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Condor Project No. 5338

August 27, 2007

Lew Mayhew
Keep It Rural Calaveras
PO Box 746
Burson, CA 95225

RE: Comments on The Ridge at Trinitas Draft Environmental Impact Report July 2007

Dear Mr. Mayhew:

At your request Condor Earth Technologies, Inc. (Condor) reviewed, with respect to groundwater impacts, the *The Ridge at Trinitas Draft Environmental Impact Report July 2007* (DEIR). The DEIR was accessed from the Calaveras County Website. This letter includes our opinion of the discussion and data supporting the "Less than Significant" designation for impact 12.2. The threshold of significance for Impact 12.2 is if implementation of the project would substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted. We consider the DEIR deficient because there is insufficient evidence in the document to support the rationale or conclusion that the potential for Impact 12.2 is less than significant.

The rationale leading to the DEIR's "less than significant" impact assessment is that the proposed groundwater wells will tap into deep aquifers which are reported to lie in the lower strata of the Valley Springs formation. The Valley Springs formation consists of eruptive and fluvial deposits of rhyolite composition, including fine grained ash deposits, sands, agglomerates and gravels that were distributed over a wide area near the project site. Ash deposits can create clay-rich separating layers in the formation but their distribution is poorly known at depth beneath the site. Type sections[1] of the Valley Springs formation include zones with conglomerates and sands throughout the formation to the north and east of the project site. These zones are believed to represent areas where the ancestral river deposited sediments as it flowed westerly into a marine basin. The project site is located in a transitional zone where overlapping and interfingering channel deposits created a coalescing alluvial fan. This depositional environment is not conducive to muddy layers of great extent that would separate aquifers. These geologic patterns indicate uncertainty in the size, consistency and continuity of separate aquifers in the lower Valley Springs formation. There is insufficient geologic information in the DEIR to conclude that a separate "deep" aquifer exists in the Valley Springs at the project site.

- The conclusions would be better supported if the DEIR included site-specific geologic evidence including well logs with stratigraphic descriptions prepared by a competent professional.

[1] Piper, A.M. et al., 1939. Geology and Groundwater Hydrology of the Mokelumne Area, California, U.S. Geological Survey Water Supply Paper 780.

The underlying assumption in the discussion of Impact 12.2 is that all existing and neighboring wells are shallow, and therefore a vertical separation is adequate to isolate them from impacts. The discussion cited in Section 12.1 is speculative, indicating only that shallow wells "tend" to be used for single family residences. No well logs or data on neighboring wells is provided. In fact, there are numerous reports (more than three) of neighbors who have recently deepened their wells because they dried up (e.g., reference: Chris Ervine Letter Calaveras Enterprise, August 21, 2007). The discussion in Section 12.1 speculates as proof of separation that the first water may be encountered at 300 feet but rapidly rises in the well. Why would neighbors not also drill to the same "first water" and experience the same rise. The supposition that domestic well drillers will stop at shallow wells when 20 gpm is achieved is non persuasive because the discussion cites first water at 300 feet. Furthermore, deep wells have the potential to deplete upper aquifers unless they are constructed to avoid tapping upper layers.

- Before claiming vertical separation of the proposed project wells from pre-existing wells, the document should include results of a well survey showing the location of all wells within ¾ mile of the project. Owners should be contacted and available data on the depth, screened intervals and seals should be included. The locations and planned construction details of the proposed wells should also be included.

The discussion in Section 12.1 cited "vast" amounts of water available as evidenced by the high production achieved at the project wells (approximate total production of 1,430 gallons per minute). High rates of production indicate transmissive aquifers but do not indicate vast reserves. Voluminous groundwater production can be sustained by depleting aquifer storage; however, long term yields could well diminish. Ultimately well production is limited by recharge. There was no delineation of the recharge area of the proposed wells. The only discussion of aquifer capacity in Section 12.1 included the alarming fact that regional groundwater resources are being depleted at the rate of 70,000 acre feet per year.

- To complement the discussion of Regional Groundwater Resources, the DEIR should include a parallel discussion of the overall groundwater balance within the recharge area of the proposed project wells. This should include an analysis of volume of the aquifer based on factual information, precipitation/infiltration in the catchment basin, runoff, groundwater flux and the potential for drawdown of the water table over years. The analysis should consider hydrographs from observation wells, existing pumping and recovery data, modeling or other methods. Such questions as, "Are pumping costs and drawdown increasing year to year?" and "Will the golf course run out of its own water before any homes are built?" should be addressed.

The discussion for Impact 12.2 claims it is unlikely there is a connection between the upper and lower strata due to the way flat particles lie horizontally. In Section 10.1 of the DEIR, the Valley Spring formation is described as a sequence of interbedded sandstones, claytones, gravels, tuffs and agglomerates. Claystones are indurated[2] and therefore brittle, subject to fracture. Tuffs and volcanic ash deposits are also subject to fracture and, in fact, are the pathway for flow to the Calaveras Springs in Douglas Flat. There is no evidence provided that fractures are absent at the project site. The contention in the discussion of Impact 12.2 that vertical containment is evidenced by the artesian pressure evident in deeper aquifers is not sufficient. Confined aquifers can be connected to overlying aquifers through porous passageways between interlayered units. Water rising in one well does not preclude vertical connection if the pressure exhibited in the lower well is derived from a higher aquifer. Hydraulic connection may exist between wells of different depths, such that depressurizing one will affect the other.

[2] Dictionary of Geological Terms, Third Edition

- Claims of vertical separation should be substantiated with data records comparing the static water levels in the wells tapping the confined aquifer and static water levels in the overlying shallow wells.
- Separation could be demonstrated by a well-designed comprehensive pumping test, or by comparing pumping records and monitoring data of water levels in shallow and deep wells. Such comparisons should be conducted by competent professionals, such as a Certified Hydrogeologist.

There is insufficient data provided in the DEIR to conclude that wells which use groundwater from the depths proposed will have no appreciable affect on other nearby wells.

Respectfully submitted,

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