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March 20, 2013

Mr. Michael A. Shull
Superintendent
Planning and Construction
City of Los Angeles Department of Recreation and Parks
221 North Figueroa Street, Suite 100
Los Angeles, California 90012

REVISED DRAFT REMEDIAL ACTION PLAN - CHATSWORTH PARK SOUTH, 22360 DEVONSHIRE STREET, CHATSWORTH, CALIFORNIA

Dear Mr. Shull:

The Department of Toxic Substances Control (DTSC) has reviewed the revised draft Remedial Action Plan (RAP) dated March 15, 2013 prepared by URS on behalf of the City of Los Angeles, Department of Recreation and Parks for the above referenced site (Site).

The proposed revised draft RAP has specified remedial action objectives, evaluated alternatives, and described the alternative proposed for the Site. The objective of the RAP is to mitigate potential risk from the contaminants in soil that may pose a threat to human health and the environment. The RAP has identified the impacted soil remedial areas derived from the findings of the site characterization and supplemental site investigation along with the human health and ecological risk assessments due to the presence of residual lead shots and other potential chemicals of concern at the Site. The RAP has also presented other logistics for regulatory compliance including air monitoring and dust control, a Health and Safety Plan and a Transportation Plan.

DTSC identified issues in the RAP that required clarification or modification. Based on the information provided in the revised draft RAP, DTSC determined that the responses to comments are adequate and the document has been revised as DTSC recommended. DTSC hereby approves the draft RAP for public commenting which will start from March 21, 2013 and end on April 22, 2013. The RAP will be finalized for implementation after addressing the public comments received in the comment period. Please deposit a copy of the draft RAP with other necessary documents in the repositories.

Should you have any questions, please contact me at (818) 717-6552.

Sincerely,

Chand Sultana

Chand Sultana, Ph.D., M.S.B.A.
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Chatsworth Office

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DRAFT

REMEDIAL ACTION PLAN

CHATSWORTH PARK SOUTH
22360 WEST DEVONSHIRE STREET
CHATSWORTH, CALIFORNIA

Prepared for

City of Los Angeles
Department of Recreation and Parks
221 North Figueroa Street, Suite 100
Los Angeles, California 90012

Attention: Mr. Paul Davis

URS Project No. 29405505

February 15, 2013 (Revised March 15, 2013)

URS

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REMEDIAL ACTION PLAN

CHATSWORTH PARK SOUTH
CHATSWORTH, CALIFORNIA

On behalf of the City of Los Angeles Department of Recreation and Parks, URS Corporation has prepared this Remedial Action Plan (RAP) for the Chatsworth Park South (the "Site"). The Site is located at 22360 West Devonshire Street, in Chatsworth (City of Los Angeles), California and it encompasses approximately 72 acres of hillside terrain in the western portion of the San Fernando Valley.

This plan was prepared in a manner consistent with the level of care and skill ordinarily exercised by professional engineers, geologists, and environmental scientists, under the technical direction of the undersigned.

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List of Tables

List of Figures

List of Figures (Continued)

List of Appendices

μg/ft^2	micrograms per square feet
μg/m^3	micrograms per cubic meter
ARARs	Applicable and Relevant and Appropriate Requirements
B(a)P-TE	benzo(a)pyrene toxicity equivalent
bgs	below ground surface
Cal/EPA	California Environmental Protection Agency
CCR	California Code of Regulations
CE	California Environmental
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CHHSL	California Human Health Screening Level
City of LA	City of Los Angeles Department of Recreation and Parks
COC	contaminant of concern
COPC	chemical of potential concern
CPS	Chatsworth Park South
DOT	U.S. Department of Transportation
DTSC	Department of Toxic Substances Control
ERA	Ecological Risk Assessment
HHRA	Human Health Risk Assessment
H&SC	Health & Safety Code
HSP	Health and Safety Plan
HUD	Housing and Urban Development
ITRC	Interstate Technology and Regulatory Council
LADBS	City of Los Angeles Department of Building and Safety
LARWQCB	Los Angeles Regional Water Quality Control Board
mg/kg	milligrams per kilogram
NAAQS	National Ambient Air Quality Standard
NCP	National Contingency Plan
NIOSH	National Institutes for Occupational Safety and Health
NOA	Notice of Availability
NOD	Notice of Determination
OMP	Operation and Maintenance Plan
OSHA	Occupational Safety and Health Administration
PAHs	polycyclic aromatic hydrocarbons
PEA	Preliminary Endangerment Assessment
PM10	particles measuring 10 micrometers or less
PPE	personal protective equipment
PRC	Public Resources Code
RACR	Remedial Action Completion Report
RAO	remedial action objective
RAP	Remedial Action Plan
RAW	Remedial Action Workplan
RCRA	Resource, Conservation, and Recovery Act
SAFR	small arms firing range

SCAQMD	South Coast Air Quality Management District
SSI	Supplemental Site Investigation
SWPPP	Storm Water Pollution Prevention Plan
Tetra Tech	Tetra Tech, Inc.
TPH	total petroleum hydrocarbons
TPHcc	total petroleum hydrocarbons with carbon-chain breakdown
TTU	transportable treatment unit
TWA	time weighted average
URS	URS Corporation
USEPA	U.S. Environmental Protection Agency
VCA	Voluntary Cleanup Agreement
VOCs	volatile organic compounds
XRF	X-ray fluorescence

Chatsworth Park South (CPS or the Site) is a City of Los Angeles Department of Recreation and Parks (City of LA) facility encompassing approximately 72 acres in the western portion of the San Fernando Valley at 22360 West Devonshire Street in Chatsworth (City of Los Angeles), California. Approximately 21 acres of the Site are developed with recreational facilities including a 10,000-square foot recreational building, tennis courts, a basketball court, picnic areas, children play areas, parking areas, and open space. The facility was closed to public access and use during the spring of 2008 because of hazards associated with lead pellets and sporting clay pigeon (target) debris from a former onsite small arms firing range (SAFR). The facility remains closed pending completion of a remedial action.

To assess park conditions, a preliminary investigation was conducted in 2008 and a Supplemental Site Investigation (SSI) and a Preliminary Endangerment Assessment (PEA) were completed in 2010 under the oversight of the Department of Toxic Substances Control (DTSC). The SSI/PEA Report included a Human Health Risk Assessment (HHRA) and an Ecological Risk Assessment (ERA). Supplemental sampling was also conducted in October 2012 to further delineate impacted soils identified during the SSI/PEA. Elevated lead and polycyclic aromatic hydrocarbons (PAHs) were documented in shallow soil throughout Site areas with visual accumulation of lead shot pellets and clay pigeon debris. Antimony and dioxins/furans were also detected and contributed to the health risk, but they are co-located with the lead and PAHs. Arsenic was also detected at the Site, but generally at background concentrations, except for one elevated concentration at 4 feet below ground surface (bgs).

This document presents the Remedial Action Plan (RAP) to mitigate the impacted soil identified at the Site and outlines specific remedial actions for the Site derived from the findings of the SSI/PEA and supplemental sampling. The RAP has been prepared to comply with the provisions of the California Health & Safety Code (H&SC) Section 25323.1, considering U.S. Environmental Protection Agency (USEPA) guidelines for conducting Engineering Evaluations/Cost Analyses and Feasibility Studies and DTSC's recommended guidelines for preparing remedial action plans.

This RAP addresses only areas of the Site that are feasible to remediate, which will be accessible by the public upon completion of the remedial action. A perimeter fence will prevent access to the portions of the Site outside the remediation area.

The remedial action objectives (RAOs) are to:

- Mitigate and/or remediate impacted media (i.e., soil) within the remediation footprint with concentrations that pose a threat to ecological receptors or exceed residential land-use cleanup levels derived for the risk-driving contaminants of concern (COCs) to minimize potential human exposure to non-volatile COCs in soil via direct contact (soil ingestion, dermal contact, and inhalation of particulates). Based on the results of the SSI/PEA HHRA, the risk-driving COCs for the Site are: antimony, lead, PAHs, and naphthalene.
- Minimize potential for migration of COCs in soil to other media (air and surface water).

As recommended by DTSC following its review of the SSI/PEA, this RAP has been prepared to propose a response action at the Site. Although the cleanup goals for the Site are derived based on human health, the findings of the Ecological Risk Assessment were considered and mitigation measures for ecological receptors were evaluated during the review of the remedial alternatives.

This plan considered at least three remedial alternatives for the COCs and presents the alternative evaluation using a seven-criteria analysis consistent with the USEPA guidance. The evaluation included:

- Alternative #1 – No Action
- Alternative #2 – Excavation, Onsite Treatment, and Offsite Disposal
- Alternative #3 – Containment Through Surface Capping

Alternative #3, Containment Through Surface Capping, has been selected as the remedy for the Site. It includes installation of a 1-foot thick cap comprising of 4 inches of imported top soil to support turf growth, 8 inches of imported base to provide a wear-resistant structural foundation for the top soil and allow drainage below the soil, and a layer of steel hardware cloth beneath the base to prevent burrowing animals from disturbing the cap. This alterative also will require the removal of trees from the remedial area except those trees designated as protected or heritage tress. Tree removal will be mitigated by replacement tree groves. In areas where replacement tree groves will be planted, the impacted soil will be excavated to a depth of 2 feet bgs, characterized for disposal, and transported offsite for disposal at an appropriate facility. A drainage system also will be installed to protect the surface cap from erosion and runoff from the adjacent hillsides. Portions of the Site with heavily-vegetated steep terrain will not be remediated and will be fenced off to restrict public access. This remedial alternative meets the threshold criteria of overall protection of human health, generally provides protection of the environment, and meets the Applicable or Relevant and Appropriate Requirements (ARARs) within the remedial footprint. The addition of a clean soil layer, coupled with the layer of steel hardware cloth beneath the base to prevent burrowing animals from disturbing the cap and contacting constituents in deeper soil, and the replacement of heritage trees all serve to reduce exposure. Although residual pellets will likely remain on the rocky outcrop, the reduction of the number of visible pellets on the rocky outcrop will also provide a net environmental benefit for birds in the area. It also is cost effective, provides long-term effectiveness and permanence, and meets all other evaluation criteria.

The RAP contains the following elements: discussion of ARARs and actions necessary for compliance during the proposed remedial actions; a detailed description of the remedial process and logistics, including air monitoring and dust control; a Health and Safety Plan; a Transportation Plan; Costs for Remedial Alternatives; and a RAP implementation schedule.

Prior to implementation, Construction Plans and Bid Documents will be prepared by the City of Los Angeles to provide detailed procedures and specifications and obtain competitive bids for implementation of the remedies proposed in this RAP.

This document presents a Remedial Action Plan (RAP) for the Chatsworth Park South (CPS or the Site) located at 22360 West Devonshire Street in Chatsworth (City of Los Angeles), California. The CPS recreational facility encompasses approximately 72 acres of hillside terrain in the western portion of the San Fernando Valley. Approximately 21 acres of the Site are developed with recreational facilities including a 10,000-square foot recreational building, tennis courts, a basketball court, picnic areas, children play areas, parking areas, and open space. The facility was closed to public access and use during the spring of 2008. The facility was closed because of hazards associated with lead pellets and sporting clay pigeon debris from a former onsite small arms firing range (SAFR). The facility remains closed pending completion of a remedial action. The Site location is shown on Figure 1. A Site Plan is presented as Figure 2.

Preparation of this RAP follows execution of a Voluntary Cleanup Agreement (VCA) between the City of Los Angeles Department of Recreation and Parks (City of LA) and the State of California Department of Toxic Substances Control (DTSC). This RAP addresses only areas of the Site that are feasible to remediate, which will be accessible by the public upon completion of the remedial action. An aerial photo of the Site showing the boundary of proposed remediation is included as Figure 3. A perimeter fence will prevent access to the portions of the Site outside the remediation area.

In 2010, a Supplemental Site Investigation (SSI) and a Preliminary Endangerment Assessment (PEA) were conducted by California Environmental (CE) with oversight by the DTSC. The SSI and PEA were conducted in accordance with a DTSC-approved work plan dated January 2010. Field activities for the SSI and PEA included completion of 42 exploratory borings for soil sampling. A draft SSI/PEA Report was prepared by CE on behalf of the City of LA dated December 15, 2010 (CE, 2010). The draft SSI/PEA Report also included a Human Health Risk Assessment (HHRA) prepared by Tetra Tech, Inc. (Tetra Tech, 2010) and an Ecological Risk Assessment (ERA) prepared by URS Corporation (URS, 2010). DTSC approved the SSI/PEA report in a letter dated January 10, 2011.

Based on results of the SSI/PEA (CE, 2010), further investigation was recommended to verify the limits of affected area. The additional investigation conducted by CE included a field boundary survey and additional soil borings completed south of the former SAFR. The supplemental investigation was completed in October 2012 and documented in a letter report attached hereto as Appendix E (CE, 2012).

As discussed above, a portion of the Site was a former SAFR. This use occurred from the early to mid-1950s until sometime in the mid-1960s. The operation of the SAFR resulted in wide surficial spreading of lead shot and clay pigeon debris containing elevated polycyclic aromatic hydrocarbons (PAHs). The City of LA acquired the property in 1973 and developed the relatively level portions of the park area with recreational improvements. The development and grading activities occurred during the 1970s and 1980s. The grading activities at the Site were associated with the leveling of the former skeet range area, planting of trees, soil removal and compaction for development of the existing recreation building, and preparation for a parking area, play areas, a basketball court, and tennis courts. Grading also occurred during placement of the water/oil transmission pipelines. Previous sampling at other SAFRs (Interstate Technology and Regulatory Council [ITRC], 2003) indicates that lead shot and target fragment accumulation under static recreational conditions would typically be limited to the upper several inches of soil. However, grading activities at the Site have distributed the firing range waste products deeper in soil and over portions of the Site which were not a recognized part of the former SAFR.

The SSI and PEA activities identified visible accumulations of lead shot pellets on the hillside area on the north end of the former firing range (Figure 2). Abundant fragments of clay pigeon debris are commonly observed at the surface and in burrowing animal casts scattered throughout the former range area. Offsite accumulations (debris piles) of clay pigeon target fragments were also observed about 100 feet south of the southern property line adjacent to an unimproved roadway (Figure 2). Elevated lead and PAHs were documented throughout areas with visual accumulation of lead shot pellets and clay pigeon debris. Vertical delineation below 4 feet bgs was not conducted; however, results for soil samples collected at 4 feet bgs suggest that in some areas of the Site (e.g., utility trenches), impacted soil may be present at deeper depths.

This RAP has been prepared by URS on behalf of the City of LA for submittal to the DTSC to mitigate the impacted soil identified above. This RAP has been prepared in general accordance with DTSC's *Remedial Action Plan (RAP) Policy* (DTSC, 1995). Additionally, this RAP was prepared in a manner consistent with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA, 42 U.S.C. 9601 et seq.), as amended, the National Contingency Plan (NCP, 40 Code of Federal Regulations [CFR] Part 300), as amended, the California Health & Safety Code (H&SC) Section 25300 et seq., as amended, applicable U.S. Environmental Protection Agency (USEPA) guidance (USEPA, 1988), and other applicable state and local laws and regulations. As discussed above, this RAP only addresses the portion of the Site that will be deemed accessible by the public and can be feasibly remediated (Figure 3).

1.1 SITE DESCRIPTION AND LOCATION

Based on information provided in the SSI/PEA Report (CE, 2010), the Site is located at the northwest corner of the San Fernando Valley where the valley floor abuts the adjacent Simi Hills/Santa Susana Mountains (Figure 1). The Site encompasses approximately 72 acres of which approximately 21 acres have been developed with recreational facilities. These facilities include a 10,000-square foot recreation building, an adjoining fenced children's play area, parking lots, sand pit play area, two tennis courts, a basketball court, and landscaped fields (Figure 2). Residential housing abuts the Site boundary to the east, undeveloped hillside terrain borders the Site to the north, west, and south. The Santa Susana Pass State Historic Park borders the Site to the north, south, and west. Various recreational trails for pedestrians, hikers, and equestrian use surround the level park facility areas. A railroad right-of-away is adjacent to the north.

Topographically, the Site occupies a box canyon with hills that ascend from the level portion of the developed recreational area to the north, west, and south. Historical topographic maps from 1926 depict the area of the Site prior to development. At that time, the alluviated canyon bottom was approximately bisected by a drainage course which extended from west to east across the property. Total topographic relief across the Site is approximately 150 feet.

The current drainage pattern mimics the historic predevelopment drainage conditions. The main drainage is unpaved vegetated swale and extends from west to east across the Site. Near the recreation building, the channel is somewhat more incised and is crossed by a small pedestrian bridge. Several small drainage culverts and pipes were placed across the drainage to facilitate placement of pathways and access points. For the most part, drainage sheet flows towards the central drainage swale where it is conveyed in an easterly direction off the property. The flow enters a subsurface storm drain east of the Site.

The Site is also a major corridor for subsurface utilities. The utility easements at the Site include a 96-inch diameter waterline (the West Valley Feeder No. 2) which is buried beneath the central portion of the former SAFR. An abandoned 6-inch diameter oil pipeline also crosses the former firing range area. The Los Virgenes Municipal Water District is planning an improvement project to be completed over the next several years. That project will include the placement of an 18-inch diameter water line extending across the former SAFR, west of the recreation building and parking lot area. The general location of the existing and proposed pipeline easements are shown on Figure 2.

Several trails originating in the Santa Susana Pass Historic State Park extend into the Site (see map in Appendix A). The trails that enter the park include the Hill Palmer Trail, the Bannon Quarry Trail, and the Chatsworth Wagon Road. The alignment of the Old Santa Susana Stagecoach Road, which is listed in the National Register of Historic Places, is located west and south of the Site.

1.1.1 Site Identification Information

Site Address:

Chatsworth Park South
22360 West Devonshire Street (Current Address)
22301 West Devonshire Street (Historical Address)
Chatsworth, California 91311

Assessor's Parcel Number (APN): 2723-010-904 (Approximately 72 acres)

Township & Range: T2N, R17W, Section 13 NW¼ from the San Bernardino Baseline Meridian

Land Use: Open space, public facilities, historic monument

Site Contact:

Mr. Paul Davis
City of Los Angeles
Department of Recreation and Parks
221 North Figueroa Street, Suite 100
Los Angeles, California 90012
(213) 202-2667

1.1.2 USEPA Identification Number

Prior to RAP implementation, an USEPA Identification Number will be obtained for the Site at 22360 West Devonshire Street, Chatsworth, California, 91311.

1.2 OPERATIONAL HISTORY

Based on information provided in the SSI/PEA Report (CE, 2010), the Site operational history was developed through research of historical documents. The research included a review of historical aerial photos, building permit records, historical city directories, inquiries with public agencies, and interpretation of historical topographic maps. The Site history is summarized below:

- The Chatsworth Historical Society indicates that James David and Rhoda Jane Hill homesteaded 110 acres that included the Site in the spring of 1886. Between 1911 and 1913, the homestead cottage, which is still located adjacent to the eastern end of the Site at 10385 Shadow Oaks Drive, was constructed. The cottage (the Minnie-Palmer homestead) is on the National Register of Historic Places.
- A Los Angeles Department of City Planning Office of Historic Resources Newsletter Volume 2, Issue 1 dated January 2008 indicates a dynamite shed was built on the Site between 1890 and 1900. The shed housed dynamite that was used to construct the Santa Susana Pass railroad tunnel from 1898 through 1904. The shed is composed of quarried stone and is located on the southeastern portion of the Site.
- Historical topographic map research indicates the Site was developed circa 1916 with six structures and an unimproved road leading to the railroad tracks from Devonshire Street. From 1940 through 1947, the Site appears undeveloped. In 1952, there are two structures developed on the Site. In 1969, the Site was developed with two structures, a pond, the Devonshire Golf Course, and several unimproved roads.
- Historical aerial photograph research indicates that the Site was developed as a homestead in 1928 through 1947. The center of the property is a field area with a west-east trending stream bound by rock outcrops of the Chatsworth Formation to the north, west, and south. In about 1955, a shooting range was developed on the central portion of the Site with six skeet shooting stations. Clay pigeons were launched to the north and shot with lead pellets. An area in the northwest corner of the Site along the stream drainage was graded. From 1965 through 1976, the Site was occupied by a residence, former dynamite shed, three small structures, fishing ponds, shooting range, and golf course. From 1989 through 2002, the park was developed on the property.
- Building permit records indicate the construction of the former golf course facility located east of the current subject property began in August 1960 and was completed in July 1961. In 1968, the golf course was redeveloped into residential apartments. In December 1977, the City of LA began development of the current park. The first structure was the community recreation building.
- Historical city directories indicate that in 1962 through 1965 the Devonshire Golf Club occupied the subject property. In 1965, the Aqua Sierra Sportsman Club occupied the Site. In 1980, the City of LA is identified as occupying the Site.
- Roy Rogers' biography indicates that in 1954 he spent time at the Aqua Sierra Gun Club. Subsequent communication with the Roy Rogers – Dale Evans Museum through their website indicated that Roy Rogers owned the gun club facility from the mid-1950s through mid-1960s.
- Los Angeles County Assessor's Office records indicate that the Site was acquired by the City of LA on June 29, 1973.
- Los Angeles County Assessor's Map indicates Las Virgenes Municipal Water District owns a small parcel along the northern property line and the Calleguas Municipal Water District owns another small parcel along the western property line. Las Virgenes Municipal Water District and Metropolitan Water District pipelines are buried beneath the north-central portion of the Site. An abandoned oil pipeline is also located onsite.

1.3 SITE GEOLOGY AND HYDROGEOLOGY

As discussed in the SSI/PEA Report, the Site is located in the western portion of the Transverse Ranges Geomorphic Province at the extreme west end of the San Fernando Valley. Sedimentary rocks of the Cretaceous Chatsworth Formation are exposed in the hillsides which surround the former SAFR on the north, west, and south. The fabric of the sedimentary rocks is a southwest-trending homocline, gently inclined towards the northwest. The center of the property is a broad open alluvial canyon (CE, 2010).

Historical topographic maps and aerial photographs indicate that surface drainage historically flowed from the upland areas to the north, south, and west into the alluvial canyon bottom with surface flow generally towards the east. A former fishing pond located northeast of the former SAFR was previously filled using onsite groundwater production and through damming of seasonal stream flows that drained from the upland areas to the west. Current surface water flow conditions were observed during July 2009 and during the sampling activities conducted between December 2009 and January 2010. Surface water discharge enters a re-entrant canyon located on the northern side of the Site adjacent to the railroad right-of-way. This discharge emanates from the adjacent railroad tunnel dewatering system. Flow from the discharge pipe was estimated at 5 to 10 gallons per minute. This surface flow continues in a southeasterly direction where it infiltrates into the alluvium on the northern side of the former SAFR (Figure 2). The groundwater then flows within the backfilled stream channel to the east towards Santa Susana Creek (currently channelized).

Geotechnical borings completed in Chatsworth Park in 1994 encountered groundwater along the base of the buried stream channel at depths ranging from 5 to 8 feet below ground surface (bgs). The geotechnical borings identified alluvial deposits which extend to depths of up to 57 feet bgs near the recreation building. Groundwater level data obtained from temporary well points in 1994 indicated a groundwater flow regime which generally followed the slope of the surface topography. During the SSI, groundwater was found at depths ranging from approximately 11½ to 13½ feet bgs in shallow temporary piezometers. The remaining 42 exploratory borings which extended to a depth of 10 feet beneath the Site did not encounter groundwater.

1.4 PURPOSE OF REMEDIAL ACTION

Based on the results and recommendations of the approved SSI/PEA for the Site, the City of LA and DTSC have determined that further action is required for the Site's soil where with metals and/or PAH concentrations exceed remedial action objectives protective of human health.

After the remedial actions are completed, a Remedial Action Completion Report (RACR) will be submitted to DTSC for review and approval. The report will include the scope of work, deviations from the approved RAP, appropriate tables, laboratory analytical reports, waste manifests, and other applicable information and data. Based on the results of the remedial action, DTSC will provide a letter to City of LA indicating that “No Further Action” is required if the impacted areas have been adequately addressed in accordance with the approved RAP.

Characterization and delineation of chemicals of potential concern (COPCs) at the Site occurred during three investigations – a preliminary investigation conducted in February and March 2008, the SSI and PEA investigations in December 2009 and January 2010, and additional sampling conducted in October 2012.

2.1 PRELIMINARY INVESTIGATION

CE visited the Site on February 15, 2008 (CE, 2008). A portable X-ray fluorescence (XRF) unit was utilized to screen individual soil samples for the presence of lead. Surface observations were also conducted to check for the presence of lead shot debris, shell casings, and clay pigeon debris. Park personnel were interviewed to determine their knowledge of the Site use history. The initial observations determined that significant amounts of clay pigeon debris were present on the surface and in rodent casts present north of the parking area and northwest of the recreation building in the area now known to be formerly occupied by the historical shooting range. Clay pigeon debris is generally found scattered across much of the area west of the central parking lot, particularly in ground that has been disturbed by either rodents or around tree wells. Significant accumulations of lead shot debris were also found north of the former skeet range on the adjacent hillside. Sampling during this investigation primarily focused on the portion of the Site developed with recreational facilities to determine if the park was safe to reopen.

Wipe sampling was conducted to evaluate lead concentrations in dust on surfaces in the toddler play area, the south playground, and the recreation building. Wipe sample locations were selected to represent surfaces, primarily floors, which children may come into contact with and which may have been contaminated by lead tracked, blown, or otherwise dispersed from the former range area.

Based on the investigation, the following findings regarding the potential health risks associated with the areas addressed in this RAP were made:

- PAHs were found in samples of clay pigeon debris. An average of approximately 10,000 milligrams per kilogram (mg/kg) of total PAHs was detected. Petroleum hydrocarbons were also found in the pigeon debris. An average of approximately 2,300 mg/kg of total petroleum hydrocarbons (TPH) were found in the samples analyzed.
- Observations found that clay pigeon debris is visible on the surface in many of tree wells located throughout the park including the far southern and eastern portions of the facility. However, XRF tests for lead in soil in these locations were generally below a health risk screening level of 150 mg/kg.
- Visible accumulations of deteriorating lead shot were observed on the adjacent hillside area at the northern end of the former shooting range area. Very high field XRF readings (10-15% lead or 100,000 to 150,000 mg/kg of lead) were obtained in areas where spent shot was visible.
- The main picnic area contained lead pellets in the soil surface and high levels of lead in near surface soil.

- One of two soil samples analyzed contained low levels of PAHs. The DTSC-recommended benzo(a)pyrene toxicity equivalent [B(a)P-TE] background concentration of 0.9 mg/kg (a statistically derived 95 percent upper tolerance limit) was exceeded in one of the samples. Leaching of the PAHs into soil could not be ruled out. However, it is possible that the soil sample was contaminated by a small fragment of clay pigeon debris.
- Wipe samples (14) obtained from the play area surfaces, picnic tables, and play equipment were non-detect (less than 10 micrograms per square feet [$\mu g/ft^2$]) for lead.
- Wipe samples (15) obtained from the recreation building surfaces were all below the USEPA Housing and Urban Development (HUD) lead dust clearance criteria. Eight of the samples were non-detect (below 10 $\mu g/ft^2$) for lead. Seven of the samples contained lead at levels ranging from 12 to 26 $\mu g/ft^2$. One sample (window trough – preschool) had a detection of 170 $\mu g/ft^2$. This level is below the USEPA recommended level of 250 $\mu g/ft^2$ for such a surface, but does indicate some accumulation of lead dust.
- Sixty-six (66) individual soil samples were obtained and analyzed for total lead content per USEPA Method 6010 at a state-certified testing lab. Twenty-three of the samples contained lead at or above the 2005 California Environmental Protection Agency (Cal/EPA) California Human Health Screening Level (CHHSL) of 150 mg/kg for soil in high contact play areas and residential sites recommended at the time of the investigation.
- Elevated levels of lead in soil were typically found in and adjacent to the drainage course which extends through the investigative area.

2.2 SSI AND PEA INVESTIGATIONS

As a part of SSI and PEA investigation, the Site was sub-divided into eight sub-areas (areas of concern) for targeted investigation. These areas of concern were identified based on knowledge of the historical operations of the SAFR, discussions with knowledgeable personnel regarding the Site use history, review of historical documentation, and results of the initial sampling conducted at the property. The areas of concern are summarized below and shown on Figure 2.

- AREA I – SHOTGUN FIRING LINE. The shotgun firing line includes the area immediately adjacent to the zone where the shotgun blasts occurred at the former SAFR. It is an area that encompasses approximately 1.44 acres at the southern end of the firing line. The contaminants of concern (COCs) associated with this area are lead, arsenic, dioxins, furans, and PAHs. Area I also includes the adjacent southerly hillside where clay pigeon debris was observed.
- AREA II – ZONE OF MAXIMUM TARGET FRAGMENT ACCUMULATION. This zone typically extends a distance of approximately 375 feet from the firing line (ITRC, 2003). This is the impact zone where sporting clay pigeons are impacted and fragments drop to the ground. The total area for this zone is about 8.51 acres. The primary COCs in this zone include lead, arsenic, and PAHs.
- AREA III – ZONE OF MAXIMUM SHOT FALL AND LEAD ACCUMULATION. This is the zone where unimpeded lead pellets and/or rounds that missed targets would

fall. The length will vary depending on wind conditions, the angle of attack, and time of day. This zone extends from 375 feet to approximately 770 feet beyond the shotgun firing line (ITRC, 2003). This area is approximately 5.87 acres. COCs in this area are arsenic, lead, and PAHs.

- AREA IV – MAXIMUM SHOT FALL AREA. This area was designated based upon the presence of visible lead pellet accumulation on bedrock outcrops. Area IV encompasses approximately 6.98 acres. The principal COCs are visible lead, arsenic and PAHs in shallow sediment.
- AREA V – FORMER FISH POND. A surface water body was historically present at the extreme northwestern end of the maximum shot fall area. It is possible that lead pellets accumulated in the sediment within and beneath the pond area. The former pond is approximately 1 acre in area. The principal COCs are lead, arsenic, and PAHs.
- AREA VI – ZONE OF SURFACE/SUBSURFACE DRAINAGE. A zone of potential COC transport was identified across the property. The zone extends across the closed SAFR and extends south and eastward to the homestead parcel. Surface and subsurface flow in Area VI are transport mechanisms for the soluble components of lead shot, clay pigeon fragments, and lead/arsenic. Area VI encompasses approximately 1.82 acres. The principal COCs are lead, arsenic, and PAHs.
- AREA VII – OFFSITE CLAY PIGEON DEBRIS PILES. Two areas of clay pigeon debris piles were observed south of the Site. The larger pile of debris is approximately 20 to 35 feet in diameter and approximately 5 to 6 feet in height. The smaller debris pile is approximately 10 feet in circumference and 3 feet in height. The principal COCs are PAHs, lead, and arsenic.
- AREA VIII – UNDOCUMENTED FILL AREA. This area includes the "unknown graded" portion of the Site. Historical data suggest the grading that occurred on the Site is likely restricted to the areas near the existing recreation building. Area VIII is identified on the southeastern portion of the Site where grading may have occurred.

2.2.1 Field Activities and Results

The SSI and PEA field investigation included completion of 42 borings. Individual soil samples were mechanically sieved to remove clay pigeon fragments and lead shot prior to laboratory analysis. The sieve procedure revealed fine-grained clay pigeon debris that could not be removed prior to sample analysis.

Visual mapping and subsurface analysis of individual soil samples revealed that clay pigeon debris is widespread across most of the level areas of the Site (Figure 2). Clay pigeon debris extends to the eastern property line of CPS. Clay pigeon debris was also observed at the top of the knoll to the south of the former firing range area suggesting that shooting of clay pigeons may also have occurred in a southerly direction. Most of the clay pigeon debris observed south of the firing line was scattered and appeared to be within the upper several inches to 0.5 foot of soil. Stockpiles of clay pigeon debris mixed with occasional lead shot were also identified and delineated. Approximately 20-25 cubic yards of this material is present offsite to the west-southwest of the property line.

The primary hazard identified at Site is the potential contact with visible lead shot observed in the central portion of Area IV and trail area on the western side of Area III. Visible accumulations of lead shot are ubiquitous on the bedrock outcroppings in the central portion of Area IV. The lead shot accumulates in areas of surface water transport and segregation during high rainfall runoff events. Where observed. the pellets appeared to be oxidizing creating soluble lead compounds that could impact the environment. The principal hazard associated with the visible lead shot is human and or animal contact. The secondary hazard associated with the lead pellets is the release of soluble lead compounds into the environment.

As part of the SSI, shallow temporary piezometers (2½-inch PVC casing) were installed. The piezometers were installed in hydraulic push borings located at the east end of Area VI and the north end of the former SAFR (Area IV). Groundwater was found at depths which range from 11½ to 13½ feet bgs. The remaining 42 exploratory borings which extended to a depth of approximately 10 feet bgs did not encounter groundwater.

Surface water runoff during seasonal winter rains and subsurface flow through the SAFR also are considered viable pathways for mobilization of PAHs and lead pellet fragments embedded in near surface soils. Sampling and analysis of surface water and groundwater was performed to evaluate these pathways. A "first flush" surface water sample (following a winter storm rainfall event) was obtained during January 2010. This was done to assess the potential for the COCs to migrate offsite in surface water. Preliminary testing of grab surface water and groundwater samples suggested no significant impact from COCs associated with the SAFR. However, PAHs were found in surface water samples associated with the water which enters the Site from the Santa Susana train tunnel dewatering system. The source of these PAHs is likely diesel exhaust associated with the long-term use of the Santa Susana train tunnel. The "first flush" surface water sample contained a low concentration (0.013 mg/kg) of lead suggesting soluble lead is available and can be mobilized during storm water runoff events. PAHs were not detected in the storm water runoff sample.

The SSI/PEA Report recommended that a Remedial Action Workplan (RAW) be developed for the Site to mitigate the hazards identified. Due to the size of the project (estimated cost greater than $1,000,000), a RAP was prepared instead of a RAW (DTSC, 1998).

2.2.2 Human Health Risk Assessment

As part of the SSI/PEA, a HHRA was prepared by Tetra Tech (2010) for the Site. The purpose of the HHRA was to evaluate potential human health risks associated with exposure to contaminants potentially released at the Site. Health risks were assessed for park workers, park visitors (adults and children), and hypothetical future onsite residents as an indicator of continuous long term exposure to constituents detected in soil and in surface water that occur intermittently at the Site. Separate evaluations of potential health risks were estimated for two exposure areas at the park: Exposure Area 1 consists of the eastern side of the park (recreational center area) and Exposure Area 2 consists of the western side of the park (former skeet shooting range). These two HHRA Exposure Areas are shown on Figure 3.

In consultation with the DTSC, COPCs were identified for contaminants detected in the soil depth interval of 0 to 4 feet bgs and were used to assess exposure for the three groups of receptors. A total of 19 COPCs were identified in soil, consisting of two metals (antimony and lead), 16 PAHs (including naphthalene), and dioxins/furans. Dioxins/furans were analyzed for Exposure Area 2 soils only. For arsenic, there was only one high concentration (26 mg/kg) at 4 feet bgs that was considered above background, and it was co-located with a high lead concentration; therefore, arsenic was not retained as a COPC in the HHRA. In surface water, eight PAHs were identified as COPCs. As discussed in the HHRA, the risk assessment was calculated using soil sample results from the sieved samples that removed lead pellets and larger fragments of clay pigeon debris. This may have resulted in lower concentration of PAHs and lead.

The risk estimates for the receptors are summarized in the table below.

	Exposure Area 1			Exposure Area 2		
	Park Worker	Park Visitor	Residential	Park Worker	Park Visitor	Residential
Cancer Risk	2×10^{-4}	2×10^{-4}	3×10^{-4}	7×10^{-3}	8×10^{-3}	1×10^{-2}
Hazard Index	0.1	0.6	0.9	0.6	2	3

Based on the results of the HHRA, the two most significant exposure pathways were soil ingestion and dermal exposure.

The HHRA also developed cleanup goals for the Site based on exposure to future park workers, park visitors, and future onsite residents, which formed the basis for the remedial action objectives (RAOs) presented in Section 3.2.

2.2.3 Ecological Risk Assessment

An ecological risk assessment (ERA) was conducted by URS. The objective of the ERA was to provide a preliminary evaluation of the biological resources and ecological risks from the presence of residual lead shot and clay pigeons present at the Site. Two potential sensitive species were identified as potentially occurring within the Site boundary. These species included the Western Mastiff Bat and the State-endangered San Fernando Spine Flower. A Phase I predictive assessment for ecological risk was performed due to the presence of the COCs in soil at the property. The ERA identified risk to birds, mammals, and invertebrates in Areas I, II, III, IV, VI, VII, and VIII.

The following table summarizes the major hazards by area and species based on the relative magnitude of the hazard quotients (HQs), the aerial extent of impacts, and professional judgment as identified in this ERA:

Area I	Area II	Area III	Area IV	Area V	Area VI	Area VII	Area VIII
Birds: DI-lead Shrew: DI-PAHs	Plants: PAHs Inverts: PAHs Birds: PI, DI-lead Mammal: DI-lead, PAHs	Birds: DI-lead; PI Shrew: DI-lead	Birds: DI-lead; PI Shrew: DI-lead; PAHs	NSR	Birds: DI-lead; PI Shrew: DI-lead; PAHs	PH Mammal: DI-PAHs	Shrew: DI-PAHs

DI- = dietary ingestion
Inverts = soil invertebrates
NSR = no significant risk
PI = Pellet ingestion by birds
PH = clay pigeon targets may pose physical and/or chemical hazard

2.3 OCTOBER 2012 SUPPLEMENTAL INVESTIGATION

In October 2012, supplemental sampling was conducted by CE to further delineate the removal areas in support of the remedial action plan. The results of this supplemental sampling were documented in a report prepared by CE (2012) and attached hereto as Appendix E.

During the supplemental sampling, surface soil samples were collected within the slope area south of the former firing line in an area of mature oak trees. A trail extends through this area and only limited testing was completed during the initial sampling program. The shallow soil (collected between 0 and 6 inches bgs) was screened in the field using a portable XRF field instrument. The XRF screening was biased along the trail alignment. Twenty percent of the XRF samples (a total of 20 soil samples) were submitted to an offsite laboratory for analysis of lead and PAHs.

Fourteen (14) additional borings to 2 feet bgs were completed in the eastern portion of the Site to further define PAHs/lead concentrations which exceed the site specific cleanup goals. Fourteen (14) borings were also completed around the northern and eastern SAFR perimeter to further define the extent of impacts in soil beneath the lead shot exposure area and to define the western limits of the SAFR impacts. XRF screening was implemented in the lead shot exposure zone to assist selection of sample locations. The borings were continuously cored utilizing a hydraulic push rig. A total of 28 surface soil samples were submitted to an offsite laboratory for analysis of lead and PAHs.

The analytical results for lead and PAHs in soil for the SSI/PEA and supplemental investigation are summarized in Table 1. Sample locations with concentrations of lead greater than 80 mg/kg and B(a)P-TE greater than 0.9 mg/kg are shown on Figures 4 and 5, respectively.

2.4 NATURE AND EXTENT OF CONTAMINATION

This section describes the nature and extent of soil impacts at the Site based on the results of the preliminary investigation, SSI, PEA, and supplemental sampling events. As indicated in Section 2.2, there are a total of eight investigative areas.

Elevated metals and/or PAHs are present throughout areas where visual surveys identified lead pellets or clay pigeon debris. Full lateral delineation of the impacted areas was not conducted because of steep terrain. Deeper delineation of the impacted areas was also not conducted because the exposure pathway to soil deeper than 4 feet bgs does not pose a significant health risk. The estimated limits of lead- and PAH-impacted soil, based on preliminary soil screening levels and the remedial action objectives are shown on Figures 4 and 5, respectively. The lead concentrations shown on Figure 4 are the concentrations detected in the soil following sieving to remove lead pellet fragments. The highest lead and PAH concentrations for each sample location was used on Figures 4 and 5, whether from the field XRF results or the samples that were submitted to the offsite laboratory for analysis. Elevated arsenic and antimony concentrations were not evaluated because it is assumed that they are co-located with the lead detections.

3.1 INTRODUCTION

Remedial action objectives (RAOs) are established to protect human health. RAOs are based on site-specific media of concern, COCs, exposure routes and receptors, and acceptable contaminant levels or range of contaminant levels for each exposure route. The media of concern for the Site is soil. Based on the results of the SSI/PEA, surface water and groundwater are not significant exposure pathways.

3.2 REMEDIAL ACTION OBJECTIVES (RAOs)

The media of concern is shallow soil (0 to 4 feet bgs) for the Site, because deeper soil does not pose a significant health risk based on the identified exposure pathways. The overall objectives for the remedial actions described in this plan include the following:

- Mitigate and/or remediate impacted media (i.e., soil) with concentrations within the remediation footprint that pose a threat to ecological receptors or exceed residential land-use cleanup levels derived for the risk-driving COCs to minimize potential human exposure to non-volatile COCs in soil via direct contact (soil ingestion, dermal contact, and inhalation of particulates). Based on the results of the SSI/PEA HHRA, the risk-driving COCs for the direct contact pathway are antimony, lead, PAHs, and dioxins/furans.
- Minimize potential for migration of COCs in soil to other media (air and surface water).

To achieve these RAOs, the following steps will be completed:

- Evaluate and select appropriate remedial action alternatives.
- Mitigate and/or remediate impacted shallow soil with non-volatile COC concentrations above risk-based cleanup levels established in the HHRA, as follows:

COC	Cleanup Goal For Soil for Onsite Residents	Basis
Lead	80 mg/kg	Cal/EPA CHHSL 2009
Antimony (co-located with lead)	30 mg/kg	HHRA risk-based cleanup goal for onsite residents
PAHs as benzo(a)pyrene-equivalent	0.9 mg/kg	Southern California regional background
Naphthalene (co-located with PAHs)	1.9 mg/kg	HHRA risk-based cleanup goal for hypothetical onsite residents

The maximum detected concentration of dioxins/furan toxicity equivalent quotient was 7.39 nanograms per kilogram (ng/kg), within the range typically observed in urban areas (i.e., 7 to 20 ng/kg). At the direction of DTSC, a cleanup goal for dioxins/furans was not developed for the Site. Although the cleanup goals for the Site are derived based on human health, the findings of the draft Ecological Risk Assessment (URS, 2010) were considered and mitigation measures for ecological receptors were evaluated during the review of the remedial alternatives.

The selected remedial alternative will focus on achieving the specified RAOs.

Identification and screening of remedial action alternatives was completed independently for the primary COCs. The contaminants include lead (and co-located antimony) and PAHs (and co-located naphthalene) within shallow soil (up to 4 feet bgs).

4.1 IDENTIFICATION AND SCREENING OF REMEDIAL ACTION ALTERNATIVES

Potential remedial action alternatives were screened based on effectiveness, implementability, and cost, as defined below:

<u>Effectiveness</u> – This criterion focuses on the degree to which a remedial action reduces toxicity, mobility, and volume through treatment; minimizes residual risk and affords long-term protection; minimizes short-term impacts; and how quickly it achieves protection.

<u>Implementability</u> – Remedial actions are evaluated with respect to technical and administrative feasibility and applicability to Site conditions. Some examples of this criterion include the ability to obtain necessary permits, regulatory approval of remedial actions, and availability of necessary materials, equipment, and skilled workers.

<u>Cost</u> – This criterion relates to relative cost screening based on estimated capital and operational and maintenance.

Screening of several remedial action alternatives using the above criteria was conducted to select remedial actions for further evaluation for each group of contaminants. The outcome of this screening is summarized in Sections 4.3 and 4.4.

4.2 EVALUATION OF REMEDIAL ACTION ALTERNATIVES

Each remedial action alternative considered for the two groups of COCs was independently evaluated without consideration to the other alternatives. The evaluation addressed the criteria listed below:

Short-term effectiveness – This criterion evaluates the effects of the remedial alternative during the construction and implementation phase until RAOs are met. It accounts for the protection of workers and the community during remedial activities and environmental impacts from implementing the action.

Long-term effectiveness and permanence – This criterion addresses issues related to the management of residual risk remaining on Site after a remedial action has been performed. The primary focus is on the controls that may be required to manage risk posed by treatment residuals and/or untreated wastes.

Reduction of toxicity, mobility, or volume – This criterion evaluates whether the remedial technology employed results in significant reduction in toxicity, mobility, or volume of the hazardous substances.

Implementability – This criterion evaluates the technical and administrative feasibility of the alternatives, as well as the availability of the necessary goods and services. This includes the ability: to construct and, if necessary, to operate an alternative; to obtain services and equipment; to monitor the performance and effectiveness of technologies; and to obtain necessary approvals and regulatory case closure, if applicable, from agencies.

Overall protection of human health and the environment – This criterion evaluates whether the remedial alternative provides adequate short- and long-term protection to human health and the environment.

Cost – This criterion involves an estimation of capital and operation and maintenance cost and is based on a variety of information. The actual costs will depend on true labor and material cost, competitive market conditions, final project scope, and the implementation schedule.

Compliance with ARARs – This criterion is an evaluation of the alternative remedial action's ability to comply with chemical-, action-, and/or location-specific Applicable or Relevant and Appropriate Requirements (ARARs).

Agency Acceptance – This criterion considers the approval and ability to permit the remedial action with applicable state and local regulatory agencies. These agencies may include the DTSC, the Los Angeles Regional Water Quality Control Board (LARWQCB), and the South Coast Air Quality Management District (SCAQMD).

Community Acceptance – This criterion considers the potential for community agreement or opposition to the remedial alternative.

The last two criteria – Agency Acceptance and Community Acceptance – are typically addressed after lead agencies and other interested parties have reviewed and commented on the remedial action implementation plan presented in this report.

Descriptions and evaluations of each remedial action alternative considered for the two groups of contaminants are discussed in the following sections. An analysis of ARARs for the remedial action alternatives for each group of contaminant is presented separately in Appendix B.

4.3 REMEDIAL ACTIONS EVALUATED

Screening of several remedial action alternatives using the above criteria (Section 4.1) was conducted to select remedial actions for further evaluation. Based on this screening, the three remedial action alternatives selected for further evaluation to address shallow soil impacts are:

Alternative #1 – No Action

Alternative #2 – Excavation, Onsite Treatment, and Offsite Disposal

Alternative #3 – Containment Through Surface Capping

Other remedial alternatives were identified and considered for application at this Site, but were screened out without detailed evaluation based on past experience at other similar sites and on engineering judgment that indicated that they would either be ineffective in achieving RAOs, inappropriate technologies for remediating the elevated lead and PAHs, or could not be implemented in a cost-effective manner (especially with consideration of the large volume of impacted soil at the Site). These alternatives included, but not limited to, in-situ fixation, soil sieving, soil washing, and excavation and disposal offsite without treatment.

As indicated in Section 4.2, each remedial action alternative was independently evaluated without consideration to the other alternatives. Further, the evaluation addressed the criteria listed in Section 4.2, and are reiterated below:

- Short-term effectiveness
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume
- Implementability
- Overall protection of human health and the environment
- Cost

4.3.1 Evaluation of Remedial Action Alternatives

A description and evaluation of each remedial action alternative for the soil impacted with metals and PAHs is discussed in the following sections. An analysis of ARARs for the remedial alternatives is presented separately in Appendix B. The remedial alternatives discussed below were selected to provide a practical foundation suited for the proposed future layout of the Site (Figure 6) and other potential improvements. To facilitate the discussion of remedial actions, the portions of the Site proposed for remediation are sub-divided into Areas A to N as shown on Figure 7 and summarized in Table 2.

4.3.1.1 Alternative #1 – No Action

The No Action alternative has been included to provide a baseline for comparisons among other remedial actions. This action includes no engineering or institutional controls, no mitigation or remediation of soil, and no monitoring.

The No Action alternative would not require implementing any measure at the Site. Consequently, there would be no activities that would disturb Site soil, and therefore, no short-term risks to Site workers or the community as a result of implementing this alternative. By definition, the No Action alternative has no associated remedial cost.

However, under the No Action alternative, the impacts due to the elevated metals and/or PAHs present in the soil would not be addressed and there would be no reduction in the potential health and environmental risks. In addition, the No Action alternative does not result in reducing the toxicity, mobility, or volume of the impacted soil present at the Site.

4.3.1.2 Alternative #2 – Excavation, Onsite Treatment, and Offsite Disposal

The Excavation, Onsite Treatment, and Offsite Disposal alternative would involve the following remedial actions:

- Grub and remove trees (with the exception of protected and heritage trees as designated by the City of Los Angeles) from the proposed remedial areas with the exception of Area A (an oak grove) and Area E (a rocky outcrop).
- Conduct a supplemental remedial investigation to better define the lateral and vertical extent of metal- and PAH-impacted soil.
- Excavate and temporarily stockpile soil exceeding the Site cleanup goals for lead and PAHs of 80 mg/kg and 900 µg/kg, respectively, with the exception of Areas A and E.

Based on existing Site data, it is assumed that a soil volume representing an average depth of 4 feet bgs will be excavated and stockpiled.

- Conduct post-excavation confirmation sampling to ensure the removal of impacted soil
- Analyze stockpiled soil for total and soluble lead. If a soil stockpile is identified to be hazardous (Resource, Conservation, and Recovery Act (RCRA) hazardous or non-RCRA California hazardous), the stockpiled soil will be processed onsite using a DTSC-approved transportable treatment unit (TTU) to produce non-hazardous soil. The stockpile will be retested and re-processed as necessary until the stockpiled soil is characterized as non-hazardous waste.
- Profile and transport non-hazardous soil to a Class III landfill for disposal or use as landfill daily cover. Backfill the excavation areas with certified clean import soil (average 4-feet thick).
- Grub and vacuum within Area E to remove lead pellets and surficial soil.
- Install fencing around the entirety of Area A (an oak grove) and individual trees retained due to their protected or heritage status. In addition, where feasible, install vertical segments of steel mesh to approximately 4 feet bgs around trees to mitigate rodent intrusion from surrounding clean fill.
- Install fencing around the perimeter of Areas A through N to restrict public access to the portions of the Site outside these areas that are not proposed for remediation because of steep terrain. Drainage features will also be implemented along the perimeter of Areas A through N to prevent runoff into the remediated areas
- Re-vegetate remedial areas and replace removed trees with native tree species.
- Prepare a Remedial Action Closure Report (RACR).

As discussed above, the portions of the Site outside of Areas A through N are not proposed for remediation because of heavily-vegetated steep terrain. These areas will be fenced to restrict public access. Drainage features will be constructed along the perimeter of Areas A through N as an engineering control to protect the remediated area from erosion and re-contamination from runoff from impacted soil on the steep hillsides. The drainage system will include the following features:

- Concrete V-ditches along the perimeter of the project area at the base of the slopes with steep terrain
- Catch basins and drainage piping to contain surface runoff, and
- A detention basin to trap sediment and modulate offsite surface water discharge.

Preliminary plans for the proposed remedial Site improvements are presented in the following figures:

- Figure 8 – Rough Grading Plan
- Figure 9 – Drainage Plan
- Figure 12 – Typical V-Ditch Section Details

- Figure 13 – Drainage Details
- Figure 14 – Detention Basin

Areas A through N (excluding E) are relatively flat and level. No excavation will occur beneath the footprint of any buildings or areas currently covered with hardscape; consequently, limited areas of uncharacterized, potentially impacted soil within the remedial boundary would remain in place. Any smaller structures, subsurface pipelines, or groundwater monitoring wells in the vicinity of excavation areas will be protected, removed and replaced, or abandoned during excavation activities, as required. The soil excavation and offsite disposal would remove the metal and PAH impacts in areas potentially accessible to the public, and therefore would reduce the long-term potential risk and reduce impacted soil volume. Potential short-term risks to onsite workers, public health, and the environment could result from dust or particulates that may be generated during excavation and soil-handling activities. These risks will be mitigated using personal protective equipment for onsite workers and engineering controls, such as dust suppression and additional traffic and equipment operating safety procedures, for protection of the surrounding community.

Excavation and offsite disposal is a well-proven, readily implementable technology that is a common method for addressing soils similar to those identified onsite. This alternative also includes the onsite processing of RCRA and/or non-RCRA hazardous soil into a non-hazardous waste. The proposed TTU has been issued a permit by the DTSC to operate under ‘permit by rule.’ The TTU will process the hazardous soil through a pug mill and add cement and proprietary additives to produce a stable non-hazardous waste. The process essentially addresses the issue of soluble lead in the soil through fixation by the addition of cement to the soil. The treated soil can be disposed or used as daily cover at a Class III landfill. Equipment and labor required to implement this alternative are relatively uncomplicated and readily available. The shallow depths of the anticipated contamination make excavation readily implementable. It is anticipated that regulatory approval would be granted because it is a proven and permanent technology. The disposal of wholly non-hazardous waste also would reduce the long-term liability risk to the City of Los Angeles associated with the offsite disposal of hazardous waste.

Following implementation of this alternative, residual contamination would remain outside of the remedial boundary, within protected or designated tree areas, and below existing buildings and paved features. Thus, engineering and institutional controls and long-term inspection and maintenance will likely be required to ensure that the remediated areas are not re-impacted by contaminants still located within the specific areas previously identified within the park boundary. Periodic inspections of the remediated and fenced areas for settlement, ponding of liquids, erosion and degradation by burrowing animals would be required. Additionally, precautions would have to be taken to ensure that the fenced areas are not disturbed by land redevelopment activities. Based on these factors, the resources required to ensure long-term effectiveness are considered moderate to high. A deed notification (restriction) would likely be required if this alternative is accepted by the DTSC for implementation.

Excavation, onsite treatment, and offsite disposal would remove the metal and PAH impacts in areas potentially accessible to the public and would reduce the toxicity, mobility, and volume of the metals and PAH contaminants through onsite soil stabilization prior to land disposal as non-hazardous waste. In addition, human health and ecological risks (see Sections 2.2.2 and 2.2.3) would be eliminated or substantially reduced due to the elimination of the following exposure pathways that contribute the majority of the excess risk:

- Soil ingestion (human health risk)
- Dermal exposure (human health risk), and
- Lead pellet ingestion (ecological hazard).

The trees removed to implement the remedial action will be replaced to mitigate the potential ecological impact associated with vegetation and habitat loss.

Community acceptance may be moderate to high based on the permanent removal of impacted soil from public areas; however, community acceptance may be moderated due to local traffic related impacts from the extensive number of truck trips required to implement this alternative (roughly 17,000 trips for soil disposal and import alone), proposed onsite treatment of hazardous waste, and the removal of non-native trees. Agency acceptance for this alternative may be moderate to high due to the removal of the bulk of impacted soil from areas readily accessible to the public and the proposed future use of this Site as a public park.

The costs for excavation and disposal depend on the method of excavation, the soil volume, and the waste classification of the excavated soil, which in turn will determine the costs of onsite treatment using a TTU and offsite transportation and disposal of the soil at a Class III landfill facility approved to accept the non-hazardous waste. The estimated volume of excavated soil based on proposed remedial area and an average depth of 4 feet is approximately 130,000 cubic yards (cy); of this total, 50 percent (approximately 65,000 cy) has been assumed to be non-hazardous waste and the other 50 percent is assumed to be non-RCRA hazardous waste. It is assumed that the non-RCRA hazardous waste will be processed onsite into non-hazardous waste using a TTU. To restore and maintain the integrity of the remediated area, it will be re-vegetated with trees and grass. In addition, a sprinkler system will be installed to irrigate the new vegetation. No other reuse improvements were included in the projected cost estimate. A summary of the estimated costs to implement Alternative #2 is presented in Table 3.

4.3.1.3 Alternative #3 – Containment Through Surface Capping

The Containment through Surface Capping alternative would involve the following remedial actions:

- Grub and remove trees (with the exception of protected and heritage trees as designated by the City of Los Angeles) from the proposed remedial Areas with the exception of Area A (an oak grove) and Area E (a rocky outcrop).
- Rough grade the upper 18 inches of native terrain in all areas (except Areas A and E) to remove existing burrowing animal tunnels and to allow the soil to be compacted.
- Cap the proposed remedial Areas (except Areas A and E) to cover the impacted soil remaining in place.
- Install fencing around the entirety of Area A (an oak grove) and individual trees retained due to their protected or heritage status.
- Grub and vacuum within Area E to remove lead pellets and surficial soil.

- Install fencing around the perimeter of Areas A through N to restrict public access to the portions of the Site outside these Areas that are not proposed for remediation because of steep terrain. Drainage features will also be implemented along the perimeter of Areas A through N.
- Excavate to approximately 2 feet bgs in areas of proposed tree groves; characterize soil and dispose offsite at lawful facility
- Construct native tree groves to mitigate tree removal required for remedial implementation.
- Prepare a Remedial Action Closure Report (RACR).

The 1-foot surface cap will consist of 4 inches of top soil to support turf growth, 8 inches of base to provide a wear-resistant structural foundation for the top soil and to allow drainage, and a layer of hardware cloth to prevent burrowing animals from disturbing the cap. A sprinkler system will be installed within the cap to irrigate the cap's turf layer. As required, provisions will be made to integrate the cap with existing and future Site development, including additional top soil for landscaping purposes.

As with Alternative #2, the portion of the Site outside of Areas A through N is not proposed for remediation because of steep terrain. These areas will be fenced to restrict public access. Drainage features will be constructed along the perimeter of the project area, and will include the following features:

- Concrete V-ditch along the perimeter of the project area at the base of the slopes with steep terrain.
- Catch basins and drainage piping to contain surface runoff.
- A detention basin to trap sediment and modulate offsite surface water discharge.

Preliminary plans for the proposed remedial Site improvements are presented in the following figures:

- Figure 8 – Rough Grading Plan
- Figure 9 – Drainage Plan
- Figure 10 – Surface Cap Section Detail
- Figure 11 – Cap and Tree Planting Detail
- Figure 12 – Typical V-Ditch Section Details
- Figure 13 – Drainage Details
- Figure 14 – Detention Basin

The native tree groves will be planted by excavating shallow metals- and PAH-impacted soil to a maximum depth of approximately 2 feet bgs using traditional excavation methods. The impacted soil will be characterized and transported to an approved offsite facility for disposal. The tree grove excavation areas will be backfilled with clean import soil. The groves will be protected from burrowing animals by installing vertical sections of hardware cloth around the perimeter of each tree or grove that ties into the surface cap's underlying horizontal hardware cloth. The surface cap sprinkler system will be extended into the tree groves to supply irrigation water.

The containment alternative itself would involve little to no disturbance of the metals- and/or PAH-impacted soil. However, prior to the installation of the surface cap, native soil will be tilled and compacted to approximately 18 inches bgs to destroy the existing burrowing animal network and to prevent future settlement. Potential short-term risks to onsite workers, public health, and the environment could result from dust or particulates that may be generated during tilling and soil-handling activities. These risks will be mitigated using personal protective equipment for onsite workers and engineering controls, such as dust suppression and additional traffic and equipment operating safety procedures, for protection of the surrounding community.

Capping of an impacted area will typically require engineering and institutional controls and long-term inspection and maintenance to protect and maintain the cap for the future and integration of the cap with Site development including required Site grading and future construction or Site modification. Periodic inspections for settlement, ponding of liquids, erosion, degradation by burrowing animals, and naturally-occurring invasion by deep-rooted vegetation would be required. Additionally, precautions would have to be taken to ensure that the integrity of the cap is not compromised by land redevelopment activities. Based on these factors, the effort required to ensure long-term effectiveness is considered moderate to high. A deed notification (restriction) would likely be required if this alternative is accepted by the DTSC for implementation.

Containment through surface capping would not lessen the toxicity or volume of the contaminants, but would limit their surface accessibility and mobility. In addition, human health and ecological risks (see Sections 2.2.2 and 2.2.3) would be eliminated or significantly reduced due to the elimination of the following exposure pathways that contribute the majority of the excess risk or hazard:

- Soil ingestion (human health risk)
- Dermal exposure (human health risk)
- Lead pellet ingestion (ecological hazard)

Containment caps are relatively simple technologies that are easily implemented and offer quick installation times. Due to the permanence of leaving elevated contaminant concentrations onsite, obtaining permits and regulatory approval can be difficult in some situations.

The overall protection of human health utilizing a containment cap is good, provided that long-term operations and maintenance are continued.

Containment technologies are typically a low to moderate cost treatment group. Even with long-term operation and maintenance requirements, containment treatments can be considerably more economical than excavation and removal of soil from large-scale waste sites. In conjunction with construction of the tree groves, the estimated volume of impacted soil to be excavated and disposed offsite is approximately 12,900 cubic yards (cy), which has been assumed to be an equal mix of non-RCRA California hazardous waste (due to soluble lead) and non-hazardous waste. A summary of the estimated costs to implement this alternative is presented in Table 4.

Community acceptance may be moderated due to the contaminants still present beneath the surface cap; however, this remedial alternative will provide public access within a reasonable time frame and mitigates potential contaminant exposure. Agency acceptance for this alternative may be moderate due to the contaminants remaining in place under the surface cap on a site dedicated to public use as park.

4.3.2 Comparative Analysis of Remedial Action Alternatives

A comparative analysis was conducted to identify the advantages and disadvantages of each remedial action alternative. The comparative analysis was conducted to address the nine criteria listed in Section 4.2.

4.3.2.1 Short-Term Effectiveness

Although the No Action alternative does not result in activities that would disturb the metals- and PAH-impacted soil, it does not address the risk posed to persons that may access the subject areas. Therefore, there would be no short-term risks associated with implementing this alternative, but there is a risk to Site workers and/or the community as a result of implementing this alternative due to the elevated COCs present at the Site that would not be addressed and there would be no reduction in the potential risks. In addition, the No Action alternative does not result in reducing the toxicity, mobility, or volume of the metals- and PAH-impacted soil present at the Site.

Alternative #2 would result in a high level of disturbance during implementation. The excavation, onsite treatment, and offsite disposal activities of Alternative #2 will require removing, handling, treating, and transporting the impacted soil, resulting in potentially higher short-term exposure risks due to the metals and PAHs. However, it is expected that these risks can be sufficiently mitigated through proven control measures.

Alternative #3 would result in a moderate level of disturbance during implementation (i.e., soil import, compaction, and limited soil excavation/disposal), which could also be mitigated through Site control measures to reduce short term impacts. For this reason, Alternative #3 is favored.

4.3.2.2 Long-Term Effectiveness and Permanence

Under the No Action alternative, the impacts due to elevated contaminant concentrations in soil would not be addressed. Consequently, there would be no reduction in the potential risks and the RAOs would not be satisfied. Alternatives 2 and 3 reduce or eliminate potential exposure to the contaminants, and therefore, satisfy the RAOs. Once implemented, Alternatives 2 and 3 would require long-term monitoring to ensure their effectiveness. In addition, future changes in land use could disturb the soil. The excavation, onsite treatment, and offsite disposal activities of Alternative #2 would remove the majority of soil with metals and PAHs from the Site; however, Alternative #3 would require long term maintenance to protect the surface cap., For this reason, Alternative #2 is favored.

4.3.2.3 Reduction of Toxicity, Mobility, or Volume

The No Action alternative does not result in reducing the toxicity, mobility, or volume of the contaminants present at the Site. Implementing Alternative #3, the Containment Through Surface Capping alternative, would not reduce toxicity or significantly reduce the volume, but would reduce the mobility and ready accessibility of the contaminants. Alternative #2, the Excavation, Onsite Treatment, and Offsite Disposal alternative, would reduce the toxicity, mobility, and volume of the metals and PAH contaminants through onsite soil stabilization prior to land disposal as non-hazardous waste. Accordingly, Alternative #2 is favored in this category.

4.3.2.4 Implementability

All three remedial alternatives evaluated are technologically feasible and easily implemented. However, all three alternatives are not easily implemented administratively, because it would be difficult to obtain the necessary regulatory permits and agency approval to leave COCs in place at a park.

4.3.2.5 Overall Protection of Human Health and the Environment

The No Action alternative would not result in any reduction in the potential risk associated with the metals- and PAH-contaminated soil at the Site, and therefore, the RAOs would not be met. Alternatives #2 and #3 meet the RAOs and are overall protective of human health and generally protective of the environment. Both alternatives also eliminate or significantly reduce potential risks to human health and ecological receptors due to the elimination of the following exposure pathways that contribute the majority of the excess risk:

- Soil ingestion (human health risk)
- Dermal exposure (human health risk), and
- Lead pellet ingestion (ecological hazard).

However, Alternative #2 is favored because it would reduce risk of long-term exposure to the soil contaminants at the Site by removing soil with the greatest impacts, whereas the Containment alternative would only reduce risk by controlling key exposure pathways. Accordingly, Alternative #2 is favored in this category.

4.3.2.6 Cost

Summaries of estimated costs to implement the proposed remedial alternatives for the shallow soil impacted with metals and PAHs are presented in Tables 3 and 4. By definition, the No Action alternative has no associated remedial cost, but it is not feasible because it does not meet the RAOs for the Site. The estimated cost for the Alternative #2 (Excavation, Onsite Treatment, and Offsite Disposal) is approximately $15,240,000, and the estimated cost for Alternative #3 (Containment Through Surface Capping) is $7,225,000. Accordingly, Alternative #3 is favored in this category. Alternative #3 will also cost approximately $10,000 per year for long-term operation and maintenance activities, such as inspections, stormwater sampling and analysis, and detention basin sediment sampling, analysis, and offsite disposal.

4.3.2.7 Agency Acceptance

The Site is dedicated for continued use as a public park. As such, agency acceptance of the No Action is not probable. Alternatives 2 and 3, the Excavation, Onsite Treatment, and Offsite Disposal and Containment Through Surface Capping alternatives, are preferred. However, both alternatives will limit future development of the Site and will require a land use covenant (deed notification/restriction).

4.3.2.8 Community Acceptance

The Site is dedicated for continued use as a public park. As such, community acceptance of the No Action alternative is likely to be low. The Excavation, Onsite Treatment, and Offsite Disposal as well as the Containment Through Surface Capping alternatives are likely to be moderate to moderately high, as they are protective of human health and reduce the overall risk of elevated metals and PAHs from the Site.

4.3.2.9 ARARs

An analysis of ARARs for the remedial alternatives is presented separately in Appendix B.

4.3.3 Recommended Remedial Action Alternative

Based on the comparative evaluation of the alternatives presented above, Alternative #3, Containment Through Surface Capping, is the preferred remedial action alternative for addressing the metals- and PAH-impacted shallow soils throughout the Site. This alternative was selected because it was determined to be effective, implementable, and cost effective as discussed below. In addition, the components of the preferred remedial action alternative are in compliance with the ARARs. The ARARs for the preferred remedial action alternative are summarized in Appendix B.

The short-term effectiveness and implementability of this alternative is high. Potential risks include exposure of onsite workers to elevated metals and PAHs during soil tilling and compaction activities. However, these risks are readily mitigated by the proper use of personal protective equipment, adherence to procedures outlined in the site-specific Health and Safety Plan (HSP), and other engineering controls such as wind screens on Site fences and water sprays to mitigate fugitive dust generated during field activities. Airborne dust monitoring will also be conducted.

The selected remedial action will result in the elimination of mobility of the elevated metals and PAHs in shallow soils at the Site through capping of the contaminated soil. The cap will prevent the accessibility of the contaminated soil by park occupants and prevent the mobility of the contaminated soil by burrowing animals. Trees removed to implement the remedial action will be mitigated by the planting of native tree groves.

The selected alternative is deemed acceptable for long- and short-term effectiveness, and overall is protective of human health and generally protective of the environment. The estimated cost for the Containment Through Surface Capping alternative is $7,225,000 compared to the estimated cost for the Excavation, Onsite Treatment, and Offsite Disposal alternative of

$15,240,000. Therefore, Alternative #3, containment, is more cost effective than the excavation and offsite disposal alternative.

The field procedures and methods that will be used to implement the remedial actions at the Site are described conceptually in this section. Prior to implementation, Construction Plans and Bid Documents will be prepared by the City of Los Angeles to provide detailed procedures and specifications and obtain competitive bids for implementation of the remedies proposed in this RAP.

5.1 PERMITTING

All necessary construction permits or approvals will be obtained prior to the planned remedial activities. The Site is located within the City of Los Angeles. It is anticipated that the following permits will be secured prior to start of construction:

- Grading Permit and Haul Route Approval – Issued by the City of Los Angeles Department of Building and Safety (LADBS)
- Fugitive Dust Rule 403 Permit – Issued by SCAQMD
- Tree Removal Permit – Issued by City of Los Angeles, Bureau of Street Services, Urban Forestry Division
- Storm Water Pollution Prevention Plan (SWPPP) – Notice of intent filed with LARWQCB.

5.2 HEALTH AND SAFETY PLAN (HSP)

A site-specific HSP has been prepared for the Site under the direct supervision of a certified industrial hygienist, and has been included in Appendix C. The HSP has been prepared in accordance with current safety standards as defined by USEPA, the Occupational Safety and Health Administration (OSHA), and the National Institute of Occupational Safety and Health (NIOSH). Additionally, the HSP was prepared in accordance with guidelines set forth in Title 8 of the California Code of Regulations (CCR), Section 5192.

Before initiating the recommended remedial activities, the selected contractor will prepare a HSP consistent with the HSP included in Appendix C. This HSP will be prepared under the direct supervision of the contractor’s corporate health and safety officer or a certified industrial hygienist.

5.3 UTILITY CLEARANCE

A geophysical survey, using non-destructive methods (including a magnetometer, electro-magnetic induction, and ground penetrating radar) will be conducted to help identify subsurface lines and other features/obstructions. Necessary precautions will be taken during grading and excavation activities to ensure that active or potentially active lines identified during the geophysical survey are not damaged or impacted.

All known utility owners of record with subsurface infrastructure (i.e., pipelines) located within the boundary of the Site will be notified during construction plan preparation to precisely identify the type, location, and size of their onsite improvements.

Prior to commencing with remedial activities, Underground Service Alert (USA) will be contacted at least 48 hours in advance to identify the location of utilities that enter the Site. The proposed remedial areas will be clearly marked with white paint or surveyors flagging as required by USA. USA will contact all utility owners of record within the Site vicinity and notify them of our intent to disturb the subsurface. All utility owners of record will be expected to clearly mark the position of their utilities on the ground surface throughout the designated area.

5.4 SITE PREPARATION

Prior to implementing the remedial activities, a temporary 6-foot tall chain-linked fence equipped with wind screen will be installed around the perimeter of the remedial area as shown on Figure 7. For portions of the Site with existing fence, wind screen will be installed on the fence. The fencing will serve two purposes: Site security and dust control.

All trees not designated as protected or heritage trees by the City of Los Angles will be removed by cutting the tree down to its base and either removing the root system in its entirety or grinding it down to a level acceptable for mass grading operations. Fences will be installed around the driplines of the protected and heritage trees, including Area A (the oak grove).

The existing Site ground is currently occupied by burrowing animals (principally gophers and ground squirrels) that have created extensive subsurface networks of tunnels. For all remedial areas other than Area A (the oak grove) and Area E (the rocky outcrop), the upper 18 inches of soil will be tilled and compacted to prevent future settlements of the cap and create a firm foundation for cap installation.

5.5 AREA E (ROCKY OUTCROP) REMEDIATION

Area E represents a rocky outcrop with extensive accumulation of visible lead pellets on the rock surface and shallow soil. Remediation of Area E will include the following activities:

- Prior to grubbing, manually remove readily visible lead pellets with vacuums, rakes, and/or shovels
- Grub the area by removing all short shrubs and seasonal vegetation to expose the underlying surface
- Scour the area and remove remaining visible lead pellets and surficial soil using manual labor equipped with vacuums, rakes, and shovels
- Contain all recovered lead pellets and any associated soil or debris in U.S. Department of Transportation (DOT)-approved drums or roll-off bins for lawful offsite disposal, and
- Profile waste and dispose offsite as non-RCRA California hazardous waste or RCRA hazardous waste, as appropriate.

5.6 CAP AND DRAINAGE SYSTEM INSTALLATION

This section summarizes the major activities associated with installation of the surface cap and the surface water drainage system improvements.

5.6.1 Rough Grading and Excavation for Drainage System/Tree Groves

Prior to rough grading the Site, soil excavation will be conducted to construct utility trenches for the subsurface portion of the drainage system. Soil from the utility trenches will be stockpiled temporarily along the alignment of the trenches and used to backfill the trenches following installation of the drainage pipes. Any excess soil remaining after pipe installation will be included in the rough grading operations.

The Site will be rough graded in accordance with the grading plan (see Figure 8) and the soil will be compacted to approximately 90 percent relative compaction. Following rough grading, the soil will be excavated to a depth of 2 feet bgs within the perimeters of the replacement tree groves. The soil will be stockpiled on plastic sheeting and covered with plastic sheeting, sampled for profiling purposes, and transported offsite, likely as non-RCRA hazardous waste, to an approved facility. The stockpile samples will be analyzed for Title 22 metals by USEPA Method 6010B/7471A, volatile organic compounds (VOCs) by USEPA Method 8260B/5035, and TPH with carbon-chain breakdown (TPHcc) by USEPA Method 8015M, and other analyses deemed necessary by the receiving facility. The estimated volume of excavated soil associated with tree grove replacement is approximately 12,900 cy. The grove excavation areas will be backfilled to approximately 1 foot abovegrade with approximately 19,400 cy of clean imported soil. The imported soil will be tested per the requirements presented in Section 5.6.4.

5.6.2 Cap Construction

For all remedial areas other than Areas A and E, and the protected and replacement tree areas, a 1-foot surface cap will be constructed. From top to bottom, the cap will consist of 4 inches of top soil to support turf growth, 8 inches of aggregate base to provide a wear-resistant foundation layer and to allow drainage, and a layer of steel hardware cloth (with 1-inch square mesh) to prevent burrowing animals from disturbing the cap. Approximately 8,400 cy of clean soil and 16,750 cy of aggregate base will be imported to the Site for construction of the cap. The sprinkler system distribution piping will be installed on top of the hardware cloth placed over the base native soil prior to placement of the aggregate base. In lieu of top soil, asphalt will be installed on top of the aggregate base in the proposed parking area. The surface cap is shown in cross section on Figure 10; in addition, Figure 11 shows the transition from the surface cap areas to the replacement tree groves.

5.6.3 Replacement Tree Groves

To mitigate the loss of trees associated with surface cap installation, approximately 4 acres of replacement tree groves are proposed as shown conceptually in Figure 6. The final design will include sufficient tree grove area to accommodate approximately 200 replacement trees. As noted in Section 5.6.1, areas located within the boundary of the surface cap will be prepared for planting of native tree species as required by the City of Los Angeles. Prior to tree removal, the

City of LA will have a biologist assess the habitat quality of the existing trees and will replace removed trees with an equal or higher quality habitat. The trees will be planted in areas excavated and backfilled with 3 feet of clean soil, i.e., 2 feet of soil to fill the original excavation and 1 foot to match the grade of the surface cap. Consequently, the public will be able to directly access the tree groves due to the removal of exposure pathways.

5.6.4 Testing of Imported Soil and Base

Prior to import to the Site, clean soil and aggregate base will be tested at a minimum frequency of one sample per 1,000 cy. Testing will generally follow the *DTSC Information Advisory, Clean Imported Fill Material* guidance document dated October 2001. Each sample will be analyzed for Title 22 metals by USEPA Method 6010B/7471A, VOCs by USEPA Method 8260B/5035, TPHcc by USEPA Method 8015M, semi-volatile organic compounds (SVOCs) by USEPA Method 8270C, and organochlorine pesticides (OCPs) by USEPA Method 8081A. The test results will be submitted to DTSC for review and approval prior to import.

5.6.5 Drainage System Improvements

Upon completion of the surface cap, the surface portions of the drainage system will be constructed. The drainage system has been designed to control runoff from upslope areas for a 10-year storm event and, thereby, protect the surface cap from erosion. Surface runoff will be captured at the base of the abrupt elevation changes along the perimeter of the surface cap and will also capture runoff on the southern side of Area A (the oak grove).

The remedial project will not alter the historical drainage patterns or significantly impact the rate of stormwater runoff. The portion of the Site north and west of the CPS access road will drain to a belowground conveyance pipe system (two 36-inch reinforced concrete pipes [RCPs]) whose alignment follows the original drainage swale roughly west to east through the northern portion of the Site. Storm drain inlets set flush in the surface cap will promote drainage of the relatively flat areas of the Site. The belowground conveyance pipe will discharge into a detention basin near the eastern property line. The purpose of the detention basin is to capture sediment entrained in the runoff and modulate flow to the offsite drainage channel that drains to the City of Los Angeles' public stormwater system. For a 10-year storm, the peak discharge into the detention basin is approximately 188 cubic feet per second (cfs). The maximum water depth within the detention basin will be approximately 3 feet. The basin will be constructed as part of grading operations and will be grass-lined. The basin will be fenced off and accessible only by maintenance staff.

The portion of the Site south of the CPS access road will continue to drain as surface water flow to the east with little modification. Except for capturing the upslope flow along the western property line, stormwater will sheet flow over the surface cap and drain to the stormwater channel located along the eastern property line.

As shown in Figures 9, 12, 13, and 14, the stormwater drainage system includes the following improvements:

- Two belowground 36-inch RCP drain pipes

- Catch basins and connection pipes
- Perimeter concrete swales (“V-ditch”)
- Perimeter fencing integrated with the concrete swales, and
- Earthen/grass-lined detention basin and outlet structure.

5.7 CONTROL MEASURES

Dust control measures will be implemented during remedial activities. Dust suppression will be performed by lightly spraying or misting the work areas with water. Water mist may also be used on soil placed in transport trucks. Additionally, all vehicles will be cleaned to remove any soil present on their tires prior to leaving the Site.

The Site perimeter will be secured with fencing fitted with windscreen, which reduces the potential for fugitive dust and for unauthorized personnel to enter the remedial areas. While on the Site, all vehicles will maintain slow speeds (i.e., less than 5 miles per hour) for safety purposes and dust control measures.

5.8 AIR MONITORING

Airborne dust monitoring will be conducted using a portable hand-held dust monitor to verify and document dust suppression efforts. As discussed above in Section 5.7, fugitive dust control measures will be implemented at the Site to mitigate offsite dust migration onto neighboring properties through light watering of the active excavation areas throughout the remedial action. Factors considered in providing fugitive dust control measures include wind direction and speed monitoring, dust control, and dust suppression.

Air monitoring for dust will be performed during the remedial activities at the perimeter of the Site utilizing an upwind/downwind sampling approach to ensure compliance with the SCAQMD Rule 403 for fugitive dust control, with a minimum of one upwind and two downwind locations. Dust monitoring will be conducted with continuous real-time particulate dust monitors, which will remain in upwind and downwind locations during all excavation and backfilling activities. The real-time and time weighted average (TWA) readings will be checked by onsite personnel approximately every 15 minutes. In addition, a portable hand-held dust monitor may be used to spot-check particulate levels at various locations at the Site if visible dust is observed, using a hand-held dust meter.

The National Ambient Air Quality Standard (NAAQS) for dust is 50 micrograms per cubic meter ($\mu g/m^3$), based on dust particles measuring 10 micrometers or less (PM10). The NAAQS dust standard (50 $\mu g/m^3$), steady for 5 minutes, has been selected as the action level for dust monitoring activities at the perimeter of the property (difference between upwind and downwind readings). This is also the action level as specified in SCAQMD Rule 403. The action level for dust for the equipment operators and workers will initially be set at 2 milligrams per cubic meter (mg/m^3) steady for 5 minutes. This action level will trigger increased dust suppression activities to mitigate dust levels below 2 mg/m^3. Respiratory protection will be worn by the equipment operators if dust levels exceed 2 mg/m^3 for greater than 5 minutes. Additional dust suppression activities will be applied to reduce dust levels below 2 mg/m^3.

Dust monitoring and visible observations will be conducted to ensure compliance with SCAQMD Rule 403, which requires that dust suppression be adequate to prevent visible dust from crossing the property boundary. Track-out of soil and particulates onto public paved roadways will be controlled, as required by SCAQMD Rule 403, by cleaning vehicle tires before leaving the Site and by providing street sweeping as necessary on adjacent streets.

In accordance with 8 CCR 5192(h) and 8 CCR 1532.1(d), an industrial hygienist will perform quantitative personal monitoring on personnel at greatest risk of lead exposure (i.e., those working in the area of soil grading, excavation, and/or removal). Samples will be collected during disturbance of the most severely lead-impacted areas at the Site first. Personnel will be monitored for inorganic lead in accordance with National Institutes for Occupational Safety and Health (NIOSH) Methods. The method utilizes a sampling pump which is calibrated to draw air at a flowrate of between 1.0 and 4.0 liters per minute. Sample filters will be forwarded via standard chain-of-custody procedures to an American Industrial Hygiene Association-accredited laboratory for analysis. Initial samples will be analyzed on an expedited turnaround basis to obtain lead results as soon as possible. Sampling will continue in highly-impacted areas until the results indicate exposures are below acceptable limits. Results will be reported and records maintained in accordance with Cal/OSHA criteria.

5.9 TRANSPORTATION ROUTE

It is estimated that approximately 2,900 transport truckloads of import material and 890 truckloads of impacted export soil and waste will be needed for implementation of the proposed remedial action. This estimate is based on each truckload weighing up to 23 tons with approximately 66,700 tons of import material (clean soil and aggregate base) and 20,500 tons of impacted export soil that will require offsite disposal at an approved facility. Preliminary truck routes to/from the Site to the nearest freeway for access to source and disposal facilities (to be determined) are presented in the Preliminary Transportation Plan, which is included as Appendix D of this RAP. The transportation plan will be finalized at the time of contract award and approval of the Haul Route by LADBS.

5.10 LONG-TERM OPERATION AND MAINTENANCE

An Operation and Maintenance (O&M) Plan will be prepared to set forth a program of inspection and monitoring to ensure that the selected remedy continues to be protective of human health and generally protective of the environment. The O&M Plan will include detailed procedures and frequencies for monitoring activities, including inspections, stormwater sampling and analysis, and detention basin sediment sampling, analysis, and offsite disposal.

5.11 PROJECT SCHEDULE

A preliminary project schedule is provided as Figure 15. This schedule is subject to change based on the construction funding, schedule, permitting, and regulatory approvals.

5.12 REMEDIAL ACTION COMPLETION REPORT

After the remedial actions are completed, a Remedial Action Completion Report (RACR) will be submitted to DTSC to review and approve.

The RACR will include the following items:

- Site description and background
- A summary of the remedial action activities
- Deviations from the approved RAP (if any)
- Figures showing the tree grove excavation limits and final as-built conditions for the Site
- Analytical laboratory reports for waste profiling and imported fill materials
- Appropriate tables
- Air monitoring data
- Copies of waste manifests and weight tickets, and
- Other applicable information and data.

In addition, the RACR will include a draft Operation & Maintenance Plan (OMP) that will describe the standard operating procedures and maintenance activities that will be employed by the City of LA to ensure that the integrity and the functionality of the surface cap are maintained. The OMP will include the DTSC notification process and proposed mitigation procedures for construction or maintenance work that potentially could expose the underlying impacted soil.

Following implementation of the RAP and review of the RACR, DTSC will provide a letter to the City of LA indicating that "No Further Action" is required if the impacted areas have been adequately addressed in accordance with the approved RAP and the Site is maintained in accordance with the OMP.

Since the Site investigation process began, the City of LA has conducted several public outreach activities for the Site. These activities included an open house to discuss the preliminary environmental investigation, fact sheets, and a website to present regular updates.

Public participation requirements for the RAP process will include preparation of a mailing list, community survey, community profile, community interviews, a public participation plan, a fact sheet, public notice, a 30-day comment period on the RAP document, a response to public comments on the RAP, and distribution of a notice prior to implementation of the RAP. The public participation activities will be conducted by the DTSC.

The California Environmental Quality Act [CEQA; Public Resources Code (PRC), Division 13, Section 21000 et seq.] and implementing Guidelines [Guidelines; CCR Title 14, Division 6, Chapter 3 Section 15000 et seq.] require public agencies to conduct an environmental impact analysis of any project subject to its discretionary approval. Such an analysis is required prior to the agency carrying out or approving the project. The City of LA is the Lead Agency with the responsibility of preparing the CEQA Initial Study and approving the project for implementation, contingent on approval of the RAP by the DTSC.

The CEQA process will be conducted simultaneously with the RAP approval process. The City of Los Angeles has prepared an Initial Study and determined that a Mitigated Negative Declaration (MND) would be required for compliance with CEQA. A Notice of Intent (NOI) will be issued by the City of Los Angeles announcing the availability of a MND for review by the public and government agencies. After a 30-day review period, the City of Los Angles will prepare a response to comments and finalize the MND. Upon approval of the MND by the Board of Recreation and Parks Commissioners of the City of Los Angeles Department of Recreation and Parks, a NOD will be filed with the County Clerk and the 30-day statutory waiting period will begin. If not legally challenged, the NOD represents the final project determination. Upon NOD approval, DTSC can approve the final RAP. In advance of formal NOD approval, DTSC may issue a conditional approval of the RAP contingent on NOD approval. DTSC’s conditional approval may expedite securing project funding and preparation of the Construction Plans and Bid Documents.

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