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STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

CLEANUP AND ABATEMENT ORDER NO. R4-2010-00XX
REQUIRING

SHELL OIL ~~PRODUCTS US~~ COMPANY

TO CLEANUP AND ABATE WASTE
DISCHARGED TO WATERS OF THE STATE
(PURSUANT TO CALIFORNIA WATER CODE SECTION 13304[1])
AT THE FORMER KAST PROPERTY TANK FARM,
CARSON, CALIFORNIA

(FILE NO. 97-XXX)

Cleanup and Abatement Order No. R4-2010-00XX requires Shell Oil ~~Products US~~ Company (hereinafter, the "Discharger") to assess, monitor, and cleanup and abate the effects of petroleum hydrocarbon compounds and other contaminants of concern discharged to soil and groundwater at their former Kast Property Tank Farm facility (hereinafter, the "Site") located southeast of the intersection of Marbella Avenue and East 244th Street, in Carson, California.

The California Regional Water Quality Control Board, Los Angeles Region (Regional Board) herein finds:

BACKGROUND

1. **Discharger:** Shell Oil ~~Products US (hereinafter, the "Discharger")~~ Company (SOC), previously Shell Company of California, is a Responsible Party (RP) due to its: (a) ownership of the former Kast Property Tank Farm, and (b) former operation of a petroleum hydrocarbon tank farm at the Site. The Discharger has caused or permitted waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and has created a condition of pollution or nuisance.

2. **Location:** The Site is located southeast of the intersection of Marbella Avenue and East 244th Street in the City of Carson, California. The Site occupies approximately ~~50~~44 acres of land and is bordered by the Los Angeles County Metropolitan Transportation Authority railroad right-of-way on the north, Lomita Boulevard on the south, Marbella Avenue on the west, and Panama Avenue on the east (Figure 1). The Site was previously owned by the Discharger, who operated three oil storage reservoirs from the 1920s to the mid-1960s. The central and southern reservoirs each had a capacity of 750,000 barrels

[1] Water Code section 13304 (a) states: Any person who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirement or other order or prohibition issued by a regional board or the state board, or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance, shall upon order of the regional board, clean up the waste or abate the effects of the waste, or, in the case of threatened pollution or nuisance, take other necessary remedial action, including, but not limited to, overseeing cleanup and abatement efforts.

of oil and the northernmost reservoir had a capacity of 2,000,000 barrels of oil. The Site presently consists of the Carousel residential neighborhood and city streets.

3. **Groundwater Basin:** The Site is located on the Torrance Plain of the West Coast Groundwater Basin (Basin), in the southwestern part of the Coastal Plain of Los Angeles County. Beneath the Site, the first encountered groundwater is estimated at 54 feet below ground surface (bgs). The Basin is underlain by a series of aquifers, the deeper of which are used for drinking water production. These aquifers are with increasing depth, the Gage aquifer, Lynwood aquifer, and Silverado aquifer. As set forth in the *Water Quality Control Plan for the Los Angeles Region* (the Basin Plan), adopted on June 13, 1994, the Regional Board has designated beneficial uses for groundwater (among which include municipal and domestic drinking water supplies) in the ~~Central~~West Coast Basin and has established water quality objectives for the protection of these beneficial uses.

4. As detailed in the findings below, the Discharger's activities at the Site have caused the release of waste resulting in soil, soil vapor, and groundwater contamination and discharges to the waters of the state.

SITE HISTORY

5. **Property Ownership and Leasehold Information:** Based on information submitted to the Regional Board by the Discharger, the Site has the following property ownership and leasehold history:

    a. According to the Sanborn maps dated 1924 and 1925, the Site was owned and operated by "Shell Company of California (Kast Property)" beginning in approximately 1924 until the mid-1960s. The Site was used as a tank farm, which included three crude oil storage reservoirs, Reservoir Nos. 5, 6 and 7. Reservoir No.5, the center reservoir, had a capacity of 750,000 barrels of oil and was under lease to General Petroleum Corporation. Reservoir No. 6, the southernmost reservoir, had a capacity of 750,000 barrels of oil; and Reservoir No. 7, the northernmost reservoir, had a capacity of 2,000,000 barrels of oil. According to Sanborn map notations, the reservoirs had concrete-lined earth-slopes with frame roofs on wood posts, surrounded by earth levees averaging 20 feet in height with 7 foot wide walks on top. One oil pump house was depicted on the 1925 Sanborn map within the southern portion of the Site. Since construction, the Site was used as a crude oil storage reservoir.

    b. ~~In the absence of records of demolition of the former Kast Property Tank Farm, Pacific Soils Engineering prepared a preliminary soils investigation in March 1966 on behalf of Lomita Development Company documenting that the demolition of the tank farm reservoirs left the concrete liners or slabs of the walls and floors of the reservoirs buried in situ.~~ In 1966, SOC sold the Site to Lomita Development Company, an affiliate of Richard Barclay and Barclay-Hollander-Curci (BHC), with the reservoirs in place. The Pacific Soils Engineering Reports dated January 7, 1966; March 11, 1966; July 31, 1967; and June 11, 1968 documented that: 1) Lomita Development Company emptied and demolished the reservoirs, and graded the Site prior to it developing the Site as residential housing; 2) part of the concrete floor of the

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central reservoir was removed by Lomita Development Company from the Site; and 3) where the reservoir bottoms were left in place, Lomita Development Company made 8-inch wide circular trenches in concentric circles approximately 15 feet apart to permit water drainage to allow the percolation of water and sludge present in the reservoirs into the subsurface.

c. ~~By~~ In phases between 1967 and 1969, Lomita Development Company ~~the site was~~ developed the Site into one- and two-story single family residential ~~properties by Lomita Development Company~~parcels and sold the developed lots to individual homeowners. ~~In aerial photographs taken in 1967, the reservoirs were demolished and the Site was redeveloped with single family residences.~~

6. **Site Description and Activities:** ~~The Discharger began~~According to information in the Regional Board's file on this Site, oil related operations at the Site began in 1923 and ~~operations~~ ended ~~in~~ by the early 196~~0s4~~. The Site was previously owned and operated by ~~the Discharger~~Shell Company of California, which was subsequently renamed Shell Oil Company, as a crude oil storage facility. The facility included equipment that~~to~~ pumped the oil to the nearby SOC~~Discharger~~'s refinery for processing from three concrete-lined oil storage reservoirs with a total capacity of 3.5 million barrels. In ~~the mid-~~ 196~~60s~~, SOC closed the Site~~facility was closed~~ and ~~the Discharger~~SOC sold the Site to Lomita Development Company, an affiliate of Richard Barclay and Barclay-Hollander-Curci. Subsequently, ~~the Site was~~Lomita Development Company ~~re~~developed the Site into the Carousel residential neighborhood, which contains~~ing~~ 285 single-family homes.

7. **Chemical Usage:** Based on the Phase I Environmental Site Assessment (ESA) dated July 14, 2008 conducted by Shell Oil Products[2] (SOPUS) consultant, URS Corporation, the Site was used for the storage of crude oil in all three reservoirs on the property from at least 1924 to 1966. Subsequent records indicate that in the 1960s the reservoirs may also have been used for storage of bunker oil. Ongoing investigations indicate petroleum hydrocarbon compounds including volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) are impacted in the subsurface soil, soil vapor, and groundwater underlying the Site.

EVIDENCE OF CONTAMINATION AND BASIS FOR ORDER

8. **Waste Releases:** The following summarizes assessment activities associated with the Site:

   a. In 2007, under the regulatory oversight of the California Department of Toxic Substances Control (DTSC), an environmental investigation was initiated at the former Turco Products Facility (TPF). Soil vapor and groundwater were investigated in areas directly west of the Site and at locations in the northwestern portion of the Site. The DTSC-required investigation detected petroleum hydrocarbons, benzene, toluene, and chlorinated solvents in soil and soil vapor. A multi-depth soil vapor survey, which included soil vapor sampling on the Site at locations coincident with the former Kast Site footprints, detected benzene at

[2] Shell Oil Products US is the dba for Equilon Enterprises LLC, which is wholly owned by Shell Oil Company.

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concentrations up to 150 micrograms per liter (µg/l) ~~in soil vapor~~. Benzene was detected at TPF groundwater monitoring well MW-8, which has a northeast flow direction, at a concentration of 1,800 µg/l. Therefore, groundwater monitoring well MW-8 is located upgradient of the Kast Site. Chlorinated solvents were also detected at the Kast Site groundwater monitoring well MW-5.~~The soil vapor samples were collected within the footprints of the former Site reservoirs. During the offsite sampling of the investigation of the former TPF by the DTSC. DTSC also reported concentrations as high as 1,800 µg/l of benzene in groundwater beneath the former TPF site. The reported use of chemicals at the former TPF did not involve petroleum hydrocarbons, and this prompted the DTSC to request the Regional Board to initiate regulatory oversight of the former Site.~~

b. ~~The Phase I Report dated August 20, 2009 showed that soil impacts consisted primarily of petroleum hydrocarbons spanning a wide range of carbon chains and including benzene, toluene, ethylbenzene, and xylene.~~The *Final Phase I Site Characterization Report* dated October 15, 2009, which was prepared by URS Corporation on behalf of SOPUS showed that soil impacts consisted primarily of petroleum hydrocarbons spanning a wide range of carbon chains and including Total Petroleum Hydrocarbons (TPH) as gasoline (g), TPH as diesel (TPHd), TPH as motor oil (TPHmo), benzene, and naphthalene (See Tables 1, 2A, 2B, and 3).

I. In June 2009, a subsurface investigation of public streets in the Carousel neighborhood consisting of ten cone penetrometer/rapid optical screening tools (CPT/ROST) was performed. The CPT/ROST logs indicated several locations within the Site with elevated hydrocarbon concentrations. The CPT/ROST logs also showed that the highest apparent soil impacts occurred at depths of 12 feet bgs, 36 feet bgs, and 40 feet bgs.

II. A total of 228 soil samples were collected during the Phase I Site Characterization. The analytical data for soil samples collected from soil borings advanced on public streets across the Site (Figure 2) were as follows:

i. The highest detected concentration of TPH was 22,000 milligrams per kilogram (mg/kg) and TPHg, TPHd, and TPHmo were 8,800, 22,000, and 21,000 mg/kg, respectively;

ii. Benzene, ethylbenzene, toluene, and xylenes were detected in concentrations as high as 21,000 micrograms per kilogram (µg/kg), 32,000 µg/kg, 12,000 µg/kg, and 140,000 µg/kg, respectively;

iii. SVOCs were detected in concentrations as high as ~~29~~47 mg/kg of naphthalene, 38 mg/kg of 1-methylnaphthalene, 63 mg/kg of 2-methylnaphthalne, 12 mg/kg phenanthrene, and 9.0 mg/kg pyrene; and

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iv. Arsenic and lead were detected in concentrations as high as 53.2 mg/kg and 52.5 mg/kg, respectively.

III. Soil vapor samples collected from a 5-foot depth and greater below the public streets in the Carousel neighborhood indicated elevated benzene and methane (Figures 3 and 4). Benzene was detected at a maximum concentration of 3,800µg/l, which exceeds the California Human Health Screening Level (CHHSL) value of 0.036 µg/l for benzene set for shallow soil vapor in a residential area. Methane was also detected in concentrations as high as 59.7 % (by volume) that significantly exceed its lower explosive limit of 5% (by volume), posing a potential safety hazard.

c. Between September 2009 and February 2010, residential soil and sub-slab soil vapor sampling was conducted at 41 parcels (Figure 5 a – f; Tables 1 and 2) and the results were as follows:

I. Surface and subsurface soil (0 to 10 feet bgs) detected concentrations of chemicals of concern that significantly exceeded soil screening levels as follows:

i. VOCs - Benzene (1~~4~~0,000 µg/kg), tetrachloroethylene (PCE) (22,000 µg/kg), 1,2,4-trimethylbenzene (34,000 µg/kg), and 1,3,5-trimethylbenzene (14,000 µg/kg);

ii. SVOCs - Naphthalene (18 mg/kg), Benzo(a)pyrene (2.9 mg/kg), benzo(a)anthracene (0.1 mg/kg), chrysene (0.27 mg/kg), phenanthrene (0.28 mg/kg), and pyrene (0.19 mg/kg); and

iii. Lead was also detected at a maximum concentration of 307 mg/kg.

II. The highest detected concentration of TPHg was 5,000 mg/kg, TPHd was ~~85~~33,000 mg/kg, and TPHmo was ~~8~~41,~~1~~000 mg/kg;

III. As of September 27, 2010, sub-slab soil vapor samples have been collected from 172 homes in the Carousel neighborhood. Additional data continues to be collected as part of the Phase II Site Characterization. The validated data from the first 41 homes detected benzene, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, ethylbenzene, p/m-xylenes, toluene, and acetone, at a maximum concentration of 4,500 micrograms per cubic meter (µg/m^3), 2,200 µg/m^3, 1,000 µg/m^3, 1,100 µg/m^3, 5,200 µg/m^3, 700 µg/m^3, 270 µg/m^3, respectively.

d. Between November 19, 2009 and February 15, 2010, additional step-out soil and soil vapor sampling at the elevated soil vapor sampling locations were conducted in selected locations beneath the public streets at the Site. The measured concentrations for petroleum hydrocarbons in soil were as follows:

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I. The highest detected concentrations of TPHg was 9,800 mg/kg, TPHd was 22,000 mg/kg, and TPHmo was 21,100 mg/kg;

II. The highest detected concentrations of benzene was 33,000 µg/kg, Ethylbenzene was 42,000 µg/kg, toluene was 11,000 µg/kg, and xylenes were 140,000 µg/kg, respectively;

III. SVOCs were detected in concentrations as high as ~~22~~47 mg/kg of naphthalene, 33 mg/kg of 1-methylnaphthalene, 53 mg/kg of 2-methylnaphthalne, 6.1 mg/kg phenanthrene, and 3.9 mg/kg pyrene; and

IV. Arsenic and lead were detected in concentrations as high as 28.2 mg/kg and 13.6 mg/kg, respectively.

e. In ~~March 2010~~July 2009, the installation of six on-site groundwater monitoring wells (Figure 6) were completed and quarterly groundwater monitoring was initiated. Groundwater was encountered at 53 feet bgs. Groundwater samples from five of the six wells contained concentrations of benzene at a maximum concentration of 140 µg/L and trichloroethylene (TCE) at a maximum concentration of 290 µg/L. One of the monitoring wells (MW-3) contains a free product or a light non-aqueous phase liquid (LNAPL) with a maximum measured thickness of 9.01~~3.4~~ foot as of May 27, 2010~~thickness~~.

9. Source Elimination and Remediation Status at the Site

a. The results of the initial soil and soil vapor investigation indicate the presence of elevated methane and benzene at concentrations exceeding the Lower Explosive Limit and the CHHSL for shallow soil vapor, at several locations ~~across~~beneath the public streets at the Site. On October 15, 2009, the Regional Board directed the Discharger to expeditiously design and implement an interim remedial action.

b. On May 12, 2010 the Regional Board approved SOPUS's proposed Soil Vapor Extraction (SVE) pilot test in order to evaluate the use of this technology as a remedial option for VOCs at the Site.

10. Summary of Findings from Subsurface Investigations

a. Regional Board staff have reviewed and evaluated numerous technical reports and records pertaining to the release, detection, and distribution of contaminants on the Site and its vicinity. The Discharger has stored, used, and/or released petroleum hydrocarbon compounds~~, including benzene and methane,~~ at the Site. Elevated levels of TPH and other contaminants have been detected in soil, soil vapor and groundwater beneath the Site.

b. The sources for the evidence summarized above include, but are not limited to:

I. Various technical reports and documents submitted by the Discharger or its representatives to Regional Board staff.

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II. Site inspections conducted by Regional Board staff, as well as meetings, letters, electronic mails, and telephone communications between Regional Board staff and the Discharger and/or its representatives.

III. Subsurface drainage study for the Site reservoirs submitted by Girardi and Keese, the law firm retained by some of the residents of the Carousel neighborhood.

11. Summary of Current Conditions Requiring Cleanup and Abatement

a. Based on the Phase I ESA for the Site dated July 14, 2008 (prepared by URS Corporation) and the most recent information provided to the Regional Board by SOPUS: 1) SOC sold the Kast Site to Lomita Development Company, an affiliate of Richard Barclay and Barclay-Hollander-Curci, in 1966 with the reservoirs in place; 2) the Pacific Soils Engineering Reports from 1966 to 1968 indicate that Lomita Development Company emptied and demolished the reservoirs, and residential housing; 3) part of the concrete floor of the central reservoir was removed by Lomita Development Company from the Site; and 4) where the reservoir bottoms were left in place, Lomita Development Company made 8-inch wide circular trenches in concentric circles approximately 15 feet apart to permit water drainage to allow percolation of water and sludge present in the reservoirs into the subsurface~~, the Discharger has not located any documentation of operation or closure activities for the Site. According to the document titled *Preliminary Soils Investigation Report* dated January 7, 1966 prepared by Pacific Soils Engineering, Inc., the bottom concrete slabs that make up the former reservoir were buried in the fill~~.

b. There is no consistent trend in the vertical distribution of detected concentrations of petroleum hydrocarbon compounds that can be discerned from soil boring data to date. Although, the majority of the aforementioned highest detected TPH concentrations were obtained from the 2.5-foot depth samples, there were multiple locations where the highest concentrations were in the 5-foot or 10-foot samples. This may be due to the nature of previous development activities by Lomita Development Company at the Site (i.e., the construction and demolition of the former reservoirs and site grading in preparation for development of the residential tract).

c. On May 11, 2010, Environmental Engineering and Contracting, consultants hired by Girardi and Keese, conducted exploratory trenching in order to locate and identify the obstructions that have been frequently encountered during the advancement of shallow soil borings at many of the residential homes investigated to date. Regional Board staff observed the encountering of an approximately 8-inch thick concrete slab extending at the trench excavation termination depth of 9 feet, 2 inches. The Pacific Soils Engineering Report dated January 7, 1966 states that the reservoirs were lined with a "four inch blanket of reinforced concrete". These obstructions are presumed to be remnants of the concrete liners of the former reservoir.

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d. ~~Based on the human health risk screening evaluation of the data for the 41 residential~~Results from the 166 Interim Residential Sampling Reports submitted to the Regional Board through November 17, 2010 indicate that for surface and subsurface soil sampling (0 to 10 feet bgs), the cancer risk index estimate is between 0 and 10 for 65 residential parcels, between 10 and 100 for 93 parcels, and exceeded 100 for ~~33~~8 parcels~~residential properties~~. ~~The cancer risk index is estimated as high as 90.~~ In the area where the highest cancer index is documented, SVOCs (i.e. Benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene and chrysene), benzene, and ethylbenzene were the primary chemicals of potential concern (COPCs) contributing to the cancer risk index.

For the Carousel neighborhood investigation, the Regional Board is using the most protective cancer risk screening levels recommended by the State and federal governments, which is one in one million (1×10^{-6}) additional risks. For screening purposes, ~~T~~the Regional Board routinely uses the most conservative (health-protective assumptions) risk based screening levels of 1×10^{-6} for the target chemical. This screening level is based on a target risk level at the lower end of the US Environmental Protection Agency (USEPA) risk management range of one-in-a-million risk (1×10^{-6}) for cancer risk and a hazard quotient of 1.

The presence of a chemical at concentrations in excess of a CHHSL does not indicate that adverse impacts to human health are occurring or will occur, but suggests that further evaluation of potential human health concerns is warranted (Cal-EPA, 2005). It should also be noted that CHHSLs are not intended to "set … final cleanup or action levels to be applied at contaminated sites" (Cal-EPA, 2005).

e. ~~Based on~~Results from the 166 Interim Residential Sampling Reports submitted to the Regional Board through November 17, 2010 also indicate that for the sub-slab soil vapor data collected from the residential parcel~~properties~~, the cancer risk index estimate was between 0 and 10 for 144 parcels, between 10 and 100 for 20 parcels, and greater than 100 for 2 parcels~~exceeded 1 in 27 of the total 40 residential properties investigated to date~~. The two highest ~~C~~cancer risk index were estimate~~d~~s as ~~high as~~ 550 and 120~~were also documented~~. In most cases, benzene was the primary contributor to the ~~soil vapor~~ cancer risk index estimate.

f. The Office of Environmental Health Hazard Assessment (OEHHA) performed a quantitative risk evaluation of TPH using surface and subsurface (0 to 10 feet bgs) soil TPH fractionation data for the 41 residential parcels (Table 3). Based on the risk calculation, OEHHA estimated maximum exposures for a child and compared the resulting exposure estimates of reference dosages with that provided by DTSC interim guidance dated June 16, 2009. OEHHA concluded that aromatic hydrocarbons in the C-9 to C-32 range at five parcels exceeded their reference values for children (Exhibit 1).

g. ~~**Soil nuisance and odor concerns:**~~ The San Francisco Bay Regional Water Quality Control Board developed the Environmental Screening Level (ESL) ~~prepared by the San Francisco Bay Regional Water Quality Control Board,~~ as

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guidance for determing when concentration of TPH may present a nuisance and detectable odor. The ESL, based on calculated odor indexes, ~~set a shallow soil ceiling level~~ for residential land-use. is 100 mg/kg for TPHg and TPHd. ~~concentrations at 100 mg/kg for residential land use.~~ The soil TPHg and TPHd data obtained from the Site were detected up to 9,800 mg/kg and 85,000 mg/kg, respectively, which exceed the ESL.

~~h. **Pollution of Waters of the State:** The Discharger has caused or permitted waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance. The State Water Resources Control Board's Resolution No. 92-49 set forth the policies and procedures to be used during an investigation or cleanup of a polluted site and defines nuisance and odor concerns as follows: "*Anything which is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property by an entire community or neighborhood, or by any considerable number of persons, or unlawfully obstructs the free passage or use, in the customary manner, of any navigable lake, or river, bay, stream, canal, or basin...is a public nuisance.*"~~

~~i. The Discharger, in a letter addressed to the Regional Board dated May 5, 2010 (Exhibit 2), stated that it is considering a variety of potential alternatives that can be applied at specific properties and in the public streets in order to avoid environmental impacts and avoid any significant risks to human health at the Site. The Discharger also indicated that if it becomes necessary for residents to relocate temporarily to perform this work, the Discharger will take appropriate steps to minimize any inconvenience and compensate them for any resulting expenses.~~

12. **Pollution of Waters of the State**: The Discharger has caused or permitted waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance. The State Water Resources Control Board's Resolution No. 92-49 set forth the policies and procedures to be used during an investigation or cleanup of a polluted site and defines nuisance and odor concerns as follows: "*Anything which is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property by an entire community or neighborhood, or by any considerable number of persons, or unlawfully obstructs the free passage or use, in the customary manner, of any navigable lake, or river, bay, stream, canal, or basin...is a public nuisance.*"~~Regional Board staff will consider cleanup goals in accordance with the following State Policies:~~

~~a. "Antidegradation Policy" (State Board Resolution No. 68-16) which requires attainment of background levels of water quality, or the highest level of water quality that is reasonable in the event that background levels cannot be restored. Cleanup levels other than background must be consistent with the maximum benefit to the people of the State, not unreasonably affect present and anticipated beneficial uses of water, and not result in accidence of water quality objectives in the *Basin Plan*.~~

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~~b. "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304" (State Board Resolution No. 92-49) which sets forth criteria to consider for those cases of pollution wherein restoration of water quality to background levels may not be reasonable.~~

13. ~~Pursuant to section 13304 of the California Water Code, the Regional Board may seek reimbursement for all reasonable costs to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action.~~Although requested by the Discharger, the Regional board is declining to name additional potentially responsible parties (PRPs) to this Order at this time. Substantial evidence indicates that the Discharger caused or permitted waste to be discharged into waters of state and is therefore appropriately named as a responsible party in this Order. However, the Regional Board will continue to investigate whether additional PRPs (including, but not limited to, Lomita Development Company, Richard Barclay, Barclay-Hollander-Curci, and/or any of its successors) caused or contributed to the contamination at the Site and whether these or other parties should be named as additional responsible parties to this Order or a separate Order. The Regional Board may amend this Order or issue a separate Order in the future as a result of this investigation. Although investigation concerning additional PRPs is ongoing, the Regional Board desires to issue this Order as waiting will only delay remediation of the Site.

14. ~~This action is being taken for the protection of the environment and as such is exempt from the provisions of the California Environmental Quality Act (Public Resources Code section 21000 et seq.) in accordance with California Code of Regulations, title 14, section 15308.~~The Discharger, in a letter to the Regional Board dated May 5, 2010 (Exhibit 2), stated that it is considering a variety of potential alternatives that can be applied at specific parcels and in the public streets in order to avoid environmental impacts and avoid any significant risks to human health at this Site. The Discharger also indicated that if it becomes necessary for residents to relocate temporarily to perform this work, the Discharger will take appropriate steps to minimize any inconvenience and compensate them for any resulting expenses.

15. Issuance of this Order is being taken for the protection of the environment and as such is exempt from provisions of the California Environmental Quality Act (CEQA) (Pubic Resources Code section 21000 et seq.) in accordance with California Code of Regulations, title 14, sections 15061(b)(3), 15306, 15307, 15308, and 15321. This Order generally requires the Discharger to submit plans for approval prior to implementation of cleanup activities at the Site. Mere submittal of plans is exempt from CEQA review at this time would be premature and speculative, as there is simply not enough information concerning the Discharger's proposed remedial activities and possible associated environmental impacts. If the Regional Board determines that implementation of any plan required by this Order will have a significant effect on the environment, the Regional Board will conduct the necessary and appropriate environmental review prior to Executive Officer approval of the applicable plan.

16. Pursuant to section 13304 of the California Water Code, the Regional Board may seek reimbursement for all reasonable costs to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action.

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THEREFORE, IT IS HEREBY ORDERED, pursuant to California Water Code section 13304, that the Discharger shall cleanup and abate the effects of contaminants of concern including, but not limited to, total petroleum hydrocarbons (TPH) and other TPH-related contaminants ~~of concern~~ discharged to soil and groundwater at the Site in accordance with the following requirements:

1. **Complete Delineation of On- and Off-Site Contamination**: Completely delineate the extent of soil, soil vapor, and groundwater contamination caused by the release of contaminants of concern including, but not limited to, TPH and other TPH-related contaminants at the Site into the saturated and unsaturated zones. Assessment has been ongoing under Regional Board oversight, but assessment is not yet complete. If ongoing reinterpretation of new data derived from the tasks performed suggests that modification or expansion of the tasks approved by the Regional Board is necessary for complete assessment, SOC is required to submit a work plan addendum(a).

2. **Continue to Conduct Groundwater Monitoring**:

   a. Continue the existing quarterly groundwater monitoring program previously required by the Regional Board, and

   b. As new wells are installed, they are to be incorporated into the existing groundwater monitoring program.

3. **Conduct Remedial Action**: Initiate a phased cleanup and abatement program with the cleanup of soil, soil vapor, and groundwater contamination and abatement of the effects of contaminants of concern, but not limited to, petroleum and petroleum-related contaminated shallow soils and pollution sources as highest priority.

   Shallow soils in this Order are defined as soils found to a nominal depth of 10 feet, where potential exposure for residents and/or construction and utility maintenance workers is considered likely (Ref. Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities – CalEPA 1996).

   Specifically, the Discharger shall:

   a. ~~Remediate the shallow soils in the unpaved areas of the Carousel neighborhood residential properties associated with contaminant releases across the footprints of the Site.~~Conduct an assessment of any potential environmental impacts of the residual concrete slabs of the former reservoir that includes: (1) the impact of the remaining concrete floors on contaminant migration where the concrete floors might still be present; (2) whether there is a need for the removal of the concrete; and (3) the feasibility of removing the concrete floors beneath (i) unpaved areas at the Site, (ii) paved areas at the Site, and (iii) homes at the Site. The Discharger is required to submit this environmental impact assessment of the residual concrete slabs to the Regional Board no later than 60 days after the date of issuance of this Order.

   b. Develop ~~and implement~~ a pilot testing work plan, which includes 1) evaluation of the feasibility of removing impacted soils to 10 feet and removal of

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contaminated shallow soils and reservoir concrete slabs encountered within the uppermost 10 feet, including areas beneath residential houses; and 2) remedial options that can be carried out where site characterization (including indoor air testing) is completed; 3) plans for relocation of residents during soil removal activities, plans for management of excavated soil on-site, and plans to minimize odors and noise during soil removal. The Discharger is required to submit this Pilot Test Work Plan to the Regional Board for review and approval by the Executive Officer no later than 60 days after the date of issuance of this Order. –Upon approval of the Pilot Test Work Plan by the Executive Officer, the Discharger shall implement the Pilot Test Work Plan within 60 days of the issuance of the approval of the Pilot Test Work Plan.~~pilot testing for removal of contaminated shallow soils and reservoir concrete slabs from affected areas, including areas beneath residential houses, if warranted by soil monitoring results. This pilot test work plan shall include impacted areas beneath any existing paved areas and concrete foundations of the homes. The pilot test work plan shall include, but is not limited to, plans for relocation of residents during soil removal activities, plans for management of excavated soil on site, and plans to minimize odors and noise during soil removal. The Discharger is required to submit this Pilot Test Work Plan to the Regional Board for review and approval by **September 15, 2010.**~~

c. Prepare ~~and implement~~ a full-scale ~~petroleum hydrocarbon~~ impacted ~~shallow~~ soil Remedial Action Plan (RAP) for the Site. The Discharger is required to submit the RAP to the Regional Board for review and approval by the Executive Officer no later than 60 days after the date of the Executive Officer's approval of the Pilot Test Report.~~**October 30, 2010**~~.

I. The RAP shall include, at a minimum, but is not limited to:

i. A detailed plan for remediation of any shallow soil contamination that will incorporate the results from the ~~not be effectively addressed by the ongoing s~~Soil Vapor Extraction Pilot Test currently being performed~~system;~~.

ii. A ~~contingency~~ plan to address any impacted area beneath any existing paved areas and concrete foundations of the homes, if warranted;

iii. A detailed surface containment and soil management plan;

iv. An evaluation of all available options including proposed selected methods for remediation of shallow soil and soil vapor; and

v. Continuation of interim measures for mitigation according to the Regional Board approved Interim Remediation Action Plan (IRAP)~~existing soil remediation with soil vapor extraction pilot testing~~.

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II. The RAP, at a minimum, shall apply the following guidelines ~~criteria stated below~~ to cleanup soil and groundwater contamination. The cleanup goals shall include:

i. Soil cleanup goals set forth in the Regional Board's *Interim Site Assessment and Cleanup Guidebook, May 1996,* ~~shall be considered. The Discharger shall consider~~ contaminant concentrations, depth to the water table, the nature of the chemicals, soil conditions and texture, and attenuation trends, human health protection levels set forth in *USEPA Regional Screening Levels (Formerly Preliminary Remediation Goals),* for evaluation of the potential intrusion of subsurface vapors (soil vapor) into buildings and subsequent impact to indoor air quality, California Environmental Protection Agency's *Use of Human Heath Screening Levels (CHHSLS) in Evaluation of Contaminated Properties*, dated January 2005, or its latest version, and the Department of Toxic Substances Control (DTSC) *Interim Guidance Evaluating Human Health Risks from Total Petroleum Hydrocarbons (Interim Guidance)*, dated June 16, 2009, Soil vapor sampling requirements are stated in the *DTSC Interim Guidance* and the Regional Board's *Advisory – Active Soil Gas Investigations*, dated January 28, 2003, or its latest version, DTSC's *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air*, revised February 7, 2005, or its latest version, USEPA Risk Assessment Guidance for Superfund, Parts A through E; USEPA User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings, 2003; USEPA Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, 2002; USEPA Supplemental Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites, 2002; CalEPA Selecting Inorganic Constituents as Chemicals of Potential Concern at Risk Assessments at Hazardous Waste Sites and Permitted Facilities, CalEPA DTSC, February 1997; CalEPA Use of the Northern and Southern California Polynuclear Aromatic Hydrocarbons (PAH) Studies in the Manufactured Gas Plant Site Cleanup Process, CalEPA DTSC, July 2009.

ii. Groundwater cleanup goals shall not exceed California's Maximum Contaminant Levels or Action Levels for drinking water as established by the California Department of Public Health at a point of compliance approved by the Regional Board.

iii. The State Water Resources Control Board's "Antidegradation Policy" (State Board Resolution No 68-16), which requires attainment of background levels of water

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quality, or the highest level of water quality that is reasonable in the event that background levels cannot be restored. Cleanup levels other than background must be consistent with the maximum benefit to the people of the State, not unreasonably affect present and anticipated beneficial uses of water, and not result in exceedence of water quality objectives in the Regional Board's *Basin Plan*.

iv. The State Water Resources Control Board's "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304" (State Board Resolution No. 92-49), which sets forth criteria to consider for those cases of pollution wherein restoration of water quality to background levels may not be reasonable.

III. If site-specific cleanup goals are proposed by the Discharger, the Discharger shall submit the site-specific cleanup goals for the Executive Officer's approval no later than 60 days after the date of issuance of this Order. The proposed site-specific cleanup goals shall include detailed technical rationale and assumptions underlying each goal.

IV. Upon approval of the RAP by the Executive Officer, the Discharger shall implement the RAP within 60 days of the issuance of the approval of the RAP.

d. Continue to conduct residential surface and subsurface soil and sub-slab soil vapor sampling under the current Regional Board approved work plan dated September 24, 2009. If the ongoing reinterpretation of new assessment data derived from the tasks described in the work plan suggests that modification or expansion of the tasks proposed in the RAP is necessary for complete cleanup, then the Discharger shall submit addenda to the September 24, 2009 work plan to the Regional Board for review and approval by the Executive Officer no later than 60 days of the date of issuance of this Order~~October 30, 2010~~.

e. If the ongoing groundwater monitoring and investigation warrants, the Discharger shall:

I. Install new wells in order to complete the groundwater monitoring well network and to fully delineate the impacted groundwater plume, and

II. Prepare a detailed impacted groundwater remedial action plan. The Regional Board will determine the due date of the groundwater RAP at a later time.

~~Public Review~~

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~~All documents submitted to the Regional Baord in compliance with the terms and conditions of this Order shall be made available to members of the public pursuant to the Freedom Information Act (5 U.S.C.§ 552), as amended, and the Public Records Act (California Government Code § 6250 et seq.).~~

~~All documents submitted to the Regional Board Executive Officer for approval shall be made available to the public for a 30 day period to allow for public comment.~~

4. ~~**Involvement of the**~~ **Public Review and Involvement:**

   a. Cleanup proposals submitted to the Regional Board for approval in compliance with the terms of this Order shall be made available to the public for a minimum 30-day period to allow for public review and comment. The Regional Board will consider any comments received before taking final action on a cleanup proposal.

   b. The Discharger shall encourage public participation. The Discharger is required to prepare and submit ~~for review~~ a Public Participation Plan for review and approval by the Executive Officer, with the goal of having the Regional Board provid~~eing~~ the stakeholders and other interested persons with:

      I. Information, appropriately targeted to the literacy and translational needs of the community, about the investigation and remedial activities concerning the contamination at the Site; and

      II. Periodic, meaningful opportunities to review, comment upon, and to influence investigation and cleanup activities at the Site.

   c. ~~Periodic, meaningful opportunities to review, comment upon, and to influence investigation and cleanup activities at the Site.~~ Public participation activities shall coincide with key decision making points throughout the process as specified or as directed by the Executive Officer of the Regional Board.

5. **Time Schedule:** The Discharger shall submit all required technical work plans and reports by the deadlines stated in this Order, which are summarized in Table 4. As field activities at this Site are in progress, additional technical documents may be required and/or new or revised deadlines for the technical documents may be issued. Therefore, Table 4 may be updated as necessary.

6. The Regional Board's authorized representative(s) shall be allowed:

   a. Entry upon premises where a regulated facility or activity is located, conducted, or where records are stored, under the conditions of this Order;

   b. Access to copy any records that are stored under the conditions of this Order;

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c. Access to inspect any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and

d. The right to photograph, sample, and monitor the Site for the purpose of ensuring compliance with this Order, or as otherwise authorized by the California Water Code.

7. **Contractor/Consultant Qualification:** A California licensed professional civil engineer or geologist, or a certified engineering geologist or hydrogeologist shall conduct or direct the subsurface investigation and cleanup program. All technical documents required by this Order shall be signed by and stamped with the seal of the above-mentioned qualified professionals.

8. This Order is not intended to permit or allow the Discharger to cease any work required by any other Order issued by this Regional Board, nor shall it be used as a reason to stop or redirect any investigation or cleanup or remediation programs ordered by this Regional Board or any other agency. Furthermore, this Order does not exempt the Discharger from compliance with any other laws, regulations, or ordinances which may be applicable, nor does it legalize these waste treatment and disposal facilities, and it leaves unaffected any further restrictions on those facilities which may be contained in other statues or required by other agencies.

9. The Discharger shall submit 30-day advance notice to the Regional Board of any planned changes in name, ownership, or control of the facility; and shall provide 30-day advance notice of any planned physical changes to the Site that may affect compliance with this Order. In the event of a change in ownership or operator, the Discharger also shall provide 30-day advance notice, by letter, to the succeeding owner/operator of the existence of this Order, and shall submit a copy of this advance notice to the Regional Board.

10. Abandonment of any groundwater well(s) at the Site must be approved by and reported to the Executive Officer of the Regional Board at least 14 days in advance. Any groundwater wells removed must be replaced within a reasonable time, at a location approved by the Executive Officer. With written justification, the Executive Officer may approve of the abandonment of groundwater wells without replacement. When a well is removed, all work shall be completed in accordance with California Department of Water Resources Bulletin 74-90, "California Well Standards," Monitoring Well Standards Chapter, Part III, Sections 16-19.

11. The Regional Board, through its Executive Officer or other delegate, may revise this Order as additional information becomes available. Upon request by the Discharger, and for good cause shown, the Executive Officer may defer, delete or extend the date of compliance for any action required of the Discharger under this Order. The authority of the Regional Board, as contained in the California Water Code, to order investigation and cleanup, in addition to that described herein, is in no way limited by this Order.

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12. Any person aggrieved by this action of the Regional Board may petition the State Water Resources Control Board (State Water Board) to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:
    http://www.waterboards.ca.gov/public_notices/petitions/water_quality
    or will be provided upon request.

13. Failure to comply with the terms or conditions of this Order may result in imposition of civil liabilities, imposed either administratively by the Regional Board or judicially by the Superior Court in accordance with Sections 13304, 13308, and/or 13350, of the California Water Code, and/or referral to the Attorney General of the State of California.

14. None of the obligations imposed by this Order on the Discharger are intended to constitute a debt, damage claim, penalty or other civil action which should be limited or discharged in a bankruptcy proceeding. All obligations are imposed pursuant to the police powers of the State of California intended to protect the public health, safety, welfare, and environment.

Ordered by: _____ Date:
Deborah Smith
Chief Deputy Executive Officer

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ATTACHMENTS

FIGURES

Figure 1:	Site Vicinity Map
Figure 2:	Previous Exploration Location
Figure 3:	Proposed Soil Vapor Sampling Locations
Figure 4:	Benzene and Methane Concentrations in Soil Vapor
Figure 5a:	Carousel Houses Tested as of March 15, 2010
Figure 5b:	Residential Methane Screening Results as of March 15, 2010
Figure 5c:	Summary of Results of Testing for Benzene Concentrations in Soil Vapor as of March 15, 2010
Figure 5d:	Summary of Results of Testing for Non-Benzene Concentrations in Soil Vapor as of March 15, 2010
Figure 5e:	Summary of Soil Sampling Results (0-10' Below Surface) as of March 15, 2010
Figure 5f:	Methane Concentrations in Soil Vapor at 5 Feet Below Surface as of March 15, 2010
Figure 6:	Proposed Groundwater Monitoring Well Locations

TABLES

Table 1:	Data Summary from Phase I and Phase~~pahse~~ II Site Characterization for Soil and Soil Vapor
Table 2A~~1~~:	Summary of Soil Samples Analytical Results -VOCs, SVOCs, and TPH
Table 2B:	Summary of Soil Vapor Analytical Results -VOCS and Fixed Gases
Table 3:	Maximum Concentration of Aliphatic and Aromatic Hydrocarbons by Hydrocarbon Fractionations at Individual Properties
Table 4:	Deadlines for Technical Work Plans and Reports

EXHIBITS

Exhibit 1:	OEHHA's Memorandum dated May 19, 2010
Exhibit 2:	Shell Oil Company Letter to the Regional Board dated May 5, 2010

Note: All Figures and Tables, except Table 4, were taken from technical reports prepared by SOPUS's consultant, URS Corporation

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