FINAL
RESPONSE ACTION MEMORANDUM

Kolekole Gulch Park
Honomu, Hawaii
TMK (3) 2-8-015:015

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List of Acronyms and Abbreviations

ARARs	Applicable or Relevant and Appropriate Requirements
bgs	below ground surface
c-EHMP	Project specific construction Environmental Hazard Management Plan
COC	Contaminant of Concern
COPC	Contaminants of Potential Concern
CSM	Conceptual site model
CY	Cubic yard(s)
DU	Decision Unit
HDOT	State of Hawaii Department of Transportation
EAL	Environmental Action Level
EHMP	Environmental Hazard Management Plan
EPA	United States, Environmental Protection Agency
HDOH	State of Hawaii Department of Health
HDOH TGM	State of Hawaii Department of Health Technical Guidance Manual
HEER	Hazardous Evaluation and Emergency Response
Kd	Desorption coefficient (the results of the SPLP test are used to determine the desorption coefficient)
LBP	Lead-Based Paint
mg/kg	Milligram per kilogram
P&R	County of Hawaii Department of Parks and Recreation
QA	Quality Assurance

RAA	Remedial Alternatives Analysis
RCRA	Resource Conservation and Recovery Act
SPLP	Synthetic Precipitation Leaching Procedure
TCLP	Toxicity Characteristic Leaching Procedure
TMK	Tax Map Key
USEPA	United States Environmental Protection Agency

1.0 Introduction

This Final Response Action Memorandum (Final RAM) has been prepared by Kealamahi Pacific Consultants (KPC) and presents the proposed (preferred) remedial alternative selected by the environmental consultant for Kolekole Gulch Park ("the site"). The site is located in Honomu in Hawaii County. The site is accessible from Old Mamalahoa Highway, approximately 12 miles north of Hilo (Figure 1). The Tax Map Key (TMK) is (3) 2-8-015: parcel 015. The County of Hawaii owns the site, and the County of Hawaii Department of Parks and Recreation (P&R) manages the site.

This Final RAM describes the proposed remedial alternatives and the selected final alternative. It also summarizes site information, environmental investigation data, and provides the basis for remediation as well as the rationale for the selected remedial alternative. This Final RAM was developed based on the Remedial Alternative Analysis (RAA) Report from February 2021 and the Draft RAM from October 2021.

1.1 Assessment of the Property

The area of concern is located below the Kolekole Stream Bridge. Lead contamination is present in soils throughout the Kolekole Gulch Park and was confirmed throughout several site investigations conducted in 2016, 2017, and 2019. The site is a public County of Hawaii managed park which is used for camping, recreation, and fishing (Figure 1) and the site is anticipated to remain a public park. Therefore, based on the current plans for future site use, a response action must be implemented to protect human and ecological health and the environment.

1.2 Description of Preferred Remedy

The overall preferred remedial alternatives for the site were recommended by the environmental consultant in coordination with the Hawaii Department of Health (HDOH) Hazard Evaluation and Emergency Response Office (HEER Office) and the Hawaii Department of Transportation (HDOT) after investigating the environmental contamination of the site. Six (6) potential remedies were selected:

1. Recycle or Reuse,
2. Destruction or Detoxification,
3. Separation, Concentration, or Volume Reduction,
4. Immobilization of Hazardous Substances,
5. On-site of Off-site Disposal, Isolation, or Containment, and
6. Institutional Controls or Long-Term Monitoring

The fifth remedial option was selected as the preferred remedy based on recommendations from the site environmental consultant, as well as a review of the site investigation and RAA report. On-site or Off-site Disposal, Isolation, or Containment is a long-term solution where all soil within the open park area that exceeds HDOH Tier 1 Unrestricted Land Use Environmental Action Level of 200 mg/kg for lead will be removed offsite for disposal and will be replaced with clean fill. This will achieve substantial risk reduction, remove the source of contamination, eliminate the need for an environmental hazard management plan (EHMP), and remove the possibility of lead-impacted soil or sediment becoming exposed during future flooding or erosion events.

2.0 Site Location and Description

2.1 Site Description

Kolekole Gulch Park is located in Honomu, Hawaii, approximately 12 miles north of Hilo. The TMK is (3) 2-8-015:015. This beach park is along the Hamakua Coast (Figure 1). It is a City and County of Hawaii park but is operated by the State of Hawaii Department of Transportation (HDOT). The site is an open, level, grassy area bordered by Kolekole Stream to the north and the Pacific Ocean to the east. The site is within the steep-sided Kolekole Gulch. The site is a public park used for camping, general recreation, and fishing.

The affected area (area of concern) within the park is located beneath Kolekole Stream Bridge and extends approximately 300-feet in the mauka (west) direction at Kolekole Beach Park. The Kolekole stream runs northwest and north of the Park. Access to the Park is via Old Mamalahoa Highway.

Figure 1: Site Location Kolekole Gulch Park

2.2 Site Background

Kolekole Stream Bridge was originally part of a railroad in the early 1900s. It was rebuilt in 1950 to be used by cars. Over many years, lead-based paints (LBPs) on the bridge dispersed into the soil below causing contamination. Testing of the paint used on the bridge indicated that its lead content was as high as 14 percent. Lead paint was completely removed from Kolekole Bridge in 2001, eliminating future sources of lead-paint flakes from the bridge.

The park was initially closed in 2016 due to concerns about lead-impacted soil. In February 2020, HDOT sent a letter to the HDOH informing them of their plans to reopen Kolekole Beach Park in March of 2020 under a temporary Interim Measure that would conditionally reopen the park for public use. The interim response measures included the following actions:

- Maintenance of healthy grass cover and placement and maintenance of mulch on all bare soil spots throughout the park to reduce the potential for exposure,
- Installation and maintenance of fencing around the area with the highest lead levels in the surface soil (the top 6 inches) to percent public access to this area,
- Posted signs to notify and caution the public regarding potential lead exposure in soils below grass in the park, and
- Restriction of specific activities by County staff and the public that would risk exposing bare soils including camping, open fires, charcoal barbeques, driving of vehicles on the grass, pounding of stakes into grass, and any digging activities.

The bridge was then restricted again on September 15, 2021, to 4-tons capacity then thereafter HDOT did repairs to upgrade it to 12-tons capacity. HDOT then entered the third phase of repairs, which are ongoing. After the repairs are completed the bridge will be back to an HS-40 loading capacity (Full semi-tractor trailer capable). The Kolekole Park remains closed to the public and is predicted to be closed through the end of 2022.

2.3 Investigation History

Initial soil sampling results show that lead-impacted soils are present in the park under and mauka (west) of the Kolekole Stream Bridge. Lead was found in soils at concentrations exceeding the 200 mg/kg lead screening action level established in Hawaii for unrestricted land use at residential areas and public parks. Some areas were also higher than the United States Environmental Protection Agency (USEPA) screening level of 400 mg/kg for parks. Concentrations above these levels do not necessarily mean there is a health risk but do suggest that additional assessment is needed.

Between 2017 and 2019, additional assessments were conducted at the park. Soil with lead above screening levels was identified in much of the open grassy areas of the park. Lead levels in soil along the stream banks were lower and below screening levels.

The concentrations of lead in the soil in the park are comparable to levels found along busy roadsides in urban areas. In this case, the lead in the soil is likely from historic, lead-based paint used on Kolekole Stream Bridge from 1950-2000. Lead-based paint was commonly used in the past and may have been released to the soil through aging and weathering, as well as past maintenance activities. Accidentally swallowing lead-impacted soil or very small lead-containing paint chips is the primary route of potential exposure in the park.

2.4 Magnitude and Extent of Contamination

The potential for harmful health effects from swallowing the lead impacted soil or lead-containing paint chips depends upon the levels of lead in the soil and paint, how much soil and paint were ingested, and how often.

Lead sample collection was conducted in 2016, 2017, and 2019. Results were compared to the HDOH Tier 1 Environmental Action Levels (EALs) for unrestricted land use (200 mg/kg for lead) (HDOH Fall 2011 revised Fall 2017). During site investigations in 2016, 2017, and 2019, lead-impacted soils were identified within Decision Units (DUs) at the park. A total of 19 lateral DUs were sampled, and only five were found to exceed the HDOH-HEER Unrestricted Land Use (residential land use) EALs for lead greater than 200 mg/kg. Five of the DUs will require actions to be taken to address the identified lead contamination to completely protect human health and the environment. These are DU1, DU2, DU3, DU4, and DU10. All exceed the HDOH-HEER EAL for unrestricted land use of 200 mg/kg for lead in shallow soil horizon (zero to three inches) below ground surface (bgs). DU4 also exceeds construction/trench worker HDOH-HEER EALs (800 mg/kg) at a depth of three to six-inches bgs and will require additional PPE for site workers if digging occurs.

Soil containing lead could potentially pose a health risk to young children who play in the park. Lead can be harmful to children who accidentally eat small amounts of lead-impacted soil or lead-containing paint chips. Lead is more harmful to children than adults because it can accumulate and persist in their bodies. Lead is particularly toxic to the developing brains and neurologic systems of young children.

The screening levels used by the HDOH and the USEPA are designed to protect people using the area. The screening levels assume that areas where children play will be barren and the soil exposed. Fortunately, the impacted soil at the park is covered with thick grass. This helps to minimize contact with the soil and reduces concerns about health risks from periodic use of the park by young children. It is important to continue efforts to make sure that the contact with the soil is minimized.

2.4.1 November 2016 – Initial Sampling Event

In November 2016, the HDOH Hazard Evaluation and Emergency Response Branch (HEER) performed a site investigation of surface soil at Kolekole Gulch Park to evaluate whether historical use of lead-based paints on Kolekole Bridge may have impacted the park. HDOH used an X-ray Fluorescence (XRF) analyzer to screen for lead, arsenic, and mercury in one composite soil sample. A single exposure DU was located directly below Kolekole Bridge and represented the most probable location of the lead-impacted soil.

Sixteen XRF measurements were taken from the combined multi-incremental soil samples and averaged. The average lead concentration was 196 milligrams per kilogram (mg/kg) and the average arsenic concentration was less than 8.7 mg/kg. Mercury was not detected in any of the XRF measurements (HDOH, 2016).

Following this initial screening of soil using an XRF, additional soil assessments were conducted at the site in 2016 and 2017 where soil samples were collected and submitted to a laboratory for analysis. These assessments were submitted in the form of multi-incremental soil samples for the laboratory to analyze for lead concentrations.

The November 2016 multi-increment soil samples were collected from four DUs at a depth of 0 to 3 inches bgs (Figure 2, orange outlined DUs). All DU sample results exceeded 200 mg/kg for lead and varied from 236 mg/kg to 664 mg/kg. The average lead result for the park was 465 mg/kg, exceeding both the HDOH Tier 1 EALs (200mg/kg) and the USEPA preliminary remediation goals screening level of 400 mg/kg for residential levels (HDOH 2017). Results were below HDOH Construction/Trench worker scenario and commercial/industrial land use (800 mg/kg)

2.4.2 May 2017 – Follow-up Sampling Event

In May 2017, a follow-up investigation expanded the area of interest. Sampling was conducted at 16 primary surface soil samples from DUs 7 through 18, Firepit, Swale, Pavilion 7, and a Background (Figure 2, yellow outlined DUs). In addition, two field replicate samples (samples DU-19 and DU-20) were collected from DU-10.

Surface soil samples (0 to 3 inches bgs) were collected from 21 DUs at the site and analyzed for lead. Lead was detected at concentrations ranging from 3.5 to 664 mg/kg. Lead was detected in the surface soils (0 to 3 inches bgs) at concentrations above the HDOH HEER Office EALs for unrestricted land use (200 mg/kg) in seven DUs (DUs 1, 2, 3, 4, 10 Fire Pit, and Swale) (ESI, 2017a, 2017d, 2017e). The Fire Pit and Swale were sub-samples located within DU1 and DU2 respectively.

The highest lead concentration identified during the investigation was identified in DU 2 (664 mg/kg maximum result). To evaluate potential disposal options for this soil (i.e., whether lead concentrations were high enough for the soil to exhibit hazardous waste characteristics), the soil samples found to contain the highest concentrations of lead were also analyzed in accordance with the Resource Conservation and Recovery Act (RCRA) toxicity characteristic leaching procedure (TCLP). TCLP lead concentrations ranged from 0.10 to 0.36 milligrams per liter, which is well below the USEPA RCRA listed hazardous waste characteristic criterion of 5 mg/L for lead.

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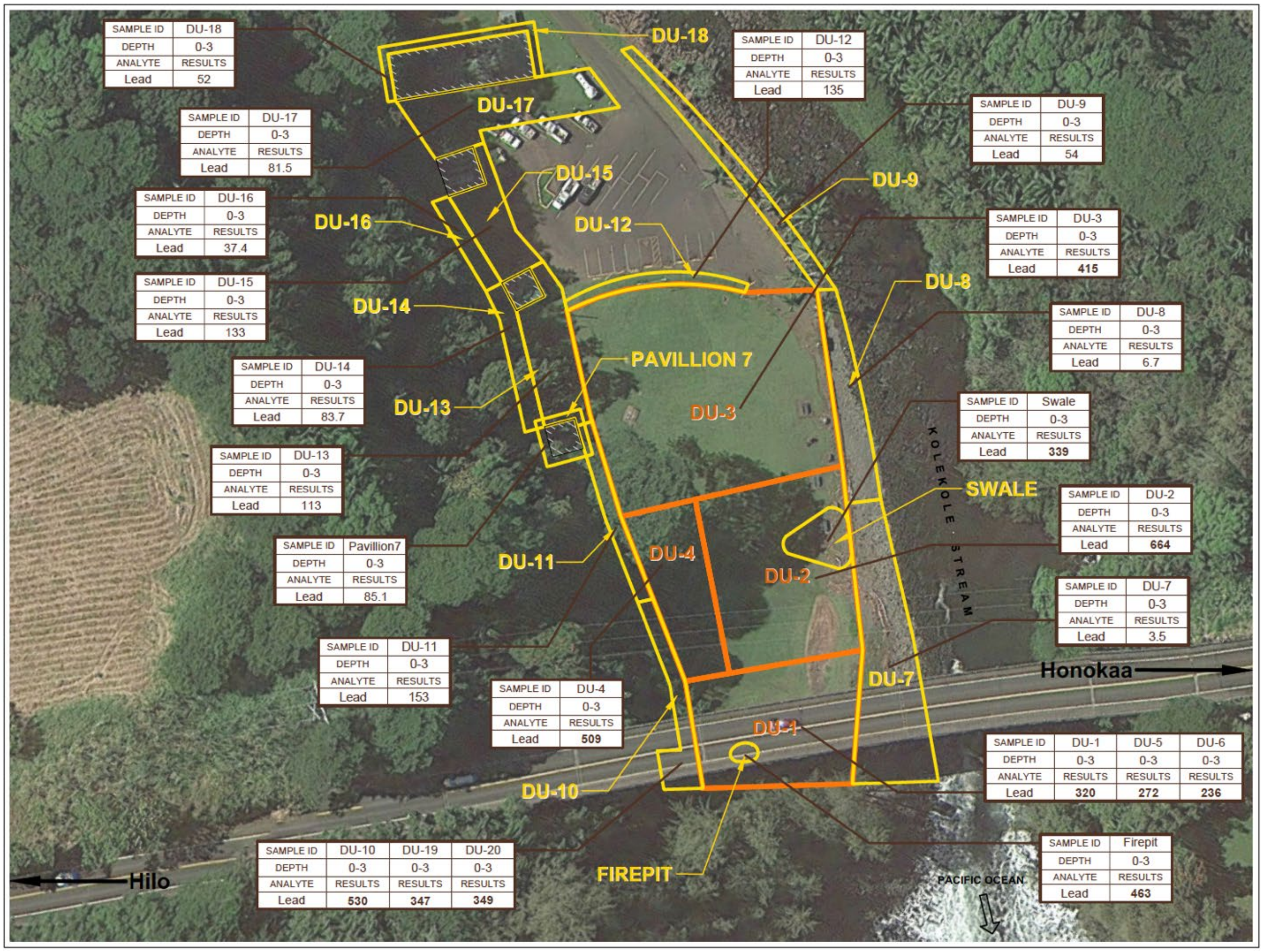
Figure 2: 2017 Sample Results Kolekole Beach Park



2.4.3 November 2018 – Hazardous Materials Survey (Lehua Environmental Inc)

A hazardous materials (HAZMAT) survey was conducted for P&R in November 2018 by Lehua Environmental Inc. (LEI 2019). The HAZMAT survey assessed materials in the pavilions for lead-based/containing paint, asbestos, and arsenic. As part of the HAZMAT survey, a soil assessment conducted adjacent to the structures was also performed to determine if heavy metals from the structures and organochlorine pesticides had impacted the soil around the bathrooms, pavilions, walkways, and parking lot areas.

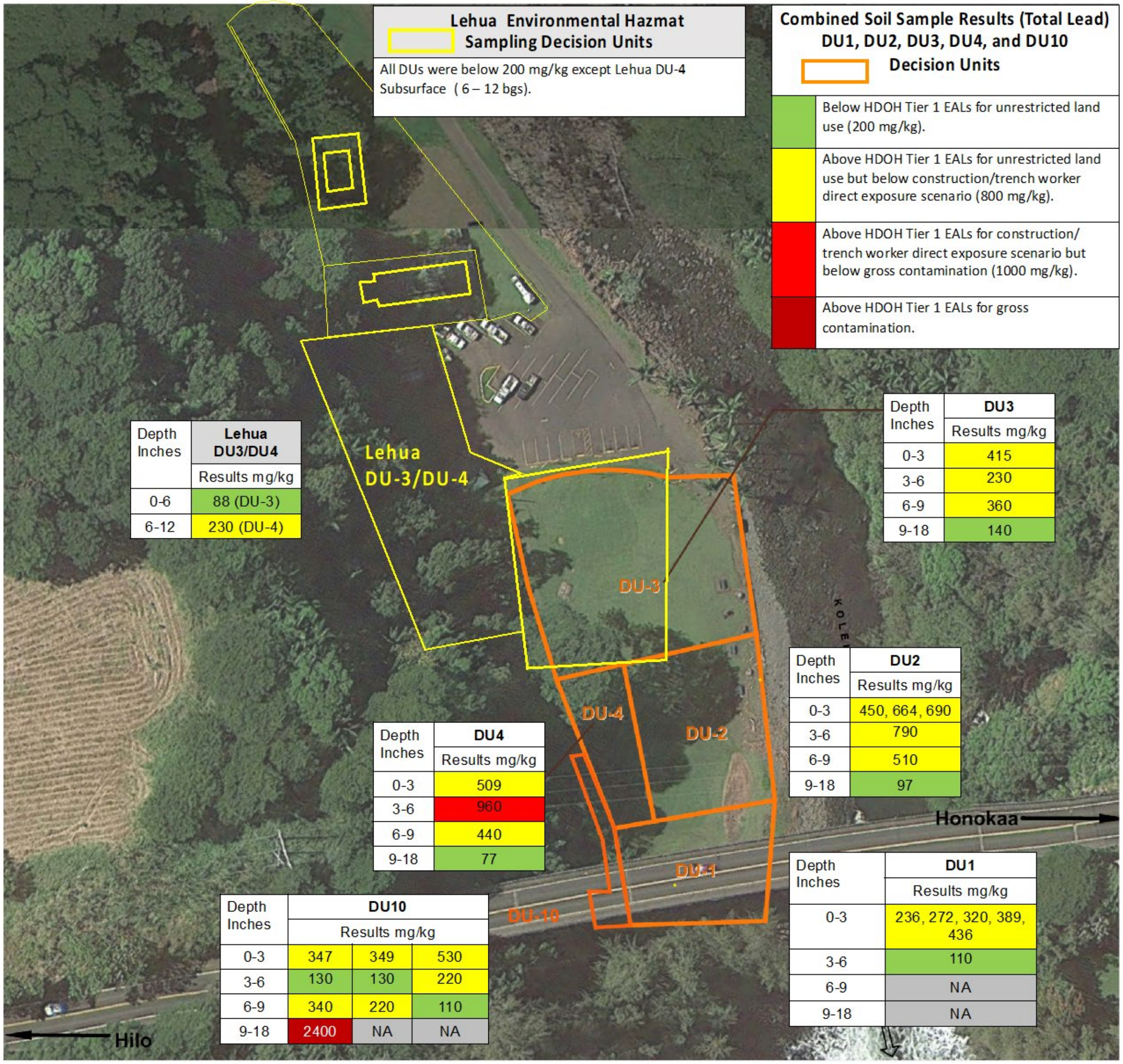
The decision units were created and analyzed separately from the lead assessment associated with Kolekole Bridge. There is duplication in the numbering of the DUs as a result. The results of the LEI HAZMAT investigation are included in the report as additional information; however, the source of the lead is likely due to the paint from the structures themselves, and not the bridge structure due to the distance and decrease in lead concentrations between the two sources.

Only one DU in the HAZMAT survey exceeded the HDOH EAL for unrestricted land use of 200 mg/kg. Lead was found at 230 mg/kg at a depth of 6 to 12 inches bgs (DU-4) on the east slope of the park surrounding Pavilion 2, Pavilion 6, and Pavilion 7. The soil sample results for the top (0 to 6 inches bgs; DU-3), of this same DU, were 88 mg/kg and did not exceed the HDOH EALs for unrestricted land use (Figure 3). The 6-12" DU exceedance is essentially "capped" and is also positioned on a heavily vegetated, steep slope on the eastern side of the valley which limits access.

Lead in this DU location does not pose a completed direct exposure pathway to park users. However, future maintenance activities, such as digging while repairing a waterline, could potentially result in the redistribution of this soil to the surface and completing the exposure pathway to human and ecological receptors. To prevent this from occurring, administrative controls restricting activities that would inadvertently result in exposure to the impacted underlying soil layer would be established in an EHMP managed by P&R. Their EHMP should address procedures to manage soil in this DU during future repair and construction activities on the pavilion structures as part of the P&R's park maintenance program. Since, it is currently not a direct exposure concern, located in a generally difficult area to access, and not likely a result of historical maintenance practice on the bridge, subsurface soil DU described in this Section is not considered further in this document as part of remedial alternatives evaluation and preferred alternative selection.

Previous Kolekole Bridge lead assessments in May 2017 extended to the LEI sample area. LEI DU areas overlap with the earlier May 2017 sample DUs; DU13, DU14, DU15, DU16, and Pavilion 7 (ESI, 2017a, 2017d, 2017e). Surface soils overlaying the sample results (0 to 3 inches bgs) from the May 2017 sampling event were all below 200 mg/kg and are supportive of the results in the LEI HAZMAT survey.

Figure 3: 2018 HAZMAT Survey Sample Results Overlaid with Combined DOT Lead Assessment Investigation Results



Note: Figure presents lead results from 2016, 2017, 2018, and 2019 sampling events.

2.3.4 April 2019 Additional Lead Site Investigation

The earlier 2016 and 2017 sample events were focused on collecting surface samples from 0 to 3 inches bgs, however, site users and construction workers may come into contact with soil at a greater depth. Although the site is currently a county park, additional sampling at greater depths would provide a more complete environmental hazard evaluation assessment of current and future receptors, if for instance the land-use changes, utility trenching is needed, or erosion or vehicular activities expose deeper soils. The HDOH Tier 1 EAL for lead for unrestricted land use (200 mg/kg) was chosen as the conservative screening level for surface and near-surface soils in the park. The HDOH Tier 1 EAL for construction/trench worker scenario (800 mg/kg for lead) is also used to identify areas that could potentially require additional PPE during excavation/ site work if lead-impacted soils were left on-site. The HDOH commercial/industrial Tier 1 EAL for lead is the same as the construction trench worker scenario and is included for future long-range planning should the land-use scenario change.

Lead contaminated surface soil in DU1, DU2, DU3, DU4, DU10, DU Fire Pit, and DU Swale was identified as potential direct exposure hazards in the Kolekole Preliminary Hazard Assessment performed by EQI (EQI, 2017e). Since the DU Fire Pit and DU Swale were smaller DUs, located within a larger DU (DU 1 and DU 2, respectively), and were only identified as DUs based on concerns related to the uppermost surface soil conditions, they were not sampled separately in the 2019 sampling event.

The multi-increment surface soil sample results were compared to the HDOH Tier 1 EALs for where groundwater is a current or potential source of drinking water and the site is less than 150 meters to a surface water body (HDOH Fall 2011 revised Fall 2017).

- At DU1, because refusal was encountered at 6-inches bgs, only soil from the 3-6-inch soil layer was collected at this DU. The underlying substrate below the 6-inch soil layer were basalt pebbles and rocks that were likely rounded in the stream and wave activity in the former stream channel or mouth of Kolekole Stream.
- At DU2, an additional multi-incremental soil sample was collected from the surface soil layer in this DU (0-3 inches) since it was previously demonstrated to have the highest lead concentration, and the 2019 investigation also aimed to evaluate the potential leaching from the soil. This sample was analyzed for total lead using the synthetic precipitation leaching procedure (SPLP) which is based on EPA Method SW846/1312 and those requirements set forth in the latest version of the National Environmental Laboratory Accreditation Committee (NELAC) Quality Systems protocols. The SPLP assists in the determination of the mobility of both organic and inorganic analytes present in liquids, solids, and wastes. Essentially, the results of the SPLP test are used to determine the desorption coefficient (Kd), which is an estimate of how mobile the contaminants of concern are and whether they pose a potential risk to ecological receptors in the vicinity of the park (e.g., vertebrate and invertebrate organisms in Kolekole Stream).

- Replicate samples were collected at DU10 to measure variability in the sampling procedure as part of the quality assurance (QA) procedure described in the project work plan (EQI, 2019). A total of three sets of 50 incremental samples from each soil layer in DU19 were performed. Refusal was also encountered during the primary sample at DU10 in approximately 40 out of 50 of the sampling increments during the 9 to 18-inch bgs sampling layer. Similar frequency of refusal and recovery were encountered during the duplicate and triplicate sampling efforts. The recovered soil from this unit was mostly hard saprolite (weathered basalt) or fragments of basalt pebbles that were collected in the shoe of the sampler (between approximately 9 to 11 inches bgs). Because of poor sample recovery, the sample submitted from the 9 to 18 inches bgs soil layer for analysis was a combination of the primary and replicate samples collected from DU10.

Method SW486 1211/6020, and SPLP lead by EPA Method SW486 1312/6020.

As described above, samples were collected at a series of depths:

- A sample and a duplicate were collected at DU 2 at a depth of 0 to 3 inches.
- Samples were collected at a depth of 3 to 6 inches at all five decision units. A duplicate and triplicate were collected at this depth at DU10.
- Samples were collected at a depth of 6 to 9 inches at four decision units. A duplicate and triplicate were collected at this depth at DU10.
- Samples were collected at a depth of 9 to 18 inches at four decision units.

Figure 4 presents a geospatial depiction of the results of the total lead results for the April 2019 event. Results are presented in Table 1 below including the historical sampling results from 2016 to 2019 and a comparison to the HDOH Tier 1 EALs for each DU and each DU depth layer.

The majority of sample results fell between 200 to 800 mg/kg for lead and would be within the construction/trench worker direct exposure scenario under the HDOH Tier I EALs for lead. However, DU4 at 3 to 6 inches and DU10 at 9 to 18 inches bgs exceeded this standard. The DU10 sample results at 9 to 18 inches bgs were 2,400 mg/kg, more than twice the HDOH Tier 1 EAL for Gross Contamination for total lead.

Samples from DU10 (9 to 18 inches), had a total lead result of 2400 mg/kg and were submitted to the lab for TCLP analysis to determine if the material would be classified as hazardous waste under RCRA, 40 CFR 26. Sample results for DU10 were 1.7 mg/L, below the TCLP regulatory level of 5 mg/L. Soils from this location are not classified as hazardous waste based on these results.

Figure 4: 2019 Vertical Delineation Sampling Results Kolekole Beach Park

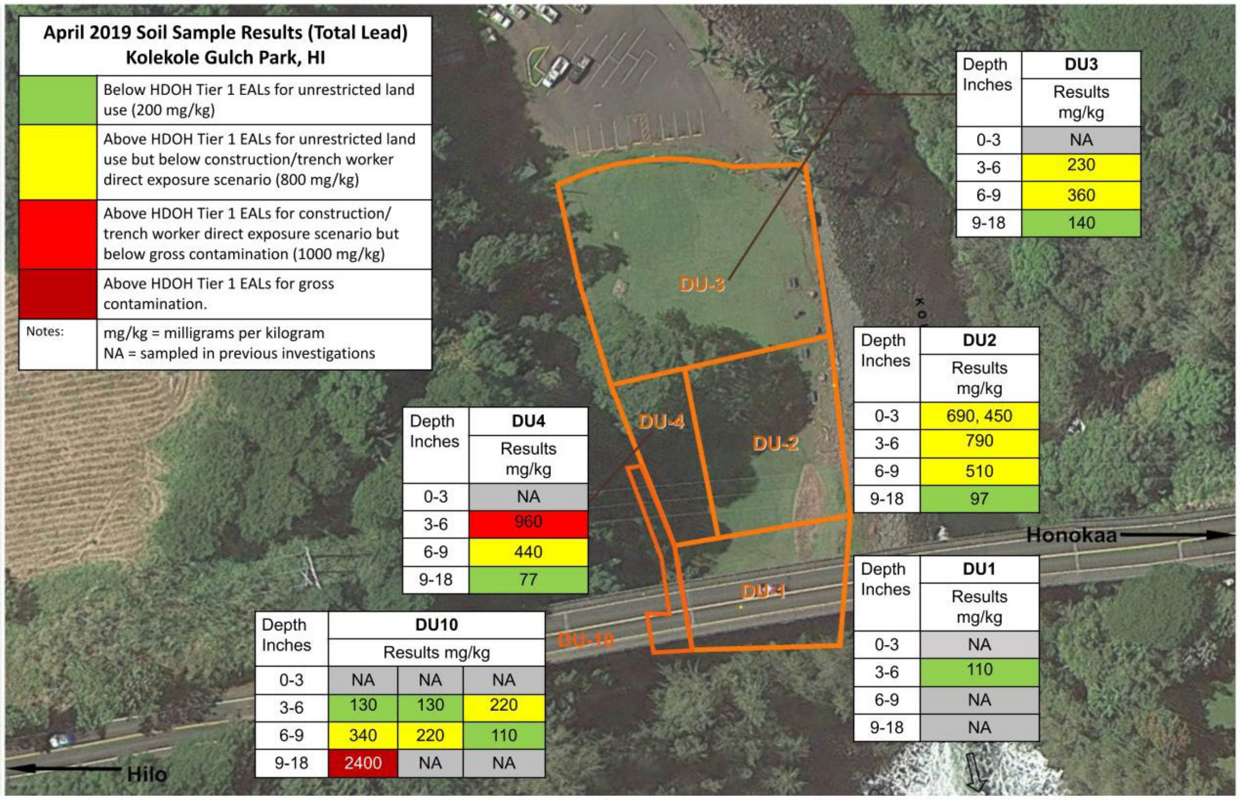


Table 1. Kolekole Gulch Park Soil Sample Results above 200mg/kg for Lead

Depth (inches)	DU1	DU2	DU3	DU4	DU10
0-3 bgs	Commercial/ Industrial 2016/2017: 236, 272, 320, 463 mg/kg	Commercial/ Industrial 2016/2017: 664 mg/kg 2019: 680, 450 mg/kg	Commercial/ Industrial 2016/2017: 415 mg/kg	Commercial/ Industrial 2016/2017: 509 mg/kg	Commercial/ Industrial 2016/2017: 347, 349, 530 mg/kg
3-6 bgs	Unrestricted 2019: 110 mg/kg	Commercial/ Industrial 2019: 790 mg/kg	Commercial/ Industrial 2019: 230 mg/kg	Exceeds Commercial/ Industrial 2019: 960 mg/kg	Commercial/ Industrial 2019: 130, 130, 220 mg/kg
6-9 bgs	NA Refusal	Commercial/ Industrial 2019: 510 mg/kg	Commercial/ Industrial 2019: 360 mg/kg	Commercial/ Industrial 2019: 440 mg/kg	Commercial/ Industrial 2019: 340, 220, 110 mg/kg
9-18 bgs	NA Refusal	Unrestricted 2019: 97 mg/kg	Unrestricted 2019: 140 mg/kg	Unrestricted 2019: 77 mg/kg	Gross Contamination 2019: 2400 mg/kg

**DU10 consists of a sample, duplicate and triplicate. For the purposes of this table, the highest total lead sample result is identified.*
2016/2017/2019: Year Sampled
mg/kg: Total Lead Results

Unrestricted	Below HDOH Tier 1 EALs for unrestricted land use (200 mg/kg)
Commercial/Industrial Scenario Acceptable	Exceeds HDOH Tier 1 EALs for unrestricted land use, below HDOH EALs for construction/trench worker direct exposure (800 mg/kg)
Exceeds Commercial/Industrial Scenario	Exceeds HDOH Tier 1 EALs for construction/trench worker direct exposure (800 mg/kg)
Gross Contamination	Exceeds HDOH EALs for Gross Contamination (1000 mg/kg)
NA	Not sampled

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3.0 Environmental Hazard Evaluation

The Environmental Hazard Evaluation (EHE) process was developed by DOH to respond to site investigation activities in an RAA. The objective of the EHE was to evaluate the existing soil on the site in relation to HDOH current criteria. A Conceptual Site Model (CSM) was developed (Table 2) to examine the potential exposure of human and ecological receptors to lead-contaminated soil at the site.

3.1 Chemicals of Potential Concern

Initial studies performed at Kolekole Beach Park assessed lead, arsenic, organochlorine pesticides, and mercury as contaminants of potential concern (COPC). Sampling identified lead as the sole contaminant of concern (COC). Lead-based paints were used as a corrosion-inhibiting coating on the Kolekole Stream Bridge for decades until completely removed in 2001. During previous analyses, lead was found to exceed the HDOH Tier 1 EALs for unrestricted land use (200 mg/kg). These results were below the HDOH EALs for construction/trench worker direct exposure scenario of 800 mg/kg for lead.

Lead is persistent in the environment and accumulates in soils and sediments through deposition. Once absorbed into the body, lead may be stored for long periods in mineralizing tissue (e.g., teeth, bones, etc.). The stored lead may be released again into the bloodstream, especially in times of calcium stress (e.g., pregnancy, lactation, osteoporosis, etc.) or calcium deficiency.

Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproduction and developmental systems, and the cardiovascular system. Lead exposure also affects the oxygen-carrying capacity of the blood.

The adverse effects of lead most commonly encountered in current populations are neurological effects in children and cardiovascular effects (e.g., high blood pressure, heart disease, etc.) in adults. Infants and young children are especially sensitive to even low levels of lead, which may contribute to behavioral problems, learning deficits, and lowered IQ.

Ecosystems near point sources of lead demonstrate a wide range of adverse effects including losses in biodiversity, changes in community composition, decreased growth and reproductive rates in plants and animals, and neurological effects in vertebrates.

3.2 Exposure Setting

Kolekole is a public, County of Hawaii Park. It is currently closed due to concerns about lead-impacted soil. The site previously served as a park, fishing area, campground, and general recreation site. The area is maintained by landscapers/site workers and construction workers on an as-needed basis.

3.3 Potential Human/Ecological Receptors

A CSM provides a framework regarding potential sources of contamination, types of contaminants, contaminated media, exposure and migration pathways, and receptors. The CSM (Table 2) was used in the preparation of the RRA. Based on the results of document review, the following are identified as potential human receptors:

- On-site construction workers – including personnel involved in repair or construction/ trenching during future site activities; and
- On-site landscapers/site workers – personnel who may maintain landscaped areas and may mow, weed whack, and perform general site maintenance (trash pickup, re-seeding, shrub trimming).
- General Public/Site Users – Including individuals of all ages, who may camp, recreate, or otherwise use the park setting and may potentially dig, touch, drive, lie, or be exposed to lead-impacted soil or dust.
- Ecological Receptors – including native and non-native birds and mammals which may nest, loaf, hunt, or transit across the site.

3.4 Exposure Pathway Analysis

Direct exposure to lead-impacted soil is a potential exposure pathway to human receptors at the site via the following pathways:

- Direct Contact: Incidental ingestion or dermal contact with soil;
- Air: Inhalation of fugitive dust;
- Surface Runoff and Sediment Exposure: Contaminants bourn by water or revealed by erosion; and
- Groundwater Exposure: Contaminants leaching from soil or impacting flowing groundwater.

An exposure assessment was performed for County workers conducting lawn maintenance activities at the Park. Workers wore badges that collected dust as they performed their usual activities. The assessment determined that workers were not exposed to lead dust when conducting regular activities at the park.

3.5 Environmental Hazard Evaluation Summary

The exposure pathway analysis described in the previous section identifies various exposure pathways (direct and indirect) where lead-impacted soil may pose risk to human and ecological receptors. The conceptual site exposure model provides a graphical comparison release mechanism, pathways, and exposure routes to potential current and future receptors at the Site (Table 2).

COPC Sources and Release Mechanisms
The primary source of the COPC at Kolekole Beach Park is lead-impacted surface and subsurface soil from lead-based paint used in historical bridge maintenance activities. Lead-impacted soil present at the site has been shown to exist at concentrations above the HDOH Tier EALs for unrestricted and commercial/industrial land use. The secondary release mechanisms, aside from direct contact with soil, include dust, surface water runoff, and leaching.

Pathways and Exposure Routes
Lead poses a hazard to potential receptors through direct exposure to contaminated media through pathways including surface soil, subsurface soil, ambient air, surface water and sediments, and groundwater. These pathways potentially expose receptors to lead via inhalation, ingestion, or dermal absorption.

Potential Receptors Current and Future Land Use
The main human exposure scenarios identified under current land use as a County of Hawaii beach park are the general public, maintenance workers, and construction works. Since the park is owned by the county and land use is not likely to change, future land use includes these same human exposure scenarios. This is also true for avian and aquatic receptors.

Complete Exposure Pathways
Complete exposure pathways exist for all receptor scenarios exposed to surface and subsurface soil at this site under current and future conditions. Exposure to dust is a complete pathway to on-site maintenance and construction workers when the current grass cover is disturbed and there is a potential for inhalation of dust under dry windy conditions when activities such as land mowing and excavation occur.

Potentially Complete Exposure Pathways
Potentially complete pathways to the general public, terrestrial and aquatic ecological receptors exist via direct exposure to fugitive dust if the grass cover was not maintained or a construction excavation project was conducted at the park and dust controls were not implemented correctly. This potential exposure route could be controlled using proper materials management practices and could limit this exposure pathway. Currently, there is no complete pathway to any receptors via surface water runoff, but again, future construction activities could potentially complete this pathway if not conducted with care. Additionally, if there were a natural disaster such as a tsunami that could scour away the current stream bank and redistribute lead impacted soils in the current park in the Kolekole valley floor sediment and runoff could be a completed exposure pathway.

Exposure to Lead Leaching
There is no complete pathway to current and future receptors via leaching in subsurface soil or groundwater.

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Table 2. Conceptual Site Model (CSM) for Human and Ecological Receptors

Primary Sources	Primary Release Mechanism	Secondary Sources	Secondary Release Mechanism	Pathway	Exposure Route	Potential Receptors							
						Current Land Use				Future Land Use			
						On-site Landscape or Construction Workers	General Public	Terrestrial Ecological	Aquatic Ecological	On-site Landscape or Construction Workers	General Public/	Terrestrial Ecological	Aquatic Ecological
Lead Impacted Soil	Lead-Based Paint from Bridge	Lead Impacted Soil	None	Surface Soil	Ingestion	X	X	X	X	X	X	X	X
					Dermal	X	X	X	X	X	X	X	X
			None	Sub-Surface Soil	Ingestion	X	X	X	X	X	X	X	X
					Dermal	X	X	X	X	X	X	X	X
			Dust	Ambient Air	Inhalation	X	O	O	O	X	O	O	O
			Surface Water Runoff	Surface Water and Sediments	Ingestion	O	O	O	O	O	O	O	O
					Dermal	O	O	O	O	O	O	O	O
			Leaching	Subsurface Soil	Ingestion	I	I	I	I	I	I	I	I
					Dermal	I	I	I	I	I	I	I	I
				Ground- water	Ingestion	I	I	I	I	I	I	I	I
					Dermal	I	I	I	I	I	I	I	I
					Inhalation	I	I	I	I	I	I	I	I

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4.0 Remedial Strategy

4.1 Development of Remedial Action Objectives

The Remedial Action Objectives for Kolekole Beach Park were based on the multiple rounds of soil sample analysis described above to identify the nature and extent of contamination. The objective of the remedial action is to meet the requirements of HDOH and protect the health of users, site workers, and ecological receptors.

4.1.1 Applicable Remedial Action Levels

the HDOT has chosen to implement soil removal and offsite disposal for soil in the open park area which exceeds the HDOH Tier 1 Unrestricted Land Use Environmental Action Level of 200 mg/kg for lead, and replacement with clean fill.

4.1.2 Remedial Action Objectives

The Remedial Action Objectives for Kolekole Beach Park as identified by the site owners and as recommended by the state guidance is to remove the lead-impacted soil which exceeds 200 mg/kg for lead from direct contact with site users, site workers, and potential ecological receptors. This option will achieve substantial risk reduction, remove the source of contamination, eliminate the need for an environmental hazard management plan, and remove the possibility of lead-impacted soil or sediment from becoming exposed during flooding/erosion in the future.

4.2 Estimation of Soil Volumes Needing Remedial Action

A total of 1,265 CY of soils that exceeded the 200 mg/kg lead criteria for soil removal will be removed off-site. This includes approximately 1,150 CY of soil exceeding 200mg/kg and approximately 115 CY of soil exceeding 800 mg/kg (Table 5).

This alternative is recommended because it will achieve substantial risk reduction, removes the source of contamination, eliminates the need for an EHMP, and removes lead-impacted soil or sediment from becoming exposed during flooding/erosion in the future.

4.3 General Response Actions

Actions may include restricting access, fencing, administrative/institutional controls, reducing contact with lead-impacted soil through physical barriers, or removing the source of contamination. The option to remove the source of contamination had an open public comment period and was ultimately chosen as the final remedial action.

4.4 Development of Remedial Alternatives

HDOT operates Kolekole Gulch Park and are responsible for the cleanup. HDOT has coordinated to investigate the environmental contamination at the site and has evaluated six (6) potential remedies. The State of Hawaii Department of Health Technical Guidance Manual (HDOH TGM) (Section 16.2.2.2) and the Hawaii State Contingency Plan [HAR 11-451-8(c)] (HAR, 1995) identifies a hierarchy of remedial response actions in the following descending order:

1. Recycle or Reuse,
2. Destruction or Detoxification,
3. Separation, Concentration, or Volume Reduction,
4. Immobilization of Hazardous Substances,
5. On-site or Off-site Disposal, Isolation, or Containment, and
6. Institutional Controls or Long-Term Monitoring.

5.0 Evaluation of Remedial Action Alternatives

Alternative 1: Recycle or Reuse
The COC is dispersed lead-paint flakes. The lead paint material is not dense enough to be separated from the soil to be recycled or reused. This alternative is not suitable to remove the contaminant from the site or reduce potential exposure pathways.

Alternative 2: Destruction or Detoxification
The lead at the site is also not organic, corrosive, or explosive and is relatively immobile. This alternative is not suitable to remove the contaminant from the site or reduce potential exposure pathways.

Alternative 3: Separation, Concentration, or Volume Reduction
Under this alternative, contaminated material may be completely or partially separated from material that is not contaminated, or contamination may be reduced in a large volume of material by concentrating the contaminant in a smaller volume. Soil particle size separation is conducted to reduce contaminated soil volume, soils at Kolekole and lead paint flakes are not suitable for volume reduction in this form and contamination would not be reduced significantly.

Alternative 4: Immobilization of Hazardous Substances
The lead is not mobile in the environment based upon the TCLP and SPLP results. Binding the metal or reducing bioavailability would not remove the direct exposure pathways. This stabilization would not reduce the risk of direct exposure to lead by current and future park users, maintenance, or construction workers as a stand-alone remedial alternative.

Alternative 5: On-site or off-site disposal, isolation, or containment
This method offers the best option to prevent the general public from coming into contact with lead-impacted soils. Three scenarios were evaluated in the RAA that are proven effective presumptive remedies for addressing lead impacted sites. Generally, if lead-impacted soil remains on-site it will be encapsulated and direct exposure to park users is prevented, however, site maintenance workers/construction workers may come in contact with it in the future. An EHMP will need to be maintained and updated when future work activities are planned in areas where encapsulated contaminated soil is present. A project specific construction EHMP (C-EHMP) will need to be prepared for each future repair and construction activity in order to plan for managing lead impact soil to account for all potentially exposed receptors for the duration of the project. Alternatively, if lead-impacted soil is removed in its entirety from the site as a remedial approach, then all potential exposure risk is removed. This alternative presents the remedial alternatives that reduced or remove contamination from direct contact with receptors at the site.

5a: On-site isolation and containment
HDOH and USEPA acceptable mitigation measures include soil encapsulation. During soil encapsulation, DUs which exceed HDOH unrestricted land use EALs for lead (DU1, DU2, DU3, DU4, and DU10) would first be covered with orange mirafi (geotextile) or black geotextile with caution tape laid at intervals to produce a visible barrier between the clean and impacted soils. Confirmation sampling will be conducted to ensure that all targeted soil is covered. Clean fill would then be brought in and overlaid across the impacted site at a depth of 24 inches and grass would be maintained to prevent potential exposure. An additional 300 cubic yards of clean soil would also be needed for drainage and grading.

Archeological consultation and monitoring would be required during the excavation (approximately one week). As the lead-impacted soil would remain on-site, an EHMP would still be needed. The soil cap would require an annual inspection and the report must be submitted to HDOH.

Annual operation and maintenance costs are not expected to be high for this alternative and would likely fit in with the parks current budget. The primary maintenance item would be cutting grass and addressing any erosional issues to the grass cover over the new layer of imported soil.

5b: Removal of all soil which exceeds 200 mg/kg for lead and replacement with clean fill
DUs which exceed HDOH Tier I unrestricted land use EALs for lead (DU1, DU2, DU3, DU4, and DU10) will be excavated, hauled to West Hawaii Sanitary Landfill, and replaced with clean fill at to a design fill depth of 24 inches.

Confirmation sampling will be conducted to ensure that all targeted soil is removed. All DUs would be excavated in 6-inch lifts until confirmation samples indicated that soil concentrations were below the HDOH EAL for unrestricted land use (200 mg/kg).

Clean fill would then be brought in and overlaid across the impacted site at a depth of 24 inches and grass would be maintained to prevent potential exposure. This alternative also includes an additional 300 cubic yards of clean soil for drainage grading.

An archaeological consultation and monitoring would be required during the excavation (approximately four weeks). The lead-impacted soil would be removed, therefore an EHMP will not be needed.

Annual operation and maintenance costs are not expected to be high for this alternative and would likely fit in with the parks current budget. The primary maintenance item would be cutting grass and addressing any erosional issues to the grass cover over the new layer of imported soil.

5c: Removal of soil that exceeds 800 mg/kg for lead, containment, and replacement with clean fill.

DU 4 and DU10 exceed the HDOH EALs for the construction/trench worker exposure for lead (800 mg/kg). Soil from these DUs will be removed. Confirmation sampling will be conducted to ensure that all targeted soil is removed. The soil will be replaced with clean fill at an estimated fill depth of 24 inches.

DU1, DU2, and DU3 exceed the HDOH EALs for unrestricted land use for lead (200 mg/kg). These DUs would first be covered with orange mirafi (geotextile) or black geotextile with caution tape laid at intervals to produce a visible barrier between the clean and impacted soils. Clean fill would then be brought in and overlaid across these DUs at a depth of 24 inches and grass will be maintained to prevent potential exposure.

An additional 300 cubic yards of clean soil would also be needed for drainage and grading.

Archaeological consultation and monitoring would be required during the excavation (approximately five weeks). A portion of the lead-impacted soil would remain on-site, therefore an EHMP will be needed.

Annual operation and maintenance costs are not expected to be high for this alternative and would probably fit in with the park's current budget. The primary maintenance item would be cutting grass and addressing any erosional issues to the grass cover over the new layer of imported soil.

Alternative 6: Institutional Controls or Long-term Monitoring

This option removes harm to the public but does not remove or reduce the impacts from the site. This option also removes the use-value from the site.

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6.0 Proposed Remedy

Based on recommendations from the site environmental consultant, as well as a review of the site investigation and remedial alternatives reports, HDOT has tentatively selected Option 5b as the long-term solution.

Specifically, the HDOT has chosen to implement soil removal and offsite disposal of all soil in the open park area which exceeds HDOH Tier 1 Unrestricted Land Use Environmental Action Level of 200 mg/kg for lead, and replacement with clean fill. This option will achieve substantial risk reduction, remove the source of contamination, eliminate the need for an environmental hazard management plan, and remove the possibility of lead-impacted soil or sediment from becoming exposed during flooding/erosion in the future.

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Table 3: Alternatives Analysis - Protectiveness

	5a. On-site isolation and containment	5b. Removal of all soil which exceeds 200 mg/kg for lead and replacement with clean fill	5c. Removal of all soil which exceeds 800 mg/kg for lead, containment, and replacement with clean fill
Is Lead-Impacted Soil Still Present?	Yes	No	Partial
Direct Contact Does the site have a complete exposure pathway for the following users under the scenario?			
Public	No	No	No
Construction/ Trench Workers	Potential	No	No: Lead is below direct exposure for construction/trench worker scenario
Site Workers (Landscapers)	Potential	No	No
Ecological Receptors	Potential	No	Potential: Unlikely
Air Exposure Does the site have a complete exposure pathway for the following users under the scenario?			
Public	No	No	No
Construction/ Trench Workers	No	No	Potential
Site Workers (Landscapers)	Potential	No	No
Ecological Receptors	Potential	No	No
Surface Water Runoff (Sediment) in River Does the site have a complete exposure pathway for the following users under the scenario?			
Public	Potential	No	No
Construction/ Trench Workers	No	No	No
Site Workers (Landscapers)	Potential	No	No
Ecological Receptors	Potential	No	No

Table 4: Reduction of Toxicity, Mobility, and Volume through Treatment Comparison

5a. On-site isolation and containment	5b. Removal of all soil which exceeds 200 mg/kg for lead and replacement with clean fill	5c. Removal of all soil which exceeds 800 mg/kg for lead, containment, and replacement with clean fill
Toxicity: Reduced but potentially present. Contaminants are still present for construction/trench workers.	**Toxicity**: Eliminated	**Toxicity**: Reduced.
Mobility: Contaminant is potentially mobile during extensive erosion and damaging storms.	**Mobility**: Eliminated Contamination is no longer present.	**Mobility**: Reduced but potentially mobile during extensive erosion.
Volume: No reduction in volume of contaminant	**Volume**: Eliminated: all contaminant removed.	**Volume**: Reduced – all soil above 800 mg/kg removed

6.1 Long-Term and Short-Term Effectiveness

Alternative 5a: Offers short-term effectiveness. The Kolekole Beach Park reopens without soil removal disposal costs. Site work is still needed in terms of applying mirafi, soil, and re-vegetation/stabilization of the site. The park is located in an area that can experience torrential rains and associated flooding, increasing the potential for long-term exposure risks. The site will need to be maintained to ensure that the containment soil cap is not breached.

Alternative 5b: Repairs to the site will take longer, and the park will not open as quickly as under scenarios 5a, 6a, and 6b. This alternative has long-term effectiveness. Sitework will include scraping soil, disposing of soils (potentially off-island), laying clean soil, and stabilization. All work will be completed, and additional work is not anticipated. The source should be removed from direct contact for all users. An EHMP will not be needed for the affected area of the park under this alternative. Construction and Landscaping crews would not require additional PPE while working in these DUs. A caveat is that while all of the lead-based paint from Kolekole Bridge will be addressed under this alternative, other sources may be present in the park, and areas outside of the DUs that may need soil testing.

Alternative 5c: Repairs to the site will offer long-term effectiveness. Site work will take as long as alternative 5a but less than 5b and will require additional materials (mirafi). Soil disposal costs and soil disposal work will be lower than alternative 5b. Sitework will include scraping soil, disposing of soils (on-island), applying mirafi, laying clean soil, and stabilization. An EHMP will also be required as lead-impacted soil will remain on-site. The removal of soils with total lead greater than 800 mg/kg will mean that construction/trench workers will not require additional PPE while working on the site. Similar to Option 5b, lead impacted soil from the bridge paint source will be removed, but other sources of lead in the park, potentially from structures or fuel spills, may be present and require soil testing/removal.

6.2 Implementability

Alternative 5a is implementable using equipment and supplies from Hawaii County or shipped to Hawaii County. This alternative will require excavators, work crews, clean fill (from Hawaii County), and EHMP document production.

Alternatives 5b and 5c are implementable using equipment and supplies from Hawaii County or shipped to Hawaii County. However, both alternatives require soil disposal. These alternatives will require excavators, work crews, topsoil, and clean fill (from Hawaii County. Alternative 5c will also require EHMP document production. The source of the topsoil and clean fill will need to be documented that the source is free of chemical and biological contamination (e.g., chlordane, little fire ants, etc.).

6.3 Estimated Costs

Table 5: Cost Summary Table

	5a. On-site isolation and containment	5b. Removal of all soil which exceeds 200 mg/kg for lead and replacement with clean fill	5c. Removal of all soil which exceeds 800 mg/kg for lead, containment, and replacement with clean fill
Planning Costs	Yes $ 41,517	Yes $ 41,517	Yes $ 41,517
EHMP Needed	Yes	No	Yes
Soil Removal and Replace	No	Yes, Approx.1150 CY	Yes, Approx. 115 CY
300 additional CY clean soil for drainage grading.	Yes	Yes	Yes
Archeological consultation and monitoring	Yes: 1 week	Yes: 4 weeks	Yes: 5 weeks
Mirafi/ Geotextile defined boundary	Yes	No	Yes
Soil Cap: Thickness Alternatives			
Total Cost including 24 inches soil cover	$1,143,252	$1,285,575	$1,335,229
Total Cost including 18 inches soil cover	$985,264	$1,285,575	$1,214,740
O&M Cost -30 years	$102,375	0	$102,375

Notes:

1) A standard three (3) percent (%) escalation factor per year should be considered when estimating the cost. Current rates present remedial alternative cost in 2022 dollars.
2) These are rough order of magnitude budgetary estimates (+50%/-30 % level of accuracy).
3) There is no cost difference between 18-inch and 24-inch soil cover cost for Alternative 5b. This remedy does not require any additional soil cover beyond the soil needed to replace the volume removed.

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7.0 Final Remedy Selected

The final remedy selected is the proposed remedy: alternative 5b which is the removal of all soil which exceeds 200 mg/kg for lead and replacement with clean fill. This is the final remedy selected because it will achieve substantial risk reduction, remove the source of contamination, eliminate the need for an EHMP, and remove lead-impacted soil or sediment from becoming exposed during flooding/erosion in the future.

This remedy is cost-effective since it offers a permanent reduction of toxicity, mobility, and completely reduces the volume of contamination at the site. It provides the most long-term effectiveness, and the park will not need additional controls. Moreover, the park can be opened for use by the public, site workers, and construction/trench workers with no additional monitoring or maintenance stipulations.

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8.0 Responsiveness Summary (specific responses to public comments)

The public comment period on the proposed remedial action described in the Draft RAM was accepted during the 30-day public comment period from November 01, 2021, to November 30, 2021. There were no written comments received, only comments submitted via email which are included in Table 6 below.

A public notice including the accessibility of the Draft RAM, contact information, and commenting period was published in the Hilo Tribune-Herald and West Hawaii Today on November 01, 2021. This public notice was also posted at the Honomu Post Office, the Honomu Transfer Station, the Akiko Matsuda Bed and Breakfast, and the Hakala Farmers Market/Food Swap. The Draft RAM was available to the public through the HDOH HEER Office website (http://hawaii.gov/doh/heer) during the public comment period and physical copies were available at the Akiko Matsuda Bed and Breakfast and Hakalau Farmers Market and Food Swap.

Table 6: Public Comments Submitted During Public Comment Phase

Public Comment	Response
Aloha Mr. Gilmore, I understand from Heather Kimball that you are looking for ideas on how to clean up the lead contaminated soil at Kolekole Park. Perhaps we qualify for a federal EPA grant that would help fund this. https://www.epa.gov/cleanups/cleanup-grants-and-funding	Thank you for the suggestion. We may conduct this cleanup with funding support from the Federal Government (e.g., Federal Highway Administration). The funding source has not been officially determined at this point. We have identified an approach for conducting the remedial action as outlined in the Remedial Alternative Analysis for Kolekole Beach Park.
Aloha, I'm writing to submit a public comment regarding the lead remediation of Kolekole Beach Park. I'm curious if phytoremediation/ bioremediation techniques have been looked at, either as an alternative to or an augment of the proposed plan to remove contaminated soil from the site? I will admit I am not an expert on the subject but in essence the area is seeded with plants that uptake large amounts of contaminates through the roots and is collected in the leaves and stalks to be harvested by humans for proper disposal (Indian Mustard is particularly good for lead from what I've read). There are also certain bacterial enzymes that can be used to treat the area but I am unfamiliar with them. There are some other steps involved, and safety measures would have to be taken to ensure humans and animals do not	Thank you for the bioremediation suggestion. Bioremediation was not one of the remedial alternatives that was evaluated in our Remedial Alternative Analysis. This is an idea that has been brought up and discussed as a result of your comment. There are several concerns with bioremediation approach to address the lead contamination at Kolekole Beach Park as follows: 1)There is a concern introducing a non-native species as it could have invasive qualities if were to become established and turn into a nuisance plant. 2) The efficacy of bioremediation to uptake lead in soil. It is difficult to estimate the rate of uptake and that uncertainty makes it difficult to determine when the park would be cleaned up via bioremediation. It could take decades to

eat the contaminated plants. I believe this could be done somewhat simply by covering the planting areas with screened archways similar to portable chickencoops (example picture attached) to prevent animals from eating the plants and hopefully prevent the plants from spreading wild (I'm assuming Indian Mustard is non-native to Hawaii). If soil collection is still the preferred method, I think bioremediation should be looked at as a means to collect and dispose of what little is left at the site post soil removal	reduce the concentrations below the project specific cleanup level. 3) There is likely to be considerable cost associated with fertilizing, harvesting, and disposing of the plants used to conduct the bioremediation. 4) Bioremediation activities would likely impact park users and delay the full use of the park until the point when/if the project specific cleanup level was reached.
Here's an idea idk if it makes any sense. But maybe could set up an incinerator to burn the soil and sand and lead contaminated debris and burn it basically to remove the lead or melt it melt the lead and separate it from the rest of the soil a machine that can filter dirt soil and sand and is hot enough to sanitize the soil or clean out the lead from the dirt or burn the lead and separate it from the soil and take the leftover burnt soil that's cleaned and mix it with fresh white sand from Hapuna or some white sandy beach or some sign from a beach that's not polluted and run like a process where you can clean out the old soil run it through the incinerator burn it have it come out clean separated into a different pile or area and then as you clean the as you start cleaning out all the soil then you start replacing it with the clean sand on the burnt the clean sound on the burnt clean old soil together that way you're taking out all the pollution and replacing it with a healthier alternative and hopes that in time it will lessen not sure if that makes any sense but figured I'd give it a shot.	Thank you for this suggestion, it has been acknowledged. However, at this time we will be moving forward with the preferred alternative that has been identified in the Remedial Alternative Analysis.
Aloha Mr. Gilmore. I live near Kolekole Park and was so sad, but then in a way, happy to see the park closed for a while. There were rumors going around the neighborhood that the park had closed because of the permanent encampments that some had made and the complaints about them, possibly. I also heard rumors about the rude and repulsive behavior of some that had decided to live there. I experienced firsthand	Thank you for taking the time to comment on this issue. We can forward this on to HDOT can defer these types of issues if necessary to the County of Hawaii Dept. of Parks & Recreation who owns the facilities less the area located directly under Kolekole Bridge and can hopefully address it when the park reopens to the public.

some of them who had made visiting the park very uncomfortable and I began to simply stay away. It was very sad as I and many around here love walking there. Also, a gentleman who is building his home outside the entrance, had his container of building supplies broken into several times. Since the park has closed most of those elements seem to have disappeared. So that's been a blessing, possibly even more important than the removal of the lead!! I guess my point is, I love having the park open to all those who would have respect for the park and other visitors. I dread thinking of the park returning to the previous state where we just stay away as so many of us really enjoy it. I'm thinking it may be beneficial to keep the park closed at night unless campers get a permit and have someone monitor their comings and goings and night closures.	
I am from and currently reside in the district of Puna on Hawai'i island. I am certified in Korean Natural Farming. And have been part of a hui of farmers utilizing KNF in our farming practices. We make locally sourced inputs. And collect, cultivate and apply IMO's (Indigenous Micro Organisms) for/to contaminated soils on the Ag lands we lease or own. Soils testing done over the last decade plus, revealed a long list of dangerous toxins in the soils like lead, agent orange, paraquat, etc. Soil testing also revealed within 1-3years soil tested clean and certified organic farming from implemented/applying IMO's and planting plants & trees to absorb toxins deep in the soil through their root systems. Further finding concluded by combining Permaculture/Agroforestry, KNF, Native Plants helped speed up the process of cleaning contaminated soils. Therefore, by applying IMO's & planting plants and trees etc. at Kolekole will help clean up All the pollutants in the soils there with 1-3 years. Also, the contaminated top layer of soil that was removed can be cleaned too with just IMO application	Thank you for this suggestion, it has been acknowledged. However, at this time we will be moving forward with the preferred alternative that has been identified in the Remedial Alternative Analysis.

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