

**SUBSURFACE SOIL
INVESTIGATION REPORT
RESIDENTIAL DEVELOPMENT
1102 PACIFIC COAST HIGHWAY, LOT #4
HUNTINGTON BEACH, CALIFORNIA**

Prepared for:

Kastala Investment Partners



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Project No. 1217-01

**August 25, 2023
(updated September 6, 2023)**

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1.0 INTRODUCTION

This report documents and presents the results of a subsurface soil investigation conducted by FREY Environmental, Inc. (FREY) at 1102 Pacific Coast Highway, Lot #4 in Huntington Beach, California (Site - Figure 1). The work documented in this report was conducted in general accordance with our workplan dated June 5, 2023 ("Workplan"). The Workplan was approved by the City of Huntington Beach Fire Department (HBFD) in a letter dated June 20, 2023.

2.0 BACKGROUND

The City of Huntington Beach has historically been an area of significant oil production. The City was among the fastest growing cities in the United States during the 1960s and 1970s. The rapid growth brought new houses and commerce into once-open oil fields. Urban development of this type created land use compatibility problems. The City of Huntington Beach addressed this problem by adopting City Specification (CS) No. 431-92 *City of Huntington Beach Fire Department Soil Quality Standard* to restore hydrocarbon contaminated soil to clean conditions and to protect the health and safety of the community. Based on CS No. 431-92, the HBFD requires the conduct of a subsurface soil investigation of the Site due to the proximity of a former oil well to the Site (HBC, 2014).

Note that the Site is located in the City of Huntington Beach Methane District. Per CS No. 429 – *City of Huntington Beach Fire Department Methane Mitigation Requirements*, methane mitigation is required for a future development if that development is located within 100 feet of an active or abandoned oil/gas well (HBC, 2016). Since the Site is located within 100 feet of a former oil/gas well, methane mitigation will be required during Site re-development, and methane assessment is not required.

Fill material is not anticipated to be imported to the Site during the proposed construction activities. Should fill be imported to the Site, it is required to comply with CS No. 431-92. Compliance with CS No. 431-92 would involve submitting a letter to the HBFD for review indicating the volume of soil to be imported and the project address. Sufficient information should be provided in the letter to demonstrate that the proposed import soil meets the requirements of CS No. 431-92.

Also note that the proposed future residence will be constructed with a subterranean parking garage constructed below the northern end of the residence. The anticipated maximum depth of grading and/or trenching for the development is 14 feet below ground surface (feet bgs).

3.0 SITE DESCRIPTION

3.1 HISTORICAL SITE SETTING

As required by the HBFD, a historical aerial photo review and a review of the State Water Resources Control Board (SWRCB) Geotracker website and Department of Toxic Substances Control (DTSC) Envirostor databases were conducted for the Site.

The historical aerial photo review indicated that the Site was undeveloped until sometime between 1952 and 1963. An oil/gas well is visible immediately adjacent to the Site, as well as many oil/gas wells in the Site vicinity in the 1928 and 1938 photos. In the 1947 photo, the oil/gas well adjacent to the Site is no longer present, but oil/gas wells are still present in the general Site vicinity. A suspected reserve pit appears to have been present in the central portion of the Site and the property east of the Site in the 1928, 1938, and 1947 photos. In the 1952 photo, the reserve pit is no longer present. In the 1962 to 2012 photos, the Site appears to be developed with the motel that was present at the Site until it was demolished sometime between October 2021 and April 2022. The nearest oil/gas well to the Site (discussed in the next paragraph), located approximately 30 feet southeast of the Site, was visible in the 1928 and 1938 photos. No evidence of oil wells or tanks were observed at the Site in the photos reviewed. Copies of representative historical aerial photos reviewed are presented in Appendix A.

According to the California Department of Conservation Geologic Energy Management Division (CalGEM) on-line database, the nearest active or former oil or gas well to the Site is reportedly a plugged oil/gas production well located approximately 30 feet southeast of the Site (CalGEM, 2023). The well, designated as “Beloil Corporation Ltd., Well #1, Groves Lease” was installed in 1927, and abandoned in 1945. Information from CalGEM regarding the former well is included in Appendix B.

No potential facilities of concern are listed on the Geotracker or EnviroStor databases within a 1,000-foot radius of the Site (Geotracker & Envirostor, 2023).

3.2 CURRENT SITE SETTING

The Site is currently an undeveloped dirt lot. The Site is planned to be re-developed with a single multi-story residence with a subterranean garage, constructed to a maximum depth of approximately 14 feet bgs. The footprint of the proposed residence is approximately 2,000 square feet and is shown on Figure 2. The total square footage of the property is approximately 4,012 square feet.

The estimated elevation at the Site is approximately 35 feet above mean sea level (feet-msl). Topography in the vicinity of the Site is relatively flat (USGS, 2018).

3.3 REGIONAL GEOLOGY

The Site lies on the Huntington Beach Mesa, within the Orange County Coastal Plain. The Coastal Plain is bounded to the northwest by the Santa Monica Mountains, to the north by the Puente Hills, to the northeast by the Santa Ana Mountains, and to the southwest by the Pacific Ocean. Along the coast, hills and mesas are aligned northwesterly as a surface expression of the Newport-Inglewood structural zone. These features are breached by gaps through which fingers of the central lowland extend to the sea. The Huntington Beach Mesa is about 2 ½ miles wide and extends inland from the ocean nearly 4 miles. The mesa attains an elevation of 70 feet-msl along its stream cut northwest bluffs, while its gullied southeastern face drops to approximately 25 feet-msl. Along the southwest boundary of the mesa, 30 to 40 foot high cliff faces abut the

Pacific Ocean. The surface of the mesa slopes inland and is submerged under the sediments of the Coastal Plain (DWR, 1967).

The Coastal Plain is comprised of coalescing alluvial fans of the Los Angeles, San Gabriel and Santa Ana Rivers. The fans descend from the Los Angeles Narrows (275 feet msl), the Whittier Narrows (200 feet msl) and the Santa Ana Canyon (275 feet msl) in gradients between 10 to 20 feet to the mile. The fans coalesce into a common plain that extends to, and merges with, the coastal tidelands. Generally, the Coastal Plain is a flat-lying physiographic feature that dips gently toward the southwest (USGS, 1956).

The Site is underlain by Pleistocene age deposits of the San Pedro formation. Oil and water well boring logs have shown the upper section of the underlying San Pedro formation to be composed of alternating thin layers of silt, clay, sand and gravel, which are in turn underlain by a thick lower section composed almost exclusively of sand and gravel (USGS, 1956).

3.4 REGIONAL HYDROGEOLOGY

The Site lies within the East Coastal Plain Hydrologic Subarea of the Lower Santa Ana River Hydrologic Area of the Santa Ana River Hydrologic Unit (Unit 801.11). The groundwater within Unit 801.11 is reported to be of beneficial use for municipal supply, domestic supply, agricultural supply, industrial service supply and industrial process supply (RWQCB, 1995).

According to the Orange County Water District's map entitled, *1997 Depth to Shallowmost Groundwater*, prepared November 2, 2015, first encountered groundwater in the Site area occurs at approximately 25 feet below ground surface (bgs) (OCWD, 2015).

4.0 OBJECTIVE

The objective of this investigation was to assess if soil contamination associated with former oil well production operations conducted in the Site vicinity is present beneath the subject property, in accordance with CS No. 431-92.

5.0 FIELD INVESTIGATION

Drilling operations for the current investigation were conducted by FREY personnel on August 2, 2023. Underground Service Alert (USA) was notified prior to field work. All activities related to this subsurface investigation were conducted under the supervision of a State of California Registered Professional Engineer in accordance with accepted engineering practice and protocol.

5.1 ADVANCEMENT AND SAMPLING OF SOIL BORINGS

On August 2, 2023, two soil borings, designated B1 and B2, were advanced to final depths of approximately 25 feet bgs with a truck mounted hydraulic direct push rig.

Soil borings B1 and B2 were located near the front and central portions of the Site, respectively, inside the future footprint of the proposed residence as shown on Figure 2. Additionally, boring B2 was advanced at a location inside the footprint of the future subterranean garage and within the suspected reserve pit observed in the air photos. Soil borings B1 and B2 were located approximately 69 and 121 feet away from the nearest former oil/gas well to the Site, respectively. The locations of the soil borings and the nearest former oil/gas well are shown on Figure 2.

Soil samples were collected continuously from the ground surface to the bottom of each boring. The upper four feet of each soil boring was advanced with a hand auger, and the remainder of each boring was advanced with the hydraulic direct-push rig. Collected soil samples were examined in order to characterize the soil lithology and to monitor for evidence of petroleum hydrocarbons. An RKI GX-6000 photo-ionization detector (RKI PID) was used to screen soil samples for concentrations of undifferentiated volatile organic compounds (UVOCs) in the field, and to adhere to the procedures outlined in the health and safety plan. The RKI PID was properly calibrated prior to use.

Soil samples collected from depths of approximately 1, 5, 10, 15, 20, and 25 feet bgs from B1 and B2 were submitted to a laboratory for possible chemical analysis. Soil samples collected for volatile organic compound (VOC) analyses were collected and preserved using EPA Method No. 5035B procedures and protocol. No other soil samples were collected during the investigation for laboratory analysis at any other depths since there were no field indications of petroleum hydrocarbon impacted soils in either soil boring. Groundwater was not encountered during the investigation.

Field procedures used in the advancement of borings and collection of soil samples, and a PID calibration log are presented in Appendix C. Boring logs and explanations regarding the format, terms and soil classification system used to describe the soil conditions are presented in Appendix D.

5.2 LABORATORY ANALYSES

Soil samples collected from 1 and 5 feet bgs in borings B1 and B2 were analyzed for California Assessment Manual (CAM) metals and pH in accordance with EPA Method Nos. 6010B/7471A and 9045D, respectively. Soil samples collected from depths of 5, 10, 15, and 20 feet bgs in borings B1 and B2 were analyzed for total petroleum hydrocarbons with carbon chain speciation (TPH) and for VOCs and total petroleum hydrocarbons as gasoline (TPHg) in accordance with EPA Method Nos. 8015B and 8260B, respectively. The soil sample collected from 25 feet bgs in each boring was submitted to the laboratory and placed on "hold." Ultimately, the 25-foot bgs soil samples were not analyzed since TPH and VOCs were not detected in the soil sample collected from 20 feet bgs in each boring.

Field duplicate soil samples were collected from boring B2 at 1, 5, and 15 feet bgs and analyzed for CAM metals and pH (1 foot bgs sample), VOCs (5 foot bgs sample), and TPH (15 foot bgs sample).

Additionally, FREY submitted a trip blank which was analyzed for VOCs in accordance with EPA Method No. 8260B.

The soil sample laboratory analyses were performed by Jones Environmental, a State-certified hazardous waste testing laboratory located in Santa Fe Springs, California.

5.3 INVESTIGATION DERIVED WASTE

Minimal soil waste was generated during the investigation due to the nature of soil boring advancement (direct-push rig, which does not generate soil cuttings). The minimal soil cuttings generated with the hand auger to clear each boring location were placed next to each soil boring. No soil wastes were transported off-Site.

The minimal volume of decontamination liquids (approximately 5 gallons) generated during the investigation was containerized in a covered and labelled five-gallon plastic bucket. Following receipt of laboratory results, the inert liquids were placed on soils adjacent to each boring.

6.0 RESULTS OF THE SUBSURFACE INVESTIGATION

6.1 SUBSURFACE CONDITIONS

Subsurface materials encountered during drilling of boring B1 consisted primarily of silt from the ground surface to approximately 7 feet bgs, silty clay from approximately 7 to 14 feet bgs, silty fine-grained sand from approximately 14 to 21 feet bgs, and fine-grained sand from approximately 21 feet bgs to the bottom of the boring at 25 feet bgs.

Subsurface materials encountered during drilling of boring B2 consisted primarily of silt from the ground surface to approximately 15 feet bgs, silty fine-grained sand from approximately 15 to 18 feet bgs, and fine-grained sand from approximately 18 feet bgs to the bottom of the boring at 25 feet bgs.

Groundwater was not encountered during the investigation.

Petroleum hydrocarbon odors were not observed, and UVOC concentrations were not detected in the soil samples and cuttings.

Soil lithologies encountered at the Site during drilling operations are depicted on the boring logs included in Appendix D.

6.2 LABORATORY RESULTS

Soil sample analytical results are summarized in Table 1. Copies of the laboratory and quality assurance reports and chain-of-custody documentation are presented in Appendix E.

Soil

TPH and VOCs were not detected in the soil samples analyzed during the investigation (Table 1).

With the exception of arsenic, which is discussed in the next section, various metals were detected in the soil samples collected from borings B1 and B2 that were analyzed for metals at concentrations below their respective EPA Regional Screening Levels (RSLs) and DTSC Modified Screening Levels (SLs) for residential soil (EPA, 2023 and DTSC, 2022, respectively) (Table 1).

Trip Blanks

VOCs were not detected in the trip blanks submitted during this investigation.

7.0 DISCUSSION

Arsenic was detected in soil sample B2-5 at a concentration exceeding the applicable SLs and RSLs for arsenic in residential soils. However, in Southern California where naturally occurring arsenic is prevalent, the DTSC considers an arsenic concentration of 12 milligrams per kilogram (mg/kg) or less as representative of regional background concentrations in soil in Southern California and acceptable for use as a screening level to assess whether arsenic is a constituent of potential concern (DTSC, 2008). The arsenic concentrations detected in soil samples during this investigation were below the DTSC Southern California Regional Background Concentration of 12 mg/kg.

8.0 CONCLUSIONS

Based on the results of this investigation, the following conclusions are presented:

- Site soils meet CS No. 431-92 standards for residential soil.
- Concentrations of detected metals were below the EPA RSLs and/or DTSC SLs, as applicable, for residential soil, with the exception of arsenic, which was below the DTSC recognized background concentration of arsenic in Southern California of 12 mg/kg.

9.0 RECOMMENDATION

Based on the results of this investigation, it is FREY's professional judgement that no further action is required for the Site at this time. If during the conduct of grading operations for the proposed residential development, petroleum hydrocarbon odors or visible signs of petroleum soil staining are encountered, additional environmental assessment may be warranted.

10.0 LIMITATIONS

The judgments described in this report are professional opinions based solely within the limits of the scope of work authorized, and pertain to conditions judged to be present or applicable at the time the work was performed. Future conditions may differ from those described herein, and this report is not intended for future evaluations of this Site unless an update is conducted by a consultant familiar with environmental assessments.

This report was compiled partially on information supplied to FREY Environmental, Inc. from outside sources, other information that is in the public domain and a visual inspection of the property. FREY Environmental, Inc. makes no warranty as to the accuracy of statements made by others, which may be contained in this report, nor are any other warranties or guarantees, expressed or implied, included or intended by the report, except that it has been prepared in accordance with the current accepted practices and standards consistent with the level of care and skill exercised under similar circumstances by other professional consultants or firms performing similar services.

Site conditions may change with time as the result of natural alterations or man-made changes on this or adjacent properties. Future environmental investigations conducted at the Site may reveal Site conditions not indicated in the data reviewed by FREY Environmental, Inc. Additionally, changes in standards or regulations applicable to the Site may occur. The findings of this report may be partially or wholly invalidated by changes of which FREY Environmental, Inc. is not aware or has not had the opportunity to evaluate.

Environmental assessments provide an additional source of information regarding the environmental conditions of a particular property or facility. The report to the Client is a professional opinion and judgment, dependent upon FREY's knowledge and information obtained during the course of performance of the services.

Should you have any questions regarding this report, please contact us.

Sincerely,

FREY Environmental, Inc.



Ed Rands
Senior Project Engineer
P.E. #58183

A handwritten signature in black ink, appearing to read "Eli Appelgate".

Eli Appelgate
Staff Geologist
GIT #1549