5	428.9	10.8	428.7	0.4	-0.3	0.1
2S/1W 26C 2	50	U	Dublin	25.6	381.0	25.0	381.5	26.5	380.0	0.6	-1.6	-1.0
2S/1W 36E 3	60	U	Dublin	4.2	342.3	3.4	343.1	4.7	341.8	0.8	-1.3	-0.5
2S/1W 36F 1	190	L	Dublin	24.7	318.0	18.1	324.6	26.6	316.1	6.6	-8.5	-1.9
2S/1W 36F 2	320	L	Dublin	25.5	317.2	21.8	320.9	26.2	316.5	3.7	-4.4	-0.7
2S/1W 36F 3	520	L	Dublin	52.3	290.4	49.0	293.7	52.4	290.3	3.3	-3.4	-0.1
2S/2E 27C 2	108	U	Spring	16.5	525.6	16.7	525.4	17.3	524.9	-0.2	-0.6	-0.7
2S/2E 27P 2	68	U	Spring	3.6	501.8	1.5	503.9	3.6	501.8	2.1	-2.1	0.0
2S/2E 28D 2	55	U	May	30.0	525.1	30.2	524.9	30.8	524.4	-0.2	-0.5	-0.7
2S/2E 28J 2	230	L	May	4.9	514.0	3.7	515.2	5.6	513.3	1.2	-1.9	-0.7
2S/2E 28Q 1	28	U	May	5.8	507.2	3.6	509.4	8.4	504.7	2.2	-4.8	-2.6
2S/2E 32K 2	43	U	Cayetano	10.0	497.5	8.9	498.6	10.1	497.4	1.1	-1.2	-0.1
2S/2E 34E 1	49	U	May	5.7	494.0	3.5	496.2	6.1	493.6	2.2	-2.6	-0.4
2S/2E 34Q 2	50	U	Spring	3.0	504.2	2.4	504.8	2.8	504.4	0.6	-0.4	0.2
3S/1E 1F 2	40	U	Mocho II	19.0	409.5	18.8	409.7	19.1	409.3	0.2	-0.3	-0.1
3S/1E 1H 3	80	U	Mocho II	28.8	394.0	26.7	396.1	28.5	394.4	2.2	-1.8	0.4
3S/1E 1J 3	300	L	Mocho II	25.7	392.2	NM	-	25.3	392.6	-	-	0.4
3S/1E 1L 1	70	U	Camp	59.7	343.4	59.7	343.3	62.3	340.8	-0.1	-2.6	-2.6
3S/1E 1P 2	50	U	Amador	24.1	365.5	24.0	365.6	25.8	363.9	0.1	-1.7	-1.6
3S/1E 1P 3	480	L	Amador	125.9	268.5	118.8	275.7	138.1	256.3	7.1	-19.3	-12.2
3S/1E 2J 2	41	U	Camp	16.5	364.4	13.1	367.8	16.7	364.2	3.4	-3.6	-0.2
3S/1E 2J 3	65	U	Camp	24.7	381.6	25.9	380.5	26.1	380.3	-1.1	-0.2	-1.3
3S/1E 2K 2	46	U	Camp	28.3	368.8	26.6	370.5	28.3	368.8	1.7	-1.7	0.0
3S/1E 2M 3	50	U	Camp	20.2	344.8	18.8	346.2	19.8	345.3	1.4	-1.0	0.4
3S/1E 2N 2	80	U	Camp	NM	-	NM	-	NM	-	-	-	-
3S/1E 2N 6	55	U	Amador	32.7	333.4	30.9	335.2	31.8	334.4	1.8	-0.8	1.0
3S/1E 2P 3	380	L	Camp	105.5	266.3	99.4	272.3	119.2	252.5	6.0	-19.8	-13.8
3S/1E 2Q 1	45	U	Amador	22.0	347.9	19.8	350.2	22.4	347.5	2.3	-2.7	-0.4
3S/1E 2R 1	33	U	Amador	11.2	365.1	17.6	358.7	20.8	355.5	-6.4	-3.2	-9.6
3S/1E 3G 2	50	U	Camp	14.5	339.8	13.3	341.0	13.6	340.6	1.2	-0.4	0.8
3S/1E 4A 1	50	U	Camp	19.0	331.7	19.0	331.7	19.9	330.7	0.0	-0.9	-0.9
3S/1E 4J 5	47	U	Camp	17.7	327.5	17.2	328.0	18.1	327.1	0.5	-0.9	-0.3
3S/1E 4J 6	110	U	Camp	21.2	324.4	21.1	324.4	22.3	323.3	0.1	-1.1	-1.1
3S/1E 4Q 2	90	U	Amador	59.6	285.9	NM	-	63.1	282.3	-	-	-3.5
3S/1E 5K 6	75	U	Camp	14.2	331.8	13.9	332.2	15.0	331.1	0.4	-1.1	-0.8
3S/1E 5K 7	150	L	Camp	22.2	324.0	21.5	324.7	23.3	322.9	0.7	-1.8	-1.1
3S/1E 5L 3	40	U	Camp	13.0	326.4	12.7	326.7	12.9	326.5	0.4	-0.3	0.1
3S/1E 5P 6	35	U	Camp	11.9	324.7	11.5	325.2	12.1	324.6	0.5	-0.6	-0.1
3S/1E 6F 3	36	U	Dublin	5.4	324.5	4.9	324.9	5.5	324.3	0.5	-0.6	-0.1
3S/1E 6G 5	200	L	Dublin	11.4	320.8	10.2	322.0	12.5	319.7	1.2	-2.3	-1.1
3S/1E 6N 2	67	U	Dublin	14.2	321.1	13.5	321.7	14.6	320.7	0.7	-1.1	-0.4
3S/1E 7B 2	152	L	Dublin	11.2	316.6	10.5	317.3	12.1	315.7	0.7	-1.6	-1.0
3S/1E 7B12	70	U	Dublin	13.0	314.8	12.6	315.2	13.9	314.0	0.4	-1.2	-0.9
3S/1E 7G 7	55	U	Dublin	14.5	312.8	14.9	312.5	16.0	311.4	-0.3	-1.1	-1.4
3S/1E 7J 5	50	U	Dublin	16.5	310.3	28.7	298.1	16.9	309.9	-12.2	11.8	-0.4
3S/1E 7M 2	88	U	Dublin	20.2	308.3	18.1	310.4	22.2	306.2	2.1	-4.2	-2.1
3S/1E 7R 8	52	U	Bernal	Dry	-	44.6	282.0	46.2	280.4	-	-1.6	-
3S/1E 8B 1	148	U	Amador	52.7	285.6	52.4	285.9	36.6	301.7	0.2	15.8	16.1
3S/1E 8G 4	85	U	Amador	59.8	281.7	58.5	283.0	63.8	277.7	1.3	-5.3	-4.0
3S/1E 8H 9	240	L	Amador	65.8	272.8	63.9	274.7	82.3	256.2	1.9	-18.4	-16.5
3S/1E 8H10	440	L	Amador	68.2	271.1	64.9	274.3	84.4	254.8	3.3	-19.5	-16.3
3S/1E 8H11	720	D	Amador	70.6	268.7	63.7	275.5	87.2	252.0	6.8	-23.5	-16.7
3S/1E 8H13	800	D	Amador	70.0	268.9	67.1	271.9	87.6	251.4	2.9	-20.5	-17.5
3S/1E 8H18	745	L	Amador	74.8	267.2	67.9	274.1	90.0	252.0	6.9	-22.1	-15.2
3S/1E 8K 1	99	U	Amador	60.8	271.6	55.8	276.6	69.1	263.3	4.9	-13.2	-8.3
3S/1E 8N 1	72	U	Bernal	49.0	274.7	45.1	278.6	58.5	265.2	3.9	-13.4	-9.5
3S/1E 9B 1	810	L	Amador	81.3	267.9	78.6	270.7	97.3	252.0	2.8	-18.7	-15.9
3S/1E 9G 1	160	U	Amador	71.0	281.4	96.0	256.4	75.4	277.0	-25.0	20.6	-4.4
3S/1E 9H10	145	U	Amador	70.2	282.7	69.6	283.3	74.7	278.2	0.6	-5.1	-4.6
3S/1E 9H11	190	L	Amador	74.8	278.2	72.2	280.9	82.6	270.4	2.7	-10.5	-7.8
3S/1E 9J 7	505	U	Amador	75.5	281.9	74.2	283.2	80.1	277.2	1.3	-5.9	-4.7
3S/1E 9J 8	305	L	Amador	83.8	273.7	80.3	277.3	94.0	263.6	3.6	-13.7	-10.1
3S/1E 9J 9	505	L	Amador	88.1	269.6	84.4	273.3	105.6	252.1	3.6	-21.2	-17.6
3S/1E 9M 3	575	L	Amador	NM	-	NM	-	NM	-	-	-	-

Figure 2.4-5
Page 1 of 4



FIGURE 2.4-5
TABLE OF SEMIANNUAL GROUNDWATER LEVELS
(Feet above Mean Sea Level, NAVD88)
FALL 2012 TO FALL 2013

Well Number	Well Depth	Aquifer	Sub-Basin	Fall 2012		Spring 2013		Fall 2013		Change in Elevation		
				Depth to Water	GW Elev	Depth to Water	GW Elev	Depth to Water	GW Elev	Seasonal		Annual
										Fall 12 to Spring 13	Spring 13 to Fall 13	
2S/1E 32E 1	70	U	Camp	37.5	355.1	37.0	355.6	38.4	354.2	0.5	-1.4	-0.9
2S/1E 32N 1	44	U	Camp	18.8	342.0	33.7	327.1	19.6	341.2	-14.9	14.1	-0.8
2S/1E 32Q 1	45	U	Camp	26.8	340.8	27.4	340.2	27.9	339.6	-0.6	-0.6	-1.1
2S/1E 33L 1	80	U	Camp	52.7	336.8	53.0	336.5	54.2	335.3	-0.3	-1.2	-1.5
2S/1E 33P 2	55	U	Camp	33.7	336.4	34.0	336.1	34.9	335.2	-0.3	-1.0	-1.2
2S/1E 33R 1	60	U	Camp	22.0	336.5	22.3	336.3	22.5	336.0	-0.3	-0.3	-0.6
3S/1E 9M 4	498	L	Amador	72.9	270.0	70.7	272.2	91.9	251.0	2.2	-21.2	-19.0
3S/1E 9P 5	105	U	Amador	70.5	278.9	68.1	281.3	75.5	273.9	2.4	-7.4	-5.0
3S/1E 9P 9	210	L	Amador	73.0	276.6	69.8	279.8	80.9	268.7	3.1	-11.1	-7.9
3S/1E 9P10	310	L	Amador	76.9	272.6	72.2	277.3	87.8	261.7	4.7	-15.6	-10.9
3S/1E 9P11	425	L	Amador	80.8	268.7	74.4	275.1	97.1	252.4	6.4	-22.7	-16.3
3S/1E 10A 1	253	L	Amador	NM	-	NM	-	NM	-	-	-	-
3S/1E 10A 2	88	U	Amador	65.3	302.0	61.3	306.0	61.6	305.8	4.0	-0.2	3.8
3S/1E 10B 8	200	L	Amador	73.2	280.5	70.6	283.0	79.7	273.9	2.5	-9.1	-6.5
3S/1E 10B 9	294	L	Amador	78.2	275.3	74.8	278.7	88.0	265.5	3.4	-13.1	-9.7
3S/1E 10B10	600	L	Amador	85.5	268.0	81.2	272.4	100.0	253.5	4.3	-18.8	-14.5
3S/1E 10B11	810	D	Amador	85.1	268.4	78.6	275.0	99.1	254.4	6.5	-20.5	-14.0
3S/1E 10D 2	212	L	Amador	70.4	278.9	67.6	281.7	79.1	270.2	2.8	-11.5	-8.7
3S/1E 10D 3	322	L	Amador	74.3	274.9	71.3	278.0	86.2	263.1	3.1	-15.0	-11.9
3S/1E 10D 4	616	L	Amador	79.8	269.5	75.2	274.1	95.4	253.9	4.6	-20.2	-15.6
3S/1E 10D 5	790	D	Amador	79.8	269.6	73.5	275.8	95.2	254.1	6.3	-21.7	-15.5
3S/1E 10D 7	215	U	Amador	76.7	284.4	76.7	284.4	81.3	279.8	0.0	-4.6	-4.6
3S/1E 10D 8	215	L	Amador	82.4	278.6	79.1	282.0	90.2	270.8	3.3	-11.2	-7.8
3S/1E 10K 2	591	L	Amador	84.4	274.3	80.0	278.6	94.4	264.3	4.4	-14.4	-10.0
3S/1E 10K 3	530	L	Amador	93.1	270.7	88.3	275.5	107.4	256.4	4.9	-19.2	-14.3
3S/1E 10N 2	195	U	Amador	77.3	283.1	76.6	283.7	81.9	278.4	0.7	-5.3	-4.7
3S/1E 10N 3	195	L	Amador	82.2	278.0	78.9	281.3	88.9	271.3	3.3	-10.0	-6.7
3S/1E 11B 1	43	U	Amador	34.2	335.2	32.6	336.8	34.8	334.6	1.6	-2.2	-0.6
3S/1E 11C 3	55	U	Amador	31.4	333.5	32.0	332.8	32.7	332.2	-0.6	-0.7	-1.3
3S/1E 11G 1	120	U	Amador	70.2	301.4	67.3	304.3	74.4	297.3	2.9	-7.0	-4.1
3S/1E 11G 2	350	L	Amador	104.1	267.6	101.3	270.3	117.8	253.9	2.8	-16.5	-13.7
3S/1E 11G 3	590	L	Amador	101.1	270.5	96.1	275.5	117.7	253.9	5.0	-21.6	-16.6
3S/1E 11G 4	790	D	Amador	103.9	267.8	96.4	275.3	118.5	253.2	7.5	-22.1	-14.6
3S/1E 11M 2	700	L	Amador	90.4	275.5	87.2	278.8	101.5	264.5	3.2	-14.3	-11.1
3S/1E 11M 3	684	L	Amador	101.6	267.6	96.4	272.8	116.8	252.5	5.2	-20.4	-15.2
3S/1E 11P 6	400	L	Amador	104.2	272.5	99.8	276.9	117.3	259.3	4.4	-17.5	-13.2
3S/1E 12A 2	69	U	Amador	43.8	357.6	38.0	363.3	41.3	360.1	5.8	-3.3	2.5
3S/1E 12G 1	73	U	Amador	64.5	340.0	62.7	341.8	63.5	341.0	1.8	-0.8	1.0
3S/1E 12H 4	270	L	Amador	141.0	266.7	135.9	271.8	152.3	255.5	5.1	-16.4	-11.3
3S/1E 12H 5	400	L	Amador	137.2	270.6	128.5	279.3	149.8	258.0	8.6	-21.3	-12.6
3S/1E 12H 6	480	L	Amador	139.6	268.2	129.8	277.9	151.0	256.7	9.8	-21.2	-11.4
3S/1E 12H 7	684	D	Amador	184.9	222.8	161.2	246.5	195.6	212.0	23.7	-34.4	-10.8
3S/1E 12K 2	300	L	Amador	147.3	259.0	143.6	262.7	161.6	244.7	3.7	-18.0	-14.2
3S/1E 12K 3	475	L	Amador	134.2	272.6	123.0	283.8	143.9	263.0	11.2	-20.9	-9.6
3S/1E 12K 4	575	D	Amador	154.8	251.9	130.5	276.2	164.0	242.7	24.3	-33.5	-9.2
3S/1E 13P 1	652	L	Amador	NM	-	NM	-	NM	-	-	-	-
3S/1E 13P 5	135	U	Amador	88.0	292.8	86.6	294.2	92.2	288.6	1.4	-5.6	-4.2
3S/1E 13P 6	255	L	Amador	107.8	273.0	101.5	279.3	119.3	261.4	6.3	-17.9	-11.5
3S/1E 13P 7	375	L	Amador	108.1	272.7	96.9	283.8	117.2	263.6	11.2	-20.3	-9.1
3S/1E 13P 8	605	L	Amador	138.8	242.0	115.0	265.8	150.0	230.8	23.8	-35.0	-11.2
3S/1E 14B 1	435	L	Amador	115.3	269.0	109.0	275.2	128.4	255.8	6.3	-19.5	-13.2
3S/1E 14D 2	740	L	Amador	97.5	274.3	91.5	280.4	110.0	261.8	6.0	-18.6	-12.5
3S/1E 14K 2	508	L	Amador	137.7	254.0	109.7	282.1	126.2	265.6	28.0	-16.5	11.5
3S/1E 15F 3	640	L	Amador	105.3	263.7	92.2	276.8	135.1	233.9	13.1	-43.0	-29.8
3S/1E 15J 3	196	L	Amador	76.7	267.9	65.6	279.0	88.9	255.7	11.1	-23.3	-12.2
3S/1E 15M 3	600	L	Amador	102.0	260.9	88.0	274.9	117.0	245.9	14.1	-29.1	-15.0
3S/1E 16A 4	603	L	Amador	91.0	268.4	84.2	275.2	112.5	246.9	6.8	-28.3	-21.5
3S/1E 16B 1	805	D	Amador	88.3	267.5	81.0	274.8	104.5	251.3	7.3	-23.5	-16.3
3S/1E 16C 2	190	L	Amador	73.5	270.9	67.4	277.0	84.7	259.7	6.1	-17.2	-11.2
3S/1E 16C 3	305	L	Amador	75.8	268.5	68.8	275.5	92.6	251.7	6.9	-23.8	-16.8
3S/1E 16C 4	375	L	Amador	76.6	267.6	68.9	275.3	92.8	251.3	7.7	-24.0	-16.3
3S/1E 16E 4	105	U	Amador	71.2	280.5	64.2	287.5	79.7	272.0	7.0	-15.5	-8.5
3S/1E 16P 5	75	U	Amador	54.9	299.6	53.9	300.7	57.4	297.2	1.0	-3.5	-2.5
3S/1E 16R 1	239	L	Amador	98.3	264.3	82.9	279.7	106.3	256.2	15.4	-23.5	-8.1
3S/1E 17B 4	248	L	Amador	61.7	276.0	60.8	276.9	72.0	265.7	0.9	-11.1	-10.3
3S/1E 17D 3	108	L	Bernal	50.7	274.5	48.9	276.3	60.7	264.5	1.8	-11.8	-10.0
3S/1E 17D 4	236	L	Bernal	50.2	274.9	48.8	276.3	60.4	264.8	1.4	-11.5	-10.2
3S/1E 17D 5	308	L	Bernal	50.0	275.1	48.6	276.5	60.2	265.0	1.4	-11.6	-10.2
3S/1E 17D 6	408	L	Bernal	48.6	276.6	46.3	278.8	58.2	266.9	2.3	-11.9	-9.7
3S/1E 17D 7	684	D	Bernal	22.5	302.6	21.4	303.7	22.6	302.5	1.1	-1.2	-0.1

Figure 2.4-5
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FIGURE 2.4-5
TABLE OF SEMIANNUAL GROUNDWATER LEVELS
(Feet above Mean Sea Level, NAVD88)
FALL 2012 TO FALL 2013

Well Number	Well Depth	Aquifer	Sub-Basin	Fall 2012		Spring 2013		Fall 2013		Change in Elevation		
				Depth to Water	GW Elev	Depth to Water	GW Elev	Depth to Water	GW Elev	Seasonal		Annual
										Fall 12 to Spring 13	Spring 13 to Fall 13	
2S/1E 32E 1	70	U	Camp	37.5	355.1	37.0	355.6	38.4	354.2	0.5	-1.4	-0.9
2S/1E 32N 1	44	U	Camp	18.8	342.0	33.7	327.1	19.6	341.2	-14.9	14.1	-0.8
2S/1E 32Q 1	45	U	Camp	26.8	340.8	27.4	340.2	27.9	339.6	-0.6	-0.6	-1.1
2S/1E 33L 1	80	U	Camp	52.7	336.8	53.0	336.5	54.2	335.3	-0.3	-1.2	-1.5
2S/1E 33P 2	55	U	Camp	33.7	336.4	34.0	336.1	34.9	335.2	-0.3	-1.0	-1.2
2S/1E 33R 1	60	U	Camp	22.0	336.5	22.3	336.3	22.5	336.0	-0.3	-0.3	-0.6
3S/1E 17D10	425	L	Bernal	52.5	275.6	50.8	277.3	62.6	265.6	1.7	-11.7	-10.1
3S/1E 17D11	603	L	Bernal	47.7	277.2	164.3	160.5	103.3	221.5	-116.7	61.0	-55.6
3S/1E 17D12	315	L	Bernal	54.1	273.8	66.7	261.2	64.1	263.8	-12.7	2.6	-10.1
3S/1E 18A 6	500	L	Bernal	53.3	273.4	56.6	270.2	63.3	263.4	-3.3	-6.7	-10.0
3S/1E 18E 4	83	U	Bernal	43.3	276.9	39.2	281.0	50.4	269.9	4.1	-11.2	-7.1
3S/1E 18J 2	71	U	Bernal	46.5	276.5	42.1	280.9	54.2	268.8	4.4	-12.1	-7.7
3S/1E 18N 1	708	L	Bernal	44.8	274.6	40.2	279.2	56.0	263.5	4.6	-15.7	-11.2
3S/1E 19A11	330	L	Bernal	57.1	277.2	54.0	280.2	NM	-	3.1	-	-
3S/1E 19C 4	78	U	Bernal	45.0	277.3	40.5	281.7	53.0	269.3	4.4	-12.5	-8.0
3S/1E 19K 1	58	U	Bernal	46.2	275.4	41.8	279.8	56.0	265.6	4.4	-14.2	-9.8
3S/1E 20B 2	500	L	Bernal	NM	-	NM	-	NM	-	-	-	-
3S/1E 20C 3	110	L	Bernal	63.5	276.8	NM	-	NM	-	-	-	-
3S/1E 20C 7	153	U	Bernal	62.2	276.4	57.9	280.7	70.4	268.2	4.3	-12.5	-8.2
3S/1E 20C 8	315	L	Bernal	64.4	274.3	60.8	277.9	75.2	263.4	3.6	-14.5	-10.9
3S/1E 20C 9	515	L	Bernal	64.4	274.4	60.2	278.6	74.4	264.4	4.2	-14.2	-10.0
3S/1E 20J 4	72	U	Bernal	50.9	280.7	47.0	284.7	58.5	273.1	3.9	-11.6	-7.6
3S/1E 20M11	71	U	Bernal	45.9	279.9	41.4	284.3	54.4	271.4	4.4	-12.9	-8.5
3S/1E 20Q 2	65	U	Bernal	22.5	303.3	21.7	304.2	22.6	303.2	0.8	-1.0	-0.1
3S/1E 22D 2	72	U	Amador	58.3	309.8	53.1	315.0	59.2	308.8	5.1	-6.1	-1.0
3S/1E 23J 1	120	U	Amador	91.2	337.0	83.5	344.7	89.5	338.7	7.7	-6.0	1.7
3S/1E 24Q 1	440	L	Amador	126.4	301.1	116.7	310.8	138.1	289.4	9.7	-21.4	-11.7
3S/1E 25C 3	146	U	Amador	90.2	364.0	88.6	365.6	91.2	363.0	1.6	-2.6	-1.0
3S/1E 29M 4	57	U	Castle	34.8	276.1	30.3	280.7	40.7	270.3	4.6	-10.4	-5.9
3S/1E 29P 2	42	U	Bernal	29.3	273.5	28.2	274.6	30.2	272.7	1.1	-2.0	-0.9
3S/1W 1B 9	162	L	Dublin	13.8	319.8	11.2	322.4	14.9	318.7	2.7	-3.7	-1.1
3S/1W 1B10	414	L	Dublin	18.5	315.0	16.3	317.3	20.2	313.4	2.2	-3.9	-1.7
3S/1W 1B11	560	L	Dublin	39.8	293.9	35.9	297.9	41.5	292.3	4.0	-5.6	-1.6
3S/1W 2A 2	47	U	Dublin	26.6	342.8	24.7	344.7	27.2	342.2	1.9	-2.5	-0.6
3S/1W 12B 2	40	U	Dublin	21.8	321.1	20.7	322.2	22.0	320.9	1.1	-1.3	-0.2
3S/1W 12J 1	62	U	Dublin	21.3	308.0	19.7	309.6	24.0	305.3	1.6	-4.3	-2.7
3S/1W 13J 1	48	U	Castle	29.7	314.3	28.2	315.7	29.7	314.2	1.4	-1.5	0.0
3S/2E 1F 2	69	U	Spring	23.0	550.0	23.1	549.9	23.5	549.5	-0.1	-0.5	-0.6
3S/2E 2B 2	46	U	Spring	10.0	529.5	8.9	530.6	10.4	529.1	1.1	-1.5	-0.4
3S/2E 3A 1	54	U	Spring	5.2	512.5	13.1	504.6	4.9	512.7	-7.9	8.2	0.3
3S/2E 3K 3	60	U	Mocho I	13.8	509.0	13.5	509.4	13.8	509.1	0.3	-0.3	0.1
3S/2E 5N 1	210	L	Mocho II	42.8	397.2	33.0	407.0	34.5	405.5	9.8	-1.5	8.3
3S/2E 7C 2	49	U	Mocho II	29.8	391.1	26.1	394.8	27.9	392.9	3.7	-1.9	1.9
3S/2E 7H 2	54	U	Mocho II	33.7	409.2	31.1	411.7	31.4	411.4	2.5	-0.3	2.2
3S/2E 7N 1	130	U	Amador	80.2	340.9	NM	-	NM	-	-	-	-
3S/2E 8G 1	465	L	Mocho II	63.0	402.1	50.3	414.7	48.1	416.9	12.7	2.2	14.9
3S/2E 8H 2	46	U	Mocho II	36.6	433.1	35.9	433.7	36.8	432.8	0.6	-0.9	-0.3
3S/2E 8H 3	195	L	Mocho II	80.8	396.5	58.7	418.6	59.5	417.8	22.1	-0.8	21.3
3S/2E 8H 4	385	L	Mocho II	159.3	317.7	78.7	398.3	93.3	383.6	80.6	-14.6	66.0
3S/2E 8K 2	74	U	Mocho II	42.4	422.4	34.6	430.2	37.1	427.7	7.8	-2.5	5.3
3S/2E 8N 2	526	L	Mocho II	91.0	362.6	51.9	401.7	43.4	410.3	39.1	8.5	47.6
3S/2E 8P 1	273	L	Mocho II	52.0	416.2	44.0	424.2	43.7	424.5	8.0	0.3	8.3
3S/2E 9L 1	516	L	Mocho II	63.0	436.4	NM	-	NM	-	-	-	-
3S/2E 9P 1	515	L	Mocho II	NM	-	85.8	415.5	81.4	419.9	-	4.4	-
3S/2E 9Q 1	572	L	Mocho II	98.0	420.2	77.0	441.1	77.1	441.0	21.0	-0.1	20.9
3S/2E 9Q 4	80	U	Mocho II	30.1	474.3	20.4	484.0	22.6	481.8	9.7	-2.2	7.4
3S/2E 10F 3	45	U	Mocho I	14.6	520.3	13.1	521.8	13.4	521.4	1.5	-0.3	1.2
3S/2E 10Q 1	44	U	Mocho II	26.4	529.0	22.2	533.1	24.1	531.3	4.2	-1.8	2.3
3S/2E 11C 1	66	U	Mocho I	27.6	529.5	27.1	530.0	27.9	529.2	0.5	-0.9	-0.3
3S/2E 14B 1	300	L	Mocho I	64.2	529.2	63.5	529.9	64.8	528.5	0.7	-1.3	-0.6
3S/2E 15E 2	192	L	Mocho II	33.2	516.5	30.6	519.1	36.2	513.5	2.6	-5.6	-3.0
3S/2E 15Q 6	301	L	Mocho II	68.2	509.0	62.9	514.4	65.4	512.1	5.4	-2.3	3.1
3S/2E 15R17	63	U	Mocho II	10.7	581.8	10.0	582.4	11.7	580.7	0.6	-1.6	-1.0
3S/2E 15R18	138	L	Mocho II	14.5	578.0	15.1	577.4	14.5	577.9	-0.6	0.6	0.0
3S/2E 16A 3	240	L	Mocho II	NM	-	32.0	495.1	35.1	492.0	-	-3.1	-
3S/2E 16E 4	45	U	Mocho II	17.1	489.2	NM	-	16.4	489.9	-	-	0.7
3S/2E 17E 2	94	U	Mocho II	17.2	450.5	17.4	450.4	18.4	449.4	-0.1	-1.0	-1.1
3S/2E 18E 1	134	U	Amador	65.1	358.8	68.9	355.0	NM	-	-3.8	-	-
3S/2E 19D 7	180	U	Amador	84.2	330.9	83.5	331.6	91.3	323.7	0.8	-7.9	-7.1
3S/2E 19D 8	260	L	Amador	85.2	329.9	84.1	331.0	92.2	322.9	1.1	-8.1	-7.0

Figure 2.4-5
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FIGURE 2.4-5
TABLE OF SEMIANNUAL GROUNDWATER LEVELS
(Feet above Mean Sea Level, NAVD88)
FALL 2012 TO FALL 2013

Well Number	Well Depth	Aquifer	Sub-Basin	Fall 2012		Spring 2013		Fall 2013		Change in Elevation		
				Depth to Water	GW Elev	Depth to Water	GW Elev	Depth to Water	GW Elev	Seasonal		Annual
										Fall 12 to Spring 13	Spring 13 to Fall 13	
2S/1E 32E 1	70	U	Camp	37.5	355.1	37.0	355.6	38.4	354.2	0.5	-1.4	-0.9
2S/1E 32N 1	44	U	Camp	18.8	342.0	33.7	327.1	19.6	341.2	-14.9	14.1	-0.8
2S/1E 32Q 1	45	U	Camp	26.8	340.8	27.4	340.2	27.9	339.6	-0.6	-0.6	-1.1
2S/1E 33L 1	80	U	Camp	52.7	336.8	53.0	336.5	54.2	335.3	-0.3	-1.2	-1.5
2S/1E 33P 2	55	U	Camp	33.7	336.4	34.0	336.1	34.9	335.2	-0.3	-1.0	-1.2
2S/1E 33R 1	60	U	Camp	22.0	336.5	22.3	336.3	22.5	336.0	-0.3	-0.3	-0.6
3S/2E 19D 9	390	L	Amador	159.1	255.9	132.6	282.4	167.6	247.4	26.5	-35.0	-8.5
3S/2E 19D10	470	L	Amador	146.8	268.1	119.1	295.8	159.1	255.8	27.7	-40.1	-12.3
3S/2E 20M 1	184	L	Amador	58.9	419.9	50.2	428.6	57.1	421.7	8.7	-6.9	1.8
3S/2E 22B 1	32	U	Mocho II	14.0	571.9	13.3	572.6	14.6	571.2	0.8	-1.4	-0.6
3S/2E 23E 1	40	U	Mocho II	16.1	597.3	16.4	597.0	16.8	596.6	-0.3	-0.5	-0.7
3S/2E 23E 2	110	L	Mocho II	14.7	598.6	14.6	598.6	14.7	598.6	0.1	0.0	0.0
3S/2E 24A 1	46	U	Mocho I	27.1	690.6	26.5	691.2	23.5	694.2	0.6	3.1	3.6
3S/2E 26J 2	44	U	Mocho II	12.6	677.4	7.4	682.6	12.6	677.3	5.2	-5.3	-0.1
3S/2E 29F 4	36	U	Amador	8.6	448.9	8.4	449.1	8.4	449.1	0.2	0.0	0.2
3S/2E 30D 2	44	U	Amador	21.4	410.2	21.2	410.4	21.1	410.5	0.2	0.1	0.3
3S/2E 30G 1	390	L	Amador	NM	-	NM	-	NM	-	-	-	-
3S/2E 33G 1	17	U	Amador	9.1	502.5	9.0	502.6	8.6	502.9	0.1	0.4	0.4
3S/2E 33K 1	15	U	Amador	6.3	540.5	NM	-	NM	-	-	-	-
3S/2E 33L 1	25	U	Amador	10.7	546.9	NM	-	NM	-	-	-	-
3S/3E 7M 2	199	L	Spring	46.4	582.2	46.6	582.1	46.8	581.9	-0.1	-0.2	-0.4
MA-C 1	0	U	Amador	0.0	354.2	0.0	357.7	0.0	355.2	3.5	-2.5	1.1
MA-K 15	0	U	Amador	0.0	333.4	0.0	333.0	0.0	332.6	-0.4	-0.4	-0.8
MA-K 18	0	U	Amador	0.0	350.7	0.0	350.9	0.0	351.2	0.2	0.3	0.5
MA-K 28	0	U	Amador	0.0	284.3	0.0	284.4	0.0	282.9	0.1	-1.5	-1.4
MA-K 37	0	U	Amador	0.0	284.3	0.0	284.4	0.0	279.7	0.1	-4.8	-4.6
MA-P 10	0	U	Amador	0.0	366.3	0.0	367.1	0.0	366.6	0.8	-0.6	0.2
MA-P 12	0	U	Amador	0.0	351.0	0.0	350.9	0.0	351.3	0.0	0.3	0.3
MA-P 27	0	U	Amador	0.0	289.0	0.0	289.3	0.0	281.4	0.3	-7.9	-7.6
MA-P 28	0	U	Amador	0.0	403.0	0.0	406.1	0.0	404.8	3.2	-1.3	1.8
MA-P 40	0	U	Amador	0.0	297.6	0.0	299.4	0.0	293.2	1.9	-6.2	-4.4
MA-P 41	0	U	Amador	0.0	409.7	0.0	413.2	0.0	410.9	3.4	-2.3	1.2
MA-P 42	0	U	Amador	0.0	280.3	0.0	282.3	0.0	284.8	2.0	2.5	4.5
MA-P 44	0	U	Amador	0.0	316.4	0.0	319.6	0.0	317.9	3.2	-1.7	1.5
MA-R 3	0	U	Amador	0.0	335.6	0.0	337.7	0.0	339.9	2.1	2.3	4.3
MA-R 4	0	U	Amador	0.0	311.3	0.0	313.5	0.0	313.5	2.2	0.1	2.2
MA-R 22	0	U	Amador	0.0	362.0	0.0	361.1	0.0	362.7	-0.9	1.7	0.7
MA-R 23	0	U	Amador	0.0	359.0	0.0	359.3	0.0	359.8	0.2	0.6	0.8

U Upper
L Lower
NM Not measured
DRY Well was dry
OBS Well was obstructed
- Not applicable
Key Well



FIGURE 2.4-6
HISTORICAL KEY WELL HYDROGRAPHS
1901 to 2013 WATER YEARS (Oct 1900 to Sep 2013)

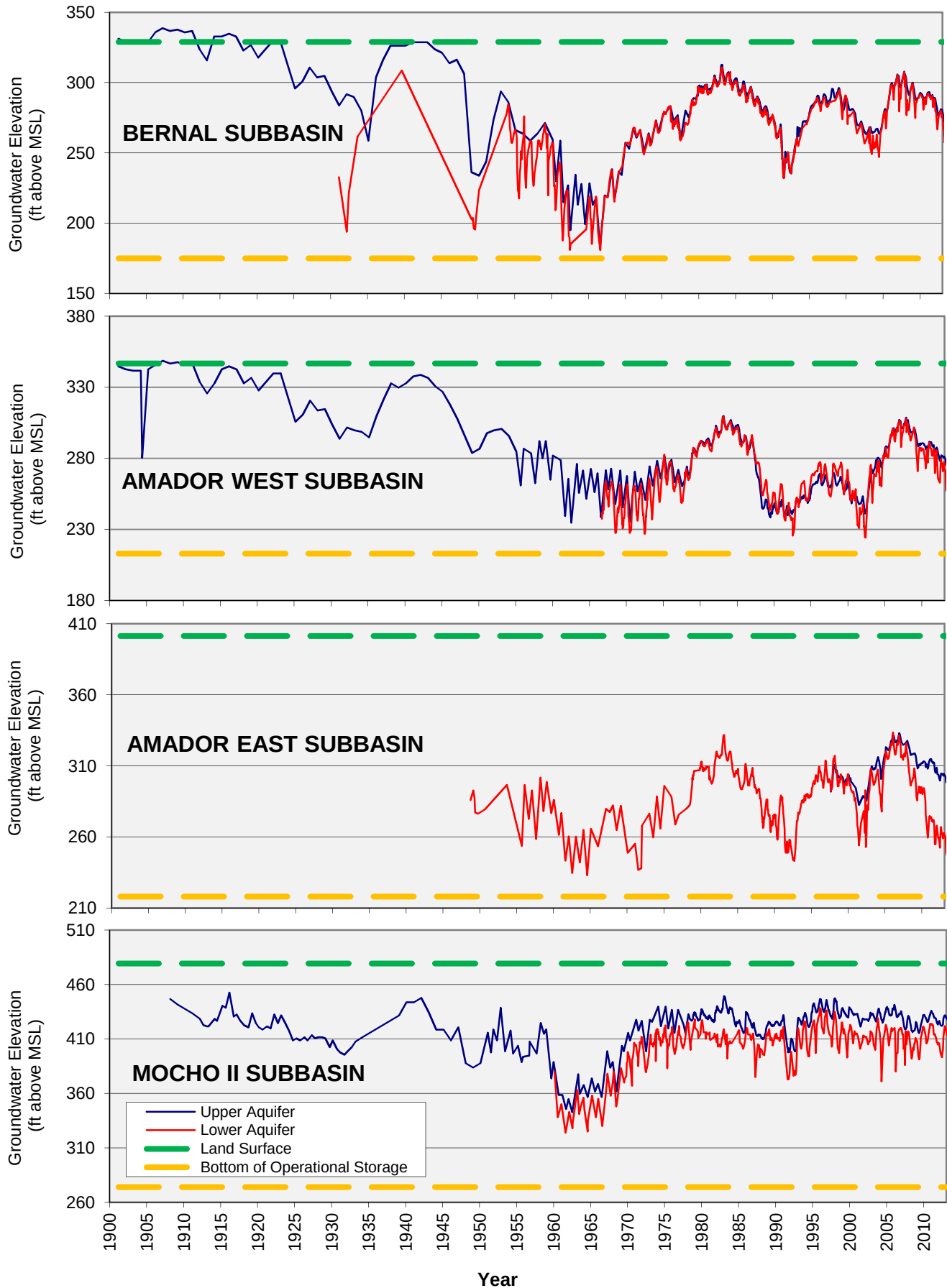
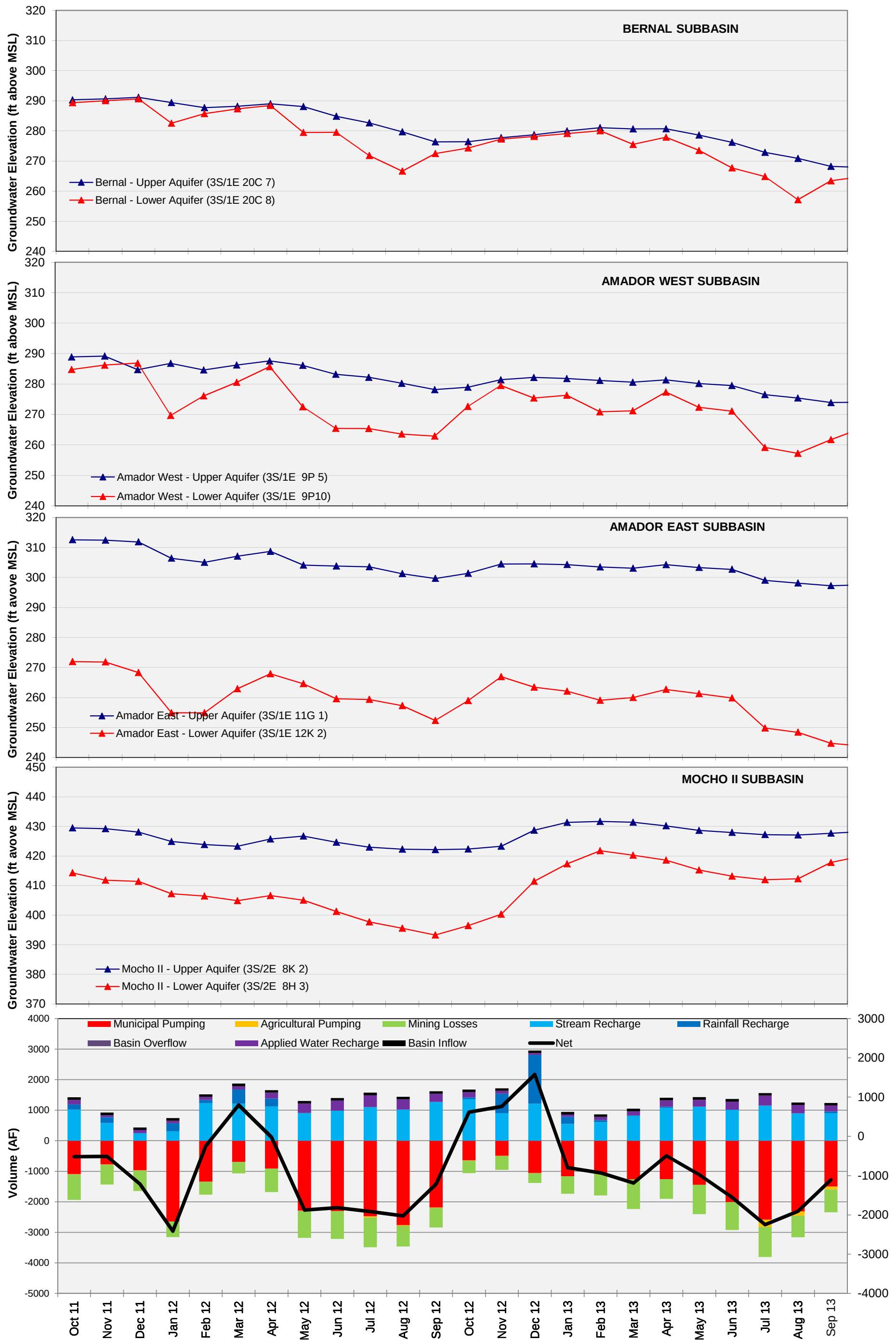
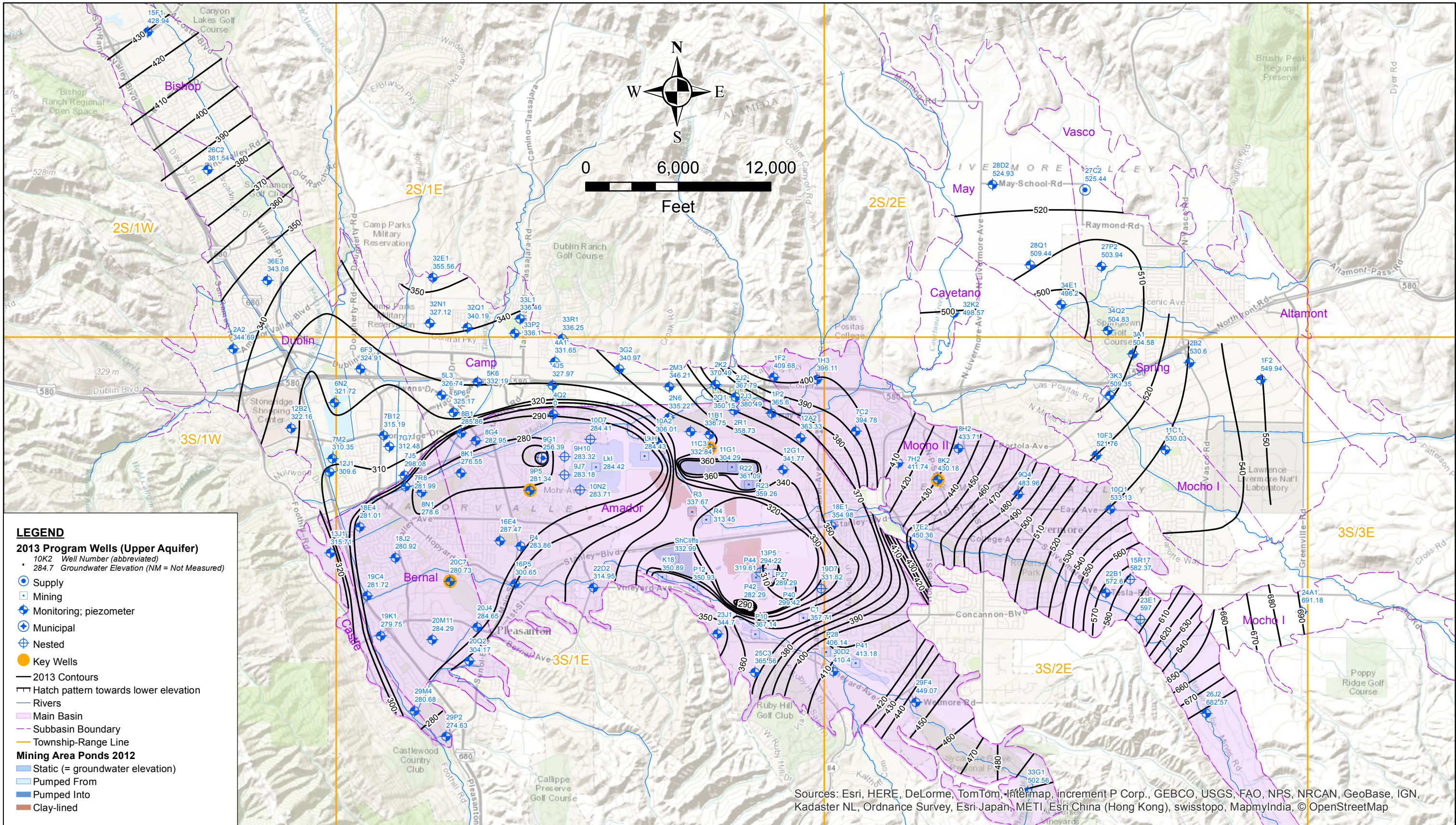




FIGURE 2.4-7
TWO-YEAR KEY WELL HYDROGRAPHS
2012 THROUGH 2013 WATER YEARS (Oct 2011 to Sep 2013)





ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR

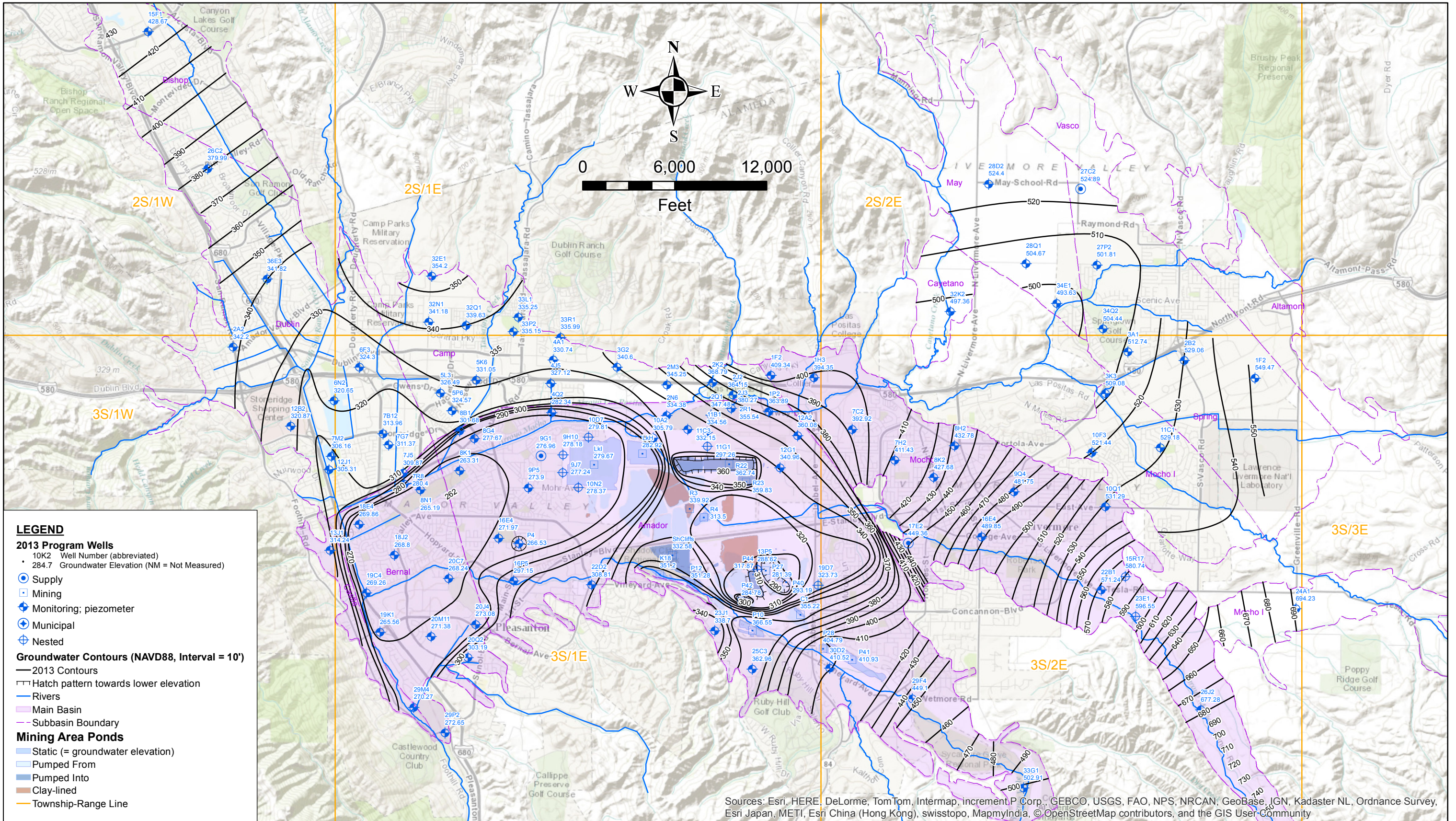
REVIEWED: MK

FILE: E:\MONITOR\GM\2013WY\AnnualReport2013\Fig2.4-08-SASpringUpper13.mxd

SCALE: 1 in = 6,000 ft

DATE: Jul 21, 2014

Figure 2.4-8
Groundwater Gradient Map
Upper Aquifer; Spring 2013 (April)
Livermore Valley Groundwater Basin



LEGEND

2013 Program Wells

- 10K2 Well Number (abbreviated)
- 284.7 Groundwater Elevation (NM = Not Measured)
- Supply
- Mining
- Monitoring; piezometer
- Municipal
- Nested

Groundwater Contours (NAVD88, Interval = 10')

- 2013 Contours
- Hatch pattern towards lower elevation
- Rivers

- Main Basin
- Subbasin Boundary

Mining Area Ponds

- Static (= groundwater elevation)
- Pumped From
- Pumped Into
- Clay-lined
- Township-Range Line

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR

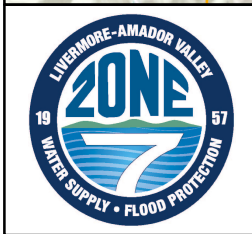
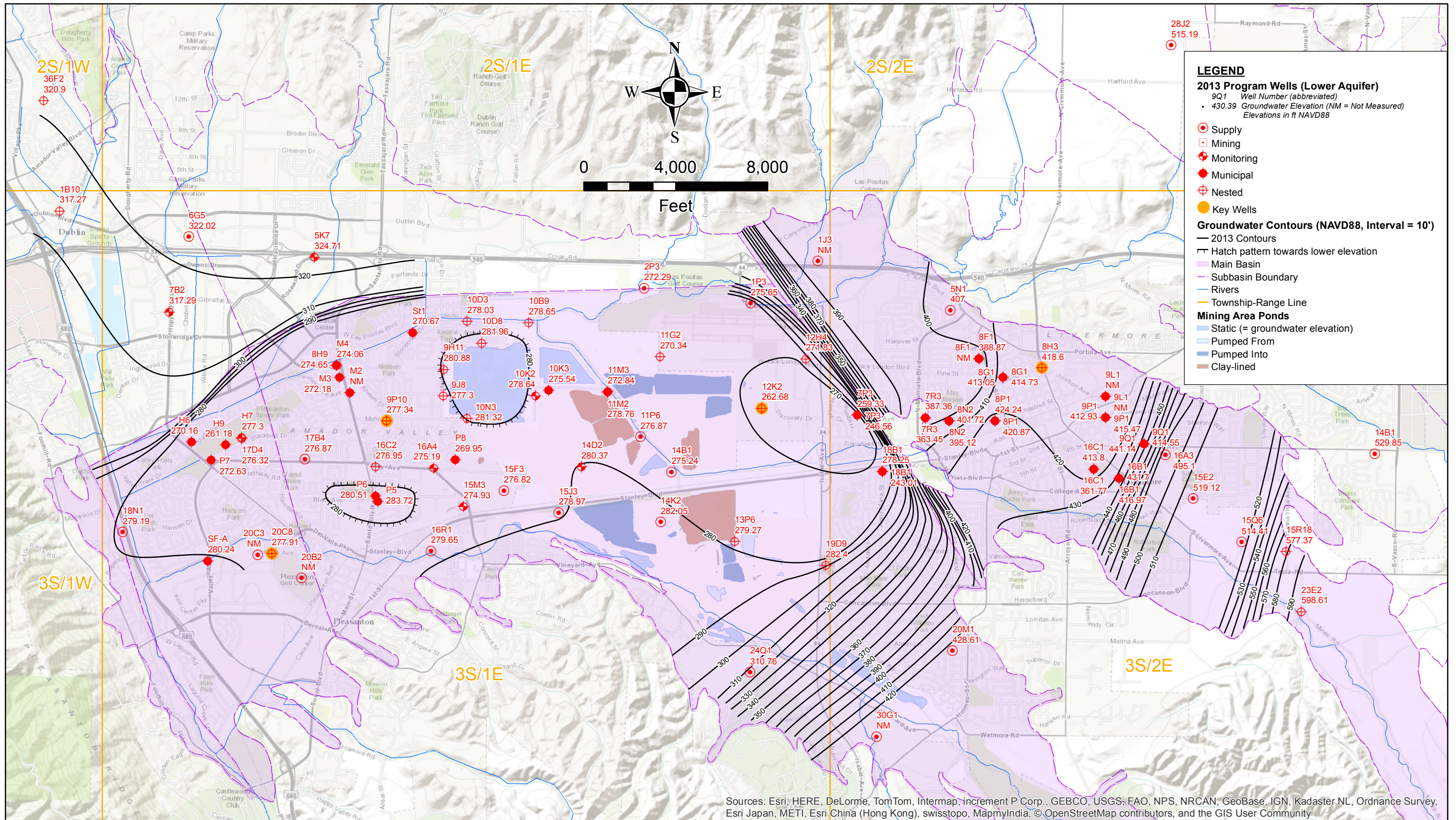
REVIEWED: MK

FILE: E:\MONITOR\GM\2013WY\AnnualReport2013\Fig2.4-09-SAFallUpper13.mxd

SCALE: 1 in = 6,000 ft

DATE: Jul 21, 2014

Figure 2.4-9
Groundwater Gradient Map
Upper Aquifer; Fall 2013 (September)
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR

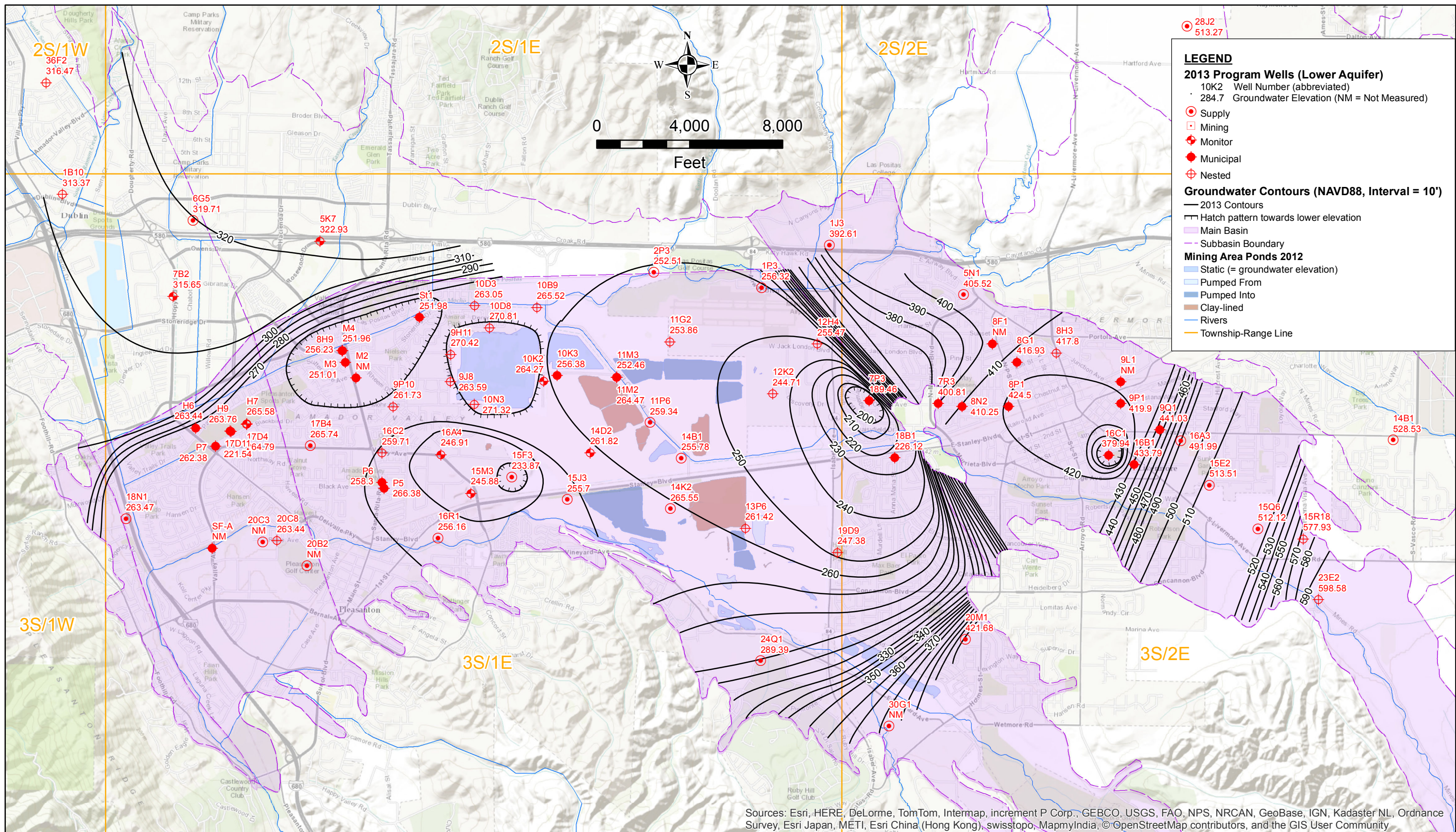
REVIEWED: MK

FILE: E:\MONITOR\GM\2013WYAnnualReport2013\Fig2.4-10-SASpringLower13.mxd

SCALE: 1 in = 4,000 ft

DATE: Jul 21, 2017

Figure 2.4-10
Groundwater Gradient Map
Lower Aquifer; Spring 2013 (April)
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR

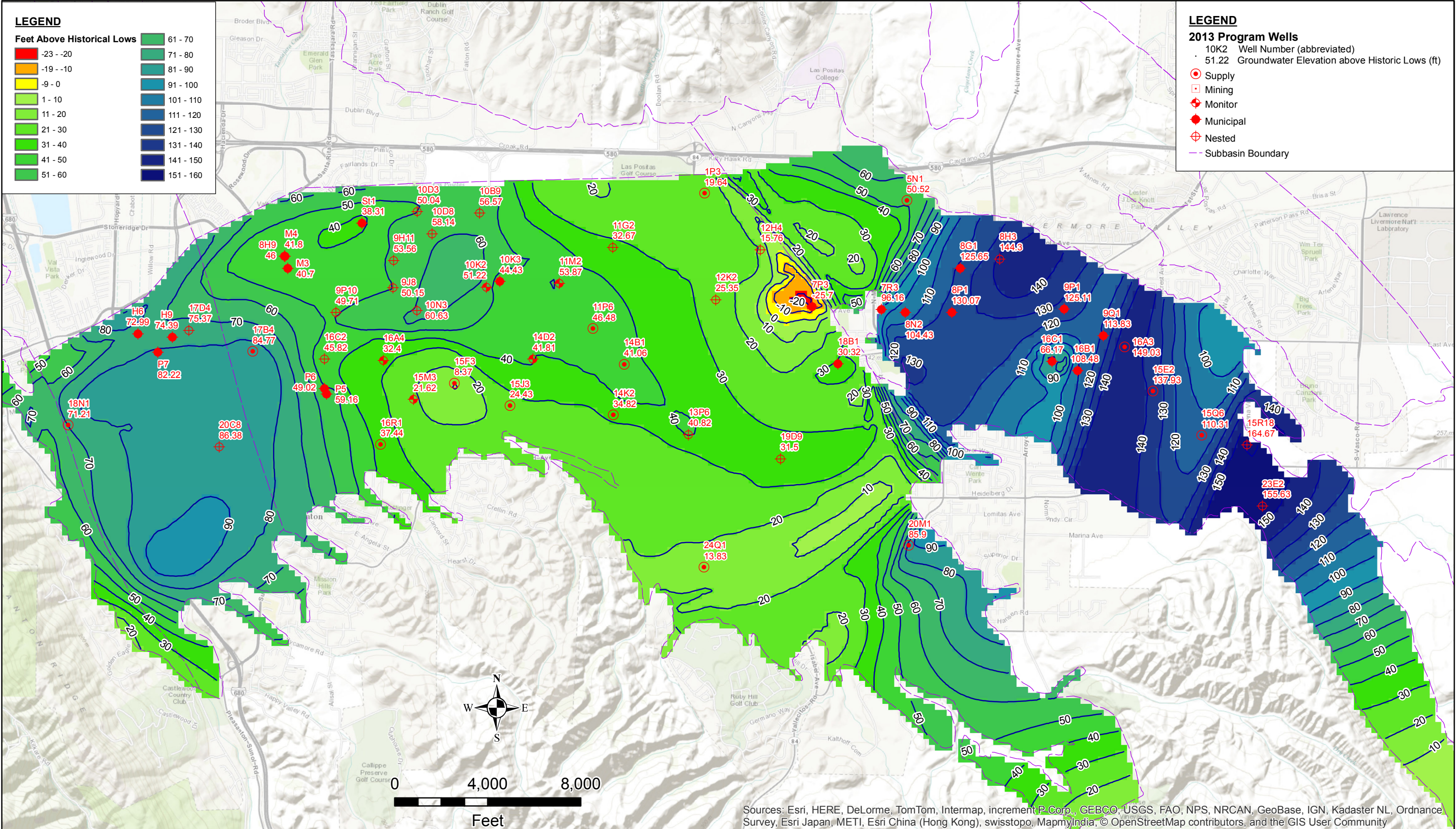
REVIEWED: MK

FILE: E:\MONITOR\GM\2013WY\AnnualReport2013\Fig2.4-11-SAFallLower13.mxd

SCALE: 1 in = 4,000 ft

DATE: Jul 21, 2014

Figure 2.4-11
Groundwater Gradient Map
Lower Aquifer; Fall 2013 (October)
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR

REVIEWED: MK

FILE: E:\MONITOR\GM\2013WY\AnnualReport2013\Fig2.4-12-AboveHL13.mxd

SCALE: 1 in = 4,000 ft

DATE: Jul 21, 2014

Figure 2.4-12
Groundwater Levels above Historic Lows
Lower Aquifer; Fall 2013 (October)
Livermore Valley Main Groundwater Basin



FIGURE 2.4-13
TABLE OF WATER QUALITY RESULTS
2013 WATER YEAR (Oct 2012 to Sep 2013)

SITE ID	DATE	TEMP. °C	EC umhos/cm	pH	Mineral Constituents (mg/L)									Select Metals (mg/L)				TDS mg/L	Hard mg/L
					Ca	Mg	Na	K	HCO ₃	SO ₄	Cl	NO ₃	SiO ₂	B	As	Fe	Mn		
2S/1E 32E 1	4-Mar-13	19.4	1272	6.9	136	27	111	1.2	573	34	138	13.24	40.7	<0.10	0.0035	<0.05	<0.01	783	451
2S/1E 32N 1	4-Mar-13	19.0	1208	7.3	101	25	126	1.6	409	46	163	11.16	32.1	0.49	0.0022	<0.05	<0.01	708	356
2S/1E 32Q 1	4-Mar-13	19.0	1649	7.1	136	46	165	1.8	533	67	272	12.31	30.0	0.63	0.0022	<0.05	<0.01	993	528
2S/1E 33L 1	4-Mar-13	18.4	1258	7.3	107	23	140	1.9	482	53	156	18.64	30.0	0.38	0.0021	<0.05	0.01	768	361
2S/1E 33P 2	4-Mar-13	16.4	2153	7.3	169	70	229	2.4	723	74	383	28.08	25.7	0.81	0.0022	<0.1	<0.02	1338	710
2S/1E 33R 1	11-Dec-12	18.4	813	7.6	74	16	72	1.3	267	20	103	19.22	25.7	0.13	0.0019	<0.05	<0.01	464	250
2S/1W 15F 1	24-Jun-13	18.6	1655	7.0	175	65	88	1.0	678	38	188	<0.44	23.5	0.25	0.0035	<0.05	2.4	913	704
2S/1W 15F 1	12-Sep-13	18.6	355	7.0	37	11	18	1.6	149	8	34	5.93	7.9	0.13	<0.001	<0.1	0.16	197	140
2S/1W 26C 2	12-Dec-12	17.3	823	7.1	114	22	38	1.3	434	31	34	25.46	32.1	0.15	0.0042	0.1	0.53	512	375
2S/1W 36E 3	3-Jun-13	18.0	978	7.5	132	17	52	0.6	404	81	70	24.00	38.5	0.13	0.0045	0.28	0.32	615	400
2S/1W 36F 1	24-Jun-13	16.8	777	7.5	65	20	76	1.0	426	16	34	<0.44	23.5	0.22	0.0083	<0.05	0.22	446	246
2S/1W 36F 2	24-Jun-13	17.2	930	7.7	40	15	131	0.6	416	<1.0	98	<0.44	23.5	0.54	0.15	0.22	0.21	515	163
2S/1W 36F 3	24-Jun-13	16.8	792	7.6	55	19	88	0.9	406	15	39	<0.44	23.5	0.31	0.017	<0.05	0.18	442	215
2S/2E 27P 2	18-Mar-13	17.8	4752	7.8	92	38	864	1.8	213	<1	1525	<0.44	30.0	25.1	<0.005	0.61	0.056	2657	386
2S/2E 28D 2	18-Mar-13	17.4	1615	7.9	84	43	186	2.4	259	40	232	181.57	32.1	0.69	0.0042	<0.05	0.019	930	390
2S/2E 28J 2	19-Mar-13	18.8	961	8.5	5	5	213	<0.5	378	60	86	<0.44	19.0	1.41	<0.001	<0.05	0.039	585	33
2S/2E 28Q 1	18-Mar-13	17.5	1414	8.1	61	43	199	0.70	346	125	231	3.90	36.4	0.62	0.01	0.053	0.17	874	330
2S/2E 32K 2	19-Mar-13	18.5	1080	7.9	52	37	133	1.8	357	63	132	10.36	38.5	0.51	0.007	<0.05	<0.01	646	282
2S/2E 34E 1	19-Mar-13	17.9	1351	8.3	18	16	230	0.6	342	85	200	<0.44	25.7	1.86	0.024	0.071	0.11	750	110
2S/2E 34Q 2	19-Mar-13	18.9	1789	7.9	83	64	189	1.1	271	146	394	4.96	32.1	2.97	0.0045	<0.05	0.027	1049	470
2S/2E 34Q 2	12-Sep-13	19.3	1758	7.6	83	55	225	1.1	269	143	389	4.56	30.0	3.55	0.0036	<0.1	0.065	1064	434
3S/1E 1F 2	22-Apr-13	18.8	1400	7.1	136	40	106	<0.5	524	43	184	43.58	42.8	0.22	0.0042	<0.05	<0.01	854	507
3S/1E 1H 3	15-Nov-12	NA	1739	NA	64	38	240	3.8	NA	72	290	NA	33	1.39	NA	NA	NA	1039	NA
3S/1E 1H 3	11-Mar-13	NA	1850	NA	69	40	250	3.5	NA	83	286	NA	32	1.48	NA	NA	NA	1093	NA
3S/1E 1H 3	10-Jun-13	NA	1760	NA	68	39	250	3.1	NA	80	NA	NA	34	1.13	NA	NA	NA	1032	NA
3S/1E 1H 3	9-Sep-13	NA	1820	NA	64	37	250	2.9	NA	75	NA	NA	32	1.18	NA	NA	NA	1068	NA
3S/1E 1L 1	4-Feb-13	20.2	1957	7.3	112	49	264	1.3	589	89	351	25.29	30.0	4.6	0.0045	<0.05	<0.01	1212	480
3S/1E 1L 1	12-Sep-13	20.4	1966	7.2	134	37	315	1.4	612	86	380	36.00	32.1	5.16	0.0045	<0.1	<0.01	1324	486
3S/1E 1P 2	15-Nov-12	NA	1328	NA	57	37	160	3.3	NA	71	238	NA	23	3.35	NA	NA	NA	780	NA
3S/1E 1P 2	20-Feb-13	17.6	1269	7.6	90	22	148	2.1	372	84	182	7.00	20.8	2.3	0.006	<0.05	0.014	740	316
3S/1E 1P 2	11-Mar-13	NA	1341	NA	58	38	150	3.8	NA	82	214	NA	24	1.56	NA	NA	NA	784	NA
3S/1E 1P 2	10-Jun-13	NA	1342	NA	58	38	160	3.4	NA	78	NA	NA	24	3.25	NA	NA	NA	754	NA
3S/1E 1P 2	9-Sep-13	NA	1360	NA	57	38	160	3.5	NA	76	NA	NA	24	2.4	NA	NA	NA	1361	NA
3S/1E 2J 2	4-Feb-13	17.9	2935	7.3	164	65	378	1.3	611	201	629	27.01	25.7	4.8	0.0046	<0.1	<0.02	1793	676
3S/1E 2J 3	4-Feb-13	20.4	1366	7.6	61	46	154	2.2	429	23	222	26.62	25.7	0.57	0.0035	<0.05	<0.01	773	340
3S/1E 2K 2	4-Feb-13	19.2	837	7.9	16	12	163	1.1	466	41	25	15.50	19.5	0.91	0.0067	<0.05	<0.01	526	90
3S/1E 2M 3	22-Apr-13	18.6	2090	7.4	85	35	338	1.8	789	77	227	66.43	27.8	2.5	0.0056	<0.1	<0.02	1248	358
3S/1E 2N 6	4-Feb-13	17.1	1361	7.4	77	36	177	1.2	492	73	181	0.80	19.0	2.7	0.0035	<0.05	<0.01	808	342
3S/1E 2P 3	4-Feb-13	18.2	807	8.2	61	27	74	2.0	302	54	86	18.78	23.5	0.60	0.002	<0.05	0.013	499	265
3S/1E 2Q 1	18-Feb-13	16.4	1985	7.4	106	50	258	1.6	514	142	365	21.88	21.4	3.4	0.0045	<0.05	<0.01	1220	472
3S/1E 2R 1	15-Nov-12	NA	1368	NA	65	47	150	2.2	NA	52	204	NA	27	3.1	NA	NA	NA	812	NA
3S/1E 2R 1	18-Feb-13	17.7	1471	7.3	85	54	157	1.4	519	62	181	25.38	23.5	2.2	0.0051	<0.05	<0.01	846	433
3S/1E 2R 1	11-Mar-13	NA	1558	NA	80	58	160	2.9	NA	63	239	NA	28	2.08	NA	NA	NA	912	NA
3S/1E 2R 1	10-Jun-13	NA	1538	NA	77	56	160	2.5	NA	61	NA	NA	27	2.68	NA	NA	NA	877	NA
3S/1E 2R 1	9-Sep-13	NA	1500	NA	71	52	160	2.4	NA	59	NA	NA	27	2.68	NA	NA	NA	866	NA
3S/1E 3G 2	18-Feb-13	17.0	1564	7.3	76	42	236	1.5	701	29	200	4.12	19.7	1.4	0.0049	<0.05	0.64	955	363
3S/1E 4A 1	11-Dec-12	18.9	891	7.5	76	16	95	1.1	342	36	92	8.77	21.4	0.33	0.0018	<0.05	0.018	516	256
3S/1E 4J 5	11-Dec-12	16.9	3741	7.8	55	56	741	<2.5	826	234	728	33.61	16.7	13	0.008	<0.25	0.29	2276	369
3S/1E 4J 5	20-Feb-13	17.0	3770	7.7	56	60	682	<2.5	829	299	772	37.16	17.5	11	0.0091	<0.25	0.29	2335	385
3S/1E 4J 6	11-Dec-12	16.9	1984	7.5	134	43	219	2.4	446	106	373	8.68	23.5	1.7	0.0021	<0.05	0.49	1130	512

NA = Not Analyzed

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 7/21/2014

Figure 2.4-13
 Page 1 of 7



FIGURE 2.4-13
TABLE OF WATER QUALITY RESULTS
2013 WATER YEAR (Oct 2012 to Sep 2013)

SITE ID	DATE	TEMP. °C	EC umhos/cm	pH	Mineral Constituents (mg/L)									Select Metals (mg/L)				TDS mg/L	Hard mg/L
					Ca	Mg	Na	K	HCO3	SO4	Cl	NO3	SiO2	B	As	Fe	Mn		
3S/1E 4J 6	20-Feb-13	16.9	1989	7.5	144	43	203	2.3	439	113	429	10.14	25.7	1.5	0.0025	<0.05	0.46	1187	537
3S/1E 4Q 2	11-Dec-12	17.7	1825	7.6	108	43	230	1.4	555	85	288	12.05	21.4	3.3	0.0033	<0.05	0.1	1064	448
3S/1E 4Q 2	20-Feb-13	17.4	1778	7.5	90	50	213	1.3	550	89	290	12.67	21.4	3.0	0.0041	<0.05	0.084	1040	431
3S/1E 5K 6	4-Mar-13	19.0	2160	7.4	161	54	257	2.4	532	235	331	43.80	19.0	1.37	0.0027	<0.1	0.65	1366	625
3S/1E 5K 7	4-Mar-13	18.1	1020	7.7	59	23	142	1.6	353	140	89	1.51	21.4	0.75	0.011	<0.05	0.097	653	244
3S/1E 5L 3	19-Feb-13	19.1	1689	7.6	119	44	205	0.9	530	287	168	0.49	19.9	0.97	0.004	<0.05	1.2	1107	480
3S/1E 5P 6	12-Dec-12	18.8	3040	7.4	208	113	340	0.9	431	587	527	21.35	25.7	1.4	0.0025	<0.1	0.43	2036	984
3S/1E 6F 3	12-Dec-12	19.2	4228	7.1	318	95	524	1.9	629	666	850	<0.44	21.4	3.7	<0.005	<0.25	20.	2786	1185
3S/1E 6F 3	12-Sep-13	19.3	3925	7.1	256	98	588	3.1	645	732	684	0.53	23.5	3.78	0.0061	0.2	0.27	2703	1046
3S/1E 6M 2	10-Dec-12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0053	NA	NA	NA	NA
3S/1E 6M 2	11-Dec-12	13.93	7385	6.57	NA	NA	NA	NA	NA	NA	464	NA	NA	NA	NA	NA	NA	6836	NA
3S/1E 6M 2	4-Jun-13	22	8620	8.18	NA	NA	NA	NA	NA	NA	444.6	NA	NA	NA	0.0053	NA	NA	6740	NA
3S/1E 6N 2	18-Oct-12	23.1	25170	7.4	2048	1089	2744	17	340	988	11865	73.07	16.9	4.81	0.077	1.2	270.	19009	9600
3S/1E 6N 2	18-Oct-12	23.1	27240	6.47	2048	1089	2744	17	340	988	11865	73.07	16.9	4.81	0.077	1.2	270.	19009	9600
3S/1E 6N 2	22-May-13	17.69	17960	6.27	NA	NA	NA	NA	NA	NA	14892	NA	NA	NA	0.01	NA	NA	21630	NA
3S/1E 6N 3	18-Oct-12	19.22	10100	6.69	NA	NA	NA	NA	NA	NA	4970	NA	NA	NA	0.0062	NA	NA	8230	NA
3S/1E 6N 3	18-Oct-12	19.2	10130	7.7	NA	NA	NA	NA	NA	NA	4970	NA	NA	NA	0.0062	NA	NA	8230	NA
3S/1E 6N 3	21-May-13	18.74	7269	6.89	NA	NA	NA	NA	NA	NA	3541	NA	NA	NA	0.0062	NA	NA	7510	NA
3S/1E 6N 4	10-Dec-12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0077	NA	NA	NA	NA
3S/1E 6N 4	11-Dec-12	17.68	4017	6.79	NA	NA	NA	NA	NA	NA	233	NA	NA	NA	NA	NA	NA	3264	NA
3S/1E 6N 4	28-May-13	23.19	4265	7.52	NA	NA	NA	NA	NA	NA	320.5	NA	NA	NA	0.0076	NA	NA	3212	NA
3S/1E 6N 5	13-Dec-12	8.67	27290	6.41	NA	NA	NA	NA	NA	NA	10900	NA	NA	NA	0.0059	NA	NA	25900	NA
3S/1E 6N 5	22-May-13	25.09	23690	6.86	NA	NA	NA	NA	NA	NA	283.77	NA	NA	NA	NA	NA	NA	26600	NA
3S/1E 6N 5	4-Jun-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0069	NA	NA	NA	NA
3S/1E 6N 6	17-Oct-12	22.0	23640	7.4	1524	1059	2860	14	229	926	11255	69.97	19.5	4.04	0.043	1.1	120.	17841	8170
3S/1E 6N 6	17-Oct-12	21.99	25340	6.38	1524	1059	2860	14	229	926	11255	69.97	19.5	4.04	0.043	1.1	120.	17841	8170
3S/1E 6N 6	22-May-13	18.44	17860	6.4	NA	NA	NA	NA	NA	NA	2688	NA	NA	NA	0.0056	NA	NA	21210	NA
3S/1E 7B 2	5-Jun-13	20.4	763	8.9	11	9	141	2.1	239	32	95	<0.44	11.1	0.84	0.0044	<0.05	0.04	437	64
3S/1E 7B12	12-Dec-12	18.0	13820	7.3	468	393	2200	2.4	332	830	4331	<0.44	19.3	2.4	<0.01	<0.5	14.	8408	2788
3S/1E 7D 1	17-Oct-12	21.97	6767	6.51	NA	NA	NA	NA	NA	NA	2510	NA	NA	NA	0.019	NA	NA	5343	NA
3S/1E 7D 1	17-Oct-12	22.0	5655	7.7	NA	NA	NA	NA	NA	NA	2510	NA	NA	NA	0.019	NA	NA	5343	NA
3S/1E 7D 1	4-Jun-13	19.69	3550	7.25	NA	NA	NA	NA	NA	NA	942.69	NA	NA	NA	0.013	NA	NA	2384	NA
3S/1E 7D 2	25-Oct-12	15.41	24630	6.3	NA	NA	NA	NA	NA	NA	5780	NA	NA	NA	NA	NA	NA	25660	NA
3S/1E 7D 2	13-Dec-12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.029	NA	NA	NA	NA
3S/1E 7D 2	4-Jun-13	18.83	28300	7.36	NA	NA	NA	NA	NA	NA	6412	NA	NA	NA	0.017	NA	NA	25020	NA
3S/1E 7D 3	17-Oct-12	18.01	16110	6.34	NA	NA	NA	NA	NA	NA	9350	NA	NA	NA	0.03	NA	NA	12880	NA
3S/1E 7D 3	17-Oct-12	18.0	16430	7.4	NA	NA	NA	NA	NA	NA	9350	NA	NA	NA	0.03	NA	NA	12880	NA
3S/1E 7D 3	20-May-13	19.2	12310	6.39	NA	NA	NA	NA	NA	NA	6662	NA	NA	NA	0.035	NA	NA	12780	NA
3S/1E 7D 4	24-Oct-12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0091	NA	NA	NA	NA
3S/1E 7D 4	25-Oct-12	20.31	11890	6.86	NA	NA	NA	NA	NA	NA	1140	NA	NA	NA	NA	NA	NA	10700	NA
3S/1E 7D 4	20-May-13	29.77	9410	6.77	NA	NA	NA	NA	NA	NA	792	NA	NA	NA	0.011	NA	NA	9600	NA
3S/1E 7G 7	12-Dec-12	18.4	17810	7.2	426	587	3020	3.3	473	1463	5067	<0.44	19.3	5.1	<0.02	<1.	11.	10819	3482
3S/1E 7J 5	22-Apr-13	18.4	2077	7.2	114	88	259	1.7	827	300	147	<0.44	27.8	4.2	0.0032	<0.1	0.27	1346	646
3S/1E 7M 2	24-Apr-13	19.5	926	8.2	82	25	91	1.5	392	66	81	<0.44	16.5	0.25	0.0039	0.09	0.19	562	308
3S/1E 8B 1	6-Mar-13	16.8	1543	8.1	66	47	205	1.3	341	156	253	<0.44	11.6	1.94	0.0046	<0.05	0.078	912	360
3S/1E 8G 4	12-Dec-12	18.8	2705	7.5	133	106	391	2.8	748	583	290	4.21	30.0	5.4	0.0024	<0.1	<0.02	1910	769
3S/1E 8H 9	5-Mar-13	18.0	959	7.7	64	40	85	2.1	352	57	101	26.44	27.8	0.69	0.0021	<0.05	<0.01	578	323
3S/1E 8H10	5-Mar-13	18.6	1159	7.6	80	43	122	2.5	439	119	119	11.56	27.8	1.0	0.0021	<0.05	<0.01	742	378
3S/1E 8H11	5-Mar-13	18.6	1765	7.2	153	93	115	3.5	649	149	218	21.97	30.0	1.37	0.0017	<0.05	<0.01	1104	767
3S/1E 8H13	5-Mar-13	18.9	1343	7.3	119	77	73	3.0	544	94	163	23.47	27.8	0.74	0.0015	<0.05	<0.01	849	614

NA = Not Analyzed



FIGURE 2.4-13
TABLE OF WATER QUALITY RESULTS
2013 WATER YEAR (Oct 2012 to Sep 2013)

SITE ID	DATE	TEMP. °C	EC umhos/cm	pH	Mineral Constituents (mg/L)									Select Metals (mg/L)				TDS mg/L	Hard mg/L
					Ca	Mg	Na	K	HCO3	SO4	Cl	NO3	SiO2	B	As	Fe	Mn		
3S/1E 8H18R	28-Jun-13	NA	1290	7.6	108	66	95	3.1	495	111	153	17.67	27.8	0.88	0.0013	0.14	<0.01	827	542
3S/1E 8K 1	23-Apr-13	17.1	1890	7.2	164	110	113	2.8	693	272	172	11.38	30.0	1.5	0.0016	<0.05	0.013	1217	863
3S/1E 8N 1	23-Apr-13	18.1	2466	7.0	215	154	164	3.2	871	434	184	22.05	32.1	1.8	<0.002	<0.1	<0.02	1638	1173
3S/1E 9B 1	15-Nov-12	18.2	968	7.8	75	51	69	1.8	369	53	113	31.04	23.5	0.78	0.0015	0.0073	<0.01	601	395
3S/1E 9B 1	23-May-13	19.9	639	7.8	42	35	45	1.5	274	37	43	18.33	25.7	0.29	0.0018	<0.005	<0.01	384	248
3S/1E 9B 1	28-Jun-13	NA	621	7.8	44	31	43	1.6	272	34	39	16.61	25.7	0.30	0.0011	<0.01	<0.01	370	238
3S/1E 9B 1	5-Aug-13	20.2	627	7.8	45	33	38	1.6	274	35	41	16.61	25.7	0.28	0.0019	<0.005	<0.01	372	248
3S/1E 9G 1	5-Jun-13	19.2	982	7.4	55	43	85	1.8	284	63	146	0.44	23.5	0.87	0.001	0.084	0.021	558	316
3S/1E 9J 7	20-Mar-13	17.4	1012	7.6	67	45	72	1.8	306	60	147	<0.44	17.3	0.85	<0.001	<0.05	0.016	562	355
3S/1E 9J 8	20-Mar-13	16.4	754	7.6	80	34	25	1.5	287	47	84	8.64	20.1	0.29	<0.001	<0.05	<0.01	443	341
3S/1E 9J 9	20-Mar-13	17.1	658	7.6	56	45	21	1.7	287	40	53	13.51	25.7	0.22	<0.001	<0.05	<0.01	398	327
3S/1E 9M 2R	6-Mar-13	17.5	1035	7.5	70	53	76	1.9	377	60	118	13.73	25.7	0.80	0.0013	0.012	<0.01	605	391
3S/1E 9M 2R	6-Aug-13	17.4	1024	7.3	88	46	58	2.0	370	67	109	11.43	23.5	0.28	<0.001	<0.005	<0.01	588	410
3S/1E 9M 3R	2-Oct-12	17.7	936	7.6	85	42	54	1.7	343	62	97	11.03	21.4	0.60	<0.001	<0.01	<0.01	544	386
3S/1E 9M 3R	5-Dec-12	17.4	966	7.8	97	42	59	1.7	370	64	109	10.72	16.7	0.65	<0.001	<0.005	<0.01	584	414
3S/1E 9M 3R	4-Feb-13	17.5	1007	7.2	94	47	62	1.9	379	70	111	13.91	21.4	0.66	<0.001	<0.005	<0.01	608	429
3S/1E 9M 3R	7-Mar-13	17.4	1080	7.3	96	56	64	2.0	425	72	128	15.41	25.7	0.63	<0.001	<0.005	<0.01	669	470
3S/1E 9M 3R	6-May-13	18.0	1117	7.4	96	58	67	2.1	405	75	124	16.03	25.7	0.71	0.0013	<0.01	<0.01	664	477
3S/1E 9M 3R	22-May-13	17.3	1145	7.7	95	57	69	2.0	420	74	122	16.43	23.5	0.67	0.001	<0.005	<0.01	668	471
3S/1E 9M 3R	4-Jun-13	17.7	1066	7.6	94	51	64	2.0	395	69	114	14.39	23.5	0.67	0.001	<0.005	<0.01	628	447
3S/1E 9M 3R	6-Aug-13	17.6	1052	7.4	66	53	70	1.9	386	58	115	15.90	25.7	0.88	0.0012	<0.005	<0.01	596	385
3S/1E 9M 4R	28-Jun-13	NA	1309	7.5	93	59	102	2.6	476	100	144	18.11	27.8	1.19	0.0012	<0.01	<0.01	782	473
3S/1E 9P 5	11-Dec-12	17.7	1021	7.2	82	43	72	2.8	322	67	142	2.75	18.6	0.86	<0.001	<0.05	<0.01	589	383
3S/1E 9P 9	11-Dec-12	17.2	1070	7.4	75	43	84	2.5	343	72	142	3.81	19.7	1.0	<0.001	<0.05	<0.01	612	364
3S/1E 9P10	20-Feb-13	16.6	765	7.2	80	33	39	1.7	270	56	87	10.32	19.9	0.36	<0.001	<0.05	<0.01	460	335
3S/1E 9P11	20-Feb-13	16.8	855	7.4	67	59	26	1.8	342	55	91	16.25	25.7	0.26	0.0013	<0.05	<0.01	511	409
3S/1E 10A 2	4-Feb-13	17.5	1872	7.3	117	64	206	2.3	582	130	291	29.27	27.8	2.7	0.0017	0.068	0.025	1155	554
3S/1E 10B 8	6-Mar-13	17.0	1449	7.3	74	73	143	2.2	550	85	177	37.38	30.0	2.12	0.0024	<0.05	<0.01	893	485
3S/1E 10B 9	6-Mar-13	17.5	1170	7.6	72	63	86	2.4	410	67	134	33.21	27.8	1.09	0.0018	<0.05	<0.01	689	440
3S/1E 10B10	6-Mar-13	18.3	676	7.6	53	40	39	1.8	298	38	51	14.30	27.8	0.31	0.0013	<0.05	<0.01	413	296
3S/1E 10B11	19-Mar-13	20.3	935	8.0	63	43	54	2.0	376	58	75	11.74	25.7	0.51	0.0018	<0.05	0.018	521	335
3S/1E 10D 2	5-Mar-13	17.0	1267	7.6	83	56	121	2.0	476	72	156	36.98	27.8	1.43	0.0037	<0.05	0.032	791	439
3S/1E 10D 3	5-Mar-13	17.5	955	7.7	67	54	64	2.1	359	52	102	32.28	25.7	0.53	0.0022	<0.05	<0.01	577	391
3S/1E 10D 4	5-Mar-13	17.8	755	7.5	60	42	45	1.7	317	45	71	17.54	25.7	0.37	0.0016	<0.05	<0.01	465	324
3S/1E 10D 5	22-Apr-13	26.7	635	7.9	44	31	44	2.0	272	39	42	15.59	25.7	0.26	0.0019	<0.05	<0.01	379	240
3S/1E 10K 2	25-Apr-13	16.9	684	7.4	61	36	29	1.5	252	43	75	7.75	21.4	0.29	<0.001	<0.05	<0.01	399	300
3S/1E 10K 3	28-Nov-12	NA	NA	NA	NA	NA	37	1.3	NA	NA	NA	NA	NA	0.38	<0.001	0.14	<0.01	NA	NA
3S/1E 10K 3	6-Mar-13	17.2	799	7.4	63	49	34	1.4	326	49	75	17.40	23.5	0.30	<0.001	0.054	<0.01	473	361
3S/1E 10K 3	20-Mar-13	NA	NA	NA	NA	NA	35	1.4	NA	NA	NA	NA	NA	0.34	<0.001	0.01	<0.01	NA	NA
3S/1E 10K 3	22-May-13	17.2	795	7.7	62	52	39	1.4	319	50	77	17.54	23.5	0.32	<0.001	0.017	<0.01	481	369
3S/1E 11B 1	15-Nov-12	NA	1781	NA	69	68	240	9.3	NA	90	256	NA	26	5.4	NA	NA	NA	1133	NA
3S/1E 11B 1	11-Mar-13	NA	1760	NA	65	59	220	5.3	NA	110	234	NA	31	1.4	NA	NA	NA	1117	NA
3S/1E 11B 1	10-Jun-13	NA	1790	NA	66	62	230	6.2	NA	110	NA	NA	29	3.5	NA	NA	NA	1065	NA
3S/1E 11B 1	9-Sep-13	NA	1720	NA	66	70	200	8.2	NA	95	NA	NA	31	2.45	NA	NA	NA	1003	NA
3S/1E 11C 3	19-Feb-13	15.9	1704	7.2	99	52	198	1.7	557	113	223	27.50	20.8	2.9	0.004	<0.05	<0.01	1010	460
3S/1E 11G 1	25-Mar-13	19.1	1218	7.4	73	79	77	2.5	487	66	113	45.61	36.4	0.93	0.0015	<0.05	0.011	733	510
3S/1E 11G 2	25-Mar-13	18.3	1066	7.5	71	68	56	1.8	398	57	106	31.18	23.5	0.82	<0.001	<0.05	<0.01	611	457
3S/1E 11G 3	25-Mar-13	16.8	741	7.6	53	53	25	1.5	297	49	63	20.11	27.8	0.26	0.001	<0.05	<0.01	440	352
3S/1E 11G 4	25-Mar-13	16.0	604	7.9	48	34	35	2.2	306	38	22	9.30	27.8	0.21	0.0016	<0.05	<0.01	369	259
3S/1E 11M 2	25-Apr-13	17.7	795	7.4	53	52	35	1.6	305	48	78	12.89	23.5	0.29	<0.001	<0.05	<0.01	455	347

NA = Not Analyzed

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Figure 2.4-13
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FIGURE 2.4-13
TABLE OF WATER QUALITY RESULTS
2013 WATER YEAR (Oct 2012 to Sep 2013)

SITE ID	DATE	TEMP. °C	EC umhos/cm	pH	Mineral Constituents (mg/L)									Select Metals (mg/L)				TDS mg/L	Hard mg/L
					Ca	Mg	Na	K	HCO ₃	SO ₄	Cl	NO ₃	SiO ₂	B	As	Fe	Mn		
3S/1E 11M 3	6-Dec-12	18.1	665	7.6	57	37	29	1.1	270	40	57	15.72	23.5	0.33	<0.001	<0.005	<0.01	394	297
3S/1E 11M 3	28-Jun-13	NA	657	7.5	52	37	32	1.3	275	38	53	16.47	25.7	0.26	<0.001	<0.01	<0.01	392	284
3S/1E 11P 6	3-Jun-13	17.8	662	7.5	62	27	33	1.5	226	46	78	3.54	18.4	0.31	<0.001	<0.05	<0.01	381	265
3S/1E 12A 2	15-Nov-12	NA	1178	NA	64	88	53	3.6	NA	56	108	NA	33	0.78	NA	NA	NA	709	NA
3S/1E 12A 2	11-Mar-13	NA	1241	NA	67	93	54	4.1	NA	69	110	NA	36	0.45	NA	NA	NA	744	NA
3S/1E 12A 2	10-Jun-13	NA	1234	NA	66	91	57	3.7	NA	69	NA	NA	36	0.61	NA	NA	NA	699	NA
3S/1E 12A 2	9-Sep-13	NA	1220	NA	62	87	55	3.6	NA	64	NA	NA	35	0.45	NA	NA	NA	699	NA
3S/1E 12G 1	15-Nov-12	NA	1097	NA	65	96	63	11	NA	50	101	NA	33	1.03	NA	NA	NA	659	NA
3S/1E 12G 1	11-Mar-13	NA	1120	NA	60	72	97	5.2	NA	68	127	NA	35	1.23	NA	NA	NA	760	NA
3S/1E 12G 1	10-Jun-13	NA	1160	NA	59	76	61	4.3	NA	58	NA	NA	24	0.77	NA	NA	NA	636	NA
3S/1E 12G 1	9-Sep-13	NA	1101	NA	58	73	68	4.7	NA	57	NA	NA	35	0.84	NA	NA	NA	668	NA
3S/1E 12H 4	27-Mar-13	18.6	681	7.5	45	51	27	1.5	289	43	55	14.08	27.8	0.25	<0.001	<0.05	<0.01	407	321
3S/1E 12H 5	27-Mar-13	19.0	707	7.5	47	48	28	1.7	299	44	50	14.57	30.0	0.27	<0.001	<0.05	<0.01	411	316
3S/1E 12H 6	27-Mar-13	19.1	682	7.8	47	46	32	2.0	321	42	39	11.82	27.8	0.24	0.0012	<0.05	<0.01	407	308
3S/1E 12H 7	27-Mar-13	20.8	436	8.4	6	7	96	0.6	198	17	34	5.36	23.5	0.42	0.028	<0.05	0.01	292	42
3S/1E 12K 2	27-Mar-13	17.6	583	7.5	36	43	23	1.3	218	39	58	7.93	23.5	0.25	<0.001	<0.05	<0.01	340	268
3S/1E 12K 3	27-Mar-13	17.9	828	7.3	54	59	33	1.6	308	51	83	24.58	25.7	0.32	<0.001	<0.05	<0.01	484	377
3S/1E 12K 4	27-Mar-13	19.1	321	7.6	18	17	22	1.0	141	7.7	18	18.20	27.8	0.13	<0.001	<0.05	<0.01	200	115
3S/1E 13P 5	28-Mar-13	16.1	603	7.6	43	21	45	1.4	162	55	82	0.97	15.0	0.32	<0.001	<0.05	<0.01	344	196
3S/1E 13P 6	28-Mar-13	17.2	714	7.4	79	27	27	1.6	270	50	67	3.41	21.4	0.29	<0.001	<0.05	0.015	410	310
3S/1E 13P 7	28-Mar-13	19.1	514	7.7	45	17	45	1.8	243	50	18	0.66	23.5	0.19	<0.001	<0.05	0.032	322	180
3S/1E 13P 8	28-Mar-13	18.8	619	7.5	58	18	41	1.7	234	49	55	4.96	25.7	0.25	<0.001	<0.05	0.074	369	221
3S/1E 14B 1	25-Apr-13	16.4	726	7.5	73	32	30	1.6	259	51	77	4.47	19.7	0.29	<0.001	<0.05	<0.01	417	315
3S/1E 14D 2	25-Apr-13	17.0	843	7.3	76	36	48	1.6	292	55	98	14.44	19.5	0.38	<0.001	0.055	<0.01	493	337
3S/1E 15J 3	25-Apr-13	18.3	982	7.2	87	49	49	2.5	374	25	129	3.50	14.3	0.40	<0.001	2.2	0.11	544	420
3S/1E 15M 3	6-Mar-13	18.1	715	7.3	55	21	66	2.0	253	37	84	9.34	27.8	0.23	<0.001	<0.05	<0.01	427	226
3S/1E 16A 2	22-Oct-12	17.1	731	8.2	72	26	39	1.2	272	41	69	9.17	20.1	0.44	<0.001	<0.05	<0.01	415	289
3S/1E 16A 4	5-Jun-13	16.8	756	8.2	84	26	31	1.7	294	46	72	7.75	20.3	0.34	<0.001	<0.05	<0.01	438	316
3S/1E 16B 1	22-Apr-13	19.5	548	8.2	58	21	32	1.7	248	39	33	8.68	23.5	0.24	0.0013	<0.05	<0.01	343	229
3S/1E 16C 2	6-Mar-13	17.6	1132	7.2	118	52	51	2.2	441	75	120	15.06	23.5	0.44	<0.001	<0.05	<0.01	674	511
3S/1E 16C 3	6-Mar-13	17.9	851	7.4	100	35	33	2.2	335	54	91	14.88	25.7	0.25	<0.001	<0.05	<0.01	521	396
3S/1E 16C 4	6-Mar-13	18.2	731	7.5	85	27	32	2.0	302	47	72	11.16	25.7	0.25	<0.001	<0.05	<0.01	451	326
3S/1E 16E 4	20-Mar-13	18.0	1043	7.2	94	44	71	2.1	445	66	95	23.87	21.0	0.55	<0.001	<0.05	<0.01	637	418
3S/1E 16L 5	26-Nov-12	16.4	1059	7.3	110	50	55	2.1	426	64	115	18.69	21.4	0.55	<0.001	0.084	<0.01	647	481
3S/1E 16L 7	5-Nov-12	20.6	995	7.5	118	35	50	1.9	392	59.9	111	15.28	23.5	0.46	<0.001	<0.05	<0.01	609	442
3S/1E 16P 5	18-Feb-13	16.3	573	6.6	38	26	43	1.9	199	32	68	3.28	14.3	0.30	<0.001	<0.05	<0.01	324	201
3S/1E 16P 5	24-Apr-13	16.3	579	6.8	37	26	41	1.8	204	28	71	1.15	15.0	0.23	<0.001	<0.05	<0.01	321	199
3S/1E 17B 4	3-Jun-13	18.4	1430	7.3	154	70	52	2.4	641	67	133	35.03	23.5	0.50	0.0011	<0.05	<0.01	854	674
3S/1E 17D 3	4-Jun-13	17.0	1486	7.3	151	86	57	2.5	687	96	111	42.82	25.7	0.47	0.0011	0.098	<0.01	911	732
3S/1E 17D 4	4-Jun-13	16.6	1216	8.5	15	4	226	0.7	275	23	219	<0.44	21.4	2.21	0.008	<0.05	<0.01	653	55
3S/1E 17D 5	4-Jun-13	16.9	1168	8.5	18	10	208	0.6	271	22	214	<0.44	15.8	2.20	0.058	<0.05	0.23	630	84
3S/1E 17D 6	4-Jun-13	16.5	1491	8.5	23	6	272	0.9	284	16	322	<0.44	21.4	1.36	0.0091	<0.05	0.057	809	81
3S/1E 17D 7	4-Jun-13	16.6	1365	8.8	14	6	243	1.8	132	<1.0	361	<0.44	4.3	1.56	0.04	<0.05	0.029	703	60
3S/1E 17D11	24-Jun-13	17.6	1415	8.2	19	5	264	0.8	297	2.7	283	<0.44	23.5	2.09	0.01	<0.05	0.038	749	67
3S/1E 17D12	28-Jun-13	NA	823	7.5	80	39	39	1.5	360	50	58	17.67	23.5	0.34	0.0011	<0.01	<0.01	487	362
3S/1E 18A 6	6-May-13	17.6	996	7.6	81	48	75	1.8	411	79	87	13.82	27.8	0.52	0.0018	<0.01	<0.01	617	398
3S/1E 18A 6	23-May-13	17.1	1017	7.6	83	50	76	1.8	421	78	87	14.08	23.5	0.51	0.002	<0.005	<0.01	622	414
3S/1E 18A 6	4-Jun-13	18.0	1007	7.6	82	45	71	1.8	421	74	83	13.37	25.7	0.50	0.0018	<0.005	<0.01	605	388
3S/1E 18A 6	28-Jun-13	NA	1017	7.5	82	45	75	1.9	427	74	83	13.55	25.7	0.53	0.0016	<0.01	<0.01	612	390
3S/1E 18A 6	5-Aug-13	17.9	1013	7.5	81	48	71	1.8	422	76	84	13.82	23.5	0.52	0.0025	<0.005	<0.01	608	402

NA = Not Analyzed



FIGURE 2.4-13
TABLE OF WATER QUALITY RESULTS
2013 WATER YEAR (Oct 2012 to Sep 2013)

SITE ID	DATE	TEMP. °C	EC umhos/cm	pH	Mineral Constituents (mg/L)									Select Metals (mg/L)				TDS mg/L	Hard mg/L
					Ca	Mg	Na	K	HCO3	SO4	Cl	NO3	SiO2	B	As	Fe	Mn		
3S/1E 18E 4	23-Apr-13	16.3	750	7.6	63	21	73	0.7	314	65	47	<0.44	25.7	0.47	0.0012	0.25	0.8	451	243
3S/1E 18J 2	18-Feb-13	17.0	3834	7.2	210	271	361	2.0	1026	708	520	<0.44	23.5	1.7	0.019	<0.25	2.9	2602	1643
3S/1E 19C 4	24-Apr-13	16.6	1054	7.2	106	55	46	2.1	439	130	68	12.36	23.5	0.34	0.0011	0.22	0.046	660	490
3S/1E 19K 1	23-Apr-13	17.3	1171	7.4	86	47	119	1.5	573	99	61	<0.44	17.3	0.53	0.0031	<0.05	1.4	714	407
3S/1E 20B 2	11-Apr-13	NA	923	7.3	94	37	59	1.6	380	57	92	17.94	27.8	0.45	<0.001	<0.05	<0.01	574	387
3S/1E 20C 3	11-Apr-13	NA	1133	7.7	110	57	57	2.4	475	71	95	22.63	19.7	0.69	<0.001	<0.05	0.011	671	507
3S/1E 20C 7	19-Feb-13	16.8	758	7.4	76	27	48	2.3	314	53	69	4.87	17.1	0.35	<0.001	<0.05	<0.01	452	300
3S/1E 20C 7	25-Apr-13	16.7	755	7.2	67	31	51	2.1	307	48	67	4.92	15.0	0.33	<0.001	<0.05	<0.01	438	296
3S/1E 20C 8	19-Feb-13	17.2	1008	7.5	114	46	38	2.2	439	52	93	24.49	21.4	0.23	<0.001	<0.05	<0.01	608	474
3S/1E 20C 9	20-Feb-13	15.9	983	7.3	112	43	42	2.4	408	63	85	15.85	23.5	0.38	<0.001	<0.05	0.017	588	459
3S/1E 20J 4	23-Apr-13	17.9	1127	6.8	65	38	128	1.0	423	71	116	16.87	34.2	0.51	<0.001	<0.05	<0.01	678	320
3S/1E 20M11	23-Apr-13	17.1	1097	7.0	98	54	58	2.0	453	68	98	21.61	23.5	0.41	<0.001	<0.05	0.014	646	467
3S/1E 20Q 2	23-Apr-13	17.5	1967	7.1	136	133	154	1.5	1065	167	99	<0.44	23.5	1.0	0.0012	2.3	2.2	1239	886
3S/1E 22D 2	18-Feb-13	18.9	1040	6.7	66	33	102	0.5	339	67	115	48.27	40.7	<0.10	<0.001	<0.05	0.015	639	300
3S/1E 23J 1	25-Apr-13	17.5	874	6.7	52	38	55	1.0	167	14	179	28.17	36.4	0.12	<0.001	<0.05	<0.01	486	286
3S/1E 25C 3	25-Apr-13	17.7	763	7.2	51	28	62	1.2	256	29	96	17.49	25.7	0.29	<0.001	<0.05	<0.01	437	243
3S/1E 28E 9	2-Jan-13	17.1	1012	6.9	64	27	117	1.4	378	35	95	48.09	27.8	0.49	<0.001	<0.05	<0.01	602	270
3S/1E 28K 2	29-Nov-12	12.9	1181	7.4	75	39	134	1.4	512	34	120	12.05	32.1	1.4	0.012	<0.05	<0.01	701	347
3S/1E 28K 3	29-Nov-12	16.5	1162	7.0	86	38	125	1.4	519	34	111	8.90	32.1	1.2	0.011	<0.05	<0.01	692	372
3S/1E 28K 4	29-Nov-12	18.5	1158	7.0	80	43	128	1.4	517	34	109	9.61	32.1	1.2	0.011	<0.05	<0.01	692	376
3S/1E 28L 8	20-Dec-12	18.6	1156	7.1	76	39	135	1.2	522	42	96	24.71	23.5	0.65	<0.001	<0.05	<0.01	695	348
3S/1E 28M 4	13-Dec-12	16.1	1101	7.1	74	30	126	1.3	480	41	90	21.04	25.7	0.56	<0.001	<0.05	<0.01	646	308
3S/1E 28N13	8-Nov-12	19.6	787	7.7	50	22	96	1.3	333	6.3	97	<0.44	21.4	0.50	0.0017	2.7	0.22	459	215
3S/1E 28N15	13-Nov-12	16.3	1109	7.3	72	36	137	1.2	468	41	116	29.10	23.5	0.59	<0.001	<0.05	<0.01	687	328
3S/1E 28N16	8-Nov-12	17.6	1268	7.4	84	38	132	1.1	355	22	225	3.99	27.8	0.48	<0.001	<0.05	0.032	709	365
3S/1E 28N17	12-Dec-12	18.1	1443	7.1	80	46	170	1.6	571	46	179	67.76	27.8	0.64	<0.001	<0.05	<0.01	900	388
3S/1E 28P 2	26-Nov-12	16.8	1793	7.4	126	65	184	1.5	579	65	246	79.71	25.7	0.92	0.0016	<0.05	<0.01	1079	585
3S/1E 28P25	26-Nov-12	19.4	1185	7.5	65	22	176	1.4	420	44	145	51.81	21.4	2.7	0.0011	<0.05	0.44	734	254
3S/1E 28P26	8-Nov-12	16.6	1778	7.5	114	71	190	1.6	556	72	245	100.97	25.7	0.89	0.0011	<0.05	<0.01	1096	580
3S/1E 28P27	26-Nov-12	18.2	1058	7.4	72	35	133	1.2	498	31	92	10.85	27.8	0.69	0.0029	<0.05	<0.01	649	323
3S/1E 28P28	29-Nov-12	18.3	1461	7.2	105	52	163	1.7	584	55	162	70.86	25.7	0.95	0.0011	<0.05	<0.01	923	475
3S/1E 28P29	19-Nov-12	17.6	1487	7.1	100	56	154	1.4	444	47	182	124.00	27.8	1.0	0.0012	<0.05	<0.01	911	479
3S/1E 28P30	13-Dec-12	17.6	1221	7.2	63	32	159	1.4	501	49	107	40.43	23.5	0.76	<0.001	<0.05	<0.01	723	291
3S/1E 29H 6	29-Nov-12	18.1	1455	6.9	97	53	132	1.2	318	37	268	31.53	30.0	0.33	<0.001	<0.05	<0.01	806	461
3S/1E 29M 4	23-Apr-13	15.8	812	6.9	67	45	40	2.9	286	125	48	<0.44	32.1	0.29	0.025	8.6	0.45	501	354
3S/1E 29P 2	23-Apr-13	16.9	1860	7.4	109	95	152	3.1	679	70	251	<0.44	21.4	1.4	0.0018	0.36	0.78	1037	662
3S/1E 33B 1	13-Nov-12	18.9	871	7.6	68	27	92	0.8	377	14	83	29.36	25.7	2.5	0.0015	<0.05	<0.01	527	281
3S/1E 33C 4	19-Nov-12	16.8	1182	7.4	79	39	134	1.1	426	23	177	29.01	30.0	1.8	0.001	<0.05	0.04	723	359
3S/1E 33C 8	18-Dec-12	16.3	666	7.5	41	23	77	1.5	281	17	72	4.47	25.7	0.46	<0.001	<0.05	<0.01	401	195
3S/1E 33C11	8-Nov-12	18.8	1340	7.6	73	35	195	1.0	553	30	167	36.49	27.8	1.7	0.0028	<0.05	0.0095	839	327
3S/1E 33C12	15-Nov-12	20.4	924	8.0	22	13	179	1.9	358	47	119	0.49	16.7	13	0.0062	0.15	0.1	579	110
3S/1E 33C14	5-Dec-12	14.9	1865	8.2	116	73	210	1.9	550	55	361	5.98	25.7	3.7	0.001	<0.05	<0.01	1127	589
3S/1E 33C16	13-Dec-12	16.5	1031	7.5	75	22	124	0.9	431	19	96	34.76	25.7	3.1	0.0017	<0.05	<0.01	611	276
3S/1E 33D 1	19-Dec-12	14.6	1080	7.8	40	35	153	2.5	318	162	100	<0.44	15.6	5.5	<0.001	6.3	2.9	666	242
3S/1E 33D 2	20-Nov-12	15.2	1099	8.0	38	30	177	2.6	372	95	145	1.73	16.1	3.3	0.0035	<0.05	0.011	692	220
3S/1E 33D 8	19-Dec-12	17.4	1155	7.5	50	38	136	3.2	302	71	184	<0.44	27.8	4.1	0.0016	3.1	0.51	659	280
3S/1E 33D14	20-Nov-12	17.0	1393	7.2	70	59	163	3.0	432	84	206	<0.44	23.5	1.9	0.0069	1.6	1.1	822	418
3S/1E 33D16	26-Nov-12	19.4	1568	7.3	98	61	152	2.7	395	22	301	7.53	19.9	2.2	0.0012	0.63	0.26	859	497
3S/1E 33D17	5-Dec-12	18.3	1372	8.1	59	37	192	2.7	407	82	209	<0.44	17.3	7.3	0.0015	0.089	0.16	804	301
3S/1W 1B 9	4-Jun-13	17.2	859	7.8	44	17	113	1.1	341	36	97	<0.44	21.4	0.41	0.0054	<0.05	0.11	499	182

NA = Not Analyzed

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Figure 2.4-13
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FIGURE 2.4-13
TABLE OF WATER QUALITY RESULTS
2013 WATER YEAR (Oct 2012 to Sep 2013)

SITE ID	DATE	TEMP. °C	EC umhos/cm	pH	Mineral Constituents (mg/L)									Select Metals (mg/L)				TDS mg/L	Hard mg/L
					Ca	Mg	Na	K	HCO ₃	SO ₄	Cl	NO ₃	SiO ₂	B	As	Fe	Mn		
3S/1W 1B10	4-Jun-13	18.0	842	7.8	48	12	118	0.6	380	<1.0	95	<0.44	27.8	0.46	0.12	0.35	0.17	491	172
3S/1W 1B11	4-Jun-13	19.4	923	8.0	28	9	149	0.8	268	<1.0	167	<0.44	25.7	0.58	0.022	0.095	0.042	514	107
3S/1W 1J 1	10-Dec-12	19.46	2875	6.53	NA	NA	NA	NA	NA	NA	110	NA	NA	NA	0.031	NA	NA	2062	NA
3S/1W 1J 1	10-Dec-12	19.5	2928	7.8	NA	NA	NA	NA	NA	NA	110	NA	NA	NA	0.031	NA	NA	2062	NA
3S/1W 1J 1	28-May-13	18.56	2609	6.35	NA	NA	NA	NA	NA	NA	174.9	NA	NA	NA	0.03	NA	NA	2054	NA
3S/1W 1J 2	13-Dec-12	16.68	2662	6.99	NA	NA	NA	NA	NA	NA	195	NA	NA	NA	0.0086	NA	NA	2040	NA
3S/1W 1J 2	28-May-13	19.46	2401	7.3	NA	NA	NA	NA	NA	NA	147.5	NA	NA	NA	0.0091	NA	NA	1830	NA
3S/1W 2A 2	12-Dec-12	18.7	1361	7.0	181	28	104	<0.5	618	70	149	7.35	21.4	0.40	0.0015	<0.05	0.015	865	566
3S/1W 12A 9	15-Oct-12	23.7	5631	7.4	538	210	379	<2.5	285	68	1846	18.42	27.8	<0.50	<0.005	0.62	1.8	3228	2210
3S/1W 12A 9	15-Oct-12	23.66	6256	6.69	538	210	379	<2.5	285	68	1846	18.42	27.8	<0.50	<0.005	0.62	1.8	3228	2210
3S/1W 12A 9	21-May-13	19.26	4199	6.78	NA	NA	NA	NA	NA	NA	11254	NA	NA	NA	0.0025	NA	NA	4328	NA
3S/1W 12A10	24-Oct-12	21.26	2674	7	NA	NA	NA	NA	NA	NA	327	NA	NA	NA	<0.0018	NA	NA	1700	NA
3S/1W 12A10	21-May-13	22.18	1986	7.25	NA	NA	NA	NA	NA	NA	10611	NA	NA	NA	NA	NA	NA	1818	NA
3S/1W 12A10	22-May-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0065	NA	NA	NA	NA
3S/1W 12B 2	12-Dec-12	19.4	1009	6.9	104	29	56	<0.5	329	128	86	19.66	34.2	0.49	<0.001	<0.05	1.6	619	381
3S/1W 12J 1	24-Apr-13	20.1	1640	7.5	109	38	208	0.8	473	271	154	1.95	27.8	0.69	0.0029	<0.05	0.6	1045	431
3S/1W 13J 1	23-Apr-13	17.4	962	6.7	100	43	38	<0.5	327	111	82	18.42	25.7	0.19	<0.001	<0.05	<0.01	579	426
3S/2E 1F 2	18-Mar-13	17.4	2783	7.6	127	51	402	1.5	230	214	670	19.18	49.2	7.20	<0.005	<0.25	<0.05	1648	527
3S/2E 2B 2	18-Mar-13	19.9	1778	7.6	128	34	183	1.4	263	94	386	29.10	40.7	1.66	0.0023	<0.05	0.016	1027	460
3S/2E 3A 1	18-Mar-13	18.1	1123	8.0	66	31	123	1.2	295	74	159	27.19	40.7	1.39	0.0037	<0.05	<0.01	670	294
3S/2E 3K 3	19-Mar-13	18.8	993	8.2	60	40	84	1.7	306	60	108	39.86	30.0	1.29	0.0019	<0.05	0.01	579	315
3S/2E 3K 3	12-Sep-13	18.5	179	7.3	14	5	15	0.8	60	10	18	7.00	4.9	0.22	<0.001	<0.1	<0.01	104	55
3S/2E 5N 1	22-Apr-13	20.0	799	7.7	55	51	37	1.7	296	41	71	45.17	34.2	0.50	<0.001	<0.05	<0.01	483	347
3S/2E 7C 2	15-Nov-12	NA	1214	NA	59	91	61	5.1	NA	68	116	NA	39	0.69	NA	NA	NA	747	NA
3S/2E 7C 2	11-Mar-13	NA	1227	NA	59	91	58	5.5	NA	78	117	NA	39	0.27	NA	NA	NA	737	NA
3S/2E 7C 2	10-Jun-13	NA	1246	NA	60	92	61	5.3	NA	75	NA	NA	39	0.71	NA	NA	NA	732	NA
3S/2E 7C 2	9-Sep-13	NA	1250	NA	58	90	60	5.1	NA	70	NA	NA	39	0.36	NA	NA	NA	1249	NA
3S/2E 7H 2	28-Mar-13	19.6	1211	7.2	68	66	90	2.7	429	141	85	58.01	32.1	0.64	0.001	<0.05	0.1	754	441
3S/2E 7H 2	12-Sep-13	19.5	1237	7.2	61	74	118	2.8	450	152	90	55.80	32.1	0.70	0.0013	<0.1	0.1	808	458
3S/2E 8H 2	25-Mar-13	20.7	825	7.1	30	63	45	0.7	263	56	93	26.35	32.1	0.31	0.0012	<0.05	<0.01	476	332
3S/2E 8H 3	26-Mar-13	18.8	1120	7.3	79	84	47	1.3	405	64	120	55.80	30.0	0.45	<0.001	<0.05	<0.01	681	541
3S/2E 8H 4	26-Mar-13	19.8	1115	7.7	57	51	100	1.8	328	28	190	22.81	23.5	0.51	0.0032	<0.05	<0.01	637	351
3S/2E 8K 2	26-Mar-13	19.4	1016	7.4	63	77	40	1.6	371	64	99	36.71	30.0	0.42	<0.001	<0.05	<0.01	595	472
3S/2E 9Q 4	19-Mar-13	19.0	1042	7.5	50	84	55	1.1	345	71	114	32.99	32.1	0.66	<0.001	<0.05	<0.01	611	472
3S/2E 10F 3	28-Mar-13	18.3	1501	7.2	90	95	85	0.9	531	110	166	38.26	34.2	1.24	0.0014	<0.05	<0.01	881	614
3S/2E 10Q 1	19-Mar-13	19.9	1559	7.2	82	109	95	0.9	541	99	173	47.39	34.2	1.41	0.001	<0.05	<0.01	907	654
3S/2E 10Q 2	9-Jan-13	16.4	706	8.0	54	29	50	2.3	192	69	86	24.89	25.7	0.64	<0.001	<0.05	<0.01	437	252
3S/2E 11C 1	20-Mar-13	18.3	969	7.6	92	31	71	2.0	404	43	100	19.35	32.1	0.49	0.0011	<0.05	<0.01	591	359
3S/2E 12C 4	9-Jan-13	13.5	1058	8.2	48	8	150	2.0	96	148	189	15.72	34.2	3.5	0.0028	<0.05	<0.01	644	153
3S/2E 12J 3	9-Jan-13	15.2	692	8.2	44	10	72	4.0	53	59	150	1.59	21.4	0.44	0.0015	<0.05	<0.01	389	151
3S/2E 14A 3	24-Apr-13	18.9	977	7.4	91	35	64	2.4	389	45	86	38.31	30.0	0.49	0.0011	<0.05	0.055	584	373
3S/2E 14B 1	20-Mar-13	16.7	891	7.5	81	35	68	2.0	308	44	92	41.27	27.8	0.61	0.0012	<0.05	<0.01	544	348
3S/2E 15E 2	4-Jun-13	19.5	1064	7.7	55	81	46	1.3	406	81	98	39.68	27.8	0.49	0.0011	0.083	<0.01	631	473
3S/2E 15R17	25-Mar-13	18.8	967	7.7	48	81	36	1.5	350	57	96	58.01	30.0	0.53	0.0014	<0.05	<0.01	581	451
3S/2E 15R18	25-Mar-13	19.6	687	7.7	56	43	24	1.3	313	46	43	4.74	27.8	0.21	0.0013	<0.05	0.17	401	318
3S/2E 16A 3	20-Mar-13	15.7	1072	7.6	55	94	34	1.2	372	81	91	47.39	27.8	0.41	<0.001	<0.05	0.01	616	525
3S/2E 16E 4	24-Apr-13	17.4	607	7.2	30	35	42	2.3	200	35	78	4.47	18.8	0.26	<0.001	<0.05	<0.01	344	221
3S/2E 17E 2	24-Jun-13	17.9	652	7.5	34	30	45	5.1	215	33	71	2.26	12.4	0.22	<0.001	0.68	0.1	339	208
3S/2E 18E 1	26-Mar-13	17.7	550	7.6	46	36	20	1.8	207	37	54	5.14	25.7	0.23	<0.001	<0.05	<0.01	328	263
3S/2E 19D 7	27-Mar-13	17.6	1026	7.5	97	55	32	2.1	316	27	158	20.90	25.7	<0.10	<0.001	<0.05	<0.01	574	468

NA = Not Analyzed

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 7/21/2014

Figure 2.4-13
 Page 6 of 7

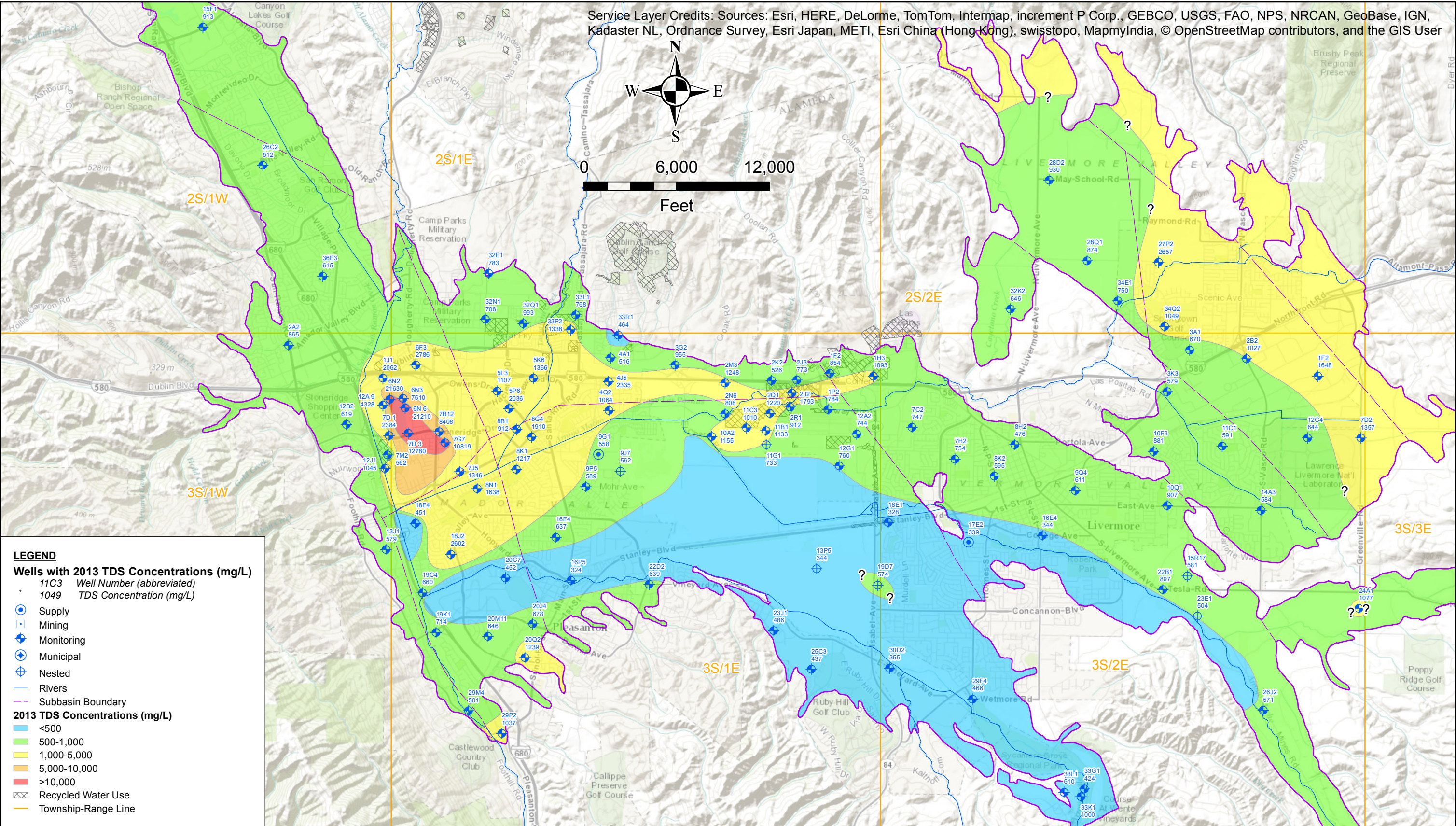
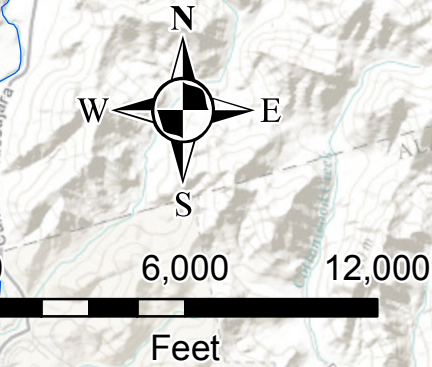


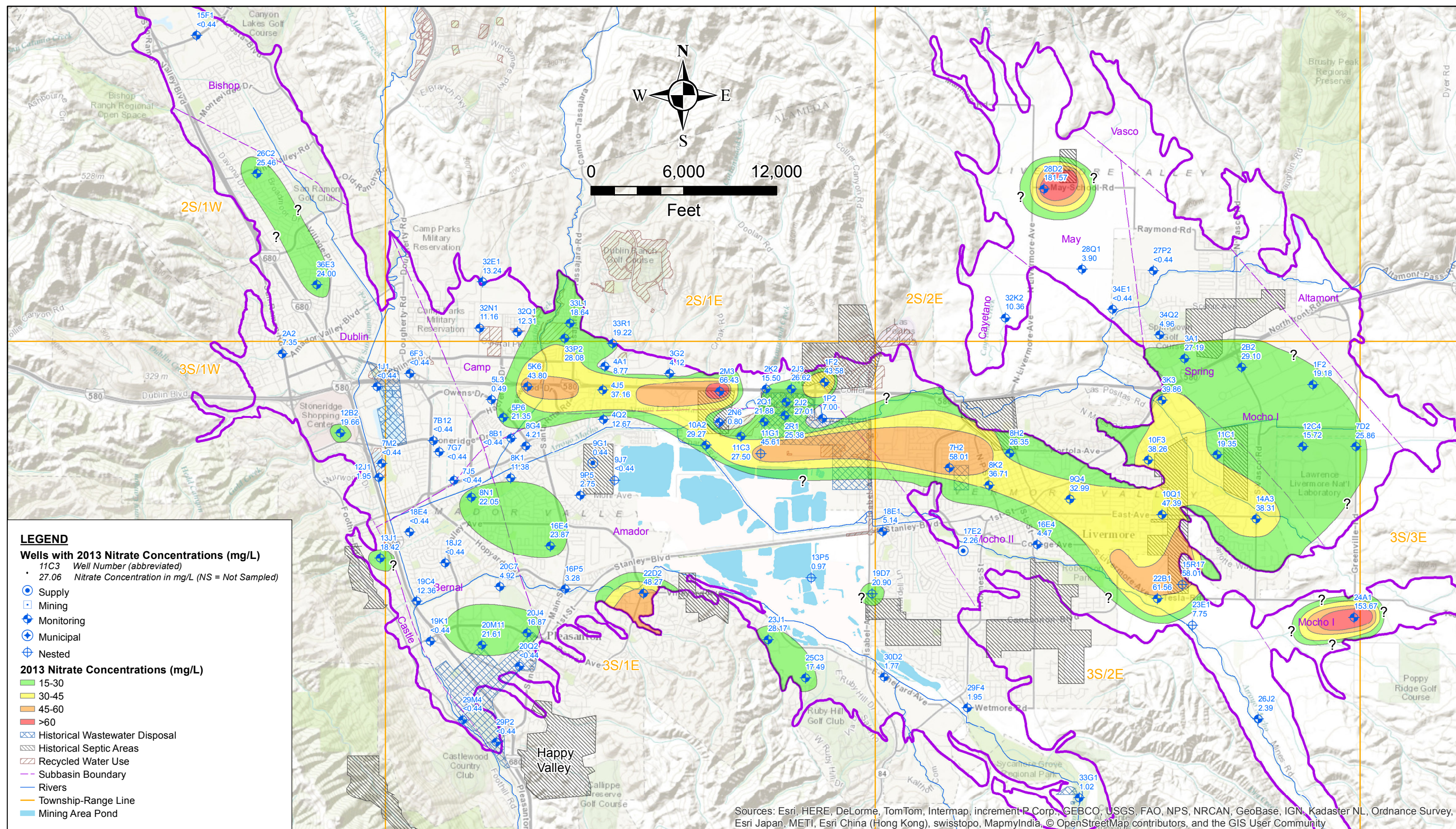
FIGURE 2.4-13
TABLE OF WATER QUALITY RESULTS
2013 WATER YEAR (Oct 2012 to Sep 2013)

SITE ID	DATE	TEMP. °C	EC umhos/cm	pH	Mineral Constituents (mg/L)									Select Metals (mg/L)				TDS mg/L	Hard mg/L
					Ca	Mg	Na	K	HCO ₃	SO ₄	Cl	NO ₃	SiO ₂	B	As	Fe	Mn		
3S/2E 19D 8	27-Mar-13	17.7	966	7.4	92	48	31	2.1	290	24	141	21.57	25.7	<0.10	<0.001	<0.05	<0.01	529	427
3S/2E 19D 8	3-Jun-13	17.8	1032	7.4	89	59	30	2.2	331	27	163	21.74	25.7	<0.10	<0.001	<0.05	<0.01	581	467
3S/2E 19D 9	27-Mar-13	18.4	448	7.5	40	17	25	1.3	126	8.5	45	55.36	25.7	<0.10	<0.001	<0.05	<0.01	280	168
3S/2E 19D10	27-Mar-13	19.0	732	7.3	65	28	43	1.7	209	32	98	53.14	27.8	<0.10	<0.001	<0.05	<0.01	452	276
3S/2E 20M 1	26-Mar-13	18.1	881	7.6	73	36	65	1.7	315	55	99	17.27	21.4	0.30	0.0012	<0.05	0.045	525	330
3S/2E 22B 1	25-Mar-13	17.3	1302	7.5	79	120	59	1.0	365	276	90	61.56	30.0	0.40	0.0011	<0.05	<0.01	897	692
3S/2E 23E 1	26-Mar-13	18.5	874	7.8	51	62	46	2.2	394	51	67	7.75	21.4	0.68	0.0018	<0.05	0.02	504	383
3S/2E 23E 2	26-Mar-13	18.6	1153	7.7	50	63	94	2.3	378	53	175	0.66	25.7	2.40	0.0027	<0.05	0.086	651	386
3S/2E 23E 2	24-Apr-13	19.4	1151	7.7	53	60	97	2.5	391	47	159	1.46	30.0	2.2	0.0022	<0.05	0.31	644	380
3S/2E 24A 1	19-Mar-13	18.4	1682	7.3	138	63	151	2.1	586	86	162	153.67	32.1	1.29	0.0011	<0.05	<0.01	1077	605
3S/2E 26J 2	26-Mar-13	16.0	986	7.6	53	80	52	2.5	489	68	56	2.39	14.3	0.75	<0.001	<0.05	0.042	571	461
3S/2E 29F 4	19-Feb-13	15.4	752	7.5	74	27	39	1.9	282	55	58	1.95	18.6	0.33	0.0036	0.074	0.086	415	294
3S/2E 29F 4	24-Apr-13	16.8	802	7.5	80	32	43	1.8	299	65	77	0.53	18.6	0.31	0.0032	0.19	0.096	466	330
3S/2E 30D 2	26-Mar-13	19.0	604	7.3	51	24	47	1.8	206	46	67	1.77	15.0	0.24	<0.001	<0.05	0.033	355	224
3S/2E 33G 1	19-Feb-13	10.1	639	7.4	45	22	51	2.2	169	73	79	1.02	13.3	0.33	0.0012	<0.05	<0.01	370	204
3S/2E 33G 1	24-Apr-13	16.3	722	7.4	52	23	60	2.9	169	89	99	<0.44	15.0	0.38	0.0016	<0.05	<0.01	424	225
3S/2E 33K 1	13-Dec-12	18.5	1500	7.4	NA	NA	NA	NA	NA	NA	230	NA	NA	NA	NA	NA	NA	860	NA
3S/2E 33K 1	14-Mar-13	15.5	1500	7.5	NA	NA	NA	NA	NA	NA	230	NA	NA	NA	NA	NA	NA	890	NA
3S/2E 33K 1	13-Jun-13	18	1600	7.4	NA	NA	NA	NA	NA	NA	250	NA	NA	NA	NA	NA	NA	1000	NA
3S/2E 33K 1	12-Sep-13	22	1500	7.2	NA	NA	NA	NA	NA	NA	240	NA	NA	NA	NA	NA	NA	930	NA
3S/2E 33L 1	13-Dec-12	18.5	930	6.8	NA	NA	NA	NA	NA	NA	110	NA	NA	NA	NA	NA	NA	490	NA
3S/2E 33L 1	14-Mar-13	13.5	940	6.9	NA	NA	NA	NA	NA	NA	130	NA	NA	NA	NA	NA	NA	540	NA
3S/2E 33L 1	13-Jun-13	17.5	990	6.7	NA	NA	NA	NA	NA	NA	150	NA	NA	NA	NA	NA	NA	610	NA
3S/2E 33L 1	12-Sep-13	21	1200	6.6	NA	NA	NA	NA	NA	NA	170	NA	NA	NA	NA	NA	NA	710	NA
3S/3E 7D 2	19-Mar-13	19.0	2196	7.6	126	53	291	2.7	250	267	423	25.86	44.9	4.73	0.0033	<0.1	<0.02	1357	533
MA-C 1	3-Oct-13	21.6	1563	8.3	131	34	179	3.5	412	88	259	<0.44	<1.1	1.00	0.0067	<0.1	<0.01	905	468
MA-K 15	3-Oct-13	21.4	729	8.8	30	33	76	3.9	207	46	107	<0.44	10.1	0.50	0.0048	<0.1	<0.01	420	212
MA-K 28	3-Oct-13	21.9	870	8.6	35	53	80	2.3	277	53	105	<0.44	18.8	0.72	0.0053	<0.1	0.012	494	306
MA-K 30_NE	3-Oct-13	22.1	2543	9.2	17	140	375	3.8	354	198	517	<0.44	2.4	3.57	0.025	0.35	0.012	1480	619
MA-K 30_SE	3-Oct-13	20.9	1310	9.8	28	69	167	1.3	168	97	243	<0.44	3.0	1.35	0.0088	<0.1	<0.01	790	357
MA-K 37	3-Oct-13	23.6	1025	8.9	23	66	110	2.7	291	73	168	<0.44	6.0	1.12	0.0046	<0.1	<0.01	614	331
MA-P 10	3-Oct-13	21.7	649	8.4	29	31	62	3.5	243	17	81	<0.44	<1.1	0.38	0.0026	<0.1	<0.01	349	201
MA-P 12	3-Oct-13	19.4	624	8.8	38	18	63	2.8	147	23	109	<0.44	14.6	0.23	0.0016	<0.1	<0.01	349	169
MA-P 27	3-Oct-13	21.8	656	8.6	34	32	65	1.8	160	56	110	<0.44	8.6	0.51	0.0036	0.11	<0.01	392	214
MA-P 28	3-Oct-13	21.8	943	8.6	55	32	100	3.1	234	49	174	<0.44	5.8	0.47	0.0045	<0.1	<0.01	543	268
MA-P 40	3-Oct-13	NA	9255	8.3	131	447	1860	11	1255	885	2220	<0.44	4.5	12.6	0.068	2.1	0.89	6199	2165
MA-P 41	3-Oct-13	22.7	901	8.9	29	48	94	3.0	220	43	171	<0.44	6.6	0.42	0.0038	<0.1	<0.01	519	270
MA-P 42	3-Oct-13	21.4	668	8.3	30	37	55	1.9	212	45	83	<0.44	16.3	0.37	0.0017	<0.1	<0.01	377	226
MA-P 43	3-Oct-13	21.7	618	8.4	38	19	61	2.5	118	56	105	<0.44	7.5	0.43	<0.001	0.14	<0.01	350	174
MA-P 44	3-Oct-13	22.1	616	8.5	34	23	60	2.3	123	52	99	<0.44	7.9	0.42	<0.001	<0.1	<0.01	342	178
MA-R 3	3-Oct-13	17.9	682	8.3	40	41	39	3.1	231	44	79	<0.44	16.7	0.31	0.0014	<0.1	<0.01	381	271
MA-R 4	3-Oct-13	20.8	682	8.5	40	44	38	2.4	232	43	77	<0.44	17.3	0.30	0.0016	<0.1	<0.01	383	283
MA-R 22	3-Oct-13	20.4	666	8.6	45	41	37	2.2	221	45	76	1.68	17.1	0.31	0.0017	<0.1	<0.01	382	282
MA-R 23	3-Oct-13	20.5	674	8.6	42	43	38	2.3	230	45	76	0.62	18.2	0.31	0.0015	<0.1	<0.01	387	285
MA-R 25	3-Oct-13	18.0	702	8.1	53	41	33	1.8	262	42	68	10.41	23.5	0.30	<0.001	<0.1	<0.01	405	301

NA = Not Analyzed

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ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR

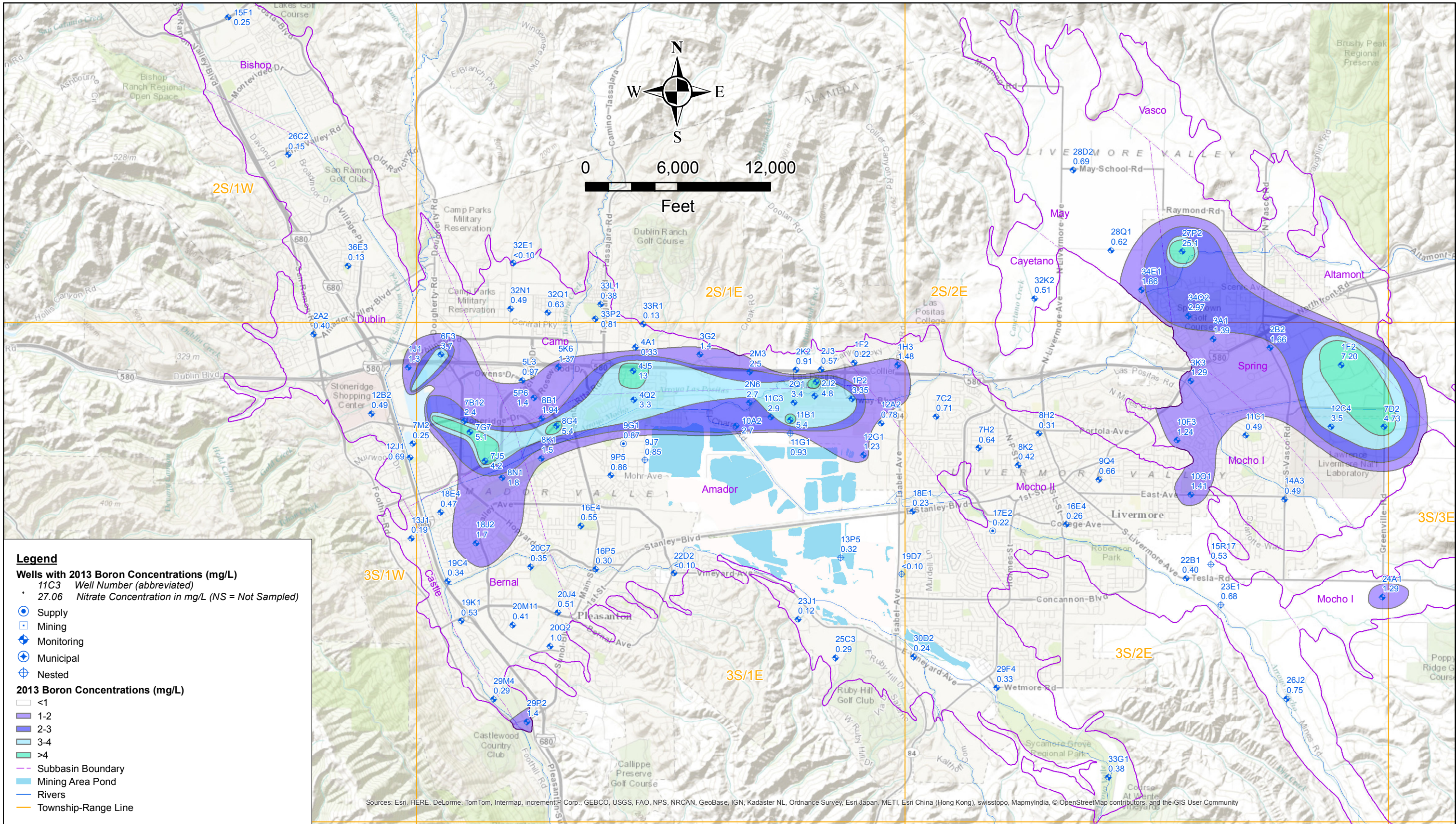
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SCALE: 1 in = 6,000 ft

DATE: Jul 21, 2014

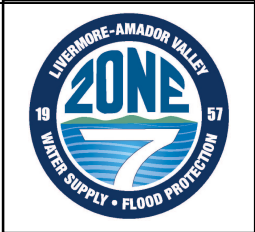
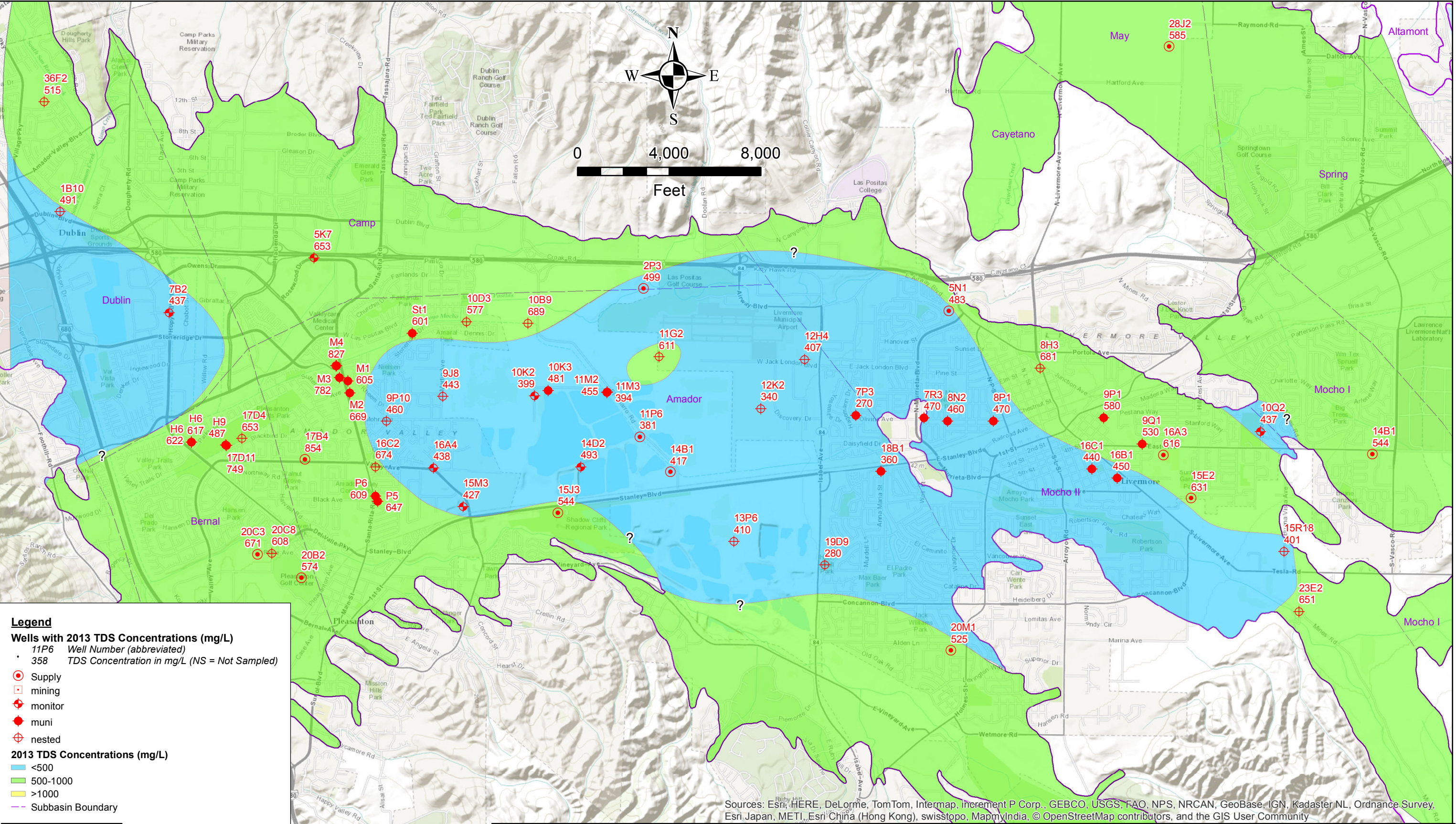
Figure 2.4-15
Nitrate Concentrations (mg/L); Upper Aquifer
2013 Water Year (Oct 2012 to Sep 2013)
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR	SCALE: 1 in = 6,000 ft
REVIEWED: CW	DATE: Jul 21, 2014
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Figure 2.4-16
Boron Concentrations (mg/L); Upper Aquifer
2013 Water Year (Oct 2012 to Sep 2013)
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

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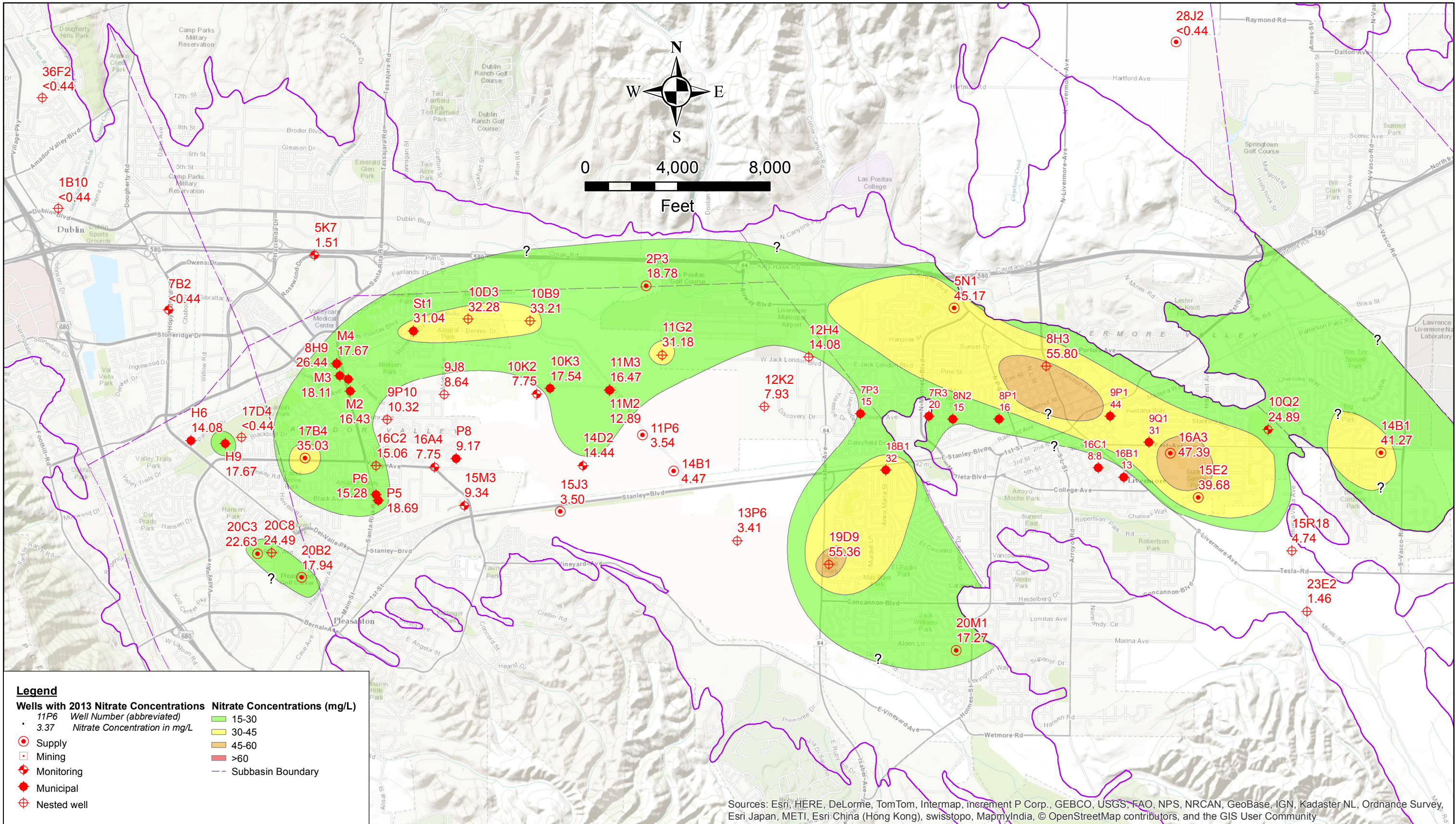
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SCALE: 1 in = 4,000 ft

DATE: Jul 21, 2014

Figure 2.4-17
TDS Concentrations (mg/L); Lower Aquifer
2013 Water Year (Oct 2012 to Sep 2013)
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: CW/TR

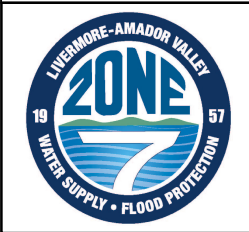
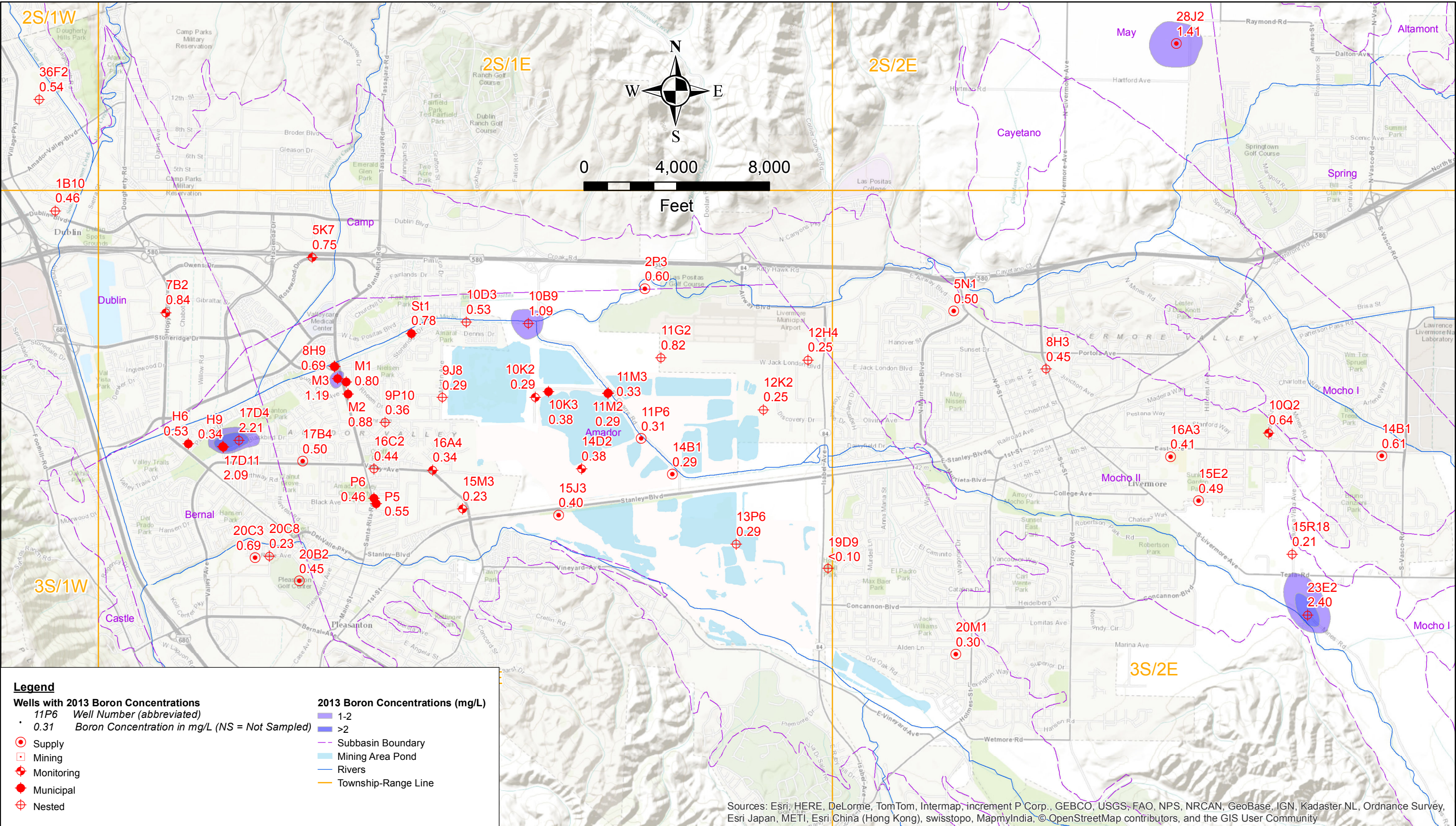
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SCALE: 1 in = 4,000 ft

DATE: Jul 21, 2014

Figure 2.4-18
Nitrate Concentrations (mg/L); Lower Aquifer
2013 Water Year (Oct 2012 to Sep 2013)
Livermore Valley Groundwater Basin



ZONE 7 WATER AGENCY
100 North Canyons Parkway
Livermore, CA

DRAWN: TR/CW	SCALE: 1 in = 4,000 ft
REVIEWED: TR	DATE: Jul 21, 2014
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Figure 2.4-19
Boron Concentrations (mg/L); Lower Aquifer
2013 Water Year (Oct 2012 to Sep 2013)
Livermore Valley Groundwater Basin



FIGURE 2.4-20
GRAPHS OF TDS CONCENTRATIONS IN KEY WELLS
1974 TO 2013 WATER YEARS (Oct 1973 to Sep 2013)

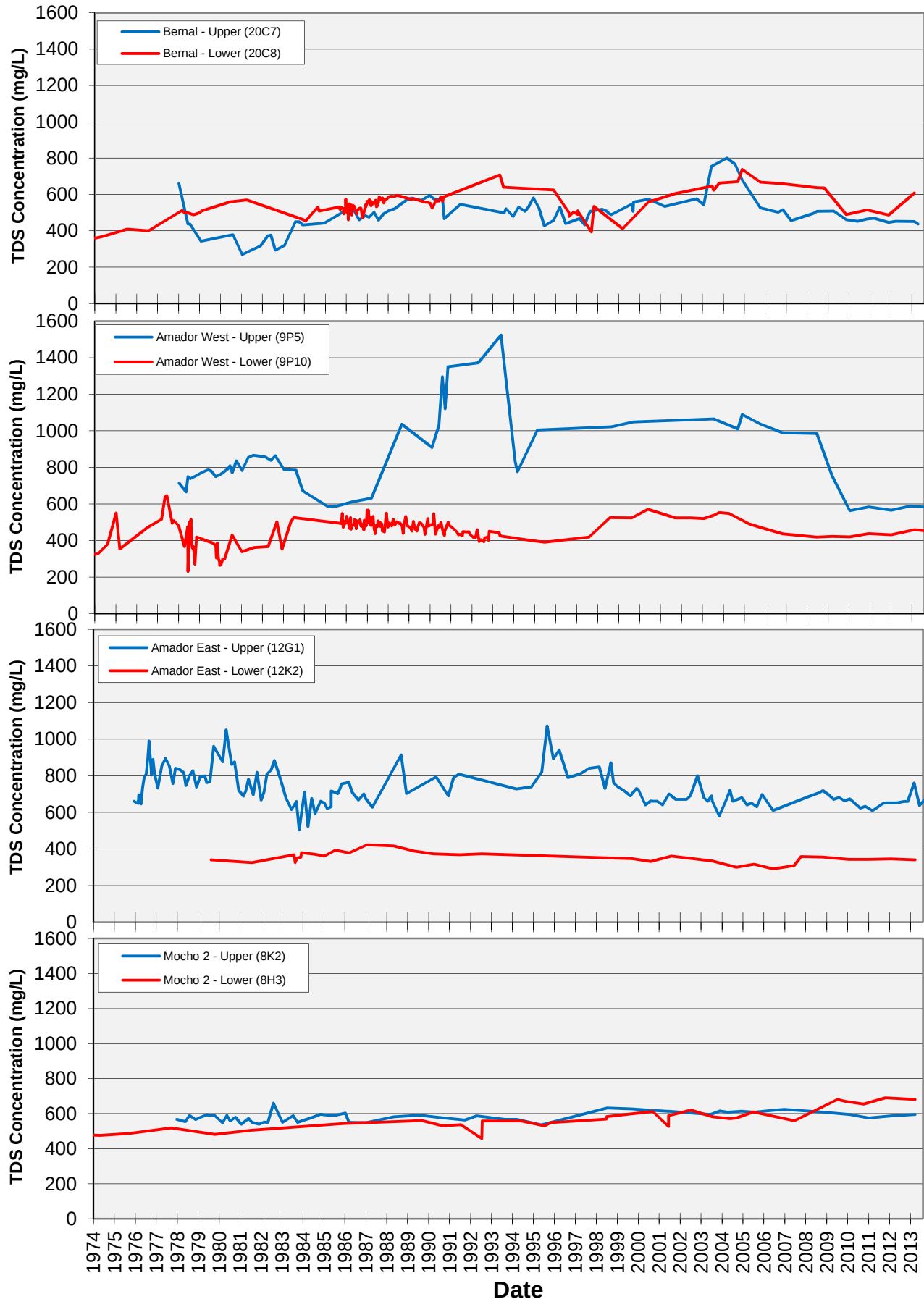
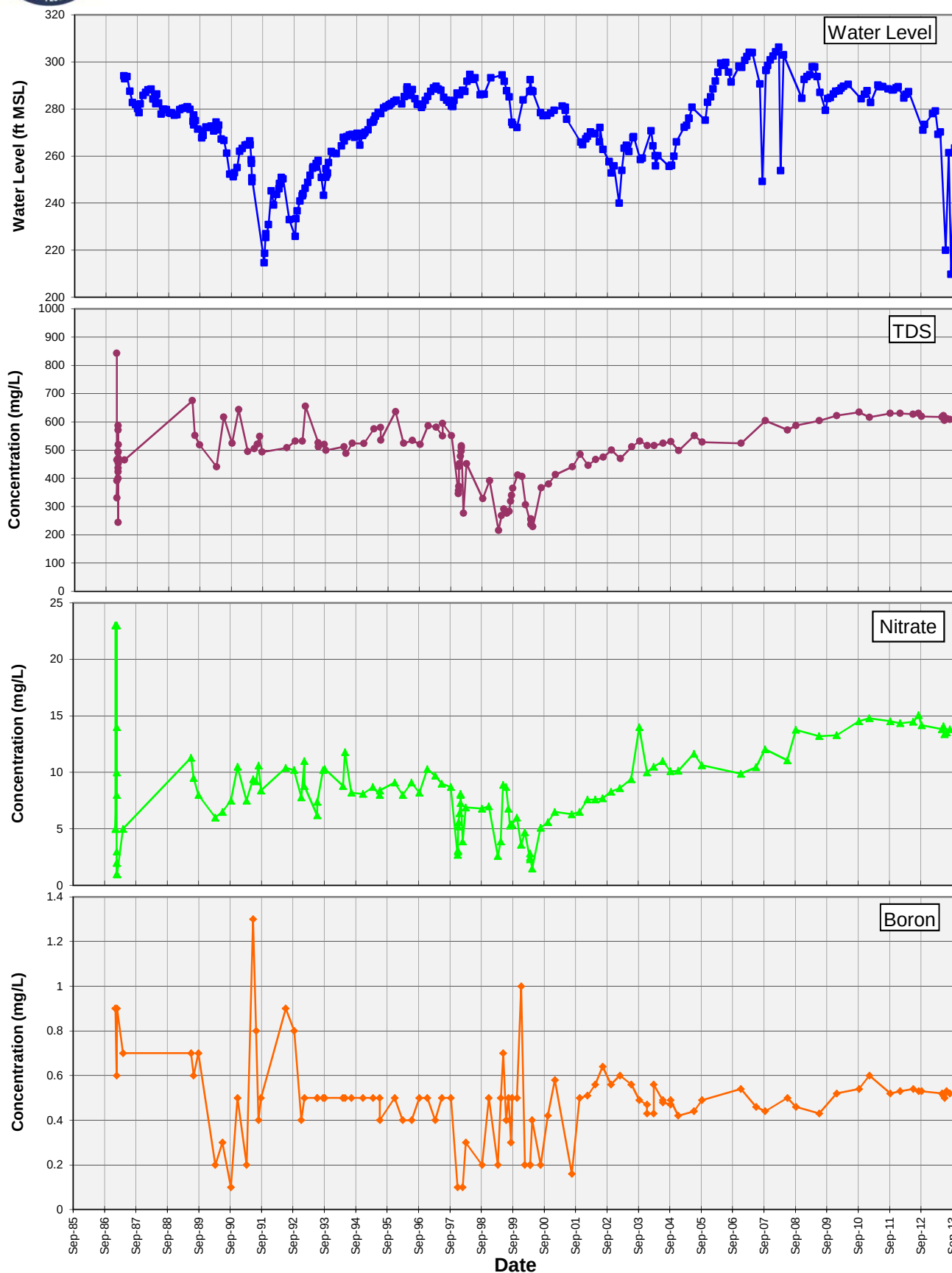




FIGURE 2.4-21
HYDRO-CHEMO GRAPH FOR 3S/2E 18A 6 (Hopyard 6)
BERNAL SUBBASIN - LOWER AQUIFER

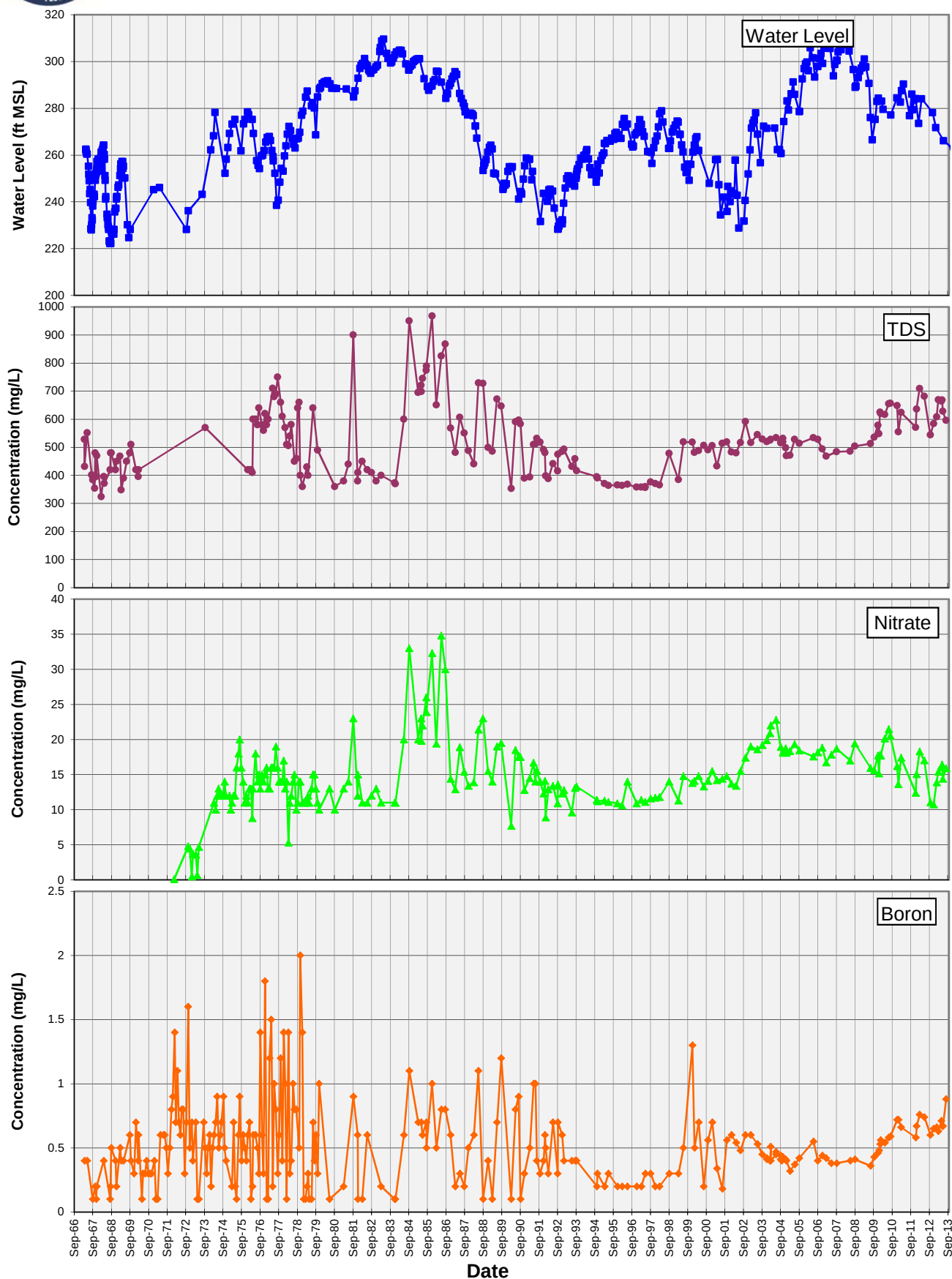


Well Depth = 273'; Wellhead Elevation = 466'; Well Screen Depth: 122 to 263' bgs.
 E:\MONITOR\GQ\2013WY\AnnualGQReport2013\Fig2.4-21to24-HydroChemoGraphs13.xls\Fig2.4-21-Grph

Figure 2.4-21



FIGURE 2.4-22
HYDRO-CHEMO GRAPH FOR 3S/1E 9M 3 (Mocho 2)
AMADOR WEST SUBBASIN - LOWER AQUIFER

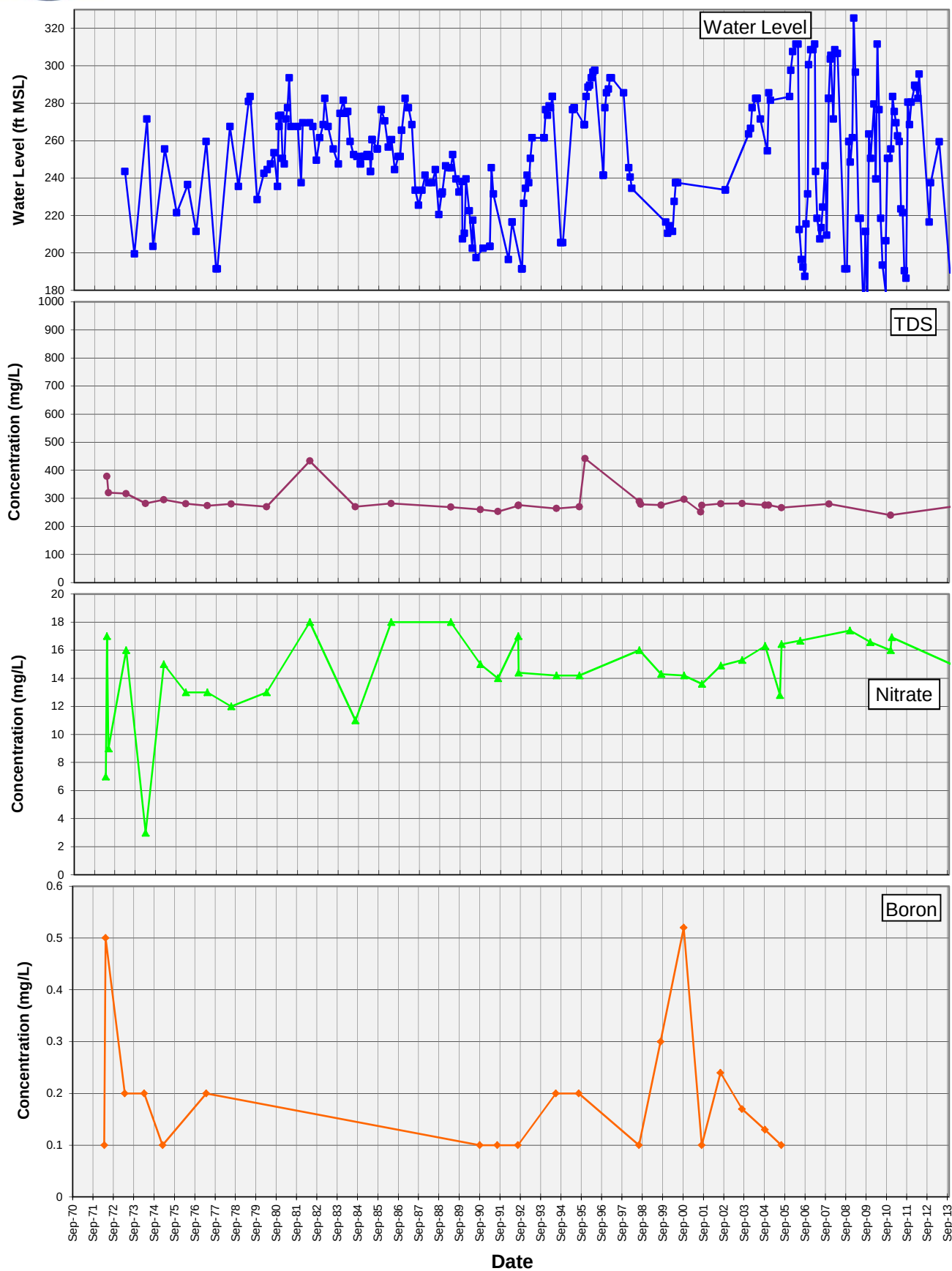


Well Depth = 575'; Wellhead Elevation = 344'; Well Screen Depth: 250 to 570' bgs.
 E:\MONITOR\GQ\2013WY\AnnualGQReport2013\Fig2.4-21to24-HydroChemoGraphs13.xls\Fig2.4-22-Grph

Figure 2.4-22



FIGURE 2.4-23
HYDRO-CHEMO GRAPH FOR 3S/2E 7P 3
AMADOR EAST SUBBASIN - LOWER AQUIFER

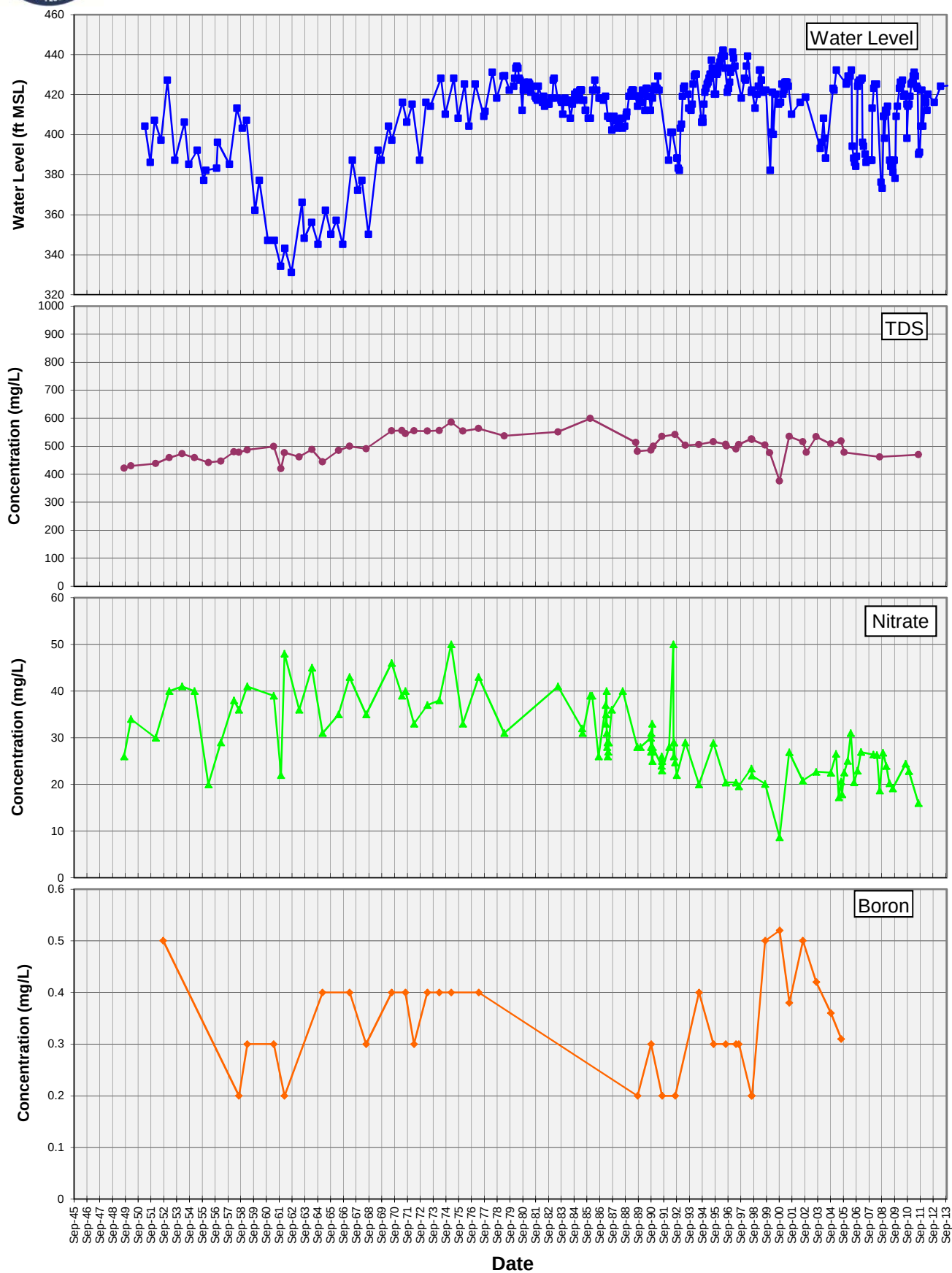


Well Depth = 510'; Wellhead Elevation = 429'; Well Screen Depth: 300 to 490' bgs.
 E:\MONITOR\GQ\2013WY\AnnualGQReport2013\Fig2.4-21to24-HydroChemoGraphs13.xls\Fig2.4-23-Grph

Figure 2.4-23



FIGURE 2.4-24
HYDRO-CHEMO GRAPH FOR 3S/2E 8P 1
MOCHO II SUBBASIN - LOWER AQUIFER



Well Depth = 273'; Wellhead Elevation = 466'; Well Screen Depth: 122 to 263' bgs.
 E:\MONITOR\GQ\2013WY\AnnualGQReport2013\Fig2.4-21to24-HydroChemoGraphs13.xls\Fig2.4-24-Grph

Figure 2.4-24



FIGURE 2.4-25
GRAPH OF MOCHO WELLFIELD MUNICIPAL WELLS
TDS CONCENTRATIONS AND VERTICAL GROUNDWATER GRADIENT
2013 WATER YEAR (Oct 2012 to Sep 2013)

