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September 24, 2018

Ms. Mary Hashem  
RE | Solutions, LLC  
1525 Raleigh Street, Suite 240  
Denver, Colorado 80204

**Re: Construction Worker Health and Safety Controls During the Former Chemoil Refinery Site Redevelopment Project**  
Former Chemoil Refinery  
2020 Walnut Avenue, Signal Hill, California

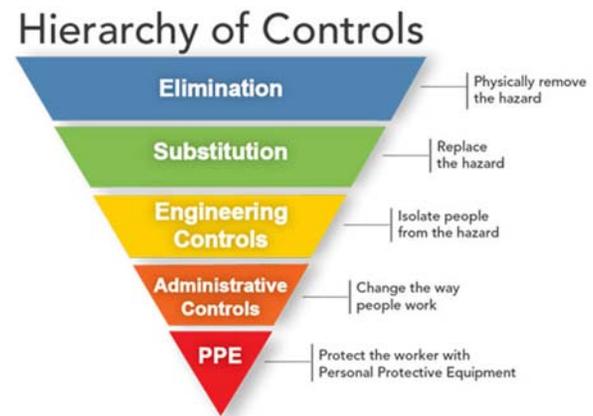
Dear Ms. Hashem,

As requested, Apex has prepared this memorandum to summarize site control measures that will be implemented during grading and soil excavation activities as part of the redevelopment of the former Chemoil Refinery property. As you are aware, previous environmental site investigations have documented soil, soil vapor, and groundwater impacts from petroleum hydrocarbons and volatile organic compounds (VOCs) associated with previous refinery operations. During redevelopment, shallow, potentially contaminated soil will be disturbed as part of trenching operations (for the installation of underground utilities) and Site grading. Various control measures are required during these soil disturbance activities to protect workers from exposure to impacted soils and vapors generated during soil movement. This document summarizes the plans to address protection of construction workers during the Site redevelopment process.

### **Site Control Considerations and Strategies**

Protection of workers and the workplace environment at contaminated sites is highly regulated. Some of the applicable regulatory authorities include the federal Occupational Safety and Health Administration (OSHA), the California Division of Occupational Safety and Health (DOSH, more commonly known as Cal/OSHA), the South Coast Air Quality Management District (SCAQMD), the Los Angeles Regional Water Quality Control Board (Water Board), and local municipal authorities. OSHA and Cal/OSHA are specifically concerned with worker protection, and the requirements to meet their standards are set forth in site-specific health and safety plans (HASPs). SCAQMD and the Water Board are concerned with soils management and controlling the release of contaminants into the environment, which includes the construction work area. Requirements to meet the SCAQMD and Water Board standards are typically set forth in site management plans, soil reuse plans, and site-specific SCAQMD permits.

Apex's proposed site control strategy is based on the hierarchy of controls, published by The National Institute for Occupational Safety and Health (NIOSH), regarding controlling exposures to occupational hazards. The Hierarchy of Controls incorporates approaches that address both controlling the release of contaminants to the environment, and the protection of workers.



**Elimination and Substitution Controls:** In general, the most effective method of protecting potential human receptors, including the construction worker, are ones that eliminate or substitute the hazard. The elimination/substitution approach, as it relates to the construction worker exposure to soil, has been addressed to the greatest extent possible through the design of both the grading plan and geotechnical work.

The grading plan for the site redevelopment was designed to minimize soil removal ("cut") and compensate by larger areas of fill, thus creating more separation between the contaminated soil and the Site surface. Similarly, the geotechnical preparation of the Site combines an approach that reduces the depth of soil excavation required for soil compaction where possible. The surface soils at the Site are considered undocumented fill, and typically would have to be over-excavated to underlying native soils, then backfilled and compacted with documented, conditioned fill soil. An alternative geotechnical approach for compaction has been incorporated that minimizes the amount of excavation that is required to achieve geotechnical structural standards.

Furthermore, prior to initiating Site grading, test pits are planned (in addition to those already completed) throughout the Site to determine the distribution of highly impacted surface soils. During the establishment of final grade, highly impacted soils will be left undisturbed to the maximum extent practicable. Long-term remediation activities (which are scheduled to be implemented as part of the property redevelopment) will address these residual soils after grading and geotechnical work is complete.

**Engineering Controls:** Engineering controls are favored over administrative and personal protective equipment (PPE) for controlling worker exposures because they are designed to remove the hazard at the source before it comes in contact with the worker. Engineering controls including vapor suppression and dust control will be part of the site control strategy for protecting the construction worker.

**Administrative and PPE Controls.** The potential hazards related to construction worker exposure to soil during property redevelopment cannot be completely eliminated by the top three tiers of site control shown in the hierarchy triangle. Consequently, administrative and PPE controls, including utilizing 40-hour OSHA trained construction workers, preparation and implementation of a site-specific Health and Safety Plan, air monitoring, and PPE will be utilized to protect workers. This approach is typical in the

industry for the protection of construction workers at sites similar to the former Chemoil Refinery property. Further details are provided below.

### **Specific Engineering, Administrative and PPE Controls for the Former Chemoil Refinery Property Redevelopment**

**Engineering Controls:** Exposed surface soils will be sprayed with potable water to suppress dust and vapor emissions. Should water spray be ineffective, areas where unacceptable vapors are observed will be sprayed with other vapor suppressing products. These products can include Simple Green™, a biodegradable soap, or specially formulated vapor suppressing foams. Sufficient quantities of these materials and mixing/application equipment will be kept on-site for rapid use if field observations indicate they are necessary. Soils that are excavated and stockpiled on-site will be covered with plastic sheeting to prevent vapor and dust emissions.

**Administrative Controls:** A site-specific HASP will be developed, implemented, reviewed, and followed by all personnel working at the Site. The HASP will require that all construction personnel performing soil disturbance activities during property redevelopment are trained to work on contaminated sites and have, at a minimum, completed the 40-hour Hazardous Waste Operations (HAZWOPER) training pursuant to 29CFR1910.120. HAZWOPER training is a health and safety standard enacted by OSHA specifically designed to train and educate workers to be safe while they perform work on contaminated sites. In addition to worker training requirements, the HASP will include a project hazard analysis, air monitoring requirements, trigger levels, and general health and safety requirements during property redevelopment. A complete copy of the HASP will be provided to the City of Signal Hill, or another regulatory agency, upon request.

The property is currently surrounded with a chain link perimeter fence; this fence will be maintained through Site redevelopment activities with fence screening material added to reduce wind effects at the Site. Hand-held vapor analyzing devices (such as a photoionization detector [PID]) and dust monitors will be used to measure vapor and dust concentrations at both the worker breathing zones and at the fence perimeter. These devices provide real-time measurements of Site conditions. The organic vapor concentration limits for safe work conditions are defined in the HASP. Trigger levels to stop work until vapor concentrations decrease, or to increase PPE (further detailed below) will be included in the HASP.

**PPE:** Workers are anticipated to wear Level D personal protective equipment (PPE) at all times on the site. This includes hard hat, boots, eye protecting glasses, long sleeve shirt and long pants (or coverall) and gloves. The outer clothing worn during work will be decontaminated (by dry brushing or scrubbing with potable water) prior to the worker leaving the site. Outer garments of Level D clothing can also be removed and left at the site for re-use the following work shift. Level D PPE is intended to prevent the worker's skin from coming in direct contact with contaminants and provide protection from general site hazards.

Should PID monitoring of the worker breathing zone(s) indicate unacceptable vapor concentrations are present in the atmosphere, there is potential the workers would upgrade to Level C PPE. However, it should be noted that an upgrade to Level C PPE has not been required during field activities conducted to date, including potholing activities that have occurred across the Site. In addition to Level D clothing, Level C would include a respirator (negative pressure with organic vapor filtering capability) and additional dermal protective barriers (e.g., impermeable gloves, boot covers, Tyvek™ cover-all, etc.).

In general, Level C is not considered likely at the Chemoil site. Although the human health risk assessment (HHRA) identified high concentrations of total petroleum hydrocarbons (TPH) in soils, in order to be conservative in the risk evaluation, the HHRA calculated the risk using the highest TPH concentrations encountered at the site. The highest TPH concentrations at the Site are encountered in soil samples collected at depths of 20 feet below the current ground surface or deeper. Planned grading activities for the Site do not require excavations to those depths. Consequently, the release of organic vapors that would require significant use of Level C PPE is not expected. There is potential for limited use of Level C PPE during specific work activities, such as utility connections in trenches or when loading soils with greater than 1,000 parts per million by volume (ppmv) (if encountered); however, Level C would be used only in the event that engineering controls cannot reduce the hazard to acceptable levels, and only long enough to complete the discrete work task.

The table below summarized the levels of PPE during required for the construction worker coming into contact with soil during Site redevelopment activities:

| PPE Level  | Level D  | Level C   |
|--|--|---|
| <b>Expected usage during property redevelopment.</b> | Most Frequently Used   | May be required in limited areas for short periods. Has not been necessary based on field activities conducted to date.   |
| <b>PPE Requirements</b>                              | <ul style="list-style-type: none"> <li>• Pair of coveralls</li> <li>• Steel-toe boots</li> <li>• Safety glasses</li> <li>• Hardhat</li> <li>• Gloves (latex or nitrile. Standard leather gloves if no direct contact with soil)</li> <li>• Hearing protection as needed</li> </ul> | <ul style="list-style-type: none"> <li>• Tyvec coveralls</li> <li>• Steel-toe boots with PCV boot covers</li> <li>• Safety glasses</li> <li>• Hardhat</li> <li>• Gloves (latex or nitrile. Standard leather gloves if no direct contact with soil)</li> <li>• Hearing protection as needed</li> </ul> |

Please let us know if you have any further questions or require additional information.

Sincerely,  
**Apex Companies, LLC**



Steve Hickey, P.E.  
Principal Engineer



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Project Manager  
RMD ENVIRONMENTAL SOLUTIONS, Inc.