Appendix D

Hydrology RTC Memorandum

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TECHNICAL MEMORANDUM

DATE: April 18, 2024 Project No. 22-2-007

TO: Scott Youdall, The Hanover Company

FROM: Scott Lewis, PG

SUBJECT: RESPONSE TO CONCERNS REGARDING IMPACTS OF USE OF PROPOSED TRIMBLE WELL ON SURFACE WATER AND SURFACE WATER DEPENDENT ECOSYSTEMS

This Memorandum address concerns regarding potential impacts to Coyote Creek and surface water dependent ecosystems resulting from the planned use of a proposed community water supply well that will be constructed as part of the 681 East Trimble mixed use development in the City of San Jose.

The proposed well will be located adjacent to Coyote Creek Trail northeast of the intersection of Seely Avenue and Montague Expressway. The well will be constructed to community supply well standards and will be incorporated into the City of San Jose's drinking water distribution system.

Hydrogeology of the Santa Clara Groundwater Subbasin

The location of the proposed well is within the Santa Clara Valley Subbasin (Subbasin). The Subbasin encompasses the structural trough between the Diablo Range to the east of the Santa Clara Valley, by the Santa Cruz Mountings to the west, the Coyote Narrows to the south, and San Francisco on the north. Multiple studies have characterized the hydrogeology of the Subbasin as being divided into an upper unconfined to leaky confined aquifer zone and a lower confined aquifer zone separated by an essentially impermeable clay cap. Recharge to the upper, unconfined aquifer zones is primarily from surface and creek infiltration. Recharge to the deep confined aquifer is primarily from the alluvial fan facies in the upland areas of the subbasin (Imamura, 1995). The 2010 *Revised Final Ground Water Vulnerability Study, Santa Clara County, California* prepared by Todd Engineers and Kennedy Jenks Consultants for the Santa Clara Water Valley District (now Valley Water) refers to the upper unconfined to leaky confined aquifer zone as the Shallow Aquifer and the lower confined aquifer zone as the Principal Aquifer. The clay cap that separates the two aquifers is a laterally extensive, regional aquitard that is typically encountered at a depth of 75 feet to 160 feet below ground surface (bgs). The 2010 Todd/Kennedy Jenks report assessed Principal aquifer vulnerability and sensitivity (the relative ease that surface or near surface contaminates can migrate into the deeper, confined aquifer). The report stated that the two aquifers are hydraulically separated due to the presence of a confining layer and that recharge from the Shallow Aquifer and creeks/streams, into the Principal Aquifer does not occur.

In the northern end of subbasin, artesian conditions (water level above ground surface) exist in the Principal Aquifer. Artesian pressures result in groundwater movement from the Principal Aquifer into the

Shallow Aquifer and to the surface if a conduit between upper and lower aquifers and the surface exists. Because of the efforts of Valley Water to maintain groundwater levels within the basin above a certain threshold to maintain groundwater storage and prevent land subsidence, artesian conditions in the Principal Aquifer are expected to persist in the area of the proposed well.

Well Design

Community supply wells in the subbasin typically target the Principal Aquifer because the quality of the groundwater in the Shallow Aquifer generally does not meet community drinking water quality standards without treatment. Community supply wells within the subbasin are generally designed with redundant cement seals to depths in excess of 200 feet below ground surface to maintain hydraulic isolation between the Principal Aquifer and the Shallow Aquifer.

The lateral separation at the ground surface between wells targeting the Principal Aquifer and surface water features, such as Coyote Creek, is not a concern when the wells are designed and constructed with deep seals that maintain hydraulic isolation between aquifers. Many community supply wells in the Subbasin that target the Principal Aquifer are constructed in close proximity to streams and creeks without concern regarding hydraulic connection to surface waters. These wells are permitted for use by Valley Water, Santa Clara County, and the State Water Quality Control Board, Division of Drinking Water (DDW).

Several community supply wells are located approximately one mile north and south of the proposed well location. Each of those wells are constructed with cement seals to at least 220 feet below ground surface (bgs) which extend below the bottom of the confining clay layer at approximately 150 feet bgs.

It is reasonable to expect that the confining clay layer will extend to 150 feet bgs at the proposed well site. The design of the proposed well will have a deep seal similar to the nearby community supply wells (200+ feet bgs). The actual seal depth and overall well design will be based on a site-specific investigation (test hole drilling) conducted to characterize the nature and depth of the subsurface materials at the project site. The information collected will be used to design a well with a deep cementitious seal(s) that will maintain the hydraulic isolation between the target aquifer and shallow and surface water features.

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Conclusion

Impacts to Coyote Creek and related surface water-dependent ecosystems are not anticipated due to the geological and hydrogeological characteristics of the subsurface formations in the vicinity of the proposed well site and the engineering specifications of the well itself.

The proposed well will be designed with specialized components, such as annular seals, intermediate seals, and depth-specific screened intervals to prevent any hydraulic connectivity and maintain hydraulic isolation between surface water, the Shallow Aquifer, and the deeper, confined Principal Aquifer targeted for drinking water supply. These design features will also manage the artesian conditions in the target aquifer, ensuring that there is no upward migration of fluids or pressure that could impact surface or near-surface water resources.