

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

ORDER No. R2-2018-0051

ADOPTION OF SITE CLEANUP REQUIREMENTS for:

**UNION OIL COMPANY OF CALIFORNIA, INC.
NOVATO PROPERTIES LLC**

for the property located at:

7455 REDWOOD BOULEVARD
NOVATO, MARIN COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter Regional Water Board), finds that:

- Site Location:** The site at 7455 Redwood Boulevard, Novato (Site) (Parcel Number 141-244-03), is in northern downtown Novato, south of Olive Avenue. The less than one-acre Site is bound on the north by a Shell-branded retail fueling station, on the west by a self-service car wash facility, to the south by commercial-retail properties, and to the east by a frontage road. The area immediately surrounding the Site is currently zoned commercial with numerous residential properties as near as 200 feet west of the Site. The City of Novato is in the process of rezoning the commercial area as mixed residential/commercial. According to the City, the draft Environmental Impact Report for the rezoning is expected to be completed in fall 2018. Adoption of the Updated General Plan for this rezoning is expected in early 2019. The current property owner intends to redevelop the Site into mixed commercial/residential once rezoning is complete.
- Site History:** Prior to 1953, the Site was undeveloped. The Site operated as a Union Oil Company of California, Inc. (Unocal) service station from approximately 1953 to 1992. In January 1992, Unocal ceased operations at the Site, and the underground fuel storage tanks, waste oil tank (WOT), dispenser islands, and associated piping were removed. Chevron U.S.A., Inc. (Chevron) merged with Unocal in 2005. Chevron never owned or operated the Site or the former Unocal station. The Site was subsequently occupied by an automotive repair facility/moving truck and trailer rental center from 1993 until February 28, 2013. Two hydraulic lifts and an oil-water separator were removed in May 2014 along with all onsite buildings. The Site is currently unoccupied, and no buildings are present at the Site.

The table below lists property ownership during and after the period when the Unocal station operated at the Site:

Time Period	Property Ownership
2005 – present	Novato Properties LLC (majority ownership Ms. Carla Ravipati)
2000 - 2005	100% Nancy Johnson (mother of Ms. Carla Ravipati) & Mr. Kleve Johnson (father of Ms. Carla Ravipati)

Prior to 2000	100% Mr. Fred Galbreath (father of Ms. Nancy Johnson) who first leased the land to Unocal
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3. **Named Dischargers:** Unocal is named as a Discharger because it discharged pollutants to soil and groundwater at the Site. Novato Properties LLC is named as a Discharger because it is the current owner of the property on which there is an ongoing discharge of pollutants, it has knowledge of the discharge or the activities that caused the discharge, and it has the legal ability to control the discharge.

If additional information is submitted indicating that other parties caused or permitted any waste to be discharged on the Site where it entered or could have entered waters of the State, the Regional Water Board will consider adding those parties to this order.

4. **Site Hydrogeology and Hydrology:** The City of Novato is located in the Novato Valley Groundwater Basin of the San Francisco Bay Hydrologic Region. Drinking water is provided to the Site and neighboring properties by the North Marin Water District. Asphalt and artificial fill are present at the Site to a depth of one to five feet below ground surface (bgs). The fill material is composed of fine- to coarse-grained sand and gravel. The fill material is found directly above the native silty sands and gravels. In general, silty to clayey sands and gravels underlie the clay from about 10 to 25 feet (ft) bgs. This sand and gravel unit is the principal groundwater-bearing zone at the Site. However, water has been encountered in two distinct lithologic units at the Site: the artificial fill unit and the sand and gravel unit. Groundwater in the fill material is likely due to localized surface infiltration, dependent on seasonal variations and localized lithologic heterogeneities. Historically, depth to groundwater is shallow, usually less than 7 feet bgs. The direction of groundwater flow is typically to the northeast at an average gradient of about 0.005 ft/ft (since 2012).

5. **Remedial Investigations:** Starting in 1992, Unocal conducted several environmental investigations at the Site including the following:

- Installation of ten groundwater monitoring wells;
- Installation eight permanent soil vapor probes in 2013 and 2014; and
- Conducting the most recent comprehensive subsurface soil investigation in June 2016.

Soil and groundwater samples at and downgradient of the former WOT are defined below detectable concentrations (or within expected background concentrations for the five heavy WOT metals). The groundwater plume extends less than 150 feet downgradient of the Site. In summary, subsurface contamination in soil, groundwater, and soil vapor are adequately defined. Significant soil, groundwater, and soil vapor contamination remains at the Site that presents a potential threat to human health and the environment (see Finding 6).

6. **Low-Threat Closure Evaluation:** In Resolution No. 2012-0016, the State Water Resources Control Board (State Water Board) adopted the [Low-Threat Underground Storage Tank Case Closure Policy](#) (LTCP) on May 1, 2012. The purpose of the LTCP is to establish consistent statewide case closure criteria for low-threat petroleum UST sites. The LTCP states that *“in the absence of unique attributes of a case or site-specific conditions that demonstrably increase the risk associated with residual petroleum constituents, cases that meet the general and media-specific criteria described in this policy pose a low threat to human health, safety or the*

environment and are appropriate for closure [...] Cases that meet the criteria in this policy do not require further corrective action and shall be issued a uniform closure letter.” The following table compares the Site to the LTCP criteria:

LTCP General Criteria	Meets LTCP Criteria?
a. The unauthorized release is located within the service area of a public water system;	Yes
b. The unauthorized release consists only of petroleum;	Yes
c. The unauthorized (“primary”) release from the UST system has been stopped;	Yes
d. Free product has been removed to the maximum extent practicable;	NO
e. A conceptual site model that assesses the nature, extent, and mobility of the release has been developed;	Yes
f. Secondary source has been removed to the extent practicable;	NO
g. Soil or groundwater has been tested for methyl tert-butyl ether (MtBE) and results reported; and	Yes
h. Nuisance as defined by Water Code section 13050 does not exist at the Site.	NO
Groundwater Media-Specific Criteria	NO
Vapor Intrusion to Indoor Air Media-Specific Criteria	NO
Direct Contact and Outdoor Air Exposure Media-Specific Criteria	NO

The Site does not meet the following LTCP criteria:

General Criteria (d). Free product has been removed to the maximum extent practicable.

Since 2016, groundwater samples from MW-2 have contained up to 0.14 feet of free product. Free product was also detected from borings S-14 and S-24 (approximately six inches of free product). A grab groundwater sample from boring S-24 collected on June 28, 2016, contained 390,000 µg/L of TPH-g, 17,000 µg/L of benzene, and 5,400 µg/l of ethylbenzene. These high concentrations in S-24 indicate a strong likelihood that free product is present at S-24. MW-2, S-14, and S-24 are located near the downgradient northeastern corner of the property. No free product removal was conducted in this area. See Finding 7 for a summary of remediation at the Site, none of which included free product removal from the area encompassing MW-2, S-14, and S-24. This area of free product represents about 10% of the entire Site but about 50% of the Site downgradient of the former dispenser area. California Code of Regulations (CCR) title 23, division 3, chapter 16, section 2655 requires that free product be removed to the maximum extent practicable.

General Criteria (f). Secondary source has been removed to the extent practicable.

The most recent comprehensive subsurface soil investigation was conducted in June 2016. Significant soil contamination remains at up to 6,400 mg/kg of Total Petroleum Hydrocarbon as gasoline (TPH-g), 9.3 mg/kg of benzene, 89 mg/kg of ethylbenzene, and 54 mg/kg of naphthalene. These high concentrations are located beneath the primary sources or adjacent to the primary sources. These high soil concentrations are the source of the residual high concentrations in groundwater at the Site. These high soil concentrations also present a potential threat to human health via direct contact and outdoor air exposure. The residual high concentrations in the soil and groundwater are the source of the high concentrations of contaminants of concern (COCs) detected in soil vapor, presenting a potential threat to human

health via vapor intrusion to indoor air. Because of these residual high concentrations in soil, groundwater, and soil vapor, secondary sources have not been removed to the extent practicable.

General Criteria (h). Nuisance as defined by Water Code section 13050 does not exist at the Site. “Nuisance” at the Site meets all of the following requirements:

- (1) 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.
- (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.
- (3) Occurs during, or as a result of, the treatment or disposal of wastes.

The remaining contamination on the Site constitutes a nuisance. Residual contamination concentrations in soil gas significantly exceed odor thresholds, with the result that future site users are likely to be exposed to offensive odors. Current soil and groundwater contamination at the Site pose a threat to future sites users via future vapor intrusion. This condition is injurious to the health of future site users during and after redevelopment of the Site. The presence of contamination at the Site will adversely affect a considerable number of people (future occupants of the Site and future subsurface workers). The presence of contamination at the Site is the result of the disposal of wastes.

Groundwater-Specific Criteria

The Site does not meet the LTCP groundwater-specific criteria:

Groundwater-Specific Criteria Number	Meets Criteria?
1. Contaminant plume < 100 feet in length; No free product; Nearest supply well or surface water body > 250 feet from plume boundary	NO (due to plume length and free product)
2. Contaminant plume < 250 feet in length; No free product; Nearest supply well or surface water body > 1,000 feet from plume boundary; Dissolved benzene < 3,000 µg/L & dissolved MtBE < 1,000 µg/L	NO (due to free product, nearest well or water body, and benzene/MtBE concentrations)
3. Contaminant plume < 250 feet in length; Free product removed to the maximum extent practicable, may still be present but does not extend offsite; Plume stable or decreasing for > five years; Nearest supply well or surface water body > 1,000 feet from plume boundary; Property owner willing to accept a land use restriction	NO (due to free product, nearest well or water body, and land use restriction)
4. Contaminant plume < 1,000 feet in length; No free product; Nearest supply well or surface water body > 1,000 feet from plume boundary;	NO (due to free product, nearest well or water body, and benzene/MtBE concentrations)

Dissolved benzene < 1,000 µg/L & dissolved MTBE < 1,000 µg/L	
5. The regulatory agency determines based upon current and reasonably anticipated near-term future scenarios, the contaminant plume poses a low threat to human health, safety, and the environment and that water quality objectives will be achieved within a reasonable time frame	NO (not low threat)

Vapor Intrusion to Indoor Air Risk Specific Criteria. Petroleum release sites shall satisfy the media-specific criteria for petroleum vapor intrusion to indoor air.

Three rounds of soil vapor sampling in 2013 and 2014 contained the following COCs at concentrations significantly above the LTCP vapor intrusion to indoor air criteria for sites without a bio-attenuation zone for both residential and commercial land uses: ethylbenzene and naphthalene and probably benzene. This Site does not have a bio-attenuation zone due to oxygen below 4% in the soil vapor samples. The high concentrations of soil vapor ethylbenzene, naphthalene, and benzene present a potential threat to human health. Methane (a chemical not covered in the LTCP) was detected at up to 40 % in the 3-foot bgs samples. The methane concentrations exceed the upper explosive limit (15% by volume). Methane is a known asphyxiant. Therefore, methane in soil vapor is a potential human health hazard. The following table summarizes the soil vapor information against the LTCP criteria:

Chemical	LTCP Residential Criteria (µg/m ³)	LTCP Commercial Criteria (µg/m ³)	Maximum concentration of soil vapor at the Site (µg/m ³)
Benzene	85	280	< 6,900
Ethylbenzene	1,100	3,600	430,000
Naphthalene	93	310	>11,000

Direct Contact and Outdoor Air Exposure Media Specific Criteria

Soil samples at the Site from 2016 significantly exceed this LTCP criteria and present a potential threat to human health:

Chemical	Shallow Soil (0-5 ft bgs)		Deeper Soil (5-10 ft bgs)	
	Residential Direct Contact Criteria (mg/kg)	2016 Maximum Concentrations (mg/kg)	Outdoor Air Exposure Criteria (mg/kg)	2016 Maximum Concentrations (mg/kg)
Benzene	1.9	2.4	2.8	9.3
Ethylbenzene	21	47	32	89
Naphthalene	9.7	48	9.7	54

The June 2016 investigation involved analyzing soil samples from 67 locations; 29 of these locations contained concentrations of benzene, ethylbenzene, and/or naphthalene that exceeded the LTCP residential criteria for direct contact and outdoor air exposure.

Significant contamination remains in soil, groundwater, and soil vapor and presents a potential threat to human health and the environment. Active remediation is needed to meet the LTCP closure criteria.

7. **Interim Remedial Measures:** To date, interim remedial activities have included excavating the areas at the former underground storage tank pit, former product piping trenches, and the former WOT pit. In addition, approximately 15,000 gallons of groundwater were removed from the Site during the 1993 excavation activities. In 2001, oxygen releasing compound (ORC[®]) socks were installed in monitoring wells MW-2, MW-3, and MW-5 to enhance biodegradation of the dissolved petroleum hydrocarbons. Two groundwater extraction events were conducted on two monitoring wells in the third and fourth quarters of 2005 from MW-3 and MW-5. In-situ chemical oxidation pilot test injections were conducted for 10 days in April 2011. The LTCP requires the removal of secondary sources to the extent practicable within a year. This contamination has remained at the Site unabated for years. Additional active remediation is needed since prior remedial activities have not sufficiently reduced contaminant concentrations in soil, soil vapor, and groundwater.

In a [letter](#) dated February 27, 2017, Chevron proposed no active remediation and, instead, proposed using engineering and institutional controls to address the residual contamination.

Active cleanup is necessary for the following reasons:

- The soil vapor concentrations at the Site indicate a substantial vapor intrusion to indoor air threat to future Site building occupants under both residential and commercial land use scenarios. Significant vadose-zone cleanup is needed to meet soil vapor screening levels in the LTCP for both residential and commercial land use scenarios.

[State Water Board Resolution No. 92-49](#) states that a Regional Water Board shall concur with any investigation and cleanup and abatement proposal which has a “*substantial likelihood to achieve compliance, within a reasonable time frame.*” Without additional remediation, compliance with the cleanup levels for soil, groundwater, and soil vapor (see B. CLEANUP LEVELS below) would not occur in a reasonable time due to the presence of free product and the high concentrations of COCs in soil, groundwater, and soil vapor. Excavation is a cleanup strategy that could be implemented at the Site.

- State Water Board Resolution No. 92-49 expressly states the Board’s preference for “*permanent cleanup and abatement solutions which do not require ongoing maintenance, wherever feasible.*” Engineering and institution controls are not a substitute for cleanup work. Cleanup permanently removes the source of contamination of vapor intrusion to indoor air at commercial or residential buildings. To remain effective and to avoid unintended “breaches”, vapor mitigation measures require ongoing attention such as: inspections, maintenance/repairs, and indoor air sampling.
- Guidance documents from the Department of Toxic Substances Control¹ and U.S. EPA² recommend cleanup action to address vapor intrusion, rather than solely relying on vapor mitigation measures.
- Engineering and institutional controls do not address the LTCP criteria for removal of free product and adequate source removal.

In this case, the reasonable timeframe to complete cleanup and meet low-threat closure criteria is within 90 days after Novato Properties LLC notifies the Regional Water Board and Unocal

¹ http://dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm. See October 2011 Vapor Intrusion Guidance.

² See June 2015 OSWER Technical Guidance. <https://www.epa.gov/vaporintrusion/technical-guide-assessing-and-mitigating-vapor-intrusion-pathway-subsurface-vapor>.

of the City of Novato's final approval of the Site's redevelopment project (e.g., development agreement) or December 31, 2019, whichever is earlier. This reasonable timeframe is based on the following rationale:

- [State Water Board Resolution No. 92-49](#) states that a Regional Water Board shall concur with any investigation and cleanup and abatement proposal which has a "*substantial likelihood to achieve compliance, within a reasonable time frame.*"
- The LTCP requires the removal of secondary sources to the extent practicable within a year. The LTCP also states that even if the secondary source is removed, additional cleanup may be required by the regulatory agency if it is necessary to abate a demonstrated threat to human health such as petroleum vapor intrusion to indoor air. In addition, the LTCP requires meeting the petroleum vapor intrusion media-specific criteria for existing occupied and reasonably expected future occupied buildings.
- The property owner intends to redevelop the Site once rezoning allows residential usage. Conducting active cleanup within 90 days after the final approval by City of Novato of entitlement to develop the Site (e.g., development agreement) or December 31, 2019, whichever is earlier to meet residential criteria prior to or during redevelopment, will protect future occupants of the Site from significant exposure to contaminants via vapor intrusion and direct contact/outdoor exposure.
- The Site is currently vacant. There are no impediments to implementation of cleanup. The LTCP requires vapor intrusion cleanup actions even in the absence of a current exposure pathway such as at a vacant property or unoccupied buildings.

8. **Regulatory Status:** This Site is currently not subject to a Water Code section 13304 cleanup and abatement order. In general, Unocal has complied with past Regional Water Board Water Code section 13267 directive letters (between 1995 – 2017) requiring submittal of technical reports (workplans, investigation reports, implementation reports, and corrective action plans). Unocal submitted two Feasibility Study/Corrective Action Plans (FS/CAPs), in 2007 and 2015, conditionally approved by Regional Water Board staff. However, Unocal is unwilling to implement either of its approved FS/CAPs. A Water Code section 13304 cleanup and abatement order is needed to require cleanup.

9. **Adjacent Sites:** Within 2,000 feet upgradient of the Site, there are two known closed underground storage tank cases: Novato Fire Station at 1000 Grant Avenue and Pini Hardware at 1107 Grant Avenue. There are two downgradient or cross-gradient closed underground storage tank cases within 300 feet of the Site: an operating Shell station at 7473 Redwood Boulevard and an operating Chevron station at 7474 Redwood Boulevard.

10. **Basis for Cleanup Levels**

- a. **General:** [State Water Board Resolution No. 68-16](#), "*Statement of Policy with Respect to Maintaining High Quality of Waters in California*," applies to this discharge. It requires maintenance of background levels of water quality unless a lesser water quality is consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial uses, and will not result in exceedance of applicable water quality objectives. This order and its requirements are consistent with Resolution No. 68-16.

State Water Board Resolution No. 92-49, "*Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*" applies to this discharge. It directs the Regional Water Boards to set cleanup levels equal to background water quality or the best water quality which is reasonable, if background levels cannot be restored. The cleanup levels established in this order are consistent with the maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial uses of such water, and will not result in exceedance of applicable water quality objectives. Cleanup levels established in this Order are greater than background because there is no feasible technology that can cost-effectively cleanup to background levels. This order and its requirements are consistent with the provisions of Resolution No. 92-49, as amended.

- b. **Beneficial Uses:** The [Water Quality Control Plan for the San Francisco Bay Basin](#) (Basin Plan) is the Regional Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan was duly adopted by the Regional Water Board and approved by the State Water Board, Office of Administrative Law, and U.S. EPA, where required.

Regional Water Board [Resolution No. 88-63](#), "*Sources of Drinking Water*" defines potential sources of drinking water to include all groundwater in the region, with limited exceptions for areas of high TDS, low yield, or naturally-high contaminant levels. Groundwater underlying and adjacent to the Site qualifies as a potential source of drinking water.

The Basin Plan designates the following potential beneficial uses of groundwater underlying and adjacent to the Site:

- Municipal and domestic water supply
- Industrial process water supply
- Industrial service water supply
- Agricultural water supply

In a 2003 well survey by Cambria for the adjacent Shell site at 7473 Redwood Boulevard, 19 supply wells were found within a 2,400-foot radius of the Shell site: 6 domestic wells, 5 municipal wells, 3 irrigation wells, 3 industrial wells, and 2 unknown use wells. The nearest supply well was an irrigation well located about 300 feet cross-gradient from the Shell site and the Site.

- c. **Basis for Groundwater Cleanup Levels:** The groundwater cleanup levels for the Site are based on applicable water quality objectives and are the more stringent of the U.S. EPA and California primary maximum contaminant levels (MCLs). Cleanup to this level will protect beneficial uses of groundwater and will result in acceptable residual risk to humans.
- d. **Basis for Soil Cleanup Levels:** The soil cleanup levels for the Site are based on the LTCP criteria for protection of human health due to direct contact and outdoor air exposure.

- e. **Basis for Soil Vapor Cleanup Levels:** The soil vapor cleanup levels for the Site are intended to prevent vapor intrusion into occupied buildings and will result in acceptable residual risk to humans. Cleanup levels for soil vapor are based on the LTCP criteria for protection of human health due to vapor intrusion to residential buildings.
11. **Future Changes to Cleanup Levels:** If new technical information indicates that the established cleanup levels are significantly over-protective or under-protective, the Regional Water Board will consider revising those cleanup levels.
12. **Reuse or Disposal of Extracted Groundwater:** Regional Water Board Resolution No. 88-160 allows discharges of extracted, treated groundwater from site cleanups to surface waters only if it has been demonstrated that neither reclamation nor discharge to the sanitary sewer is technically and economically feasible.
13. **Basis for Order:** Water Code section 13304 authorizes the Regional Water Board to issue orders requiring a discharger to cleanup and abate waste where the discharger has caused or permitted waste to be discharged or deposited where it is or probably will be discharged into waters of the State and creates or threatens to create a condition of pollution or nuisance. As discussed above, these conditions are present here. Water Code section 13267 authorizes the Regional Water Board to issue orders requiring a discharger to submit technical or monitoring program reports where the discharger has discharged, discharges, or who is suspected of having discharged or discharging waste that could affect the quality of water, as is the case here. The burden of preparing the required reports, including costs, bears a reasonable relationship to the need for the report and the benefits to be obtained, namely ensuring the protection of human health and the environment.
14. **California Safe Drinking Water Policy:** It is the policy of the State of California that, every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This Order promotes that policy by requiring discharges to meet maximum contaminant levels designed to protect human health and ensure that water is safe for domestic use.
15. **California Environmental Quality Act (CEQA):** This action is an order to enforce the laws and regulations administered by the Regional Water Board. As such, this action is categorically exempt from the provisions of CEQA pursuant to CCCR title 13, section 15321.
16. **Notification:** The Regional Water Board has notified the Dischargers and all interested agencies and persons of its intent under Water Code section 13304 to prescribe site cleanup requirements for the discharge and has provided them with an opportunity to submit their written comments.
17. **Public Hearing:** The Regional Water Board, at a public meeting, heard and considered all comments pertaining to this discharge.

IT IS HEREBY ORDERED, pursuant to sections 13304 and 13267 of the California Water Code, that the Dischargers (or their agents, successors, or assigns) shall cleanup and abate the effects

described in the above findings as follows and submit technical and monitoring program reports described in the tasks and Self-Monitoring Program below:

A. PROHIBITIONS

1. The discharge of wastes or hazardous substances in a manner that will degrade water quality or adversely affect beneficial uses of waters of the State is prohibited.
2. Further significant migration of wastes or hazardous substances through subsurface transport to waters of the State is prohibited.
3. Activities associated with the subsurface investigation and cleanup that will cause significant adverse migration of wastes or hazardous substances are prohibited.

B. CLEANUP LEVELS

1. **Groundwater Cleanup Levels:** The following groundwater cleanup levels shall be met in all wells identified in the attached Self-Monitoring Program:

Constituent	Concentration ($\mu\text{g/l}$)	Basis*
Benzene	1	MCL
Ethylbenzene	700	MCL
MtBE	5	MCL
TPH-g	300	MCL/odor
Toluene	150	MCL
Total Xylenes	1,750	MCL

*MCL: Lower of the U.S. EPA or Cal/EPA primary or secondary MCL.

MCL/odor: Cal/EPA's secondary MCL for odor is 3.0 units, or 3 times the odor threshold for any constituent. The Regional Water Board's environmental screening levels define the odor threshold for TPH-g at 100 $\mu\text{g/l}$. See also Bay Basin [Table 3-5](#) (water quality objectives for municipal supply).

2. **Soil Vapor Cleanup Levels:** The following soil vapor cleanup levels shall be met in all onsite vadose-zone soils beneath the proposed building(s) and in a buffer area within 30 feet of the proposed building(s):

Constituent	Concentration ($\mu\text{g/m}^3$)	Basis*
Benzene	85	LTCP
Ethylbenzene	1,100	LTCP
Naphthalene	93	LTCP

*LTCP criteria for Petroleum Vapor Intrusion to Indoor Air assuming residential land use and no bio-attenuation zone. There is no bio-attenuation zone because soil vapor samples collected in 2013 and 2014 contain oxygen at less than 4%.

3. Soil Cleanup Levels: The following soil cleanup levels shall be met in all onsite vadose-zone soils:

Constituent	Concentration (mg/kg) (0 – 5 ft bgs)	Concentration (mg/kg) (5 – 10 ft bgs)	Basis*
Benzene	1.9	2.8	LTCP
Ethylbenzene	21	32	LTCP
Naphthalene	9.7	9.7	LTCP

*LTCP criteria for Direct Contact and Outdoor Air Exposure Criteria assuming residential land use

C. TASKS

1. FEASIBILITY STUDY / CORRECTIVE ACTION PLAN

COMPLIANCE DATE: December 31, 2018

Submit a technical report acceptable to the Executive Officer containing:

- a. Summary of remedial investigation
- b. Summary of risk assessment (if necessary)
- c. Evaluation of the installed interim remedial actions
- d. Feasibility study evaluating alternative final remedial actions
- e. Recommended final remedial actions to meet residential cleanup levels
- f. Implementation tasks and time schedule

The Feasibility Study/Corrective Action Plan (FS/CAP) must propose remedial work to eliminate unacceptable threats to human health and restoring beneficial uses of water in a reasonable time of within 90 days after final approval by City of Novato of entitlement to develop the Site (e.g., development agreement) or December 31, 2019, whichever is earlier (see Finding 7 for rationale). The FS/CAP must address the full extent of contamination originating at the Site, including any contamination extending beyond the source-property boundary. The FS/CAP must contain all the details of how the final recommended remedial action(s) will be implemented and a time schedule of implementation.

Item d shall include projections of cost, effectiveness, benefits, and impact on public health, welfare, and the environment of each alternative action.

Items a through d shall be consistent with the guidance provided by Subpart F of the National Oil and Hazardous Substances Pollution Contingency Plan (40 C.F.R. § 300), CERCLA guidance documents with respect to remedial investigations and feasibility studies, Health and Safety Code section 25356.1(c), and State Water Board Resolution No. 92-49 as amended ("Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304").

In item e, the Dischargers may propose alternate residential soil vapor cleanup levels based on additional attenuation between ground-floor commercial use and upper-floor residential use.

2. **FS/CAP IMPLEMENTATION PLAN**

COMPLIANCE DATE: February 28, 2019

Submit a technical report acceptable to the Executive Officer. The report shall include a detailed plan for implementing the chosen remedial action alternative outlined in the FS/CAP. This FS/CAP Implementation Plan must include the following:

- Detailed design of the chosen remedial action alternative;
- Groundwater management plan for managing the discharge of any extracted groundwater during implementation of the FS/CAP;
- Methane Management Plan (to mitigate the potential risk of explosion from methane in the soil vapor during the implementation of the remedy and future redevelopment); and
- CAP implementation schedule.

3. **IMPLEMENTATION OF REMEDIATION SYSTEM**

COMPLIANCE DATE: 90 days after Novato Properties LLC notifies the Water Board and Unocal of the City of Novato's final approval of the Site's redevelopment project or December 31, 2019, whichever is earlier

Complete tasks in the Task 2 implementation plan and submit a technical report acceptable to the Executive Officer documenting their completion. For ongoing actions, such as soil vapor extraction or groundwater extraction, the report shall document system start-up (as opposed to completion) and shall present initial results on system effectiveness (e.g., capture zone or area of influence). Proposals for further system expansion or modification may be included in annual reports (see attached Self-Monitoring Program).

4. **CLEANUP COMPLETION REPORT**

COMPLIANCE DATE: 120 days after Executive Officer approval of the Task 3 report

Submit a technical report acceptable to the Executive Officer evaluating the effectiveness of the approved remedial action plan. The report shall include:

- a. Summary of effectiveness in controlling contaminant migration and protecting human health and the environment
- b. Comparison of contaminant concentration trends with cleanup levels
- c. Comparison of anticipated versus actual costs of cleanup activities
- d. Performance data (e.g., groundwater volume extracted, chemical mass removed, mass removed per million gallons extracted)
- e. Cost effectiveness data (e.g., cost per pound of contaminant removed)
- f. Summary of additional investigations (including results) and significant

- modifications to remediation systems
- g. Additional remedial actions proposed to meet cleanup levels as applicable including a time schedule

If cleanup levels have not been met and are not projected to be met within a reasonable time, the report shall assess the technical practicability of meeting cleanup levels and discuss one or more alternative cleanup strategies.

5. **VAPOR INTRUSION AND SOIL MITIGATION WORKPLAN**

COMPLIANCE DATE: 60 days after Executive Officer approval of the Task 4 report

If the cleanup does not result in meeting the residential cleanup levels in this Order, submit a technical report acceptable to the Executive Officer consisting of a mitigation workplan for mitigating the pollution above the cleanup levels. These mitigation measures may include vapor intrusion engineering controls, a risk management plan, and a deed restriction.

6. **VAPOR INTRUSION AND SOIL MITIGATION IMPLEMENTATION REPORT**

COMPLIANCE DATE: 60 days after Executive Officer approval of the Task 5 Workplan

Submit a technical report acceptable to the Executive Officer. The report shall include detailed documentation of the implementation of the mitigation workplan.

7. **PROPOSED DEED RESTRICTION**

COMPLIANCE DATE: 90 days after required by the Executive Officer

If the cleanup does not result in meeting the residential cleanup levels in this Order, submit a proposed deed restriction acceptable to the Executive Officer whose goal is to limit onsite occupants' exposure to Site contaminants to acceptable levels. The proposed deed restriction shall prohibit the use of shallow groundwater beneath the Site as a source of drinking water until cleanup levels are met and prohibit sensitive uses of the Site such as residences and daycare centers outside the cleaned-up area (including the buffer area) unless additional investigation demonstrates that there would be no unacceptable vapor intrusion threat. The proposed deed restriction shall incorporate by reference the risk management plan. The proposed deed restriction shall name the Regional Water Board as a beneficiary and shall anticipate that the Regional Water Board will be a signatory. Novato Properties LLC shall be responsible for this task. The Executive Officer will require this task once active cleanup is completed.

8. **RECORDATION OF DEED RESTRICTION**

COMPLIANCE DATE: 60 days after Executive Officer approval of the proposed deed restriction

Record the approved deed restriction and submit a technical report acceptable to the Executive Officer documenting that the deed restriction has been duly signed by all parties and has been recorded with the appropriate County Recorder. The report shall include a copy of the recorded deed restriction. Novato Properties LLC shall be responsible for this task.

9. **PROPOSED CURTAILMENT**

COMPLIANCE DATE: 60 days prior to proposed curtailment

Submit a technical report acceptable to the Executive Officer containing a proposal to curtail remediation. Curtailment includes system closure (e.g., well closure), system suspension (e.g., cease extraction but wells retained), and significant system modification (e.g., major reduction in extraction rates, closure of individual extraction wells within extraction network). The report shall include the rationale for curtailment. Proposals for final closure shall demonstrate that cleanup levels have been met, contaminant concentrations are stable, and contaminant migration potential is minimal.

10. **IMPLEMENTATION OF CURTAILMENT**

COMPLIANCE DATE: 60 days after Executive Officer approval of Task 10

Implement the approved curtailment and submit a technical report acceptable to the Executive Officer documenting completion of the tasks identified in the proposed curtailment report.

11. **EVALUATION OF NEW HEALTH CRITERIA**

COMPLIANCE DATE: 90 days after Executive Officer requirement letter

Submit a technical report acceptable to the Executive Officer evaluating the effect on the approved remedial action plan of revising one or more cleanup levels in response to revision of drinking water standards, maximum contaminant levels, or other health-based criteria.

12. **EVALUATION OF NEW TECHNICAL INFORMATION**

COMPLIANCE DATE: 90 days after Executive Officer requirement letter

Submit a technical report acceptable to the Executive Officer evaluating new technical information which bears on the approved remedial action plan and cleanup levels for this Site. In the case of a new cleanup technology, the report should evaluate the technology using the same criteria used in the feasibility study. Such technical reports shall not be required unless the Executive Officer determines that the new information is reasonably likely to warrant a revision in the approved remedial action plan or cleanup levels.

13. **Delayed Compliance:** If the Dischargers are delayed, interrupted, or prevented from meeting one or more of the completion dates specified for the above tasks, the

Dischargers shall promptly notify the Executive Officer of the reasons for delay, and the Regional Water Board or Executive Officer may consider revision to this Order.

D. PROVISIONS

1. **No Nuisance:** The storage, handling, treatment, or disposal of polluted soil or groundwater shall not create a nuisance as defined in Water Code section 13050(m).
2. **Good Operation and Maintenance (O&M):** The Dischargers shall maintain in good working order and operate as efficiently as possible any facility or control system installed to achieve compliance with the requirements of this order.
3. **Access to Site and Records:** In accordance with Water Code section 13267(c), the Dischargers shall permit the Regional Water Board or its authorized representative:
 - a. Entry upon premises in which any pollution source exists, or may potentially exist, or in which any required records are kept, which are relevant to this Order.
 - b. Access to copy any records required to be kept under the requirements of this Order.
 - c. Inspection of any monitoring or remediation facilities installed in response to this Order.
 - d. Sampling of any groundwater or soil that is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the Dischargers.
4. **Self-Monitoring Program:** The Dischargers shall comply with the Self-Monitoring Program as attached to this order and as may be amended by the Executive Officer.
5. **Contractor / Consultant Qualifications:** All technical documents shall be signed by and stamped with the seal of a California registered geologist, a California certified engineering geologist, or a California registered civil engineer.
6. **Lab Qualifications:** All samples shall be analyzed by State-certified laboratories or laboratories accepted by the Regional Water Board using approved U.S. EPA methods for the type of analysis to be performed. Quality assurance/quality control (QA/QC) records shall be maintained for Regional Water Board review. This provision does not apply to analyses that can only reasonably be performed onsite (e.g., temperature).
7. **Document Distribution:** Copies of all correspondence, technical reports and other documents pertaining to compliance with this order shall be provided to the following agencies:
 - a. Regional Water Board
 - b. City of Novato
 - c. County of Marin, Office of Waste Management

The Executive Officer may modify this distribution list as needed.

Electronic copies of all correspondence, technical reports, and other documents pertaining to compliance with this order shall be uploaded to the State Water Board's

GeoTracker database within five business days after submittal to the Regional Water Board. Guidance for electronic information submittal is available at:

http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal

8. **Reporting of Changed Owner or Operator:** The Dischargers shall file a technical report on any changes in contact information, Site occupancy, or Site ownership associated with the property described in this order. An amendment to this Order would be necessary to transfer this order requirements to the new owner.
9. **Reporting of Hazardous Substance Release:** If any hazardous substance is discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, the Dischargers shall report such discharge to the Regional Water Board by calling the spill and complaint line at: (510) 622-2369.

A written report shall be filed with the Regional Water Board within five working days. The report shall describe: the nature of the hazardous substance, estimated quantity involved, duration of incident, cause of release, estimated size of affected area, nature of effect, corrective actions taken or planned, schedule of corrective actions planned, and persons/agencies notified.

This reporting is in addition to reporting to the California Emergency Management Agency required pursuant to the Health and Safety Code.

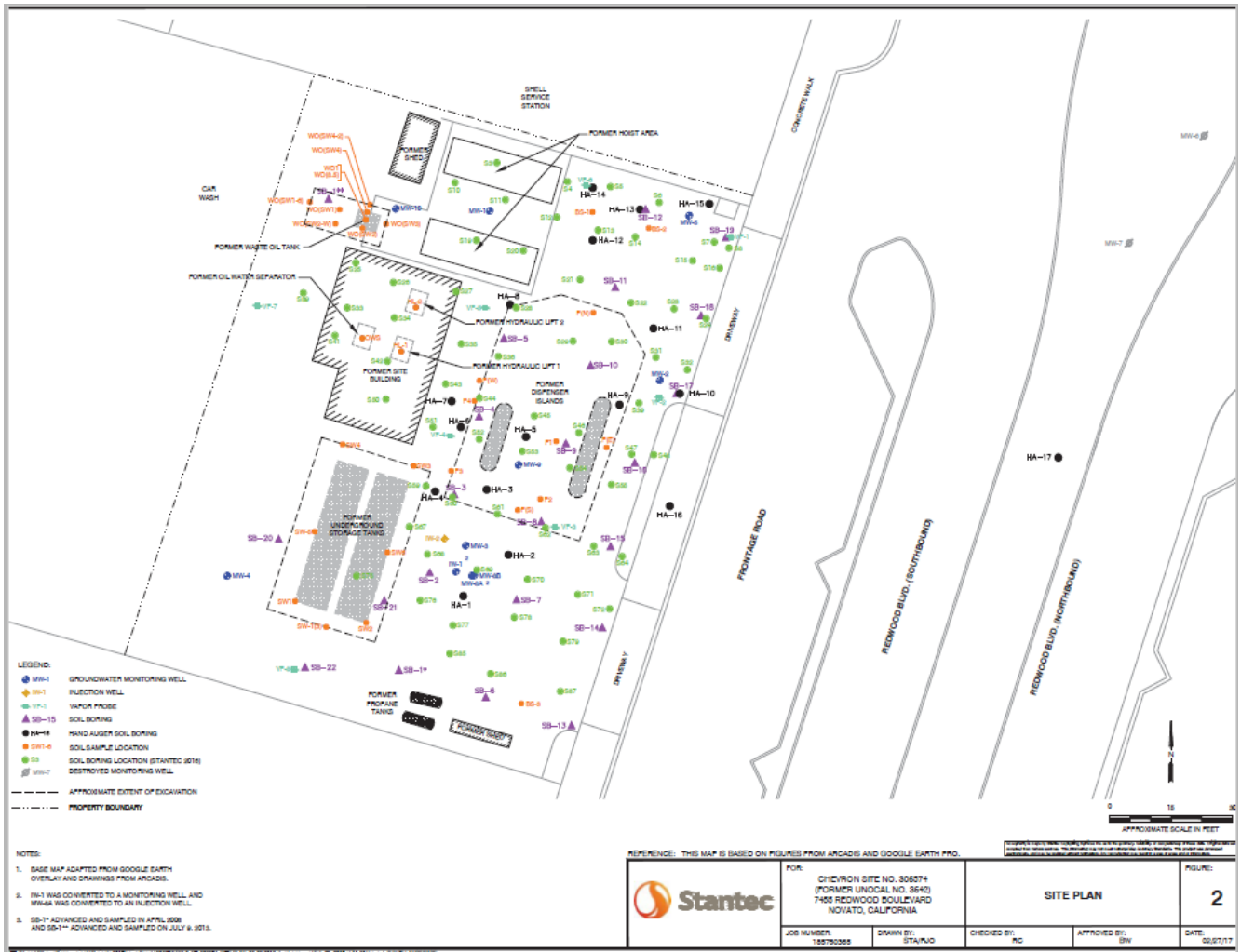
10. **Periodic Order Review:** The Regional Water Board will review this Order periodically and may revise it when necessary. The Dischargers may request revisions and upon review, the Executive Officer or the Regional Water Board may revise these requirements.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on November 14, 2018.

Bruce H. Wolfe
Executive Officer

Failure to comply with the requirements of this order may subject you to enforcement action, including but not limited to: imposition of administrative civil liability under Water Code sections 13268 or 13350 or referral to the Attorney General for injunctive relief or civil or criminal liability.

Attachments: Site Map
Self-Monitoring Program



**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

SELF-MONITORING PROGRAM for:

**UNION OIL COMPANY OF CALIFORNIA (UNOCAL)
NOVATO PROPERTIES LLC**

for the property located at:

7455 REDWOOD BOULEVARD
NOVATO, MARIN COUNTY

1. **Authority and Purpose:** The Regional Water Board requests the technical reports required in this Self-Monitoring Program pursuant to Water Code sections 13267 and 13304. This Self-Monitoring Program is intended to document compliance with Regional Water Board Order No. R2-2018-0051 (site cleanup requirements).
2. **Groundwater and Soil Vapor Monitoring:** The Dischargers shall measure groundwater elevations quarterly in all monitoring wells, and shall collect and analyze representative samples of groundwater according to the following schedule:

Well #	Sampling Frequency	Analyses
MW-2, MW-3, MW-5, MW-8A, IW-1 (for groundwater)	Monthly for three months after implementation of the RAP, quarterly thereafter	TPH-g, TPH-d, BTEX, Naphthalene
VP-1 thru VP-8 (for soil vapor)	Monthly for three months after implementation of the RAP, quarterly thereafter	TPH-g, BTEX, Naphthalene, Fixed Gas (O ₂ , CO ₂ , CH ₄ , leak detection compound)

Key: TPH-g = Total Petroleum Hydrocarbon as gasoline
TPH-d = Total Petroleum Hydrocarbon as diesel
BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
O₂ = Oxygen
CO₂ = Carbon Dioxide
CH₄ = Methane

The Dischargers shall sample any new monitoring, extraction, injection, and soil vapor wells according to the above schedule and analyze groundwater or soil vapor samples for the same constituents as shown in the above table. The Dischargers may propose changes in the above table. Any proposed changes are subject to Executive Officer approval.

3. **Quarterly Monitoring Reports:** The Dischargers shall submit quarterly monitoring reports to the Regional Water Board no later than 30 days following the end of each

calendar quarter (e.g., report for first quarter of the year due April 30). The first quarterly monitoring report shall be due on January 30, 2019. The reports shall include:

- a. **Transmittal Letter:** The transmittal letter shall discuss any violations during the reporting period and actions taken or planned to correct the problem. The letter shall be signed by the Dischargers' duly authorized representative(s), and shall include a statement by the official, under penalty of perjury, that the report is true and correct to the best of the official's knowledge.
 - b. **Groundwater Elevations:** Groundwater elevation data shall be presented in tabular form, and a groundwater elevation map shall be prepared for each monitored water-bearing zone. Historical groundwater elevations shall be included in the fourth quarterly report each year.
 - c. **Groundwater, Soil Vapor, and Indoor Air Analyses:** Groundwater, soil vapor, and indoor air sampling data shall be presented in tabular form, and an iso-concentration map should be prepared for the key contaminants of concern for the vadose zone and each monitored water-bearing zone, as appropriate. The report shall indicate the analytical methods used, detection limits obtained for each reported constituent, and a summary of QA/QC data. A line graph showing historical groundwater, soil vapor, and indoor air sampling results for each sampling location shall be included in the fourth quarterly report each year. The report shall describe any significant increases in contaminant concentrations since the last report and any measures proposed to address the increases. Laboratory data sheets need not be included in the hard copy of the report submitted to the Regional Water Board. Laboratory data sheets should be included in electronic copies of the report submitted to the Regional Water Board and uploaded to the [GeoTracker](#) database.
 - d. **Groundwater Extraction:** The report shall include groundwater extraction results in tabular form, for each extraction well and for the Site as a whole, expressed in gallons per minute and total groundwater volume for the quarter. The report shall also include contaminant removal results, from groundwater extraction wells and from other remediation systems (e.g., soil vapor extraction), expressed in units of chemical mass per day and mass for the quarter. Historical mass removal results shall be included in the fourth quarterly report each year.
 - e. **Status Report:** The quarterly report shall describe relevant work completed during the reporting period (e.g., site investigation, interim/final remedial measures) and work planned for the following quarter.
4. **Violation Reports:** If the Dischargers violates requirements in the Site Cleanup Requirements, then the Dischargers shall notify the Regional Water Board office by telephone as soon as practicable once the Dischargers have knowledge of the violation. Regional Water Board staff may, depending on violation severity, require the Dischargers to submit a separate technical report on the violation within five working days of telephone notification.

5. **Other Reports:** The Dischargers shall notify the Regional Water Board in writing prior to any Site activities, such as construction or underground tank removal, which have the potential to cause further migration of contaminants or which would provide new opportunities for site investigation.
6. **Record Keeping:** The Dischargers or their agent(s) shall retain data generated for the above reports, including lab results and QA/QC data, for a minimum of six years after origination and shall make them available to the Regional Water Board upon request.
7. **Self-Monitoring Program Revisions:** Revisions to the Self-Monitoring Program (SMP) may be ordered by the Executive Officer, either on his/her own initiative or at the request of the Dischargers. Prior to making SMP revisions, the Executive Officer will consider the burden, including costs, of associated self-monitoring reports relative to the benefits to be obtained from these reports.