



March 6, 2015

IES PROJECT NO. 15-02-001

Kevin Canning
Orange County Public Works/Orange County Planning
300 N. Flower St.
Santa Ana, CA 92702-4048
Email: kevin.canning@ocpw.ocgov.com
Subject: **Esperanza Hills**

Steven K. Harris, AICP
Director of Community Development
City of Yorba Linda
Email: sharris@yorba-linda.org

**Re: Review of the Environmental Documents for the
Proposed Esperanza Hills Development
Yorba Linda, Orange County, California**

Dear Mr. Canning and Mr. Harris:

At your request, Innovative Environmental Solutions (IES) has reviewed the Final Environmental Impact Report (FIER) for the proposed Esperanza Hills housing development (Project), located within the Sphere of Influence (SOI) for the City of Yorba Linda (City), with respect to geology related public health hazards. We have identified a number of concerns related to public health impacts and recommend that further studies be conducted as part of the environmental review for the project.

Initially we note that while the FEIR reflects significant efforts to identify fault line and fault trace patterns to avoid building homes on or too near such geological features, no attempts have been made to identify the presence and specific locations of methane and hydrogen sulfide reserves on, under and near the project site. As a general proposition, buildings should not be placed over or too near to such reserves due to expected negative impacts upon human health. Accordingly, the identification of the presence of certain compounds should occur before siting decisions are made for residential structures. The presence of some contaminants can and should lead to decisions to avoid building on portions of any site.

Our firm routinely tests of the presence and concentration of volatile organic compounds as part of Phase II evaluations of project sites. When chemicals of concern are found to be present, on the surface and or subsurface, the exact locations, distributions and concentrations generally need to be determined so that appropriate avoidance and/or mitigation measures can be identified and implemented.

Such standard assessment steps appear, to our reading, to be deferred for the Esperanza Hills Project until after project approval. This possibly will preclude the ability of the County to require meaningful avoidance and mitigation measures.

The presence of abandoned and active oil wells on and near the site strongly suggests the presence of naturally occurring and economically developed oil and gas deposits that result in the generation of a multitude of toxins including both methane and hydrogen sulfide that could be spread over wide areas. In addition, the presence of below surface conduits (oil wells and conveyance piping) can create pathways for larger quantities of these gases to move rapidly towards the surface. This is in addition to whatever natural conditions that might or might not allow direct flows (incremental or otherwise) to the surface. The accurate determination of the quantity, adequacy and the durability of “capped” wells is an important part of any assessment seeking to identify actual or potential health hazards.

We also note that waste products from both the drilling and operation of oil wells and related infrastructure are often found on and around operational areas and beyond. These can also occur some distances away from the facilities as past disposal practices have not been particularly well regulated. Further, we understand that at least portions of the project site have been used in the past for cattle grazing and this raises issues of surface and near surface contamination from animal waste products which could include consolidated methane and nitrates.

With this background, we have the following specific observations, comments and recommendations.

DRAFT EIR for the Esperanza Hills Development

Chapter 5, Section 5.7.2, No. 1 of the Draft Environmental Impact Report (EIR) states that “oil operations from three existing oil wells located in the southwestern area of the site” is one of the current uses of the Project property. This is reiterated in No. 10 of the same section which goes on to state that “[o]il and well operations have the potential of releasing hazardous contaminants that can impact surrounding soils and groundwater, and releasing methane gas.” In addition, the EIR identifies up to ten above-ground storage tanks (of unknown size and contents), associated pipelines and seven oil wells located within the Project southern boundary, the three previously mentioned “active” wells, and four “inactive or previously abandoned” wells. The EIR states that “[i]t is unknown if the well casings remain intact below the ground surface or how the wells were capped” and that “[a] Phase II ESA will be prepared identifying abandoned well locations, hidden pits, or accumulations of drilling mud. The Phase II ESA will verify regulatory compliance with previously abandoned wells.”

Table 5-7-5 of the EIR identifies “stained soil in the immediate vicinity of the oil wells, storage vessels and conveyance piping” and “approximately ten above-ground storage tanks” as well as petroleum odors in the vicinity of this infrastructure. Section 5.7.5 sites Mitigation Measure Haz-3, which requires the Phase II ESA identifying abandon well locations, hidden pits or accumulation of drilling mud and

verification of proper well abandonments in accordance with the California Department of Conservation, Oil Gas and Geothermal Resources (DOGGR), the regulatory agency that oversees oil production well compliance in California.

According to the EIR, historical oil well drilling operations were conducted within the proposed project boundary. Prior to regulatory oversight, there were no guidelines as to the correct disposal of toxic components. This creates the potential for large scale surface deposits of historic drilling mud throughout the proposed project boundary.

Orange County Fire Authority Documents

As part of the document review, IES acquired and reviewed the Orange County Fire Authority (OCFA) document entitled *Requirements for Construction of Structures Adjacent to Oil Well(s) – Guideline C-02*, dated January 1, 2011. The purpose of *Guideline C-02* states that “[s]tructures located adjacent to oil wells can be negatively impacted by un-expected emergencies and the natural products they produce.” This document limits building construction unrelated to well operations to a distance of a 100-feet from the well and restricts new well drilling operations to 300-feet away from any existing structure. It also sets standards for approval of alternate structure locations. According to *Guideline C-02*, “there shall be no case in which a structure will be approved closer than 50 feet to an oil well and structures with assembly, educational and institutional occupancy groups will not be approved closer than 150 feet to an oil well.”

IES also reviewed the OCFA Esperanza Hills NOP response letter dated January 17, 2013 for the Project. The OCFA is the local oversight agency for environmental investigations in Orange County in accordance with the Certified Unified Program Agency (CUPA). The OCFA states that they have “significant concerns in the development of the project within historical wildfire areas” and that “[s]ince the property has been subject to extensive oil drilling, the developer shall provide a combustible gas/methane assessment study to OCFA for review and approval. Should measurable quantities of methane gas be detected, the developer shall also submit and obtain OCFA approval for a mitigation plan to address the issue.”

National Resources Defense Council Report

In order to determine potential health threats associated with oil and gas development, which is known to produce volatile organic compounds (VOCs), IES reviewed a National Resources Defense Council document entitled *Drilling in California: Who's at risk?*, dated October 2014 (NRDC). The NRDC document indicates that “multiple studies have found that air pollution from oil and gas development can reach levels associated with adverse health impacts for residents and communities in regions with intense oil and gas development.” NRDC goes on to state that “air pollution from unconventional oil and gas development can be classified into emissions during preproduction, production, transmission and storage use, and after well abandonment.” NRDC identifies chemicals associated with oil well production to include “methane and non-methane VOCs, including numerous toxic air contaminants (TACs), may continue to be released from the wellhead and other equipment such as condensate tanks, compressor stations, and open wastewater impound pits. Oil and gas transmission and storage releases VOCs and

methane. Improper plugging of a well at the end of its life cycle can cause continued leakage of oil, methane, and other VOCs even after the well has ceased production.” The NRDC sites a broad range of adverse health effects associated with exposure to these air pollutants including respiratory, neurological, and cardiovascular damage, birth defects and cancer.

NRDC also identifies Hydrogen Sulfide (H₂S) as a chemical associated with well stimulation. The Centers for Disease Control and Prevention National Institute of Occupational Safety and Health recommends to “AVOID ALL CONTACT ” with H₂S and in all cases of exposure to “CONSULT A DOCTOR .” The physical dangers indicate that H₂S “is heavier than air and may travel along the ground distant ignition possible.”

Recommendations

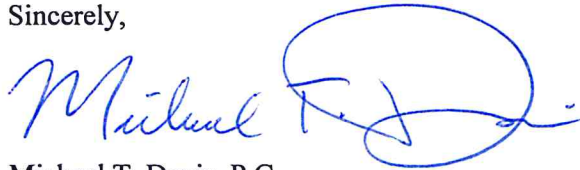
IES agrees with the EIR recommendation for the performance of a site wide and comprehensive Phase II ESA, however we strongly recommend that this ESA occur prior to project approval to preserve options for avoidance and mitigation measures. Depending upon what is determined through the ESA process, there may be major issues about the propriety of construction on portions of the site that are now slated for home building.

Clarification is required as to the location and number of areas that require investigation. IES also agrees with the OCFA that the project needs a combustible gas/methane assessment but strongly recommends that this should be site-wide in scope and occur prior to project approval to preserve options for avoidance and mitigation measures.

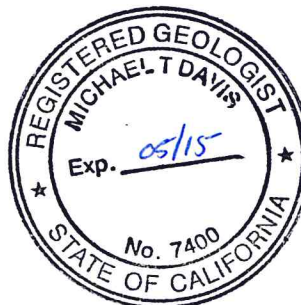
Because the EIR identified that three “active” wells and four “inactive or previously abandoned” wells occur within the proposed Project boundary, confirmation of proper well construction and abandonment should be a part of the Phase II ESA. The Phase II should also identify and assess any unmapped oil well locations and all drilling mud pits and assess their size and contents. In addition, information regarding the location and depths of oil and gas deposits can be rendered from the well boring and construction logs. The Phase II ESA should also include an analysis of human health risks associated with exposure to site specific contaminants of concern.

If you have any questions, or if you need any additional information or clarification, please contact myself at (760) 632-2330 (office) or (760) 846-2330 (mobile).

Sincerely,



Michael T. Davis, P.G.
Principal Geologist



Cc: response@ocgov.com