



LEGEND

- Well from MCWRA database (see Table 1 for well ID)
 - ▲ Well from Yates et al 2005
 - 50 Estimated Groundwater Elevation Contour Based on Jan 2001 data and contour map (Geosyntec, 2007), MCWRA database, and Yates et. al (2005).
- Well IDs for Supplemental Wells**
- | | |
|------------------|-------------------|
| 1) 16S/02E-03A01 | 6) 15S/03E-18F01 |
| 2) 16S/02E-02D05 | 7) 15S/03E-18C02 |
| 3) 16S/02E-02D01 | 8) 15S/03E-18B01 |
| 4) 15S/02E-25C01 | 9) 15S/03E-08T50 |
| 5) 15S/03E-18M02 | 10) 15S/03E-17M01 |

NOTES:
 Geology adapted from Clark et al. 2000, Rosenberg, L.I. 2001, Yates et al. 2005, Kennedy Jenks, 2004
 Well locations are approximate.

Cross-Sections Have 2X Vertical Exaggeration
 2,500 0 2,500 Feet

Geologic Map and Cross-Sections from El Toro to Salinas Valley

El Toro Groundwater Study
 Monterey County, CA

Geosyntec
 consultants

June 2010

Accompanying Documentation

Geologic Map and Cross-Sections from El Toro to Salinas Valley

The geologic map and cross-sections are presented as a supplement to the El Toro Groundwater Study (Geosyntec, 2007). The geologic interpretations are based on the USGS Geologic Map of the Spreckels 7.5-minute Quadrangle (Clark et al. 2000), and additional compilations of geology and hydrostratigraphy of the vicinity (e.g. Rosenberg, 2001; CH2M Hill, 2004; Yates et al., 2005; Kennedy Jenks, 2004). A stratigraphic column of geologic units in the El Toro Area is attached. A detailed explanation of units depicted on the geologic map is included on Figure 2-3 of the El Toro Groundwater Study (Geosyntec, 2007). Additional geologic cross-sections within the El Toro Area are provided as Figures 2-4 through 2-8 in the 2007 Report. The U.S. Geologic Survey (USGS) geologic map of the Spreckels quad is also available on a USGS web site: <http://pubs.usgs.gov/mf/2001/2349/>.

Based on available information, the Plio-Pleistocene Continental Deposits (QTc) are contiguous between the El Toro area and the Salinas Valley. The QTc deposits comprise the majority of the Primary Aquifer in the El Toro Planning Area, and are commonly called the Paso Robles, but portions may also include the Aromas sands.

Granitic rocks uplifted along the Harper Fault likely limit hydraulic connection to the northeast from the San Benancio subarea of the El Toro Planning Area to the Salinas Valley. However, the continuous presence of the Paso Robles Formation beneath the El Toro Creek, the Hwy 68 corridor, and Fort Ord military reserve to the northwest provides hydraulic connection between the El Toro Planning Area and the Salinas Valley.

Groundwater level data indicate that hydraulic gradient under the El Toro Creek Valley and the Hwy 68 corridor is generally northeastward toward the Salinas Valley. Groundwater contours shown on the geologic map are based on the January 2001 contour map and data provided in the El Toro Groundwater Study (Figure 4-5, Geosyntec, 2007) and supplemental well and water level data from additional wells for a similar time period provided by the Monterey County Water Resources Agency (MCWRA).

As reported previously (e.g. Staal Gardner & Dunne, 1991; Fugro, 1996; Geosyntec, 2007), planning boundaries based on local topographic watersheds are not relevant to the groundwater aquifers, which are the sole source of water supply in the El Toro Planning Area.

References

- Anderson-Nichols & Co, 1981, *Final report, El Toro Area Groundwater Study*, prepared for Monterey County Flood Control and Water Conservation District, 112, p.
- CH2M Hill, 2004, *Hydrogeologic Assessment of the Seaside Groundwater Basin, Draft Report*, prepared for Somach, Simons and Dunn, and Cal Am Water, January 2004.
- Clark et al., 2000, *Geologic map of the Spreckels 7.5 minute quadrangle, Monterey, California*, USGS MF-2349.
- Feeney, Martin, and L. Rosenberg. 2002. *Deep Aquifer Investigation—Hydrogeologic Data Inventory, Review, Interpretation and Implications*. Technical Memorandum—Technical Review Draft. Prepared for WRIME, Inc. September 2002.
- Fugro West, Inc., 1996, *Additional Hydrologic Update, El Toro Area, Monterey County, California*, prepared for Monterey County Water Resources Agency, 28 p.
- Harding ESE. 2001a. *Final Report: Hydrogeologic Investigation of the Salinas Valley Basin in the Vicinity of Fort Ord and Marina, Salinas Valley, California*. Prepared for Monterey County Water Resources Agency. Prepared by Taraszki, M. and D.J. Craig. April 2001.
- Kennedy/Jenks Consultants, 2004, *Hydrostratigraphic Analysis of the Northern Salinas Valley*, prepared for MCWRA, 14 May 2004.
- Logan, John. 1982. *Hydrogeology of the Seaside Area*. Prepared for Monterey Peninsula Water Management District. June 1982.
- Rosenberg, L.I. 2001. *Geologic Resources and Constraints, Monterey County, California: A Technical Report for the Monterey County 21st Century General Plan Update Program*. Unpublished Report to Monterey County Environmental Resource Policy Department, 167 pp., 10 sheets, scale 1:250,000, one CD-ROM.
- Schmidt and Associates, 2001, *Letter regarding groundwater conditions to Monterey County Environmental Health Division*, May 31, 2001.
- Staal, Gardner & Dunne, Inc., 1991, *Hydrogeologic Update, El Toro Area, Monterey County, California*, prepared for Monterey County Water Resources Agency, 53 p.
- Thorup, Richard R., 1971a, *Groundwater report for Toro Water Committee*, unpublished report to Monterey County Board of Supervisors.
- _____, 1974, *Groundwater survey of Laguna Seca Ranch, Salinas-Monterey Highway 68, Monterey County, California*, unpublished report.

_____, 1977, *Final report, groundwater study of Highway 68*, unpublished report to Laguna Seca Ranch and Standex International, 57 p. 7 appendices, 7 sheets.

USGS, 2002. *Geohydrology of a Deep-Aquifer System Monitoring-Well Site at Marina, Monterey County, California*. Prepared in cooperation with the Monterey County Water Resources Agency. Water-Resources Investigations Report 02-4003. Prepared by Hanson, R.T., R.R. Everett, M.W. Newhouse, S.M. Crawford, M.I. Pimentel, and G.A. Smith.

Yates, Eugene B., Feeney, Martin B., Rosenberg, Lewis I., 2002, *Laguna Seca Subarea Phase III Hydrogeologic Update*, prepared for Monterey Peninsula Water Management District, November 2002.

Yates, Feeney & Rosenberg, 2005, *Seaside Groundwater Basin: Update on water resource conditions*, prepared for Monterey Peninsula Water Management District, April 2005.

PERIOD OR SYSTEM	GEOLOGIC SYMBOL	MAP UNIT	DESCRIPTION OF MAP UNITS	THICKNESS (FT)
QUATERNARY	HOLOCENE	Qls	Landslide Deposits	0-120
		Qal, Qyf Qc, Qof	Alluvial Deposits, Flood Plain Deposits	
TERTIARY	PLEISTOCENE	Qtc	Continental Deposits (Aromas / Paso Robles)	0-1,000
	Tmd, Tm	Monterey Formation (Shale)	0-2,300	
				Tus
	Tuss	Unnamed Sandstone (Undifferentiated)	0-1,500	
				CRETACEOUS
msc	Schist			
PRE CRETACEOUS	ms	Metamorphic Quartzofeldspathic Rocks		

El Toro Primary Aquifer System

Adapted from Clark et al. (2000)

Stratigraphic Column

El Toro Groundwater Study
Monterey County, CA

Geosyntec
consultants

June 2010