

APPENDIX J

MEMORANDUM

TO: William Hutton, Esq.

FROM: Sarah Battelle, Geo-Logic Associates
William Lopez, Geo-Logic Associates

DATE: October 9, 2009

**RE: EVALUATION OF CURRENT UTILIZATION OF GROUNDWATER
RESOURCES IN THE PALA GROUNDWATER BASIN
SAN DIEGO COUNTY, CALIFORNIA**

The purpose of this memorandum is to present an evaluation of the current utilization of groundwater resources from the Pala Groundwater Basin.

As shown in Exhibit 4.15-4, included in RFEIR (2007), the Pala Basin extends over eight miles along the San Luis Rey River and covers about 4500 acres. The San Luis Rey Municipal Water District (SLRMWD) was formed to protect the groundwater quality, quantity and water rights of landowners within the San Luis Rey River Basin, of which the SLRMWD manages approximately 1750 acres within the western portions of the Pala Basin. The Pala Basin also includes significant portions of the Pala Indian Reservation immediately east of the SLRMWD boundary.

Land use within the SLRMWD is primarily low density agriculture/farmland, although, the SLRMWD anticipates future development within the Basin providing water and wastewater services to support a combination of residential, recreational, educational, and commercial projects over the next 21 years. The Pala Indian Reservation land uses include residential, casino/hotel, an off road motocross raceway, and aggregate plants.

For this evaluation GLA performed an assessment of changes in land use in the Pala Basin, identified permitted wells drilled within the Basin over the past 15 years, and reviewed available literature for the Basin including the following:

1. Moreland, J.A., 1974, Hydrologic and salt-balance investigations utilizing digital models, Lower San Luis Rey River area, San Diego County, California, USGS Water Resources Investigation Bulletin 24-74.
2. Don Owens & Associates, 1995, Groundwater Management Planning Phase II: Analysis of Hydrology and Determination of Available Water Supply.
3. NBS Lowry, 1995, Groundwater Feasibility Study, prepared for the San Diego County Water Authority.
4. San Diego County Water Authority (SDCWA), 1997, Groundwater Report, June.
5. San Luis Rey Municipal Water District, 2006, Notice of Preparation of a Draft Program Environmental Impact Report for the San Luis Rey Municipal Water District Water and Wastewater Master Plan, February 2.

6. San Diego Local Agency Formation Commission (LAFCO), 2006, Draft Municipal Service Review and Sphere of Influence Update for the Municipal Water Districts within the Bonsall and Pala Hydrologic Subarea, October.
7. PCR, 2002, Final Environmental Impact Report for the Gregory Canyon Landfill.
8. Tierra Environmental Services, 2002, Draft Environmental Assessment for the Pala Gaming Facility.

Moreland (1974) completed an investigation of the San Luis Rey watershed, including the Pala Basin, to assist in developing a comprehensive water quality management plan. In his study, Moreland found a lack of data to develop a hydrologic model for the basin. He noted that most of the wells are not metered, underflow into and out of the basin is not known, gauged data on tributary flow is sparse, precipitation entering the groundwater basin is not directly measurable, and quantities of irrigation return have never been estimated. Nevertheless, Moreland used a digital model, and available data (driller's logs, specific capacity tests, and water level measurements) to arrive at a near-steady state of 2,500 AFY for the Pala Basin. He noted that this near steady state condition probably does not represent true steady-state values but rather the conditions required to maintain the initial head conditions in equilibrium. Thus, it may be concluded that the 2,500 AFY value provided for the Pala Basin is a relatively conservative (low) value.

Owen (1995) performed a safe yield study for the SLRMWD portion of the Pala Basin, and reported that the effective maximum groundwater storage capacity of the Basin is approximately 18,000 acre-feet. He reported that production (pumping rate) within the Basin had remained relatively stable at approximately 2,400 acre-feet per year (AFY). Mr. Owen concluded that the long-term dependable yield in the SLRMWD portion of the basin could be increased to 3,350 acre feet per year with reasonable management practices.

GLA also spoke to Mr. Jack Hoagland (pers.comm, February 19, 2009), of John E. Hoagland & Associates, a consultant for the SLRMWD, who indicated that the SLRMWD contracted with a company to look at the safe yield within the district and the study concluded that Moreland, Owens and others were all in the same "ballpark" of 2000 to 3000 AFY safe yield for the SLRMWD.

Changes in Water Use - GLA reviewed the land use within the Basin since 1995 and found no notable increases in residential, agricultural or livestock water uses that would create an increased demand for groundwater within the Basin. In fact, water demand within the Basin has likely decreased as a result of the Hansen aggregate plant closure, just north of the GCLF landfill site, and discontinuation of agricultural/livestock operations and vacating of associated residential properties located on the GCLF property.

Based on the 2002 Environmental Impact Report (EIR), historical water use on the GCLF property was estimated to be 465 AFY, of which, the Verboom dairy and residences used approximately 78 to 187 AFY; the Lucio dairy and residences used approximately 150 AFY; Embesi orchard and residence used approximately 50 AFY; and the Guthrie agriculture and residence used approximately 128 AFY.

Water demand at the Hansen aggregate plant is unknown. It is assumed that the groundwater that the Hansen plant used was discharged back into the Pala Basin, but some water loss (approximately 20 to 25%) would be expected primarily from evaporation from the processing ponds.

Although the Vulcan Mining plant property is north of the alluvial limits of the Pala Basin, before it closed it was also likely a significant user of groundwater from on-site wells that might have had a connection to the underflow of Pala Basin. Located about 1.5 miles east of the Pala casino, the property has been modified and converted to be operated as a 240-acre motocross raceway under a long-term lease between MX Motocross Raceway and the Pala Tribe identified as the Pala Raceway. There were no water supply estimates available for the now-defunct Vulcan Mining plant, however, based on a meeting held by the San Luis Rey Watershed Council on May 22, 2008, a Pala Raceway representative indicated that the water use for the raceway would be 10 times less than that used by Vulcan Mining. Eventually, the facility will use tertiary treated (recycled) water from the Pala Tribe wastewater treatment plant, which we understand is currently being constructed.

The most significant increase in water use within the Basin is from construction of the Pala casino and 507-room hotel on the Indian reservation, to the east of the GCLF project site. Review of the Environmental Assessment (EA) for the Pala casino's initial construction estimated that water use would be 80,000 gallons per day (gpd) with a peak quantity of 100,000 gpd (or 90 to 112 AFY). However, the Pala casino project EA (excluding the hotel) stated it would provide water from a reservoir with a nominal capacity of 750,000 gpd to support facility operation (20,000 gpd [25 percent of average daily demand]), fire sprinklers (102,000 gpd) and emergency storage (622,000 gpd). The EA for development of the 507-room hotel at the Pala casino was not available for use in assessing additional water requirements. Based on available literature (City of Los Angeles Master Plan of Sewers), 130 gpd per room is typically estimated for two-person hotel occupancy, or a peak daily water use of approximately 65,910 gpd for full occupancy of the 507-room hotel. Recognizing that the fire sprinkler and emergency supply represent fixed storage rather than daily use, the peak casino and hotel water use is estimated to be 165,910 gpd (100,000 gpd peak daily use for the casino and 65,910 gpd peak daily use for the hotel), or about 186 AFY¹. With the exception of a net water loss of about 20 to 25 percent (or about 37 to 47 AFY²) associated with evaporation and irrigated plant transpiration, the water that is used at the Pala casino and hotel, and is pumped to a wastewater treatment plant, is assumed to be discharged back to the underflow of the Pala Basin. Therefore, the estimated water use by the Pala casino and hotel is expected to be 37 to 47 AFY

GLA contacted the San Diego County Department of Planning and Land Use to identify new domestic/agricultural wells that may have been drilled within the Basin since 1995 as another indicator of changes in groundwater usage within the Basin. This review indicated that well permit applications were obtained for three parcels within the Basin. One of the wells was permitted for the Pala Rey Ranch, located immediately south of the GCLF property, while the other two parcels are located within the Hansen aggregate plant property. Since these properties have already been developed (and the Hansen property has now ceased operation), it is believed

¹ 165,910 multiplied by 365 days is approximately 60.6 million gallons per year; divided by 325,850 gallons per acre-foot per year, it equals 186 AFY.

² 186 AFY multiplied by 0.20 (20%), and 0.25 (25%) equals 37.2 AFY and 46.5 AFY, respectively.

that the groundwater wells constructed since 1995 were most likely used to supplement or replace existing wells and would not result in an increased demand for water within the Basin.

Changes in Water Levels - Some moderate increase in groundwater use is expected associated with recent drought conditions within the region, and GLA reviewed the historical water levels in alluvial wells located on the GCLF property for evidence of a decreasing water table within the Basin. Based on water level data obtained over the past four years, alluvial water within the Basin has remained relatively static reflecting only minor seasonal changes. Hydrographs for wells in the Pala Basin were also retrieved from the California Department of Water Resources, but the data is limited to pre-1985 measurements. Mr. Jack Hoagland indicated that water level data show no significant change at the Monserate narrows to the west of the GCLF property, near the Pala Rey Ranch.

Gregory Canyon Landfill Project Percolating Water Use – For the Gregory Canyon Landfill project, it is proposed that a portion of the water (about 66.4 AFY) be supplied by pumping from a series of fractured crystalline bedrock wells located at the toe of Gregory Canyon and in three smaller canyons within the project boundaries, outside of the Pala Basin and defined as percolating groundwater. Safe yield calculations have been performed at each location and calculation of the total recoverable groundwater stored in the fractured crystalline bedrock indicates that pumping of the calculated safe yield represents less than 5% of the total volume of recoverable water stored within the fractured crystalline bedrock system, and even so, any flows from the fractured crystalline bedrock into the Pala Basin are an insignificant volume compared with the available alluvial water within the Pala Basin.

Protocols established for these wells will include the use of totalizer meters for each area to monitor the volume of water that is being extracted from the bedrock so that the annual volume does not exceed the calculated safe yield at each canyon. In addition, based on the results of long term pumping test data, water level controls will be placed in each well so that even in severe drought conditions, groundwater pumping does not occur below the sustainable depth of the effective aquifer and result in over-drafting of the bedrock system. As a result, the proposed pumping of percolating groundwater would have a much less than significant impact on the water resources in the Pala Basin.

Conclusion - Based on our assessment, changes in known groundwater usage have likely resulted in a net reduction in water demand. In addition, there appears to be no evidence of a significant increase in the agricultural, industrial or commercial demand for water resources in the portion of the Pala Basin that is managed by the SLRMWD. This conclusion is consistent with the Gregory Canyon EIR (PCR, 2002), which noted a reduction in water demand within the Pala Basin following discontinuation of the dairy and associated residential water demand on the GCLF property. No significant change in groundwater levels are noted within the alluvium on the GCLF property, or at the Monserate narrows, suggesting that groundwater storage in the basin has remained relatively constant in the Pala Basin even under recent drought conditions within the region. The safe yield calculation developed by Owen (1995) of about 2400 AFY for the SLRMWD portion of the Pala Basin, included in the EIR for the Gregory Canyon Landfill, appears to be relatively consistent with safe yield calculations developed by others for the Pala Basin which were more conservatively estimated without hard data (water metering, flow gauging, precipitation data).