



May 4, 2017

Mr. Michael Battaglia
CalAtlantic Homes
15360 Barranca Parkway
Irvine, California 92618

Subject: Response to Comments/Clarifications
Phase I Environmental Site Assessment dated April 15, 2016 (Rev. November 21, 2016)
Soil Management Plan dated September 29, 2015
Addendum to Soil Management Plan dated July 14, 2016
Proposed Rancho La Habra (Westridge) Residential Development
1400 S. La Habra Hills Boulevard
LA Habra, California 90631
EEI Project No. SPH-71933.7

Dear Mr. Battaglia:

Pursuant to our meeting with the City of La Habra, EEI has prepared the following response to comments and clarifications regarding the referenced documents. The following *comment summary* and associated **responses/information** are provided herein:

- 1) *Summary the previous investigation and cleanup of the property.* – As outlined in detail on our Phase I Environmental Site Assessment and Soil Management Plan, the golf course was previously the northern portion of the West Coyote Hills Oil field. Chevron was the field operator and the party ultimately responsible for cleanup of the property in preparation for development. Starting in 1986, Chevron began a 10-year investigation and cleanup that involved 17 oil well sites, 10 “historical” sites impacted with crude oil, three above ground tank areas, and numerous “miscellaneous” locations including pipelines, sumps, pits, detention basins, etc. Soils in these areas were excavated, stockpiled on site and tested to determine the degree of crude oil contaminants on site. Testing determined that the principal contamination was heavy petroleum hydrocarbons (crude oil) with only minor fractions of volatile organics (VOC’s) and lighter end hydrocarbons present. Once tested, the soils were placed in the three designated reuse areas as approved by the Santa Ana Regional Water Quality Control Board and the Orange County Health Care Agency, due to the low potential for the crude oil contamination to leach from the soil in the future. Approximately 220,000 cubic yards of impacted soil was placed in Reuse Area 1 (beneath the western half of the golf course), 30,000 cubic yards in Reuse Area 2 (beneath the driving range), and 176,000 cubic yards in Reuse Area 3 (beneath the far western portion of the golf course). During placement, the impacted soils were “landfarmed” (discing and hydration to promote natural biodegradation of the soil) to reduce overall hydrocarbon concentrations in accordance with the Santa Ana Regional Water Quality Control Board’s approval. The landfarming consisted of regular Upon successful completion of the fill placement and capping, the property received regulatory closure from the Regional Water Quality Control Board and Orange County Health Care Agency in 1999.

- 2) *Soil reuse in deep fill is a standard industry practice.* The reuse of soil containing crude oil on site as deep fill and the overlaying of that fill with clean soil (i.e. soil capping) is a standard industry practice and one of the most common and safest forms of engineering controls at regulated cleanup sites. This practice is regularly approved by USEPA, the California State Water Board, Regional Water Quality Control Boards throughout the state, and cities and counties throughout the state, including Orange County Health Care, because it has been found to eliminate the risk of contaminants being released from soil into the environment. Soil capping involves the placement of a defined thickness of clean soil over the top of reused soil. The clean soil layer provides a buffer separating the contamination from future site occupants and the environment. USEPA requires the thickness of clean soil to be at least 2 to 3 feet in nonresidential locations, and 10 feet for residential uses. The approved soil management plan for Rancho La Habra will utilize a minimum 10-foot clean soil cap throughout the site, plus an additional 10 feet as an added safety measure for a total of 20 feet of clean soil through the site (double the thickness required by USEPA. Underneath the reused soil, there will be a 20-foot clean soil buffer maintained between the base of the contaminated fill and the estimated groundwater surface, as required by the Regional Water Quality Control Board. This buffer will prevent any potential mixing of soil containing crude oil and shallow groundwater.
- 3) *Minimal impacted soil observed during subsequent investigation.* – EEI observed the drilling and sampling of 10 geotechnical soil borings at the site in 2014. The drilling was conducted by LGC Geotechnical and sampling occurred at 5-foot intervals at each location. EEI visually screened the samples collected for evidence of contamination (dark staining and/or odor) and retained a total of 18 samples for laboratory analysis of petroleum hydrocarbons. Of the 18 samples, only three showed any evidence of crude oil-impacted soil, and only at specific depths. These locations were along the southern margin of the golf course (at a depth of 50 to 70 feet), near the maintenance building (at a depth of 2 to 3 feet), and in the northwest corner of the golf course along Beach Boulevard (at a depth of 10 to 40 feet).
- 4) *Beneficial changes to crude oil impacted soil since burial* – Crude oil-impacted soil excavated and buried in reuse areas at the site was exposed to the elements to varying degrees since the start of the oil fields operational history at the beginning of the 20th Century. Throughout that time, wind, weather and microbial degradation would have altered the original nature of the oil. Small-chain hydrocarbons and volatile organics, where present, were reduced in concentration by volatilization and exposure to sunlight, and longer-chain hydrocarbons (oil) were slowly be consumed by bacteria and fungi. This process is accelerated during soil agitation, such as when the soil is excavated and moved, and slows down during burial. Once buried, volatilization essentially grinds to a halt, and microbial forces take over. Where air (oxygen) is available the microbes, the byproducts of degradation are harmless to site occupants (essentially carbon dioxide, water, and an increased population of microorganisms). If conditions are without oxygen, a different set of biota take over and the principal byproduct is methane. At the site, crude oil impacted soil was placed in an oxygen-rich environment with rapid microbial degradation initially, slowing over time as oxygen became depleted. This beneficial degradation process is occurring now and will be accelerated again once the soil is re-excavated during development and placement into burial cells. This process of biodegradation is generally considered beneficial for the overall reduction in hydrocarbon concentrations.
- 5) *Performance Standards to Ensure No Harm to Future Site Occupants*– A number of performance standards will be required for this project, regulating various aspects of the excavation, stockpiling, and reuse of crude-oil impacted soil at the property.
 - A) *Use of buffer zones* – as previously discussed, the use of a minimum 10-foot, clean soil buffer zone throughout the site has been mandated at this site, to separate site occupants from potentially

impacted soil. The Orange County Health Care Agency has directed that soil used in the 10-foot buffer must contain less than 100 mg/kg Total Petroleum Hydrocarbons, and must meet the screening levels outlined in USEPA's Regional Screening Levels and supplemented by the Department of Toxic Substances Control HERO Note 3. An additional 10 feet of clean fill will be utilized at the site, in accordance with Orange County Health Care Agency directives, as an added safety measure for a total of 20 feet of clean soil. These soils will be tested by a remediation specialist to ensure compliance with the mandated soil screening levels. In addition, a 20-foot buffer zone has been mandated beneath the impacted soil to protect groundwater quality.

- B) Soils Management Plan – the excavation, stockpiling, sampling, and placement must follow the approved Soils Management Plan. This includes the proper handling of potentially impacted soils during removal and placement such that potential impacts due to odor, dust, runoff, and physical contact are mitigated to the greatest extent practicable. In addition, control of petroleum hydrocarbon vapor emissions will follow the guidelines set forth by South Coast Air Quality Management District Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil. While significant volatile organic compounds are not anticipated at this site, based on previous testing, impacted soil will be monitored during grading with an Organic Vapor Analyzer for vapor emissions and control measures will be implemented whenever levels exceed applicable thresholds (i.e., greater than 50 ppm).
- C) Analytical Testing – Soil testing by a qualified remediation specialist, as overseen by Orange County Health Care Agency, will occur prior to completion of grading to: 1) verify the complete removal of previously placed fill soil in the original reuse areas; 2) characterize the excavated fill once it is placed in stockpiles; and 3) verify that all soils in the upper 10 feet meet the criteria established by Orange County Health Care Agency.
- D) During construction, soil piles will be watered (misted) or covered when necessary to prevent fugitive dust. This will prevent the potential release of contaminated soil into the environment.

If you have any further questions or comments, please feel free to give me a call.

Sincerely,

EEI



Bernard A. Sentianin, PG
Senior Geologist

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