2.0 PROJECT DESCRIPTION

INTRODUCTION

This chapter of the EIR provides a description of the proposed remedy for the former Kast Property Tank Farm (also referred to as the "site") in the Revised Remedial Action Plan (RAP or the "project") dated June 2014 and Addendum dated October 2014 that is under review by the Los Angeles Regional Water Quality Control Board (Regional Board). The RAP and Addendum to the RAP are provided in Appendix B of this EIR. Upon approval of the RAP, the remediation activities would be implemented by Equilon Enterprises LLC, doing business as Shell Oil Products U.S. ("Shell" or also referred to as the "Responsible Party" or "RP"). The proposed RAP is included as Appendix B of this EIR. The proposed RAP presents the detailed componets of the proposed remediation plan for the site.

Remedial Action Plan Background

The approximately 44-acre site is developed with 285 single-family residences, referred to as the Carousel Tract (the "site"). In 2008, environmental investigations were conducted in connection with the adjacent former Turco Products Facility. During those investigations, contamination by petroleum hydrocarbons was discovered at sample locations within the site. The Department of Toxic Substances Control (DTSC) communicated these findings to the Regional Board in March 2008, and in April 2008 the Regional Board sent an inquiry to Shell regarding the status of any environmental investigations at the site. This inquiry was followed by the Regional Board's California Water Code (CWC) Section 13267 Order to Conduct an Environmental Investigation at the former Kast Property issued to Shell on May 8, 2008. Shell conducted a series of extensive multimedia sampling and investigations, pilot studies, and other environmental evaluations of the site in response to that Order and subsequent 13267 Orders issued on October 1, 2008 and November 18, 2009, Section 13304 Order dated October 15, 2009, and Cleanup and Abatement Order R4-2011-0046 (CAO) dated March 11, 2011, as amended. All of the investigations have occurred under Regional Board oversight, following work plans reviewed by the Regional Board in consultation with other governmental agencies including the Office of Environmental Health Hazard Assessment (OEHHA), the Los Angeles County Fire Department, and the Los Angeles County Department of Public Health and approved by the Regional Board. Results of the investigations show that the site has been impacted with petroleum hydrocarbons and related constituents and non-petroleum related constituents associated with former crude oil storage during the period prior to residential redevelopment, as discussed under the "Site History" subsection below.

The CAO requires Shell to prepare a RAP that at a minimum, will attain cleanup goals that are based on residential (i.e., unrestricted) land use, that will achieve applicable water quality objectives set forth in the Regional Board's Water Quality Control Plan, that will comply with State Water Resources Control Board (State Water Board) Resolution 68-16 ("Statement of Policy with Respect to Maintaining High Quality of Waters in California", i.e., the State's "Anti-degradation Policy"), and that will comply with State Water Board Resolution 92-49 ("Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304). Shell prepared a Draft RAP and Draft Feasibility Study (Draft FS) in March 2014 and submitted it to the Regional Board in accordance with the CAO and in response to the Regional Board's letter dated January 23, 2014 directing Shell to submit a RAP and Human Health Risk Assessment (HHRA) pursuant to California Water Code Section 13304. The Regional Board reviewed the RAP, FS, and HHRA and in a letter dated April 30, 2014, provided comments and directives to Shell on these

documents. On June 30, 2014, Shell submitted a revised RAP, FS, and HHRA addressing the comments and directives contained in the Regional Board's April 30, 2014 letter. The Revised RAP, Revised FS and Revised HHRA are the basis for the EIR. In addition, Addendums to the RAP, FS, and HHRA were submitted in October 2014.[1]

The Revised FS dated June 2014 evaluates remedial action alternatives for the site and presents the rationale for selecting a preferred alternative. Out of the alternatives analyzed in the FS, the "preferred alternative proposed by the RP" for remediation of the site includes:

- Excavation of site soil from both landscaped areas and beneath residential hardscape to a depth of five (5) feet below ground surface (bgs) and targeted excavation to 10 feet bgs where warranted and feasible (details provided in subsection 5 below);
- Soil vapor extraction (SVE)/bioventing;
- Sub-slab vapor mitigation;
- Removal of light non-aqueous phase liquid (LNAPL); and
- Monitored natural attenuation (MNA) to address groundwater.

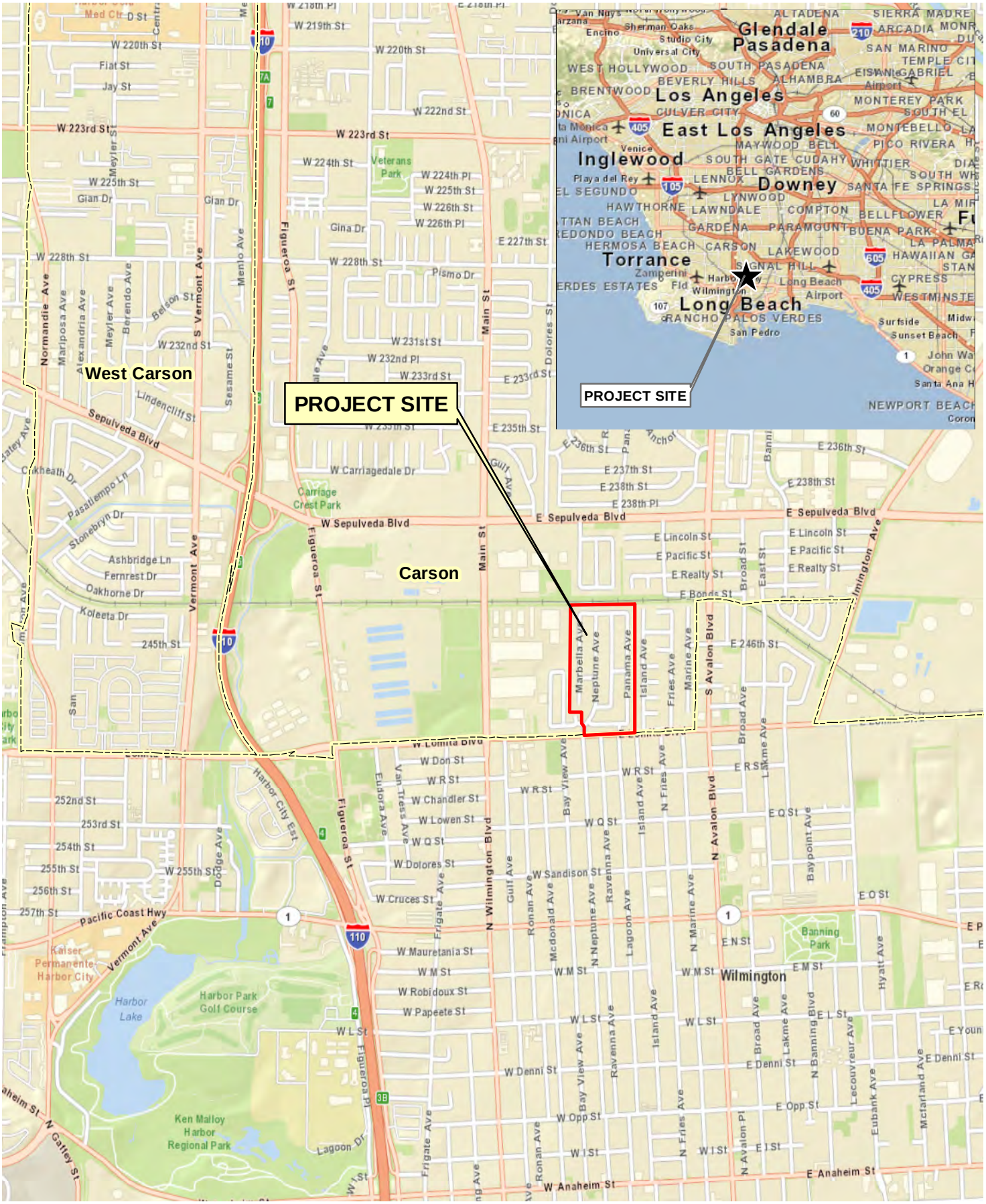
The RAP has been prepared in compliance with the CAO and summarizes the remedial alternative evaluation process and identifies and describes the proposed actions for cleanup and/or treatment of impacted soil and other media at the site. As such, the preferred alternative proposed by the RP in the RAP is the "project" being evaluated in this EIR.[2] Each of the project's components is described in detail below. The other remedial alternatives considered in the Revised FS are described in Chapter 3, *Description of Alternatives*, in this EIR.

1. PROJECT LOCATION AND SURROUNDING USES

Regional access to the site is provided via Interstate 110 (the "Harbor Freeway"), Interstate 405 (the "San Diego Freeway) and Interstate 710 (the "Long Beach Freeway) as shown in **Figure 2-1**, *Regional Location and Project Vicinity Map*. The site, which is located in the southern portion of the City of Carson, is bounded by Lomita Boulevard to the south, single-family residential properties of the Monterey Pines Community and industrial property of the former Turco Products Facility to the west, and single-family residential properties to the east (refer to **Figure 2-2**, *Project Site and Surrounding Uses).* The Los Angeles County Metropolitan Transportation Authority (MTA) railroad tracks [formerly owned by the Burlington Northern Santa Fe (BNSF) Railway Company] are located to the north of the site. The area directly south of the site across Lomita Boulevard is located within the City of Los Angeles and is designated as within a methane mitigation zone. Neighborhood streets within the Carousel Tract include Marbella Avenue, Neptune Avenue, Ravenna Avenue, Panama Avenue, E. 244th Street, E. 247th Street, E, 248th Street, and E. 249th Street.

[1] *The Revised RAP and Addendum to the RAP are provided in Appendix B of this EIR. Portions of the Revised HHRA and Addendum to the HHRA are provided in Appendix E of this EIR. The Revised HHRA and Addendum to the HHRA in its entirety and the Revised FS and Addendum to the FS are available for public review at the Regional Board's Los Angeles Office at 320 W. 4th Street, Suite 200, Los Angeles, CA 90013. These documents are also available on the Regional Board's website at: http://www.waterboards.ca.gov/losangeles/ under "Announcements".*

[2] *The project has an option that is discussed in more detail below. Thus, the project is also referred to as a base remedy and the option is referred to as the expedited implementation option.*



PCR

0 1,000 2,000 Feet

Regional Location and Project Vicinity Map

Former Kast Property Tank Farm Site Remediation Project

Source: ESRI Street Map, 2009; PCR Services Corporation, 2014.

FIGURE

2-1

PCR

N

0 600 Feet

Project Site and Surrounding Uses

Former Kast Property Tank Farm Site Remediation Project

Source: URS, 2014.

FIGURE

2-2

Historically, prior to development of many existing residential uses, the local project vicinity was primarily an industrial area inclusive of numerous oil refinery and other chemical-related facilities, many of which have documented hazardous materials releases. The RAP document discusses these facilities in detail. Surrounding industrial properties that have documented hazardous materials releases include: the former Turco Products/Purex Facility (Turco) (an industrial chemical facility) adjacent to and west of the site; the Fletcher Oil and Refining Company (FORCO) facility and associated Fletcher Oil Storage Yard to the west of the site; and the former Oil Transport Company Inc. (OTC) property (formerly included a chicken processing plant and truck washing operations) adjacent and to the southwest of the site. In the mid-1990s, the OTC property was redeveloped as the Monterey Pines community of single-family homes. Given the project area's historic industrial character and more recent inclusion of residential uses, numerous other past and present property uses and associated infrastructure (i.e., oil wells, dry cleaner facilities, and oil pipelines) are potential sources of hazardous materials in the local project vicinity.

2. SITE HISTORY

The site was purchased in 1923 by Shell Company of California and developed with three concrete oil storage reservoirs (see **Figure 2-3**, *Former Site Uses)*. Two of the reservoirs (the central and southern Reservoirs No. 5 and 6) had capacities of 750,000 barrels each, and the third reservoir (northern Reservoir No. 7) had a capacity of 2 million barrels. The reservoirs were partially in-ground and partially aboveground with earthen berms constructed using soil excavated from the belowground portions of the reservoirs. The reservoirs had wire-mesh reinforced concrete-lined floors and side walls, and were covered with wood frame roofs supported by wooden posts on concrete pedestals. The outer berms were 15 to 20 feet above surrounding grade, and the outer walls of the berms are believed to have been covered with asphalt. The oil storage reservoirs were primarily used to store crude oil. Historical records indicate that bunker oil or heavier intermediate refinery streams may also have been stored in the reservoirs at one time, but the time and quantity of bunker oil storage is unknown.

The site was used as an active oil storage facility until the 1950s, when the site was used only on a standby reserve basis. In October 1965, Shell Oil Company entered into a Purchase Option Agreement to sell the site with the oil storage reservoirs intact to Richard Barclay, a real estate developer and principal in Barclay Hollander Curci (later renamed Barclay Hollander Corporation) and Lomita Development Company.

The historic account of the site demolition and subsequent grading performed by Lomita Development Company (Lomita), as provided by Pacific Soils Engineering, Inc. (PSE) include the following: 1) Lomita emptied and demolished the reservoirs, and graded the site prior to developing the site as residential housing; 2) part of the concrete floor of the central reservoir was removed from the site by Lomita; and 3) the reservoir bottoms were left in place. The PSE report described that soil used to fill in the reservoirs and return the property to its natural grade came from the berms surrounding each reservoir and surrounding the perimeter of the site. In phases between 1967 and 1969, Lomita developed the site into one- and two-story single family residential parcels and sold the developed lots to individual homeowners. The residences are typically wood frame with concrete slab-on-grade and stucco exterior wall construction.

3. EXISTING SITE CONDITIONS

The site is relatively flat, with a gradual slope to the northwest. The elevations across the site range from approximately 30 to 40 feet above mean sea level (msl). The shallowest groundwater beneath the site occurs at a depth of approximately 53 feet below ground surface (bgs), with a groundwater flow direction to the northeast. The site is occupied by 285 single-family residential properties and City streets. Some of the

residences have walls, fences, mature landscaping, and swimming pools that extend to varying depths below the ground surface.

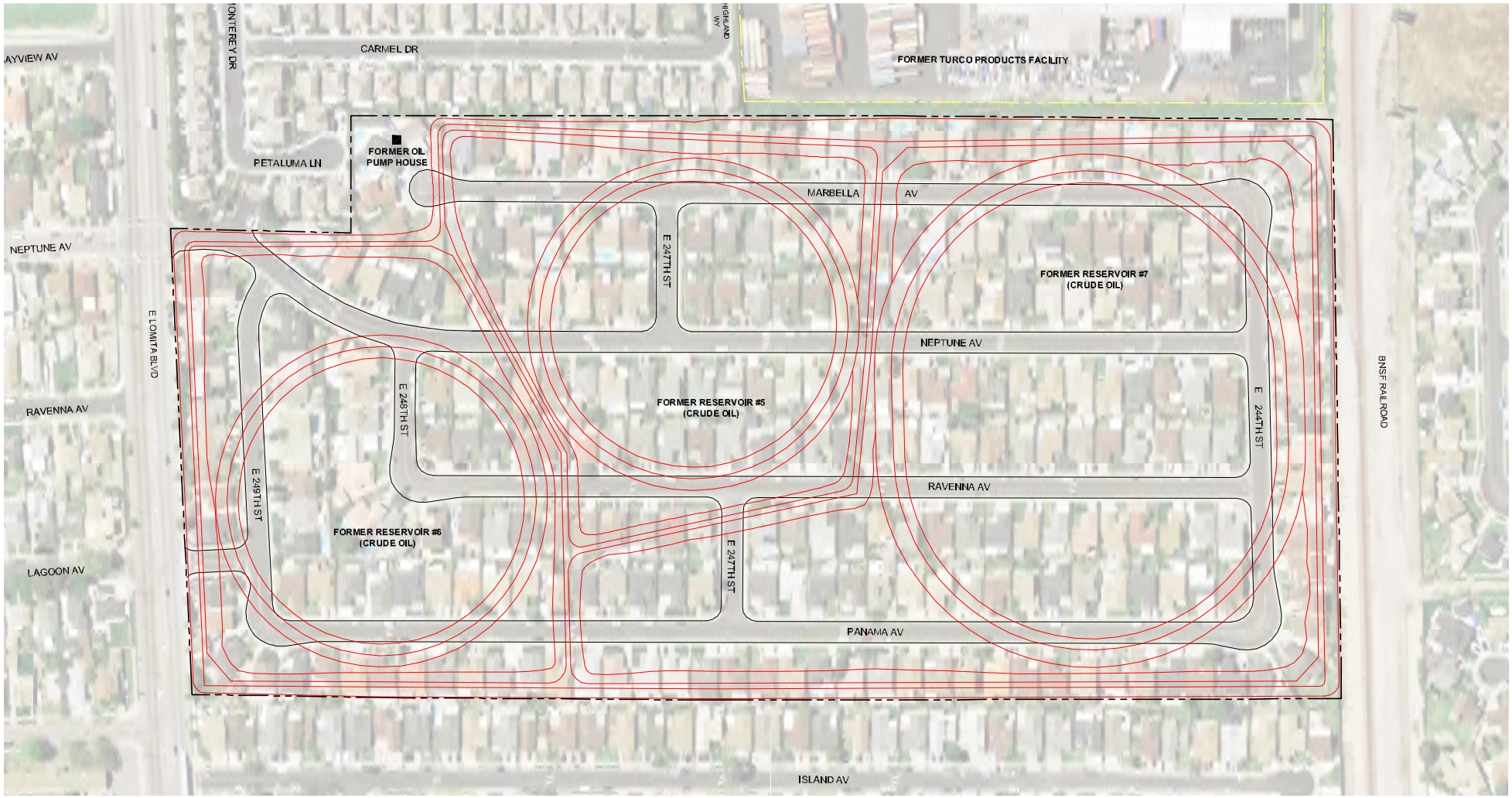
As mentioned above, extensive multimedia sampling and testing have been conducted at the site during investigations from 2008 to present. Details of the sampling and the findings of other site assessments are included in Chapter 3.0, *Previous Investigations*, of the RAP document. Also, Section 5.4, *Hazards and Hazardous Materials*, in this EIR, provides an in-depth discussion of the impacts in soil, soil vapor, indoor and outdoor air, and groundwater based on the investigations conducted at the site. As summarized in Section 5.4 of this EIR, sampling completed during site characterization confirms that there were petroleum releases consisting of crude oil at the site. In addition, chlorinated compounds were detected in all site media. Other compounds have also been detected at the site (e.g., fuel oxygenates). Petroleum hydrocarbon and related volatile organic compound (VOC) and semi-volatile organic compound (SVOC) impacts occur in shallow and deep soils; VOCs and methane resulting from degradation of petroleum hydrocarbons are present in subsurface soil vapor; dissolved-phase VOC and total petroleum hydrocarbons (TPH) impacts are present in groundwater, and light non-aqueous phase liquid (LNAPL) in the form of crude oil is locally present in the site soils at the groundwater table. LNAPL consists of petroleum hydrocarbons (crude oil inferred to have originated during site operations as a crude storage facility) that are not soluble in water and have lower density than water. Thus, once LNAPL infiltrates the ground, it will stop at the height of the water table and float on top of the water. There are also localized occurrences of residual tarry materials in the unsaturated soils.

In addition to hydrocarbon-related impacts, chlorinated solvents, such as tetrachloroethene (PCE) and trichloroethene (TCE), and from trihalomethanes (THMs) are present in all media at the site. Methane is generally present in the shallow subsurface but has not been detected in residences or enclosed areas of the site at levels that pose a hazard. Soil vapor methane has been identified as a result of biodegradation of residual petroleum hydrocarbons, leaking natural gas utility lines, and a leaking sewer line.

4. PROJECT OBJECTIVES

The underlying purpose of the proposed RAP is to remediate the site in compliance with the Regional Board's CAO R4-2011-0046 dated March 11, 2011, as amended, and applicable laws and policies. In accordance with the provisions of the CAO and as required by Section 15124(b) of the CEQA Guidelines, the below listed objectives for the proposed RAP have been established. The objectives will aid decision makers in their review of the project and environmental impacts, and alternatives.

1. Implement a RAP that complies with the CAO and meets the media-specific (i.e. soil, soil vapor, and groundwater) Remedial Action Objectives (RAOs) developed for the site. (See below for a list of the RAOs for the site.)
2. Maintain the residential land use of the site and avoid permanently displacing residents from their homes or physically dividing the established Carousel Tract community.
3. Minimize short-term disruption to residents.
4. Allow residents the long-term ability to safely and efficiently make improvements requiring excavation or penetration into shallow site soils (i.e., landscaping, hardscape, gardening, etc.) on their properties.
5. Limit or minimize environmental impacts associated with the cleanup activities.



EXPLANATION

Approximate Property Line

Approximate Location of Reservoir and Outer Berms

PCR

N

0 250 Feet

Former Site Uses

Former Kast Property Tank Farm Site Remediation Project

Source: Geosyntec Consultants, 2014.

FIGURE

2-3

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5. DESCRIPTION OF THE PROJECT

Remedial Action Objectives and Site-Specific Cleanup Goals

The Regional Board approved numerical Site Specific Cleanup Goals (SSCGs) for the constituents of concern (COCs) developed for the site and the media-specific (i.e. soil, soil vapor, and groundwater) RAOs have been developed to achieve the numerical SSCGs. These media-specific RAOs and SSCGs were used primarily to identify the recommended response actions for each impacted medium that are proposed in the RAP. The below-listed RAOs are proposed for the site. Each RAO and further explanation of its meaning as applicable to the project is provided in Section 5.4 of this EIR.

- RAO #1. Prevent human exposures to concentrations of COCs in soil, soil vapor, and indoor air such that total (i.e., cumulative) lifetime incremental carcinogenic risks are within the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) risk range of 1×10^{-6} to 1×10^{-4} and noncancer hazard indices are less than 1 or concentrations are below background, whichever is higher. Potential human exposures include on-site residents and construction and utility maintenance workers. For on-site residents, the lower end of the NCP risk range (i.e., 1×10^{-6}) and a noncancer hazard index less than 1 are used. Prevent direct contact exposure to COCs at concentrations above applicable risk-based SSCGs in soil for on-site residents and construction and utility maintenance workers.
- RAO #2. Prevent fire/explosion risks in indoor air and/or enclosed spaces (e.g., utility vaults) due to the accumulation of methane generated from the anaerobic biodegradation of petroleum hydrocarbons in soils. Eliminate methane in the subsurface to the extent technologically and economically feasible.
- RAO #3. Remove or treat LNAPL to the extent technologically and economically feasible, and where a significant reduction in current and future threat to groundwater will result.
- RAO #4. Reduce COCs in groundwater to the extent technologically and economically feasible to achieve, at a minimum, SSCGs and the water quality objectives in the Regional Board Basin Plan to protect the designated beneficial uses, including municipal supply.

The numerical SSCGs for soil, soil vapor and groundwater and the media-specific RAOs are identified in Section 5.4 of this EIR.

Proposed RAP Components

Overview

The RAP consists of the following multi-media components to remediate the site. The following provides a brief overview and each of the components is described in further detail below.

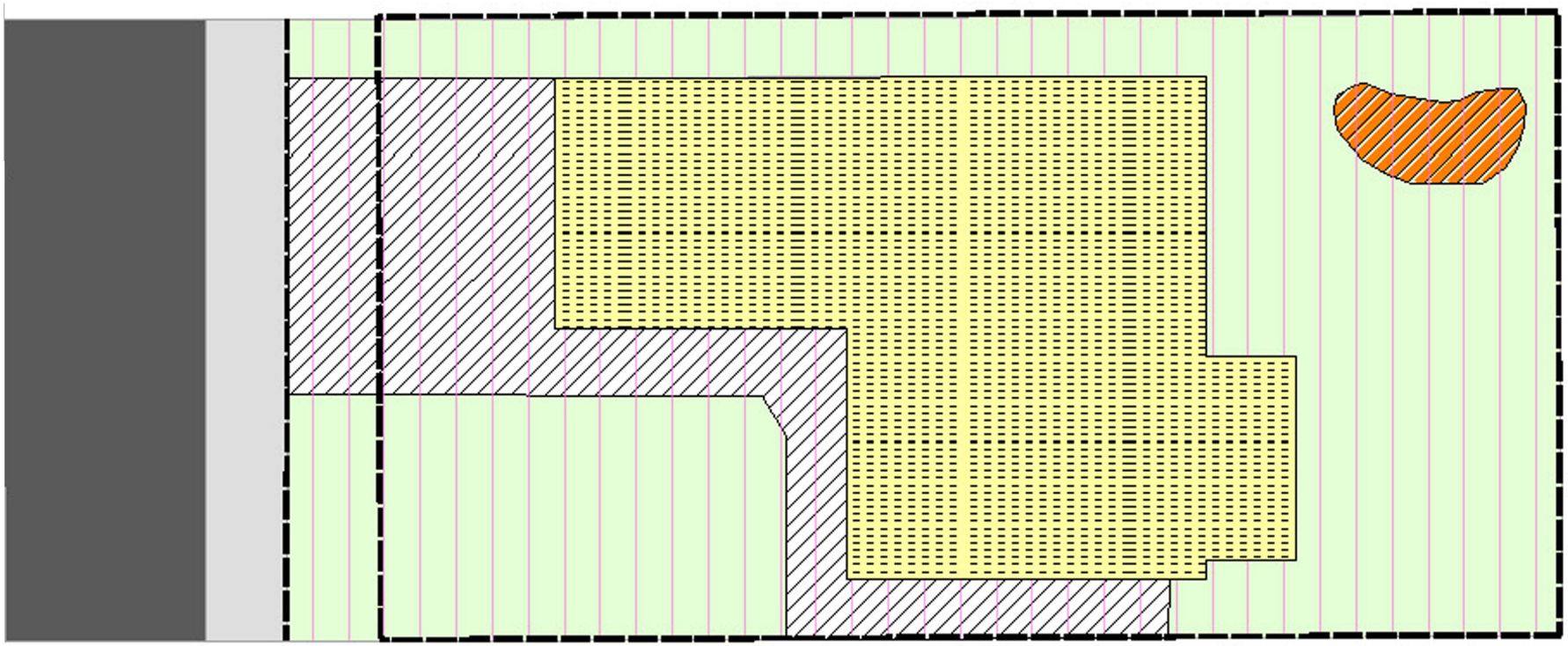
- Excavation of soil would be conducted at impacted residential properties where RAOs are not met under existing conditions. Excavation would be conducted in both landscaped and hardscaped areas of residential yards, excluding beneath City sidewalks and houses, to a depth of five (5) feet bgs and targeted excavation where practicable to 10 feet bgs at properties where residual NAPL soil concentration and significant hydrocarbon mass can be reduced based on detected TPH concentrations. The excavation would also remove residual concrete slabs if encountered in excavations. Following excavation, hardscape and landscaping would be restored to like conditions.

- SVE/bioventing would be used to address petroleum hydrocarbons, VOCs, and methane in soil and soil vapor and to promote degradation of residual hydrocarbon concentrations where RAOs are not met following soil excavation activities. A SVE system with SVE wells in City streets and on residential properties would be installed and operated. Bioventing in concert with SVE would be used to increase oxygen levels in subsurface soils and promote microbial activity and degradation of longer-chain petroleum hydrocarbons. Bioventing would be integral with SVE via cyclical operation of SVE wells. After installation and startup of the SVE/bioventing system, periodic monitoring of the SVE/bioventing system would be conducted. Results of the monitoring and analyses, in conjunction with measured flow rates, field readings and time of operation, would be used to estimate the mass of VOCs removed from the subsurface, degradation of longer-chain hydrocarbons, and as a basis for optimizing and eventual shutdown of SVE operations and switching from the SVE/bioventing to bioventing mode of operations.
- Sub-slab vapor mitigation would be implemented at properties where RAOs for soil vapor would not be met based on potential exposure due to vapor intrusion of petroleum hydrocarbons or chlorinated ethenes (e.g. PCE and TCE) from soil vapor to indoor air, and where detected methane concentrations in sub-slab soil vapor probe samples exceed the upper methane SSCG. In addition, the RP would install a sub-slab mitigation system at any residence at which a homeowner requests such a system.[3]
- LNAPL recovery would continue from wells MW-3 and MW-12 on a monthly basis, and if LNAPL is detected in other wells, monthly LNAPL recovery would be initiated on these wells if they have an LNAPL thickness of greater than 0.5 foot to the extent technologically and economically feasible.
- Groundwater Source Reduction and Monitored Natural Attenuation - COCs in groundwater would be reduced to the extent technologically and economically feasible via source reduction and MNA. If, based on a 5-year review following initiation of SVE system operation, groundwater plumes are not stable or declining and site COCs in groundwater do not show a reduction in concentration, an evaluation of additional groundwater treatment technologies would be conducted and implemented as needed.

For soil less than 5 feet bgs and sub-slab soil vapor, potential exposures would be addressed in the short term. Deeper soil, soil vapor, and groundwater risk reduction would be implemented over a longer period of time through SVE/bioventing and MNA. **Figure 2-4**, *Remedial Actions on a Given Property*, illustrates an example of the remedial actions and technologies that could be applied on a given property. The SVE/bioventing that is listed as an additional technology on Figure 2-4 would be installed after the excavation of the soil, but before final backfill and re-landscaping for properties where both activities are scheduled to occur.

There are approximately 12 properties for which access has not been granted and the required sampling has been completed at 86 percent of the residences including two rounds of indoor air sampling as of October 17, 2014. If access is granted to these properties during implementation of the RAP, sampling would be conducted, and the results would be analyzed consistent with the approach described above to determine what remedial measures, if any, would be taken. These additional properties are assumed to require remedial actions so as to provide a conservative or worse-case analysis of environmental impacts. While the

[3] *The RP has offered to install a sub-slab mitigation system at any residence within the Carousel tract at which a homeowner requests such a system. If a homeowner requests such a system, the system would be installed by the RP.*



Legend:

- Property Line
- Sub Slab Mitigation
- Excavate Exposed Soils to 5 ft./ Targeted Properties to 10 ft.
- Remove residential hardscape
- Mobile LNAPL Removal
- Road
- Sidewalk
- Driveway/Conc.Walk
- Residence
- Landscaping
- LNAPL

Additional Technologies
1) Existing Institutional Controls
2) Groundwater MNA and Contingency Remediation
3) SVE/bioventing

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Remedial Actions on a Given Property

Former Kast Property Tank Farm Site Remediation Project

Source: URS, 2014.

FIGURE

2-4

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remedial actions for these properties are still to be determined, the description of the RAP's components will not materially change by these determinations. Since these properties are included in the analyses, should all or a portion of these properties require remedial actions, the associated environmental impacts would not change.

Excavation of Soil

Impacted soil would be excavated from 219 residential properties where results of the previous site assessments indicate that RAOs and the more stringent of the health risk-based or leaching to groundwater criteria are not met under existing conditions.[4] Soil would be excavated to a depth of 5 feet below existing grade at 219 properties (410 yards) with targeted excavated to 10 feet below existing grade at 97 of the properties at selected yards (146 yards).[5] Excavation would occur from both landscaped areas and areas currently covered by hardscape, including walkways, driveways, patio areas, and hardscape associated with landscaping. In general, the lateral extent of the excavation would be up to the back of the City sidewalk and up to the houses, subject to required setback distances. For the purposes of this EIR, it is assumed that the 12 properties for which no soil data exist would be excavated to a depth of 10 feet below grade as discussed above. On average, a conservative estimate of approximately 611 cubic yards (CY) of soil would be excavated from each of the 122 properties identified for 5 foot excavation, and approximately 867 CY from each of the 97 properties identified for targeted 10-foot excavation. Approximately 161,700 CY plus a 10 percent contingency of 16,170 CY for a total of 177,870 CY of soil would be removed from residential excavations.[6] This estimate assumes that soil would be excavated to a depth of 5 feet from the front, side, and back yards of each property; targeted deeper excavation to 10 feet would occur only in front and/or back yards of identified properties. During the preparation of the Property-Specific Remediation Plans (PSRPs), the specific excavation areas for each property would be identified. In some cases, the volume of soil to be excavated for each property would be less or more than the average value.[7]

In addition to impacted soil, implementation of the RAP would result in the removal of fences, walkways, and landscaping. On average, approximately 45 CY of demolition waste (fencing, etc.) and 14 CY of green waste (landscaping plants, sod, etc.) would be removed from each of the 219 properties. Thus, there would be a total volume of approximately 177,870 CY of soil, 9,550 CY of demolition waste, and 2,300 CY of green waste removed from the residential properties on-site.

In addition, if remnants of concrete slabs from the demolished oil storage tanks are found in the upper 5 feet of the excavations or the upper 10 feet for the targeted excavation properties, these remnants would be removed to the extent practicable and where it could be done safely. If encountered, concrete extending

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[4] *The 219 properties assumes all 12 properties with no data would require excavation after data become available and are evaluated.*

[5] *The properties refer to an individual residential property and the yards refer to a front, side and/or rear yard.*

[6] *The volume estimates assume excavation of front, back and side yards to 5 feet. The estimate is based on measurements of yard areas taken from aerial photos and measurements taken in the field at the time of site investigations. This is an upper bound volume estimate, as it does not include a reduction in volume for setbacks, sloping of excavation walls, and avoidance of the transite water supply pipelines. However, a contingency of 10 percent is added to the soil excavation amount in order to account for unforeseen circumstances that might occur in the field such as a need to laterally extend excavation to remove additional impacted soil.*

[7] *The analyses contained in Chapter 5 of this EIR assume the excavation volumes with the 10 percent contingency. Should the volume of soil excavated from a particular property be less than the estimate, the daily extent and type of remedial actions and associated environmental impacts would not be greater than the impacts associated with this estimate. This approach is used to ensure that the potential environmental impacts associated with the remedy are not underrepresented. At the same time, it is believed that any variance would not be substantial, and, for this reason, the estimated environmental impacts are believed to be representative of what the actual impacts would be.*

laterally beneath a structure or beneath the sidewalk would be cut at the edge of the structure or inner edge of the sidewalk and the remaining concrete slab remnant would be left in place.

Soil samples generally were collected from multiple locations at each property sampled at depths of 0.5, 2, 5 and 10 feet bgs, where feasible. Samples were also collected at other depths when field observations or field instrument readings indicated possible impacts. Revised Table 6-1 and Revised Figure 6-1 in the Addendum to the RAP lists and illustrates the identified 219 properties that would include excavation of soil. Revised Table 6-1 and Revised Figure 6-3 in the Addendum to the RAP also lists and illustrates the identified 97 properties that would include targeted excavation to 10 feet bgs. The 12 properties with no soil data are included in the 97 properties that would be excavated to 10 feet bgs, thus providing a conservative analysis of the potential environmental impacts associated with the RAP. If data are collected from these properties in the future and less excavation were necessary, the removal of these properties for soil excavation would reduce the overall duration of the RAP implementation, which is described below.

Post-excavation soil samples would be collected to document concentrations of certain COCs remaining on properties following excavation. Post-excavation samples would be collected from the excavation bottom from each front yard and back yard adjacent to the residence excavation bottom, from each front part and back part of the side yards adjacent to the residence, and from the excavation adjacent to City sidewalks in front yards. Samples would only be collected from walls of excavations along property lines, where the adjacent property has not been or is not scheduled to be excavated. Samples would be collected from two locations at two depths along property lines in the front and back yards of properties where the adjacent property would not be excavated. Additional samples may be collected from the excavation bottom at the wall along property lines at locations where the adjacent property is not scheduled for or has not been excavated, or along the tract perimeter. Depths of sidewall samples would be established in the field based on visual observations.

Residents would be provided temporary living assistance while active excavation, backfill, and hardscape restoration work are being implemented (see Preliminary Relocation Plan, Appendix E, of the RAP for further details). In addition, the residents of the immediately adjacent properties within the Carousel Tract and properties adjacent to the perimeter of the Carousel Tract where excavation work is being conducted (i.e. properties in the Monterey Pines Tract that abut the Carousel Tract or properties on Island Avenue that abut the Carousel Tract), would be offered relocation as necessary.

Hardscape and landscaping would be removed during the initial stage of excavation and restored to like conditions following completion of excavation backfill in consultation with the homeowner. It may be necessary to remove fences and block walls between yards and ornamental or partitioning walls on individual properties, as the depth of excavation likely would exceed fence post and footing depths. As with other hardscape, fences and walls would be restored following completion of excavation backfill prior to restoration of landscaping. Exceptions to excavation beneath hardscape include patios covered by structures and roofs, swimming pools and pool decking surrounding swimming pools. These hardscape areas would not be excavated to avoid structural demolition and potential damage to swimming pools and appurtenant equipment. No excavation for the purposes of direct soil removal remediation would occur beneath City streets and sidewalks or beneath houses. However, excavation within City streets would be conducted for trenching as part the of the SVE conveyance piping installation process. In addition to treatment by the SVE/bioventing system discussed below, remaining soil in these non-excavated areas would be addressed in the Soil Management Plan (SMP) and by existing City regulatory requirements, which are also discussed further below.

PSRPs would be prepared for each property to be excavated and would define areas to be excavated, features to be removed and those that would be protected in place, and locations of underground utilities that need to be either protected in place or removed and restored. The PSRPs would also include landscape restoration plans that would be developed in consultation with the property owners/residents.

Following backfill and utility and hardscape restoration, residents would move back into their homes during landscape restoration and fence/block wall construction, or, at their option, wait to return until after the landscape restoration is completed. Residents of properties adjacent to those where excavation work is being conducted would be offered relocation as necessary.

Excavation Approach

Proposed Excavation Methods and Equipment

Table 2-1, *Typical Equipment for Implementation of Various Phases of the RAP*, provides a list of the types of equipment that would be used on the site for the different activities associated with the implementation of the RAP.[8] As can be seen in Table 2-1, excavation would be conducted using rubber track-mounted excavators or rubber-tired backhoes. Medium-sized excavator would be used for work in front yards and back yards where sufficient access is available and smaller mini-excavators would be used in back yards with narrow access via side yards. Excavation would be conducted using a front-end loader and/or Bobcat skid-steer mini-loader to move soil from back yards to front yards and vice versa to bring in clean fill soil.

Table 2-1

Typical Equipment for Implementation of Various Phases of the RAP

Activity	Equipment
Residential Properties	
Demolition	Bobcat (ex. S510), Chain Saw, 6,000 Watt Generator, Water Pump
Excavation	15,000 to 18,000 lbs Excavator, Bobcat, 6000 Watt Generator, Water Pump
SVE Well Installation	Bobcat with Auger, 6000 Watt Generator
Subslab Vent Installation	Bobcat with Auger, 6000 Watt Generator
Backfill and Compaction	Bobcat, Small Compactor (Wacker), Water Pump
Slurry Backfill	Concrete Pump
Site Restoration	6000 Watt Generator, Concrete Pump
Street Trenching	Backhoe, Compressor, Generator, Concrete Saw
Well Installation	Drill Rig
Street Paving	
Grinding	Cold Plane Grinding Machine, Street Sweeper
Paving	Paving Machine, Steam Roller, Street Sweeper
Other Activities/General Equipment	Vapor Control System, Meteorological Station, Handheld Organic Vapor Monitoring Instruments, Employee Comfort Stations

Source: URS and Geosyntec Consultants, 2014

[8] *The list of equipment is representative of the types of equipment that would be used for the various activities. The list is not all inclusive and other pieces of equipment, including hand tools, could be used.*

Conventional excavation using slot-trenching as necessary to protect structures or other features and open bulk excavation with appropriate sloping, setbacks, and/or shoring would be used where possible. Slot trenching consists of excavating an approximately 3 to 5-foot wide trench slot and then backfilling the trench before excavating the adjacent slot. This method was established to be feasible during a pilot test. However, in some areas where targeted excavation from 5 to 10 feet would be conducted, a limited access bucket auger drilling rig would be used in conjunction with conventional excavation equipment. Auger excavation using a limited access rig would allow excavation to be conducted in relatively tight spaces adjacent to structures to remove a column of soil. Using this approach, a 3-foot diameter borehole would be excavated and then backfilled with controlled low strength material (CLSM, also referred to as sand-cement slurry) and allowed to cure overnight.[9] The adjacent column would then be excavated and backfilled with CLSM the following day. If necessary, a second row of boreholes could be completed adjacent to the first row with the centers of the boreholes offset to achieve maximum soil removal. **Figure 2-5**, *Plan View and Cross Section of Conceptual Remediation at a Residence*, illustrates the approach. Use of this method would also require re-excavating the upper approximately 3 to 5 feet of CLSM fill material and replacing it with clean import soil, unless the auger excavation is in an area that would be covered with hardscape. Use of auger excavation would be slow and would therefore be used in limited application in favor of conventional excavation wherever possible.

In areas where access for equipment is severely limited, such as side yards, a mini-excavator or hand tools and wheelbarrows would be used to conduct excavations.[10]

Excavations would be made with side slopes at the horizontal to vertical ratio recommended by the Geotechnical Engineer and approved by the LACDPW and City of Carson in the Grading Permit for the particular property being excavated.[11] The basic excavation protocols would be altered as needed as excavations are conducted and to address any previously unknown utilities, concrete debris or foundations unearthed. If possible and approved by the LACDPW and the City, excavations would have vertical sidewalls to maximize removal of impacted soil to the full depth of excavation. It is anticipated that excavation sidewalls would be sloped below foundation footings of structures and block wall footings.[12]

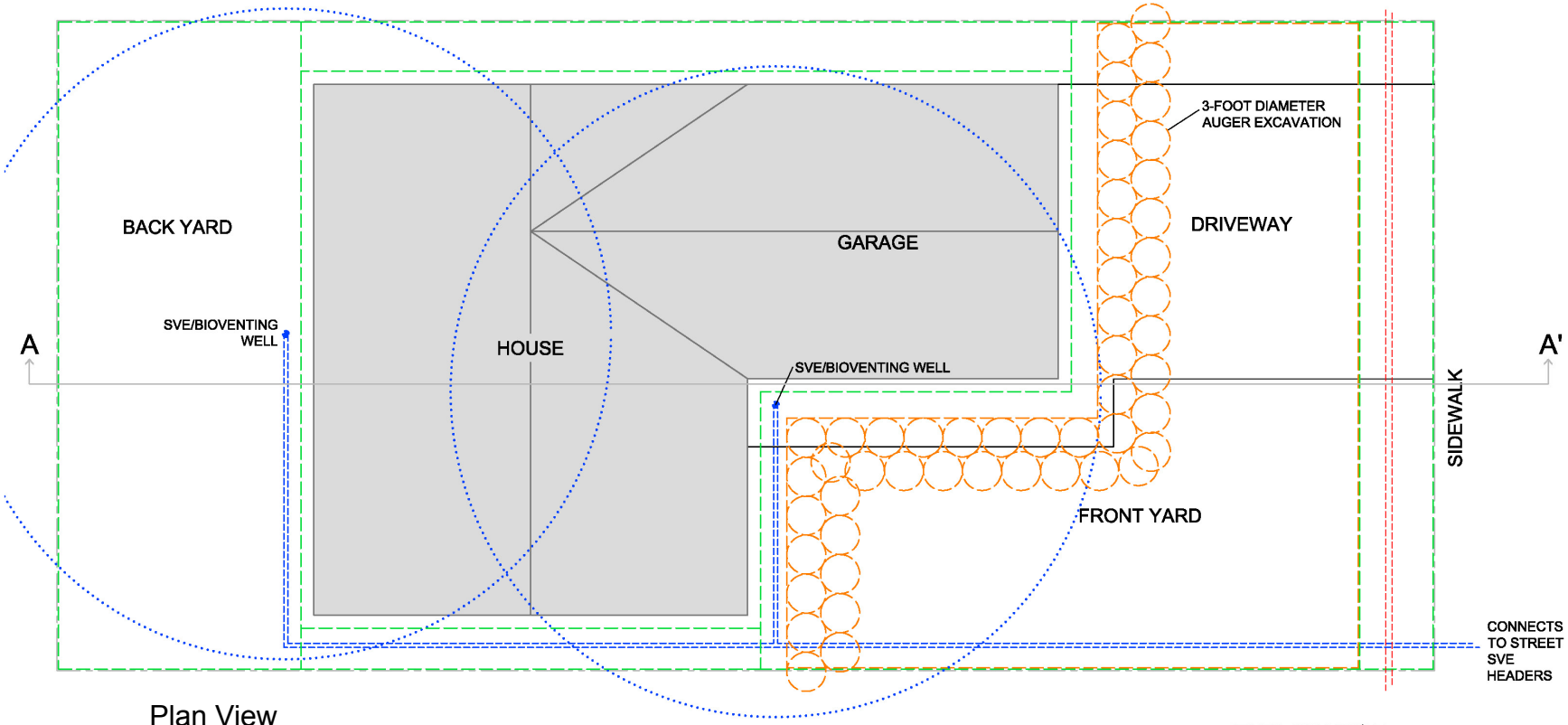
Excavation would be completed in clusters, with each cluster including approximately eight contiguous properties. Where possible, each cluster would include homes that share a common backyard property line (e.g., the east side of Marbella and west side of Neptune Avenues). This approach would be used to minimize disruption to residents and increase efficiency, in that if it is necessary to remove back fences or block walls, the fences can be removed one time and excavation and backfilling could be conducted in both yards before the fences are restored. For properties on the perimeter of the tract, work would proceed at a smaller number of properties for each phase. This phased excavation approach would require that access can be obtained and Grading Permits for the properties are available for all eight properties in a phase before work

[9] *CLSM can be designed to have low enough compressive strength to allow excavation with hand tools and a range of permeability to air and liquids. The CLSM mix would be designed to have permeability comparable to that of surrounding soils in order to effectively operate the SVE/bioventing systems.*

[10] *Depth of excavation using these methods is restricted to 5 feet bgs.*

[11] *The City of Carson follows the LACDPW Grading Guidelines and is a contract city, meaning that the LACDPW provides plan check services for the City.*

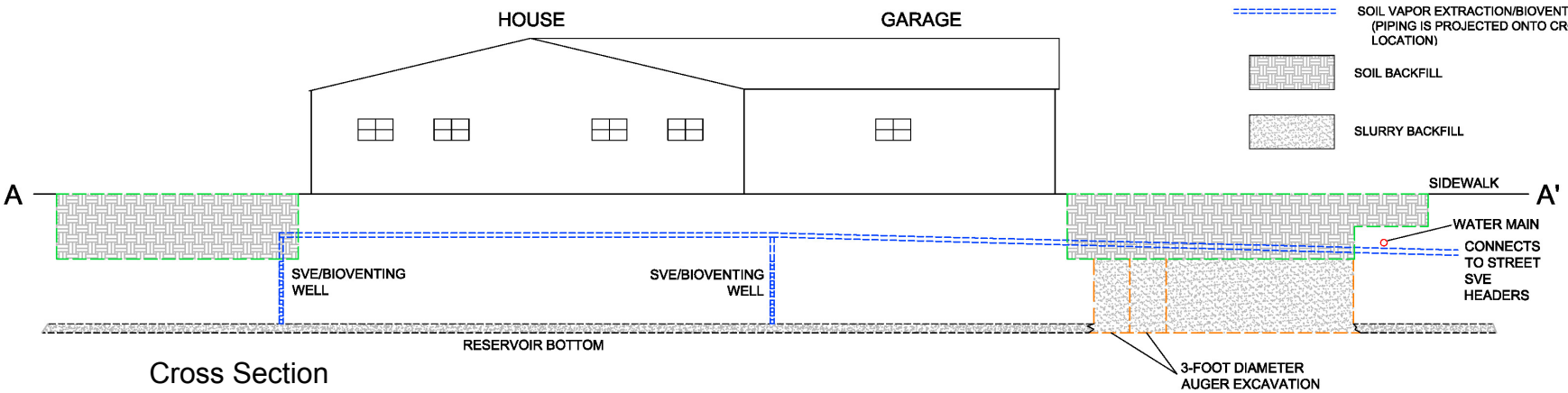
[12] *Potentially, the LACDPW and City would require setbacks from structures in accordance with appropriate elements of Sections J101, J104, J106, and J108 of the County Grading Code as amended by the City of Carson.*



Plan View

EXPLANATION

- 5-FOOT EXCAVATION
- 10-FOOT TARGETED EXCAVATION
- SOIL VAPOR EXTRACTION/BIOVENTING WELL AND SYSTEM PIPING (PIPING IS PROJECTED ONTO CROSS-SECTION FROM SIDE YARD LOCATION)
- SOIL BACKFILL
- SLURRY BACKFILL



Cross Section

PCR

0 10 Feet

Plan View and Cross Section of Conceptual Remediation at a Residence

Former Kast Property Tank Farm Site Remediation Project

Source: URS, 2014.

FIGURE

2-5

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commences. In the event that a property does not require excavation, that property would be skipped in the sequencing of work; however, side yard and back property fences may need to be removed to allow excavation of the adjacent properties.

Backfill would begin upon completion of excavation and installation of other remedial elements. Borings from auger excavation would be backfilled with controlled low strength material (CLSM, also referred to as flowable fill or sand-cement slurry) the same day they are excavated. Where slot trenching is used for 5-foot excavations or for targeted deeper excavations to 10 feet, the lower part of the slot trenches would also be backfilled with CLSM. The upper 3 feet of excavations would be backfilled with certified clean imported soil. Backfill soil would be free of deleterious organic matter (i.e., vegetation) and cobbles larger than four inches in diameter, and would be approved by the Geotechnical Engineer. Backfill soil would be moisture conditioned to near optimal moisture content and compacted to at least 90 percent relative compaction, or as determined by the Geotechnical Engineer and approved by Los Angeles County Department of Public Works (LACDPW) and the City of Carson in the Grading Permit. The upper foot of soil backfill would be topsoil suitable for vegetation growth and would be compacted to not more than 85 percent relative compaction.

Following excavation and backfill but prior to site restoration, SVE/bioventing wells would be installed at each property where required. Additionally, for those 28 properties where a sub-slab mitigation system is proposed, the system would be installed concurrent with or following the excavation activities. As indicated previously, the RP would install a sub-slab mitigation system at any residence at which a homeowner requests such a system.

Materials Handling and Hauling

Excavated soil would be loaded directly into an awaiting transport vehicle (i.e., end-dump truck, dump truck, or covered soil bin) using the excavator, front-end loader or skid-steer mini-loader. To the extent possible, impacted soil would be direct loaded into approved waste haulers using the excavator for transport to the appropriate recycling or disposal facility. In the unlikely event that it is necessary to temporarily stockpile soil on-site before loading, soil either would be placed upon plastic sheeting and covered with plastic, or they would be temporarily placed in a covered bin. Care would be taken to ensure that all loose soil is brushed off the transporter and properly managed prior to covering with a tarp. Haul trucks would not be permitted to stage for long periods of time on public streets, including those within the Carousel Tract while waiting to be loaded. To ensure continuous pedestrian (including bicycle) and vehicular safety at the entrance and exit points of the site, a flag person would be made available during work hours to assist with truck ingress and egress, as needed.

Approximately 177,870 CY of soil would be removed from residential excavations at the site and an almost equal amount of clean soil would be imported.[13] Based on truck capacity, there would be a total of approximately 10,800 loads of export soil and 10,580 loads of import soil. The estimated truck loads per day would be on average 13 loads/day of export soil and 14 loads/day of import soil. In addition to the residential soil excavation, there would be approximately 8,100 CY of soil excavated for SVE piping

[13] *The 177,870 CY includes a contingency; soil removed from the residential properties is estimated to be 161,700 CY with a 10 percent contingency for a total of 177,870 CY.*

installation in the public rights-of-way. This would represent a total of approximately 580 loads of export soil. Impacted soil would likely be transported to Soil Safe's Thermal Desorption facility located in Adelanto, California or a closer equivalent treatment/disposal facility. The Soil Safe facility is located in the Mojave Desert approximately 100 miles from the project site. Import is assumed to be from fairly local sources, less than five miles from the site.

In addition to the excavated soil, other materials consisting of "hardscape debris" (non-hazardous landscape and other residential improvements, such as fencing material, etc.), residual concrete debris, asphalt and green waste would be removed as part of the excavation process, where necessary. **Table 2-2**, *Volumes of Material by Activity*, provides a summary of the quantities of materials anticipated to be removed during the remediation activities. There would be an estimated 740 truck loads of residential hardscape construction debris and 70 truck loads of asphalt from SVE trenching for pipe installation that would be hauled off-site for recycling or disposal. It is anticipated that approximately one truck load of green waste and two truck loads for concrete debris, on average, would be removed from each property.

Green waste likely would either be loaded into roll off bins provided by the City of Carson's contracted/franchise waste company, or placed in bins provided by the contractor and hauled to an appropriate facility. The specific recycling/disposal facility for removed asphalt would be determined by the contractor performing the work; however, it is assumed the facility would be located within the South Coast Air Basin. Hardscape debris would likely be transported to an appropriate facility, assumed to be within 30 miles of the site.

In addition, materials would need to be hauled to the site to complete the remediation. **Table 2-3**, *Average Daily Truck Trips*, provides a summary of the average truck trips that would result for the various activities at the site. As shown in Table 2-3, on average 60 trucks per day would enter and exit the site. On a peak day up to 90 truck trips could occur.[14] Haul trucks using regional freeways regardless of their origin/destination would access local streets to and from I-110 at Sepulveda Boulevard. Incoming trucks would access the site via Sepulveda Boulevard eastbound, Wilmington Avenue southbound, Lomita Boulevard westbound, and a right turn on either Neptune or Lagoon Avenues. Trucks leaving the site would then travel westbound on Lomita, northbound on Main Street, and westbound on Sepulveda to the I-110. The haul route(s) on municipal streets would be stipulated in a Construction Traffic Management Plan reviewed and approved by the City of Carson prior to project implementation.

Dust, Vapor and Odor Control

Monitoring would be performed by the RP during site remediation activities to ensure consistency with applicable South Coast Air Quality Management District (SCAQMD) rules and regulations. Applicable SCAQMD regulations are discussed and evaluated in Section 5.1, *Air Quality*, of this EIR. Dust suppression using water mist would be performed during excavation activities to minimize particulate matter emissions.

[14] *For analysis purposes in this EIR, the average of 60 truck trips is analyzed as a base case. In addition, because there could be days in which there is a greater level of activity, a peak day of 90 truck trips is also evaluated as appropriate.*

Table 2-2

Volumes of Material by Activity

Activity	Volumes of Material (cubic yards)
Demolition Export	
Residential Properties	9,550
Residential Property – Greenwaste	2,300
Street Trenching	2,060
Street Grinding	960
Subtotal	*14,870*
Soil/Waste Export	
Residential Property – Soil	177,870
Concrete Reservoir Bases	1,400
Street Trenching	8,100
Well Installation Transport to Off-site	725
Subtotal	*188,095*
Backfill Import	
Residential Properties	132,000
Slurry Backfill	
Residential Properties	38,600
Street Trenching	5,000
Subtotal	*43,600*
Restoration	
Residential Property – Concrete	8,300
Street Trenching – Asphalt	1,300
Street Paving – Asphalt	960
Subtotal	*10,560*

Source: URS and Geosyntec Consultants, 2014 and PCR Services Corporation, 2014

Care would be taken to ensure that the soil is not over-saturated which could generate runoff that would need to be managed and increase the weight of soil to be disposed. In accordance with SCAQMD requirements excavation and loading operations would cease if the wind speed is greater than 15 miles per hour (mph) averaged over a 15-minute period or instantaneous wind speeds exceed 25 mph.

Based on monitoring data or odor perception, vapor and odor control would be implemented on an as needed basis. Water mist would also provide the first level of vapor and odor control. Odor suppressants, such as Rusmar AC-565 Long Duration Foam or equivalent, and necessary support equipment, would be staged and ready for application at locations where remedial excavations are conducted.

Utilities

Prior to starting demolition of existing landscaping and hardscape and initiation of excavation, potential subsurface obstructions would be identified. Utility lines would be clearly marked in the field for removal or avoidance. Hand excavation would be used to confirm the location and depth of the transite pipe water

Table 2-3

Average Daily Truck Trips

Activity	Average Daily Truck Trips [a]
Residential Properties	46 trucks/day
Street Trenching	9 trucks/day
Well Installation	5 trucks/day
Total	60 trucks/day
Street Grinding and Paving (would occur after residential property excavation, street trenching, and well installation)	24 trucks/day

[a] *The above provides the average daily truck trips* (defined here as a one-way vehicle trip, either inbound or outbound at the site). *On a peak day up to 90 truck trips could occur, with the increase of 30 truck trips likely occurring as a result of an increase in materials at the residential properties.*

Source: URS and Geosyntec Consultants, 2014 and PCR Services Corporation, 2014

mains located in the front yards. Other underground utilities would be located, as deemed necessary, by hand excavation "potholing". Utilities within the site are summarized below.

- Water. Water service to the Carousel Tract is provided by California Water Service Company (Cal-Water). Water mains are located in the front yard of residential properties approximately 3.5 feet in from the inner edge of the sidewalk on the west side of named streets and on the south side of numbered streets at approximately 3 to 3.5 feet bgs. The water mains are of asbestos-cement (transite) pipe construction, and according to Cal-Water, these water mains will need to be avoided and not exposed in excavations. The RP and their contractor(s) would work closely with Cal-Water on this aspect of the utility location work, with setbacks to transite lines established in consultation with Cal-Water, as necessary.
- Sewer. Based on the 5-to 10-foot depth of excavation, sewer laterals at some properties may be affected. If sewer laterals are present within the 5-foot or targeted deeper 5 to 10-foot excavations, they would be capped, removed and replaced. No septic tanks or other septic systems are located within the site.
- Gas. Gas mains located in City streets would not be affected by excavation work. Gas service laterals to houses where excavations occur in front yards would be protected in place or would be capped, removed, and replaced when excavation is completed and excavations have been backfilled.
- Telephone/Cable. Telecommunications service trunk lines are located in a common trench with gas mains in the street or beneath the sidewalks and would not be affected by the work. Telecommunications lines to houses where excavation occurs in front yards may need to be removed and replaced. Replacement of telecommunications lines would be done by an AT&T contractor that routinely does telephone cable work in the Carousel Tract.
- Electrical. Electrical service is provided by overhead power lines with power drops to the rear of houses. Overhead power lines would potentially need to be removed due to the potential for the excavator to hit the overhead utility lines, which could create a hazard. The overhead power lines would be restored upon completion of the excavation.

SVE/Bioventing

SVE and bioventing are remedial technologies that would be used to address petroleum hydrocarbons, VOCs, and methane in soil vapor and to promote degradation of residual hydrocarbon concentrations remaining in soil following excavation that do not meet RAOs. The SVE process involves inducing airflow in the subsurface with an applied vacuum, enhancing in-situ volatilization of VOCs, and effecting movement of the VOCs to vapor extraction wells for removal from the subsurface. The SVE technology is also effective at removing methane from subsurface soil and has been used for this application at other hydrocarbon-impacted sites and at landfills.

Bioventing is an in-situ technology generally applicable to the remediation of petroleum hydrocarbons in soil. In this process, air is introduced into the subsurface to provide oxygen to enhance biodegradation of petroleum compounds. As summarized in Chapter 4 of the RAP and in more detail in the final Bioventing Pilot Test Summary Report,[15] bioventing was found to be effective at reducing hydrocarbon concentrations in site soil over time. SVE working in concert with bioventing would promote microbial degradation of longer-chain petroleum hydrocarbons and, over the long term, reduce concentrations of these less-volatile compounds in the subsurface.

Use of SVE/bioventing would address impacted soil beneath existing paved areas, City sidewalks, and concrete foundations of the homes, in addition to addressing reduction of COC concentrations in excavated areas below 5 feet bgs and unexcavated areas with the goal of achieving SSCGs over time. Operation of the SVE/bioventing system would also address impacted media that may be associated with residual concrete reservoir slabs left in place below the depth of excavation.

The SVE/bioventing infrastructure would consist of a system of vertical extraction/inlet wells, below ground conveyance piping, and an above ground treatment system. Findings of previous site testing regarding properties where concentrations of COCs and methane would not meet RAOs were used to identify properties that would require SVE/bioventing. Based on this data and in consideration of pilot test studies which evaluated the average effective radius of vacuum influence (ROVI) of wells at varying depths throughout the site, the RAP identifies the number and general locations of wells on-site necessary to remediate the site.[16,17] Wells would generally be placed in three zones: the "shallow zone" from approximately 5 to 10 feet bgs; the "intermediate zone" from approximately 15 to 25 feet bgs; and the "deep zone" from approximately 30 to 40 feet bgs.[18]

Within the "shallow zone," the RAP identifies 236 residential properties for which wells would be installed within front- and/or backyards.[19] There would be a total of 498 shallow wells on the residential properties.[20]

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[15] *Bioventing Pilot Test Summary Report. Former Kast Property, Carson, California. Geosyntec, December 6, 2012.*

[16] *The SVE pilot test activities and results are summarized in Chapter 4 of the RAP.*

[17] *The final locations for installation of SVE/bioventing wells would be established during the final SVE system design phase.*

[18] *Wells could potentially be placed deeper depending on depths of soil impact and depth to groundwater.*

[19] *The Addendum to the RAP provides a range of 224 to 236 properties for which wells would be installed. The 236 properties include the 12 properties for which no environmental characterization data have been collected as of October 17, 2014. For purposes of this EIR, the 12 properties for which there is no data are assumed to be included in the remediation in terms of excavation and installation of wells. The number of shallow wells on residential properties assumes two wells are installed on each of the 12 properties with no data.*

Well and piping components for SVE/bioventing wells installed on residential properties would be entirely below grade. At residential properties where remedial soil excavation would be performed, wells would be installed following backfill placement either by hand or using a small Bobcat skid-steer or similar equipment with a power auger attachment. Conveyance piping would be laid prior to final backfill and grading and would be extended to the back of sidewalks for later connection to piping in the streets. At residential properties that would not have excavation performed but that would have SVE/bioventing wells, installation of the well and piping would occur in the same general timeframe as nearby properties. At non-excavated properties, the wells would be installed by hand and piping would be laid in hand excavated trenches. Hardscape and landscaping that is affected by well and/or piping installation would be restored to like conditions following installation. Figure 2-5 shows a plan view and cross-section of a typical residence SVE/bioventing well system installation.

In addition to the 498 stand-alone shallow wells on the residential properties, there would be 65 stand-alone shallow wells in the streets. Thus, there would be a total of 563 stand-alone shallow wells on the site. **Figure 2-6**, *Typical Shallow Well Construction Detail*, provides an illustration of a typical stand-alone shallow well.

In addition to the stand-alone shallow wells in the streets, 63 "triple-nested" wells would be installed in the streets.[21] These nested wells would include shallow, intermediate, and deep zone wells (3 total wells in each nested well). The nested wells would all be constructed in the same borehole, separated by cement/bentonite seals. A typical nested well construction detail is shown of **Figure 2-7**, *Typical Nested Well Construction Detail*. Each nested well and the 65 stand-alone shallow wells in the streets would be installed within a flush-mount well vault surrounded by a concrete skirt.

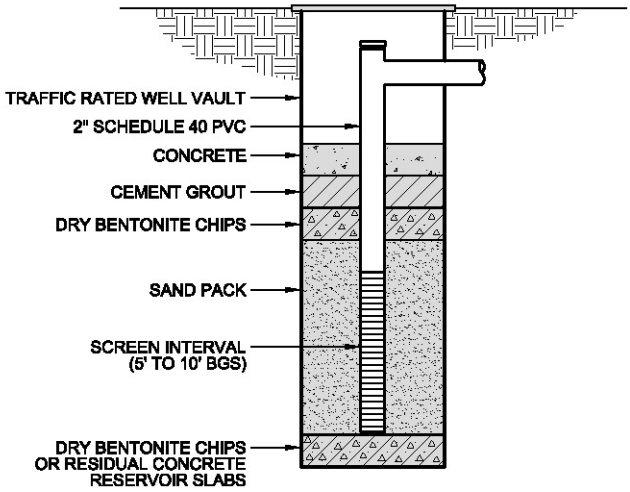
In summary, the RAP, inclusive of the stand-alone shallow wells and the nested wells, would include 626 shallow wells, 63 intermediate wells, and 63 deep wells. Thus, in total there would be 752 wells. **Table 2-4**, *Extraction/Inlet Wells Summary*, provides a tabular summary of the proposed on-site wells. The estimated vapor extraction coverage for the shallow, intermediate, and deep zones is shown on Figures 8-2, 8-3 and 8-4, respectively, in the RAP. As illustrated therein, the proposed wells would provide vapor extraction coverage in the varying zones for nearly the entire site. The wells throughout the site would be connected to the SVE system (described below) via conveyance piping, which would be installed in the streets.

The SVE equipment would consist of an entrained-moisture separator (knock-out pot), 3,000 standard cubic feet per minute (scfm) positive displacement blower with a 150 to 250 horsepower motor, control panel, and thermal/catalytic oxidizer. The system would operate using electrical power from Southern California Edison with a separate power drop and meter. The SVE system would be operated in a cyclic manner, with active extraction in different portions of the site at different times. During periods of vapor extraction from a sub-set of wells, the SVE system would remove hydrocarbon vapors and would also draw oxygen into the subsurface to enhance the biodegradation of residual petroleum hydrocarbons in soil. During periods when

[20] *Despite the shallow wells having a ROVI of 50 feet, the shallow well distribution for the site was based on a ROVI of 25 feet to conservatively account for potential short-circuiting from surface landscaping. Monitoring of the site (as discussed below) would be in place to readily identify any potential malfunction of the system. Should any malfunction be identified, the RP or its contractors would fix the problem.*

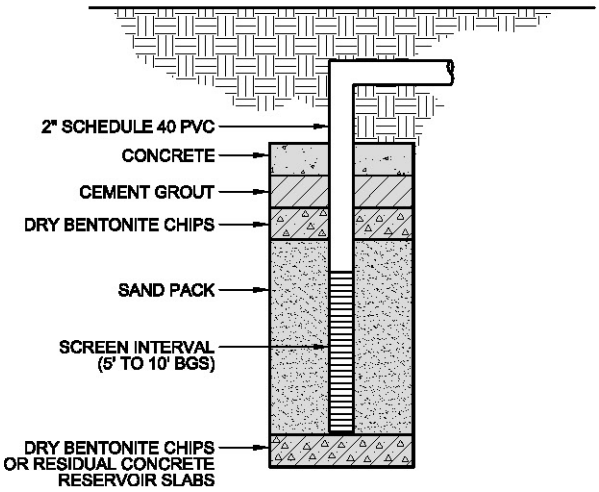
[21] *Based on the estimated ROVI of 50 feet, additional stand-alone shallow zone wells may be installed between the nested wells in the streets in select areas of the site to provide increased vapor extraction coverage within the shallow zone.*

SHALLOW STREET SOIL VAPOR EXTRACTION WELL



BORING DIAMETER: 6 3/4" MINIMUM
TOTAL DEPTH (APPROXIMATE): 11' BGS

SHALLOW RESIDENTIAL SOIL VAPOR EXTRACTION WELL



BORING DIAMETER: 6 3/4" MINIMUM
TOTAL DEPTH (APPROXIMATE): 11' BGS

NOTES:
BGS = BELOW GROUND SURFACE
PVC = POLYVINYLCHLORIDE

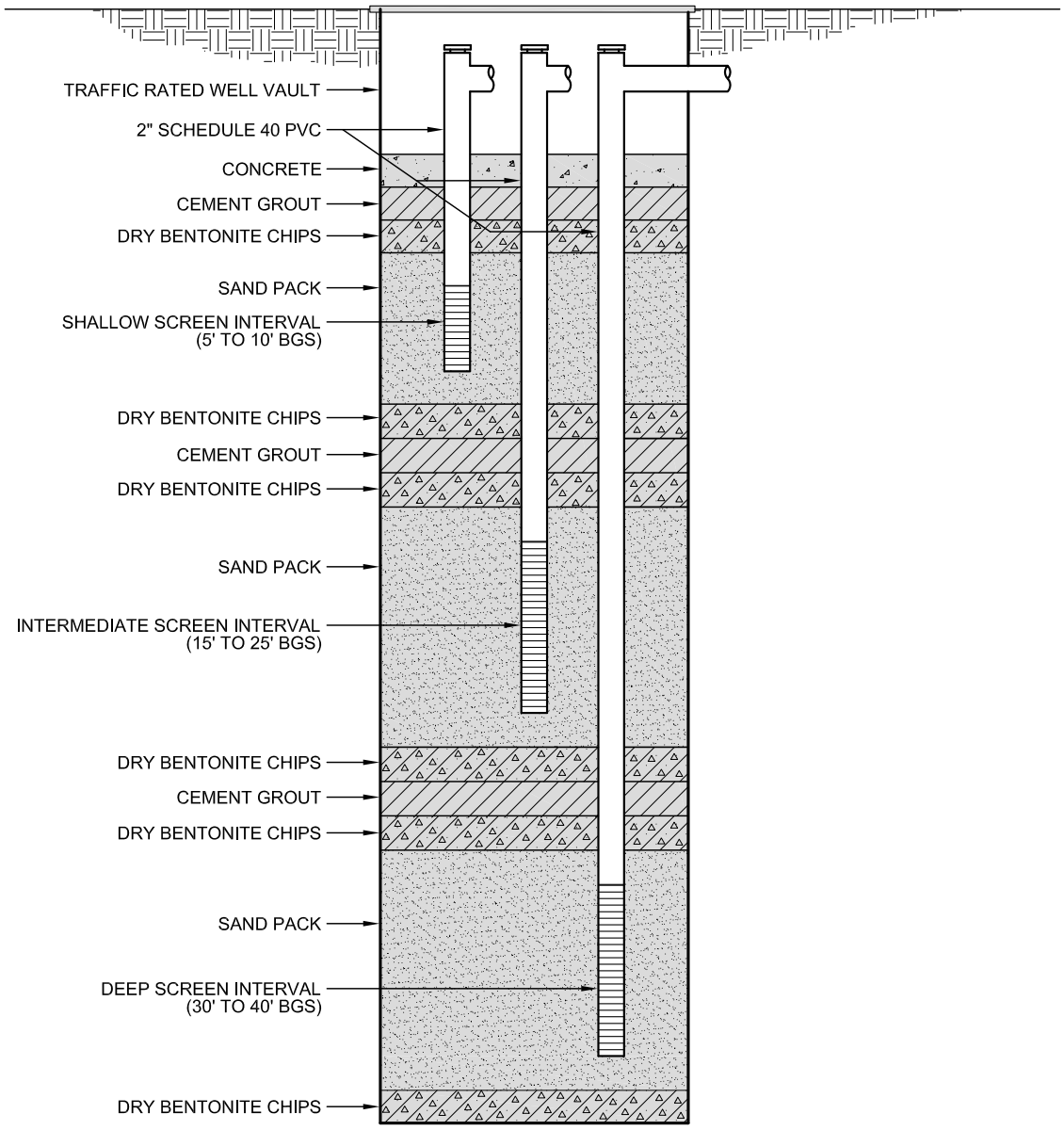
PCR

Typical Shallow Well Construction Detail

Former Kast Property Tank Farm Site Remediation Project
Source: URS, 2014

FIGURE
2-6

TRIPLE COMPLETION STREET SOIL VAPOR EXTRACTION WELL



BORING DIAMETER: 11 3/4"
TOTAL DEPTH (APPROXIMATE): 42' BGS

NOTES:
BGS = BELOW GROUND SURFACE
PVC = POLYVINYLCHLORIDE

PCR

Typical Nested Well Construction Detail

Former Kast Property Tank Farm Site Remediation Project
Source: URS, 2014.

FIGURE
2-7

Table 2-4

Extraction/Inlet Well Summary

Well Type	Shallow Zone (5-10 feet bgs)	Intermediate Zone (15-25 feet bgs)	Deep Zone (30-40 feet bgs)	Total No. of Wells
Shallow Zone Wells				
Stand Alone – 236 Residential Properties[1]	498	--	--	498
Stand Alone in City Streets	65	--	--	65
Within Nested Well in City Streets	63	--	--	63
			Total Shallow Zone Wells	**626**
Intermediate Zone Wells				
Within Nested Well in City Streets	--	63	--	63
			Total Intermediate Zone Wells	**63**
Deep Zone Wells				
Within Nested Well in City Streets	--	--	63	63
			Total Deep Zone Wells	**63**
			Total Wells	**752**

Notes: [1] The Addendum to the RAP provides a range of 224 to 236 properties for which wells would be installed. The total number of shallow zone wells for residential properties assumes the installation of two wells on each of the 12 properties for which no environmental characterization data have been collected as of October 17, 2014.
Bgs = Below ground surface

Source: Addendum to the Remedial Action Plan for the Former Kast Property, Carson, California, prepared by URS Corporation, October 2014 and PCR Services Corporation, 2014.

no extraction is occurring for a set of wells, remediation would be achieved through biodegradation alone (i.e., bioventing). The system would be designed to use the same infrastructure (i.e., extraction wells) for both SVE and bioventing, and the cyclic operating conditions would be used to implement both remedial actions. The SVE/bioventing system would be operated in a manner to achieve the soil oxygen demand estimated from the bioventing pilot tests.[22]

Oxidation equipment (thermal or catalytic) is used for destroying contaminants in the exhaust gas from SVE systems. Thermal oxidation units are typically single chamber, refractory-lined oxidizers equipped with a propane or natural gas burner and a stack. Flame arrestors are always installed between the vapor source and the thermal oxidizer. Burner capacities in the combustion chamber range from 0.5 to 2 million British thermal units (Btus) per hour. Operating temperatures range from 760 to 870 °C (1,400 to 1,600 °F), and gas residence times are typically 1 second or less.[23]

During catalytic oxidation, the addition of a catalyst accelerates the rate of oxidation by adsorbing the oxygen and the contaminant on the catalyst surface where they react to form carbon dioxide, and water. The catalyst

[22] *Ibid.*

[23] *Federal Remediation Technologies Roundtable, Remediation Technologies Screening Matrix and Reference Guide, Version 4.0, Chapter 4.57, (2002).*

enables the oxidation reaction to occur at much lower temperatures than required by a conventional thermal oxidation. VOCs are thermally destroyed at temperatures typically ranging from 320 to 540 °C (600 to 1,000 °F) by using a solid catalyst. First, the VOC-laden air is directly preheated (electrically or, more frequently, using natural gas or propane) to reach a temperature necessary to initiate the catalytic oxidation of the VOCs. Then, the preheated VOC-laden air is passed through a bed of solid catalysts where the VOCs are rapidly oxidized. Thermal oxidizers can often be converted to catalytic units after initially high influent contaminant concentrations decrease to less than 1,000 to 2,000 parts per million by volume (ppmv).

The design of the SVE system potentially would include use of multiple treatment technologies in a staged approach, depending on inlet concentrations. The remediation equipment would provide the flexibility to transition from thermal oxidation to catalytic oxidation followed by granular activated carbon (GAC) treatment, when the concentrations have decreased sufficiently.

The RP is evaluating three off-site locations for the installation of the remediation equipment. **Figure 2-8**, *Potential Soil Vapor Extraction Treatment System Locations*, shows the three locations, which are located within the developed industrial area to the immediate west or northwest of the site.[24] The SVE system would be installed in an enclosed structure constructed with sound attenuation insulation to reduce operating noise levels in accordance with City of Carson Noise Ordinance. The structure would have an approximately 320 square foot building footprint (two 8-foot by 20-foot skids), be up to approximately 12 feet high and have an effluent discharge stack with a minimum height of 13 to 15 feet extending from the top of the structure for dispersion of treated off gases. The actual stack height would be established in consultation with the SCAQMD as part of the Permit to Construct and Operate for the system. Additionally, a canopy would be attached to an outer wall of the structure to cover the header manifold (piping system from the wells to the treatment system).

The SVE/bioventing system would be operated until SSCGs are reached. The system would be operated on a continuous cyclic basis and shut down only during performance of routine maintenance. Based on data collected during the SVE and bioventing pilot tests, the estimated operating time for the SVE system is expected to be approximately 5 years.[25] Actual operating time would be dependent on monitoring data results to determine if the site's applicable RAOs and SSCGs are achieved. Bioventing to biodegrade residual hydrocarbons at concentrations of approximately 10,000 mg/kg in soil is expected to occur within approximately 30 to 40 years.[26]

Field activities associated with the system operation would include periodic site visits to record operating parameters, to monitor VOC and methane concentrations in the influent, effluent, and extraction wells using field instrumentation; and to perform routine system preventive maintenance and troubleshooting. The recorded operating parameters, and influent, effluent, and well concentrations would be used to fine tune and adjust the system and to optimize influent VOC and methane concentrations to sustain removal rates to achieve remediation with the shortest possible time frame, and to maintain compliance with the SCAQMD permit.

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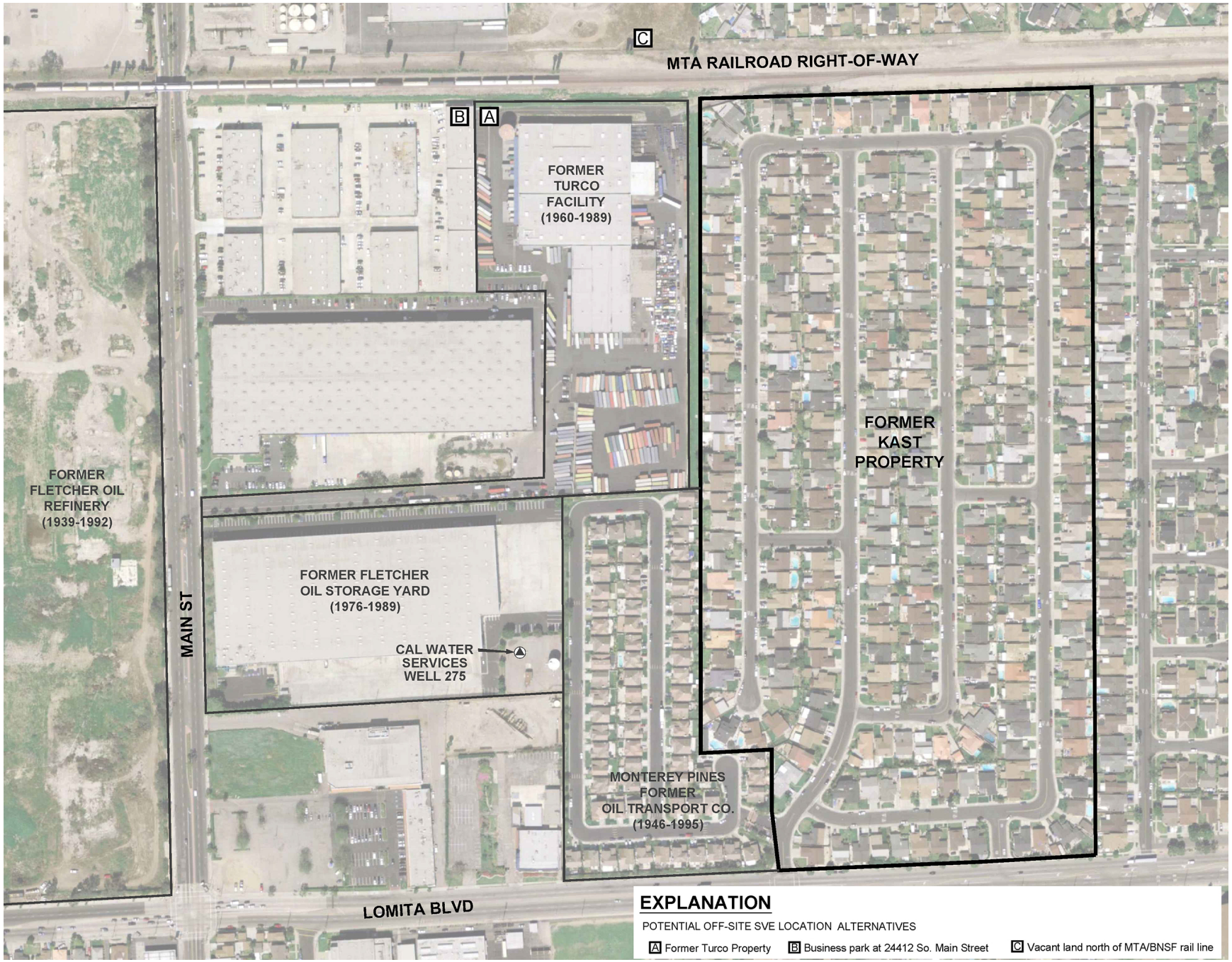
[24] *Piping would be installed from the Carousel Tract to the location of the remediation equipment. The installation of the piping would require minimal trenching and would not result in permanent or visible changes to the physical environment. The potential impacts from the trenching would be within the parameters of the project evaluated in Chapter 5 of this EIR.*

[25] *Soil Vapor Extraction Pilot Test Report, Former Kast Property, Carson, California, Site Cleanup No. 1230, Site ID 2040330. URS, September 30, 2010; and Bioventing Pilot Test Summary Report. Former Kast Property, Carson, California. Geosyntec, December 6, 2012.*

[26] *URS Corporation and Geosyntec, Revised Remedial Action Plan Former Kast Property, June 30, 2014, Appendix C, page C-3.*



N

0 600 Feet

Potential Soil Vapor Extraction Treatment System Locations

Former Kast Property Tank Farm Site Remediation Project

Source: URS, 2014.

FIGURE

2-8

PCR

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Sub-Slab Vapor Mitigation

Sub-slab vapor mitigation systems would be installed at 28 residential properties where RAOs for soil vapor would not be met based on potential exposure due to vapor intrusion of petroleum hydrocarbons or chlorinated ethenes (e.g. PCE and TCE) from soil vapor to indoor air, and at the two locations where detected methane concentrations in sub-slab soil vapor probe samples exceed the methane SSCG (0.5 percent). (See Table 6-1 and Figure 6-4 in the Addendum to the RAP for a listing of and figure showing the properties). One of these properties has already had an interim mitigation system installed, and the other only slightly exceeds the methane SSCG of 0.5 percent methane in a single measurement from a single sub-slab probe.[27] In addition, while the data do not indicate that vapor intrusion is an issue at any of the residences, an offer to install a sub-slab mitigation system to any of the homeowners in the neighborhood has been proposed by the RP. If a homeowner requests a sub-slab mitigation system, the system would be installed during the remediation of that property.

In order to keep vapors emanating from the soil below from entering a building a sub-slab depressurization (SSD) system would be used. The SSD system creates a negative pressure below the slab of the residence using a fan to remove air from below the slab and exhaust it above the building. The SSD system would include a manometer or in-line pressure gauge to provide a simple measure that the system is operating as designed. Additionally, the RP's contractors would confirm that homes with a SSD have a carbon monoxide (CO) monitor, as required in all homes by California law.

SSD design, installation, and operation would be in accordance with the DTSC Vapor Intrusion Mitigation Advisory.[28] The system would consist of creating holes in the slab or footing of the structure, removing a quantity of soil from beneath the slab to create a suction pit and installing suction pipes into the holes. The suction pipes would be directed to above the roof and a fan connected to the system to create a sub-slab vacuum.

After installation of the SSD system, based on diagnostic testing to assess the vacuum distribution beneath the building foundation, any necessary adjustments to the SSD system (e.g., larger fan or additional suction pits) would be made.

Because the SSD systems would be operated in an active mode using a fan to create a vacuum, the SSD systems would be permitted by the SCAQMD. Vapors vented by the system would be treated prior to discharge as required by the SCAQMD permit.

LNAPL Recovery

LNAPL removal would occur in localized areas through pumping at or beneath the surface of groundwater in monitoring wells. LNAPL is currently being recovered from monitoring wells MW-3 and MW-12 on a monthly basis using dedicated pneumatic total fluids pumps installed in the wells (refer to Figure 5.5-3, in

[27] *Sub-slab vapor mitigation systems would not be installed at residential properties where the vapor intrusion risk estimates are driven by trihalomethanes (i.e., chloroform, bromodichloromethane, or dibromochloromethane), because the presence of these constituents in soil vapor is believed to be due to off-gassing from municipal water (either leaking water lines or sewer lines or applied irrigation) and not a result of historical Site operations.*

[28] *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). DTSC, October 2011.*

Section 5.5 of this EIR for a graphic showing the groundwater monitoring well locations). Recovered LNAPL is placed in drums which are immediately transported off-site for proper disposal.

As part of RAP implementation, LNAPL recovery would continue from wells MW-3 and MW-12 on a monthly basis, and, if LNAPL is detected in other wells, monthly LNAPL recovery would be initiated on these wells if LNAPL accumulates to a thickness of greater than 0.5 foot. A dedicated pump similar to the current LNAPL recovery setup in use for MW-3 and MW-12 would be used for LNAPL recovery in other wells if needed. Monitoring of LNAPL and water levels, and LNAPL recovery volume monitoring would continue during LNAPL recovery events. When LNAPL recovery shows a declining trend in wells in which LNAPL occurs, recovery trends would be evaluated, a recommendation may be made to the Regional Board to reduce the frequency of LNAPL recovery, as appropriate.

Groundwater and Monitored Natural Attenuation

There are currently 25 groundwater monitoring wells that have been installed on the site, which are monitored quarterly. Quarterly groundwater monitoring started in August 2009 after the first set of wells was installed. Groundwater occurs at a depth of approximately 53 feet beneath the site, with a groundwater flow direction to the northeast. Groundwater monitoring results have consistently indicated that groundwater is impacted with site COCs and may be impacted by discharges from upgradient sources. A detailed description of groundwater conditions including occurrence, quality, COCs, and COC sources as well as the SSCGs for groundwater are provided in Section 5.5, *Hydrology and Water Quality*, of this EIR.

Natural attenuation is the process by which contaminant concentrations in the environment are reduced "through biological processes (aerobic and anaerobic biodegradation, plant and animal uptake), physical phenomena (advection, dispersion, dilution, diffusion, volatilization, sorption/desorption), and chemical reactions (ion exchange, complexation, abiotic transformation)."[29] It has been proven to be highly effective in reducing petroleum based contaminants. Monitoring would be necessary to determine whether natural attenuation is occurring effectively at this site.

It is assumed that groundwater remediation of non-site-related COCs (e.g., chlorinated compounds) to the extent not removed by the selected remedy may be accomplished by directing responsible parties to remediate off-site upgradient sources to achieve water quality standards.

COCs

While natural processes would reduce site-related petroleum COCs (benzene, naphthalene, TPH) over time to meet RAOs (expected to be on the order of 70 years), implementation of the RAP would accelerate the process through removal of mass above and at the groundwater table (i.e., excavation of shallow soil, SVE/bioventing, and LNAPL recovery). Section 5.5 of this EIR provides a detailed analysis of the proposed remedial actions, along with MNA, relative to groundwater remediation.

If based on the initial five years of annual MNA data following implementation of SVE/bioventing operations, the concentrations of site-related COCs are not stable or declining, (i.e., the SVE/bioventing and natural processes are not sufficient), contingency supplemental remediation of certain site-related COCs in localized areas of groundwater may be implemented. The purpose of this contingency supplemental remediation would be to further shorten the time over which the concentrations of COCs would return to background or

[29] *http://toxics.usgs.gov/definitions/natural_attenuation.html*

MCL levels. Such supplemental remediation would likely consist of in-situ treatment using injection of chemical oxidants into the localized areas. Should such supplemental groundwater treatment be warranted, a pilot test of the most appropriate in-situ technology would be conducted and the supplemental groundwater treatment implemented. A subsequent environmental analysis would be conducted for future groundwater treatment options, as necessary pursuant to applicable CEQA requirements.

Implementation Schedule

Implementation of the remediation activities would potentially commence in Fall 2015 and would be implemented in phases of eight properties. Clusters of eight properties could be completed within approximately eight to ten weeks. More specifically, it is estimated that excavation and backfill would take approximately six weeks per property and restoration would take an additional approximately two to four weeks. Work on the next cluster of properties (i.e., the next eight properties working down the block), would begin approximately at the end of week six to week eight of work on the first cluster. During the restoration activities for the properties, the installation of the SVE wells and piping in City streets would occur After excavation and backfill, property restoration and SVE installation are complete it is anticipated that the final SVE construction activities may take approximately six months. During this final phase, the streets within the tract would be repaired as required and overlaid with new asphalt.

Based on approximately eight to ten weeks to complete a cluster of eight properties, with some overlapping of remediation activities, the suite of residential remedial construction activities including excavation, onproperty SVE/bioventing well and piping installation, backfill, sub-slab vapor mitigation, and site restoration is estimated to take approximately 6 years to complete. This estimate of time needed to complete these activities is dependent upon obtaining access to the properties in a timely manner and does not include loss of time due to inclement weather or other delays that might occur outside of the RPs control.

During the most labor intensive work periods, numerous activities are likely to be occurring simultaneously. These may include air-vac borehole clearance, SVE well drilling, landscape clearance, hardscape demolition, excavation and backfill at residential properties, and trenching to install SVE piping. During these activities as many as 32 employees are expected to be on-site at any one time, excluding truck drivers. Most workers would park off-site and would be shuttled to the site, likely in a van or small bus. It is assumed that about one-half of the workers (16 workers) would park off site and that the remaining 16 workers would drive directly to the site. During the street grinding and paving up to 22 workers are expected to be on-site at any one time, excluding truck drivers. In addition to workers, it is expected that up to nine (9) visitors, which would likely be various agency staff (i.e., Regional Board, City of Carson, SCAQMD, etc.), could be at the site on a given day.

Expedited Implementation Option

Based on experience in the field during the initial implementation of the RAP, it is possible that an increase in the number of properties being remediated at one time could occur. This would only occur if it is feasible and determined to be safe for residents and workers. Rather than a cluster of up to 8 properties, the number being actively remediated could be incrementally increased with up to 16 properties active at one time. Given the overlap in activity with the clusters there could be up to 32 properties in some stage of remediation or restoration at one time. Under the Expedited Implementation Option the clusters would not be contiguous but would be located in a different area within the site. Two clusters under active remediation and restoration would be separated by a minimum distance of 64 meters (105 feet) as measured from the closest site boundary of each cluster.

The Expedited Implementation Option would result in additional workers on site at any one time, when feasible, with up to 47 workers on the site at one time. As with the project, about one-half of the workers would park off-site and would be shuttled to the site, likely in a van or small bus. For the Expedited Implementation Option it is assumed that 23 workers would park off site and that 24 workers would drive directly to the site. Truck trips would double, with an average of 104 truck trips per day to and from the site. On a peak day, it is anticipated that up to 151 truck trips could occur. As with the RP's Proposed Remedy, the street grinding and paving, which would be a less intense phase of the remediation, would occur after the completion of the excavation and restoration of properties and the installation of wells, piping, and sub-slab mitigation.

The Expedited Implementation Option would result in an increase in the number of workers and number of properties active at one time on the site, which would reduce the overall timeframe necessary for the implementation of the RAP. This approach would not modify the construction hours but rather the amount of activity occurring at one time on the site. As with the RP's Proposed Remedy, under the Expedited Implementation Option, remediation would begin in 2015. However, with the increase in implementation, it is anticipated that the remediation would be complete in 2019. For analysis purposes, the Expedited Implementation Option is evaluated in each technical section in Chapter 5 of this EIR so as to understand any potential impacts that might occur if the RAP were to be implemented more quickly.

Construction Hours

Remediation activities are expected to occur on-site Monday through Friday, starting as early as 7:00 a.m., with employee arrival, safety meetings, and work day preparations (e.g., equipment inspections), ending as late as 5:00 p.m. Powered equipment is expected to be operational from 7:30 a.m. to 4:30 p.m.; trucks for import, export, or material deliveries are expected to access the site no earlier than 8:00 a.m. and would typically depart the site no later than 4:00 p.m. The same hours would apply under the RP's Proposed Remedy and the Expedited Implementation Option.

Notification and Safety Measures

Notifications/Community Relations

The Regional Board and/or RP would implement various measures, as listed below, to notify the public and agencies of the remediation activities and to maintain open communication with residents and property owners.

- Notices, fact sheets, and similar documents intended for public/stakeholder distribution/ consumption would be made available by the Regional Board in English and in Spanish.
- Underground Service Alert (USA) would be notified at least 72 hours prior to subsurface activities, to allow marking of underground utilities that may exist in the area, as required by state law.
- Regional Board staff would continue to develop and distribute bulletins connected and timed to critical developments, and to advise of opportunities for public participation and comment.
- Pertinent documents and information are available at the Carson Public Library, located at 151 E. Carson St., Carson, CA 90745-2797 and on the State Water Resources Control Board's GeoTracker website.

- A 24-hour community information hotline (English and Spanish) would be monitored and maintained by the RP.
- Email address for stakeholders to request basic information about cleanup activities would be set up, monitored and maintained by the RP.
- A website with links to pertinent information, documents and progress updates on the cleanup would be publicized by the Regional Board to all stakeholders.
- Work notices would be prepared by the RP and posted in a timely fashion.
- Regional Board staff would hold block/community meetings connected and timed to critical developments in the cleanup process. All meetings would be held in English with headsets for Spanish available.
- Residents may call with questions or request a meeting with Regional Board project staff to discuss project status or activities by calling: (310) 576-6694.
- Regional Board staff would continue to maintain communications with key City of Carson personnel and government officials throughout the remediation process.

Health and Safety

Health and Safety Plan (HSP)

Pursuant to State of California Division of Occupational Safety and Health (Cal/OSHA) Hazardous Waste Operations Standards (Title 8, CCR Section 5192) and Code of Federal Regulations (Title 40 CFR, Section 1910.120), a project-specific site-specific Health & Safety Plan (HSP) would be prepared for remedial activities to be conducted at the site to protect the health and safety of the public and site workers. The HSP is further discussed in Section 5.4 of this EIR.

All work would be done in accordance with the HSP and Job Safety Analyses (JSAs) that would be prepared for specific work tasks and activities that would be conducted. Site field personnel conducting the work would review applicable JSAs at daily tailgate safety meetings.

Emergency Response Plan

The RP's contractors would prepare an Emergency Response Plan to provide specific information on potential hazards that may arise from the excavation program and subsequent SVE well and piping installation work that could affect the Carousel Tract and to describe the risk mitigation and emergency response procedures that would be instituted. The Plan would outline roles, responsibilities, and authorities of the RP and its subcontractors, as well as public agencies who are or may be involved in emergency preparedness, mitigation, and response activities to address potential hazards associated with soil remediation activities at the Carousel Tract. The Plan would outline existing and potential hazards associated with soil, soil vapors, and soil excavation activities, and would describe procedures, communications, and coordination processes for initiating emergency response to safeguard the community in the event of an emergency. The Plan would also provide information on emergency notification services, based on existing public resources. Finally, the Plan would provide a list of important public agency contacts and emergency preparedness resources. The Emergency Response Plan would be approved by the Regional Board and shared with Responsible Agencies.

Post-Construction Operation and Maintenance Activities

Following the completion of active remedial activities (soil excavation and SVE/bioventing system installation), operation and maintenance of the SVE/bioventing system would occur. Subsequent activities may include monthly or less frequent LNAPL recovery, quarterly or less frequent groundwater monitoring, and monitoring of utility vaults and street soil vapor probes. In addition, annual inspections to verify that the SSD systems are operating (monitoring of the vacuum and flow rate of the SSD fan) would be conducted.

In addition to the monitoring and maintenance activities referenced above, a Surface Containment and Soil Management Plan (SMP) (included as Appendix D of the RAP) would be reviewed and approved by the Regional Board as part of the RAP, and revised with more detail as part of the RDIP. The SMP provides the detailed approach to mitigate potential residential, construction, or utility worker exposure to soil that do not meet RAOs that may remain at the site following implementation of the excavation activities outlined in the RAP. These soil are referred to as "residual soil." Residual soil may be present at depths below the depth of excavation, as well as in areas not excavated such as beneath homes, City sidewalks and streets. Section 5.4 of this EIR provides an analysis of the environmental impacts from the site's residual soil and how the SMP would assist in addressing these soil.

Long-Term Regulatory Controls

Following completion of the remediation activities, the Carson Municipal Code, (enacted through City Ordinance 14-1534U passed March 18, 2014, which adopts the L.A. County Building Code as amended January 1, 2014), would limit through permitting processes contact with impacted soil below a depth of two feet by requiring issuance of a permit for excavations deeper than two feet. The City could readily inform residents and workers of other appropriate precautions necessary for excavations below three feet through existing administrative processes, and also notify the RP that monitoring and disposal may be required.

The RP would coordinate with the City of Carson to establish a process through existing building and grading permit reviews, General Plan overlay or footnote, area plan, or similar process, to ensure that if a property owner were to conduct activities involving excavations greater than three feet deep at the site (such as building renovation, installation of a pool or deeper landscape alterations), the RP would be notified so that the RP could arrange for sampling and proper handling of impacted soil.

Additionally, the RP's contractors are, and would continue to be, set up within the Underground Service Alert (USA) one-call system to receive notification of planned excavation work in the Carousel Tract. Upon notification of planned excavations, the RP or their contractors would coordinate with the entity that contacted USA (whether the homeowner or their representative, a homeowner's contractor, or utility company such as Cal-Water, Southern California Gas Company, or AT&T) to provide monitoring and management and handling of residual soil during excavation activities.

If excavation of soil is necessary for residential or utility service provider construction activities, it is likely that impacted soil would not be suitable for reuse. If requested by the property owner or utility service provider, the RP would arrange for the removal, transportation, and off-site disposal of impacted soil by a qualified waste contractor. If potentially impacted soil is observed during urgent or emergency construction activities (e.g., a gas line repair), and an authorized representative is not on-site, the RP should be notified as early as possible to allow the material to be profiled and properly disposed. If site soil are being excavated

on an urgent basis, the property owner or contractor should ensure that potentially impacted soil is segregated and stockpiled to allow for proper soil profiling and management.

To the extent possible, impacted soil would be direct-loaded into approved waste containers for transport to the appropriate recycling or disposal facility. With advance notice, the RP would provide suitable containers based on the nature of the excavation work being conducted. Excavated impacted soil would be transported off-site to appropriately licensed recycling/disposal facilities by a state-licensed waste hauler for appropriate recycling or disposal. To the extent possible, soil would be pre-profiled, and approval would be obtained from the recycling/disposal facilities before excavation activities begin. Documentation pertaining to waste disposal profiles and waste disposal acceptance would be in place prior to off-site shipments of waste.

Project Design Features

Project design features (PDFs) are specific design elements proposed as part of the project to prevent the occurrence of or to minimize the significance of potential environmental effects. Because these features have been incorporated into the project, they do not constitute mitigation measures, as defined by Section 15126.4 of the State CEQA Guidelines (Title 14 of the California Code of Regulations). However, PDFs would be included in the Mitigation Monitoring and Reporting Program (MMRP) to ensure their implementation as a part of the project. As with mitigation measures, if the project is modified through the public hearing process in a manner that would require modification(s) to the PDFs, the RP may be permitted to modify the PDFs before they are included in the MMRP proposed for adoption. The project would implement the below listed PDFs.

Air Quality

PDF AQ-1 All off-road diesel construction equipment remaining on-site for more than 15 work days will meet USEPA Tier 3 off-road emission standards, if commercially available locally. Use of Tier 3 engines results in a substantial reduction in NO_X emissions compared to similar Tier 2 or lower engines, and has been shown to increase fuel economy over similar Tier 2 engines.[30] Documentation of all off-road diesel construction equipment on-site including Tier 3 certification will be maintained and made available to the Regional Board for inspection upon request.

PDF AQ-2 All on-road waste haul trucks exporting soil to the appropriate receiver facility will be model year 2007 or newer or retrofitted to comply with USEPA Year 2007 on-road emissions standards. Documentation of all on-road trucks exporting soil will be maintained and made available to the Regional Board for inspection upon request.

PDF AQ-3 The contractor will prohibit the idling of on- and off-road heavy duty diesel vehicles for more than five minutes at a time. This project design feature is consistent with California regulations and laws as well as CARB ATCM requirements.

[30] *Komatsu Technical Report, Development of Tier 3 Engine ecot3, Vol. 52, No. 157, http://www.komatsu.com/CompanyInfo/profile/report/pdf/157-03_E.pdf. 2006. Accessed August 2014.*

PDF AQ-4 The contractor will install SVE and bioventing systems to address petroleum hydrocarbons, VOCs, and methane in soil vapor and to promote degradation of residual hydrocarbon concentrations that do not meet Remedial Action Objectives (RAOs), or are not removed by excavation. The SVE and bioventing systems will require a permit from the SCAQMD. Periodic monitoring will be conducted as specified in the SCAQMD Permit.

PDF AQ-5 Sub-slab vapor mitigation will be installed at 28 identified properties (27 based on RAO exceedance for potential vapor intrusion and 1 based on SSCG exceedance for methane). Sub-slab vapor mitigation will also be installed at any additional properties where the homeowner requests a sub-slab mitigation system. The system will use sub-slab depressurization (SSD), which will create a negative pressure below the slab of the residence using a fan to remove air from below the slab and exhausting it above the building.

PDF AQ-6 The project will comply with applicable SCAQMD rules that govern the control of air pollutant emissions from the site, including: SCAQMD Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil.

- Submit a Mitigation Plan in accordance with Attachment A of SCAQMD Rule 1166, and obtain approval from the SCAQMD. VOC suppression measures shall include water mist as a first level of vapor and odor control. Care will be taken to ensure that the soil is not over-saturated, which could generate runoff that would need to be managed and increase the weight of soil to be disposed. Based on monitoring data or odor perception, vapor and odor control will be implemented on an as needed basis. Based on experience from the excavation pilot test, Rusmar AC-565 Long Duration Foam was found to be most effective at controlling vapors and odors. This type of foam, or equivalent, and necessary support equipment will be staged and ready for application at locations where remedial excavations are conducted and there is the potential for odor releases. A copy of the approved plan will be on-site during the entire excavation period.
- Monitor for the presence of VOC, and implement the approved mitigation plan when VOC-contaminated soil, as defined in Rule 1166, is detected.
- If required, obtain a SCAQMD Permit for project activities, and provide a copy of said Permit to the Regional Board.

PDF AQ-7 The project will implement fugitive dust control measures consistent with SCAQMD rules and regulations. The dust control measures will consist of various elements including: proper maintenance and watering of internal haul roads; water spraying of soil excavated and placed for cover or soil reconsolidation; applying water on intermediate soil cover areas; and seeding/planting vegetation on the completed protective cap. This project design feature is consistent with SCAQMD Rule 403 requirements.

PDF AQ-8 Exposed surfaces and active excavation sites will be controlled with water and/or suppressants certified by CARB, the SCAQMD, or other air pollution control agency, to control fugitive dust, vapors, and odors. Such suppressants include foams (e.g., Rusmar AC-565 Long Duration Foam), nontoxic binders, or other suppressants to reduce fugitive dust emissions and to control vapors and odors. Logs of water purchase or usage and suppressant application (including brand/manufacturer, date of application, area treated

and amount applied) will be maintained by the RP and made available to the Regional Board and SCAQMD for inspection upon request.

PDF AQ-9 Prior to leaving the site, each haul truck, and other delivery trucks that come in contact with site waste, will be inspected and put through procedures, such as brushing, to remove loose debris from tire wells and on the truck exterior. Haul truck operators (drivers) will be required to have the proper training and registration by the State and as applicable to the material they will be hauling. Trucks transporting hazardous waste are required to maintain a hazardous waste manifest that describes the content of the materials. These manifests will be supplied by the waste receiver facility and prepared by the contractor or trucking company and the Kast Property RP representative(s) prior to export off-site. The contracted trucking company will be a certified hazardous waste transportation contractor, if the material is profiled as hazardous. A log of manifest data will be maintained by the RP and made available to the Regional Board for inspection upon request.

PDF AQ-10 Waste haul trucks and soil delivery trucks entering and exiting the site will be required to follow the approved traffic plan that establishes the trucking route, days and hours of truck operation, and various requirements to provide traffic, pedestrian and bicycle safety. Truck operators will be provided with a trucking route map and hours of operation allowed.

PDF AQ-11 In order to minimize traffic congestion at or near the site, construction worker parking will be provided at a nearby off-site location. Shuttles and/or vans will be provided to transport construction workers from the off-site parking location to the site.

PDF AQ-12 To the maximum practical extent, recyclable materials, including non-hazardous construction and demolition debris, will be reused or recycled.

PDF AQ-13 Under the Expedited Implementation Option, the contractors will require that two clusters under active remediation and restoration are separated by a minimum distance of 64 meters (105 feet) as measured from the closest site boundary of each cluster.

Geology and Soils

PDF GEO-1 Prior to issuance of a grading permit, a final geotechnical investigation and remedial excavation grading plan with final design recommendations applicable to every excavated area will be prepared by a California-registered geotechnical and civil engineer and submitted to the LACDPW and City of Carson for review. The geotechnical report will describe the characteristics of underlying natural or fill soils, including expansive soils, potential differential settlement and varying soils strength and the placement of backfill. The geotechnical report will contain recommendations for any needed cut slopes or compaction of fill materials. The remedial excavation grading plan will detail the excavation and backfill design details based on the findings and recommendations of the geotechnical report.

PDF-GEO-2 The geotechnical report and remedial excavation grading plans will include site-specific design criteria related to the excavation activities in proximity to foundations and footings.

PDF-GEO-3 Pre-excavation and post-excavation surveys of the existing structures and improvements at the site and at adjacent properties that have granted access will be conducted to document pre-excavation conditions and any changes in those conditions following excavation. Documentation will consist of written notes, digital photographs, and videos. Existing cracks or other distress present in structures or concrete will be documented and measured. Cracks will be monitored by direct measurement using a dial caliper capable of measuring distances to approximately ±0.001 inch, or using commercially available crack monitoring devices installed on the existing cracks, such that any potential change of crack size during implementation of the RAP can be monitored and documented.

PDF-GEO-4 Full time observation should be provided by a licensed engineer during the excavation of the vertical slot cuts. Any conditions encountered within the field that are different than those anticipated (i.e. irrigation water seepage, localized loose soils, clean sand, etc.) will be brought to the immediate attention of the geotechnical engineer for corrective measures.

PDF-GEO-5 Clean soil will be imported for backfill of excavations from an offsite source. Before importing the backfill soil to the site, samples of the proposed import soil will be submitted for laboratory geotechnical and chemical characterization analysis. Geotechnical tests include gradation, plasticity index (PI), maximum density and optimum moisture, and corrosivity tests. The geotechnical engineer will approve the backfill soil prior to its import, placement, and compaction at the site.

PDF-GEO-6 Upon completion of excavation, concrete removal and environmental sampling (as appropriate), excavated areas will be backfilled as soon as possible. Backfill soils would be moisture conditioned to near optimal moisture content and compacted to at least 90 percent relative compaction, or as determined by the Geotechnical Engineer and approved by Los Angeles County Department of Public Works (LACDPW) and the City of Carson. Borings from auger excavation would be backfilled with controlled low strength material (CLSM, also referred to as flowable fill or sand/cement slurry) the same day they are excavated. Where slot trenching is used for 5-foot excavations or for targeted deeper excavations to 10 feet, the lower part of the slot trenches would also be backfilled with CLSM. The upper 3 feet of excavations would be backfilled with certified clean imported soil. Backfill soil would be free of deleterious organic matter (i.e., vegetation) and cobbles larger than four inches in diameter, and would be approved by the Geotechnical Engineer. The upper foot of soil backfill would be topsoil suitable for vegetation growth and would be compacted to not more than 85 percent relative compaction.

PDF-GEO-7 Landscaping of backfilled properties would be restored to “like conditions” or as agreed to with the homeowners.

Greenhouse Gas Emissions

PDF GHG-1 The project will comply with the use of low carbon vehicle fuels as required under State law.

In addition, several PDFs associated with air quality would also reduce potential greenhouse gas emissions. These measures are provided above and include: PDF AQ-1, PDF AQ-2, PDF AQ-3, PDF AQ-11 and PDF AQ-12.

Hazards and Hazardous Materials

PDF HAZ-1 Remediation activities conducted at the property located at 24832 Panama Avenue shall implement additional measures to control volatile TAC emissions, due to high concentrations of vinyl chloride found on-site. These measures include applying water at least twice daily or Rusmar AC-565 foam (or similar) in accordance with manufacturer recommended specifications) to active excavation areas. Workers performing remediation activities at this address shall use appropriate Personal Protective Equipment (PPE).

Hydrology/Water Quality

PDF H/WQ-1 The Responsible Party will provide a Surface Containment and Soil Management Plan to permitting agencies prior to the start of RAP implementation. This document will provide measures for surface containment and management of residual soils containing COCs above SSCGs and will serve as part of the grading permit process. In addition, in compliance with the General Construction NPDES Permit, the Responsible Party will provide specific BMPs on proposed grading plans to reduce the potential for discharge of runoff into the storm drain system during grading. In accordance with the Los Angeles County Building Code, BMPs must demonstrate that eroded sediments and other pollutants will be retained on site and not transported from the site via sheetflow, swales, area drains, natural drainage courses, or wind; stockpiles of earth and other construction-related materials will be protected from being transported from the site by the forces of wind or water; fuels, oils, solvents, and other toxic materials will be stored in accordance with their listing and will not contaminate the soil and surface waters; spills will be cleaned up immediately and disposed of in a proper manner and not washed into the drainage system; non-stormwater runoff from equipment. Vehicles will be dry decontaminated before leaving the site to avoid water runoff. Excess or waste concrete will not be washed into the public way or any other drainage system and provisions will be made to retain concrete wastes on site until they can be disposed of as solid waste; sediments and other materials will not be tracked from the site by vehicle traffic, construction entrance roadways will be stabilized so as to inhibit sediments from being deposited into the public way, and accidental depositions will be swept up immediately and will not be washed down by rain or other means. Site-specific BMPs will be submitted to the Los Angeles County Department of Building and Safety (reviewing agency for the City of Carson) for review and approval. For areas of one-acre or greater, the RP shall prepare a SWPPP that describes all structural and non-structural BMPs. BMPs must be reviewed and approved by the Los Angeles County Department of Buliding and Safety prior to issuance of a grading permit. In accordance with Los Angeles Building Code, Appendix J, Section J111.3 a Wet Weather Erosion Control Plans (WWECP) for each storm season will be submitted for all active grading projects.

PDF H/WQ-2 Dust monitoring will be conducted for all excavations. If visible dust is encountered, periodic watering of the active excavation areas will be recommended throughout the excavation and backfill activities. Watering will be monitored to prevent off-site runoff.

PDF-H/WQ-3 Impacted soil will be directly loaded into approved waste containers (such as drums, bins, or directly into trucks) for off-site transport. The RP will provide suitable containers based on the nature of the excavation work being conducted. In the event that it is necessary to temporarily stockpile soil onsite before loading, soils will be placed upon plastic sheeting and covered with plastic until they can be loaded into approved waste containers to be provided by the RP.

PDF H/WQ-4 LNAPL will be recovered where it has accumulated in monitoring wells to the extent technologically and economically feasible, and where a reduction in current and future risk to groundwater will result.

PDF H/WQ-5 A stable or decreasing plume of site-related COCs will be maintained beneath the site. This will be achieved through reduction of COCs in soils through soil vapor extraction (SVE) and bio-venting, which would reduce COCs entering groundwater via on-site soils, removal of wastes in soil, and monitored natural attenuation (MNA) of groundwater.

PDF H/WQ-6 Periodic groundwater monitoring will continue as part of the remedial action. If, based on a five-year review following soil excavation and initiation of the SVE/bioventing system operation, the groundwater plume is not stable or declining, an evaluation of additional groundwater treatment technologies will be conducted and implemented as needed.

PDF H/WQ-7 The Shallow Zone and Gage aquifer will be returned to background levels for site-related benzene and naphthalene through natural biodegradation.

Noise and Vibration

PDF NOISE-1 The Project contractor(s) will equip all construction machinery and equipment, fixed or mobile, with properly operating and maintained noise mufflers, consistent with manufacturers' standards.

PDF NOISE-2 Engine idling from construction equipment such as excavators and haul trucks will be limited, to the extent feasible.

PDF NOISE-3 Expected hours for construction equipment use on-site will be 730 A.M. to 430 P.M. Monday through Friday, with hauling activities from 800 A.M. to 400 P.M.

PDF NOISE-4 Project-related heavy truck traffic will be limited to specific routes.

PDF NOISE-5 During excavation, acoustical attenuation blankets 12 feet in height will be installed between the excavation site and occupied houses to reduce community noise exposure from stationary sources of substantial noise, such as generators and water buffalos (trailer).

Traffic and Circulation

PDF TRAF-1 Prior to implementation of the RAP, the project contractor will submit a Haul Route Plan to the City of Carson for review and approval. The proposed haul route will be restricted to the City's designated truck route roadways and will be as shown in Figure 5.7-2 of this EIR.

PDF TRAF-2 Prior to implementation of the RAP, the project contractor will prepare a Construction Traffic Management Plan that will be submitted to the City of Carson for review and approval prior to the start of any work. This plan will comprise site traffic control plans, including but not limited to such elements as the designation of haul routes for construction-related trucks, the sequencing of construction activities, any driveway turning movement restrictions, temporary traffic control devices, travel time restrictions for construction-related traffic, consolidation of construction truck deliveries, flag control, and designated staging and parking areas for workers and equipment.

Because the construction activities occur within a public street right-of-way, the following design features would also apply

- A site-specific construction work site traffic control plan will be prepared for each construction phase and submitted to the City of Carson for review and approval prior to the start of any construction work. This plan will include such elements as the location and hours of any necessary lane closures, local traffic detours (if any), protective devices and traffic controls (such as barricades, cones, flag persons, lights, warning beacons, temporary traffic signals, warning signs), the location and hours of any necessary access limitations for abutting properties, and provisions to maintain emergency access through construction work areas.
- Generally accepted construction safety standards will be followed to separate pedestrians from construction activity through such measures as protection barriers and signage indicating alternative pedestrian access routes where existing facilities would be affected. This would include the sidewalks around the perimeter of an active excavation site.
- Advance notice of planned construction activities will be provided to any affected residents and property owners in the vicinity of the construction site.
- The project contractor will coordinate with emergency service providers (police/sheriffs, fire, ambulance and paramedic services) to provide advance notice of ongoing construction activity and construction hours.

PDF TRAF-3 One travel lane will be kept open at all times during residential property remediation, well installation and street trenching phases.

PDF TRAF-4 The project contractor will arrange for off-site parking within 5 miles of the site and will provide shuttle services to the site for approximately 50 percent of on-site workers.

Utilities and Service Systems (Solid Waste)

While there are no specific PDFs regarding solid waste, PDF AQ-12, above, requires that to the maximum practical extent, recyclable materials, including non-hazardous construction and demolition debris, will be reused or recycled.

6. REQUIRED AGENCY ACTIONS AND PERMITS

Permits and other approvals required to implement the RAP are anticipated to include, but may not be limited to, those listed in **Table 2-5**, *Subsequent Permits, Approvals, Review and Consultation Requirements*.

As referenced in Table 2-4, following approval of the RAP, the Regional Board would review and approve a site-wide Remedial Design and Implementation Plan (RDIP) and individual PSRPs. The site-wide RDIP would provide more specific detail on the design and implementation of the planned remediation activities outlined in the RAP, such as the SVE/bioventing system design including well, piping and treatment system layout. The PSRPs for each property would specifically define areas to be excavated, features to be removed and those that would be protected in place, and locations of underground utilities that need to be either protected in place or removed and restored.

As part of RDIP and PSRP preparation, the RP's contractors would meet with homeowners, and their legal representatives as appropriate, to obtain necessary information for relocation during remedial implementation and to discuss hardscape and landscape restoration. In some cases, the RP may provide alternative landscape restoration from existing conditions if desired by the homeowner. If during this meeting the homeowners express a desire that existing hardscape not be removed from their property, an option would be discussed of leaving hardscape in place with the homeowners agreeing to enter into a Land Use Covenant (LUC) (deed restriction) that would be recorded with the County Recorder's Office advising of the potential presence of impacted soil beneath hardscaped areas. If the hardscape is removed in the future and potentially impacted soils below the hardscape are exposed, they would be managed in accordance with the SMP.

While it is acknowledged that a future site-wide RDIP and individual property PSRPs would be prepared following approval of the RAP, this EIR evaluates the totality of the remedial actions to be implemented by the proposed RAP. Thus, a realistic worse-case scenario of impacts resulting from implementation of the RAP's remedial action components is disclosed in this EIR. The details to be provided in the site-wide RDIP and individual property PSRPs would not materially change the project description of the RAP or the disclosure of impacts included in this EIR.

Table 2-5

Subsequent Permits, Approvals, Review and Consultation Requirements

Agency	
Los Angeles Regional Water Quality Control Board	▪ Certification of Final EIR for RAP ▪ RAP ▪ Site-wide Remedial Design and Implementation Plan (RDIP) ▪ Individual Property-Specific Remediation Plans (PSRP) ▪ Storm Water Pollution Prevention Plan (SWPPP) ▪ Emergency Response Plan ▪ Update to Public Participation Plan
South Coast Air Quality Management District	▪ Rule 1166 permit for any necessary handling of VOC-impacted materials ▪ Permit-to-Construct/Permit-to-Operate for the SVE/bioventing equipment ▪ Permits for Sub-Slab Depressurization (SSD) Systems ▪ Asbestos Notifications/Abatement Permits
Los Angeles County Flood Control	▪ Permit for piping associated with SVE system to cross flood control channel
City of Carson	▪ Construction Traffic Management Plan ▪ Grading Permits from Department of Building and Safety[a] ▪ Excavation and Encroachment Permits for equipment staging and operations, lane closures in public streets, and for encroachment onto sidewalks and City property/easements ▪ Trash Bin/Containers Permit, as necessary ▪ Plumbing and Electrical Permits if plumbing or electrical service is removed and replaced ▪ Masonry Permit may be required for construction of replacement masonry block walls ▪ Landscaping Permit may be required for restoration of property landscaping ▪ The SVE system(s) would be installed in an enclosed structure, which may require plumbing, electrical, building, and construction permits.
Occupational Safety & Health Administration (OSHA)	▪ The contractor retained to perform the excavation work shall have a valid OSHA Trenching Permit per 29 CFR 1926.650, 29 CFR 1926.651, and 29 CFR 1926.652 and Cal/OSHA Trenching Permit CCR Title 8 Section 341.

[a] *The City of Carson follows the LACDPW Grading Guidelines and is a contract city, meaning that the LACDPW provides plan check services for the City. Ultimately, the grading permits would be issued by the City.*

Source: PCR Services Corporation, 2014

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