DRAFT
ENVIRONMENTAL IMPACT STATEMENT

NEW KAUA‘I LANDFILL
MA‘ALO, KAUA‘I, HAWAI‘I

Prepared for:

County of Kaua‘i
Department of Public Works
Solid Waste Division
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EXECUTIVE SUMMARY

The County of Kaua'i (County) proposes to develop and operate a new municipal solid waste landfill (MSWLF) at Ma'alo, on the Island of Kaua'i, Hawai'i. The proposed action (project) includes the construction and operation of a new MSWLF, a 2.8-mile access road, and associated support infrastructure. See Figure ES-1. The MSWLF site is approximately 4 miles north of Līhu'e, east of Ma'alo Road, mauka (west) of Kālepa Ridge and Kūhiō Highway, and more than 1 mile inland from the Pacific Ocean. The proposed MSWLF site is owned by the State of Hawai'i and on Tax Map Key (TMK) (4) 3 9 002: 020.

![Figure ES 1: Project Location Map for New MSWLF Site, Access Route E3, and Utility Corridor, Ma'alo, Island of Kaua'i](image)

The purpose of the new MSWLF is to ensure that island-wide landfill facility needs are met when Kauai’s only permitted landfill, Kekaha MSWLF, reaches capacity in approximately 10 to 12 years (County of Kauai, based on projected remaining capacity). Because of the years needed to for the planning, design, and permitting of a new MSWLF, action is needed now to avoid risks to public health and safety and inappropriate financial management that would occur without a permitted MSWLF on island.

This Draft Environmental Impact Statement (DEIS) was prepared by the County Department of Public Works (DPW) in accordance with Hawai'i Revised Statutes (HRS) Chapter 343 and its implementing rules, Hawai'i Administrative Rules (HAR) Title 11 Chapter 200. Compliance under HRS Chapter 343 is required as the proposed action involves the use of County funds and State land, and a landfill. The accepting agency is the Office of the Mayor of Kaua'i, as delegated by the Governor.
Project Background and History. The County’s sole operating MSWLF in Kekaha is currently approaching its design capacity. Important decision factors for the development of a new MSWLF site on Kaua‘i were identified and analyzed, including landowner willingness to allow use of the site for a landfill, high value agricultural sites, sustainability, and proximity of the site to Kaua‘i’s waste generation centroid. The site selection process for a new MSWLF was initiated in 2000 and has involved the following studies and evaluations:

- Kaua‘i MSWLF Siting Studies 2001/2002
- Mayor’s Advisory Committee on Landfill Site Selection 2009
- County of Kaua‘i Integrated Solid Waste Management Plan 2009
- Community Criteria Evaluation (CCE) 2012
- Kaua‘i Landfill Siting Study Report, July 2012
- New Kaua‘i Landfill Traffic and Roadways Engineering Feasibility Study (TREFS), April 2014/November 2016
- Conceptual Design Report, Municipal Solid Waste Landfill and Resource Recovery Park at Ma‘alo, August 2014
- Alternatives Analysis, Proposed New Kaua‘i Landfill and Resource Recovery Park Ma‘alo 2017

PROPOSED ACTION

The proposed action and the subject of this EIS document is the development and operation of a new MSWLF on a 270-acre site at Ma‘alo in the southeast part of the island of Kaua‘i. The proposed action includes construction and operation of: (1) a new MSWLF and (2) a new 2.8 mile off-site access road and utility infrastructure to support the landfill. When construction is completed and operations begin, the Ma‘alo MSWLF will provide for the proper disposal of island-generated MSW that cannot be further reused, recycled, or otherwise recovered; provide for the practical, reliable and safe disposal of MSW generated on Kaua‘i; and replace the MSWLF provided at Kekaha. The proposed action will avert significant health, social, and economic problems that would result without a permitted facility for the safe, sanitary, and efficient disposal of Kaua‘i’s MSW.

The new MSWLF will meet all applicable requirements of the Resource Conservation and Recovery Act (RCRA) Federal Regulations Subtitle D, which includes regulations on leachate and gas collection, landfill location, facility design standards, operating requirements, groundwater monitoring and corrective action, closure and post-closure care, and financial assurance. The regulations governing location prevent the siting of a MSWLF near airport runways or in ecologically or geographically sensitive areas (e.g., flood plains, fault lines, seismic zones, and unstable terrain). Operating requirements prohibit hazardous waste and include applying daily cover, controlling disease vector populations, monitoring methane gas, restricting public access, controlling storm water runoff, protecting surface water, and keeping appropriate records.

Cost Estimates. Detailed cost estimates are provided for developing Phase 1A of the MSWLF. Estimated construction costs are summarized in Table ES-1.

<table>
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<th>Components</th>
<th>MSWLF</th>
<th>Access Roads and Utilities*</th>
<th>Total</th>
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<td>$17,321,000</td>
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* Access roads and utilities costs are from the Traffic and Roadways Engineering Feasibility Study (AECOM 2016; Appendix F): Project Access Route E3 (Kaua‘i Beach Drive).

ALTERNATIVES TO THE PROPOSED PROJECT

The County considered a range of reasonable alternatives to address its island-wide MSWLF needs. The alternatives considered include:
• No Action: This alternative involves taking no further action to develop an alternative site or technology for the disposal of MSW. The Kekaha MSWLF would reach capacity in approximately 10 to 12 years and the process to close the Kekaha MSWLF would be initiated which would leave the County without a viable means of disposal of MSW. No Action fails to meet the County’s purpose, need, and objectives for the handling of MSW. Rather, it serves as a baseline from which to measure the effects of all other alternatives.

• Alternative Locations for a New MSWLF: This alternative involves establishing a new MSWLF at an alternative site on Kaua‘i identified in previous County landfill siting studies. Eight potential sites were identified for consideration in the 2012 Siting Study (AECOM 2012).
  - Kekaha Mauka
  - Kīpū
  - Kālepa
  - Kōloa
  - Kumukumu
  - Ma‘alo
  - Pu‘u Papa‘i
  - ‘Umi

The County evaluated each of the eight sites, weighing the pros and cons of the various site rankings, important decision making criteria, and other measures presented in the 2012 Siting Study. While all eight potential MSWLF sites are feasible for the County’s new MSWLF, the proposed project site at Ma‘alo is considered the most practicable and viable alternative.

The Ma‘alo site was determined to be a long-term solution for the County’s waste disposal needs. The Ma‘alo site has an estimated site life of 264 years and is the only site identified that currently has a potentially willing landowner. It is also the most economical site over the life of the landfill, ranks very well in the Community Criteria Evaluation (CCE) system, and it is located within Kaua‘i’s waste generation centroid (which will save costs and fuel, result in less waste-related traffic, and have positive sustainability effects).

• Alternative Technologies and Other Methods: This includes a summary of alternative technologies and other methods to process the County’s MSW stream. Alternative Technologies and Other Methods would not be capable of processing the County’s entire MSW stream and therefore fails to meet the County’s purpose, need, and objectives.

**SUMMARY OF POTENTIAL PROJECT EFFECTS AND MITIGATION MEASURES**

**PHYSICAL AND BIOLOGICAL ENVIRONMENT**

*Climatic and Green House Gases (GHGs).* The proposed project would not significantly impact the levels of GHGs affecting climate of the project area or region. A preliminary analysis of GHGs associated with the proposed project indicate a nonmethane organic compound (NMOG) emission rate for the proposed MSWLF indicates NMOG emissions for Phase 1 may exceed 50 megagrams (Mg) per year (Mg/yr) during the 4th year of waste acceptance and may reach a peak mass emission rate of 304 Mg/yr during the final year of Phase 1 operations of the MSWLF. This would be equivalent to 0.0000000004 percent of the State of Hawai‘i 2020 emissions goal level at 50 Mg, and 0.0000000022 percent at 304 Mg.

While the proposed scope and scale of the project are not sufficient by itself to significantly influence the climate, landfill emissions would contribute to the cumulative levels of GHGs, such as methane and carbon dioxide. Methane, carbon dioxide, and non-methane organic compounds are some of the
landfill gas (LFG) constituents. LFG would be mitigated through the use of an active gas collection and control system, where it can be: vented, if it is determined to be safe to do so based on regular air quality monitoring; flared, which would destroy the ability of LFG to interact with the atmosphere causing air quality impacts associated with GHGs; or collected, for future use in energy generation. The use of cover material maintained across the landfill will also be employed to increase the efficiency of controlling any LFGs that are generated.

**Air Quality.** The proposed project would not significantly impact air quality. The generation of LFG would be mitigated through the active landfill gas collection and control system, where it can be vented, flared, or collected for future use in energy generation. Proper cover would continue to be maintained across the landfill to promote control of LFG by limiting migration of the gas to the surface. Fugitive dust would be controlled in accordance with HAR 11-60.1-33. Landfill operation practices and good housekeeping measures to minimize the working face of the landfill combined with the natural incidence of trade winds will dissipate much of the localized odor that can be generated during landfilling.

**Geology, Topography and Soils.** No significant impacts to geology, topography, and soils would occur. The project’s design and construction will adhere to Federal, State, and County standards and regulations, e.g., Kaua‘i grading standards, HAR Chapters 11-54 and 11-55 and others, to prevent and control soil erosion through the use of management, structural, and vegetative controls and practices.

**Surface Water Resources.** No primary, secondary, or cumulative effects to surface water resources from MSWLF operations are expected. No streams classified as perennial or intermittent, no lakes, and no reservoirs are contained within the proposed project boundaries containing the MSWLF site. The proposed project will incorporate a site surface drainage system designed to control surface water flows over the landfill site and minimize infiltration of rainfall into the waste mass.

**Groundwater and Hydrology.** Primary, secondary, or cumulative impacts to groundwater and hydrology are not expected. The project site is more than 1,000 ft from known drinking water sources, and no active wells are currently present and no plans to develop any wells within 1,000 ft of the project site are proposed. In addition to the use of the measures described above in Surface Water Resources, the potential for leachate migration into groundwater will be controlled by the landfill liner system, leachate monitoring and collection where leachate can be processed in an on-site evaporation pond, and the use of final cover and grades to address the long-term impact of rainfall infiltration into the landfill waste mass.

**Wetlands.** Potential primary, secondary, or cumulative effects associated with wetlands are not expected. Consultation with the U. S. Army Corps of Engineers (USACE) confirmed that the project boundaries do not contain wetland resources as delineated in the U. S. Fish & Wildlife Service (USFWS) National Wetlands Inventory (NWI). As noted above, the proposed project will incorporate a site surface drainage system to control surface water flows. See also Section 2.1.4. With the use of the planned site surface drainage system nearby wetlands are not expected to be affected.

**Acoustic Characteristics.** The potential for adverse primary, secondary and cumulative impacts associated with construction and operation of the Ma‘alo MSWLF and E3 access roadway are not expected. The area surrounding the proposed MSWLF site has few noise receptors as the project site is bounded by the Kāʻelepa Ridge to the east and to the north, west and south, much of the land and terrain consists of agricultural parcels. The closest residences to the MSWLF site are located along Laukona Street and Kā‘elepa Circle to the south more than 1 mile away and are not expected to be affected.

The construction of the new access roadway designated E3 in this EIS would service the landfill. Residences along the planned access route include the Kāʻelepa Village residences along segments of Kāʻelepa Circle, and residences along the northeast segment of Laukona Street. These areas could be affected by noise during construction of the landfill access roadway from the use of heavy equipment vehicle exhausts, earthmoving activities, and the surfacing of the access road. During operation of the
landfill when the access road would be in regular use vehicle exhausts and the movement of heavy trucks transiting across the road surface may also periodically be noticed by residents. The greatest period for potential noise impacts is during construction which would be temporary and of short duration. Longer term, the potential for noise impacts from refuse vehicles using the access road could be periodically noticed from some of the larger refuse trucks employing air brakes or the use of engine braking. However, traffic noise levels attributable to the transit of refuse vehicles to and from the MSWLF are predicted to be well below current federal and local noise mitigation thresholds for motor vehicles traveling on roadways near noise sensitive receptors.

Although some noise may be periodically noticed by residents, severe noise impacts are not expected inside air conditioned structures beyond 100 to 500 feet from active project construction sites. Inside naturally ventilated structures, interior noise levels are estimated to range between 65 to 75 dBA at 100 feet and between 49 to 59 dBA at 500 feet distances from the construction site. Doors and windows facing the access road construction site are recommended to be closed during work hours to reduce interior noise levels. This would result in a general noise reduction of between 5 to 10 dBA.

With the implementation of the measures above including adherence to HRS Chapter 342F – Noise Pollution, HAR Chapter 11-42 – Vehicular Noise Control for Oahu establishing noise level limits for light and heavy vehicles to address noise, and the use of normal work days and construction curfew times, no severe impacts to the acoustic environment are expected from the construction and operation of the proposed MSWLF and access road.

**Flora and Fauna.** Primary, secondary, or cumulative impacts to flora and fauna resources would not occur. Clearing, grubbing, and construction of the proposed MSWLF site to ready the site for the use of landfill cells; installation of the landfill associated buildings; installation of the surface water, leachate collection, and LFG extraction systems; and construction of the internal and access roadway system would not result in any impacts including displacement, as no federally delineated Critical Habitat is located within the project site (USFWS 2012). These activities would be relatively short in duration with no night work planned during the construction of the proposed project.

Operational practices to manage the landfill site would include the use of daily and intermediate soil cover during the approximately 264 year site life and the control of open sources of standing water such as from the planned leachate evaporation pond by using netting or gridwire installed above the high water line to deter wildlife. No nighttime operations are planned. Exterior security lighting associated with the proposed MSWLF would be installed in compliance with Hawai‘i County Code, Article 9, Outdoor Lighting (Sections 14-50 through 14-55.1), which requires that all exterior lights be fully shielded or full cut-off luminary fixtures, such that the bulb can only be seen from below using the lowest wattage bulbs possible to reduce ambient glare. No impacts to seabirds are expected due to the daytime operating hours and the use of fully shielded lights.

To avoid impacts to Hawaiian geese (Nēnē) during construction of the proposed project, a biologist familiar with the nesting behavior of the Hawaiian goose will survey the project area prior to the initiation of any work, or after any subsequent delay in work of three or more days (during which birds may attempt nesting). If a nest is discovered, work should cease immediately and USFWS should be contacted for further guidance. In addition, all on-site project personnel should be apprised that Hawaiian geese may be in the vicinity of the project at any time during the year. If a Hawaiian goose (or geese) appears within 100 feet of ongoing work, all activity should be temporarily suspended until the Hawaiian goose (or geese) leaves the area of its own accord.

All practices at the proposed MSWLF site will meet regulatory requirements and be designed to maintain for the long term, a safe and secure MSWLF facility that addresses the concerns of proper vector control, loss of windblown litter, and the generation of landfill associated odor that could serve as an attraction to flora and fauna.

**Natural Hazards.** Potential primary, secondary, or cumulative impacts associated with earthquakes, hurricanes, floods, and tsunamis have been considered in the design and operating practices for the
proposed MSWLF. Adverse impacts are not expected. Safe engineering and design standards have been incorporated in the design and construction of the proposed project as described in this EIS. The standards applied to the site are designed to maintain a reasonable level of long term safety due to natural hazards from earthquakes, hurricanes, floods, or tsunami.

**Scenic and Aesthetic Environment.** Based on an assessment of viewplanes completed for this project no negative adverse impacts to scenic views associated with the construction or operation of the proposed MSWLF on the Ma'alolo parcel are expected. Views of the proposed project site from Kūhiō Highway and the nearby residential neighborhoods of Hanamā'ulu Town would not be possible due to dense vegetation and the rising Kālepa Ridge. Views of the proposed project site would be primarily be from along the upland segments of Ma'alolo Road, Ehiku Street, and the network of rudimentary agricultural roadways serving the uplands surrounding the project site. However, travel along the privately owned portion of Ehiku Street and the network of agricultural roads in the uplands would be restricted to users with permission to enter the private roadways. These views are expected to be minimized and building and landfill mass significantly reduced due to the approximately 1 mile and sometimes greater distances between the roadway and the landfill site.

Ma'alolo Road is identified as a Scenic Roadway Corridor in the Kaua'i County General Plan’s “Līhu’e Planning District Heritage Resources Map.” The viewplane from segments of the Ma'alolo Road include the south and west boundary of the proposed project site, surrounding agricultural fields, the Kālepa Ridge, and the Wailua Falls. Views of the proposed project site are reduced by existing vegetation that borders Ma'alolo Road and the distances involved.

Existing vegetative cover along segments of the roadways and between the MSWLF site and roadways is expected to further minimize views of the landfill site. Operational activities that are expected to be seen within this view corridor would include refuse trucks and vehicles transiting toward the project site along the access road, the use of landfill operations equipment, and office and maintenance buildings. Building and landfill design criteria will be implemented to reduce the building and landfill mass when viewed from Ma'alolo Road and Ehiku Street across the Līhu’e Basin and would not have a negative adverse impact on eastern views of Kālepa Ridge.

No negative adverse affects to viewplanes are expected from the proposed project.

**PUBLIC SERVICES**

**Traffic and Circulation.** Primary, secondary, or cumulative impacts to traffic and circulation are not expected. The County commissioned the *New Kaua'i Landfill Traffic and Roadways Engineering Feasibility Study* (AECOM 2016; Appendix F) to analyze current and future anticipated traffic impacts associated with the proposed project and include projections of vehicular use. The proposed access route, Route E3 via Kaua‘i Beach Drive and Driveway 3, was selected based on balancing multiple concerns including feasibility, directness of route, mitigation of potential traffic impacts, cost requirements, and related factors. When completed, the access road would direct some traffic away from the core of Hanamā'ulu, as requested by local residents, and provide consideration for traffic signalization at the intersection of the access road with Kūhiō Highway and the Kaua‘i Beach Driveway. All roadway improvements would conform to State Department of Transportation (DOT) and County requirements.

**Utilities.** Primary, secondary, or cumulative impacts to utility services would not occur. The proposed MSWLF site requires electricity, telephone service, potable water and wastewater service. During the construction of the proposed MSWLF access roads, utility corridors would be established to bring electric, telephone, telecommunications, and potable water to the proposed MSWLF site. Development and operation of the proposed utilities would support the proposed MSWLF site and would not significantly impact the capacity of utility systems. Wastewater service is planned to be provided with an individual onsite wastewater system septic tank and absorption bed. The wastewater system will be designed in accordance with the requirements of the County of Kaua‘i and State Department of Health (DOH) and will not feed into existing municipal treatment facilities.
Other Public Facilities and Services. The proposed action will result in a new and larger MSWLF facility, but will have little to no direct effects on public facilities (police, fire, education, parks and recreation, and medical services) and no indirect, secondary or cumulative impacts.

MANMADE ENVIRONMENT

Land Use and Ownership. The proposed MSWLF site (Ma’alo) is designated as TMK: (4) 3-9-002: 020, owned by the State of Hawai‘i, and comprises 2,162.78 acres. The County of Kaua‘i is presently in active discussions with the State for the use of TMK: (4) 3-9-002: 020, for the MSWLF. The MSWLF site is located in the State Agricultural District and County Zoned Agricultural and Open Districts. The proposed project would change the land use of the 270 acre site from agriculture/pasture to a public infrastructure facility serving the County. However, this area is not designated as Important Agricultural Land (IAL) and the use of the site would serve to prevent other areas of Kaua‘i, from being subject to potential use for a landfill for a period of approximately 264 years. The proposed project would not result in significant secondary impacts on land use ownership as the surrounding remaining approximately 1,893 acres of the State owned parcel would continue to be used for pasture and agricultural purposes.

Aircraft Wildlife/Bird Strike Hazard. The Li‘i‘hu’e Airport (LIH) operations area is approximately 12,200 feet (2.3 miles) from the proposed landfill. Operation of the MSWLF and the potential for effects to aircraft transiting the LIH may be present from overflights of birds that may be attracted to the landfill. Because exposed putrescible waste and other food materials at landfills attract wildlife, specifically birds that can increase the risk of aircraft bird strikes, the State DOT and the Federal Aviation Administration (FAA) have expressed their opposition to the proximity of the proposed landfill to the existing LIH. In response to DOT and FAA’s concern over the increase in risk of bird aircraft strikes that could result from the proposed landfill, a Landfill Wildlife Hazard Assessment (LWHA) (Appendix G) was prepared. A coordinated strategy and a number of active wildlife controls to mitigate potential attractants and deter birds and wildlife that attract birds that could pose hazards to LIH operations was identified and documented in the County’s Landfill Wildlife Management Plan (LWMP) (Appendix H). The coordinated strategy involves multiple stakeholders (e.g., U. S. Department of Agriculture Wildlife Services [USDAWS], USFWS, DOT) and will evolve as plans and site conditions change. As such, the LWMP will be evaluated, reviewed, and revised as appropriate on an annual basis. The landfill Wildlife Coordinator (WC) will be key in this process and will consult with USDAWS, USFWS, DOT, and other agencies as needed in future revisions. Mitigation measures identified in the LWMP will serve to minimize risk of aircraft wildlife/bird strikes from LIH aircraft operations.

As indicated above, this coordinated strategy is expected to require collaboration and joint cooperation involving the County of Kaua‘i, State DOT, the FAA, and other agencies as needed. This effort will be implemented as required, by the County and is expected to be finalized after the completion of the Final EIS for this project.

Socioeconomics. The construction and operation of a MSWLF on Kaua‘i would affect the communities around the site and the entire island. The community most affected by the daily operations of the MSWLF would be Hanamā‘ulu, since it is nearest to the project site. Direct, indirect, and induced economic impacts of the proposed MSWLF facility on employment, earnings, and fiscal impacts were evaluated for the proposed MSWLF. Community issues and concerns and other social impacts of the new MSWLF were also evaluated. The project will result in a new and larger MSWLF facility, and therefore directly improve public solid waste management, while enabling the necessary timely closure of the current Kekaha MSWLF. The proposed project will not stimulate unexpected changes to the population, but will accommodate the current and anticipated future needs of the population of the Island of Kaua‘i for a MSWLF.

The proposed MSWLF would benefit all of the communities of Kaua‘i with a safe, secure, and well-regulated means of handling on-island MSW. However, the community in which the landfill would be located will necessarily be impacted by its presence. These impacts could include an increase in traffic and noise, evidence of landfill related activities, and other landfill concerns that have been expressed
by residents at previous community meetings for the project. For these reasons, the County intends to work with the community to address potential concerns and further discussions of a Host Community Benefits (HCB) Program with features similar to the on-going Kekaha HCB program. The use of the HCB Program would be considered as a way to recognize and take proactive steps to help address public concerns of the community most affected by the siting of a landfill. Further information on the use of the County’s HCB Program can be found at: http://www.kekahahcb.net/.

**Historic and Archaeological Resources.** Potential primary, secondary or cumulative impacts associated with historic and archaeological resources were assessed during the Archeological Inventory Survey (AIS) of the proposed project site (CSH 2014). Pedestrian inspection of the study area identified one historic property, State Inventory of Historic Properties (SIHP) # 50-30-11-2218, within the study area. SIHP # 50-30-11-2218 consists of 82 archaeological features identified within the proposed MSWLF site, an Alternative RRP site (discontinued from consideration), along Potential Driveways 1 and 2, 1, 2, and 3, and along Access Roads A, B, C, D, E, and F. Of the 82 archaeological features identified in the AIS study area, 44 features are located within the proposed action area (Ma’alo MSWLF site, driveway 3, and access roads C [utility corridor only], D, and E). The project-specific effect recommendation is “no historic properties affected.” Sufficient information regarding the location, function, age, and construction methods of the archaeological features has been generated by the archaeological inventory survey investigation to mitigate any adverse effect caused by proposed development activities. Should any burials or other cultural finds be identified during ground disturbance, the construction contractor shall immediately cease all work while the appropriate agencies including the State Historic Preservation Division (SHPD), are notified pursuant to applicable law (HRS, Chapter 6E).

**Cultural Impact Assessment.** Potential primary, secondary or cumulative impacts associated with cultural resources were assessed during the Cultural Impact Assessment (CIA) for the project (CSH 2013). The proposed project is not expected to adversely affect cultural resources or practices. As noted above in Historical and Archaeological Resources, appropriate notification to appropriate agencies including the SHPD will be made.

**Permits and Regulatory Approvals that May be Required**

The proposed MSWLF would be subject to the design, operational, financial, and other requirements set forth in RCRA Subtitle D and in the HAR Chapter 11-58.1. Prior to development of the MSWLF, a Solid Waste Management Permit Application would be prepared and submitted to the State DOH Solid & Hazardous Waste Branch (SHWB) for review and approval. The landfill owner and operator would conduct all required monitoring and reporting before, during, and after the useful life of the facility, in accordance with the solid waste management permit, subject to oversight by DOH.

The parcels containing the proposed access route are zoned as Residential and Industrial; estimated time for rezoning and requisite right-of-way acquisitions is approximately 12 months. Estimated time for approval of a National Pollutant Discharge Elimination System (NPDES) Form C permit from the State DOH for the MSWLF site, access road, and related construction activities is approximately 6 months.

**Organizations, Agencies, Public Parties, and Individuals Consulted in the Environmental Impact Statement Process**

**Community Meetings.** The County initiated a series of community meetings to advise the public of its efforts for the selection of a new MSWLF and RRP (Resource Recovery Park). (Note: The RRP is no longer a part of the subject project). The meetings were designed to inform and solicit public comments. A total of seven community meetings were held from May 2012 through February 2013 and included six community meetings and one site visit to the proposed project site at Ma’ało.
The purpose of the meetings was to:

1. Solicit community input to identify environmental and other relevant issues that should be considered and addressed in the EIS; and,

2. Provide the community with updated information on the status of the EIS.

The result of the community meetings involved a number of comments that were used in the development of the subject EIS document.

**FEA/EISPN HRS, Chapter 343, Notification Process.** Following the 2012 and 2013 community meetings, the Final Environmental Assessment/Environmental Impact Statement Preparation Notice (FEA/EISPN) for the New Kaua’i Landfill and Resource Recovery Park (County of Kaua’i 2013) was published by the State OEQC on February 8, 2013. The purpose of the FEA/EISPN was to provide notification of the County’s start of the HRS, Chapter 343 EIS process, inform interested organizations, agencies, public parties, and individuals of the proposed project, and seek relevant public comment on subjects that should be addressed in the EIS documentation. Comments were received during the public comment period ending on March 9, 2013.

This DEIS has been prepared to address comments received during the 30-day public comment period for the FEA/EISPN. A future opportunity for public comments will be made available following publication of this DEIS with the OEQC.

**SIGNIFICANCE CRITERIA AND DETERMINATION**

The proposing agency has considered the significance criteria in HAR §11-200-12 to determine whether the proposed action would have a significant effect on the environment. The proposed project would provide a major public infrastructure facility for the sufficient handling of MSW for the County and all residents and visitors to Kaua’i. The evaluation of the significance criteria in HAR §11-200-12, in summary indicates (see Section 11.1):

**Criterion 1:** Involves an irrevocable commitment to, loss or destruction of any natural or cultural resources. The irrevocable commitment of State land for a MSWLF will be required. However, the adverse loss of natural resources is not expected as referenced in Section 4.0 of this document. Potential negative impacts will be addressed through the mitigation measures and practices identified in this document. Further, the project is not expected to result in the adverse loss of cultural or archeological resources as referenced in Sections 6.4 and 6.5.

**Criterion 2:** Curtails the range of beneficial uses of the environment. The proposed project would change current agricultural land uses within the facility footprint. Portions of land not in use, however, are expected to remain in agriculture until the parcel is needed. Other lands outside the project boundary could remain in agricultural/pasturage uses for the foreseeable future.

**Criterion 3:** Conflicts with the State’s long-term environmental policies or goals and guidelines as expressed in HRS, Chapter 344. The proposed MSWLF will be constructed and operated in compliance with HRS, Chapter 344, and is necessary to meet Kaua’i’s need for the disposal of MSW. This EIS document is prepared in accordance with Federal, State, and County of Kaua’i regulations, laws, policies and provisions. The Ma’alo site is the preferred alternative and the potential for adverse impacts would be addressed through the mitigation measures and practices as set forth herein.

**Criterion 4:** Substantially affects the economic welfare, social welfare, and cultural practices of the community or State. No significant adverse impacts to economic welfare, social welfare, and cultural practices are expected. The proposed project is expected to have a beneficial effect on the economic and social welfare of the island and will address the need for the safe, sanitary and efficient disposal of MSW. Any potential for adverse effects will be addressed through the mitigation measures and practices as provided in this EIS document.
Criterion 5: Substantially affects public health. The proposed action will have long-term positive impacts on public health and safety through the proper disposal of MSW. Operating procedures will address public health and safety concerns related to heavy equipment operation, vector control, landfill gas generation, and other actions. A new, modern MSWLF, engineered to current standards, would be beneficial and help to maintain public health and safety.

Criterion 6: Involves substantial secondary impacts, such as population changes or effects on public facilities. The proposed project is not expected to result in substantial secondary or cumulative impacts from population changes or increased demand for public services or facilities. The proposed project will improve the long-term capacity of the County to manage solid waste. This is not expected to stimulate unexpected population change, but would accommodate current and future solid waste requirements. As required, upgrades and improvements for the Ma’alo MSWLF are identified to ensure against adverse direct, secondary, or cumulative effects.

Criterion 7: Involves a substantial degradation of environmental quality. An analysis of air and water quality, geology, flora and faunal resources, and land use associated with the construction, operation and maintenance of the proposed project has determined that environmental quality will not be substantially degraded. The new MSWLF will replace the existing Kekaha MSWLF and would not constitute a duplication of services or result in unanticipated potential impacts. All MSWLF activities will be conducted in compliance with Federal, State, and County rules and regulations governing environmental quality and public health.

Criterion 8: Is individually limited, but cumulatively has considerable effect on the environment, or involves a commitment for larger actions. The Ma’alo site is sufficient to accommodate Kaua‘i’s MSW disposal needs for an estimated 264 years. Therefore, a new landfill or related facility is not expected to be required for generations. No significant cumulative effects or larger commitments are expected.

Criterion 9: Substantially affects a rare, threatened, or endangered species or its habitat. An investigation for rare, threatened, or endangered botanical and faunal species was completed for the subject EIS. Two endangered endemic species (Nēnē and Hawaiian Duck) were observed at the project site. A Habitat Conservation Plan will be developed to address any impacts to these species. No other species were identified that are listed as rare, threatened, or endangered by the State of Hawai‘i or Federal government. See also Section 6.2 for discussion on Aircraft Wildlife/Bird Strike Hazard.

Criterion 10: Detrimentally affects air or water quality or ambient noise levels. A landfill gas collection system would be designed to collect and control landfill gas, which could otherwise pass through the landfill to the atmosphere or migrate horizontally through soil. Therefore, detrimental impacts to air quality are not expected. A modern engineered base liner system and leachate management systems would prevent water quality impacts, and groundwater monitoring would be conducted to ensure that groundwater is not impacted by landfill operations. Detrimental effects to water quality are not expected. Measures and practices, as described in this EIS document for potential noise impacts will be implemented to ensure no long-term detrimental effects to the environment.

Criterion 11: Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters. Based on the analyses of the project site performed by the County, the proposed site is not located in an environmentally sensitive area. The project site is located upland of the Underground Injection Control (UIC) line and would be subject to regulatory coordination with the Department of Health and County Department of Water to identify and develop appropriate measures for protection of groundwater. The base liner and leachate management systems would prevent water quality impacts, and groundwater monitoring would be conducted to ensure that groundwater is not impacted. Detrimental effects to water quality are not expected. See also Sections 4.4, 4.5., and 4.9.
Criterion 12: Substantially affects scenic vistas and view planes identified in County or State plans or studies. Ma'alo Road is identified as a scenic road resource by the County of Kaua‘i. The final closure of each of the cells within the MSWLF will be accompanied with a final landfill cover including the use of vegetative cover. Potential visual impacts associated with initial construction of landfill cells are expected to be temporary. Measures that will address viewplane impacts include the use of landscaping based on use of existing vegetation. Landscaping may also be applied for use along selected segments of the access road as needed. As much as possible, native Hawaiian vegetation will be integrated into the landscaping.

Criterion 13: Requires substantial energy consumption. Energy requirements for operation of the proposed MSWLF and potential future RRP include electricity and the use of (likely diesel) fuel. The proposed new MSWLF and future RRP, which would primarily replace existing facilities, are not expected to significantly increase the daily load of local utilities or increase daily consumption of fossil fuels. An important consideration for the use of the Ma'alo MSWLF site was its location within the centroid where the majority of Kaua‘i’s MSW is generated. It possible that with the future use of the site that landfill gas to energy may be provided. See Section 2.1.2 and Section 4.1.2.

Based on the evaluation of the HAR §11-200-12 significance criteria contained in this DEIS, the proposed project is not anticipated to result in a significant environmental effect on the environment. However, the County acknowledges that the proposed project would provide a major new public infrastructure facility in an area within proximity to the community of Hanamā‘ulu. Impacts, while not expected to be significant, could include an increase in traffic and noise, evidence of landfill related activities, and other landfill concerns that have been expressed by residents at previous community meetings for the project. For these reasons, the County intends to work with the community to address potential concerns and further discussions of a HCB Program with features similar to the on-going Kekaha HCB program. Other methods, measures, and practices to address all other potential impacts as described in the DEIS is provided in further detail in Sections 2, 4, 5, and 6. In accordance with HAR §11-200-11.2, this DEIS will be submitted for publication and public review in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.
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<td>Volatile Organic Compounds</td>
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<td>WtE</td>
<td>Waste to Energy</td>
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## PROJECT SUMMARY

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<th>Project:</th>
<th>New Kaua‘i Landfill</th>
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| Applicant: | Department of Public Works  
                County of Kaua‘i  
                4444 Rice Street, Suite 275  
                Līhu‘e, Hawai‘i 96766  
                Lyle Tabata, Acting County Engineer |
| Accepting Authority: | Office of the Mayor of Kaua‘i  
                        4444 Rice St., Suite 235  
                        Līhu‘e, Hawai‘i 96766  
                        Bernard P. Carvalho, Jr., Mayor  
                        Delegated by:  
                        Office of the Governor, State of Hawai‘i  
                        Executive Chambers, State Capitol  
                        Honolulu, Hawai‘i 96813  
                        The Honorable David Ige |
| Agent: | AECOM Technical Services, Inc.  
            1001 Bishop Street, Suite 1600  
            Honolulu, Hawai‘i 96813-3698 |
| DEIS Preparer: | R. M. Towill Corporation  
                      2024 North King Street, Suite 200  
                      Honolulu, Hawai‘i 96819-3494 |
| Tax Map Key(s): | (4) 3-9-002:020 (Municipal Solid Waste Landfill [MSWLF]), State of Hawai‘i |
| Proposed Action: | The proposed action and the subject of this EIS document is the development and operation of a new MSWLF on a 270-acre site at Ma‘alo in the southeast part of the island of Kaua‘i. The proposed action includes construction and operation of: (1) a new MSWLF and (2) a new 2.8 mile off-site access road and utility infrastructure to support the landfill. When construction is completed and operations begin, the Ma‘alo MSWLF will provide for the proper disposal of island-generated MSW that cannot be further reused, recycled, or otherwise recovered; provide for the practical, reliable and safe disposal of MSW generated on Kaua‘i; and replace the MSWLF provided at Kekaha. |
| Land Area: | Proposed MSWLF: TMK: (4) 3-9-002:020 – 2,162.78 acres  
                        Area of Development: 270.2 acres |
| State Land Use District: | Agricultural |
| Existing Land Uses: | Pasture land and fallow agriculture |
| Present Zoning: | Agricultural and Open Space |
| Special Management Area: | No |
| Permits That May Be Required: | HRS Chapter 343 Environmental Impact Statements, HAR Title 11-200 Environmental Impact Statement Rules, State Special Use Permit or State Land Use District Boundary Amendment (SLUDBA); State Department of Health Solid Waste Management Permit, Covered Source Air Permit, National Pollutant Discharge Elimination System (NPDES) Permit Application for Discharges of Construction Storm Water (Notice of Intent [NOI] Form C), and Industrial Activities (NOI Form B); and County Building Permits. |
| Significance Determination and Proposed Mitigation Measures: | The proposing agency has considered the significance criteria in HAR §11-200-12 to determine whether the proposed action would have a significant effect on the environment. However, the County acknowledges that the proposed project would provide a major new public infrastructure facility in an area within proximity to the community of Hanamā‘ulu. The County intends to work with the community on the potential for use of Host Community Benefits (HCB) as a way to recognize and take proactive steps to help address public concerns of the community most affected by the siting of a landfill. Other methods, measures, and practices to address all other potential impacts as described in the DEIS is provided in further detail in Sections 2, 4, 5, and 6. In accordance with HAR §11-200-11.2, this DEIS will be submitted for publication and public review in accordance with HRS, Chapter 343, and HAR, Chapter 11-200. |
Project: New Kaua'ici Landfill

Alternatives Considered: The County considered a range of reasonable alternatives to address its island-wide MSWLF needs. The alternatives considered include:

- No Action: This alternative involves taking no further action to develop an alternative site or technology for the disposal of MSW and fails to meet the County's purpose, need, and objectives for the handling of MSW.
- Alternative Locations for a New MSWLF: This alternative involves establishing a new MSWLF at an alternative site on Kaua'i identified in previous County landfill siting studies. Eight potential sites were identified for consideration in the 2012 Siting Study (AECOM 2012): Kekaha Mauka, Ki'pū, Kālepa, Kōloa, Kumukumu, Ma'alolo, Pu'u Papa'i, and 'Umi. The Ma'alolo site was determined to be a long-term solution for the County's waste disposal needs.
- Alternative Technologies and Other Methods: This includes alternative technologies and other methods to process the County's MSW stream. Alternative Technologies and Other Methods would not be capable of processing the County's entire MSW stream and therefore fails to meet the County's purpose, need, and objectives.

Unresolved Issues: The development of a future Resource Recovery Park (RRP) by the County is considered to be an important part of reducing landfill dependency by seeking to use proven, environmentally safe, and economically feasible methods and technologies to reduce and recycle Kaua'i's MSW stream. The timing and development of the RRP is presently unknown but is planned to be pursued by the County at a later date and is not part of this EIS document.

Compatibility with Land Use Plans and Policies:

FEDERAL: Resource Conservation and Recovery Act (RCRA); Clean Air Act (CAA); Clean Water Act (CWA); Safe Drinking Water Act (SDWA); Endangered Species Act; Migratory Bird Treaty Act; Animal Control Act; and Federal Insecticide, Fungicide, and Rodenticide Act

STATE: HRS Chapter 226 Hawai'i State Plan; HRS Chapter 205 State Land Use Law; HRS Chapter 205-42 Important Agricultural Lands; HRS Section 205(A)-2 Coastal Zone Management; HAR Chapter 55 Water Pollution Control; HRS Chapter 342H Solid Waste Pollution and HAR Chapter 58 Solid Waste Management Control; HRS Chapter 195D; and HRS Chapter 183D-62

COUNTY OF KAUA'ICI: Kaua'i County General Plan and Chapter 8 Kaua'i County Code Comprehensive Zoning Ordinance
1.0 INTRODUCTION

The County of Kaua’i (County) Department of Public Works (DPW) Solid Waste Division (SWD) is responsible for the proper management and disposal of municipal solid waste (MSW) in the safest and most efficient manner possible. The Kekaha Municipal Solid Waste Landfill (MSWLF) presently serves as Kaua’i’s sole landfill facility for the disposal of MSW.

1.1 PURPOSE AND NEED FOR ACTION

The purpose of the County’s proposed new MSWLF (proposed action) is to ensure that island-wide landfill facility needs are met when the Kekaha MSWLF reaches capacity in approximately 10 to 12 years. The 10- to 12-year projection of remaining landfill capacity is based on: (1) the existing Phase II of the Kekaha Landfill serving for approximately four more years, and (2) the successful design and permitting of the proposed Kekaha MSWLF Cell 2 Lateral Expansion, which is anticipated to last for approximately 7 years.1 Because of the years needed for the planning, design, and permitting of a new MSWLF, the County must act to avoid the potential risk to public health and safety, or inappropriate financial management, in the event that Kaua’i is left without a landfill.

The need for future landfill capacity is the result of extensive County planning efforts that incorporate the use of Integrated Solid Waste Management. As defined by the U.S. Environmental Protection Agency (U.S. EPA):

Integrated Solid Waste Management (ISWM) is a comprehensive waste prevention, recycling, composting, and disposal program. An effective ISWM system considers how to prevent, recycle, and manage solid waste in ways that most effectively protect human health and the environment. ISWM involves evaluating local needs and conditions, and then selecting and combining the most appropriate waste management activities for those conditions. The major ISWM activities are waste prevention, recycling, and composting, and combustion and disposal in properly designed, constructed, and managed landfills. Each of these activities requires careful planning, financing, collection, and transport... (U.S. EPA, accessed on 28 July 2017)

The County’s Integrated Solid Waste Management Plan (R.W. Beck, September 2009) presents strategies for implementing environmentally prudent and cost-effective ISWM components to enhance or upgrade the County’s existing solid waste management system. Strategies presented in the Plan addresses:

- Source Reduction at the residential and commercial level
- Recycling and Bioconversion to further divert waste requiring disposal through collection, composting and processing, and reuse
- Special Waste handling and processing to segregate special waste from the municipal waste stream for appropriate handling and disposal. Special Waste includes:
  - Asbestos
  - Agricultural waste
  - Abandoned and derelict vehicles
  - Sewage sludge
  - Waste combustion ash
  - White goods (refrigerators, washing machines, etc.)
  - Tires
  - Used motor oil and cooking oil
  - Lead acid and household batteries

1 Estimated landfill capacities for Kekaha Landfill are from annual surveys conducted by Waste Management and County of Kaua’i.
- Propane gas tanks
- Construction and demolition materials

- Infectious Medical Waste handling and disposal includes infectious medical waste, cultures and stock infectious agents, blood and body fluids, pathological waste, contaminated needles, and contaminated animal carcases, body parts and bedding.
- Household Hazardous Waste (HHW) and Electronic Waste handling, recycling and disposal. This form of waste includes discarded, unused, or leftover portions of household products containing toxic chemicals, and used electronics that can be collected and recycled, or disposed.

In addition to the above strategies for the handling of specific types of solid waste the ISWMP identifies a public education and information component, and a materials marketing and procurement component to disseminate public information and activities that can be applied toward reducing the islandwide generation of MSW requiring landfill disposal.

The County’s 2009 ISWMP identifies strategies to minimize disposal ultimately to a landfill; however as noted in the Plan, “…even if the County significantly reduces reliance on landfill disposal through upstream diversion activities such as green waste composting and a [Waste to Energy] WtE facility, a new, Subtitle D landfill will still be required.”

The closure of the Kehaka MSWLF upon the exhaustion of landfill space without an alternative means of disposal of MSW generated on-island is neither practical nor feasible because it would fail to provide for the safe and sanitary handling and disposal of islandwide MSW essential to the maintenance of public health and safety.

The County’s selection of the site for a new MSWLF represents an island-wide and long-term process that involved current and prior County administrations since the year 2000. Then as now, the selection of the required course of action must: (1) provide for the proper disposal of all forms of MSW that cannot practicably be further reused, recycled, or otherwise recovered; (2) practicably, reliably and safely dispose of all forms of MSW generated on the island of Kaua’i; and (3) be operational when the Kekaha MSWLF reaches capacity requiring the start of the landfill closure process. The proposed action therefore seeks to balance the potential for environmental, technical, economic, and social impacts to the public and surrounding community, with the need to provide a rational and feasible means for the treatment and handling of MSW. Should finalization and acceptance of the Final Environmental Impact Statement (FEIS) for this project occur, the County will work to acquire land rights, and permit, design, approve, and construct the new MSWLF to accept refuse. Although this process is expected to take several years, the proposed project is time-critical due to the pending closure of the Kekaha MSWLF.

The County recognizes the need to reduce, reuse and recycle as much of the solid waste stream as practicable and feasible to reduce the need for landfilling. Its objective for the new MSWLF is to promote an efficient and more environmentally sustainable facility. Accordingly, this EIS document provides additional information on the County’s desire for the future development of a Resource Recovery Park (RRP) to more comprehensively manage solid waste that is generated on-island.

Although details of an RRP are not yet available for evaluation and are not a part of the proposed EIS action, information is provided on how a potential future RRP facility could be used to reflect the County’s efforts toward a more sustainable balance between the need for landfilling and the need for a more sustainable solid waste management approach.

1.2 EXISTING LANDFILL: KEEKAH MSWLF

The Kekaha MSWLF is approximately 1.3 miles northwest of the town of Kekaha in the southwest part of Kaua’i. It is the County’s sole operating MSWLF and is owned by the County, administered by the DPW, and operated under contract by Waste Management, Inc. The Kekaha MSWLF is projected to reach capacity within an approximately 10-12 year timeframe necessitating the need to identify a new
MSWLF site within this period to prepare for the planning, design, permitting and construction of the new facility to accept MSW.

Data provided by the DPW Solid Waste Division (SWD) indicates that Kekaha MSWLF received approximately 75,000 tons of solid waste per year in recent years, with prior peak values of 95,000 tons per year. County MSW collected from residential and commercial customers is compacted into open-top trailers at one of four County-operated transfer stations for transport to the Kekaha MSWLF. Kekaha MSWLF also accepts solid waste from commercial haulers and the public.

The Kekaha MSWLF has been operated in two phases. Phase I reached capacity years sooner than anticipated due to a sharp increase in disposal following Hurricane 'Iniki in 1992. Phase II opened in 1993 and is approaching its design capacity. In 1998, the maximum height of the Phase II landfill was increased to 60 feet (ft) above mean sea level (msl). Since that time, the County has implemented two vertical expansions, one to 85 ft msl and a second to 120 ft msl with a horizontal expansion (“Cell 1”). The County is currently designing and attempting to permit an additional horizontal expansion (“Cell 2”), which is expected to extend the useful life of the existing landfill. Assuming construction of the proposed Cell 2 Expansion proceeds on schedule, the useful life of the current Kekaha Landfill would be extended to early 2028, by which time the new Ma'alo MSWLF must be designed, constructed, permitted and operational.

1.3 HISTORY OF NEW LANDFILL SITE SELECTION

The process of selecting a site for a new County landfill began in 2000 and has involved several studies and evaluations, summarized below.

1.3.1 Kaua’i MSWLF Siting Studies 2001/2002

The 2000 Kaua’i Municipal Solid Waste Landfill Siting Study (Earth Tech 2001/2002) identified eight sites (Kālepa, Kekaha Mauka, Kīpū, Kōloa, Kumukumu, Ma’alo, Pu’u Papa’i, and ‘Umi) to address Kaua’i’s future solid waste landfill needs, meet established siting and environmental criteria, and comply with all regulatory requirements. Figure 1-1 displays the location of the eight potential MSWLF sites that were identified in the 2001/2002 study. The study evaluated, scored, and ranked these sites based on a set of 19 environmental, technical, and social/cultural criteria. See Section 3.2 and Appendix B for further detail on the 2001/2002 study.

1.3.2 Mayor’s Advisory Committee on Landfill Site Selection 2009

In 2007, then-Mayor Bryan Baptiste convened the County of Kaua’i Mayor’s Advisory Committee on Landfill Site Selection (MACLS) to involve the community in developing siting selection criteria for a new MSWLF site. The committee added to the existing criteria from the 2001/2002 siting study, established weighting (i.e., importance) factors for the 26 criteria they developed, and scored seven of the eight previously identified potential MSWLF sites using each of their criteria (one site, Kumukumu, was excluded from evaluation due to the acquisition of land use entitlements for development at that time). The 26 “Community Criteria” developed by the 2009 MACLS are listed in Table 3-3. In May 2009, technical consultant, RMTC, published the results in Volume 1: Report of the Mayor’s Advisory Committee on Landfill Site Selection (Volume 2: Site Data Sheets was issued in March 2009) (RMTC 2009). For further detail on the 2009 MACLS study see Section 3.2 and Appendix B.

1.3.3 County of Kaua’i Integrated Solid Waste Management Plan 2009

In September 2009, the County updated the ISWMP (R. W. Beck 2009). Section 11 of the 2009 Plan proposed a four-stage site selection process as a facility siting strategy (see Section 3.2 and Appendix B for more detail). The preparation of the RMTC (2009) and AECOM (2012) siting studies are consistent with the general process outlined in the ISWMP.
Figure 1-1: Potential New MSWLF Sites, Island of Kaua’i
1.3.4 Community Criteria Evaluation (CCE) 2012

The 2012 CCE updated the 2009 MACLS report using the MACLS study’s framework and general methodology. The CCE used current data and updated the methodology, based on public comments received and a technical review of the 2009 MACLS report. One important addition to the report was the Kumukumu site, which was excluded from the MACLS report because it was then slated for development that did not subsequently occur. See Section 3.2.1 and Appendix B for further detail on the 2012 CCE. The CCE was included as part of the 2012 Siting Study (AECOM 2012), discussed in Section 1.3.5.

1.3.5 Kaua‘i Landfill Siting Study Report, July 2012

In 2012, The New Kaua‘i Landfill Siting Study Report (AECOM 2012; Appendix B) reevaluated the eight potential landfill sites (Kālepa, Kekaha Mauka, Kipū, Kōloa, Kumukumu, Ma‘alo, Pu‘u Papa‘i, and ‘Umi) using State Landfill Criteria (HAR §11-58.1-13; DOH 1994) and the results of the 2012 CCE. The 2012 Siting Study also presented a preliminary engineering evaluation (PREE) and planning-level cost estimate of the sites, listed other critical decision-making factors, and presented conclusions and recommendations. The primary factors considered in recommending the proposed MSWLF site included the CCE results, site life, costs, landowner willingness to sell, sustainability, and agricultural importance of the land. The report recommended the Ma‘alo site (the proposed project) due to its high ranking for all assessment criteria. See Section 3.2.1 for further detail on the 2012 Siting Study. The Siting Study’s Executive Summary and Overall Site Comparison and Recommendation sections are presented in Appendix B.

1.3.6 Kaua‘i Resource Recovery Park Feasibility Study (RRP FS), April 2013

The 2013 RRP FS (AECOM 2013; Appendix C) evaluated the 1991 statewide goal of diverting 50 percent (%) of the waste stream from landfills by 2000, and the County’s goal for the adoption of zero waste principles to promote the highest and best use of materials to eliminate waste and pollution (the Kaua‘i County Council adopted a Zero Waste Resolution in October 2011; KCC 2011). The RRP FS was subject to two community meetings in January 2013 after publication of the Draft RRP FS was made available through the County’s New Landfill website (www.kauai.gov/newlandfillsite/). The results of the meetings were factored into the evaluation process and made a part of the Final RRP FS, which provided recommendations for facilities to include in a new County RRP.

1.3.7 New Kaua‘i Landfill Traffic and Roadways Engineering Feasibility Study (TREFS), April 2014/November 2016

The 2014/2016 New Kaua‘i Landfill Traffic and Roadways Engineering Feasibility Study (TREFS) (AECOM 2016; Appendix F) analyzed traffic impacts, recommended roadway improvements, and evaluated the potential for social impacts associated with the potential access route alternatives between the Kūhiō Highway and the site of the proposed new landfill at Ma‘alo. The study evaluated existing baseline conditions against the proposed conditions associated with: a Traffic Assessment, an Infrastructure Improvements Assessment, and a Social Impacts Assessment. The TREFS concluded with the recommended access route E to the Ma‘alo MSWLF site.

1.3.8 Conceptual Design Report, Municipal Solid Waste Landfill and Resource Recovery Park at Ma‘alo, August 2014

The 2014 Conceptual Design Report, Municipal Solid Waste Landfill and Resource Recovery Park at Ma‘alo (AECOM 2016; Appendix D) evaluated the technical feasibility of the proposed MSWLF and future potential RRP facilities, evaluated potential design alternatives, cost estimates, and helped to evaluate and quantify the potential for environmental effects.
1.3.9 Alternatives Analysis, Proposed New Kaua'i Landfill and Resource Recovery Park Ma'alo 2017

The 2017 Alternatives Analysis New Kaua'i Landfill and Resource Recovery Park Ma'alo (AECOM 2017; Appendix I) evaluated potential alternatives to the proposed new MSWLF and a potential future RRP. The potential alternatives studies included the No Action and Delayed Action alternatives, and a number of other alternatives including alternative landfill sites and technologies, that could replace or eliminate the need for a new MSWLF on Kaua'i.

1.4 ANALYTICAL FRAMEWORK FOR NEW LANDFILL SITE SELECTION

The analytical framework summarized below was used in the 2012 Siting Study for a new Kaua'i landfill (AECOM 2012; Appendix B). The 2012 Siting Study built on the previous site selection studies conducted since 2000 and included exclusionary criteria based on State landfill siting requirements and other considerations, a Preliminary Engineering Evaluation (PREE) that provided conceptual site schematics and planning-level estimates of the engineering potential of the eight sites under consideration, planning-level cost estimates for developing each site, a refined Community Criteria Evaluation (CCE), and consideration of other important decision factors.

1.4.1 Introduction

The eight potential MSWLF sites – Kālepa, Kekaha Mauka, Kīpū, Kōloa, Kumukumu, Ma'alo, Pu'u O Papa'i, and 'Umi – were each analyzed using a multi-faceted evaluation process. The evaluation began with the application of exclusionary criteria (Section 1.4.2). Sites falling outside any physically excluded zone were evaluated through several frameworks:

- PREE (Section 1.4.3)
- Cost estimation for landfill development and operation at each site (Section 1.4.4)
- Application of the 26 MACLS criteria in a CCE (Section 1.4.5)
- Examination of each MSWLF site with respect to “other important decision factors” (Section 1.4.6)

1.4.2 Exclusionary Criteria

The exclusionary criteria included both regulatory criteria and other factors that could or should exclude a site, such as engineering requirements, constructability, environmental effects, and cultural concerns. Two categories of exclusionary criteria were used to eliminate from consideration areas on the island of Kaua'i where it would be best not to site a MSWLF: (1) State of Hawai'i regulations for MSWLF siting and (2) additional exclusionary criteria selected for engineering, environmental, cultural, and other reasons.

The State of Hawai'i regulations for MSWLF siting, contained in HAR §11-58.1-13 Municipal solid waste landfills, site analysis, provide the primary set of exclusionary criteria used to delineate areas where it is best not to site a MSWLF. These criteria include the following:

- Areas within 10,000 ft of airport runways
- 100-year floodplains and floodways
- Wetlands
- Fault areas
- Seismic impact zones
- Unstable areas
- Tsunami inundation areas
In addition to the criteria in HAR §11-58.1-13, the following areas were excluded due to engineering, environmental, cultural, or other reasons:

- **Special Management Areas (SMAs):** SMAs are sensitive areas that have been protected by legislation, administration, or other agencies or organizations. To eliminate risk of damage to a known sensitive area, these areas were excluded from consideration.

- **Areas within 1,000 ft of shoreline:** To protect the sensitive shoreline area, all areas within 1,000 ft of the shoreline were excluded from consideration.

- **Federal Government lands:** Federal Government lands were mapped for exclusion due in part to the difficulty of acquisition.

- **Areas with undesirable topography (i.e., slope greater than 33.3 degrees):** An estimate of the slope was calculated from the digital elevation model (DEM) imagery for Kaua‘i provided by the University of Hawaii’s School of Ocean and Earth Science and Technology, Coastal Geology Group (www.soest.hawaii.edu/coasts/data/kauai/dem.html) (UH SOEST 2011). These data were manipulated using the spatial analyst extension of ArcGIS software, and all areas with a calculated slope steeper than 3:1 were included in the Undesirable Topography exclusion zone.

- **Areas within 300 ft of perennial streams:** For protection of water resources, a 300-ft exclusion zone was drawn around streams classified as perennial.

- **State conservation lands:** Areas designated as State conservation lands were removed from consideration. All features corresponding to the Conservation Land Use District (i.e., code “c”) were included in the State conservation land exclusion zone.

- **Areas within 0.5 mile of urban lands:** To minimize impacts on population, areas within 0.5 mile of urbanized lands were removed from consideration.

- **Areas within 1,000 ft of potable surface water or groundwater supply sources:** In order to protect drinking water source supplies, MSWLFs are not recommended to be placed within 1,000 ft of a drinking water source. Although the locations of drinking water sources were once publicly available (e.g., during the previous 2001/2002 siting studies), since the events of September 11, 2001, the DOH does not divulge the location of drinking water sources. Therefore, drinking water source exclusion zones were not mapped. However, both the DOH and the County of Kaua‘i Department of Water (DOW) reviewed the eight potential sites and confirmed that they were not within 1,000 ft of current potable water or groundwater supply sources; a requirement of HAR, Chapter 11-62, Wastewater Systems, to help protect potable water resources.

### 1.4.3 Preliminary Engineering Evaluation Methodology

The PREE (included in the 2012 Siting Study report) compared the eight previously identified potential MSWLF sites being considered for a new County landfill, presented conceptual site schematics, and provided planning-level estimates of the engineering potential of each site in terms of size, quantity, estimated useful lifetimes, costs, and other engineering parameters (AECOM 2012; Appendix B).

### 1.4.4 Site Operation Cost Estimation

Site operational costs were estimated in the 2012 Siting Study report and were based on the site conceptual schematics presented in the PREE and experience at the existing Kekaha MSWLF and other landfill sites in Hawai‘i. A brief description of the basis for each cost item follows:

- **Basic Landfill Operation Costs:** Operating costs estimates were based on current operating costs provided by the County DPW, and are expected to be similar for each site.
• **Onsite Labor Costs**: County employees constitute most of the staff that operate the landfill, which results in labor costs, including fringe benefits and overtime. Similar costs are incurred by administrative support personnel.

• **Wet Weather Operations**: Sites with higher annual rainfall and more intense storms would require additional costs for wet weather operations, such as maintaining gravel access roads.

• **Semi-annual Groundwater Monitoring and Reporting**: Each site would require a semi-annual groundwater detection monitoring program for compliance with applicable regulations.

• **Regulatory Compliance, National Pollutant Discharge Elimination System (NPDES)**: Each site would require an annual NPDES compliance program in accordance with applicable regulations.

• **Regulatory Compliance, Surface Water and Spill Prevention**: Each site would require an annual surface water and spill prevention compliance program in accordance with applicable regulations.

• **Daily/Alternate Cover**: The County DPW provided data for the PREE regarding the amount of cover soil used during the previous year at the existing Kekaha facility. It was assumed that the soil initially excavated from each potential site would be available for use as daily cover, and that the County would have to procure the remainder of the soil from offsite locations.

• **Operations Plan and Solid Waste Permit Update (5-year cycle)**: These items would be updated every 5 years, with costs spread out accordingly.

• **Landfill Gas (LFG) Extraction System Operation; Probe Measurements**: Each site would require a LFG extraction system operation and monitoring program.

1.4.5 Community Criteria Evaluation

The CCE updated the community-based landfill site evaluation previously summarized in the MACLS report (RMTC 2009). It ranked the potential MSWLF sites according to overall scores based on evaluation of the 26 siting criteria originally identified by the 2009 MACLS study. The CCE retained in full the relative weighting (i.e., importance) of the individual criteria, as determined by the community (MACLS).

The CCE was based on the most recent raw data available, incorporated the results of the PREE and the cost estimates, and modified the scoring system developed in the MACLS to bolster the MACLS’ relative weighting of criteria. As such, the CCE addresses the community concerns and potential improvements identified by RMTC and the MACLS since publication of the 2009 report. One site not analyzed in the previous MACLS study (Kumukumu) was also analyzed in the CCE.

1.4.6 Other Important Decision Factors

Other decision factors considered critical to the comparison process were identified and analyzed for each of the eight sites. These factors included landowner willingness, high value agricultural sites, sustainability and proximity of the site to Kauaʻi’s waste generation centroid, as well as the implications of developing a future co-located RRP.

During negotiations with landowners over the last 16 years, the project was repeatedly derailed as landowners ultimately opposed using their site as a landfill. Therefore, landowner willingness has been identified as a critical decision factor to allow this project to move forward in a timely fashion (i.e., before the County’s sole existing MSWLF in Kekaha reaches capacity). Of the eight sites, two – Kekaha Mauka and Ma’alo – are government (State) owned, and the others are privately owned. While the County does have the option of condemning private land to create a landfill, the County greatly
prefers to identify a willing landowner. If a willing landowner can be identified, the County would potentially save significant legal and related compensatory expenses (the value of which cannot currently be quantified), as well as prevent significant delay to the project which would result from a contested condemnation action. This would allow the County to avoid an undesirable situation.

To document the attempt to locate a willing landowner, and to assess whether any of the landowners had reconsidered their past positions, the County prepared landowner willingness questionnaires for each landowner, delivered via certified mail. The questionnaire included a map of the potential MSWLF site and a potential co-located RRP site, and asked the landowner whether they might consider negotiating the use of the site with the County. A second and third questionnaire was sent to those landowners who did not respond to previous requests.

All landowners eventually responded, and only the Ma’alo landowners responded affirmatively. The owner of the Ma’alo site stated that they are willing to consider the use of the site for a MSWLF and RRP. The County is currently discussing landowner terms and requirements for the use of the Ma’alo site.

1.5 PURPOSE OF THE DEIS

This DEIS is prepared to address the requirements of the Hawai‘i Environmental Policy Act (HEPA) in Hawai‘i Revised Statutes (HRS), Chapter 343, and HAR, Chapter 11-200. The County Department of Public Works is the proposing agency for this project. The accepting authority for this Environmental Impact Statement (EIS) is the County of Kaua‘i Office of the Mayor as delegated by the Governor, State of Hawai‘i, in accordance with HAR, Chapter 11-200-4, Identification of accepting authority.

The specific actions requiring compliance under HRS Chapter 343 for this project involve: (1) the use of county funds and state lands for development [HRS §343-5(a)(1)] and (2) the proposed construction of a new landfill [HRS §343-5(a)(9)(C)]. Because the County has determined that the proposed project may have a significant potential environmental effect, as a result of its Final Environmental Assessment/EIS Preparation Notice (FEA/EISPN), an EIS is being prepared (HAR §11-200-11.2).

The State of Hawai‘i DOH Office of Environmental Quality Control (OEQC) published the FEA/EISPN for the subject project on February 8, 2013. A 30-day public comment period followed the publication of the FEA/EISPN, and this DEIS responds to and documents substantive written public comments received. Written responses to substantive comments were mailed on (Insert Date; County has not yet mailed responses). Supporting information is provided in Appendix A.

The filing and publication of this DEIS with the OEQC will be followed by a 45-day public comment period.

1.6 ORGANIZATION OF THIS DEIS

Section 1.0 describes the purpose and need for the proposed action, the purpose of this DEIS document, the existing conditions of the Kekaha MSWLF, the process that preceded the County’s decision to proceed with the proposed project, the analytical framework for landfill site selection, and the overall organization of this report.

Section 2.0 describes the proposed action.

Section 3.0 describes alternatives to landfilling for the disposal of MSW and alternative locations considered for the siting of the new Kaua‘i MSWLF.

Section 4.0 presents the physical and biological environmental setting of Ma’alo and includes the potential for environmental effects from development and operation of the MSWLF at Ma’alo as well as suggested mitigation measures.
Section 5.0 presents the public infrastructure, utility, and other services currently serving the Ma'alo site and includes the potential for effects from development and operation of the MSWLF at Ma'alo as well as suggested mitigation measures.

Section 6.0 presents the manmade environmental setting of the Ma'alo site and includes the potential for effects from development and operation of the MSWLF at Ma'alo as well as suggested mitigation measures.

Section 7.0 describes the permits and regulatory approvals that may be required for the proposed action.

Section 8.0 describes the project's relationship to existing land use plans, policies, and controls in the context of regulatory requirements and approvals for the proposed action.

Section 9.0 describes the project's other considerations including the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity, irreversible and irretrievable commitment of resources, secondary and cumulative effects, and unresolved issues and provides an approach to address these issues.

Section 10.0 summarizes the EIS public informational meetings held on Kaua'i in May and June 2012 and February 2013, the agencies, organizations, and individuals that have been consulted, the public comments received during the FEA/EISPN process, and written responses to the FEA/EISPN comments.

Section 11.0 describes the HAR, Chapter 11-200, significance criteria for environmental impacts in relation to the proposed development and operation of a MSWLF at the Ma'alo site.

Section 12.0 identifies the list of EIS preparers.

Section 13.0 provides reference information for the documents used in the preparation of this EIS document.
2.0 PROPOSED ACTION

The proposed action and the subject of this EIS document is the development and operation of a new MSWLF on a 270-acre site at Ma'alo in the southeast part of the island of Kaua'i. The proposed action includes construction and operation of: (1) a new MSWLF and (2) a new 2.8 mile off-site access road and utility infrastructure to support the landfill. When construction is completed and operations begin, the Ma'alo MSWLF will provide for the proper disposal of island-generated MSW that cannot be further reused, recycled, or otherwise recovered; provide for the practical, reliable and safe disposal of MSW generated on Kaua'i; and replace the MSWLF provided at Kekaha. The proposed action will avert significant health, social, and economic problems that would result without a permitted facility for the safe, sanitary, and efficient disposal of Kaua'i's MSW.

The proposed new MSWLF will meet all applicable requirements of the Resource Conservation and Recovery Act (RCRA) Federal Regulations Subtitle D, which includes regulations on leachate and gas collection, landfill location, facility design standards, operating requirements, groundwater monitoring and corrective action, closure and post-closure care, and financial assurance. The regulations governing location prevent the siting of a MSWLF near airport runways or in ecologically or geographically sensitive areas (e.g., flood plains, fault lines, seismic zones, and unstable terrain). Operating requirements prohibit hazardous waste and include applying daily cover, controlling disease vector populations, monitoring methane gas, restricting public access, controlling storm water runoff, protecting surface water, and keeping appropriate records.

The County intends to implement the RRP facility at the Ma'alo site at a later future date, when funding for the planning and design of an RRP is available and the facility is determined to be feasible. A separate HRS Chapter 343 document will be prepared for the RRP at that time. The area identified within the Ma'alo site for an RRP is based on the preliminary basis of design. See the RRP FS (AECOM 2013; Appendix C) and Conceptual Design Report (AECOM 2016; Appendix D).

Figure 2-1: Proposed Project Site’s Tax Map Key Information and Exclusionary Zones displays displays ownership and general boundary information of the project site for the location of the proposed MSWLF and future RRP. Figure 2-2 is the site layout for the proposed MSWLF.

2.1 MSWLF DESIGN FEATURES

The following identifies the features of the MSWLF design as provided in the Conceptual Design Report, presented in Appendix D. The basic design features or components are stipulated in Federal and State regulations, and site-specific design components are identified to prevent the attraction of wildlife, particularly avian species that may interfere with aircraft. These site-specific components were identified in the Ma'alo Landfill Project Wildlife Management Plan (AECOM 2017; Appendix H).

Other technical factors considered in the design include geotechnical design, LFG extraction system, leachate management system, surface water management system, and building infrastructure, as summarized below. The MSWLF will be constructed in five phases, further detailed in Section 2.2.2. Phasing will affect the design and development of each of the above components and factors. The provision of access roads and utilities, permitting, and monitoring are summarized in Section 2.3 and further described in Section 7.2.
Figure 2-1: Proposed Project Site’s Tax Map Key Information and Exclusionary Zones
Figure 2-2: Proposed Ma’alo Site Schematic

NOTES:
1. Preliminary schematic is subject to change
2. Base Map: http://gis.data.hawaii.gov/maps/World_Imagery
3. Map Projection: State Plane Zone 4 Feet
2.1.1 Geotechnical Design

Geotechnical design of the MSWLF includes an evaluation of structural criteria to ensure long-term stability and protection of the landfill base liner system, sideslopes, and LFG extraction and leachate management systems. A preliminary evaluation of geotechnical and groundwater conditions was based on analyses of six boring samples selectively collected from across the 270-acre Ma’alo site in 2012 for soils classification, compaction, and moisture-density (AECOM 2016; Appendix D). The results of the analyses indicated that the site was considered suitable for construction of a landfill; existing site soils that would be subject to excavation were shown to be sufficient for use as daily/intermediate cover, topsoil, and a rooting-zone layer. The analyses indicated the use of sideslope diversion berms could also be suitable for use as a low-permeability compacted soil layer, pending further analysis during the design phase of work.

2.1.1.1 Slope Stability Evaluation

The slope stability of the proposed landfill geometry was analyzed based on the anticipated final shape after completion of waste placement and installation of final cover. The landfill permit application would contain the complete geotechnical evaluations for the final design. Top slopes are designed to be sloped at 5% (20:1 H:V); sideslopes of both final and intermediate covers (e.g., for each phase) are designed to be sloped at a ratio of 3.5:1 (H:V).

The slope stability analysis included two types of failure scenarios based on the geometry of the facility and the geotechnical properties of foundation soils and waste mass:

- A block type failure along the base liner critical interface
- A circular failure that passes through the foundation soils or support structures (e.g., perimeter berms) as well as through the waste mass

For slope stability, the factor of safety is defined as a minimum ratio of maximum available resisting forces divided by actual driving forces under various scenarios. Consistent with current industry practice, the U.S. Army Corps of Engineers Slope Stability Engineer Manual (USACE 2003) recommends a minimum factor of safety of 1.5 for long-term static conditions. The calculated factor of safety was compared to the minimum allowable factor of safety for static (nonseismic) conditions of 1.5 for each scenario. The calculated factor of safety was significantly higher than 1.5 in all static cases, therefore suggesting stable conditions and acceptable design.

Slope stability was also analyzed under seismic conditions, to evaluate the stability of the facility during a seismic event. The analysis was performed to evaluate whether the waste mass and liner system would be able to withstand the design seismic event, based on a horizontal peak ground acceleration (PGA) of 0.1g. The RCRA Subtitle D Seismic Design Guidance for Municipal Solid Waste Landfill Facilities (EPA 1995) states that a factor of safety of 1.0 has been shown to be conservative in assessments of slope performance in earthquakes. A factor of safety of 1.0 (when the maximum available resisting forces are equal to the driving forces) or greater demonstrates overall stability for a seismic event, whereas a factor of safety of less than 1.0 suggests that slope failure would be expected to occur. For conservative design, a minimum allowable factor of safety (for seismic conditions) of 1.20 was chosen for the analysis. The results of the analysis indicated that all landfill sections and scenarios evaluated, met, or exceeded the criterion.

2.1.1.2 Seismicity and Liquefaction Evaluation

In addition to the above, the stability of the final cover design was evaluated for susceptibility to seismic and seismic-induced liquefaction of the soils. Liquefaction can occur in a saturated, cohesionless, medium-dense to loose sand layer, due to an earthquake that creates sudden high pore pressures, resulting in decreased shear strength. Liquefaction may cause ground failures such as settlement or lateral spreading.
The results of the seismicity and liquefaction evaluation indicated that the final cover system, waste mass, and base liner system of the proposed Ma'alo MSWLF are expected to remain stable under a seismic event of 0.10g. This is the magnitude of seismic event that was identified as the design requirement to maintain safety for the geographic location of Ma'alo, in accordance with HAR §11-58.1-13(e) and the Code of Federal Regulations (CFR) §40 (Subtitle D) Part 258.14.

Further, given the in situ soil material properties at Ma'alo, including the lack of sandy soil, liquefaction is not expected. While not expected to be an issue, liquefaction would be evaluated as part of the overall site geotechnical program during detailed design and permitting if sandy soils are encountered for any individual phase of the proposed landfill.

2.1.1.3 GEOMEMBRANE COMPATIBILITY

The geomembrane proposed for the Ma'alo MSWLF is manufactured from high density polyethylene (HDPE), which has high ultraviolet ray and chemical resistance while providing flexibility. These features make an HDPE geomembrane ideal for leachate retention at the proposed MSWLF. HDPE geomembranes are the predominant means of liner systems for all modern landfills. The proposed liner system is also based on recognition that the vicinity of the proposed MSWLF is not used for groundwater supply. However, the site is located mauka of (above) the UIC line, and in order to provide sufficient protection to safeguard the underlying aquifer, the County has selected the proposed double liner system, with each liner incorporating a 60-mil HDPE geomembrane and geosynthetic clay liner (GCL).

The use of HDPE geomembrane for the Ma'alo MSWLF base liner is the appropriate application, required by regulation, and would perform well in retaining collected leachate and overall site stability. The use of GCL is also appropriate as it combines geosynthetic materials with bentonite clay to form a highly impermeable barrier that performs well in demanding applications such as serving as part of the liner system for a MSWLF.

2.1.2 Landfill Gas (LFG) Extraction System

A MSWLF requires a LFG extraction system to prevent buildup of flammable gas (principally methane) produced by the microbial digestion of organic waste over time. The LFG extraction system would include extraction wells, extraction piping, and a control device to extract the gas for flaring off, or for collection and treatment as a fuel if the gas is of sufficient quality and quantity for use.

The design includes vertical LFG wells and open flares, installation of well boreholes no closer than 10 ft to the liner material, use of corrosion-resistant materials such as polyvinyl chloride (PVC) or high-density polyethylene (HDPE) and extraction well connector assemblies, allowance for expandability and accessibility, and sufficient flexibility and modulus of elasticity of the header pipe material. The control systems would be sized when needed according to the approximately 6-year timeframe when installation becomes necessary, and to address the County’s requirements.

The detailed design, which would include component sizing calculations and equipment selection, would be accomplished at a later date, based on (1) the likelihood that the LFG extraction system would not be required until approximately 6 years after initial waste acceptance (the anticipated period when landfill associated gases would be of sufficient volume to require control), and (2) in the event there are major modifications to the landfill design, the LFG extraction system would not need to be redesigned to comply with regulations.

The conceptual design includes vertical gas extraction wells, associated header piping, a condensate management system, and blower flare facility. The conceptual design also includes the capability to add an energy recovery system, if and when the County decides to do so.
The LFG extraction system would include gas extraction wells, gas extraction piping, and a control device. The system components, which meet the requirements listed in 40 CFR §60.759, would be as follows:

- Air intrusion would be minimized by ensuring that the well screen is no closer than 15 ft to the finished ground surface and by using only the minimal required vacuum pressure to extract LFG.
- Damage to underlying liners would be avoided by ensuring that the well borehole does not extend closer than 10 ft to the liner material.
- Corrosion-resistant materials such as PVC or HDPE would be used.
- Extraction wells would have connector assemblies (e.g., closing valves, sampling ports) suitable for monitoring under EPA’s New Source Performance Standards (40 CFR Part 60).
- Extraction devices would be installed at appropriate spacing intervals to ensure that gas is extracted from all areas warranting control, as detailed in Appendix D.
- The LFG extraction system would allow for expandability and accessibility: blind flanges would be included at strategic locations in the system layout to allow for future expansions of the system. In addition, HDPE pipe could be cut and new components fused in place to expand the system easily, if needed.
- The flexibility and modulus of elasticity of the header pipe material would be verified to be sufficient to prevent collapse due to settlement and to withstand planned overburden and traffic loads. Well pipes would not be PVC because PVC is more susceptible to bending when heated.
- The active LFG extraction system would be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control, over the intended use period of the LFG extraction system equipment.
- Open flares used for control would be designed and operated in accordance with 40 CFR §60.18.

Planning for the implementation of a LFG Extraction System is presently underway at the Kekaha MSWLF. The future system planned for the Ma'alolo MSWLF would employ the same or improved technology to recover LFG for the generation of energy or for other productive uses.

2.1.3 Leachate Management System

Leachate is any liquid that contacts and is then released by waste materials. Leachate must be properly collected and managed due to its potential for containing environmental contaminants. Water entering the MSWLF from rain events or arriving at the site within the waste percolates through the MSW and collects in the granular drainage layer overlying the liner system. This leachate is removed by leachate collection and transmission pipes located in the granular drainage layer.

The system design would remove landfill-associated leachate passively by gravity-fed leachate collection and transmission pipes located in the granular drainage layer. Phase 1 is planned to be divided into seven areas, with one leachate collection and transmission pipe per area. At the perimeter of the system, a perforated leachate collection pipe would transition to a non-perforated pipe that drains to a dual-contained leachate transfer pipe located within the perimeter berm. The dual-contained leachate transfer pipe would gravity-drain to a wet well located near the southwest corner of Phase 1. The leachate would then be pumped from the wet well through a force main to a proposed leachate evaporation pond for treatment. Netting or gridwire will be designed and installed above the high-level water line across the entire surface of the leachate evaporation pond to deter wildlife.

Figure 2-3: Proposed Phase 1 Leachate Management System, displays a schematic of the leachate management system proposed for Phase 1 of the proposed action. Leachate from the leachate collection piping located within each cell would be transferred to a dual-containment HDPE pipe system.
Figure 2-3: Proposed Phase 1 Leachate Management System
The leachate collection piping would be allowed to pass through the base liner system at an engineered pipe penetration that allows for gravity leachate collection (no pumping required). The dual-containment leachate piping would slope to the south to a wet well connected to the proposed leachate evaporation pond south of Phase 4. When the leachate level in the wet well reaches a set point, a pump in the wet well would be activated to pump out the leachate to the leachate evaporation pond. The proposed landfill phasing, base liner geometry, and gravity leachate management system for the proposed action would meet regulatory requirements for leachate head levels in the landfill to minimize the potential for release of leachate. The final design would be further refined during the design phase for the project and would be subject to regulatory review.

### 2.1.4 MSWLF Surface Water Management System

A surface water management system would be established to maintain the stability of the landfill, minimize erosion and generation of leachate, and prevent the transport of contaminants to offsite areas. This is typically accomplished by using a network of berms, channels, and other structures to control surface water run-on to the site from offsite areas and stormwater run-off from the site.

Run-on to the property would be routed around the landfill facilities by channels, culverts, and berms. Run-on routed around the facility would discharge from the site at locations similar to pre-development flows (e.g., in the north and south troughs of the saddle areas). The stormwater analysis performed for the project confirms that the peak flow rates exiting the site to the north and south would be reduced from existing conditions during the design storms as a result of site development. Therefore, no negative impacts to downstream features or structures are expected.

Surface water flow on the landfill itself would be controlled to prevent contact with waste and minimize the potential for erosion of the landfill cover. Diversion berms, consisting of low-profile compacted soil mounds, would be located on the landfill sideslopes, approximately 10–30 ft below the perimeter of the Phase 1 landfill top deck. These berms are designed to convey run-off from a 100-year 1-hour, and a 25-year 24-hour storm event and would direct surface water to rock-lined downslope channels with sideslopes of 2:1 and a width of 4 ft. Each downslope channel would have a trapezoidal cross-section capable of managing the 100-year 1-hour and 25-year 24-hour storm events that would convey water to a surface water basin via a perimeter channel or a culvert in some locations. The proposed surface water management system for Phase 1 is shown on Figure 2-4. It is expected that the system would be expanded as needed to cover each phase of the MSWLF as new phases come online. During operation of each phase, temporary sideslope berms and surface water control features would be maintained to prevent contact with waste and minimize potential for erosion of the landfill intermediate cover. Operationally, this may require construction of temporary sumps to collect surface water adjacent to developed liner areas.

Because the surface water basin is open-air, it is designed to discharge all water within 48 hours of the storm conclusion in order to minimize standing water, which could attract wildlife. Between storm events the basins will be designed to remain dry and netting or gridwire designed and installed above the high-level water line across the entire surface of the stormwater basin to deter wildlife. The surface water management system will be designed in accordance with the County of Kaua‘i DPW Storm Water Runoff System Manual (DPW 2001).

### 2.1.5 MSWLF Building Infrastructure

Infrastructure such as office and maintenance buildings and parking areas are required for operating a MSWLF. These infrastructure facilities include a shop area, scale house, drop-off area, and internal roadways. Buildings and a refuse vehicle scale to measure refuse loads are expected to be similar to facilities at the existing Kekaha MSWLF, with the exception of the office building, which is expected to be one-half the size of the existing office at the Kekaha MSWLF.

Figure 2-2 shows the infrastructure facilities for the proposed MSWLF, including the office and maintenance areas, scale house, access road, parking lot, internal roadways. The development of a future RRP would utilize the remaining open areas, as required.
Figure 2-4: Proposed Phase 1 Surface Water Management Plan
2.2 MSWLF SITE DEVELOPMENT

The construction and operation of the new MSWLF would consist of the following:

- **An impermeable base liner to impede landfill leachate from impacting the groundwater aquifer beneath the landfill.** The landfill liner system for the proposed MSWLF would have multiple layers of environmental protection to help ensure that leachate will not penetrate and adversely affect the underlying groundwater aquifer. A nine-layer base liner system is planned.

- **Development of the landfill in sequential phases.** The proposed MSWLF would be constructed in five phases, with Phases 1–4 physically defined by the lateral limits of the base liner systems, and Phase 5 being a vertical phase that directly overlays the completed Phases 1–4. The phasing would be further subdivided into cells constructed on an as-needed basis.

- **Use of daily soil cover and final cover when the landfill reaches final capacity.** Daily cover of up to 12 inches of soil would be applied to the active working areas of the landfill to reduce the attractiveness of the site to vectors including rodents, flies, and avifauna that could transit the area. An alternative daily cover, Posi-Shell® (or equivalent), is a thin, durable, stucco layer that eliminates waste exposure and odors off the active landfill face, thereby reducing bird attractants. It would be applied frequently throughout each working day to minimize birds and other wildlife on the landfill, and would reduce the material, equipment, and labor associated with a soil cover. Posi-Shell® is a blend of clay binders, reinforcing fibers, and polymers that, when mixed with water or leachate, creates a mortar that can be spray-applied to the active face of the landfill. The proposed final cover system, planned for use when the space available for the landfill is exhausted, would consist of (top-to-bottom): (1) 18-inch topsoil/root zone soil layer, (2) geocomposite drainage layer; (3) 40-mil linear low-density polyethylene (PE) liner; (4) GCL; and (5) a 12-inch intermediate cover over the top of the waste. The use of daily cover or an approved alternative such as Posi-Shell®, is a general requirement of all MSWLFs subject to regulation under RCRA Subtitle D.

- **Estimation of landfill capacity.** The projected total capacity for the five phases is approximately 33.4 million cubic yards (cy) of waste mass volume, for an expected site life of 264 years (at current rates of landfilling).

Details of the above development components are discussed further below.

### 2.2.1 MSWLF Base Liner

The landfill base liner system, from bottom to top, would include:

1. Prepared subbase grade (existing in-situ soil below the liner system, compacted and covered with 6-inch granular foundation lift, compacted, and prepared for liner installation)
2. Secondary GCL (to provide secondary inhibition of flow of leachate and to enhance the liner’s ability to withstand deformation); the secondary GCL is not required by the regulations, but is adopted as a part of the proposed landfill design to address environmental conditions
3. Secondary 60-mil HDPE geomembrane (to inhibit secondary flow of leachate); the secondary GCL is not required by the regulations, but is adopted as a part of the proposed landfill design to address environmental conditions
4. Primary GCL (to provide primary inhibition of flow of leachate and to enhance the liner’s ability to withstand deformation)
5. Primary 60-mil HDPE geomembrane (to inhibit primary flow of leachate)
6. Nonwoven cushion geotextile (to protect the primary geomembrane)
7. 12-inch granular drainage layer (to collect leachate and transport it from the liner, preventing excessive leachate build-up)
8. Nonwoven separator geotextile (to maintain composition of the drainage layer)
9. 24-inch operations layer of recompacted soil (to protect the liner from penetration due to placement of MSW and equipment usage atop the base liner system)

The base liner design is presented on Figure 2-5 (Drawing 31, Detail 1 [Base Liner Detail]). The proposed base liner exceeds the requirements of RCRA Subtitle D and HAR, Chapter 11-58.1 and includes minimum design requirements incorporating a base liner with a geomembrane liner overlaying 2 ft of recompacted soils.
Figure 2-5: Details of Baseline and Leachate Collection System
2.2.2 MSWLF Phasing

The MSWLF would be constructed in five phases with a total footprint of the limit of waste (LOW) of 160.5 acres. Phases 1–4 would be physically defined by their base liner systems’ lateral limits, and Phase 5 would be a vertical phase that directly overlays completed Phases 1–4. The overall layout, proposed phases, and initial development areas of the MSWLF are shown in Figure 2-6: Proposed Landfill Facility Layout.

To maximize available airspace for disposal, each phase would be overlain onto the previous phase, as shown in the cross-sections on Figure 2-7: Proposed Landfill Cross Sections A–A’, B–B’ and Figure 2-8: Proposed Landfill Cross Sections C–C’, D–D’. Overlaying of one phase onto another is accomplished by connecting the base liners of each phase over the perimeter berm, creating one continuous base liner system, as shown on Figure 2-5.

Subbase liner elevations would range from approximately 270 to 307 ft msl, a minimum of 10 ft above groundwater elevations reported in the perched water encountered in borings advanced at the site (MFA 2012). The subbase grades for the proposed MSWLF are proposed to be 10 ft below and roughly parallel to the current topography and drainage features of the property: base grades for Phases 1 and 2 slope from a high point on the east to a low point on the west, and Phases 3 and 4 slope from a high point on the west to a low point on the east. This orientation of subbase grades was chosen to minimize land disturbance during each phase’s operation and to provide groundwater separation based on current (limited) groundwater information. Subbase slopes and other dimensions are shown for the proposed landfill on Figure 2-9: Proposed Subbase Grading Plan.

The filling sequence of the proposed landfill is anticipated to be as follows:

- **Phase 1**: Filling would commence in the southeastern portion of the site. The initial site development would include the infrastructure required to be in place at the beginning of landfill operations, including the portion designated Cell 1.1 (Figure 2-10 [Drawing 27]). The entrance area, and initial phases of constructing the landfill control systems and the slopes and dimensions of Phase 1 are shown for the proposed landfill on Figure 2-11 [Drawing 22].
- **Phase 2**: Once the last cell of Phase 1 has been completed, operation would commence in a second plot located directly north of Phase 1. Phase 2 would overlay onto the north sideslope of Phase 1.
- **Phase 3**: Once the last cell of Phase 2 has been completed, operation would commence in a third plot, west and adjacent to Phase 2. Similar to the Phase 2 overlay onto the north sideslope of Phase 1, Phase 3 would overlay onto the west sideslope of Phase 2.
- **Phase 4**: The final lateral phase would be located directly adjacent to the west side of Phase 1 and the south side of Phase 3. Phase 4 would overlay waste mass onto the west sideslope of Phase 1 (and a portion of Phase 2), as well as the south sideslope of Phase 3.
- **Phase 5**: Phase 5 would not add any new horizontal area to the LOW, but would overlay Phases 1–4 and increase the facility’s overall final waste mass height.

Each landfill phase would consist of a series of cells, which would be constructed as needed to maintain operational airspace and can vary in size and shape based on this need. The landfill cells would be a smaller portion of the overall phase, allowing for smaller work areas and controlled site operations, requiring less capital expenses for construction and operation, and facilitating the limiting and managing of leachate and LFG production and extraction.

The date of construction of each subsequent cell would depend on the rate of incoming waste, compaction efficiency, daily cover soil needs, and the required construction time, tempered by the need to control the amount of time that liner systems are exposed to the elements.
Figure 2-6: Proposed Landfill Facility Layout
Figure 2-7: Proposed Landfill Cross Sections A–A’, B–B’
Figure 2-8: Proposed Landfill Cross Sections C–C', D–D'
Figure 2-9: Proposed Subbase Grading Plan
Figure 2-10: Proposed Initial Landfill Site Development Plan [dr27]
Figure 2-11: Proposed Phase 1 Subbase Grading Plan [dr22]
2.2.3 Final Cover

Final cover would be applied to the landfill when it reaches final capacity, prior to site closure. Regulations specify infiltration and permeability requirements for the final cover: HAR §11-58.1-17(a) requires that landfill covers have an 18-inch infiltration layer with a permeability less than or equal to the permeability of layer that can sustain plant growth and inhibit erosion, or approved equivalent.

The following top-to-bottom cover system, as shown on Figure 2-5 (Drawing 31, Detail 5 [Final Cover System]), is expected to be proposed in the Solid Waste Management Permit application to the DOH:

1. 18-inch topsoil/root zone soil layer
2. Geocomposite drainage layer
3. 40-mil linear low-density PE liner (double-sided textured)
4. GCL
5. 12 inches of intermediate cover material
6. Top of waste in landfill

The proposed final cover design would meet the requirements of HAR §11-58.1-17(a).

Figure 2-7 and Figure 2-8 (Drawing 28 and Drawing 29) superimpose the final cover grades on the nearby Kālepa Ridge, and the proposed Phase 1 final cover grading plan is shown on Figure 2-12, and for the entire landfill on Figure 2-13.

2.2.4 Landfill Capacity

The proposed MSWLF would be a new facility and the estimate of available airspace is controlled by the overall footprint of the facility, final cover design grades, height constraints, if any, and related practical or operational considerations. The waste stream and compaction rates of municipal solid waste and refuse accepted at the new facility are assumed to be comparable to the existing Kekaha MSWLF, which receives approximately 82,000 TPY with an in-place compacted waste mass density of approximately 1,300 pounds per cubic yard (lbs/cy) (0.65 ton of MSW per cy of airspace).

The above assumptions are conservative and used to provide a projection of the volume of waste that can reasonably be handled. Table 2-1 lists the projected capacities of the first cell, the remainder of Phase 1, and the remaining four phases for the proposed MSWLF. As shown in Table 2-1, the anticipated capacity of the landfill is 32,296,000 cy, or approximately 264 years.

Table 2-1: MSWLF Projected Capacity for Proposed Action

<table>
<thead>
<tr>
<th>Phase</th>
<th>Design Waste Mass Volume (cy)</th>
<th>Annual Waste Tonnage (tons)</th>
<th>Compaction Factor (tons of waste/in-place cy)</th>
<th>Annual Airspace Consumed (cy)</th>
<th>Expected Site Life (years, rounded)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A (initial development)</td>
<td>1,099,000</td>
<td>82,000</td>
<td>0.65</td>
<td>126,154</td>
<td>9</td>
</tr>
<tr>
<td>1 (remainder)</td>
<td>3,360,000</td>
<td>82,000</td>
<td>0.65</td>
<td>126,154</td>
<td>27</td>
</tr>
<tr>
<td>2</td>
<td>4,399,000</td>
<td>82,000</td>
<td>0.65</td>
<td>126,154</td>
<td>35</td>
</tr>
<tr>
<td>3</td>
<td>5,149,000</td>
<td>82,000</td>
<td>0.65</td>
<td>126,154</td>
<td>41</td>
</tr>
<tr>
<td>4</td>
<td>9,973,000</td>
<td>82,000</td>
<td>0.65</td>
<td>126,154</td>
<td>79</td>
</tr>
<tr>
<td>5</td>
<td>9,316,000</td>
<td>82,000</td>
<td>0.65</td>
<td>126,154</td>
<td>74</td>
</tr>
<tr>
<td>Total</td>
<td>33,296,000</td>
<td></td>
<td></td>
<td></td>
<td>264</td>
</tr>
</tbody>
</table>

Note: (1) Expected site life does not account for waste mass settlement over time (consolidation), which is expected to add to the site life; (2) Totals may not add due to rounding.
Figure 2-12: Proposed Phase 1 Final Cover Grading Plan
Figure 2-13: Proposed Final Cover Grading Plan
2.2.5 Soils Balance

Soil balance is an engineering calculation that evaluates the availability of onsite soils for grading, daily cover material, and final cover. Construction and operation of the proposed MSWLF would require acquisition of soil from on- and offsite sources. Onsite sources of soil include those areas planned for excavation (e.g., areas within the proposed limits of waste (LOW), portions of the surface water management system, and areas proposed for mass grading for infrastructure development). Offsite sources of suitable soil would need to be identified by the County.

Based on preliminary geotechnical investigation of the site, granular material for the drainage and operations layers does not appear to be available on site and would be obtained from local aggregate suppliers (AECOM 2016; Appendix D). Concurrent with Phase 1 development, soil could be stockpiled within the facility based on construction and operational needs. Soil material quantities available within the facility and the quantity required for construction and operation of the proposed MSWLF are summarized in Table 2-2. Significant quantities of cover soil would need to be identified in later years of site operations.

Table 2-2: Available and Required Soil Material Quantities for the Proposed Action

<table>
<thead>
<tr>
<th>Phase</th>
<th>Topsoil</th>
<th>Miscellaneous Soil</th>
<th>Granular Material</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Available within Ma'alo MSWLF (cy)</td>
<td>Required (cy)</td>
<td>Available within Ma'alo MSWLF (cy)</td>
</tr>
<tr>
<td>1</td>
<td>37,300</td>
<td>28,300</td>
<td>749,700</td>
</tr>
<tr>
<td>2–5</td>
<td>154,800</td>
<td>124,600</td>
<td>312,600</td>
</tr>
</tbody>
</table>

Note: All quantities in cubic yards (cy).

2.2.6 MSWLF Construction Activities

Construction activities to develop the Ma'alo site would include equipment and materials mobilization, clearing, excavation, grading, and landscaping. During excavation and grading work, ground disturbance would be held to the minimum area necessary to accommodate the movement of heavy equipment and materials, to ensure protection of the site from erosion during storm conditions. Staging and stockpile areas would be prepared as necessary with appropriate stormwater discharge pollution prevention features, fugitive dust containment, parking areas for workers, and provision of water and wastewater facilities.

Site development activities would include:

- Clearing and grubbing
- Excavation
- Temporary erosion control, dust control, and maintenance of best management practices (BMPs) during construction
- Subgrade preparation, installation of liner, and LFG extraction and leachate management systems
- Construction Management (CM)/Construction Quality Assurance (CQA)
- Leachate evaporation pond
- Drainage improvements
- Infiltration basin
- Office building, shop, scale and scale house, public drop-off facility
- Site work
- Access road
- Traffic flow
- Noise mitigation along the E3 access route
- Heavy equipment purchase
Upon completion of construction activities, restoration of the site would include the following:

- Existing utilities would be restored to an appropriate operational condition.
- Inadvertent damage or other impacts from construction traffic to roadways or other offsite features, if any, would be repaired.

All areas damaged by construction staging would be restored. Exposed ground areas would be seeded, hydro-mulched, or revegetated, as appropriate.

The tentative physical placement of facilities at the Ma'alo site is shown on Figure 2-2: Proposed Ma'alo Site Schematic.

### 2.3 Access Road and Utilities

The proposed action includes construction of paved roadways and utilities to connect to the public systems. Utilities include electrical, telephone, telecommunications services, and potable water. Wastewater service, landscaping, and site security would be provided on site.

#### 2.3.1 Access Road

The 2014/2016 *New Kaua‘i Landfill Traffic and Roadways Engineering Feasibility Study* (TREFS) (AECOM 2016; Appendix F) analyzed traffic impacts, recommended roadway improvements, and identified the potential for social impacts of five potential access routes between Kūhiō Highway and the proposed MSWLF site.

The proposed access route was selected based on balancing multiple concerns including feasibility, directness of route, mitigation of potential traffic impacts, cost requirements, and related factors. The alternatives considered in the TREFS were also discussed with the community, and the resulting dialog became a key consideration in the selection of Route E, described in the TREFS as:

**Route E3:** Via Kaua‘i Beach Drive and Driveway 3. The intersection is Kaua‘i Beach Drive/Kūhiō Highway (a stop-sign-controlled T-intersection). Total route length is 2.8 miles.

Figure 2-14 identifies the proposed access route to the proposed MSWLF site. The offsite access route starts at the intersection of Kaua‘i Beach Drive with Kūhiō Highway. It continues southwest for approximately 1.4 miles, roughly following Kuhio Highway (mauka of the Highway), until it intersects with Laulima Street. At Laulima Street, the 1.4-mile driveway continues north to the southern corner of the proposed MSWLF.

The following provides a detailed description of the planned access to the Ma'alo MSWLF site.
Figure 2-14: Proposed Access Route from Kūhiō Highway to the Proposed Project Site
Kaua‘i Beach Drive / Kūhiō Highway Intersection

The existing Kaua‘i Beach Drive / Kūhiō Highway intersection is a 3-way, unsignalized intersection, as shown on Figure 2-15. The Hawai‘i State Department of Transportation (DOT) right-of-way (ROW) is 60 ft wide. The existing intersection can accommodate a minimum-design turning radius of 40 feet (i.e., WB-40 truck-turning movement). A left-turn lane in the northbound direction on Kūhiō Highway would be required.

The proposed improvements to the Kaua‘i Beach Drive / Kūhiō Highway intersection are:

- Signalize the intersection.
- Widen roads and pave with 2 inches asphalt concrete pavement (ACP), 6 inches asphalt concrete base (ACB), 6 inches aggregate subbase.
  - Right-turn lane in southbound direction on Kūhiō Highway: 12-ft lane, 150-ft storage length, 150-ft taper length.
  - Right-turn lane on Kaua‘i Beach Drive onto Kūhiō Highway in southbound direction: 12-ft lane, 150-ft storage length, 150-ft taper length.
- Construct two raised median islands with American Disabilities Act (ADA)-accessible pedestrian ramps.
- Acquire additional ROW land (including survey maps).

Alternatively, the County may consider the use of a roundabout such as recommended in consultation with the DOT for the area between Kapule and the Wailua Bridge, Kaua‘i. This would require further investigation and discussion with the DOT for the development of an appropriate design.

Access Roadway: Kaua‘i Beach Drive

The proposed access roadway, shown on Figure 2-15, is owned by Visionary LLC and Grove Farm Co., Inc., and includes land proposed for Driveway 3, below. The existing access is an unimproved road with a gate restricting public access to private land; there are no defined lane widths or shoulder widths. The recommended improvements to the proposed access roadway, to conform to County of Kaua‘i requirements, are:

- Acquire additional ROW (including survey maps).
- Stabilize shoulders and provide erosion control.
- Provide drainage improvements (potentially including shoulder swales, culverts, and drainage outfalls).
- Establish utility corridors to bring water, electricity, and telephone service to the proposed project site.
- Widen roads and pave: 12-ft lanes with 4-ft shoulders; 2 inches ACP, 6 inches ACB, and 6 inches aggregate subbase.
- Provide chain-link fence on both sides of the access roadway.

The access road pavement would be capable of sustaining heavy traffic consisting of 20-ton multiaxle vehicles. The road design provides adequate turning room for trucks up to 48 ft in length.
Figure 2-15: Plan of Kaua’i Beach Drive / Kūhiō Highway Intersection
Driveway 3

Driveway 3 connects Laulima Street to the proposed project site. Proposed improvements to the driveway are:

- Provide chain-link fence on both sides of the driveway.
- Establish utility corridors to bring water, electricity, and phones to the proposed project site.
- Provide new pavement (including road widening): 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase.
- Acquire additional ROW land (including survey maps).

2.3.2 Utility Connections

Utility connections would be required for the proposed MSWLF.

Electrical supply, telephone, and telecommunications services would involve the following:

- Electricity and telephone service would connect at the intersection of Laulima Street and Kūhiō Highway. Utility poles carrying services would be constructed along Laulima Street and the site access roadway to the site entrance(s). All electrical systems would comply with applicable codes. All buildings would be provided with sufficient power supply for the proposed building use and electrical equipment requirements. Electrical service panels would be provided with circuit breakers.
- Shielded mast lighting compatible with Kaua‘i guidelines would be provided for emergency use on all roadways and parking areas, but would not be regularly turned on at night unless required by an emergency. Interior lighting would be provided to suit ceiling height and work space with adequate illumination levels for space usage.
- An uninterruptable power supply system would be provided as emergency backup where required. An emergency generator would have sufficient capacity for operation of main buildings and scale house interior lighting, computers and communication systems, and pumping systems during a power failure.

Onsite telephone lines and internet access would be provided to scale houses, offices, and buildings. The fire detection, alarm, and firefighting systems would be provided in accordance with local fire code requirements.

2.3.2.1 WATER SUPPLY

The nearest connection to the County water system is a 12-inch main along Kūhiō Highway at the intersection of Laulima Street. A 12-inch waterline would be connected there and installed parallel to the access roadway to the MSWLF site. Potable water would be provided to all buildings with staff during operating hours.

2.3.2.2 WASTEWATER

Wastewater would be managed with the installation of a wastewater system septic tank and absorption bed at the proposed MSWLF site. The sizing of the system would be based on personnel requirements and comply with State and County of Kaua‘i standards.

2.3.2.3 LANDSCAPING

The MSWLF site would be grassed along open areas where needed to control dust and erosion, and to improve aesthetics. Additional landscaping may be considered, if required, to provide visual screening of portions of the landfill site from along the access roadway system. Whenever possible, native vegetation would be used along the access roadway system for this purpose.
2.3.2.4 SECURITY

Security at the MSWLF site would include gated access roads, perimeter fencing, and natural and other types of barriers to deter unauthorized access. Fencing would limit access to the site from adjacent roadways and neighboring properties, and gates would be kept locked at night and when the facility is closed.

Lighting would also be provided at the office/administration building. During working hours, the attendant at the scale house would provide security to prevent unauthorized access or illegal dumping. Onsite security during periods when the landfill is closed at the end of the workday or on holidays would be determined by the DPW and adjusted as necessary to deter vandals and prevent unwanted entry into the site.

2.4 PROJECT SCHEDULE AND PROJECT COST ESTIMATE

The project schedule for the proposed project includes information summarized from the Conceptual Design Report (AECOM 2014: Appendix D). Cost estimates for the proposed project are summarized from data presented in the Conceptual Design Report and the TREFS (AECOM 2016; Appendix F).

2.4.1 Project Schedule

Once the EIS and the public-review process are completed, the land would need to be acquired or the land use rights secured in favor of the County of Kaua‘i for the operation of a MSWLF on the Ma‘alo parcel. Detailed engineering design, permitting, and other approvals would also need to be obtained and completed before construction could begin.

2.4.1.1 MSWLF PHASING PLAN

Assuming that an agreement is reached, it may take an additional 6 years after completion of the EIS to acquire the land and design, permit, construct, and begin operation of the new landfill. Based on the estimate of completion of the EIS process within the 2018 timeframe, the MSWLF could become operational starting in the 2023-2024 timeframe. The projected timescale for operation of the proposed MSWLF over the site life would terminate in the year 2279 (see Table 2-3):

Table 2-3: Proposed Action MSWLF Projected Schedule of Use

<table>
<thead>
<tr>
<th>Phase *</th>
<th>Expected Site Life b (yrs., rounded)</th>
<th>Projected Timeframe (calendar yr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A (initial development)</td>
<td>9</td>
<td>2032</td>
</tr>
<tr>
<td>1 (remainder)</td>
<td>27</td>
<td>2050</td>
</tr>
<tr>
<td>2</td>
<td>35</td>
<td>2085</td>
</tr>
<tr>
<td>3</td>
<td>41</td>
<td>2126</td>
</tr>
<tr>
<td>4</td>
<td>79</td>
<td>2205</td>
</tr>
<tr>
<td>5</td>
<td>74</td>
<td>2279</td>
</tr>
<tr>
<td>Totals c</td>
<td>264</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes:
Estimated durations assume that waste is deposited at current rates. Operation of the future RRP could result in extending these phased end dates.

* The projected starting year is in 2023.
* The expected site life does not account for waste mass settlement over time (consolidation), which is expected to add to the site life.
* Totals may not add due to rounding.

The projected timescales are based on current rates of waste disposal and can be significantly influenced as the County pursues the operation of a future RRP, which would reduce the disposal of solid waste in the MSWLF. Conversely, projected timescales could change if significant population,
development and tourism growth were to occur in a shorter than expected period of time. Additionally, the occurrence of a natural disaster such as a hurricane or tsunami could significantly increase the amount of waste requiring disposal due to clean-up and clearing of disaster debris.

2.4.2 Project Cost Estimates

Funding for the project would be provided by the County of Kaua‘i, refuse operating budget (i.e., tipping fees), and/or other sources as determined appropriate by the County. One source recently confirmed with the Department of Health, Clean Water Branch, is the use of the State Revolving Fund which is available for a portion of the design and construction of the proposed Ma‘alo MSWLF.\(^2\)

Project implementation will be phased to construct elements of the MSWLF as required. Major portions of land may remain unused for extended periods (possibly 100 or more years); therefore, current land uses and occupants may be allowed to continue to use large portions of the site for agricultural activities until these areas are required for landfill purposes.

2.4.2.1 MSWLF Costs

The total preliminary estimated cost for supporting infrastructure and Cell 1.1 of the proposed Ma‘alo MSWLF (without contingencies) is approximately $41.0 million (for planning purposes, a contingency of $6.1 million is recommended). These costs include the use of approximately 57.7 acres of the property.

The following are the cost components for construction of the MSWLF, which includes landfill Cell 1.1 and the required supporting landfill infrastructure (the costs for each component are summarized in Table 2-4):

- **Earthwork.** Earthwork for development of the MSWLF would encompass 57.7 acres. Development of Cell 1.1 and the supporting infrastructure would require excavation and segregation of existing soils, clearing and grubbing of surface vegetation (e.g., trees, shrubs, organic debris), and erosion control (such as silt fencing) around disturbed areas.

- **Facility entrance.** The main artery for landfill activities is the facility entrance. Associated operational support structures include a septic system to process wastewater from the onsite personnel and visitors and an office building to house County and site operator personnel associated with the MSWLF, a maintenance building for onsite servicing of landfill heavy equipment, a scale/ticket house for documentation of actual incoming MSW tonnage (public and private hauler use), and a public drop-off facility.

- **Cell 1.1 base liner construction.** The base liner is the actual component of the MSWLF that would be prepared to contain the MSW.

- **Leachate management system.** Leachate collected from the in-place MSW along the base liner would be removed from the base liner by gravity along the slope of the base liner, perforated piping on the base liner, and dual-contained piping outside the cell.

- **Surface water management system.** Surface water management consists of physical features of the facility used to control, store, and discharge surface water. This would be completed by managing run-on water from outside the MSWLF boundaries with designed control berms and channels and various-sized culverts, and using riprap and erosion control matting to deter soil erosion.

- **Access roads.** Access roads are the primary designated and controlled routes for vehicle traffic into, on, and off the MSWLF. Access roads include asphalt-paved roads and areas for the main

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\(^2\) County of Kaua‘i, Solid Waste Division, March 2017.
gated entrance, public drop-off facility, site office, ticket/scale house, and maintenance building; and an aggregate (gravel) road from the asphalt-paved areas to the operational area of Cell 1.1.

- **Miscellaneous features and programs.** Miscellaneous features for the MSWLF include security, safety, communication, and office supplies/hardware features such as security fencing and access gates around the perimeter of the developed facility for controlled access, bollards around the public drop-off area, and special communication hardware for the wet well.

- **Utilities.** Utilities would include electrical, water, and wastewater required to support the operations of the new MSWLF.

- **Construction Management (CM) and Construction Quality Assurance (CQA).** CM and CQA are services provided by a qualified engineering consulting firm or similar that operates as the onsite representative of the County to direct and document construction of the facility.

- **Engineering and permitting.** Engineering for development of the MSWLF includes submittal of all required permit submittals (e.g., the solid waste permit application) prior to the construction of the MSWLF.

**Contingency.** A contingency is a designated amount of funds that are allocated and maintained to offset unforeseen or uncontrollable situations. These situations may include, but are not limited to, weather delays during construction, permit delays, new regulations, changes in subsurface features, changes in costs over time, or requested design changes.

The cost breakdown is presented in Table 2-4, as follows:

### Table 2-4: Proposed Action MSWLF Construction Cost Estimate Summary

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Earthwork</td>
<td>$10,216,177</td>
</tr>
<tr>
<td>2. Facility Entrance</td>
<td>$1,296,696</td>
</tr>
<tr>
<td>3. Cell 1.1 Base Liner Construction</td>
<td>$1,507,131</td>
</tr>
<tr>
<td>4. Leachate Management System</td>
<td>$8,490,892</td>
</tr>
<tr>
<td>5. Surface Water Management System</td>
<td>$883,070</td>
</tr>
<tr>
<td>6. Internal access roads</td>
<td>$911,669</td>
</tr>
<tr>
<td>7. Utilities</td>
<td>$8,162,900</td>
</tr>
<tr>
<td>8. Miscellaneous Items</td>
<td>$1,292,335</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>$32,760,870</td>
</tr>
<tr>
<td>Engineering and Permitting: 12%</td>
<td>$3,931,304</td>
</tr>
<tr>
<td>CM/CQA: 8%</td>
<td>$2,620,870</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>$33,334,174</td>
</tr>
<tr>
<td>Hawai’i General Excise Tax: 4.166%</td>
<td>$1,637,781</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$40,950,825</td>
</tr>
<tr>
<td>Contingency: 15%</td>
<td>$6,142,624</td>
</tr>
</tbody>
</table>

Source: AECOM (2016, Table 10); Appendix D

#### 2.4.2.2 Access Route Costs

The 2016 TREFS (AECOM 2016; Appendix F) estimated the cost to establish the proposed E3 access route and utility lines from Kūhiō Highway to the MSWLF at approximately $17.3 million.

#### 2.4.3 Project Cost Summary

A summary of project costs are presented in Table 2-5. This project cost summary does not include contingency costs to account for future changes, scope clarifications, or cost escalation.

### Table 2-5: Summary of Estimated Initial Construction Costs for Proposed MSWLF Phase 1A

<table>
<thead>
<tr>
<th>Components</th>
<th>MSWLF</th>
<th>Access Roads and Utilities*</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Action</td>
<td>$40,950,825</td>
<td>$17,321,000</td>
<td>$58,271,825</td>
</tr>
</tbody>
</table>

* Access roads and utilities costs are from the Traffic and Roadways Engineering Feasibility Study (AECOM 2016; Appendix F): Project Access Route E3 (Kaua‘i Beach Drive).
3.0 ALTERNATIVES TO THE PROPOSED PROJECT

The County considered a range of reasonable alternatives to address its island-wide landfill needs. The MSW stream. The alternatives considered include:

- No Action: This alternative involves taking no further action to develop an alternative site or technology for the disposal of MSW. The Kekaha MSWLF would reach capacity in approximately 10 to 12 years and the process to close the Kekaha MSWLF would be initiated which would leave the County without a viable means of disposal of MSW. No Action fails to meet the County's purpose, need, and objectives. Rather, it serves as a baseline from which to measure the effects of all other alternatives. See Section 3.1 for further detail.

- Alternative Locations for a New MSWLF: This alternative involves establishing a new MSWLF at an alternate site on Kaua‘i identified in previous County landfill siting studies. Eight potential sites were identified for consideration in the 2012 Siting Study (AECOM 2012). See Section 3.2 for further detail.

- Alternative Technologies and Other Methods: This includes a summary of alternative technologies and other methods to process the County’s MSW stream. Alternative Technologies and Other Methods would not be capable of processing the County’s entire MSW stream and therefore fails to meet the County’s purpose, need, and objectives. See Section 3.3 for further detail.

3.1 NO ACTION ALTERNATIVE

HRS, Chapter 343, requires the consideration of the No Action Alternative to serve as a baseline against which other potential actions can be measured. The No Action Alternative would involve taking no further action to replace the Kekaha MSWLF when it reaches capacity. Taking No Action would fail to address the project’s purpose and need: it would not provide for the proper disposal of MSW that cannot be further reused, recycled, or otherwise recovered; does not provide a practicable, reliable and safe method of MSW disposal; and, is not an alternative that can reasonably address the pending closure of the Kekaha MSWLF.

Under No Action, the County would have no permitted disposal facility for the safe, sanitary, and efficient disposal of Kaua‘i’s MSW. This would cause waste to accumulate and issues to arise from an expected significant volume of decomposing organic matter. Without the benefit of a sanitary MSWLF, vector issues associated with attracting rats, mice, flies, and related pests would increase and alternative means of waste disposal would become critically urgent. This could lead to illegal disposal throughout the island of Kaua‘i which would create significant environmental problems and safety hazards. Illegal dumping of household hazardous waste (HHW) and other materials can threaten human health, wildlife, and the environment, and pollute soil, waterways, groundwater, and the marine environment. Illegal dumping also increases rodent and other vector populations, which poses significant health risks. Uncontrolled dumping can also result in fires that pollute the air and pose threats to health, safety, and property.

By not addressing the pending closure of the Kekaha MSWLF, the future need for the safe and efficient disposal of MSW on the island would not be met. Significant health, social, and economic problems would result, severely diminishing the quality of life on the island. Public nuisances would be created, and the County’s ability to maintain public health and safety, and prevent the spread of disease would be severely compromised. In addition to these concerns, the County of Kaua‘i, Solid Waste Division has indicated that the State Department of Health, Solid Waste Section, has stated that there would be no further expansion of the Kekaha MSWLF permitted, and the Pacific Missile Range Facility
(PMRF) Barking Sands, situated west of the Kekaha MSWLF, has stated that no further vertical expansion of the landfill would be allowed to maintain safety of the PMRF airfield airspace.3

For the reasons cited above, the No Action Alternative is removed from further consideration.

### 3.2 Alternative Locations

This alternative is for the development of a new MSWLF site on Kaua‘i to replace the existing Kekaha MSWLF. The eight potential alternative MSWLF sites listed below have been under investigation by the County since the year 2000 (see also Section 1.4 for the chronological history of effort by the County in the site selection process for a new landfill).

The initial siting factors and processes from siting studies in 2001 and 2002, the MACLS study in 2009, and the ISWMP updated in 2009 follows. Section 3.2.1 presents the New Kauai Landfill Siting Study Report prepared in 2012, and Section 3.2.2 describes the alternatives analysis for the access road.

#### Siting Studies (2001 and 2002)

The 2000 Kaua‘i Municipal Solid Waste Landfill Siting Study (Earth Tech 2001) originally identified seven sites (Kekaha Mauka, Kīpū, Kōloa, Kumukumu, Ma’alo, Pū’u Papa‘i, and ‘Umi) to address Kaua‘i’s future solid waste landfill needs, meet established siting and environmental criteria, and comply with all regulatory requirements. Shortly after the 2001 study was completed, a new landowner proposed a new landfill site, Kālepa, located in East Kaua‘i, roughly south of the Ma‘alo proposed landfill site. By June 2002, the analysis of the Kālepa site indicated that it similarly met the identified needs, criteria and requirements for a new MSWLF.

The 2001/2002 siting studies included island-wide evaluations to identify exclusion areas where siting a landfill would or should not be considered. HAR, §11 58.1-13 (DOH 1994), provided the primary criteria for identifying exclusion areas. Other criteria were also applied, as identified below in Table 3-1. The studies used GIS-based analysis to map areas that did not meet the exclusionary criteria. The remaining areas were further evaluated as potential candidate sites.

<table>
<thead>
<tr>
<th>Environmental Criteria</th>
<th>Technical Criteria</th>
<th>Social/Cultural Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquifer status</td>
<td>Site drainage</td>
<td>Availability of land</td>
</tr>
<tr>
<td>Location of groundwater wells</td>
<td>Availability of soil for daily cover</td>
<td>Proximity to private residences</td>
</tr>
<tr>
<td>Geologic/hydrogeologic conditions</td>
<td>Precipitation</td>
<td>Potential impact to people as a result of the prevailing wind</td>
</tr>
<tr>
<td>Endangered species and sensitive ecological areas</td>
<td>Topography</td>
<td>Scenic views</td>
</tr>
<tr>
<td>Relative importance of agricultural land</td>
<td>Site capacity</td>
<td>Accessibility of site to a well-traveled road</td>
</tr>
<tr>
<td></td>
<td>Availability of utilities</td>
<td>Archaeological and historical significance of site</td>
</tr>
</tbody>
</table>


The sites were assigned a score between 1 (least suitable) and 5 (most suitable) for each criterion. The score was multiplied by a weighting factor that expressed the importance of each criterion relative

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3 County of Kaua‘i, Department of Public Works, Solid Waste Division, March 25, 2018.
2018 DEIS, New Kaua‘i Landfill Alternatives to the Project

to the others. Totals for each site were summed to create the list of sites ranked according to suitability for a landfill (Table 3-2).

**Table 3-2: Sites Ranked According to Suitability, 2001/2002 Siting Studies**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Site</th>
<th>Total Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Kekaha Mauka</td>
<td>420</td>
</tr>
<tr>
<td>2nd</td>
<td>Kīpū</td>
<td>396</td>
</tr>
<tr>
<td>3rd</td>
<td>Kālepa</td>
<td>392</td>
</tr>
<tr>
<td>4th</td>
<td>Kumukumu</td>
<td>377</td>
</tr>
<tr>
<td>5th</td>
<td>Pu‘u o Papa‘i</td>
<td>372</td>
</tr>
<tr>
<td>6th</td>
<td>Ma‘alo</td>
<td>351</td>
</tr>
<tr>
<td>7th</td>
<td>Kōloa</td>
<td>345</td>
</tr>
<tr>
<td>8th</td>
<td>‘Umi</td>
<td>306</td>
</tr>
</tbody>
</table>


**MACLS Study (2009)**

In 2007, Kaua‘i Mayor Bryan J. Baptiste convened the Mayor’s Advisory Committee on Landfill Site Selection (MACLS). The committee was tasked with developing new community-based criteria, adding to the criteria from the 2001/2002 siting studies, and weighting the criteria they had developed. The MACLS developed 26 community-based criteria. The criteria were weighted according to perceived importance and assigned a weight between 1 (least important) and 10 (most important) (Table 3-3).

**Table 3-3: MACLS Community Criteria and Weighting Factors**

<table>
<thead>
<tr>
<th>No.</th>
<th>Criterion</th>
<th>Weighting Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Location of site relative to the UIC Line</td>
<td>10</td>
</tr>
<tr>
<td>1</td>
<td>Population density near site</td>
<td>9</td>
</tr>
<tr>
<td>20</td>
<td>Cost of development</td>
<td>9</td>
</tr>
<tr>
<td>18</td>
<td>Haul distance from major municipal solid waste generation areas</td>
<td>9</td>
</tr>
<tr>
<td>26</td>
<td>Landfill capacity or site life</td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td>Consistency of the designation of the site for a landfill with the Kaua‘i General Plan</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>Distance to nearest residence, school, hospital or non-compatible business</td>
<td>8</td>
</tr>
<tr>
<td>21</td>
<td>Cost of operations</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>Displacement of residences and/or businesses including agricultural businesses</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Archaeological and/or historical significance</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>Cost of site acquisition</td>
<td>7</td>
</tr>
<tr>
<td>14</td>
<td>Proximity to surface water</td>
<td>7</td>
</tr>
<tr>
<td>15</td>
<td>Flora and fauna habitat</td>
<td>5</td>
</tr>
<tr>
<td>16</td>
<td>Annual precipitation</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Site distance from major highway</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Schools or hospitals along access road</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Ceded or Hawaiian Homestead Land</td>
<td>3</td>
</tr>
<tr>
<td>25</td>
<td>Proximity to parks and recreational facilities</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>Residential units or developments along access road</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>Consistency of the site with the existing State Land Use Designation</td>
<td>2</td>
</tr>
<tr>
<td>19</td>
<td>Adequacy of site drainage</td>
<td>2</td>
</tr>
<tr>
<td>22</td>
<td>Availability of utilities</td>
<td>2</td>
</tr>
<tr>
<td>24</td>
<td>Availability of existing access roadway from major highway or collector street</td>
<td>2</td>
</tr>
</tbody>
</table>
The 26 criteria and weighting factors were applied to seven of the eight sites identified in the 2001/2002 siting studies. The Kumukumu site was removed from the evaluation within the timeframe of the study due to an anticipated subdivision development within a major portion of the site.

The MACLS applied the siting criteria and weighting factors and produced the rankings shown in Table 3-4.

Table 3-4: MACLS Landfill Site Ranking

<table>
<thead>
<tr>
<th>Rank</th>
<th>Site</th>
<th>Score</th>
<th>Difference in Points from Next-Highest-Ranked Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>'Umi</td>
<td>334</td>
<td>8</td>
</tr>
<tr>
<td>2nd</td>
<td>Kekaha Mauka</td>
<td>326</td>
<td>31</td>
</tr>
<tr>
<td>3rd</td>
<td>Kōloa</td>
<td>295</td>
<td>7</td>
</tr>
<tr>
<td>4th</td>
<td>Kīpū</td>
<td>288</td>
<td>19</td>
</tr>
<tr>
<td>5th</td>
<td>Pu‘u o Papaʻi</td>
<td>269</td>
<td>4</td>
</tr>
<tr>
<td>6th</td>
<td>Maʻalo</td>
<td>265</td>
<td>17</td>
</tr>
<tr>
<td>7th</td>
<td>Kālepa</td>
<td>248</td>
<td>—</td>
</tr>
</tbody>
</table>

Source: RMTC (2009)

In May 2009, the Committee’s technical consultant published the results in Volume 1: Report of the Mayor’s Advisory Committee on Landfill Site Selection (RMTC 2009). The report noted the small difference in scores separating the ranking for three pairs of sites: ‘Umi and Kekaha Mauka, Kōloa and Kīpū, and Pu‘u o Papaʻi and Maʻalo.

Update to the County of Kauaʻi Integrated Solid Waste Management Plan (ISWMP) (2009)

In September 2009, consultant R. W. Beck updated the County of Kauaʻi Integrated Solid Waste Management Plan (ISWMP) for the DPW SWD (R. W. Beck 2009) from its previous 1994 update. Section 11 of the 2009 plan proposes a four-stage site selection process as a facility siting strategy: (1) establish a siting task force, (2) identify excluded sites and develop county-specific siting criteria, (3) define ranking criteria and rank available sites, and (4) select a proposed site. The general principles outlined in the ISWMP emphasized an open and flexible process to resolve conflicts, disputes, and impasses. The RMTC (2009) and AECOM (2012) siting studies adheres to the general processes outlined in the ISWMP.

3.2.1 New Kauaʻi Landfill Siting Study Report (2012)

In 2012, The New Kauaʻi Landfill Siting Study Report (AECOM 2012; Appendix B) reevaluated the eight potential landfill sites using State Landfill Criteria (HAR §11-58.1-13; DOH 1994) and the results of a Community Criteria Evaluation (CCE) to update the 2009 MACLS study. The CCE, included in the 2012 Siting Study, used the MACLS framework with the following updates:

- The use of current and more accurate information including data generated by the preliminary engineering evaluation (PREE) and the planning level cost estimates.
The primary factors considered in recommending the proposed MSWLF site included the CCE results, site life, costs, landowner willingness to sell, sustainability, and agricultural importance of the land. The report recommended the Ma'alo site (the proposed project) due to its high ranking for all assessment criteria.

SITING CRITERIA (2012 SITING STUDY)

The criteria and process used in the 2012 Siting Study (AECOM 2012) to evaluate and recommend a location for a new County MSWLF are detailed below.

Exclusionary Criteria

Two categories of exclusionary criteria were used to eliminate from consideration those areas where it would be best not to locate a new MSWLF. The following exclusionary criteria were provided by State of Hawai‘i regulations for MSWLF siting (HAR §11-58.1-13; DOH 1994), which are based on the EPA Subtitle D landfill regulations:

- Areas within 10,000 ft of airport runways used by jet-powered aircraft
- 100-year floodplains and floodways
- Wetland
- Fault areas
- Seismic impact zones
- Unstable areas
- Tsunami inundation areas

In addition to the HAR §11-58.1-13 criteria, secondary exclusionary criteria included the following areas excluded for engineering or other reasons:

- Special Management Areas (SMAs)
- Areas within 1,000 ft of the shoreline
- Federal government land
- Areas with undesirable topography, i.e., slope greater than 3:1
- Areas within 300 ft of perennial streams
- State Conservation District lands
- Areas within 0.5 mile of urban lands
- Areas within 1,000 ft of potable surface water or groundwater sources

Use of the exclusionary criteria to identify areas best suited for a new MSWLF are discussed in the evaluation results below.

Geographic Information System Methodology

GIS software was used to update the initial 2001/2002 island-wide evaluation. GIS enables manipulation of geographic and technical data to conduct complex spatial analysis to support informed decision-making. The 2012 Siting Study used current data from Federal, State, and County sources to create maps displaying exclusionary zones. The exclusionary criteria and methodology for applying each using GIS are detailed in Table 3-5.
### Table 3-5: 2012 Siting Study Methodology for Applying Exclusionary Criteria Using GIS

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Management Areas</td>
<td>SMA s are sensitive areas that have been protected by legislation or other agencies or organizations. These areas were excluded from consideration to eliminate risk of damage to a known sensitive area. The SMA exclusion zone was produced using the SMA layer downloaded from the State of Hawai‘i Office of Planning Statewide GIS Program web page (hawaii.gov/dbedt/gis/download.htm) on August 3, 2011.</td>
</tr>
<tr>
<td>Areas within 1,000 feet of the Shoreline</td>
<td>All areas within 1,000 ft of the shoreline were excluded from consideration to protect the sensitive shoreline area.</td>
</tr>
<tr>
<td>Tsunami Inundation Areas</td>
<td>All areas within tsunami (tidal wave) zones were excluded from consideration. The Tsunami Inundation Area exclusion zone layer (tsunevac.shp) was downloaded from the Office of Planning GIS web page on August 3, 2011.</td>
</tr>
<tr>
<td>Fault Areas</td>
<td>The entire island of Kaua‘i is categorized as Seismic Zone 1, areas where MSWLFs are permitted. Therefore, no Seismic Impact exclusion zone was mapped for the island.</td>
</tr>
<tr>
<td>Seismic Impact Zones</td>
<td>The entire island of Kaua‘i is categorized as Seismic Zone 1, areas where MSWLFs are permitted. Therefore, no Seismic Impact exclusion zone was mapped for the island.</td>
</tr>
<tr>
<td>Federal Government Lands</td>
<td>Federal Government lands were mapped as exclusion zones because of the difficulty of acquisition. Federal Government lands were identified by downloading the Government-owned land layer (gov_own.shp) from the Office of Planning GIS web page on August 3, 2011, and selecting the records that listed the major owner as &quot;Government Federal.&quot;</td>
</tr>
<tr>
<td>Areas within 100-Year Floodplains</td>
<td>Prior to construction, MSWLF owners must demonstrate that a proposed site will not restrict the flow of a 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste. All areas within 100-year floodplains were excluded from further consideration. The exclusion zone was produced using the digital flood layer (dfirm.shp) downloaded from the Office of Planning GIS web page on August 4, 2011. All areas classified as Zone A, Zone AE, Zone AH, Zone AO, Zone VE, or as a floodway were combined to produce the 100-year floodplain exclusion zone.</td>
</tr>
<tr>
<td>Areas within 300 Feet of Perennial Streams</td>
<td>Perennial streams were identified using the Hawai‘i Department of Land and Natural Resources, Division of Aquatic Resources stream database layer (darstreams.shp), downloaded from the Office of Planning GIS web page on August 4, 2011. A 300-ft line was drawn around streams classified as perennial to produce the exclusion zone for Areas within 300 Feet of Perennial Streams.</td>
</tr>
<tr>
<td>Areas with Undesirable Topography</td>
<td>As part of applying the HAR §11-58.1-13 in unstable areas exclusionary criterion, areas with slopes steeper than 3:1 (horizontal to vertical) were eliminated from consideration. A 10-meter by 10-meter horizontal resolution digital elevation model (DEM) was downloaded from the University of Hawai‘i’s School of Ocean and Earth Science and Technology Coastal Geology Group, DEM Imagery for Kaua‘i web page on August 10, 2011. An estimate of the slope was calculated from the DEM, and all areas with a calculated slope steeper than 3:1 were included in the Undesirable Topography exclusion zone.</td>
</tr>
<tr>
<td>State Conservation Lands</td>
<td>Areas designated as State Conservation Lands were removed from consideration. The State Land Use Districts layer (slud.shp) was downloaded from the Office of Planning GIS web page on August 15, 2011. All features corresponding to Conservation Land Use District (i.e., code “C”) were included in the State Conservation Land exclusion zone.</td>
</tr>
<tr>
<td>Areas within 0.5 Mile of Urban Lands</td>
<td>To minimize impacts, areas within 0.5 mile of urban lands were removed from consideration. The State Land Use Districts layer (slud.shp) was downloaded from the Office of Planning GIS web page on August 15, 2011. All features corresponding to Urban Land Use District (i.e., code “U”) were selected, and a 0.5-mile buffer was drawn to produce the exclusion zone for Areas within 0.5 Mile of Urban Lands.</td>
</tr>
</tbody>
</table>
### Criterion Methodology

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areas within 10,000 Feet of Airport Runways</td>
<td>Due to potential bird hazards, areas within 10,000 ft of the end of any airport runway used by turbojet aircraft were excluded. MSWLF owners proposing a site within a 5-mile radius of any airport runway end must notify the affected airport and the Federal Aviation Administration (FAA) (HAR §11-58.1-13(a)(3)). Three airport runways (Lihʻe, Princeville, and Pacific Missile Range Facility Airports) were identified as runways meeting the HAR criteria. A line 10,000 ft from the airport runways was drawn to produce the exclusion zone for Areas within 10,000 Feet of Airport Runways. MSWLFs cannot be established within 6 miles of a public airport that is primarily served by aircraft and regularly scheduled flights designed for 60 passengers or less, unless the State aviation agency requests and is granted an exemption by the FAA (Public Law 106-181 Section 503). This law does not apply to the Lihʻe Airport because it is not primarily served by flights of 60 passengers or less. This law may apply to the Princeville Airport, but none of the eight potential MSWLF sites is located within 6 miles of the Princeville Airport.</td>
</tr>
<tr>
<td>Areas within 1,000 Feet of Drinking Water Sources</td>
<td>In order to protect drinking water sources, it is recommended that MSWLFs not be placed within 1,000 ft of them. The locations of drinking water sources were formerly publicly available; however, since the events of September 11, 2001, the State of Hawaiiʻi DOH does not divulge the location of drinking water sources. Therefore, drinking water source exclusion zones have not been mapped. To satisfy the exclusionary criterion, AECOM met with a DOH Safe Drinking Water Branch representative on August 24, 2011, to discuss the potential landfill sites and their distances from drinking water sources. After the meeting, AECOM sent GIS files for the potential landfill sites to the Safe Drinking Water Branch representatives, who confirmed that the proposed landfill sites are all more than 1,000 feet from known drinking water sources. In addition, the County DOW reviewed the locations of the potential landfill sites to determine whether any current or planned water supply wells are located in the vicinity of the potential landfill sites. A DOW representative reported that there are no active wells within 1,000 ft of the perimeter of any of the eight potential landfill sites, and, with the exception of the Kōloa site (the DOW indicated it may want to add more water supply wells near this site), there are no active plans for future water supply wells within 1,000 ft of any of the other seven potential sites (Eddy 2011).</td>
</tr>
<tr>
<td>Wetland Areas</td>
<td>To protect the sensitive ecology of a wetland, locating MSWLFs in a wetland area is discouraged, unless the criteria in HAR §11-58.1-13(c) are met. There is no strict prohibition against locating a MSWLF in a wetland, but to do so, several requirements must be met, and mitigations measures would likely be required. The USFWS’s NWI provides information on wetlands. The NWI provides users with the status, extent, characteristics, and functions of wetland, riparian, deep-water, and related aquatic habitats in priority areas. Wetlands are mapped by NWI. If a site is identified for further consideration and it contains a feature mapped in the NWI, then the USACE will be consulted to determine whether the feature is a regulated wetland under Section 404 of the Clean Water Act. If a feature is regulated, further investigations may be required. This would not necessarily preclude using a given site as a MSWLF, but may require additional studies and mitigation, which could present additional costs to the County (which are not accounted for at this stage). Wetlands data for Kauaʻi was downloaded from the USFWS NWI’s Wetlands Mapper web page (<a href="http://www.fws.gov/wetlands/data/Mapper.html">www.fws.gov/wetlands/data/Mapper.html</a>) on December 21, 2011. If a potential wetland area is mapped on a potential MSWLF site that is chosen for further consideration, then a wetlands survey and consultation with regulatory agencies should be conducted to determine whether the site actually contains a jurisdictional wetland.</td>
</tr>
</tbody>
</table>

Source: AECOM (2012, Section 3.4)

The results of applying the exclusionary criteria using GIS are illustrated on Figure 3-1, which depicts the merged exclusion zones, potential wetland areas not in the exclusion zones, and the locations of the eight potential landfill sites.
Preliminary Engineering Evaluation (PREE)

Introduction

During the MACLS evaluation (RMTC 2009), it was determined that engineering analysis and inputs were required to quantify several siting parameters, mostly related to site availability, useful lifetime, and costs for acquisition, development, and operation. The PREE, published as part of the 2012 Siting Study (AECOM 2012), presented a more rigorous (though still planning-level) evaluation of several of the criteria developed from the 2009 MACLS study. It compared the eight potential MSWLF sites and presented conceptual site schematics and planning-level estimates of the engineering potential of each site. Schematics and costs were presented for the initial phase (development required prior to accepting waste), and for the final phase (at the end of the landfill’s useful lifespan).

The PREE presented preliminary estimates of the following attributes:

- Landfill capacity
- Potential soil needs for liner construction (base and final cover) and daily cover
- Surface water control and site drainage considerations
- Potential for expansion
- Availability of utilities
- Distance from existing major roadways
- Factors influencing site development and operations costs

Conceptual Design Information

Several assumptions were made to develop the conceptual schematics and engineering estimates, which were applied to each site:

- A 150-ft setback from all site borders was observed for the LOW.
- All sites were assumed to be excavated to 10 ft below ground surface (bgs), with the exception of Kekaha Mauka, which was assumed to be excavated to 5 ft bgs, due to the proximity of groundwater. This excavated soil is presumed to be available for use as daily cover, the remainder of which would need to be obtained from other sources.
- Side slopes: 3:1 (horizontal to vertical [H:V]) (typical).
- Waste to Soil Ratio: 4:1 (based on information from WMI, the current operator of the Kekaha Phase II landfill).
- Annual MSW Tonnage (tons): 82,000 (based on data provided by the DPW).
- Waste Mass Density (lbs/cy): 1,320 (based on information from WMI).
- Annual Airspace Consumed by Waste (cy): 124,000 (calculated).
- Annual Daily Cover Soil Volume (cy): 31,000 (calculated).
- Infrastructure facilities such as the shop area, scalehouse, drop-off area, and internal roadways were sized to match the facilities at the existing Kekaha MSWLF as closely as practicable, with the exception of the office building, which was set to one-half the size of the existing office at Kekaha.

The maximum landfill height, total capacity, and overall useful life were calculated based on the available site area and geometry, the limit of waste (LOW) setback, and the side slopes. Table 3-6 summarizes these and related engineering data associated with the conceptual designs, and ranks the sites in terms of useful lifetime.
Figure 3-1: Exclusion Zones, Potential Wetland Areas, and Potential Landfill Sites
Table 3-6: PREE – Conceptual Design Data

<table>
<thead>
<tr>
<th>Parameter (Unit)</th>
<th>Kālepa</th>
<th>Kekaha Mauka</th>
<th>Kīpū</th>
<th>Kōloa</th>
<th>Kumukumu</th>
<th>Ma'alō *</th>
<th>Pu'u o Papa'i</th>
<th>'Umi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Property Area (ac)</td>
<td>78</td>
<td>176</td>
<td>146</td>
<td>125</td>
<td>173</td>
<td>270</td>
<td>146</td>
<td>127</td>
</tr>
<tr>
<td>Limit of Waste (LOW) Area (ac)</td>
<td>44</td>
<td>85</td>
<td>73</td>
<td>76</td>
<td>102</td>
<td>194</td>
<td>96</td>
<td>72</td>
</tr>
<tr>
<td>Below Grade Depth (ft)</td>
<td>10</td>
<td>5</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Volume for Waste Mass + Daily Cover Below Grade (cy)</td>
<td>710,000</td>
<td>686,000</td>
<td>1,178,000</td>
<td>1,226,000</td>
<td>1,646,000</td>
<td>3,130,000</td>
<td>1,549,000</td>
<td>1,162,000</td>
</tr>
<tr>
<td>Volume for Waste Mass + Daily Cover Above Grade (cy)</td>
<td>3,322,323</td>
<td>8,568,828</td>
<td>7,526,858</td>
<td>9,413,682</td>
<td>14,518,268</td>
<td>37,834,455</td>
<td>13,245,854</td>
<td>7,020,034</td>
</tr>
<tr>
<td>Total Available Airspace (cy)</td>
<td>4,032,323</td>
<td>9,254,828</td>
<td>8,704,858</td>
<td>10,639,682</td>
<td>16,164,268</td>
<td>40,964,455</td>
<td>14,794,854</td>
<td>8,182,034</td>
</tr>
<tr>
<td>Maximum Waste Mass Elevation (ft above msl)</td>
<td>417</td>
<td>150</td>
<td>480</td>
<td>423</td>
<td>421</td>
<td>585</td>
<td>529</td>
<td>560</td>
</tr>
<tr>
<td>Onsite Access Road (lf)</td>
<td>7,800</td>
<td>17,600</td>
<td>14,600</td>
<td>12,500</td>
<td>17,300</td>
<td>28,040</td>
<td>14,600</td>
<td>12,700</td>
</tr>
<tr>
<td>Paved Access Roads (lf)</td>
<td>9,504</td>
<td>—</td>
<td>—</td>
<td>10,560</td>
<td>—</td>
<td>8,448</td>
<td>3,160</td>
<td>—</td>
</tr>
<tr>
<td>Utility (lf)</td>
<td>17,304</td>
<td>17,600</td>
<td>14,600</td>
<td>23,060</td>
<td>17,300</td>
<td>36,488</td>
<td>17,760</td>
<td>12,700</td>
</tr>
<tr>
<td>Daily Cover Soil Volume (cy)</td>
<td>806,000</td>
<td>1,851,000</td>
<td>1,741,000</td>
<td>2,128,000</td>
<td>3,233,000</td>
<td>8,193,000</td>
<td>2,959,000</td>
<td>1,636,000</td>
</tr>
<tr>
<td>Cover Soil Required (cy)</td>
<td>129,000</td>
<td>1,245,000</td>
<td>616,000</td>
<td>972,000</td>
<td>1,640,000</td>
<td>4,933,000</td>
<td>1,574,000</td>
<td>564,000</td>
</tr>
<tr>
<td>Waste Mass Volume (cy)</td>
<td>3,355,000</td>
<td>7,623,000</td>
<td>7,177,000</td>
<td>8,793,000</td>
<td>13,146,000</td>
<td>31,894,438</td>
<td>12,494,000</td>
<td>6,706,000</td>
</tr>
<tr>
<td>Site Life (years)</td>
<td>26</td>
<td>60</td>
<td>56</td>
<td>69</td>
<td>104</td>
<td>264</td>
<td>95</td>
<td>53</td>
</tr>
<tr>
<td>Estimated Site Life in Years Rank (1 = Lowest, 8 = Highest)</td>
<td>8</td>
<td>5</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: AECOM (2012, Table 4-1)

Assumptions:
- Waste to Soil Ratio (X:1): 4
- Annual Waste Quantity (tons): 82,000
- Waste Mass Density (lbs/cy): 1,320 (waste only, in-place density)
- Annual Airspace Consumed by Waste (cy): 124,000
- Annual Daily Cover Soil Volume (cy): 31,000

A brief description of the eight alternative MSWLF sites is presented in Table 3-7.

Site-specific assumptions regarding infrastructure improvements and mitigation measures for the eight sites are presented in Table 3-8.
Table 3-7: Description of the Eight Alternative MSWLF Sites

<table>
<thead>
<tr>
<th>Site</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kāepea</td>
<td>Kāepea is located relatively close to a residential community to the south, and is the site closest to a significant residential population. Kāepea is adjacent to and involves several of the same considerations described for the Ma’alo site (e.g., distance from residential uses and view of the landfill). The Okinawa Reservoir is a short distance mauka. The access road site would pass close behind the nearby residential area.</td>
</tr>
<tr>
<td>Kekaha Mauka</td>
<td>The Kekaha Mauka site currently contains irrigated crop fields on a relatively flat parcel with an irrigation canal system along its perimeter. It is across the highway from the existing Kekaha Landfill, which offers potential savings due to re-use of infrastructure. The Kekaha Mauka site would be the easiest and quickest site to bring online and begin operations, from a logistical, technical, financial, operational, and possibly zoning perspective. The Kekaha site would use an existing, relatively non-congested route (Kaumuali‘i Highway) between the landfill site and waste-generating areas centered at the Lihu‘e corridor and would not require the introduction of a new waste-hauling route. Kaumuali‘i Highway is a County-designated scenic route and is heavily traveled by tourists; therefore, a commitment to landscaping will be required for visual impact mitigation. The Kekaha site would use an existing, relatively non-congested route (Kaumuali‘i Highway) between the landfill site and waste-generating areas centered at the Lihu‘e corridor and would not require the introduction of a new waste-hauling route. Kaumuali‘i Highway is a County-designated scenic route and is heavily traveled by tourists; therefore, a commitment to landscaping will be required for visual impact mitigation. Kaumuali‘i Highway is a County-designated scenic route and is heavily traveled by tourists; therefore, a commitment to landscaping will be required for visual impact mitigation.</td>
</tr>
<tr>
<td>Kipū</td>
<td>The Kipū site is located close to Līhu‘e, near Kaumuali‘i Highway off a smaller access road (Hulemalu Road). The site is currently fallow, but contains remnants of an irrigation system with a non-potable water supply at the site. Visual impacts would need to be addressed by landscaping along the roadway to screen the view coming from both the east and west directions. The Kaua‘i County General Plan discusses the possible re-designation of the Hulemanu Plateau for future urban use as it is a “logical extension of the Puakea master-planned community.” Puakea is close to Līhu‘e, jobs, and shopping. These future development areas are located a few miles east of the Kipū parcel.</td>
</tr>
<tr>
<td>Kōloa</td>
<td>The Kōloa site is the most distant of the eight sites from the nearest highway (Kaumuali‘i). Although the site is relatively removed visually and geographically from the town of Kōloa, landfill traffic would pass near a residential area along Ala Kinoiki Road on the way to its intersection with Maluhia Road. The Waialu Reservoir is located just northeast of the site. The State is in the process of designating Kōloa Road as the Holo Holo Kōloa National Scenic Byway under a Federal program. The landfill site would likely not impact the Kōloa visual corridor, although an enhanced landscaping plan could ultimately be recommended. Maluhia Road between the project site and Kaumuali‘i Highway is designated a County Scenic Corridor in the Kaua‘i County General Plan.</td>
</tr>
<tr>
<td>Kumukumu</td>
<td>The Kumukumu site is located mauka of Kūhūi Highway in the northwest part of the island. On the makai side of the highway in this location, a large-lot residential development is currently under construction. The landfill may be visible from some of the proposed residences. Although the County is not required to preserve private views (only views from public right of ways), landowners in this development will likely raise view preservation as a concern. Besides potential visual impacts, the presence of a landfill, its associated truck traffic, and any real or perceived impacts to the surrounding community may also result in this site approval process being contentious. Although an irrigation and non-potable water system is available, potable water would be difficult or expensive to bring to the site from the highway.</td>
</tr>
<tr>
<td>Ma’alo</td>
<td>Ma’alo is the largest of the landfill parcels and has the largest capacity and longest usable lifetime. It is relatively close to the urbanized area of Līhu‘e, and is not proximate to residential/developed areas. Ma’alo Road, which connects the landfill site to Kūhūi Highway, is located near a residential community. Kūhūi Highway in this section of the island has a significant amount of traffic as it provides a link between Līhu‘e and the Kapa’a-Wallua area. The Ma’alo Road intersection with Kūhūi Highway is at the base of a ravine and at the midpoint of a curve. Ma’alo Road is the main tourist road to Wallua Falls Park. It is also part of a future mauka bypass-road network providing relief to Kūhūi Highway. Ma’alo Road, which is designated as a scenic resource in the Kaua‘i County General Plan, will utilize landscaping based on the use of existing vegetation along its corridor to mitigate views of the landfill.</td>
</tr>
<tr>
<td>‘Umi</td>
<td>Development of the ‘Umi site for use as a landfill would require removal of current coffee farming operations, and relocation of an existing access road that transits the center of the site and provides access to properties east of the site. The adjacent Haleiwi Road is designated a critical route in the Kaua‘i County General Plan. Although the nearest residential area is some distance away on a ridge east of this site, the topography from the ridge makes this landfill site very visible. During a site visit, vehicles along Haleiwi Road were seen traveling at fast speeds. Unlike Kaumuali‘i Highway in this area, Haleiwi Road contains numerous curves and dips with limited sight distances and shoulders. If the DOW proceeds with its plans to develop groundwater in the area, additional controls and monitoring may be required (that cost is not estimated in this report).</td>
</tr>
</tbody>
</table>

Source: AECOM (2012, section 4.3.2)
### Table 3-8: Site-Specific Development Assumptions for the Eight Alternative MSWLF Sites

<table>
<thead>
<tr>
<th>Site</th>
<th>Drainage Improvements</th>
<th>Utilities and Access Road</th>
<th>Visual Impact Mitigation</th>
<th>Traffic Flow</th>
<th>Noise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kālepa</td>
<td>Drainage improvements at Kālepa would include extending the Lihi ditch to divert stormwater from running onto the site.</td>
<td>An access road, potable water, and electrical connection would need to be brought in a significant distance from Ma'alo Road.</td>
<td>Landscaping is recommended along the south, west, and north borders of the site.</td>
<td>A signalized intersection and acceleration, deceleration, and left-turn lanes at the Ma'alo Road/Kūhiō Highway intersection are recommended.</td>
<td>Sound walls are recommended along the access road near the residential community.</td>
</tr>
<tr>
<td>Kekaha Mauka</td>
<td>—</td>
<td>—</td>
<td>Landscaping is recommended at the south, east, and west sides of the landfill.</td>
<td>Acceleration/deceleration and turn lanes are required. Ideally, a mauka curb cut for the new landfill would be directly opposite the existing makai landfill cut. Signalization might be recommended, depending on the results of a traffic analysis.</td>
<td>Based on surrounding land uses, sound walls are not recommended.</td>
</tr>
<tr>
<td>Kīpū</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Based on surrounding land uses, sound walls are not recommended.</td>
</tr>
<tr>
<td>Kōloa</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>BASED ON THE EXPECTED TRAFFIC IN THE VICINITY, TRAFFIC FLOW IMPROVEMENTS ARE NOT EXPECTED.</td>
</tr>
<tr>
<td>Kumukumu</td>
<td>Drainage improvements at the Kumukumu site would be somewhat more extensive than most of the other sites, due to the existing waterway and potential wetland.</td>
<td>—</td>
<td>Landscaping is recommended along south and west site borders.</td>
<td>The speed limit along this stretch of Kūhiō Highway is posted at 50 miles per hour. An acceleration/deceleration and left-turn lane for northbound trucks entering the site is recommended, and signalization may be recommended.</td>
<td>Based on surrounding land uses, sound walls are not recommended.</td>
</tr>
<tr>
<td>Ma'alo</td>
<td>Drainage improvements would be somewhat more extensive than most of the other sites, due to existing canals being refurbished (including the Lihi ditch, located makai of the site border), replaced, or realigned.</td>
<td>The access road and electrical connection would need to be brought in a significant distance, from Ma'alo Road. During initial discussions, the alternate RRP site landowner requested the County investigate installing a water supply and irrigation line (details to be determined).</td>
<td>Landscaping is recommended along the entire site perimeter.</td>
<td>A signalized intersection as well as acceleration, deceleration, and left-turn lanes at the Ma'alo Road/Kūhiō Highway intersection is recommended. It is assumed at this stage that the width and geometry of Ma'alo Road is sufficient, but that the road requires repaving.</td>
<td>Based on surrounding land uses, sound walls are not recommended.</td>
</tr>
<tr>
<td>Pu'u o Papa'i</td>
<td>Non-potable water is assumed available from the nearby reservoir. Electricity would be brought onsite from Kaumuali'i Highway.</td>
<td>—</td>
<td>Landscaping is recommended at the south, east, and west sides of the landfill.</td>
<td>Acceleration/deceleration, turn lanes, and signalization are recommended.</td>
<td>Based on surrounding land uses, sound walls are not recommended.</td>
</tr>
<tr>
<td>Umi</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>BASED ON SURROUNDING LAND USES, IT IS ASSUMED THAT SOUND WALLS ARE NOT REQUIRED.</td>
</tr>
</tbody>
</table>

Source: AECOM (2012, Section 4.3.2)

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* The Siting Study PREE assumptions presented here underwent extensive refinement for the Ma'alo site in the TREFS (AECOM 2014; Appendix F). The proposed access route changed from Ma'alo Road to the Roberts Hawaii Driveway.
Planning-Level Cost Estimates

The planning-level cost estimates for each alternative landfill site consists of acquisition, development, and operation costs. All costs are presented in 2012 dollars.

Table 3-9 summarizes the estimated site acquisition cost for each site, represented in total dollars and in terms of dollars per estimated years of site life. The assessed land values likely underestimate the true purchase costs of the sites, assuming a landowner would be willing to negotiate. For the Kekaha Mauka and Ma'alo sites, it is assumed that the County would not need to purchase the land, as those parcels are owned by the State. The State in preliminary discussions with the County has stated a willingness to consider the use of the Ma'alo site for a MSWLF. The County is currently in discussions with the State to identify landowner terms, requirements, and other conditions that may apply. The negotiation of such terms and conditions would be initiated during the design process, which will occur after the completion of the EIS process.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Kālepa</th>
<th>Kekaha Mauka</th>
<th>Kīpū</th>
<th>Kōloa</th>
<th>Kumukumu</th>
<th>Ma'alo</th>
<th>Pu'u o Papa'i</th>
<th>'Umī</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential Landfill Site Size (ac)</td>
<td>77.6</td>
<td>175.9</td>
<td>145.8</td>
<td>125.4</td>
<td>172.9</td>
<td>270.2</td>
<td>145.7</td>
<td>126.7</td>
</tr>
<tr>
<td>Assessed Property Value ($)</td>
<td>157,655</td>
<td>7,806</td>
<td>144,460</td>
<td>108,865</td>
<td>1,416,064</td>
<td>882,663</td>
<td>135,705</td>
<td>486,215</td>
</tr>
<tr>
<td>Cost of Site Acquisition ($)</td>
<td>157,655</td>
<td>0</td>
<td>144,460</td>
<td>108,865</td>
<td>1,416,064</td>
<td>0</td>
<td>135,705</td>
<td>486,215</td>
</tr>
<tr>
<td>Contingency (25%)</td>
<td>39,414</td>
<td>0</td>
<td>36,115</td>
<td>27,216</td>
<td>354,016</td>
<td>0</td>
<td>33,926</td>
<td>121,554</td>
</tr>
<tr>
<td>Subtotal Acquisition Cost ($)</td>
<td>197,069</td>
<td>0</td>
<td>180,575</td>
<td>136,081</td>
<td>1,770,080</td>
<td>0</td>
<td>169,631</td>
<td>607,769</td>
</tr>
<tr>
<td>Site Life (years)</td>
<td>26</td>
<td>60</td>
<td>56</td>
<td>69</td>
<td>104</td>
<td>264</td>
<td>95</td>
<td>53</td>
</tr>
<tr>
<td>Site Acquisition Cost per Year ($)</td>
<td>6,064</td>
<td>0</td>
<td>2,580</td>
<td>1,578</td>
<td>13,616</td>
<td>0</td>
<td>1,428</td>
<td>9,174</td>
</tr>
</tbody>
</table>

Source: AECOM (2012, Table 5-1)
Note: All costs and property values are in 2012 dollars

The 2012 Siting Study developed planning-level site development costs at two stages: during the initial construction (required prior to receiving waste at the landfill), and during the final construction, completed subsequent to landfilling over the site’s lifetime. Although the initial-development cost estimate is of immediate importance to the County’s decision-making process, the final development cost, expressed in terms of dollars per year of site operation, was considered a more reasonable basis of comparison for the CCE evaluation. This total, overall cost per year of construction over the entire landfill life presents a clearer picture of the life-cycle costs, and is therefore used in CCE criterion number 20 (cost of development). No interest or discount rates are applied to this economic evaluation; costs estimates are presented in 2012 dollars.

Table 3-10 summarizes the final site development cost for each site, both in total dollars and in dollars per year of estimated site life. Costs allowances were added for design and permitting (12%). A 10% contingency is included.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Kālepa</th>
<th>Kekaha Mauka</th>
<th>Kīpū</th>
<th>Kōloa</th>
<th>Kumukumu</th>
<th>Ma'alo</th>
<th>Pu'u o Papa'i</th>
<th>'Umī</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost ($MM)</td>
<td>79</td>
<td>129</td>
<td>118</td>
<td>122</td>
<td>162</td>
<td>309</td>
<td>154</td>
<td>118</td>
</tr>
<tr>
<td>Cost Per Year of Site Life ($MM/year)</td>
<td>3.04</td>
<td>2.15</td>
<td>2.12</td>
<td>1.77</td>
<td>1.56</td>
<td>1.17</td>
<td>1.62</td>
<td>2.22</td>
</tr>
</tbody>
</table>

Source: AECOM (2012, Table 5-4)
Note: All costs are in 2012 dollars
$MM million dollars
Estimates of the site operational costs were produced based on the site conceptual design (included as part of the 2012 Siting Study) and experience at the existing Kekaha Phase II MSWLF and at other landfill sites in Hawai‘i.

Table 3-11 summarizes the estimated annual site operation costs for each site. A 10% contingency is included. The estimated annual operation costs for each site do not vary greatly, with the least-expensive sites (Kīpū and Kālepa) only 5% less expensive than the most expensive site (Kekaha Mauka).

Table 3-11: Landfill Operations Costs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Kālepa</th>
<th>Kekaha Mauka</th>
<th>Kīpū</th>
<th>Kōloa</th>
<th>Kumu-kumu</th>
<th>Ma’alo&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Pu’u o Papa’i</th>
<th>‘Umi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Annual Operations Cost ($MM/year)</td>
<td>5.31</td>
<td>5.44</td>
<td>5.31</td>
<td>5.34</td>
<td>5.36</td>
<td>5.32</td>
<td>5.38</td>
<td>5.33</td>
</tr>
</tbody>
</table>

Source: AECOM (2012, Table 5-5)

Notes: (1) All costs are in 2012 dollars; (2) Costs associated with implementing a Landfill Wildlife Management Plan (LWMP) for use of the Ma’alo site will be determined following the EIS process and therefore have not been included in the overall annual operational costs. This would not be applicable to all sites.

Using the foregoing data, Table 3-12 summarizes and compares the cost estimates for each site. The first four rows of data present the overall costs, normalized per year of site life, which are the values used in the CCE; the last row shows the estimated cost of initial construction for each site. The largest sites are expected to be significantly less expensive over their lifetime. The three least-expensive sites per year of operation are, in order, Ma’alo, Kumukumu, and Pu’u o Papa’i. In fact, this cost efficiency is understated for the sites with less capacity, as it does not include the additional cycles of landfill siting, EIS, site investigation, design, and permitting required each time a site is closed and a new site is opened. Therefore, the larger sites are expected to be even less expensive over their entire life (relative to the smaller sites) than these numbers suggest.

The site with the lowest estimated cost of initial site development is Kekaha Mauka, followed by Kōloa and Kīpū (see Table 3-12). The site with the lowest estimated total cost of final site development is Kālepa, followed by Kīpū and Kōloa. The site with the lowest estimated cost of total site development, in terms of dollars per year of site life (provides the clearest picture of life-cycle costs), is Ma’alo (the proposed project), followed by Kumukumu and Pu’u o Papa’i.

Table 3-12: Summary of Cost Estimates

<table>
<thead>
<tr>
<th>Cost Per Year of Site Life</th>
<th>Kālepa</th>
<th>Kekaha Mauka</th>
<th>Kīpū</th>
<th>Kōloa</th>
<th>Kumu-kumu</th>
<th>Ma’alo&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Pu’u o Papa’i</th>
<th>‘Umi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Acquisition ($MM/year)</td>
<td>0.006</td>
<td>0.000</td>
<td>0.003</td>
<td>0.002</td>
<td>0.014</td>
<td>0.000</td>
<td>0.001</td>
<td>0.009</td>
</tr>
<tr>
<td>Site Development ($MM/year)</td>
<td>3.04</td>
<td>2.15</td>
<td>2.12</td>
<td>1.77</td>
<td>1.56</td>
<td>1.17</td>
<td>1.62</td>
<td>2.22</td>
</tr>
<tr>
<td>Site Operations ($MM/year)</td>
<td>5.31</td>
<td>5.44</td>
<td>5.31</td>
<td>5.34</td>
<td>5.36</td>
<td>5.32</td>
<td>5.38</td>
<td>5.33</td>
</tr>
<tr>
<td>Total Effective Annual Cost ($MM/year)</td>
<td>8.36</td>
<td>7.59</td>
<td>7.42</td>
<td>7.11</td>
<td>6.94</td>
<td>6.49</td>
<td>7.00</td>
<td>7.56</td>
</tr>
<tr>
<td>Overall Annual Cost Rank (1 = Lowest, 8 = Highest)</td>
<td>8</td>
<td>7</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Initial Site Development Cost ($MM)</td>
<td>32.3</td>
<td>26.5</td>
<td>28.7</td>
<td>27.6</td>
<td>30.9</td>
<td>38.1</td>
<td>29.6</td>
<td>30.1</td>
</tr>
<tr>
<td>Initial Site Development Rank (1 = Lowest, 8 = Highest)</td>
<td>7</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>8</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: AECOM (2012, Table 5-6)

Note: All costs are in 2012 dollars

**$MM** million dollars

<sup>a</sup> The proposed project
Community Criteria Evaluation (CCE)

The CCE, presented in the 2012 Siting Study (AECOM 2012), updated the community-based landfill site evaluation summarized in the 2009 MACLS report (RMTC 2009). It ranked the potential landfill sites according to overall scores based on evaluation of the 26 siting criteria developed by the MACLS.

Original Scoring in 2009

The 2009 MACLS established Weight Factors to reflect the community’s valuation of the relative importance of the criteria. Table 3-13 shows the point values (scale) and weight for each of the criteria. Each site was assigned its overall site score using the following steps:

- Each site was assigned “points” according to the values shown. For example, for Criterion #1, Population Density, a site with a population density of “less than 25 people per square mile living within one-half mile of the site” was awarded a value of 4 points as its criterion score (as lower populations near the landfill are favorable). Sites with higher population densities (unfavorable) were awarded 0 or 2 points, depending on the population density.
- The weighted score for each criterion for each site was calculated as the product of the criterion point value and the associated weight. For example, Criterion #1 has a weight of 9. If the criterion score for a particular site was 4, then the weighted score for this criterion for the site was 36 (i.e., 4 × 9).
- The weighted scores for each site were summed to get the total site score.

Table 3-13: 26 MACLS Community-Based Criteria and Scoring Values (2009)

<table>
<thead>
<tr>
<th>No.</th>
<th>MACLS Community-Based Criterion</th>
<th>Point Values</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Population density near the site</td>
<td>0-2-4</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Distance to nearest residence, school, hospital, or business</td>
<td>1-2-3</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>Displacement of residences and/or businesses</td>
<td>1-3</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Archaeological and/or historical significance</td>
<td>1-2-3</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>Cost of site acquisition</td>
<td>1-2-3</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>Ceded or Hawaiian Homestead Land</td>
<td>0-2-4</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Site distance from major highway</td>
<td>1-2-3</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Schools or hospitals along access road</td>
<td>1-2-3</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>Residential units or developments along access road</td>
<td>1-2-3</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Consistency of the designation of the site for a landfill with the Kaua‘i General Plan land use designation (later changed to: Quality of Agricultural Lands)</td>
<td>0-2-4</td>
<td>8</td>
</tr>
<tr>
<td>11</td>
<td>Consistency of the site with the existing County land use zoning designation</td>
<td>0-2-4</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Consistency of the site with the existing State Land Use District designation</td>
<td>0-2-4</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>Location of site relative to the UIC Line</td>
<td>1-2-3</td>
<td>10</td>
</tr>
<tr>
<td>14</td>
<td>Proximity to surface water</td>
<td>0-2-4</td>
<td>7</td>
</tr>
<tr>
<td>15</td>
<td>Flora and fauna habitat</td>
<td>0-2-4</td>
<td>5</td>
</tr>
<tr>
<td>16</td>
<td>Annual precipitation</td>
<td>1-2-3</td>
<td>5</td>
</tr>
<tr>
<td>17</td>
<td>Wind direction relative to populated areas</td>
<td>1-3</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>Haul distance from major municipal solid waste generation areas</td>
<td>1-2-3</td>
<td>9</td>
</tr>
<tr>
<td>19</td>
<td>Adequacy of site drainage</td>
<td>1-2-3</td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>Cost of development</td>
<td>1-2-3</td>
<td>9</td>
</tr>
<tr>
<td>21</td>
<td>Cost of operations</td>
<td>1-2-3</td>
<td>7</td>
</tr>
<tr>
<td>22</td>
<td>Availability of utilities (water)</td>
<td>1-2-3</td>
<td>2</td>
</tr>
<tr>
<td>No.</td>
<td>MACLS Community-Based Criterion</td>
<td>Point Values</td>
<td>Weight</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------------------------------------------</td>
<td>--------------</td>
<td>--------</td>
</tr>
<tr>
<td>23</td>
<td>Access to fire protection</td>
<td>1-2-3</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>Availability of existing access roadway from highway or collector street/road</td>
<td>1-2-3</td>
<td>2</td>
</tr>
<tr>
<td>25</td>
<td>Proximity to parks and recreational facilities</td>
<td>1-2-3</td>
<td>3</td>
</tr>
<tr>
<td>26</td>
<td>Landfill capacity or site life</td>
<td>1-3</td>
<td>8</td>
</tr>
</tbody>
</table>

Source: RMTC (2009)

*Issues with the 2009 Study*

During public meetings held in 2010, several suggestions were made to improve the precision of the scores or make them more understandable to the community. The suggestions included:

1. **Updating the data.** Some observers felt that using the 2000 Census could result in an inaccurate evaluation due to the age of the data. They felt that the 2010 Census results, which became available in 2011, would provide more accurate estimates. It was agreed to expand the evaluation and to review all criteria to ensure the incorporation of the most recent data available.

2. **Eliminating zeroes from the scoring ranges.** Some observers felt that multiplying a nonzero weight by a zero score caused problems in comparability. Although this procedure may be statistically acceptable, it was agreed that eliminating zeroes from the scoring ranges would help clarify the community’s understanding of the scoring methodology.

3. **Adopting comparable if not equal scoring ranges.** Some observers felt that the use of different score ranges (1-2-3 vs. 0-2-4) for different criteria could also compromise comparability. They felt this practice had an effect similar to changing the criterion weights.

4. **Enhancing the differentiation of scores.** It was also mentioned that the scoring system produced final scores that differed by only one or two points, which made it difficult to justify decisions. If the top two sites differed by only one point, for example, some observers felt that the scoring system would be insufficient for making important site selection decisions. They suggested the system use scores and weights so the differences in site scores would be greater, thus enhancing the decision-making process.

5. **Adjusting the content of some criteria.** Certain criterion measurements were thought to be a less-than-precise measure of the intent of the MACLS. For instance, observers felt that agricultural land was not treated effectively in Criterion #10 (“Consistency of the designation of the site for a landfill with the Kaua‘i General Plan land use designation”) of the MACLS report. It was agreed to review definitions of all criteria and adjust them as necessary. Because of feedback, Criterion #10 from the MACLS report was revised in the 2012 CCE to reflect the agricultural importance of each potential landfill site and to evaluate the “Quality of Agricultural Lands.”

*2012 CCE Objectives*

The objectives of the CCE were to update the underlying data and address the issues with the 2009 study identified above by developing a revised set of criterion scores and scoring procedures for the 2012 CCE. The new system therefore accomplished the following:

- Made use of the most recent data available for all scores
- Provided objective engineering data, where appropriate
- Eliminated zeroes from the possible score
- Standardized all scores to a common range from 1 to 10
- Made appropriate adjustments to content, as needed
- Retained the MACLS weighting system

2012 CCE Procedures

*Updated Data* – 2010 Census data were used to update data elements that relied on 2000 Census data. All other raw data were updated using the most recent data available, including use of the PREE for criteria 5, 7, 19, 20, 21, 22, 24, as referenced below.

*Revised Scaled Score Ranges* – The original MACLS scoring system was revised with uniform scores ranging from 1 to 10 points for all criteria. Table 3-14 shows the differences between the 2009 and 2012 scoring ranges for each criterion; the latter are further described below. By eliminating zero values and evaluating the same range for all criteria, the CCE approach yields a more mathematically robust scoring system responsive to input from the community.

*Final Scores* – The CCE retained the weights and relative values previously established by the MACLS, thus preserving the community’s relative valuation of criteria. The final score is the product of the MACLS weight and the CCE score. For each criterion, a site could receive a score ranging from 1 to 10 times the weight. This results in higher criterion scores in the CCE (up to 100) than used in the 2009 MACLS (up to 40).

Table 3-14: MACLS Point Values and CCE Scoring Ranges for Community-Based Criterion

<table>
<thead>
<tr>
<th>No.</th>
<th>Community-Based Criterion</th>
<th>2009 Point Values</th>
<th>2012 CCE Scaled Score Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Population density near the site</td>
<td>0, 2, 4</td>
<td>1–10</td>
</tr>
<tr>
<td>2</td>
<td>Distance to nearest residence, school, hospital, or business</td>
<td>1, 2, 3</td>
<td>1–10</td>
</tr>
<tr>
<td>3</td>
<td>Displacement of residences and/or businesses</td>
<td>1, 3</td>
<td>1, 10</td>
</tr>
<tr>
<td>4</td>
<td>Archaeological and/or historical significance</td>
<td>1, 2, 3</td>
<td>1, 6, 10</td>
</tr>
<tr>
<td>5</td>
<td>Cost of site acquisition</td>
<td>1, 2, 3</td>
<td>1–10</td>
</tr>
<tr>
<td>6</td>
<td>Ceded or Hawaiian Homestead Land</td>
<td>0, 2, 4</td>
<td>1, 10</td>
</tr>
<tr>
<td>7</td>
<td>Site distance from major highway</td>
<td>1, 2, 3</td>
<td>1–10</td>
</tr>
<tr>
<td>8</td>
<td>Schools or hospitals along access road</td>
<td>1, 2, 3</td>
<td>1–10</td>
</tr>
<tr>
<td>9</td>
<td>Residential units or developments along access road</td>
<td>1, 2, 3</td>
<td>1–10</td>
</tr>
<tr>
<td>10</td>
<td>Consistency of the designation of the site for a landfill with the Kaua‘i General Plan</td>
<td>0, 2, 4</td>
<td>1, 4, 7, 10</td>
</tr>
<tr>
<td></td>
<td>land use designation (later changed to: Quality of Agricultural Lands)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Consistency of the site with the existing County land use zoning designation</td>
<td>0, 2, 4</td>
<td>1, 6, 10</td>
</tr>
<tr>
<td>12</td>
<td>Consistency of the site with the existing State Land Use District designation</td>
<td>0, 2, 4</td>
<td>1, 6, 10</td>
</tr>
<tr>
<td>13</td>
<td>Location of site relative to the UIC Line</td>
<td>1, 2, 3</td>
<td>1, 6, 10</td>
</tr>
<tr>
<td>14</td>
<td>Proximity to surface water</td>
<td>0, 2, 4</td>
<td>1–10</td>
</tr>
<tr>
<td>15</td>
<td>Distance to the nearest flora and fauna habitat</td>
<td>0, 2, 4</td>
<td>1–10</td>
</tr>
<tr>
<td>16</td>
<td>Rainfall intensity</td>
<td>1, 2, 3</td>
<td>1–10</td>
</tr>
<tr>
<td>17</td>
<td>Prevailing wind direction relative to populated areas</td>
<td>1, 3</td>
<td>1, 10</td>
</tr>
<tr>
<td>18</td>
<td>Haul distance from major municipal solid waste generation areas</td>
<td>1, 2, 3</td>
<td>1–10</td>
</tr>
<tr>
<td>19</td>
<td>Adequacy of site drainage</td>
<td>1, 2, 3</td>
<td>1, 4, 7, 10</td>
</tr>
<tr>
<td>20</td>
<td>Cost of development</td>
<td>1, 2, 3</td>
<td>1–10</td>
</tr>
<tr>
<td>21</td>
<td>Cost of operations</td>
<td>1, 2, 3</td>
<td>1–10</td>
</tr>
<tr>
<td>22</td>
<td>Availability of utilities (water)</td>
<td>1, 2, 3</td>
<td>1–10</td>
</tr>
<tr>
<td>23</td>
<td>Access to fire protection</td>
<td>1, 2, 3</td>
<td>1–10</td>
</tr>
<tr>
<td>24</td>
<td>Availability of existing access roadway from highway or collector street/road</td>
<td>1, 2, 3</td>
<td>1–10</td>
</tr>
</tbody>
</table>
2012 CCE Total Site Scores

The CCE method arriving at the master site score is identical to the method used in the MACLS scoring system. Weighted scores were summed across the 26 criteria to produce the CCE total site score. With the new CCE scores and the MACLS weighting of 1 to 10, the total site scores under the CCE evaluation have a minimum possible value of 133 (i.e., if each of the 26 criterion scores for a site was 1), and a maximum possible value of 1,330 (if each of the 26 scores was 10). This range of total site scores provides a broader range of values than in 2009, providing greater distinction in scoring between the sites. The CCE total site scores and site rankings identified from the 26 criteria for the eight potential landfill sites are presented in Table 3-15.

2012 CCE Results

The results of the adjustments to the Kaua‘i landfill site selection scoring system provided new site scores for the 26 community-based criteria, total CCE site scores, and site CCE rankings for each of the eight alternative landfill sites (see Table 3-15).

The new scoring system has the following desirable characteristics:

- All raw scores are based on the most recent data available.
- No scaled scoring ranges include zeroes.
- All criteria have scaled scoring ranges from 1 to 10, with 1 indicating the least desirable site and 10 indicating the most desirable site.
- Some data ranges have been revised as suggested by the community.

The CCE site list includes the Kumukumu site, which was not analyzed in the MACLS study. Therefore, the site rankings are not exactly comparable. Nevertheless, the recommended adjustments to the scoring system resulted in clear differences in rankings between the sites.

In general, changes in rankings resulted from the following: First, new data were available in 2011–2012 that were not available in 2008–2009 when the first assessment was completed. The new data reflected expected changes (e.g., population data from the 2010 Census) and more precise and more accurate data for the sites (e.g., data obtained from the PREE); and Second, the choice of a range of values from 1–10 for all criteria made the overall scoring mathematically more robust. For example, under the previous system:

- Criterion 1 had a weight of 9 and allowable point values of 0, 2, or 4. Therefore, the highest possible score for Criterion 1 was 36 (9×4).
- Criterion 13 had a weight of 10 and allowable point values of 1, 2, or 3. Therefore, the highest possible score Criterion 13 was 30 (3×10).
- Criterion 1 could have a higher maximum possible score than Criterion 13 (36 vs. 30), despite Criterion 1 being weighted lower than Criterion 13 (9 vs. 10).
Table 3-15: 2012 CCE Scores and Site Rankings for 26 Criteria

| Criterion Description                                                                 | Criteria Numbers | Weight | Kālepa     | CCE Rank: | Kekaha-Mauka | CCE Total Site Score: | Kīpū     | CCE Rank: | CCE Total Site Score: | Kōloa     | CCE Rank: | CCE Total Site Score: | Kumukumu | CCE Rank: | CCE Total Site Score: | Ma'alo * | CCE Rank: | CCE Total Site Score: | Pu'u o Papa'i | CCE Rank: | CCE Total Site Score: | 'Umi     | CCE Rank: | CCE Total Site Score: | Source: AECOM (2012, Table 6-3) Wtd weighted |
|---------------------------------------------------------------------------------------|-------------------|--------|------------|-----------|--------------|-----------------------|------------|-----------|-----------------------|------------|-----------|-----------------------|-----------|-----------|-----------------------|-----------|-----------|-----------------------|-----------|-----------|-----------------------|-----------|
| Population near the site                                                             | 1                 | 9      | 1          | 9         | 10           | 90                    | 1          | 9         | 10                    | 90         | 1          | 90                    | 90        | 10       | 90                    | 90        | 5        | 45                    | The proposed project |
| Number of residences, schools, hospitals or businesses along the access roadway       | 2                 | 8      | 10         | 80        | 10           | 80                    | 1          | 8         | 10                    | 80         | 10         | 80                    | 80        | 10       | 80                    | 80        | 10       | 80                    | *          |
| Displacement of residences and/or businesses, including agricultural businesses       | 3                 | 7      | 1          | 7         | 10           | 70                    | 1          | 7         | 10                    | 70         | 10         | 70                    | 70        | 10       | 70                    | 70        | 10       | 70                    | *          |
| Proximity to sites of archaeological and historical significance                      | 4                 | 7      | 1          | 7         | 50           | 35                    | 1          | 7         | 50                    | 35         | 10         | 70                    | 70        | 10       | 70                    | 70        | 10       | 70                    | *          |
| Cost of site acquisition                                                              | 5                 | 6      | 40         | 60        | 60           | 10                    | 80        | 50        | 90                    | 90         | 10         | 70                    | 70        | 10       | 70                    | 70        | 10       | 70                    | *          |
| Ceded or Hawaiian Homestead land                                                      | 6                 | 7      | 10         | 10        | 10           | 10                    | 10         | 10        | 10                    | 10         | 10         | 10                    | 10        | 10       | 10                    | 10        | 10       | 10                    | *          |
| Distance from principal highway                                                       | 7                 | 4      | 20         | 20        | 20           | 20                    | 20         | 20        | 20                    | 20         | 20         | 20                    | 20        | 20       | 20                    | 20        | 20       | 20                    | *          |
| Schools and hospitals along access routes                                             | 8                 | 8      | 10         | 10        | 10           | 10                    | 10         | 10        | 10                    | 10         | 10         | 10                    | 10        | 10       | 10                    | 10        | 10       | 10                    | *          |
| Residential units or developments along access road                                   | 9                 | 9      | 20         | 10        | 10           | 20                    | 10         | 10        | 20                    | 10         | 10         | 20                    | 10        | 10       | 20                    | 10        | 10       | 20                    | *          |
| Quality of agricultural lands                                                        | 10                | 2      | 20         | 20        | 20           | 20                    | 20         | 20        | 20                    | 20         | 20         | 20                    | 20        | 20       | 20                    | 20        | 20       | 20                    | *          |
| Consistency of site with existing County land use zoning designation                 | 11                | 2      | 10         | 10        | 10           | 10                    | 10         | 10        | 10                    | 10         | 10         | 10                    | 10        | 10       | 10                    | 10        | 10       | 10                    | *          |
| Consistency of site with existing State land use district designation                 | 12                | 2      | 10         | 10        | 10           | 10                    | 10         | 10        | 10                    | 10         | 10         | 10                    | 10        | 10       | 10                    | 10        | 10       | 10                    | *          |
| Location of site relative to the UIC line                                             | 13                | 1      | 10         | 10        | 10           | 10                    | 10         | 10        | 10                    | 10         | 10         | 10                    | 10        | 10       | 10                    | 10        | 10       | 10                    | *          |
| Proximity to water surface                                                           | 14                | 7      | 20         | 20        | 20           | 20                    | 20         | 20        | 20                    | 20         | 20         | 20                    | 20        | 20       | 20                    | 20        | 20       | 20                    | *          |
| Distance to nearest flora and fauna habitat                                           | 15                | 5      | 10         | 10        | 10           | 10                    | 10         | 10        | 10                    | 10         | 10         | 10                    | 10        | 10       | 10                    | 10        | 10       | 10                    | *          |
| Rainfall intensity                                                                   | 16                | 5      | 20         | 20        | 20           | 20                    | 20         | 20        | 20                    | 20         | 20         | 20                    | 20        | 20       | 20                    | 20        | 20       | 20                    | *          |
| Wind direction relative to populated areas                                           | 17                | 1      | 10         | 10        | 10           | 10                    | 10         | 10        | 10                    | 10         | 10         | 10                    | 10        | 10       | 10                    | 10        | 10       | 10                    | *          |
| Haul distance from major municipal solid waste generation areas                      | 18                | 9      | 90         | 90        | 90           | 90                    | 90         | 90        | 90                    | 90         | 90         | 90                    | 90        | 90       | 90                    | 90        | 90       | 90                    | *          |
| Adequacy of site drainage                                                            | 19                | 2      | 10         | 10        | 10           | 10                    | 10         | 10        | 10                    | 10         | 10         | 10                    | 10        | 10       | 10                    | 10        | 10       | 10                    | *          |
| Cost of development                                                                  | 20                | 9      | 10         | 10        | 10           | 10                    | 10         | 10        | 10                    | 10         | 10         | 10                    | 10        | 10       | 10                    | 10        | 10       | 10                    | *          |
| Cost of operations                                                                   | 21                | 10     | 70         | 70        | 70           | 70                    | 70         | 70        | 70                    | 70         | 70         | 70                    | 70        | 70       | 70                    | 70        | 70       | 70                    | *          |
| Availability of utilities (water)                                                    | 22                | 2      | 10         | 10        | 10           | 10                    | 10         | 10        | 10                    | 10         | 10         | 10                    | 10        | 10       | 10                    | 10        | 10       | 10                    | *          |
| Access to fire protection                                                            | 23                | 1      | 50         | 50        | 50           | 50                    | 50         | 50        | 50                    | 50         | 50         | 50                    | 50        | 50       | 50                    | 50        | 50       | 50                    | *          |
| Availability of existing access roadway from highway or collector street/road        | 24                | 2      | 10         | 10        | 10           | 10                    | 10         | 10        | 10                    | 10         | 10         | 10                    | 10        | 10       | 10                    | 10        | 10       | 10                    | *          |
| Proximity to parks and recreational facilities                                       | 25                | 3      | 10         | 10        | 10           | 10                    | 10         | 10        | 10                    | 10         | 10         | 10                    | 10        | 10       | 10                    | 10        | 10       | 10                    | *          |
| Landfill capacity or site life                                                       | 26                | 8      | 10         | 10        | 10           | 10                    | 10         | 10        | 10                    | 10         | 10         | 10                    | 10        | 10       | 10                    | 10        | 10       | 10                    | *          |
Table 3-16 shows the difference in the scores and ranking of the sites. In 2009, seven of the eight (Kumukumu was excluded) potential MSWLF sites were ranked between 1 (most desirable) and 7 (least desirable); in the 2012 study all eight potential MSWLF sites were ranked between 1 (most desirable) and 8 (least desirable). The Maʻalo site was ranked number one in the 2012 study and number six in the 2009 study. The ‘Umi site was ranked number one in the 2009 study and number four in the 2012 study.

Table 3-16: Comparison of Community Criteria Site Ranks and Total Scores, 2009 and 2012

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Kālepa</th>
<th>Kekaha-Mauka</th>
<th>Kīpū</th>
<th>Kōloa</th>
<th>Kumukumu</th>
<th>Maʻalo a</th>
<th>Puʻu o Papaʻi</th>
<th>‘Umi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank 2009</td>
<td>7</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>a</td>
<td>8</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Rank 2012</td>
<td>8</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Score 2009</td>
<td>248</td>
<td>326</td>
<td>288</td>
<td>295</td>
<td>a</td>
<td>265</td>
<td>269</td>
<td>334</td>
</tr>
<tr>
<td>Score 2012</td>
<td>585</td>
<td>835</td>
<td>769</td>
<td>665</td>
<td>707</td>
<td>877</td>
<td>848</td>
<td>780</td>
</tr>
</tbody>
</table>

Sources: RMTC (2009); AECOM (2012)
a The Kumukumu site was not evaluated in the 2009 MACLS report due to prior land use entitlements that had been secured for development of a subdivision. The site has since been re-included as a potential landfill site.

High-Value Agricultural Sites

All of the eight identified sites currently have various degrees of agricultural or similar uses (e.g., livestock grazing). Most of the sites are predominantly or significantly classified as “prime” or “unique” agricultural land by the State under the “Agricultural Lands of Importance to the State of Hawai’i” (ALISH) system. Kekaha Mauka is the parcel with the least portion classified as prime or unique. However, a range of different uses is currently being pursued.

For example, on one end of the spectrum is Kumukumu, which appears to be partially used for grazing only, which could be considered minimally burdensome to relocate. On the other end of the spectrum, the ‘Umi site has well-established coffee growing operations, and is the only potential landfill site designated as Important Agricultural Land (IAL). Coffee plants are high-value crops that take significant time to establish and therefore could be considered more burdensome to relocate. Both the State and County are undertaking significant effort to promote high-value agricultural sites.

Sustainability

An additional decision factor, not considered in the studies previous to the 2012 Siting Study, is the proximity of the site to Kauaʻi’s waste generation centroid. The distance between a MSWLF site and Kauaʻi’s waste generation centroid provides a measure of the hauling of waste that will be required. According to the data in the County’s ISWMP, the island’s waste generation centroid is estimated to lie between Līhuʻe and Hanamāʻulu. Siting the MSWLF closer to the island’s waste generation centroid will have positive impacts on:

- Fuel consumption
- Carbon footprint
- Waste transportation–related costs
- Waste transportation–related traffic

While an analysis of the relative sustainability of the proposed landfill sites is beyond the scope of the Alternatives Analysis, one important consideration is addressed: waste transportation cost and associated resource use (e.g., fuels, carbon footprint, costs). Generally, sites that minimize waste shipment are more sustainable and less expensive. Table 3-17 compares the MSW transported and distance from the County’s four transfer stations to the eight potential landfill sites. The table uses data from the ISWMP (R. W. Beck 2009). Results are presented in terms of the product of the distance and the amount of MSW shipped (ton-miles per year). The cost factor is based on the County’s unit cost (dollars per ton-mile) of transportation. The sites are sequenced from those requiring the least to the most transportation.
### Table 3-17: Waste Shipment Comparison of Alternative Landfill Sites

<table>
<thead>
<tr>
<th>Transfer Station</th>
<th>Kumu-kumu</th>
<th>Kolepa</th>
<th>Kipu</th>
<th>Ma'aloa*</th>
<th>Umi</th>
<th>Koloa</th>
<th>Pu'o o Papa'i</th>
<th>Kekaha Mauka</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hanalei Daily Waste (TPD)</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Annual Waste (TPY)</td>
<td>7,392</td>
<td>7,392</td>
<td>7,392</td>
<td>7,392</td>
<td>7,392</td>
<td>7,392</td>
<td>7,392</td>
<td>7,392</td>
</tr>
<tr>
<td>Distance (miles)</td>
<td>15.5</td>
<td>27.8</td>
<td>30.5</td>
<td>29.1</td>
<td>40.5</td>
<td>38.2</td>
<td>46.8</td>
<td>54.7</td>
</tr>
<tr>
<td>Ton-Miles/year</td>
<td>114,576</td>
<td>205,498</td>
<td>225,456</td>
<td>215,107</td>
<td>299,376</td>
<td>282,374</td>
<td>345,946</td>
<td>404,342</td>
</tr>
<tr>
<td>Hanapepe Daily Waste (TPD)</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Annual Waste (TPY)</td>
<td>8,448</td>
<td>8,448</td>
<td>8,448</td>
<td>8,448</td>
<td>8,448</td>
<td>8,448</td>
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<td>8,448</td>
</tr>
<tr>
<td>Distance (miles)</td>
<td>28.5</td>
<td>20.7</td>
<td>15.1</td>
<td>22.0</td>
<td>6.5</td>
<td>15.4</td>
<td>3.4</td>
<td>11.2</td>
</tr>
<tr>
<td>Ton-Miles/year</td>
<td>240,768</td>
<td>174,874</td>
<td>127,565</td>
<td>185,856</td>
<td>54,912</td>
<td>130,099</td>
<td>28,723</td>
<td>94,618</td>
</tr>
<tr>
<td>Kapa'a Daily Waste (TPD)</td>
<td>31</td>
<td>31</td>
<td>31</td>
<td>31</td>
<td>31</td>
<td>31</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>Annual Waste (TPY)</td>
<td>10,912</td>
<td>10,912</td>
<td>10,912</td>
<td>10,912</td>
<td>10,912</td>
<td>10,912</td>
<td>10,912</td>
<td>10,912</td>
</tr>
<tr>
<td>Distance (miles)</td>
<td>3.7</td>
<td>10.5</td>
<td>13.1</td>
<td>11.7</td>
<td>23.1</td>
<td>20.9</td>
<td>29.5</td>
<td>37.3</td>
</tr>
<tr>
<td>Ton-Miles/year</td>
<td>40,374</td>
<td>114,576</td>
<td>142,947</td>
<td>127,670</td>
<td>252,067</td>
<td>228,061</td>
<td>321,904</td>
<td>407,018</td>
</tr>
<tr>
<td>Lihu'e Daily Waste (TPD)</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>Annual Waste (TPY)</td>
<td>11,968</td>
<td>11,968</td>
<td>11,968</td>
<td>11,968</td>
<td>11,968</td>
<td>11,968</td>
<td>11,968</td>
<td>11,968</td>
</tr>
<tr>
<td>Distance (miles)</td>
<td>12.9</td>
<td>5.0</td>
<td>6.2</td>
<td>6.3</td>
<td>6.3</td>
<td>6.3</td>
<td>6.3</td>
<td>6.3</td>
</tr>
<tr>
<td>Ton-Miles/year</td>
<td>154,387</td>
<td>59,840</td>
<td>74,202</td>
<td>75,398</td>
<td>193,882</td>
<td>167,552</td>
<td>270,477</td>
<td>365,024</td>
</tr>
<tr>
<td>Total Ton-Miles/year</td>
<td>550,106</td>
<td>554,787</td>
<td>570,170</td>
<td>604,032</td>
<td>800,237</td>
<td>808,086</td>
<td>967,050</td>
<td>1,271,002</td>
</tr>
<tr>
<td>Unit Cost ($/Ton-Mile)</td>
<td>0.70</td>
<td>0.70</td>
<td>0.70</td>
<td>0.70</td>
<td>0.70</td>
<td>0.70</td>
<td>0.70</td>
<td>0.70</td>
</tr>
<tr>
<td>Total Hauling Cost ($/year)</td>
<td>385,074</td>
<td>388,351</td>
<td>399,119</td>
<td>422,822</td>
<td>560,166</td>
<td>565,660</td>
<td>676,935</td>
<td>889,701</td>
</tr>
<tr>
<td>% Exceeding Minimum Site</td>
<td>—</td>
<td>0.9%</td>
<td>3.6%</td>
<td>9.8%</td>
<td>45.5%</td>
<td>46.9%</td>
<td>75.8%</td>
<td>131.0%</td>
</tr>
</tbody>
</table>

Source: AECOM (2012, Table 7-1)

Note: Tons per year for each transfer station is the daily rate times 352 days/year.

* The proposed project

### OVERALL SITE COMPARISON

The environmental impacts of developing a new MSWLF are similar for all sites assessed and include:

- Potential transport of contaminants offsite by surface water/stormwater, mitigated by installing and maintaining an effective surface water management system
- Potential contaminant migration to underlying soil and groundwater, mitigated by installing and maintaining a modern landfill liner system and leachate management system
- Collected leachate requiring potential treatment and disposal
- Greenhouse gases (e.g., methane, carbon dioxide) generated by waste decomposition, mitigated by installing and maintaining a LFG extraction system or a gas-to-energy facility
- Odor nuisance, mitigated by implementing daily soil cover of the active landfill cells
- Source required for sufficient quantities of daily soil cover
- Increased vehicle emissions and dust generation
- Provides essential place for safe disposal of island’s MSW
- Generates traffic nuisance

Table 3-18 compares some of the major considerations for the eight alternative sites. The order of the decision factors is not intended to imply relative importance as any identified real or perceived deficiency in a particular site can potentially be mitigated. The table also identifies advantages and disadvantages for each site.
### Table 3-18: Overall Comparison of Site Attributes and Rankings for Eight Potential MSWLF Sites, County of Kaua‘i

<table>
<thead>
<tr>
<th>Site</th>
<th>Total Property Area (acres)</th>
<th>Willing Landowner?</th>
<th>Estimated Site Life in Years (and Rank)</th>
<th>CCE Score (and Rank)</th>
<th>Estimated Cost in $MM (and Rank)</th>
<th>Agricultural Location/Sustainability Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kukua</td>
<td>77.6</td>
<td>No</td>
<td>26 (86)</td>
<td>585 (86)</td>
<td>$8.36 (86) $32.3 (87)</td>
<td>Yes</td>
<td>Near island’s waste centroid, providing cost savings and positive sustainability effects. Unwilling private landowner. Shortest site life of all sites under consideration. Ranks last on the CCE. Most expensive annual cost over site life. Second highest initial cost for site development. Active agricultural land use. Mitigation measures could be required to minimize wildlife hazards potentially posed to Līhu‘e Airport operations.</td>
</tr>
<tr>
<td>Kekaha Mauka</td>
<td>175.9</td>
<td>No</td>
<td>60 (85)</td>
<td>835 (83)</td>
<td>$7.59 (87) $26.5 (81)</td>
<td>No</td>
<td>Ranks third on the CCE. Lowest initial cost for site development. Located near existing Kekaha Landfill, which has some in-place infrastructure. Located near existing roadway. Relatively low nuisance factor due to distance from population. Located below the UIC line. Low rainfall. Unwilling landowner (State of Hawai‘i). County cannot condemn State-owned property; requires willing landowner. Second most expensive annual cost over site life. Active agricultural land use. Distant from island’s waste centroid. Local community has already hosted the existing Kekaha Landfill.</td>
</tr>
<tr>
<td>Kīpō</td>
<td>145.8</td>
<td>No</td>
<td>56 (86)</td>
<td>769 (85)</td>
<td>$7.42 (85) $28.7 (83)</td>
<td>Yes</td>
<td>Low initial cost for site development. Near island’s waste centroid, providing cost savings and positive sustainability effects. Located near existing roadway. Unwilling private landowner. Third shortest site life. Mitigation measures could be required to minimize wildlife hazards potentially posed to Līhu‘e Airport operations. Distant from island’s waste centroid. Local community has already hosted the existing Kekaha Landfill. Recommended site.</td>
</tr>
<tr>
<td>Kīla</td>
<td>125.4</td>
<td>No</td>
<td>69 (84)</td>
<td>665 (87)</td>
<td>$7.11 (84) $27.6 (82)</td>
<td>No</td>
<td>Low initial cost for site development. Located near existing roadway. Unwilling private landowner. Groundwater utility: the County DOW has stated that groundwater supply wells in the area are productive, and that they may want to advance additional wells in the future.</td>
</tr>
<tr>
<td>Kumukumu</td>
<td>172.9</td>
<td>No</td>
<td>104 (82)</td>
<td>707 (86)</td>
<td>$6.94 (82) $30.9 (85)</td>
<td>Yes</td>
<td>Second longest site life. Second least annual cost over site life. Near island’s waste centroid, providing cost savings and positive sustainability effects. Located near existing roadway. Disruption of current site activities relatively minor compared to other sites. Unwilling private landowner. Ranked somewhat low on the CCE. Possible wetlands features may require mitigation.</td>
</tr>
<tr>
<td>Ma'alo (Proposed Project)</td>
<td>270.2</td>
<td>Yes</td>
<td>264 (#1)</td>
<td>877 (#1)</td>
<td>$6.49 (#1) $38.1 (#8)</td>
<td>Yes</td>
<td>Only landowner (State of Hawai‘i) willing to site MSWLF and RRP. Private landowner of adjacent site willing to site RRP. Longest site life. Ranks best on the CCE. Overall least annual cost over site life. Near island’s waste centroid, providing cost savings and positive sustainability effects. Low nuisance factor due to local topography. Highest initial cost for site development. Possible offsite wetland features may require mitigation if the Alternative RRP site is implemented and if Driveway 1 is used to connect the sites. Mitigation measures could be required to minimize wildlife hazards potentially posed to Līhu‘e Airport operations.</td>
</tr>
<tr>
<td>Puu O Papa'i</td>
<td>145.7</td>
<td>No</td>
<td>96 (83)</td>
<td>848 (82)</td>
<td>$7.00 (83) $29.6 (84)</td>
<td>No</td>
<td>Third longest site life. Ranks second on the CCE. Third least annual cost over site life. Low rainfall. Unwilling private landowner. Active agricultural land use. Distant from island’s waste centroid. Site may be prohibited due to proximity to Port Allen Airport.</td>
</tr>
<tr>
<td>Uma</td>
<td>126.7</td>
<td>No</td>
<td>53 (87)</td>
<td>835 (86)</td>
<td>$7.56 (86) $30.1 (85)</td>
<td>Yes</td>
<td>Located near existing roadway. Located below the UIC line. Low rainfall. Unwilling private landowner. Second shortest site life. High annual cost over site life. High initial cost for site development. Disruption of current agricultural uses relatively significant compared to other sites. Designated as Important Agricultural Land. Low initial cost for site development. Distant from island’s waste centroid. Site may be prohibited due to proximity to Port Allen Airport.</td>
</tr>
</tbody>
</table>

Note: Rank is between 1 (most desirable) and 8 (least desirable)

Source: AECOM, 2012

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2018 DEIS, New Kaua‘i Landfill
Alternatives to the Project

3-22
All eight potential MSWLF sites are technically feasible sites for the County of Kaua‘i’s new landfill.

The County evaluated each of the sites, weighing the pros and cons of the various site rankings, important decision making criteria, and other measures presented in the 2012 Siting Study. The proposed project site at Ma‘alo is considered the most practicable and viable alternative and is retained for further consideration based on:

- The Ma‘alo site represents the longest-term solution for Kaua‘i’s waste disposal requirements. Ma‘alo has an estimated site life of approximately 264 years which can potentially be extended further with the operation of a RRP, making it a near-permanent solution to the County’s needs. As the last 12 years of the County’s efforts to site a landfill show, the value of this near-permanent solution cannot be overemphasized.

- The Ma‘alo site is also the only site identified that currently has a potentially willing landowner. As the lack of a willing landowner for the use of the site as a landfill has been the cause of failure of previous siting efforts, this could reasonably be an overriding decision-making factor.

- Although it has a relatively high initial cost, the Ma‘alo site is the most economical site over the life of the landfill, due to its long site life. The overall site development costs would not be incurred at the inception of use of the site; the County can build successive cells as they become needed. Similarly, displacement and relocation of current land users would be phased over many years, lessening the potential for impacts.

- The Ma‘alo site ranks the highest in the CCE system. Other factors favoring the Ma‘alo site include its central location (which would save cost and fuel, decrease waste-related traffic, and provide positive sustainability effects), the relatively ease with which current land uses (grazing) can be relocated to nearby locations, and topography that shields the site, minimizing adverse visual impacts.

For the reasons stated above, the Ma‘alo site is retained and the seven other potential MSWLF sites are eliminated from further consideration.

### 3.2.2 Alternative Access Routes

In addition to the consideration of the Ma‘alo landfill site location, the County responded to public concerns regarding the proposed Ma‘alo MSWLF site access route and prepared the New Kaua‘i Landfill TREFS (AECOM 2016; Appendix F), which analyzed five potential access route alternatives for the proposed project. Each alternative access route consists of a “road” (labelled A–E) and up to two “driveway” alternatives (labelled 1–3) and connects to regional access at one of five intersections (see Figure 6-2):

- **Route A1/A2:** via Ma‘alo Road and Driveway 1 or Driveway 2. The intersection is Ma‘alo Road/Kūhiō Highway, a stop-sign-controlled T-intersection. Total route length is 4.7–4.8 miles.

- **Route B1/B2:** via ‘Ehiku Street, Ma‘alo Road, and Driveway 1 or 2. The intersection is ‘Ehiku Street/Kūhiō Highway, a signalized intersection. Total route length is 5.6–5.7 miles.

- **Route C3:** via Laulima Street and Driveway 3. The intersection is Laulima Street /Kūhiō Highway, a stop-sign-controlled four-legged intersection. Total route length is 1.7 miles.

- **Route D3:** via Roberts Hawai‘i Driveway and Driveway 3. The intersection is Roberts Hawai‘i Driveway/Kūhiō Highway (a stop-sign-controlled T-intersection). Total route length is 2.2 miles.
• **Route E3** (proposed project): Via Kaua‘i Beach Drive and Driveway 3. The study intersection is Kaua‘i Beach Drive/Kūhiō Highway (a stop-sign-controlled T-intersection). Total route length is 2.5 miles.

The TREFS analyzed objective data (such as traffic impacts, recommended improvements, and related costs) and solicited concerns and opinions from the public, particularly those most directly affected by the choice of the proposed access route. Several public meetings were held to gather public comments, and additional outreach and engagement was conducted through the internet and local media sources.

All access scenarios present potential traffic impacts that can be addressed via physical and operational improvements at their respective Kūhiō Highway intersection (in several cases, these improvements could improve the existing traffic in these areas). Access route improvements are recommended for all access scenarios, including paving and utility work, bringing water, electricity, and phone lines to the proposed project site, and other roadway improvements. Table 20 of the TREFS (AECOM 2016; Appendix F) summarizes key features of each potential access route and the projected impacts and costs.

Overall, Access Routes C, D, and E provide the best balance of feasibility, directness, traffic impacts, cost requirements, and other impacts. While these three routes are progressively longer and therefore more expensive, few other significant technical advantages or disadvantages distinguish Routes C, D, and E. However, members of nearby communities expressed a preference for Access Route E, which would minimize the traffic impact to the core of Hanamā‘ulu and pass fewer residences and businesses. Therefore, while Route C is slightly preferable from a technical and financial standpoint, in order to address concerns raised by the community during the early planning process, the County has selected Access Route E as the preferred access route.

### 3.3 ALTERNATIVE TECHNOLOGIES AND OTHER METHODS

The following alternative technologies and other methods do not meet the project’s purpose, need, and objectives to provide a new MSWLF for the County. The criteria used to evaluate the alternative technologies and other methods are based on the 2009 ISWMP (R. W. Beck 2009) and responds to the need to properly dispose of all forms of MSW that cannot practicably be further reused, recycled, or otherwise recovered; the need to reliably and safely dispose of all forms of MSW generated on the island of Kaua‘i; and the need for the technology to be operational when the Kekaha MSWLF reaches capacity (see AECOM 2017, Appendix I, for detail). The criteria include:

- The alternative must be capable of processing the County’s MSW stream.
- The alternative must be proven; i.e., similar facilities must have operated continuously for two or more years at a capacity sufficient to handle the County’s MSW waste stream. The similar facilities have been fully operational for at least 90% of the time while meeting the necessary environmental requirements.
- If applicable, products from the facility have been successfully marketed for at least two years. Products are defined as either energy or physical material that has value to the County.
The following sections are provided to describe the alternative technologies and other methods that were evaluated:

- Section 3.3.1 provides a summary of the non-thermal and thermal alternative technologies evaluated and provides an explanation regarding why each of the technologies do not address the project requirements and criteria.

- Section 3.3.2 provides a summary of Off-Island Transshipment of MSW, Landfill Mining and Reclamation, and Enhanced Recycling. These alternatives either divert or convert MSW from requiring landfilling on the island of Kaua'i. An explanation is also provided why these methods do not address the project requirements and criteria.

### 3.3.1 Alternative Technologies

There are two types of alternative technologies for the elimination or reduction of MSW requiring disposal in a MSWLF:

**Non-thermal.** These processes do not use heat and produce a material, such as compost. Non-thermal alternative technologies evaluated included the following:

- Anaerobic digestion
- Aerobic digestion
- Hydrolysis/fermentation

**Thermal.** These processes use heat to reduce the weight and volume of the waste and produce energy or a fuel that can be used to produce energy and may produce recyclables. Alternative thermal technologies evaluated in this DEIS include the following:

- Plasma arc
- Gasification/pyrolysis
- Waste to Energy (WtE) – this is the most proven alternative technology

### Non-Thermal Technologies

#### Anaerobic Digestion

Anaerobic Digestion is a biological process where microorganisms decompose or break down organic material in the absence of oxygen. The process breaks down the organic or compostable portion of the MSW, including paper, yard waste, food waste, and other organic waste. End-products generally include liquid, methane, carbon dioxide, and solid materials. The solid materials are the digested organic fractions of MSW, which after a period of aerobic stabilization, may be suitable for reuse as a soil amendment. Anaerobic digestion is not capable of processing the County’s entire MSW stream; it is therefore not a practicable or feasible alternative to the establishment of a new MSWLF.

#### Aerobic Digestion

Aerobic Digestion is a non-thermal technology in which bacteria that thrive in oxygen-rich environments break down and digest the MSW. Composting is one example of aerobic digestion. During aerobic digestion, organic matter, nutrients, and dissolved oxygen are consumed and carbon dioxide, water, and heat are generated. Solids that remain following aerobic digestion may be suitable as a soil amendment. Aerobic digestion is not capable of processing the County’s entire MSW stream; it is therefore not a feasible alternative to establishment of a new MSWLF.

#### Hydrolysis and Fermentation

Hydrolysis and fermentation are used to convert the cellulosic portion of MSW into ethanol. While the technology is well established using agricultural and other relatively uniform feedstock, hydrolysis and
fermentation of MSW present challenges, and cannot process the entire MSW waste stream. Hydrolysis and fermentation is not a proven technology, and would not be capable of processing the County's entire MSW stream; it is therefore not a feasible alternative to establishment of a new MSWLF.

Thermal Technologies

Thermal technologies use high temperatures to breakdown organic materials and produce a significant amount of heat. During the processes, both organic and non-organic materials are combusted, with non-combustible materials recycled and landfilled either before or after combustion. Thermal technologies include plasma arc, gasification, and WtE.

Plasma Gasification

Plasma gasification (sometimes referred to as plasma arc) involves high temperature ionization and breakdown of feedstock into “syngas” (a synthetic gaseous fuel) and “slag” (a glassy residue). Although there have been successful pilot projects, and the technology is promising, there are currently no known plasma gasification plants that have successfully processed MSW for a significant period. Plasma gasification is not a proven technology and might not be capable of processing the County's entire annual MSW stream (82,000 TPY), and might require landfiling of residual slag; it is therefore not a feasible alternative to establishment of a new MSWLF.

Gasification/Pyrolysis

Gasification is the process of reducing MSW to a synthetic or fuel gas by using oxygen and heat. Pyrolysis is similar to gasification and is often considered a type of gasification technology, although the process requires the absence of oxygen. The byproducts of gasification are syngas and vitrified material (slag). Pyrolysis byproducts include solid carbon and liquid fuel. The gasification/pyrolysis alternative does not meet County of Kaua’i ISWMP criteria for alternatives, which require that there be a commercial facility in the United States operating on MSW. Although some facilities were constructed in the late 1970s and early 1980s, they never become commercially successful and were shut down. One of the commercial pyrolysis facilities in Japan operates on more than 200 TPD of MSW. Preprocessing requirements and costs may be a concern. The reported diversion of between 72 and 95 percent of MSW from landfill disposal is dependent on developing a market for the solid residue (char) byproduct of the pyrolysis process.

Waste-to-Energy (WtE) Technologies

WtE, also known as Waste to Energy, is the process of recovering energy in the form of heat or electricity from the incineration of waste. During the incineration process, the volume of waste is reduced by as much as 90%. Various extensively used types of thermal technologies can be used for a WtE facility:

- Starved air (or multi-stage combustion)
- Mass burn (or single-stage combustion)
- Refuse-derived fuel (RDF)
- Fluidized bed
- Rotary kiln

These technologies differ in the extent to which they have been commercially successful. Mass burn technology is the most extensively used, due to its ability to process a mixed waste stream using a relatively simple operation. WtE technology is incapable of processing the County's entire MSW stream, and some types of waste cannot be incinerated (e.g., construction and demolition debris [C&D waste]). The waste by products consisting of residue and combustion ash requires disposal in a MSWLF. WtE is a proven technology and is in use on O'ahu, and in a number of mainland U.S. states.
However WtE does not meet the County’s purpose, need, and objectives because a MSWLF would still be needed. Additionally, the Kaua‘i Resource Recovery Park Feasibility Study, AECOM 2013, Pages 71-72 (Appendix C), indicates that although a WtE facility has the potential to extend the expected life of the new landfill by a factor of approximately 4, WtE is a very expensive technology, requiring significant up-front capital costs, and carrying a significant financial risk if the waste feedstock decreases and the facility does not run at capacity. For these reasons it is not recommended as part of a future RRP.

3.3.2 Other Methods

Other methods to eliminate or significantly reduce the need for a new MSWLF include:

- Off-Island Transshipment of MSW
- Landfill Mining and Reclamation (LFMR)
- Enhanced Recycling

**Off-Island Transshipment of MSW**

This alternative involves the shipment of MSW to the U.S. mainland for disposal in a landfill or to the H-POWER facility on O‘ahu and offers the advantage of avoiding the need for an on-island landfill for disposal of MSW. This benefit however, would need to be weighed against the landfill space required to dispose of allowable prohibited materials and emergency disaster debris. Transshipment is also expected to be costly and the acceptance of waste at the H-POWER facility on O‘ahu or a U.S. mainland landfill could be interrupted by natural disasters or contract issues (e.g., a shipping strike).

Transshipment to H-POWER offers some environmental benefit and could extend the life of the current landfill by 4–15 years, but it is not a long-term solution and only delays the time when the County would eventually require a new landfill, at an expected much higher cost due to increased land costs, price escalation of labor, and the likely need to fulfill new environmental regulations and requirements. To date, the off-island transshipment of MSW to the U.S. mainland has not been proven to be a feasible or reliable alternative and is therefore unlikely to be capable of handling the County of Kaua‘i’s MSW waste stream. Transshipment of Kaua‘i’s MSW to the U.S. mainland is therefore not considered a practicable alternative. Similar issues are expected with the transshipment of MSW to O‘ahu’s H-POWER facility; however, further investigation and analyses would be required.4

**Landfill Mining and Reclamation**

LFMR would be applied to the existing Kekaha Phase I MSWLF and consists of excavating the unlined landfill cells; reclaiming material with value or energy from the excavated waste; constructing a new, lined MSW landfill meeting modern state and federal standards in the existing Phase I footprint; and, landfilling the residual waste material in the new portion of the landfill. The completion of the LFMR project would result in the reclamation of landfill space in the Phase I area, thereby providing new unused airspace and increasing the useful life of the Kekaha MSWLF beyond its current capacity.

LFMR was considered against the County’s objective of providing for the disposal of waste that cannot be further reused, recycled or otherwise recovered. However, this alternative would produce waste by-products that would eventually require disposal in a MSWLF. LFMR may help to increase the existing capacity of Phase I of the existing Kekaha MSWLF, however, it would provide only a projected six

4 According to the County of Kaua‘i, Solid Waste Division, the City and County of Honolulu, Department of Environmental Services, informed the County of Kaua‘i that the Honolulu City Charter would need to be changed before it would allow the acceptance of MSW from the neighbor islands for uses such as waste incineration. Solid Waste Division, County of Kauai, March 25, 2018.
additional years of lifespan and has the potential for major public health, safety, environmental impacts, and high costs that make it a less desirable alternative. LFMR therefore is not further considered as a potentially viable or feasible alternative and is not further considered.

**Enhanced Recycling**

Enhanced Recycling involves significantly increasing the County’s current efforts at waste reduction through recycling. Presently the County of Kaua‘i has the highest recycling rate of any County in the State at 43%. At the same time, however, the recycling industry is in a major waste commodity downturn due to the Far East elimination of major imports of recyclable materials (County of Kaua‘i, Refuse Division, March 2018).

Enhanced Recycling is expected to require a lengthy environmental permitting process, and the need for siting, constructing, and operating the facility before the Kekaha MSWLF reaches capacity. Expanding the County’s current recycling infrastructure to support Enhanced Recycling could decrease the amount of materials sent to the landfill, but cannot entirely eliminate the need for a landfill for the disposal of waste materials that cannot be further reused, recycled, or have a readily available recycled materials market. The cost of collecting, sorting, and processing additional recyclable materials on Kaua‘i is also presently unknown and would require a cost benefit analysis to determine the cost effectiveness of recycling.

Although Enhanced Recycling offers many benefits, this alternative is eliminated from further consideration as it cannot completely eliminate the need for a landfill.
4.0 POTENTIAL PROJECT EFFECTS AND MITIGATION MEASURES—PHYSICAL AND BIOLOGICAL ENVIRONMENT

4.1 CLIMATE AND GREEN HOUSE GASES (GHGs)

4.1.1 Affected Environment

The project area’s climate is characterized as semi-tropical and is influenced by its geographic location within the tropics, southwest of the Pacific High or anticyclone region. Characteristic features are the equable daily and seasonal temperatures, the predominant northeasterly trade winds, and the marked variation in rainfall, from the wet to the dry season and from place to place. The average annual temperature recorded at the Lih‘u‘e International Airport, the nearest National Weather Service weather station to the proposed MSWLF site, ranges from 71.3 degrees Fahrenheit during the coolest month to 79.1 degrees Fahrenheit during the warmest month. Winds at the Lih‘u‘e Airport are predominantly from the northeast at speeds of 10–13 knots.

Relative humidity, moderate to high in all seasons, is slightly higher in the wet season than in the dry. The average relative humidity recorded at Lih‘u‘e Airport is 67 percent in mid-afternoon and 83 percent in the early morning hours. Completely cloudless skies are rare. On average, clouds cover 60–70 percent of the sky during the daylight hours. Average annual rainfall in the Ma‘alo area is 60–80 inches per year (Izuka and Gingerich 1998; Giambelluca et al. 1986); most rainfall occurs during the winter months. On average, three-fourths of this total falls during the 7-month wet season (October–April); the dry season occurs during May–September.

According to recent findings by researchers at the University of Hawai‘i (IPRC, 2013, var.), the effects of climate change are increasingly evident in Hawai‘i: air temperature has risen; rain intensity has increased while total rainfall has decreased; stream flows have decreased; sea surface temperatures and sea levels have increased; and the ocean is becoming more acidic (SB No. 2745, 2012).

Research is also in agreement that Green House Gas (GHG) emissions, including carbon dioxide, methane, nitrous oxide, and fluorinated gases, are a key contributor to the unprecedented increases in global atmospheric warming over the past century (EPA, 2011 and IPRC, 2013). These trends are projected to continue to increase in the future posing unique and considerable challenges to Hawai‘i. Research at the University of Hawai‘i, School of Ocean and Earth Science and Technology indicates that sea level has risen in Hawai‘i by approximately 0.6 inches per decade (1.5 mm per year) over the past century (SOEST, 2012). The estimates point to a potential aggregate rise of 1.3 ft (40 cm) by the year 2060 and a rise of 3.3 ft (100 cm) by 2110. According to the Intergovernmental Panel on Climate Change’s Fifth Assessment Report, Climate Change 2013, Chapter 13, Sea Level Change, released in 2014, it is estimated that at most, a global sea-level rise of approximately 0.45–0.82 meters (1.48 – 2.70 ft) is likely to occur for the period of 2081-2100. There will be deviations of local and regional sea level change from the global change – it is estimated that about 70% of coastlines are projected to experience a relative sea level change within 20% of the global mean sea level change.

Methane from the generation of landfill gas is considered a primary source of GHG emissions at MSW landfills. LFG generation is a byproduct of anaerobic decomposition of landfilled waste. The main constituents of landfill gas include methane and carbon dioxide, with the methane concentration of the gas typically ranging from 40 to 60 percent. Additional minor constituents of landfill gas include oxygen, nitrogen, and hydrogen sulfide non-methane organic compounds.

Potential impacts associated with climate change are being addressed through long-range planning. The Kaua‘i County Planning Department commissioned a technical study, the Kaua‘i Climate Change and Coastal Hazards Assessment (SOEST, 2014) to address climate change related risks and hazards in anticipation of the Kaua‘i General Plan (GP) update. The study recommended that potential climate change impacts be factored into planning and policy-making.
In 2007, Hawaii became the second state in the Nation to set a binding cap on greenhouse gas (GHG) emissions through Act 234, which declared a policy to reduce GHG emissions statewide to 1990 levels by the year 2020. Using national and international standards for GHG emissions accounting, emissions in the year 1990 are estimated to be 13.660 megatons [million metric tons] of carbon dioxide equivalents (MMCO2e). In 2007, Hawaii emitted about 15.487 MMCO2e. These numbers include long-term carbon storage features, such as managed forests (sinks). To meet Act 234 requirements, Hawaii must reduce covered emissions by about 12 percent (or 1.827 MMCO2e) below 2007 levels by the year 2020.

While municipal waste combustion operations and municipal solid waste landfills are excluded from the State GHG reduction requirements, the Clean Air Act contains, among other things, New Source Performance Standards for stationary sources of air pollutants (40 CFR §60) that are intended to reduce the emissions of landfill gas, which is composed of both nonmethane organic compounds (NMOC) and methane. A preliminary analysis of the NMOC emission rate of the proposed MSWLF indicates that NMOC emissions for Phase 1 may exceed 50 megagrams (Mg) per year (Mg/yr) during the 4th year of waste acceptance and may reach a peak mass emission rate of 304 Mg/yr during the final year of Phase 1 operations of the MSWLF. This would be equivalent to 0.0000000004 percent of the State of Hawai‘i 2020 emissions goal level at 50 Mg, and 0.0000000022 percent at 304 Mg.

Potential Project Effects

4.1.2 Potential Project Effects

**Construction.** Construction GHG emissions would result primarily from fuel used in construction equipment. However this would be temporary and localized and no significant secondary or cumulative impacts at the project site are expected.

**Operations.** The generation of landfill gas is an incremental process, where increasing quantities of LFG are generated with subsequent placement of solid waste. Over time, decomposition of solid waste in the proposed landfill will produce LFG. Methane, carbon dioxide, and non-methane organic compounds are some of the landfill gas constituents. LFG would be mitigated through the use of an active gas collection and control system so that the LFG can be collected and vented or burned off through a flare system to control the escape of methane and non-methane landfill associated gases, or conditioned for use as a fuel for the cost-effective generation of electricity. It is expected however, that the sufficient quantity and quality of LFG or for use as a fuel would not be expected until the site has been operational for several years. Therefore, plans for LFG recovery are expected to be phased in after several years of operation. See Section 2.1.2.

LFG collection efficiency generally governs how much landfill gas generated within the landfill can be collected for destruction or collection, and is dependent upon the type of cover on the landfill, atmospheric conditions, and the quality of the gas collection and control system.

The type of cover is especially important; a landfill may be under three types of cover at any given time, which, when combined with the gas collection and control system have varying collection efficiencies: daily cover has an approximately 60% collection efficiency, the thicker intermediate cover has an approximately 75% collection efficiency, and final soil and geomembrane capping systems have an approximately 95% or greater collection efficiency. Maintaining the proper cover across the landfill, dependent upon its status within the life of the landfill, will increase LFG collection efficiency and increase its likelihood of destruction or collection.

A future RRP facility may include the construction and operation of a landfill gas to energy (LFGtE) facility on the Ma'alo site to manage LFG. This facility would beneficially use the methane generated in the Ma'alo MSWLF for electricity production, combining methane destruction with green power generation, with both activities mitigating the impacts of GHGs released into the atmosphere. Methane combustion for electricity generation rather than flares is generally found to be more efficient in eliminating GHG emissions. In addition, the beneficial use of GHG reduces the State’s GHG emissions.
through the generation of renewable “green power” which would replace power generated through traditional fossil fuel combustion methods.

4.1.3 Mitigation Measures

No mitigation measures are necessary or recommended.

4.2 AIR QUALITY

4.2.1 Affected Environment

The Hawai‘i DOH Clean Air Branch (CAB) established an air quality monitoring station on Hulemalu Road in the Niumalu residential subdivision of Līhu‘e. This is the only monitoring station on the island of Kaua‘i. The area is primarily commercial and residential with surrounding agricultural lands. The Niumalu monitoring station, which is in the vicinity of Nāwiliwili Harbor, measures sulfur dioxide gas (SO₂), nitrogen dioxide gas (NO₂), and particulate matter (PM2.5; particulate matter less than or equal to 2.5 microns in aerodynamic diameter). The most recent air quality data from the Niumalu monitoring station indicates that the federal National Ambient Air Quality Standards and the State Ambient Air Quality Standards are being met in the vicinity of the Nāwiliwili Harbor site, with annual trends remaining stable since 2012.

4.2.2 Potential Project Effects

Construction. A potential exists for short-term localized impacts on air quality during site construction activities with the operation of vehicles, heavy equipment, and generators at the project site. Fugitive dust and substantive construction related emission sources would be regulated stationary sources under HAR 11-60.1 and controlled in a manner that would not significantly impact air quality. These measures include ensuring that project staff and contractors properly maintain their internal combustion engines, the compacting and use of intermediate cover, use of portable and permanent litter fences along the working face of the landfill in relation to prevailing winds to confine windblown litter, and the use of maintenance personnel in the event of high winds to collect litter off site. Adjacent areas may be temporarily affected during the period of construction by dust and pollution. These impacts would be temporary and would cease when construction is completed.

Short-term impacts to air quality during construction would be mitigated via the following practices:

- Phasing construction to minimize dust-generating activities
- Minimizing the use of dust-generating materials and centralizing material transfer points and onsite vehicle travel ways
- Locating dusty equipment in areas of least impact
- Providing an adequate water source for dust control at the site prior to start-up of construction activities
- Landscaping bare areas, including slopes, starting from the initial grading phase
- Providing adequate dust control measures during weekends, after hours, and prior to daily start-up of earthwork

Operations. The natural incidence of trade winds helps to dissipate much of the localized odor that can be generated during the landfilling of MSW; however, high winds can also increase the incidence of litter, dust, and odors blowing from active working areas of the site. Landfill operation practices that minimize the working face of the landfill will minimize these effects, and good housekeeping measures will quickly address the effects of high winds. Fugitive dust would be controlled in accordance with HAR 11-60.1-33.
Air pollutant emissions associated with the generation of LFG would be subject to the requirements of the July 14, 2016 EPA issued final New Source Performance Standards, 40 CFR Part 60, to reduce emissions of methane-rich LFG from new, modified and reconstructed MSW landfills, updating standards that were issued in 1996. In a separate action, EPA also issued revised guidelines for reducing emissions from existing MSW landfills, updating the previous Emissions Guidelines, which also were issued in 1996. Both actions are part of the President’s Climate Action Plan: Strategy to Reduce Methane Emissions. (Section 4.1 discusses the County’s efforts to reduce and capture methane and other greenhouse gases produced from the proposed MSWLF).

Emissions from MSWLF related equipment and electrical generators would be regulated sources. Potentially substantive sources of air emissions would include: the use of internal combustion powered equipment and vehicles associated with landfill operations, e.g., bulldozers, trucks, stationary generators, etc.; a landfill gas flare used for the destruction of LFG generated as a result of the decomposition of organic matter; and the possible use of rock crushing equipment which may be utilized for on-site fabrication of cover material. The use of vehicles would be subject to regulation under existing Federal, State and County laws for the operation of motor vehicles including the use of mufflers and catalytic convertors for the control of air emissions. Stationary sources such as generators, landfill gas flares, and rock crushing equipment would also be subject to regulation under the Environmental Protection Agency (EPA), Title V, Clean Air Act, and as delegated to the Hawai‘i Department of Health. The permit would require that air emissions be monitored as appropriate. For these reasons, no significant impacts to air quality would occur.

For any future RRP, fugitive dust air emissions would be associated with public vehicle traffic and onsite traffic when moving collection bins. The grinding, crushing, and shredding of materials at the RRP (e.g., metals, C&D materials, used tires) would create air emissions including dust/particulates. The potential for odors would exist but would be controlled by allowing only a minimal amount of putrescible waste to be collected at this location. Fugitive dust requiring control by use of water spraying for dust suppression may also result from mobile equipment and truck traffic. Other forms of air emissions requiring control would ultimately depend on the type of recycling or recovery process that is utilized.

4.2.3 Mitigation Measures

No mitigation measures are necessary or recommended.

4.3 GEOLOGY, TOPOGRAPHY, AND SOILS

4.3.1 Affected Environment

Geologic Setting. Kaua‘i is the fourth largest of the eight major islands of the Hawaiian Archipelago. It lies near the northwest end of the group of the main Hawaiian islands, between latitudes 21°52' and 22°14' north, and longitudes 159°17' and 159°48' west. Kaua‘i is separated from the island of O‘ahu to the southeast by the Kaua‘i Channel, 72 miles wide at its narrowest and up to approximately 10,000 ft deep. To the west, Kaua‘i is separated from the island of Ni‘ihau by the Kaulakahi Channel, 18 miles wide and nearly 2,500 ft deep (Wentworth 1939). Kaua‘i is nearly circular, with a maximum distance of 33 miles east-to-west and 25 miles north-to-south, a perimeter of 94 miles, and an area of approximately 562 square miles. The central mountain massif rises to an altitude of 5,243 ft above sea level at Kawaikini Peak, and 5,148 ft at Mount Wai‘ale‘ale, 1 mile to the north.

Kaua‘i was formed by layered basalt flows erupted from a central shield volcano beginning approximately 5.1 million years (my) ago, and is oldest and most structurally complex of the major Hawaiian Islands. The shield lava flows, the Waimea Canyon Basalts, have been subdivided into four members, the Nāpali, Olokele, Makaweli, and Hā‘upu. The tholeiitic basalts of the Nāpali Member are the oldest and most widespread geologic formation on Kaua‘i. About 3.5 my ago, part of the original central shield volcano cone collapsed to the east, creating the Līhu‘e Depression (or Līhu‘e Basin).
The Līhu'e Basin, a large (~110 km2) semicircular depression bounded by steep cliffs, dominates the topography of eastern Kaua‘i. The basin ranges from the Wa‘iale‘ale massif on the west to the Kālepa and Nonou ridges on the east.

Between approximately 1.5 my and 0.5 my ago, the Nāpali basalts, which formed the base and walls of the Līhu'e Basin and crop out on the surrounding ridges, were covered by the Kōloa Volcanics, which consist of basaltic lava flows, cinder cones, a small shield volcano, and numerous dikes (Reiners et al. 1999). Before volcanic activity resumed with eruption of the Kōloa Volcanics, the shield lavas (Nāpali formation) were displaced by structural collapse and deeply eroded. The resulting structural depressions and stream channels were later filled with the Kōloa Volcanics. The Kōloa volcanic rocks are much less permeable than the Nāpali formation because they were deposited as nearly flat layers, in contrast to the moderately dipping Nāpali lava beds. Flat layers tend to be massive and devoid of permeability elements, whereas sloped lava beds tend to be highly fractured and frequently separated by permeable rubble beds between flows (Mink and Lau 1992).

The western portion of the proposed MSWLF site is mapped as lava flows of the Kōloa Volcanics, while the eastern portion of the site is mapped as Older Alluvium, consisting of consolidated sand and gravel deposits (Sherrod et. al. 2007). Kālepa Ridge, located immediately east of the site, consists of Nāpali basalts deposited during the early shield-building stage of the island.

**Topographical Setting.** The MSWLF site topography ranges from approximately 280 to 360 ft above sea level. The Ma'alo site consists mostly of former sugarcane land presently in use for pasturage, and is generally hummocky, covered with clumps of tall grasses such as California grass, with few trees. The overall site slopes gently to the south, with a low saddle running north and south through the approximate middle of the site.

An active irrigation ditch (trampled by cattle) is present toward the middle of the northernmost extent of the proposed MSWLF site. Just north of the proposed northern boundary, the primary flow in an offsite irrigation ditch makes a 90-degree turn to the west, although a small portion of that flow continues southward into the site, partially filling an irrigation ditch approximately one-fifth of the way into the site. During a 2012 site reconnaissance conducted for the Siting Study/ EA/EISPN there was no obvious sign of surface flow in the vicinity of this ditch, and no vegetation characteristic of wetlands was noted. This ditch from the north also defines (and lies just outside of) the proposed northwest border of the MSWLF site.

Standing water, artificially fed by irrigation piping, was observed just outside the site’s west boundary, but was not observed during other events. Another area with a small amount of surface water fed by irrigation piping was observed midway along the eastern border a relatively short distance inside the proposed landfill boundary. The vegetation at the edge of the wet area matched that of the surrounding grasslands.

Consultation with the USACE to determine whether any of the onsite irrigation features might be considered jurisdictional wetlands or considered “waters of the U.S.” under jurisdiction of USACE is documented in Section 4.4 and Section 4.6.

**Soil Setting.** Soil information for the project site was obtained from the *Soil Survey of Islands of Kaua‘i, O‘ahu, Maui, Moloka‘i and Lāna‘i, State of Hawai‘i*, as prepared by the United States Department of Agriculture (USDA) (USDA NRCS 1972).

Generally, two soil associations are found at the proposed MSWLF and future RRP site:

- The Līhu‘e-Puhi association consists of deep, nearly level to steep, well-drained soils that have a fine textured or moderately fine textured subsoil on uplands.
- The Rough Mountainous Land-Rough Broken Land-Rock Outcrop association consists of well-drained to excessively drained, very steep to precipitous lands of mountains and gulches.
The following soil types are found at the proposed MSWLF and future RRP site (see Figure 4-1):

- **Līhu'e silty clay, 0–8 percent slopes (LhB), Līhu'e Series**: found on the tops of broad interfluvies in the uplands. In a representative profile the surface layer is dusky-red silty clay approximately 12 inches thick. The subsoil, more than 48 inches thick, is dark-red and dark reddish-brown, compact silty clay that has subangular blocky structure. The substratum is soft, weathered rock. Permeability is moderately rapid, run-off is slow, and the erosion hazard is slight.

- **Līhu'e silty clay, 8–15 percent slopes (LhC), Līhu'e Series**: well-drained soils located on the uplands. Run-off is slow, and the erosion hazard is slight.

- **Nonopahu clay, 2–10 percent slopes (NnC), Nonopahu Series**: moderately well drained soils on uplands. They are gently sloping to moderately sloping. In a representative profile the surface layer is dark grayish-brown clay approximately 17 inches thick. The next layer is approximately 48 inches thick, is brown or grayish-brown clay and silty clay that has angular blocky and subangular blocky structure. Permeability is moderately slow, run-off is medium, and the erosion hazard is moderate.

- **Ioleau silty clay loam, 2–6 percent slopes (IoB), Ioleau Series**: well-drained soils on uplands. The profile is like that of Ioleau silty clay loam, 6–12 percent slopes, except that it is 10–20 inches deeper to the compact layer. Run-off is slow, and the erosion hazard is slight.

- **Līhu'e gravelly silty clay, 0–8 percent slopes (LIB), Līhu'e Series**: similar to Līhu'e silty clay, 0–8 percent slopes, except that it contains ironstone-gibbsite pebbles and has brighter color in the B horizon.

- **Kalapa silty clay, 20–40 percent slopes (KdE), Kalapa Series**: well-drained soils at the base of slopes. Run-off is rapid, and the erosion hazard is severe.

- **Līhu'e gravelly silty clay, 8–15 percent slopes (LIC), Līhu'e Series**: features slow run-off, and the erosion hazard is slight.

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In 2012, the report *Preliminary Geotechnical Investigation, Kaua‘i Landfill Siting EIS, Ma‘alo Site, Island of Kaua‘i, Hawai‘i* was completed by Masa Fujioka & Associates to investigate the geotechnical and groundwater conditions of the proposed MSWLF site (MFA 2012; Appendix B in Appendix D). The site exploration included advancing and logging six soil borings selectively located throughout the 270-acre Ma‘alo site, and collection and geotechnical analysis of soil samples.
Figure 4-1: Ma'alo Soils
Laboratory testing included soil classification tests, compaction tests, and moisture-density relationships. Based on the borings and laboratory results, the predominant foundation soils on site are residual silts and clays. The Geotechnical Investigation Data Report summarizes the subsurface conditions at the Ma'alo site as follows:

"Site topography, geology, and soils generally conform to the published information, except that MFA did not encounter any granular soils."

"All 6 borings encountered residual soil overlying saprolite. In most borings, saprolite was encountered at depths of approximately 4-5 feet below ground surface (bgs), except B2, in which the residual soil persisted to about 7.5 feet bgs. Topsoil was encountered only in boings B1 (approx. 6 inches thick) and B2 (approx. 2 feet thick). Soils were mostly stiff or hard, but much of the saprolite encountered was brittle (broke apart easily with pressure). Basalt rock was encountered in the western three borings: hard basalt at 39 feet bgs in B1; hard basalt at 40 feet bgs in B3, and weathered basalt at 50.5 feet bgs in B4."

"Perched groundwater was encountered in all borings at depths between 14 and 38 feet bgs. Boring B3 [total depth 41.5 ft] was left open for 24 hours to allow the water level to stabilize. The water level in B3 was measured at a depth of 15.7 feet bgs on May 16, 2012."

### 4.3.2 Potential Project Effects

The proposed project would involve development of an approximately 270-acre parcel for the construction of the Ma'alo MSWLF site and future RRP.

**Construction.** The potential impacts to geology, topography and soils of the Ma'alo MSWLF site are expected to involve changes to the landforms and the underlying soils and topography of the site. The topography of the project site would require alteration for construction of a MSWLF and site infrastructure including the administrative building, accessory buildings, scale and scale house, access roads, and other related facilities. The majority of impacts to the topography in the proposed study area would be direct impacts associated with clearing, grading, and filling operations during the initial construction of the landfill.

From a geotechnical standpoint, the project site was considered suitable for construction of the proposed landfill. Excavated site soils would likely be suitable for use as daily/intermediate cover, topsoil, a rooting-zone layer, and sideslope diversion berms and may also be suitable for use as a low-permeability compacted soil layer. Top slopes are designed to be sloped at 5% (20:1 H:V); sideslopes of both final and intermediate covers (e.g., for each phase) are designed to be sloped at a ratio of 3.5:1 (H:V). The final cover system, waste mass, and base liner system of the proposed Ma'alo MSWLF are expected to remain stable under a seismic event of 0.10g. Based on in situ soil material properties at the site, including the lack of sandy soil, liquefaction is not expected. Construction and operation of the proposed MSWLF would require acquisition of soil from both on- and offsite sources. Offsite sources of suitable soil may need to be identified by the County.

Potential adverse effects would be avoided with following requirements:

- Preparing updates to studies, or conducting additional studies as needed, to maintain the soils and geologic stability of the site as required by the County DPW, the State DOH, and other regulatory agencies as required by law

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5 The United States Geological Survey (USGS) defines "g" as the factor of Earth’s acceleration of gravity 9.8 (m/s2) or the strength of the gravitational field (N/kg). When there is an earthquake, the forces caused by the shaking can be measured as a percentage of gravity, or percent “g”.
• Modifying the final design based on maintaining the stability of all cut slopes and review by registered professionals during construction
• Excavating all slopes to meet required factors of safety
• Performing all work in accordance with OSHA requirements

During the permit review and while construction is in progress, the DOH engineers and staff are expected to review all aspects of the proposed project.

**Operations.** Throughout the life of the proposed project, soil and geologic integrity of the area of use would be maintained, and remain in compliance with the regulatory requirements of the Solid Waste Management Permit. All grading, excavation, and other construction activities required for the proposed project would be in accordance with County and State regulatory requirements.

Adverse direct, secondary, and cumulative impacts to geology, topography, or soils are not expected with the design and operating requirements in the State Solid Waste Management Permit.

### 4.3.3 Mitigation Measures

No mitigation measures are necessary or recommended.

**4.4 Surface Water Resources**

#### 4.4.1 Affected Environment

The island of Kaua‘i is the wettest and most weathered of the Hawaiian Islands, and possesses a relatively high number of freshwater wetlands. More than 40 major streams and numerous tributaries are present on the island.

The existing proposed MSWLF site is principally used for agriculture and grazing, and is relatively undeveloped. Surface water resources near the Ma’alo parcel include the Ai‘i Reservoir, located approximately 1.4 miles west; the Kapaia Reservoir, located approximately 2.3 miles west; the Pukaki Reservoir, located approximately 1.6 miles to the southwest; the Okinawa Reservoir, located approximately 0.5 miles southwest; an unnamed reservoir located approximately 0.6 miles north; the South Fork of the Wailua River, which runs roughly parallel to and approximately 0.5 miles from the north and northwest boundary of the Ma’alo parcel; and the Hanamā‘ulu Stream, located approximately 0.6 miles southwest (Figure 4-2).

No streams classified as perennial or intermittent, no lakes, and no reservoirs are contained within the proposed project boundaries containing the MSWLF site. However, the United States Fish & Wildlife Service (USFWS) National Wetlands Inventory (NWI) database mapped several ditches and swales in and around the Ma’alo site (USFWS 2011). In addition, standing water was observed in and around the Ma’alo site during site reconnaissance for the 2012 Siting Study (AECOM 2012). To determine whether any of the onsite irrigation features or standing water might be considered jurisdictional wetlands or "waters of the U.S." under jurisdiction of United States Army Corps of Engineers (USACE), a Jurisdictional Determination was requested to ascertain the potential for adverse impacts. In a letter dated March 15, 2013, the USACE responded that,

“Based on our review of the information you furnished, staff site visits to the proposed project location, and other resources available to our office, we have determined that your proposed project site does not contain waters of the U.S., nor any adjacent wetlands. Therefore, the proposed project site is not subject to Section 10 of the Rivers and Harbors Act of 1899 or Section 404 of the Clean Water Act, and any structure, work, or discharge of fill material does not require a Department of the Army permit.” (USACE, File No. POH-2012-00066, 3/15/13; USACE 2013).
Figure 4-2: Surface Water in the Project Vicinity
4.4.2 Potential Project Effects

**Construction.** The potential for direct adverse effects to surface waters are not expected from the construction of the proposed project, as there are no perennial or intermittent streams located within the proposed MSWLF footprint. However, there is the potential for short-term construction related impacts resulting from the discharge of sediments and turbidity in construction stormwater run-off. Construction activities would include excavation and grading to achieve proper elevations and grades of the site for the MSWLF. Because planned improvements would result in more than 1 acre of ground disturbance during construction, project activities would be subject to a NPDES Notice of Intent (NOI) Form C for Storm Water Discharges Associated with Construction Activity from the DOH Clean Water Branch (CWB). This application requires the implementation of BMPs including site management measures and physical controls (e.g., diversion berms, silt fences, detention ponds, and management and vegetative controls) to reduce pollutants in stormwater run-off.

The project would comply with HAR, Chapter 54, *Water Quality Standards*; HAR, Chapter 55, *Water Pollution Control*; and the County of Kaua‘i grading and erosion control standards and BMPs *(Sediment and Erosion Control Ordinance No. 808; Interim Construction BMPs for Sediment and Erosion Control for the County of Kaua‘i, 2004)*. Measures and BMPs would include the following:

- **General BMPs:** Construction near drainageways shall be limited to avoid the potential for release of sediments into stormwater.
- **Before Construction:** Existing groundcover shall not be destroyed, removed, or disturbed more than 20 calendar days prior to the start of construction. Erosion and sediment control measures shall be in place and functional before earthwork begins, and shall be maintained throughout the construction period. Temporary measures may be removed at the beginning of the work day, but shall be replaced at the end of the work day.
- **During Construction:** Clearing shall be held to the minimum necessary for grading, equipment operation, and site work. Construction shall be sequenced to minimize the exposure time of cleared surface areas. Areas of one phase shall be stabilized before another phase can be initiated. Stabilization shall be accomplished by protecting areas of disturbed soils from rainfall and run-off by use of structural controls such as polyvinyl chloride sheets, geotextile filter fabric, berms or sediment basins, or vegetative controls such as grass seedling or hydromulch.
- **Temporary soil stabilization with appropriate vegetation shall be applied on areas that remain unfinished for more than 30 calendar days, and permanent soil stabilization using vegetative controls shall be applied as soon as practicable after final grading.**
- **All control measures shall be checked and repaired as necessary, e.g., weekly in dry periods and within 24 hours after any heavy rainfall event. During periods of prolonged rainfall, daily checking shall be conducted.**
- **After Construction:** All areas of ground disturbance shall be stabilized with landscaping consisting of planted vegetation and groundcover.
- **During Adverse Weather Conditions:** The contractor shall monitor weather reports daily during the work period. If an emergency weather warning is issued, work shall cease. All equipment and materials shall be secured against wind, rainfall and flooding, and the work area cleared of construction debris to the extent practicable. Work shall not resume until conditions improve and weather warnings are lifted.
- **Prior to recommencement of work following the weather warning, the Contractor shall inspect all BMPs, including silt fencing, sandbag barriers, and the stabilized construction entrance, to repair or replace any materials as required to maintain proper functioning.**
- **Construction materials and debris that are dispersed due to wind or rainfall shall be collected by the Contractor, as practicable, for reuse or disposal in compliance with State and County regulations.**
• Facility and site stormwater management features may include the use of detention and infiltration basins and ditches, berms, downdrains, and other related control features.

**Operations.** No significant effects from MSWLF operations on surface water resources would occur. The following requirements will prevent potential adverse impacts to surface water resources:

• Installing a surface water management system to control run-off from areas upslope as well as within the proposed project site. An engineered drainage control system would be developed for the MSWLF to manage rainfall, run-on, and run-off. The design and construction of the system would be in accordance with the requirements of the County of Kaua‘i drainage and erosion control standards and the DOH SHWB, as part of the County’s application for the Solid Waste Permit. This may include the use of soil stabilization berms, drainage channels, detention and infiltration basins, and other features as required to prevent run-on and run-off, and to promote drainage while maintaining site stability. The future RRP’s integrated center drop-off area would be on a paved surface or pad with proper site drainage for stormwater collection and management, to minimize potential effects to groundwater. A roof or canopy over the various drop-off bins would protect the materials from inclement weather and minimize any potential contamination.

• Designing and analyzing the final design to confirm that the surface water management system would be capable of handling the design flow rates, and to ensure that post-development peak flow rates to offsite areas would not exceed pre-development peak flow rates during the design storms, while ensuring that surface water basins would discharge within 48 hours.

• Including the regulatory requirements of the County of Kaua‘i and the State of Hawai‘i in the basis of design for the surface water management system.

• Employing operational practices including the use of BMPs and monitoring to maintain control of surface water run-off and prevent the comingling of run-off with potential non-storm-water discharges.

• Installing a leachate management system based on the use of preventative measures to mitigate against the opportunity for a leachate-contaminated groundwater plume to discharge into surface water resources, as identified in Section 4.5.

Because the new MSWLF facilities would provide a long term solution to the solid waste disposal requirements of the County, the potential for secondary and cumulative impacts to surface water resources are not expected. The proposed practices, procedures and measures provided in this EIS have been designed to maintain the use of the site until the exhaustion of airspace or possibly at such time that new technologies or methods for the handling of MSW are developed that would eliminate the need for a landfill. Long term monitoring and inspection of the site by the EPA will be further provided through a required post closure plan for not less than 30 years following the closure of the site.

4.4.3 Mitigation Measures

No mitigation measures are necessary or recommended.

4.5 GROUNDWATER AND HYDROLOGY

4.5.1 Affected Environment

Rainfall is the source of all fresh water on Kaua‘i. Some of the rainfall runs off directly to the sea via surface flow or streams, some escapes into the atmosphere by evaporation and transpiration, and some percolates downward through soils and rocks, eventually becoming groundwater. The complex geology of Kaua‘i and the wide range of permeability in the volcanic rocks are not favorable for the formation of large, well-developed aquifers such as those present on O‘ahu and Maui. Throughout most of Kaua‘i, rocks above and below sea level are thick-bedded, massive, and dense, with relatively
low permeability. The lava beds are typically cut by dikes or other structures that restrict groundwater flow, and thus prevent the formation of extensive fresh water lenses.

Under the State of Hawai‘i’s Underground Injection Control (UIC) program, the Hawai‘i Department of Health (DOH) has delineated inland (mauka) areas on Kaua‘i where underground injection wells are prohibited to protect potable groundwater sources, and seaward (makai) areas where injection wells are allowed by permit (Figure 4-3). These areas are delineated and separated by a UIC line (DOH 1992). Groundwater resources located inland of the UIC line are generally considered current or potential drinking water sources. Areas seaward of the UIC line are not considered potential drinking water sources due to the potential for contamination from injection wells and seawater intrusion. The proposed landfill site lies inland of the UIC Line; therefore, the State of Hawai‘i has designated groundwater beneath the site as a potential drinking water source.

The State of Hawai‘i has further classified Kaua‘i groundwater resources based on the criteria of location, hydrology, geology, potential for development, utility, water quality, uniqueness, and vulnerability to contamination (Mink and Lau 1992). The state classification criteria and groundwater designations are identified by unique Aquifer and Status Codes, and follow EPA Groundwater Protection Guidelines (EPA 1988). The DOH considers the state groundwater classifications when developing cleanup goals for environmental sites addressed under its Hazard Evaluation and Emergency Response (HEER) program and underground storage tank (UST) program.

According to the Aquifer Identification and Classification for Kaua‘i: Groundwater Protection Strategy for Hawai‘i (Mink and Lau 1992), the proposed MSWLF site is located in the Hanamā‘ulu System of the Līhu‘e Aquifer Sector (Figure 4-4). Groundwater in the Hanamā‘ulu System occurs within two types of aquifer:

- Unconfined groundwater within horizontally extensive lavas, e.g., the younger Koloa Volcanics.
- Confined groundwater in dike compartments, e.g., within the older Waimea Canyon Basalts.

Mink and Lau classify both aquifers as potential sources of drinking water, with chloride concentrations less than 250 mg/L. The unconfined groundwater is considered highly vulnerable to contamination, while the confined groundwater is considered moderately vulnerable to contamination.

As evidenced by groundwater levels measured in wells installed before 1960, confined groundwater occurs in the lava flows of the Nāpali formation in Kālepa ridge (east of the site), in most of Hā‘upu Ridge (south of the site), and probably in Nonou Ridge (north of the site). The confined conditions are most likely due to the impounding effect of the Kōloa Volcanic lava flows that surround the ridge. Dikes divide the aquifer into discrete compartments; however, the available geologic and hydrogeologic data are not sufficient to estimate the size of the compartments or their water-bearing capacities. A significant increase in chloride content is typically observed when the hydraulic head decreases by more than 3 ft, indicating that seawater intrusion would likely limit the quantity of potable groundwater that could be obtained from the aquifer. No large springs that would indicate favorable potential for development of high-level groundwater in the Nāpali formation surrounding the Līhu‘e Basin have been identified. Although groundwater is discharged from small springs and streams that drain the high west wall of the basin, the confined, compartmentalized groundwater that occurs within the Nāpali volcanics surrounding the basin would be difficult to develop as a potable water source.
Figure 4-3: Underground Injection Control (UIC) Line in the Project Vicinity
Wells drilled to sea level in the southern Līhu’e Basin (south of the proposed MSWLF site), including well numbers 5822-02, 5824-06, 5824-09, and 5923-01, had water levels ranging from 190 to 360 ft above mean sea level (msl) (USGS 1998). Although water levels in these wells remained hundreds of feet above sea level, most wells showed water-level declines of a few feet as they were deepened. Water levels in other wells screened in the Kōloa Volcanics declined by as much as 200 ft during drilling. In 2012, Masa Fujioka and Associates advanced six borings for a geotechnical investigation of the proposed MSWLF site. Perched groundwater was encountered in all six borings at depths ranging between 14 and 38 feet bgs (MFA 2012). These observations, i.e., distinct differences in water levels between wells screened at similar depths in the same formation, indicate that, like the Nāpali Volcanics, the Kōloa Volcanics are cut by numerous dikes and other low-permeability units (e.g., pyroclastic deposits) that restrict flow between groundwater compartments. These structural features, combined with the overall low permeability of the Kōloa volcanic rocks, limit the potential for development of groundwater in the Līhu’e Basin as a significant source of drinking water. Groundwater levels are highly variable and well yields are typically quite low, although the water is fresh. This is also the area where the USGS drilled a number of "monitor" wells, none of which were of a yield that warranted development into a production well (personal communication between T.Nance of TNWR and L.Tabata, County of Kaua‘i, October 2017).

The Grove Farm Waiahi surface water treatment plant (SWTP), located above Hanamā‘ulu at the Kāpaia Reservoir (Figure 4-2), supplies most of the drinking water for Līhu’e and eastern Kaua‘i. Groundwater within the Līhu’e Basin at and near the proposed landfill site is not likely to be used for potable water supply because the SWTP and other large sources of potable surface water and
groundwater are available, and groundwater in the basin area surrounding the proposed landfill site would be difficult to develop as a drinking water source. Furthermore, the County of Kaua‘i Department of Water (DOW) has reviewed the location of the proposed MSWLF site to determine whether there are any current water supply wells or any planned development of well sites near the proposed landfill site. A DOW representative reported that there are no active wells within 1,000 feet of the proposed landfill site, and that the DOW does not plan to develop any wells at or near the site (Eddy 2011). The 1,000 feet distance from drinking water sources is a regulatory requirement of the DOH (HAR, Chapter 11-62, Wastewater Systems) to help protect potable water resources.

4.5.2 Potential Project Effects

Construction. A preliminary evaluation of geotechnical and groundwater conditions analyzed six boring samples selectively collected from across the 270-acre Ma'alo site in 2012 for soils classification, compaction, and moisture-density (AECOM 2016; Appendix D). The results of the analyses indicated that the site was considered suitable for construction of a landfill; existing site soils that would be subject to excavation were shown to be sufficient for use as daily/intermediate cover, topsoil, and a rooting-zone layer. The analysis indicated the use of sideslope diversion berms could also be suitable for use as a low-permeability compacted soil layer, pending further analysis during the design phase of work.

Construction of the subbase grades for the proposed MSWLF are proposed to be 10 ft below and roughly parallel to the current topography and drainage features of the property: base grades for Phases 1 and 2 slope from a high point on the east to a low point on the west, and Phases 3 and 4 slope from a high point on the west to a low point on the east. This orientation of subbase grades was chosen to minimize land disturbance during each phase’s operation and to provide groundwater separation based on current (limited) groundwater information.

Geotechnical design of the MSWLF includes an evaluation of structural criteria to ensure long-term stability and protection of the landfill base liner system, sideslopes, and LFG extraction and leachate management systems. An important function of the leachate management system is to avoid any releases of landfill associated leachate from the liner. Impacts may occur with the inadvertent or accidental release of leachate. The release of hazardous and nonhazardous components of leachate could render an aquifer unusable for drinking water and other uses. Leachate impacts to groundwater may also present a danger to aquatic species and the environment if a leachate-contaminated groundwater plume discharges to streams. Once leachate is formed and is released to the groundwater environment, it will migrate through the unsaturated zone (the portion of the subsurface above the groundwater table) until it eventually reaches the saturated zone (a zone underlying the unsaturated zone in which all the pores and rock fractures are filled with water). Because groundwater generally moves slowly, contamination often remains undetected for long periods of time. Furthermore, remediation of a contaminated site is difficult and costly. Therefore, prevention is the most important safeguard that can be employed at a RCRA Subtitle D landfill.

The development of the proposed MSWLF would also be subject to regulatory coordination with the DOH SDWB, SHWB, and County DOW to identify and develop appropriate measures to maintain protection of groundwater resources within the UIC zone. This would include development of a Groundwater Monitoring Plan in accordance with HAR §11-58.1-16, 40 CFR 258 Subpart E, and the State of Hawai‘i Landfill Groundwater Monitoring Guidance Document (DOH 2002). The monitoring plan would be submitted and approved by the DOH prior to site operation and would require a semi-annual groundwater detection monitoring program for compliance with applicable regulations. In general, groundwater monitoring wells would be initially installed around the landfill perimeter in upgradient, cross gradient, and downgradient locations. New groundwater wells may need to be constructed over the landfill life as new cells are brought into operation. Prior to opening of the landfill for acceptance of MSW, a 2-year quarterly background monitoring program would be conducted to establish background groundwater conditions. A statistical evaluation approach would then be used to
detect for the presence of volatile organic compounds and statistically significant increases in concentrations of leachate indicator parameters.

Based on the consideration of geotechnical, groundwater, and groundwater monitoring proposed during construction and prior to operation of the MSWLF, detrimental effects to soils stability and groundwater resources are not expected.

**Operations.** Modern engineered base liner and leachate management systems would be constructed to prevent water quality impacts, and groundwater monitoring would be conducted to ensure that groundwater is not impacted by landfill operations. Therefore, detrimental effects to water quality are not expected.

The proposed MSWLF base liner elevations would range from approximately 270 to 307 ft msl, a minimum of 10 ft above groundwater elevations reported in the perched water encountered in borings advanced at the site (MFA 2012; see Section 2.2.2.1). The construction and operational use of the new MSWLF on the Ma'alo parcel would consist of an impermeable base liner to impede landfill leachate from impacting the groundwater aquifer beneath the landfill. Modern landfills are well-engineered facilities that include the use of a multi-layer landfill liner system to ensure that leachate will not penetrate and adversely affect the underlying groundwater aquifer. To provide sufficient protection to safeguard the underlying aquifer, the County has selected the proposed nine part base liner system which includes a double liner system, with each liner incorporating a 60-mil HDPE geomembrane and GCL liner. It will be composed of multiple layers, including geosynthetic high-density geosynthetic plastic, bentonite, and crushed rock (to cushion and protect the plastic layer). This robust liner system is expected to remain functional throughout the active life of the landfill, including the post-closure period after the landfill stops accepting waste. The liner system planned for the proposed MSWLF will be evaluated and approved by the EPA and State DOH prior to use.

A leachate management system would collect and monitor the generation of leachate. The monitoring of leachate in combination with the monitoring of other landfill controls would measure landfill performance and allow the County and operator to make periodic improvements to maintain the efficiency and safety of the facility. Leachate monitoring during landfill operation would likely be conducted on at least an annual basis to develop a database of potential source information and to evaluate the suitability of site monitoring parameters. Groundwater monitoring during landfill operation would likely be conducted at least semi-annually. Each monitoring event would consist of the sampling of each well and measuring groundwater levels to determine groundwater flow direction and hydraulic gradient. Groundwater and leachate analytical results would be summarized in reports that would regularly be submitted to the DOH for their review.

Other required measures implemented as part of the proposed project to maintain the protection of groundwater resources within the UIC zone, would include the following:

- The site surface drainage system would be designed to control surface water flows in order to limit percolation of stormwater through the landfill liner system. This would serve to reduce the generation of leachate and minimize infiltration of rainfall into the waste mass.
- The development of the proposed MSWLF and future RRP would be subject to regulatory coordination with the DOH SDWB, SHWB, and County DOW to identify and develop appropriate measures to maintain protection of groundwater resources within the UIC zone.

The proposed landfill design and operational measures will minimize the potential for impacts to groundwater quality beneath the site. The proposed landfill design includes a multi base liner and leachate management system beneath the entire footprint of the landfill. Together with the proposed stormwater management and moderate-permeability soils on-site, the probability of a landfill release (or leak) occurring and impacting groundwater is highly unlikely. Moreover, in the unlikely event of such an occurrence, monitoring of the leachate collection systems and the groundwater beneath the landfill along with the groundwater monitoring well network around the perimeter of the landfill will allow...
for detection of such a release before it could leave the landfill property. Once detected, the source of the release could be identified and repaired, while the area of impact within the site could be remediated.

### 4.5.3 Mitigation Measures

No mitigation measures are necessary or recommended.

### 4.6 WETLANDS

#### 4.6.1 Affected Environment

The USACE and EPA define wetlands as “…areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands generally include swamps, marshes, bogs, and similar areas. The USACE evaluates three indicators of wetlands when making wetland determinations: vegetation, soil, and hydrology. All three characteristics must be present during some portion of the growing season for an area to be a wetland. If the area occurs in a flood plain or otherwise has low spots in which water stands at or above the soil surface during the growing season, then it meets the criteria for wetland hydrology.

As part of the 2012 Siting Study (AECOM 2012; Appendix B), a preliminary investigation of the project site was undertaken to identify potential resources relative to the three wetland indicators using the USFWS NWI, followed by site reconnaissance. Because the NWI mapped several former and current irrigation ditches on the proposed MSWLF site as potential wetlands, the USACE was consulted. As detailed in Section 4.4 and Section 4.6, according to the USACE, no jurisdictional wetlands exist on the proposed MSWLF and future RRP site, and the proposed project is not subject to Section 10 of the Rivers and Harbors Act of 1899 or Section 404 of the Clean Water Act (USACE, File No. POH-2012-00066, 3/15/13; USACE 2013).

A wetland is located southwest of the proposed MSWLF site border, near the terminus of the offsite Hanamā‘ulu Stream. The NWI labels the wetland as “Freshwater Emergent Wetland,” with a classification of PEM1C (see Figure 4-5), which is defined as follows (USFWS 2011):

- **P** System – Palustrine: The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean derived salts is below 0.5 part per thousand (ppt). Wetlands lacking such vegetation are also included if they exhibit all of the following characteristics: (1) are less than 8 hectares (20 acres); (2) do not have an active wave-formed or bedrock shoreline feature; (3) have at low water a depth less than 2 meters (6.6 feet) in the deepest part of the basin; and (4) have a salinity due to ocean-derived salts of less than 0.5 ppt.

- **EM** Class – Emergent: Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.

- **1** Subclass – Persistent: Dominated by species that normally remains standing at least until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine systems.

- **C** Water Regime – Seasonally Flooded: Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.
Figure 4-5: USFWS-Designated Wetlands in the Project Vicinity
4.6.2 Potential Project Effects

**Construction.** A preliminary review of the proposed project site concluded that the project boundaries do not contain wetland resources as delineated by the USFWS NWI. This was confirmed by consultation with the USACE (see Section 4.4 and Section 4.6). Therefore, no adverse environmental impact to wetlands from the development of the proposed MSWLF site is expected.

**Operations.** No adverse environmental impacts to wetlands associated with the operation of the proposed MSWLF on the Ma'alō parcel are expected. With the required surface water and groundwater controls, no impacts to offsite wetlands are expected.

4.6.3 Mitigation Measures

No mitigation measures are necessary or recommended.

4.7 Acoustic Characteristics

4.7.1 Affected Environment

The general area of the project is predominantly used for agriculture. Noise receptors are few at the proposed location of the Ma'alō MSWLF. The closest residences to the MSWLF site are along Laukona Street and Kālepa Circle to the south at distances of approximately 1.05 miles away. The MSWLF site and majority of the proposed E3 access route is bounded by the Kālepa Ridge to the east and to the north, west and south much of the land and terrain consists of agricultural parcels.

The new access roadway designated E3 in this EIS would service the MSWLF. A portion of the access roadway would traverse past residences along north facing segments of Kālepa Circle and Laukona Street located in the Hanamā'ulu area, before it bends northward to the entry of the MSWLF. During operations of the landfill there is the concern that these areas could be affected from noise generated by refuse vehicular traffic using the E3 access route. The potential for noise impacts along the landfill access road was cited as an important concern during early community meetings.

The relationship of noise to the human environment is complex and technical. Noise is generally defined as unwanted sound that disrupts normal activities or that diminishes the quality of the environment. It is usually caused by human activity adding to the natural acoustic setting of a locale. Various descriptors are used to describe sound and noise levels. These include the day-night average sound levels (DNL) and percentile levels, A-weighted decibel scale (dBA), and sound level equivalents (Leq).

The descriptor currently used by U. S. Federal agencies to assess environmental noise is DNL (or Ldn). This descriptor incorporates a 24-hour average of instantaneous A-Weighted sound levels. The maximum A-Weighted sound level occurring while a noise source such as a heavy truck or aircraft is moving past a listener (i.e., the maximum sound level from a “single event”) is referred to as the “Lmax value.” This instantaneous sound level times the duration of the event is known as the "Sound Exposure Level", or Lse (Y. Ebisu & Associates 2018).

The DNL values represent the average noise during a typical 24-hour day of the year. DNL exposure levels of 55 or less are typical of quiet rural or suburban areas. DNL exposure levels of 55 to 65 are typical of urbanized areas with medium to high levels of activity and street traffic. DNL exposure levels above 65 are representative of densely developed urban areas and areas fronting high volume roadways. Sound levels which occur during the nighttime hours of 10:00 PM to 7:00 AM are increased by 10 decibels prior to computing the 24-hour average by the DNL descriptor. Because of the averaging used, DNL values in urbanized areas typically range between 50 and 75 DNL. In
comparison, the typical range of intermittent noise events may have maximum Sound Level Meter readings between 75 and 105 dBA (Y. Ebisu & Associates 2018).

In the State of Hawai‘i noise exposure is regulated in the following statutes and rules: HRS Chapter 342F – Noise Pollution, HAR Chapter 11-42 – Vehicular Noise Control for Oahu, HAR Chapter 11-46 – Community Noise Control, and HAR §12-200.1 – Occupational Noise Exposure. Maximum permissible sound levels for Class C zoning districts, including lands zoned agricultural and industrial, is 70 dBA 24-hours a day (HAR Chapter 11-46-4). Maximum permissible sound levels for Class A zoning districts including lands zoned residential is 55 dBA during daytime hours (7 a.m. to 10 p.m.) and 45 dBA during nighttime hours (10 p.m. to 7 a.m.) (HAR Chapter 11-46).

See also Sections 4.8 and 6.2 regarding the potential for noise impacts to flora and fauna, and avifauna resources.

4.7.2 Potential Project Effects

The 2018 Acoustic Study for the Municipal Solid Waste Landfill, Ma‘alo, Kaua‘i, Hawai‘i by Y. Ebisu & Associates (Appendix E) was undertaken by the County of Kaua‘i in response to community and resident concerns regarding the potential for noise impacts of the proposed MSWLF and landfill access road on the surrounding communities. The study assessed the future and potential noise impacts associated with the proposed project and if required, would provide recommendations for noise attenuation that could include the use of noise barrier or wall.

The study objectives included an assessment of (1) the possible noise impacts resulting from short term construction activities, (2) the potential for long term noise impacts from heavy equipment operations at the proposed MSWLF site, and (3) the potential noise impacts from future refuse vehicle traffic along the primary access road, E3.

A summary of the findings of the 2018 Acoustic Study for the Municipal Solid Waste Landfill is provided below.

**Short-term Construction Impacts.** Adverse noise impacts are not expected during the construction of the proposed project. Large buffer distances of approximately one mile to the nearest noise sensitive residences south of the proposed landfill site would reduce construction noise levels to the range of 33 to 48 dBA.

Much higher noise levels of 55 to 85 dBA are expected at residences along Kālepa Circle and Laukona Street during construction of the landfill access road. During roadway work along the landfill access road, construction noise levels are expected to be highest at existing residences along Kālepa Circle and range from 75 to 85 dBA. At existing residences along Laukona Street, construction noise levels during roadway work are predicted to range from 55 to 80 dBA. Adverse impacts from construction noise are not expected to be in the "public health and welfare" category due to the temporary nature of the work and administrative controls available for its regulation. These impacts to the acoustic environment would be temporary and localized, occurring only in the immediate vicinity of the roadway construction work site (Y. Ebisu & Associates 2018).

Completely reducing construction noise to inaudible levels will not be practical in all cases due to the intensity of the construction noise sources (75 to 85 dBA at 100 feet distance), and due to the outdoor nature of the work (excavation, grading, paving, etc.). Construction activities will be conducted in accordance with State of Hawai‘i requirements set forth in HRS Chapter 342F – Noise Pollution; HAR Chapter 11-42 – Vehicular Noise Control for Oahu, establishing noise level limits for light and heavy vehicles. This would include the use of properly muffled internal combustion engines to reduce noise from construction equipment and vehicles.
Severe noise impacts are not expected inside air conditioned structures which are beyond 100 to 500 feet from active project construction sites. Inside naturally ventilated structures, interior noise levels (with windows or doors opened) are estimated to range between 65 to 75 dBA at 100 feet and between 49 to 59 dBA at 500 feet distances from the construction site. All doors and windows facing the construction site are recommended to be closed during work hours if it is necessary to further reduce interior noise levels. This would result in a general noise reduction of an additional 5 to 10 dBA (Y. Ebisu & Associates 2018).

Construction activities are planned to take place during the normal work day with no night work planned. HAR, Chapter 11-46 – Community Noise Control, generally identifies these hours as between 7:00 am to 6:00 pm on weekdays, between 9:00 am and 6:00 pm on Saturdays, with Sundays and holidays not considered normal working days. The adherence to the construction noise limits and curfew times, applicable throughout the State, would further reduce the potential for adverse acoustic effects associated with the proposed project.

The Hawai‘i Occupational Safety and Health (HIOSH) Division has set the permissible occupational noise exposure at 90 dBA for a continuous 8-hour exposure. Permissible noise exposures for shorter periods are higher, with a maximum exposure of 115 dBA permissible for a duration of 15 minutes or less (HAR Chapter 12-200.1 – Occupational Noise Exposure). If workers experience noise exceeding HIOSH standards, administrative or engineering controls would be implemented. Use of personal protective equipment such as earplugs or muffs may also be required.

**Long-term MSWLF Operations Impacts.** The potential for noise impacts from the operation of equipment including bulldozers, compactors and dumptrucks at the Ma‘alo MSWLF are expected to be minimal due to distances of approximately one to two miles serving as a buffer between the operating landfill equipment and the closest residences along Laukona Street and surrounding residential streets. Because of the remote location of the proposed landfill site the landfill operations would be well below (by 22 to 23 DNL) current federal noise impact criteria and standards for environmental noise at the closest existing residences, with very low potential noise levels of 33 dBA at the closest existing residences. This is well below the State of Hawai‘i maximum permissible sound level of 55 dBA for Class A zoning districts including lands zoned residential during daytime hours.

Landfill operating activities will be conducted in accordance with State of Hawai‘i requirements set forth in HRS Chapter 342F – Noise Pollution; HAR Chapter 11-42 – Vehicular Noise Control for Oahu, establishing noise level limits for light and heavy vehicles. This would include the use of properly muffled internal combustion engines to reduce noise from landfill operating equipment and vehicles.

MSWLF operations are planned to take place during the normal work day with no night work planned. HAR, Chapter 11-46 – Community Noise Control, generally identifies these hours as between 7:00 am to 6:00 pm on weekdays, between 9:00 am and 6:00 pm on Saturdays, with Sundays and holidays not considered normal working days.

**Long-term Access Roadway Impacts.** The potential for noise impacts from the operation of the landfill access roadway are expected to be minimal due to adequate setback distances of sensitive receptors from the landfill access road. However, the potential for noise impacts from refuse vehicles using the access road could be periodically noticed from some of the larger refuse trucks employing air brakes or the use of engine braking. Noise sensitive receptors that would experience the highest noise levels during operation of the access road are located along Kālepa Circle and Laukona Street due to their proximity to the future landfill access road.

To assess impacts associated with the operations of the access roadway refuse vehicle traffic noise levels were estimated along the primary access road, E3. Forecasts of refuse delivery vehicle traffic to and from the MSWLF were used to model noise levels along the primary landfill access road closest to existing residences.
Table 4-1 summarizes the expected truck traffic during operations of the proposed Ma'alo MSWLF based on landfill trip generation data from the Kekaha MSWLF. These data were used to project weekday AM peak, PM peak, and daily vehicle-trip totals to and from the proposed project site for both the Opening Year and the Future Long-Range Year conditions.

### Table 4-1: Ma'alo MSWLF Truck Trip Generation – Opening Year and Future Long-Range Year

<table>
<thead>
<tr>
<th>Project Component</th>
<th>Daily</th>
<th>Weekday AM Peak Hour</th>
<th>Weekday PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Inbound</td>
<td>Outbound</td>
</tr>
<tr>
<td>Landfill Trip Generation – Opening Year</td>
<td>220</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Landfill Trip Generation – Future Long-Range Year</td>
<td>270</td>
<td>19</td>
<td>18</td>
</tr>
</tbody>
</table>

Source: AECOM (2016, Tables 3 and 4); Appendix F

Along the landfill access road, which would service the proposed MSWLF site, noise levels were determined to not exceed 59.3 Leq(h), or average noise level at the closest existing residences during the peak traffic hour, and 48.3 DNL. These predicted refuse vehicle noise levels are 5 to 7 Leq(h) below the Federal Highway Administration and Hawai'i Department of Transportation noise mitigation thresholds; and 6 to 7 DNL below the most stringent federal criteria at the closest noise sensitive residences (DNL exposure levels of 55 or less are typical of quiet rural or suburban areas). These traffic noise levels attributable to the transit of refuse vehicles to and from the MSWLF are 5 to 7 dBA below current federal and local noise mitigation thresholds for motor vehicles traveling on roadways near noise sensitive receptors.

Based on the above, the risk of potential noise impacts from refuse vehicle traffic is considered to be very low at existing noise sensitive receptors because of adequate setback distances from the landfill access road. For these reasons, the use of sound attenuation measures along the proposed landfill access road near existing noise sensitive residences were determined not to be required (Y. Ebisu & Associates 2018).

### 4.7.3 Mitigation Measures

No negative adverse impacts to the acoustic environment associated with the construction and operation of the proposed MSWLF on the Ma'alo parcel and E3 access route are expected. Based on the 2018 Acoustic Study for the Municipal Solid Waste Landfill, Ma'alo, Kaua'i, Hawai'i by Y. Ebisu & Associates (Appendix E) noise impacts associated with the project were determined to be well below current federal and state noise impact criteria and standards for environmental noise at the closest existing residences.

While no significant adverse impacts to the acoustic environment are expected, the County of Kaua'i recognizes the concerns of the surrounding community regarding the new facility. To address any further concerns regarding noise the County intends to continue to work with the community as the project progresses and may propose the opportunity to participate in a Host Community Benefits (HCB) Program, to be implemented at the appropriate time. See Section 6.3.3.3 regarding the potential for use of HCB.

### 4.8 FLORA AND FAUNA

#### 4.8.1 Affected Environment

A biological survey of the site was conducted in April 2013 by AECOS Consultants (Appendix M). The purpose of the survey was to determine the presence of botanical, avian, or mammalian species currently listed as endangered, threatened, or proposed for listing under either the Federal or the State of Hawai'i’s endangered species programs on, or within the immediate vicinity of the site. The pasture lands immediately north and west of the proposed MSWLF site were surveyed by AECOS in previous
studies (AECOS 2011, David and Guinther 2009). Federal and State of Hawai‘i listed species status follows species identified in documents from the State of Hawai‘i Department of Land and Natural Resources (DLNR 1998), Federal Register 2005, and USFWS (2013). The results of the botanical survey are identified in Table 4-2, avian survey in Table 4-3, and mammalian survey in Table 4-4.

Table 4-2: Plant Species Found at Project Site

<table>
<thead>
<tr>
<th>Family</th>
<th>Species</th>
<th>Common Name</th>
<th>Status</th>
<th>Abundance Proposed MSWLF Site</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flowering Plants (Dicotyledons)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACANTHACEAE</td>
<td><em>Thunbergia fragrans</em> Roxb.</td>
<td>sweet clockvine</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>AMARANTHACEAE</td>
<td><em>Amaranthus spinosus</em> L.</td>
<td>spiny amaranth</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>ANACARDIACEAE</td>
<td><em>Schinus terebinthifolius</em> Raddi</td>
<td>Christmas berry</td>
<td>Nat</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>APIACEAE</td>
<td><em>Cichorium intybus</em> L.</td>
<td>common chicory</td>
<td>Nat</td>
<td>R</td>
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<tr>
<td>ASTERACEAE (COMPOSITAE)</td>
<td><em>Acanthospermum austral</em> (Loefl.) Kuntze</td>
<td>Paraguay bur</td>
<td>Nat</td>
<td>R3</td>
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</tr>
<tr>
<td></td>
<td><em>Ageratum conyzoides</em> L.</td>
<td>maile hohono</td>
<td>Nat</td>
<td>C1</td>
<td></td>
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<tr>
<td></td>
<td><em>Bidens pilosa</em> L.</td>
<td>ki</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Calystegia sepium</em> Less.</td>
<td>—</td>
<td>Nat</td>
<td>R</td>
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<tr>
<td></td>
<td><em>Conyza bonariensis</em> (L.) Cronq.</td>
<td>hairy horseweed</td>
<td>Nat</td>
<td>U</td>
<td></td>
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<tr>
<td></td>
<td><em>Eclipta prostrata</em> (L.) L.</td>
<td>false daisy</td>
<td>Nat</td>
<td>U</td>
<td>&lt;1&gt;</td>
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<tr>
<td></td>
<td><em>Emilia fossbergi</em> Nicolson</td>
<td>Flora’s paintbrush</td>
<td>Nat</td>
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<td></td>
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<td></td>
<td><em>Parthenium hysterophorus</em> L.</td>
<td>false ragweed</td>
<td>Nat</td>
<td>AA</td>
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<tr>
<td></td>
<td><em>Verbena enceloides</em> (Cav.) Benth. &amp; Hook.</td>
<td>golden crown-beard</td>
<td>Nat</td>
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<td>BORAGINACEAE</td>
<td><em>Heliotropium procumbans</em> Mill.</td>
<td>—</td>
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<td>R</td>
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<td>BRASSICACEAE</td>
<td><em>Lepidium virginicum</em> L.</td>
<td>—</td>
<td>Nat</td>
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<td>CASURINACEAE</td>
<td><em>Casuarina equisetifolia</em> L.</td>
<td>ironwood</td>
<td>Nat</td>
<td>R</td>
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<td>CONVOLVULACEAE</td>
<td><em>Ipomoea obscura</em> (L.) Ker-Gawl.</td>
<td>—</td>
<td>Nat</td>
<td>R</td>
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<tr>
<td></td>
<td><em>Ipomoea triloba</em> L.</td>
<td>little bell</td>
<td>Nat</td>
<td>R</td>
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<td>EUPHORBIACEAE</td>
<td><em>Euphorbia hirta</em> L.</td>
<td>garden spurge</td>
<td>Nat</td>
<td>R</td>
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<tr>
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<td><em>Euphorbia hypericifolia</em> L.</td>
<td>graceful spurge</td>
<td>Nat</td>
<td>R</td>
<td></td>
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<tr>
<td></td>
<td><em>Euphorbia prostrata</em> Alton</td>
<td>prostrate spurge</td>
<td>Nat</td>
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<tr>
<td></td>
<td><em>Macaranga tanarius</em> (L.) Müll. Arg.</td>
<td>—</td>
<td>Nat</td>
<td>O</td>
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<tr>
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<td><em>Phyllanthus debilis</em> Klein ex Wild.</td>
<td>niuri</td>
<td>Nat</td>
<td>R</td>
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<td></td>
<td><em>Ricinus communis</em> L.</td>
<td>castor bean</td>
<td>Nat</td>
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<td>FABACEAE</td>
<td><em>Alysicarpus vaginalis</em> (L.) DC.</td>
<td>Alyce clover</td>
<td>Nat</td>
<td>O</td>
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<tr>
<td></td>
<td><em>Canavalia cathartica</em> Thours</td>
<td>maunaloa</td>
<td>Nat</td>
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<tr>
<td></td>
<td><em>Chamaecrista nictitans</em> (L.) Moench</td>
<td>partridge pea</td>
<td>Nat</td>
<td>C</td>
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<tr>
<td></td>
<td><em>Crotalaria assimica</em> Bentham.</td>
<td>rattlepod</td>
<td>Nat</td>
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<tr>
<td></td>
<td><em>Crotalaria incana</em> L.</td>
<td>fuzzy rattlepod</td>
<td>Nat</td>
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<tr>
<td></td>
<td><em>Desmanthis permambucanu</em> (L.) Thellung</td>
<td>virgate mimosa</td>
<td>Nat</td>
<td>R</td>
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<tr>
<td></td>
<td><em>Desmodium incanum</em> DC.</td>
<td>Spanish clover</td>
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<td>O</td>
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<tr>
<td></td>
<td><em>Falcataria moluccana</em> (Miq.) Barney &amp; Grimes</td>
<td>albizia</td>
<td>Nat</td>
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<tr>
<td></td>
<td><em>Indigofera soufruticosa</em> Mill.</td>
<td>indigo</td>
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<td>R</td>
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<tr>
<td></td>
<td><em>Leucaena leucocephala</em> (Lam.) deWit</td>
<td>koa haole</td>
<td>Nat</td>
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<tr>
<td></td>
<td><em>Macroptilium atropurpureum</em> (DC.) Urb.</td>
<td>—</td>
<td>Nat</td>
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<td></td>
<td><em>Medicago lupulina</em> L.</td>
<td>black medic</td>
<td>Nat</td>
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<tr>
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<td><em>Medicago minima</em> (L.) Bartal.</td>
<td>small bur clover</td>
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<td></td>
<td><em>Mimosa pudica</em> L.</td>
<td>sensitive plant</td>
<td>Nat</td>
<td>C</td>
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<tr>
<td></td>
<td><em>Neonotonia wightii</em> (Wight &amp; Arnott)</td>
<td>glycine</td>
<td>Nat</td>
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<tr>
<td></td>
<td><em>Senna occidentalis</em> (L.) Link</td>
<td>coffee senna</td>
<td>Nat</td>
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<tr>
<td>LAMIACEAE</td>
<td><em>Leonotis nepetifolia</em> (L.) R. Br.</td>
<td>lion’s ear</td>
<td>Nat</td>
<td>—</td>
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<tr>
<td>MALVACEAE</td>
<td><em>Malvastrum comoremandelanum</em> (L.) Garcke</td>
<td>false mallow</td>
<td>Nat</td>
<td>R</td>
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<tr>
<td>Family</td>
<td>Species</td>
<td>Common Name</td>
<td>Status</td>
<td>Abundance</td>
<td>Notes</td>
</tr>
<tr>
<td>--------</td>
<td>---------</td>
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<td>-----------</td>
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<tr>
<td>Sida acuta N.L. Burm.</td>
<td>—</td>
<td>Nat</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Sida rhombifolia L.</td>
<td>Cuba jute</td>
<td>Nat</td>
<td>A</td>
<td>—</td>
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<tr>
<td>Sida spinosa L.</td>
<td>prickly sida</td>
<td>Nat</td>
<td>R</td>
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<tr>
<td>MYRTACEAE</td>
<td>Psidium guajava L.</td>
<td>common guava</td>
<td>Nat</td>
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<tr>
<td>Syzygium cumini (L.) Skeels.</td>
<td>Java plum</td>
<td>Nat</td>
<td>R</td>
<td>—</td>
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<tr>
<td>ONAGRACEAE</td>
<td>Ludwigia octovalvis (Jacq.) P. H. Raven</td>
<td>primrose willow</td>
<td>Nat</td>
<td>U2</td>
<td>&lt;1&gt;</td>
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<tr>
<td>PAPAVERACEAE</td>
<td>Argemone mexicana L.</td>
<td>Mexican poppy</td>
<td>Nat</td>
<td>—</td>
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<tr>
<td>PLANTAGINACEAE</td>
<td>Plantago lanceolata L.</td>
<td>nrw-lvd. plantain</td>
<td>Nat</td>
<td>R</td>
<td></td>
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<tr>
<td>Plantago major L.</td>
<td>brd-lvd. plantain</td>
<td>Nat</td>
<td>R1</td>
<td>—</td>
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<tr>
<td>POLYGALACEAE</td>
<td>Polygala paniculata L.</td>
<td>bubblegum plant</td>
<td>Nat</td>
<td>C</td>
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<tr>
<td>PORTULACACEAE</td>
<td>Portulaca oleracea L.</td>
<td>pigweed</td>
<td>Nat</td>
<td>R</td>
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<tr>
<td>Portulaca pilosa L.</td>
<td>—</td>
<td>Nat</td>
<td>—</td>
<td>—</td>
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<td>PRIMULACEAE</td>
<td>Anagallis arvensis L.</td>
<td>scarlet pimpernel</td>
<td>Nat</td>
<td>O</td>
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<tr>
<td>PROTEACEAE</td>
<td>Grevillea robusta A. Cunn. Ex R. Br.</td>
<td>silk oak</td>
<td>Nat</td>
<td>U</td>
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<tr>
<td>RUBIACEAE</td>
<td>Spermacoce assurgens Ruiz. &amp; Pav.</td>
<td>buttonweed</td>
<td>Nat</td>
<td>U</td>
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<tr>
<td>SOLANACEAE</td>
<td>Solanum americanum Mill.</td>
<td>pōpolo</td>
<td>Ind</td>
<td>—</td>
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<tr>
<td>STERCULIACEAE</td>
<td>Waltheria indica L.</td>
<td>‘uhaloa</td>
<td>Ind</td>
<td>R</td>
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<td>VERBENACEAE</td>
<td>Lantana camara L.</td>
<td>lantana</td>
<td>Nat</td>
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<td>Stachytarpheta cayennensis (Rich.) Vahl</td>
<td>—</td>
<td>Nat</td>
<td>U</td>
<td>—</td>
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<tr>
<td>Verbena litoralis Kunth</td>
<td>—</td>
<td>Nat</td>
<td>A</td>
<td>—</td>
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</tbody>
</table>

**Flowering Plants (Monocotyledons)**

<table>
<thead>
<tr>
<th>Family</th>
<th>Species</th>
<th>Common Name</th>
<th>Status</th>
<th>Abundance</th>
<th>Notes</th>
</tr>
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<tbody>
<tr>
<td>ARECACEAE</td>
<td>Phoenix hybrid</td>
<td>date palm</td>
<td>Nat</td>
<td>R</td>
<td>&lt;1&gt;</td>
</tr>
<tr>
<td>CYPERACEAE</td>
<td>Cyperus polystachyos Rottb.</td>
<td>—</td>
<td>Ind</td>
<td>O</td>
<td>&lt;1&gt;</td>
</tr>
<tr>
<td>Fimbristylis miliacea (L.) Vahl.</td>
<td>—</td>
<td>Nat</td>
<td>U3</td>
<td>&lt;1&gt;</td>
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</tr>
<tr>
<td>POACEAE</td>
<td>Andropogon virginicus L.</td>
<td>broomsedge</td>
<td>Nat</td>
<td>O3</td>
<td></td>
</tr>
<tr>
<td>Avena sativa hybrid</td>
<td>commercial oat</td>
<td>Om</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Axonopus fissifolius (Raddi) Kuhl.</td>
<td>nrw-lvd. carpetgrass</td>
<td>Nat</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Bothriochloa pertusa (L.) A. Camus</td>
<td>pitted beardgrass</td>
<td>Nat</td>
<td>U</td>
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<tr>
<td>Cenchrus echinatus L.</td>
<td>common sandbur</td>
<td>Nat</td>
<td>U</td>
<td>—</td>
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<tr>
<td>Chloris barbata (L.) Sw.</td>
<td>swollen fingergrass</td>
<td>Nat</td>
<td>C</td>
<td>—</td>
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<tr>
<td>Chloris radiate (L.) Sw.</td>
<td>plushgrass</td>
<td>Nat</td>
<td>U</td>
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<tr>
<td>Cynodon dactylon (L.) Pers.</td>
<td>Bermuda grass</td>
<td>Nat</td>
<td>AA</td>
<td>—</td>
<td></td>
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<tr>
<td>Digitaria insularis (L.) Mez ex Ekman</td>
<td>sourgrass</td>
<td>Nat</td>
<td>R</td>
<td>—</td>
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<tr>
<td>Digitaria ciliaris (Retz.) Koeler</td>
<td>Henry’s crabgrass</td>
<td>Nat</td>
<td>C</td>
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<tr>
<td>Eleusine indica (L.) Gaertn.</td>
<td>wiregrass</td>
<td>Nat</td>
<td>U</td>
<td>—</td>
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<tr>
<td>Eragrostis pectinacea (Michx.) Nees</td>
<td>Carolina lovegrass</td>
<td>Nat</td>
<td>A</td>
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<tr>
<td>Paspalum fimbriatum Kunth</td>
<td>fimbriate paspalum</td>
<td>Nat</td>
<td>O</td>
<td>—</td>
<td></td>
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<tr>
<td>Paspalum urvillei Steud.</td>
<td>Vasey grass</td>
<td>Nat</td>
<td>O</td>
<td>1&lt;1&gt;</td>
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<tr>
<td>Sporobolus cf. africans (Poir.) Robyns &amp; Tourney</td>
<td>smutgrass</td>
<td>Nat</td>
<td>O</td>
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<tr>
<td>Sporobolus sp.</td>
<td>dropseed</td>
<td>Nat</td>
<td>O</td>
<td>—</td>
<td></td>
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<tr>
<td>Urochloa maxima (Jacq.) R. Webster</td>
<td>Guinea grass</td>
<td>Nat</td>
<td>AA</td>
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<td>Urochloa mutica (Forssk.) Nguyen</td>
<td>California grass</td>
<td>Nat</td>
<td>O</td>
<td>1&lt;1&gt;</td>
<td></td>
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</tbody>
</table>

**Legend:**
- **Status:** distributional status
- **Ind:** indigenous; native to Hawai‘i, but not unique to the Hawaiian Islands
- **Nat:** naturalized, exotic plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation
- **Orn:** exotic, ornamental, or cultivated; plant not naturalized (not well-established outside of cultivation)
- **Abundance:** occurrence ratings for plants in the project area
- **—:** not observed
- **R:** Rare – seen in only one or perhaps two locations
- **U:** Uncommon – seen at most in several locations
- **O:** Occasional – seen with some regularity
Table 4-3: Avifaunal Species Found at Project Site

<table>
<thead>
<tr>
<th>Order</th>
<th>Family / Sub-Family</th>
<th>Scientific Name</th>
<th>Common Name</th>
<th>ST</th>
<th>Proposed MSWLF Site</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSERIFORMES</td>
<td>ANATIDAE – Ducks, Geese &amp; Swans / ANSERINAE – Geese &amp; Swans</td>
<td>Branta sandvicensis</td>
<td>Hawaiian Goose (Nēnē)</td>
<td>EE</td>
<td>—</td>
<td>0.91</td>
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<tr>
<td>GALLIFORMES</td>
<td>PHASIANIDAE – Pheasants &amp; Partridges</td>
<td>Gallus gallus</td>
<td>Red Junglefowl</td>
<td>A</td>
<td>2.67</td>
<td>1.82</td>
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<tr>
<td></td>
<td></td>
<td>Phasianus colchicus</td>
<td>Ring-necked Pheasant</td>
<td></td>
<td>0.83</td>
<td>1.00</td>
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<tr>
<td>PELECANIFORMES</td>
<td>ARDEIDAE – Herons, Bittern &amp; Allies</td>
<td>Bubulcus ibis</td>
<td>Cattle Egret</td>
<td>A</td>
<td>2.00</td>
<td>5.45</td>
</tr>
<tr>
<td>CHARADRIIFORMES</td>
<td>CHARADRIIDAE – Lapwings &amp; Plovers</td>
<td>Pluvialis fulva</td>
<td>Pacific Golden-Plover</td>
<td>IM</td>
<td>0.17</td>
<td>0.09</td>
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<tr>
<td>COLUMBIFORMES</td>
<td>COLUMBIDAE – Pigeons &amp; Doves</td>
<td>Streptopelia chinensis</td>
<td>Spotted Dove</td>
<td>A</td>
<td>1.00</td>
<td>1.91</td>
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<tr>
<td></td>
<td></td>
<td>Geopelia striata</td>
<td>Zebra Dove</td>
<td>A</td>
<td>1.17</td>
<td>1.55</td>
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<tr>
<td>PSITTACIFORMES</td>
<td>PSITTACIDAE – Lories, Parakeets, Macaws, &amp; Parrots / PSITTACINAE – Typical Parrots</td>
<td>Psittacula krameri</td>
<td>Rose-ringed Parakeet</td>
<td>A</td>
<td>0.17</td>
<td>0.27</td>
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<tr>
<td>PASSERIFORMES</td>
<td>ALAUDIDAE – Larks</td>
<td>Alauda arvensis</td>
<td>Sky Lark</td>
<td>A</td>
<td>2.67</td>
<td>1.45</td>
</tr>
<tr>
<td></td>
<td>CETTIIDAE – Cettiia Warblers &amp; Allies</td>
<td>Cettia diphone</td>
<td>Japanese Bush-Warbler</td>
<td>A</td>
<td>1.33</td>
<td>0.82</td>
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<tr>
<td></td>
<td>ZOSTEROPIDAE – White-eyes</td>
<td>Zosterops japonicus</td>
<td>Japanese White-eye</td>
<td>A</td>
<td>1.33</td>
<td>1.27</td>
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<td></td>
<td>TIMALIDAE – Babblers</td>
<td>Garrulax canorus</td>
<td>Chinese Hwamei</td>
<td>A</td>
<td>2.17</td>
<td>1.82</td>
</tr>
<tr>
<td></td>
<td>MIMIDAE – Mockingbirds &amp; Thrashers</td>
<td>Mimus polyglottos</td>
<td>Northern Mockingbird</td>
<td>A</td>
<td>0.50</td>
<td>0.45</td>
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<td>STURNIDAE – Starlings</td>
<td>Acidotheres tristis</td>
<td>Common Myna</td>
<td>A</td>
<td>7.83</td>
<td>5.73</td>
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<td>CARDINALIDAE – Cardinals Saltators &amp; Allies</td>
<td>Cardinalis cardinalis</td>
<td>Northern Cardinal</td>
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<td>1.50</td>
<td>1.36</td>
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<tr>
<td></td>
<td>ICTERIDAE – Blackbirds</td>
<td>Sturnella neglecta</td>
<td>Western Meadowlark</td>
<td>A</td>
<td>8.00</td>
<td>5.55</td>
</tr>
<tr>
<td></td>
<td>FRINGILLIDAE – Finches / CARDUELINAE – Cardueline Finches</td>
<td>Haemorhous mexicanus</td>
<td>House Finch</td>
<td>A</td>
<td>1.33</td>
<td>3.09</td>
</tr>
<tr>
<td></td>
<td>ESTRILDIDAE – Estrildid Finches</td>
<td>Amandava amandava</td>
<td>Red Avadavat</td>
<td>A</td>
<td>3.17</td>
<td>3.91</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lonchura punctulata</td>
<td>Nutmeg Mannikin</td>
<td>A</td>
<td>—</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lonchura atricapilla</td>
<td>Chestnut Munia</td>
<td>A</td>
<td>2.83</td>
<td>6.09</td>
</tr>
</tbody>
</table>
### Table 4-4: Mammalian Species Found at Project Site

<table>
<thead>
<tr>
<th>Order</th>
<th>Family</th>
<th>Scientific Name</th>
<th>Common Name</th>
<th>ST</th>
<th>Detection Type Proposed MSWLF Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>PASSERIFORMES</td>
<td>ESTRILDIDAE – Estrildid Finches</td>
<td>Padda oryzivora</td>
<td>Java Sparrow</td>
<td>A</td>
<td>0.33</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.18</td>
</tr>
</tbody>
</table>

**Legend:**
- **ST** Status (Hawai‘i, e.g., native, indigenous, alien, not detected)
- **X** Alien – Introduced to the Hawaiian Islands by humans
- **V** Visual – Species detected visually
- **A** Audio – Species detected aurally
- **S** Species detected by animal sign
- **Sc** Species detected by the presence of scat (fecal material)
- **Sk** Species detected by observing skeletal remains

### Botanical

The findings of the botanical survey indicated that no State or Federal listed protected plant species are present on the proposed MSWLF site. Although the site is directly adjacent to the Kālepa Forest Reserve, no plants of any interest were observed along the boundary; alien plants dominate the area of the reserve close to the proposed MSWLF site. No federally delineated Critical Habitat is located within the project site (USFWS 2012).

The vegetation across the proposed MSWLF site is composed mostly of pasture grasses and other herbs. Scattered trees, primarily associated with former irrigation ditches that ran north–south across the property, are present. Some wet areas are present that are associated with irrigation channels, and have flowing water in them. Vegetation in and adjacent to these ditches is noticeably lush.

A total of 83 plant taxa were identified. Of the total list, only 3 (or 3.6%) are native species, 79 (95.2%) are regarded as naturalized species, and 1 species is agricultural. The three native species present in the area are *pōpolo* (*Solanum americanum*), ‘uhaloa (*Waltheria indica*), and a sedge (*Cyperus polystachyos*).
The eastern boundary of the proposed MSWLF site is marked by a change from pastureland to scrub and forested land of the lower slopes of Kālepa Ridge and beyond the existing fence is an assemblage of plants different from that present on the pasture side. An offsite ditch parallels the property line upslope of the fence. The flora in this area is dominated by Java plum (Syzygium cumini), Christmasberry (Schinus terebinthifolius), and She oak (Grevillia robusta) trees; with broomsedge (Andropogon virginicus), niu (Cocos nucifera), downy myrtle (Rhodomyrtus tomentosa), strawberry guava (Psidium cattleianum), koa haole (Leucaena leucocephala), lantana (Lantana camara), Guinea grass (Panicum maximum), 'uhaloa, and sword fern (Nephrolepis multiflora) noted as present to common. Some of these species occur within the proposed MSWLF site, but in low abundance.

Avian

Avian diversity and densities were consistent with the quality of habitats present at the project site, as well as with the findings of at least one other faunal survey conducted on lands near to the site by AECOS in 2011 (AECOS 2011). A total of 491 individual birds of 23 different avian species, representing 16 separate families were recorded (21 during station counts and an additional two species as incidental observations) (Table 4-3). Four of the species recorded during the survey are native to the Hawaiian Islands: Hawaiian Goose known as Nēnē (Branta sandvicensis) and Hawaiian Duck (Anas wyvilliana) are both endemic endangered species; and Black-crowned Night-Heron (Nycticorax nycticorax hoactli) is an indigenous breeding water-obligate species and Pacific Golden-Plover (Pluvialis fulva) is an indigenous migratory shorebird species. Neither the Black-crowned Night-Heron nor the Pacific Golden-Plover is a federally listed threatened or endangered species. The other 19 species recorded are alien to the Hawaiian Islands.

Four species, including Chestnut Munia (Lonchura atricapilla), Common Myna (Acridotheres tristis), Western Meadowlark (Sturnella neglecta), and Cattle Egret (Bubulcus ibis) accounted for 51% of all birds recorded during station counts. Three species; Western Meadowlark, Common Myna and Red Avadavat (Amandava amandava) accounted for 47% of the total number of birds (~243) recorded on the proposed MSWLF site. The most common avian species recorded was Chestnut Munia, which accounted for slightly more than 14 and 20% respectively, of the total number of birds recorded for the general project area. Western Meadowlark was the most frequently recorded species on the proposed MSWLF site, accounting for 20% of birds recorded on that site.

Nēnē were seen flying low over the MSWLF site during the two morning surveys. A lone Hawaiian Duck was incidentally flushed from one of the irrigation channels within the MSWLF site. Two species, Hawaiian Duck (Anas wyvilliana) and Black-crowned Night-Heron (Nycticorax nycticorax hoactli), were recorded flying over the property (incidental observations) while transiting between count stations. Only one individual was seen of each of these two species. The Black-crowned Night-Heron is commonly found across the state in any habitat that has standing or running water. Pacific Golden-Plover is an indigenous migratory shorebird species that nests in the high Arctic during the late spring and summer months, returning to Hawai‘i and the Tropical Pacific to spend the fall and winter months each year. The Pacific Golden-Plover usually leave Hawai‘i for the trip back to the Arctic in late April or the very early part of May.

Although not detected during the survey, the endangered Hawaiian black-necked stilt (Himantopus mexicanus knudseni), Hawaiian moorhen (Gallinula chloropus sandvicensis), Hawaiian coot (Fulica alai) (collectively referred to as Hawaiian waterbirds), the endangered Hawaiian Petrel (Pterodroma sandwichensis), the threatened sub-species of Townsend’s (Newell’s) Shearwater (Puffinus auricularis newelli), and a candidate species for listing the band-rumped storm-petrel (Oceanodroma castro) (collectively referred to as seabirds) are known to occur or transit through the proposed project area.

Although no designated critical habitat is present within the vicinity of the proposed project area, a number of irrigation channels are present on the proposed MSWLF site and therefore the potential exists for Hawaiian waterbirds to be attracted to the site. In particular, the Hawaiian stilt is known to nest in sub-optimal locations (e.g., any ponding water) if water is present. Hawaiian waterbirds
attracted to sub-optimal habitat may suffer adverse impacts, such as predation and reduced reproductive success, and thus the project may create an attractive nuisance.

The Save Our Shearwaters Program has recovered Hawaiian Petrel and Newell’s Shearwater species from the general area on an annual basis over the past three decades (Morgan et al. 2003, 2004; David and Planning Solutions 2008; Save our Shearwater Program 2012). Seabirds, including the Newell’s shearwater, Hawaiian petrel, and band-rumped storm petrel fly at night and are attracted to artificially-lighted areas resulting in disorientation and subsequent fallout due to exhaustion. Seabirds are also susceptible to collision with objects that protrude above the vegetation layer, such as utility lines, guy-wires, and communication towers. Additionally, once grounded, they are vulnerable to predators and are often struck by vehicles along roadways (USFWS 21014 & 1983; Simons and Hodges 1998; Ainley et al. 2001). Neither nesting colonies nor appropriate nesting habitat for seabird species occur within the project site.

Mammalian

Seven terrestrial mammalian species were detected during the course of the MSWLF site survey (Table 4-4). Also found were tracks, scat, and skeletal remains. The findings of the mammalian survey were consistent with the habitats present on and adjacent to the project site, as well as with the findings of at least one other survey conducted on lands adjacent to the site (AECOS 2011). All seven terrestrial mammalian species detected during the course of this survey are alien to the Hawaiian Islands. Three of the species, cow (Bos taurus), domestic goat (Capra h. hircus), and domestic sheep (Ovis aries), are domestic farm animals; all were recorded within fenced pastures. Feral pig (Sus s. scoca) was recorded on the project site, as were dog (Canis f. familiaris) and cat (Felis catus). While not observed on the MSWLF site it is likely that some, if not all of the four established alien Muridae found on Kaua‘i, European house mouse (Mus musculus domesticus), roof rat (Rattus r. rattus), Norway rat (Rattus norvegicus), and Polynesian rat (Rattus exulans hawaiiensis), use various resources found within the general project area on a seasonal basis. All of these introduced rodents are deleterious to native ecosystems and native faunal species.

Although the Hawaiian hoary bat was not recorded during the survey, this endangered bat is widely dispersed in the lowlands of Kaua‘i, and on a seasonal basis bats have been recorded in the general vicinity on numerous occasions (David 2012). The Hawaiian hoary bat roosts in both exotic and native woody vegetation and, while foraging, will leave young unattended in “nursery” trees and shrubs when they forage. If trees or shrubs suitable for bat roosting (greater than 15 feet tall) are cleared during the breeding season (June 1 through September 15), there is a risk that young bats could inadvertently be harmed or killed. It can be expected that Hawaiian hoary bats forage over the in the general vicinity of the project site, however, no suitable roosting habitat occurs on the MSWLF site, making it highly unlikely that there are resident bats present.

4.8.2 Potential Project Effects

Construction. Clearing, grubbing, and construction of the proposed MSWLF site would not result in any impacts including displacement, as no federally delineated Critical Habitat is located within the project site (USFWS 2012).

To avoid impacts to Hawaiian geese (Nēnē) during construction of the proposed project, a biologist familiar with the nesting behavior of the Hawaiian goose will survey the project area prior to the initiation of any work, or after any subsequent delay in work of three or more days (during which birds may attempt nesting). If a nest is discovered, work should cease immediately and USFWS should be contacted for further guidance. In addition, all on-site project personnel should be apprised that Hawaiian geese may be in the vicinity of the project at any time during the year. If a Hawaiian goose (or geese) appears within 100 feet of ongoing work, all activity should be temporarily suspended until the Hawaiian goose (or geese) leaves the area of its own accord.
The principal potential impact of the proposed project to Hawaiian Petrels, Newell’s Shearwaters, and band-rumped storm petrel is the increased threat that birds would be downed after becoming disoriented by exterior lighting that may be required in conjunction with nighttime construction activities or the servicing of construction equipment at night. Because the proposed project would be constructed during daylight hours with no night work planned, no impacts to seabirds are therefore expected.

Noise would be temporarily generated during construction activities and is not expected to result in significant effects to faunal resources in the area. In the unlikely event that the Hawaiian goose, Hawaiian waterbirds, or seabirds are present within the project area, it is expected that they would readily disperse to nearby areas with higher quality habitat in response to disturbance. As such, the potential effects of the proposed action are expected to be limited to temporary construction-related disturbance (e.g., noise); these impacts are considered to be less than significant, such that no conservation measures would be required. Injury or mortality of Hawaiian goose (Nēnē), Hawaiian waterbirds (or their nests), and Hawaiian seabirds is not expected.

**Operations.** Operation of the proposed MSWLF would not result in any impacts including displacement, as no federally delineated Critical Habitat is located within the project site (USFWS 2012).

No nighttime operations are planned. Noise generated at the site during operations is not expected to result in significant effects to faunal resources in the area. It is expected that noise resulting from daytime operations would result in the dispersion of Hawaiian geese, Hawaiian waterbirds, or seabirds present in the project vicinity to areas with higher quality habitat.

Exterior security lighting associated with the proposed MSWLF would be installed in compliance with County of Kaua‘i regulations, which require that all exterior lights be fully shielded. No impacts to seabirds are expected due to the daytime operating hours and the use of fully shielded lights.

Operation of the MSWLF may have the potential for effects to aircraft transiting the Līhu‘e Airport from overflights of birds that may be attracted to the landfill. A number of active wildlife controls would be used to deter birds and wildlife that attract birds to minimize the risk of aircraft bird strike hazards. See Section 6.2 for further discussion and detail.

**4.8.3 Mitigation Measures**

Mitigation includes all operational wildlife control measures identified in the Landfill Wildlife Hazard Assessment (LWHA) (Appendix G) that will be monitored and revised as landfill and wildlife conditions evolve.

**4.9 NATURAL HAZARDS**

**4.9.1 Earthquake**

**4.9.1.1 Affected Environment**

HAR § 11-58.1-13(e) and the CFR § 40 (Subtitle D), Part 258.14 require that “new MSWLF units... shall not be located in seismic impact zones, unless the owner or operator demonstrates... that all containment structures... are designed to resist the maximum horizontal acceleration in lithified earth material for the site.” HAR § 11-58.1-3 defines a “seismic impact zone” as an area with a 10 percent or greater probability that the maximum horizontal acceleration in lithified earth material (rock) would exceed the earth’s gravitational pull (g) by 10 percent (i.e., 0.10g) in 250 years.
The entire island of Kaua‘i, including the proposed site, is designated in Seismic Zone 1, a designation indicating minimal seismic hazard (See Figure 4-5). MSWLFs are permitted within this designation. According to the U.S. Geological Survey’s Seismic Deaggregation website, the seismic hazard, magnitude, and the horizontal PGA can be determined for a set latitude and longitude. Using the Ma'alo site latitudes of between 21°52’ and 22°14’ north, and longitudes of 159°17’ and 159°48’ west, a horizontal PGA of 0.10g was obtained for the proposed site (USGS 2014), as documented in Appendix D.

Slope stability of the MSWLF was analyzed under seismic conditions, to evaluate the stability of the facility site during a seismic event. The analysis was performed to evaluate whether the waste mass and liner system would be able to withstand the design seismic event, based on a horizontal PGA of 0.10g. The RCRA Subtitle D Seismic Design Guidance for Municipal Solid Waste Landfill Facilities (EPA 1995) states that a factor of safety of 1.0 has been shown to be conservative in assessments of slope performance in earthquakes. A factor of safety of 1.0 (when the maximum available resisting forces are equal to the driving forces) or greater demonstrates overall stability for a seismic event, whereas a factor of safety of less than 1.0 suggests that slope failure would be expected to occur.

For conservative design, a minimum allowable factor of safety (for seismic conditions) of 1.20 was chosen for the analysis. The results of the analysis indicated that all landfill sections and scenarios evaluated, met, or exceeded the criterion.

In addition to the above, the stability of the final cover design was evaluated for susceptibility to seismic and seismic-induced liquefaction of the soils. Liquefaction can occur in a saturated, cohesionless, medium-dense to loose sand layer, due to an earthquake that creates sudden high pore pressures, resulting in decreased shear strength. Liquefaction may cause ground failures such as settlement or lateral spreading. Given the in situ soil material properties at Ma'alo, including the lack of sandy soil, liquefaction is not expected. While not expected to be an issue, liquefaction would be evaluated as part of the overall site geotechnical program during detailed design and permitting if sandy soils are encountered for any individual phase of the proposed landfill.

4.9.1.2 POTENTIAL PROJECT EFFECTS

Construction. Construction of the proposed project is not expected to be adversely affected by seismic activity. In case of a seismic hazard, construction activities would cease for the period that the seismic hazard exists. Equipment would be secured in work and support areas.

Operations. Operation of the proposed project is not expected to be adversely affected by seismic activity. No habitable structures would be required. Buildings associated with the proposed MSWLF would be designed and constructed in accordance with the Uniform Building Code (UBC), providing minimum design criteria to address potential for seismic damage. The UBC scale is rated from Seismic Zone 0 to Zone 4, with 0 the lowest level for potential seismic-induced ground movement. All buildings and structures, including graded surfaces, will be developed in accordance with such applicable standards to address construction activities in Seismic Zone 1.

The results of the seismicity and liquefaction evaluation indicated that the final cover system, waste mass, and base liner system of the proposed Ma'alo MSWLF are expected to remain stable under a seismic event of 0.10g, the magnitude of seismic event that was identified as the design requirement to maintain safety for the geographic location of Ma'alo, in accordance with HAR §11-58.1-13(e) and CFR §40 (Subtitle D) Part 258.14.

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Figure 4-6: Hawai‘i Seismic Hazard Zones
4.9.1.3 **MITIGATION MEASURES**

No mitigation measures are necessary or recommended.

4.9.2 **Hurricane**

4.9.2.1 **AFFECTED ENVIRONMENT**

The Hawaiian Islands are seasonally susceptible to Pacific hurricanes from the late summer to early winter months. The island of Kauaʻi has experienced two major hurricanes since 1982: 'Iwa in 1982 and 'Iniki in 1992. It is difficult to predict these natural occurrences, but it is reasonable to assume that future such events will occur. The proposed project site is, however, no more or less vulnerable than the rest of the island to the destructive winds and torrential rains associated with hurricanes.

4.9.2.2 **POTENTIAL PROJECT EFFECTS**

**Construction.** Construction of the proposed project is not expected to be adversely affected by a hurricane. In case of a hurricane, construction activities would cease for the period that the hazard exists. Equipment would be secured in work and support areas.

**Operations.** The occurrence of a hurricane is not expected to result in significant adverse impacts to the surrounding area with the application of the proposed MSWLF design and operational measures. Extremely high wind conditions are of concern for any landfill site with an active cell in use. A landfill cell is a discrete portion of the landfill where MSW is placed, compacted, and covered; the active cell is that portion of the landfill that is receiving MSW at a given time. The operation of the active portion of the landfill provides some inherent mitigation against significant wind impacts by allowing active filling of only one cell at a time, use of daily cover soil to cover the active portion at the end of each work day, and closure of cells as they fill up. Landfill cells that have been filled to capacity are covered by soil and revegetated to stabilize the surface, thereby reducing wind and run-off. These combined measures reduce the potential for landfilled refuse materials to become displaced and airborne. High wind and rain conditions associated with hurricanes have the potential to disperse litter, cover material (principally soils), and excessive amounts of water onto areas surrounding the proposed MSWLF site.

Operational requirements and measures that address the potential for adverse effects from hurricanes to landfill and operations include the following:

- Working on only one active landfill cell at a time to reduce the exposure of MSW
- Conducting proper maintenance and operating practices including the use of cover material and compaction, and ensuring that vegetative controls are established as soon as practicable to stabilize the site
- Performing proper maintenance of the landfill drainage control system
- Continually monitoring site conditions and conducting contingency planning

In the event a hurricane does occur after the proposed MSWLF has become operational, the MSWLF would provide an important resource to manage debris on the island of Kauaʻi. This would provide an overall benefit for the maintenance of public health and safety.

4.9.2.3 **MITIGATION MEASURES**

No mitigation measures are necessary or recommended.
4.9.3 

Flood Hazards

4.9.3.1 

AFFECTED ENVIRONMENT

The boundary of the proposed MSWLF site is within Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel 140F, Zone X (see Figure 4-7), which has been determined to be outside the 0.2 percent annual chance (500-year) floodplain.

Owners proposing the siting of a MSWLF within a floodplain must demonstrate prior to permitting that the proposed landfill would not restrict the flow of a 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste. Accordingly, all areas classified as Zone A, AE, AH, AO, VE, or as a floodway were combined to produce the 100-year floodplain exclusion zone for MSWLF site selection. The proposed MSWLF site is located in Zone X, and is not within a 100-year floodplain.

4.9.3.2 

POTENTIAL PROJECT EFFECTS

Construction. No impacts due to flooding area expected during the construction of the proposed project.

Operations. The proposed project is not expected to exacerbate flood conditions or be adversely affected by flooding. Operational measures that address the potential for adverse effects from flood hazards to landfill and future RRP operations include the following:

- Placing intermediate cover over areas that are not being actively worked. Compacting the intermediate cover to a minimum of approximately 1 ft to increase the stability of the site, and then grading to promote run-off in a controlled manner.
- Developing all proposed facilities outside of the floodplain exclusion zone
- Performing design and construction of structures in compliance with Section 8-12, Kaua‘i County Code

4.9.3.3 

MITIGATION MEASURES

No mitigation measures are necessary or recommended.

4.9.4 

Tsunami

4.9.4.1 

AFFECTED ENVIRONMENT

A tsunami involves the generation of a series of destructive ocean waves that can affect all shorelines. The generation of these waves can occur at any time with limited or no warning. Persons in shoreline or beach areas are advised to go to higher ground immediately.

According to the Kaua‘i Civil Defense Agency, the proposed project site is not subject to evacuation in the event of a tsunami (www.Kaua‘i.gov/CivilDefense). The coastal areas requiring evacuation are along the Ahukini Recreation Pier State Park, and generally from the Lydgate State Park northward encompassing much of the coastal area along the Kūhiō Highway. The location of the proposed project site mauka of the highway (and the Kālepa ridge) is located at an elevation at 270-300 ft msl and considered to be outside the area of potential wave action.
Figure 4-7: Flood Zones in the Project Vicinity
4.9.4.2 POTENTIAL PROJECT EFFECTS

Construction. The proposed project site is not identified as a location subject to inundation by a tsunami. Therefore, the potential for adverse effects during construction of the proposed project due to tsunami are not expected.

Operations. The potential for adverse effects due to tsunami are not expected during the operations of the proposed MSWL.

4.9.4.3 MITIGATION MEASURES

No mitigation measures are necessary or recommended.

4.10 SCENIC AND AESTHETIC ENVIRONMENT

4.10.1 Affected Environment

The project area and vicinity in which the Ma'alo MSWLF facility will be constructed is a relatively flat area, known as the Li'hu'e Basin, that stretches approximately 1.8 miles across. Li'hu'e Basin is bordered by the Wailua River State Park to the north, Kālepa Ridge to the east, and Kilohana Crater to the southwest. The MSWLF facility would be constructed on the northeastern portion of the Li'hu'e Basin and would border the Kālepa Ridge. The vicinity of the project site is principally rural with few developed structures nearby. The proposed project location is within and surrounded by agricultural fields, some of which are fallowed.

Approximately 0.8 miles north of the project site is the South Fork of the Wailua River. The banks above this fork are green and lush with vegetation. On this portion of the Wailua River is the Fern Grotto, a tourist destination in the Wailua River State Park. The proposed project site cannot be seen from the Wailua River or Fern Grotto due to the low elevation of these features at close to mean sea level (MSL) relative to the rising terrain of the Li'hu'e Basin and proposed project site at elevations between 280 to 360 feet MSL (Section 4.3).

The Wailua Falls is approximately 1.25 miles northwest of the boundary of the proposed project site and is accessed by Ma'alo Road which terminates at this location. The falls is a visitor and tourist destination. Views of the proposed project site cannot be seen from the falls due to the lush vegetation and trees at the area of the falls, and the rising terrain toward the proposed project site.

Ma'alo Road travels roughly north to south and is west of the proposed project site boundary at distances that range from approximately 1.1 miles to 1.5 miles. Ma'alo Road is identified as a Scenic Roadway Corridor in the Kaua'i County General Plan's "Li'hu'e Planning District Heritage Resources Map" (see Figure 4-8). The purpose of the General Plan Heritage Resource Maps is to document important natural, scenic, and historic features, particularly in relation to the urban and agricultural lands which are developed or may be developed in the future. The viewplane from segments of the Ma'alo Road include the south and west boundary of the proposed project site, surrounding agricultural fields, the Kālepa Ridge, and the Wailua Falls. Views of the proposed project site are reduced by existing vegetation the boarders Ma'alo Road and the distances involved.

Ehiku Street is configured in a roughly U-shaped configuration that travels in a northwest, northeast, and southeast alignment until it meets with Laulima Street at a road fork. Ehiku Street intersects with Ma'alo Road and the Kūhiō Highway. The lower portions of Ehiku Street are used by residents, visitors, and farmers, but in the uplands the use of the road would be restricted to users with permission to enter the private portions of the roadway. The upland portion of Ehiku Street at its intersection with Ma'alo Road is approximately 1.25 miles southwest of the boundary of the proposed project site and the closest point to the south boundary of the proposed project site. Views of the proposed project site from Ehiku Street are reduced due to the distances involved.
Hanamāʻulu Town is a residential area located south of the proposed MSWLF site. The nearest residential communities of Hanamāʻulu Town to the project site are located along Laukona Street and Kālepa Circle, both approximately 1.05 miles from the proposed project site boundary. Adjacent residential communities along Laukona Street are not likely to readily view the MSWLF site due to heavy existing vegetation consisting of tall trees and brush immediately to the north of the residences. Views of the MSWLF site from the nearby residential area located along Kālepa Circle are obscured by the Kālepa Ridge.

Kūhiō Highway, located approximately 1.3 miles south and east of the project site, is situated along the coastline. This segment of Kūhiō Highway is also identified in the Kaua‘i County General Plan’s “Lihu‘e Planning District Heritage Resources Map” as an important roadway corridor (see Figure 4-8). The project site is not readily visible from the highway primarily due to the Kālepa Ridge to the west and heavy vegetative growth along the highway which effectively prevents views into the proposed project site.

Viewplane analyses from six positions are shown on Figure 4-8 on the USGS map indicating the six photos and their location or reference towards the proposed project site.

Photo 1 is toward the project site from the northern portion of Maʻalo Road

Photo 2 is toward the project site from the middle reaches of Maʻalo Road at the intersection with a private agricultural roadway

Photo 3 is toward the project site from the intersection of Maʻalo Road and Ehiku Street

Photo 4 is toward the project site from Laukona Street within a nearby residential community located in Hanamāʻulu Town

Photo 5 is toward the project site from Kūhiō Highway south of the proposed MSWLF site

Photo 6 is toward the project site from Kālepa Circle within a nearby residential community located in Hanamāʻulu Town

Along the northern portion of Maʻalo Road no view of the project site is possible due to the heavy vegetative growth along the highway combined with the rising terrain (Photo 1). In the middle reaches of Maʻalo Road at its intersection with a private agricultural roadway (Photo 2) and at the intersection of Maʻalo Road with Ehiku Street (Photo 3) views of the site may be possible. However, due to the distances involved the building and MSWLF mass will be significantly reduced and would not adversely affect views of Kālepa Ridge to the east when viewed from across the Lihuʻe Basin. In addition, existing vegetation bordering Maʻalo Road will reduce the views of the proposed project site and soften the impacts of proposed structures. Views of the project site from Laukona Street within a nearby residential community (Photo 4) are not possible due to the heavy vegetative growth. Similarly, no views of the proposed project site can be seen from Kūhiō Highway south of the proposed project site (Photo 5) or Kālepa Circle within a nearby residential community (Photo 6) due to heavy vegetative growth and the rising terrain of Kālepa Ridge.

Passenger, air tour, and agricultural support (e.g., “crop dusting”) aircraft transiting the area would be able to view the relatively flat Lihuʻe Basin consisting of agricultural fields and the proposed landfill site and access roadway located along the base of the Kālepa Ridge.
Figure 4-8: USGS map showing the viewplane analysis for five reference locations and views towards the proposed MSWLF site.
Photo 1
Location of proposed Ma'alo MSWLF Site

~ 1.50 Miles

Northern Ma'alo Road

Photo 2
Location of proposed Ma'alo MSWLF Site

~ 1.25 Miles

Upper reaches of Ma'alo Road at the intersection with a private agricultural roadway
4.10.2 Potential Project Effects

Construction. The proposed project will involve the use of construction equipment and materials, and soils, which could temporarily reduce the overall aesthetic quality of views toward the MSWLF site and the Kālepa Ridge beyond. Short-term visual impacts during construction, however, would not affect views from the Kūhiō Highway due to heavy vegetative growth along the highway combined with the rising terrain of the Kālepa Ridge.

Travelers using the Ma'alo Road may be able to observe construction activities, these views are expected to be minimized due to the greater than 1 mile distances from the site combined with existing vegetative cover along segments of the roadway. Views of construction activities would be temporary and intermittent, consisting of grading and excavation to establish the initial and later landfill cells. Other temporary activities would include the construction of landfill facility buildings and utilities, and the landfill access road.

The viewplane along the upland segments of Ehiku Street would include the southwest boundary of the site where a planned access road would be constructed. Views toward the project site are minimized by the approximately 1.25 mile distance from the facility. However, views of construction equipment and machinery present at the site, and construction equipment and personnel working on the landfill access road would be visible. Both activities would be of limited duration and in the case of the proposed project site, are expected to be intermittent, lasting only for the period of grading and excavation to establish the initial landfill cell.

Operations. Based on the viewplane analyses no negative adverse impacts to viewplanes associated with the operation of the proposed MSWLF on the Ma'aloh parcel are expected. Views of the proposed project site from Kūhiō Highway and the nearby residential neighborhoods of Hanamā'ulu Town would not be possible due to dense vegetation and the rising Kālepa Ridge. Views of the proposed project site would be primarily be from along the upland segments of Ma'aloh Road, Ehiku Street, and the network of rudimentary agricultural roadways serving the uplands surrounding the project site. Travelers using Ma'aloh Road or Ehiku Street may be able to observe the southern and western portions of landfill site, however, views of the site are expected to be minimized and building and landfill mass significantly reduced due to the greater than approximately 1 mile distances between the roadways and the landfill site. Existing vegetative cover along segments of the roadways and between the MSWLF site and roadways is expected to further minimize views of the landfill site.
Operational activities that are expected to be seen within this view corridor would include refuse trucks and vehicles transiting toward the project site along the access road, the use of landfill operations equipment, and office and maintenance buildings. The MSWLF will be designed in accordance with RCRA Federal Regulations Subtitle D. Buildings and a refuse vehicle scale to measure refuse loads are expected to be similar to facilities at the existing Kekaha MSWLF, with the exception of the office building, which is expected to be one-half the size of the existing office at the Kekaha MSWLF. Buildings are expected to be one to two stories tall and will adhere to requirements set forth in the County of Kaua’i Comprehensive Zoning Ordinance (CZO), unless a taller height is required for the storage of operations equipment or other purposes. Buildings will be designed to complement the character of the region and exterior materials selected to blend rather than contrast with the adjacent natural vegetation. Interior roads within the MSWLF site would be carefully located using the terrain as much as practicable to limit views of vehicles transiting to and from active areas of landfilling. This practice will be based on the need to weigh the benefit of visual mitigation against the maintenance of safe access within the site. In the longer term, the side slopes of landfill cells that are scheduled for closure would involve the use of revegetation, as appropriate, as the cells are incrementally closed. The vegetation selected would be compatible with the existing area rainfall and designed to match the vegetative cover of the surrounding area. Native vegetation will be used when possible. These design criteria are expected to reduce the building and landfill mass when viewed from Ma’alo Road and Ehiku Street across the Līhu’e Basin and are not expected to have a negative adverse impact on eastward views of Kālepa Ridge. No negative adverse effects to viewplanes are expected from the proposed project.

4.10.3 Mitigation Measures

With the proposed measures and practices identified above, no adverse effects with regard to construction and operations activities are expected. identified. No further mitigation measures are necessary or recommended.
5.0 POTENTIAL PROJECT EFFECTS AND MITIGATION MEASURES—PUBLIC SERVICES

5.1 TRAFFIC AND CIRCULATION

5.1.1 Affected Environment

The proposed project site in Ma'alo is approximately 2 miles from the urbanized areas of Hanamā‘ulu and Līʻu'e. It is currently accessed by unpaved roads off Ma'alo Road. Ma'alo Road connects with the section of Kūhiō Highway providing a link between Līʻu'e and the Kapa'a-Wailua area, near the base of a ravine and at the midpoint of a curve.

Connection of the MSWLF site to the public roadway system would include the construction of new paved roadways and connection to exiting roadways. Figure 2-14 identifies the proposed access route to the MSWLF site. The MSWLF site itself is not located near residential or developed areas, but the proposed access route E, which is expected to connect the proposed MSWLF site to Kūhiō Highway, is located near residences in Hanamā‘ulu. The offsite access route starts at the intersection of Kaua‘i Beach Drive with Kūhiō Highway. It continues southwest for approximately 1.4 miles along an existing cane haul road (“dirt road”) and the Roberts Hawaii Driveway, roughly following Kūhiō Highway (mauka of the Highway), until it intersects with Laulima Street. At Laulima Street, the 1.4-mile driveway continues north along existing cane haul roads to the southern corner of the proposed MSWLF. See Section 2.3 for a detailed description of the planned access route.

The following is a description of the existing key roadways located along the proposed access route:

- Kūhiō Highway is a State Highway traversing the northern and eastern shores of Kaua‘i, extending from Ha'ena State Park in the north to Līʻu'e, where it terminates at Rice Street at the junction with Kaumuali‘i Highway (State Highway 50), which continues west to Kekaha. Within the project area, Kūhiō Highway is designated as State Highway 56 and runs in a southwest–northeast orientation, generally providing one lane in each direction, widening to accommodate turn pockets or additional storage at select intersections. A second northbound lane is provided from the junction with Kapule Highway in Hanamāʻulu north to Wailua. Primarily functioning as a rural highway, Kūhiō Highway generally lacks sidewalks within the project area, with the exception of some isolated segments partially present on one side of the street through the urbanized portions of Hanamā‘ulu and Līʻu'e. Kūhiō Highway in this section of the island has a significant amount of traffic since it provides a link between Līʻu'e and the Kapa’a-Wailua area. Traffic is managed along the 4-lane portion of Kūhiō Highway between the Kapule Highway intersection to Wailua, using transient lane operations to increase vehicle throughput during the weekday morning peak commute periods. The transient lane is managed to provide a third, temporary contra-flow southbound travel lane during weekday mornings; at all other times, two lanes travel in both directions.

- Kaua‘i Beach Drive is a mauka–makai unimproved collector road with a gate providing local access from Kūhiō Highway to Nukoli‘i Beach Park and several resorts at Kaua‘i Beach. The Kaua‘i Beach Drive access is owned by Visionary LLC and Grove Farm Co., Inc. and features one travel lane in each direction, widening to two lanes in each direction within the Kaua‘i Beach resort area, but lacks sidewalks, highway signalization, and defined lane and shoulder widths.

- The existing Kaua‘i Beach Drive / Kūhiō Highway intersection is a 3-way, unsignalized intersection. The Hawai‘i State DOT ROW is 60 ft wide. The existing intersection can accommodate a minimum-design turning radius of 40 feet (i.e., WB-40 truck-turning movement). The Kaua‘i Beach Drive / Kūhiō Highway intersection does not have crosswalks. The Kaua‘i
Beach Drive / Kūhiō Highway intersection currently operates at level of service (LOS)7 F during both the weekday AM and PM peak hours due to side-street delay. To improve traffic flow, traffic cones are placed at the intersection to provide two southbound through lanes and a southbound left-turn pocket and maintain the slip lane into southbound Kūhiō Highway for westbound left-turn movements from Kaua‘i Beach Drive.

- An existing unimproved crane haul road connects the existing Kaua‘i Beach Drive / Kūhiō Highway intersection to the Roberts Hawai‘i Driveway and bypasses the town of Hanamā‘ulu.

- The Roberts Hawai‘i Driveway is a short collector roadway along the mauka side of Kūhiō Highway, primarily providing local access for a vehicle maintenance and storage yard for tour operator Roberts Hawaii, Inc. The Roberts Hawaii Driveway is mostly a gravel road, with a short paved section near its intersection with Kūhiō Highway, approximately 400 feet west of the Kūhiō Highway/Kapule Highway intersection.

5.1.2 Potential Project Effects

**Construction.** The major source of disturbance to traffic is expected from construction activities during deliveries and transit of vehicles to and from the job site. Occasional increases in construction traffic may also result from the periodic movement of vehicles to and from the job site to dispose of demolition debris. These impacts however will be short term in duration and will cease with the completion of the road improvements. Measures to minimize impacts to residents or visitors who may use the surrounding area roads would include the planning of construction activities during the daytime hours with no night work expected to be required, and the use of flagmen and/or traffic controls to maintain accessibility. Prior to construction a traffic management plan for work within public roadways will be prepared to mitigate impacts to traffic during construction.

**Operations.** The County commissioned the *New Kaua‘i Landfill Traffic and Roadways Engineering Feasibility Study* (AECOM 2016; Appendix F) to analyze traffic impacts associated with the proposed project. Projections of landfill associated refuse vehicle trips at the opening year of operations would be approximately 220 total vehicle trips per day (combined inbound and outbound), with future long-range projections at approximately 270 vehicle trips per day (combined inbound and outbound) (AECOM 2016).

The proposed access route was selected based on balancing multiple concerns including feasibility, directness of route, mitigation of potential traffic impacts, cost requirements, and related factors. The alternatives considered in the TREFS were also discussed with the community, and the resulting dialog became a key consideration in the selection of Route E, described in the TREFS as:

**Route E3:** Via Kaua‘i Beach Drive and Driveway 3. The intersection is Kaua‘i Beach Drive/Kūhiō Highway (a stop-sign-controlled T-intersection). Total route length is 2.5 miles.

The majority of community members expressed a preference for Route E (followed by Route D), as it utilizes the Kaua‘i Beach Drive / Kūhiō Highway intersection. Utilizing this intersection to access the MSWLF site from Kūhiō Highway moves the landfill intersection traffic along Kūhiō Highway the farthest away from the core of Hanamā‘ulu, thereby allowing landfill bound traffic from Kapa‘a and North Kaua‘i to be directed away from Hanamā‘ulu and Līhu‘e residences and businesses, minimizing landfill traffic impacts in these areas.

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7 The level of service (LOS) and capacity of a signalized intersection are the criteria by which the quality of traffic service is measured. The levels of service range between LOS A (relatively congestion-free) to LOS F (congested). Source: www.brookhavenny.gov, accessed 9/20/17.
With or without the proposed project, the Kauaʻi Beach Drive / Kūhiō Highway intersection would continue to operate at LOS F during both the weekday AM and PM peak hours in the MSWLF Opening Year Baseline (2020) and Future Long-Range Year (2040), and would satisfy the Manual on Uniform Traffic Control Devices (MUTCD) peak-hour traffic signal warrant during the weekday PM peak hour. Operation of the MSWLF would increase average delays and the Kauaʻi Beach Drive / Kūhiō Highway intersection would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour regardless of whether or not the RRP component is included. Overall potential traffic impacts of the proposed project are assessed in detail in the TREFS (AECOM 2016). Projected vehicle traffic generation for the various potential RRP components/facilities is included in the RRP FS (AECOM 2014).

The TREFS recommends several roadway improvements to minimize impacts of vehicles accessing the MSWLF site, including signalization of the Kauaʻi Beach Drive / Kūhiō Highway intersection and paving of the driveway to the site. The Kauaʻi Beach Drive / Kūhiō Highway intersection traffic signal would benefit existing traffic along Kūhiō Highway and traffic turning out of the Kauaʻi Beach Drive by significantly reducing delay and increasing safety. Due to the proximity of the signalized Kapule Highway/Kūhiō Highway intersection, traffic signals on Kūhiō Highway at the Kauaʻi Beach Drive and Kapule Highway intersections would need to be interconnected and coordinated. Proposed road designs at the MSWLF site would provide adequate turning room for trucks up to 48 ft in length and be capable of sustaining heavy traffic consisting of 20-ton multiaxle vehicles.

Specific improvements to the Kauaʻi Beach Drive / Kūhiō Highway intersection include:

- Signalize the intersection.
- Widen roads and pave with 2 inches of asphalt concrete pavement (ACP), 6 inches of asphalt concrete base (ACB), and 6 inches of aggregate subbase.
  - Right-turn lane in southbound direction on Kūhiō Highway: 12-ft lane, 150-ft storage length, and 150-ft taper length.
  - Right-turn lane on Kauaʻi Beach Drive onto Kūhiō Highway in southbound direction: 12-ft lane, 150-ft storage length, and 150-ft taper length.
- Construct two raised median islands with Americans with Disabilities Act (ADA)-accessible pedestrian ramps.
- Acquire additional ROW land (including survey maps).

Driveway 3 connects Laulima Street to the proposed MSWLF site. The proposed improvements to the driveway include:

- Stabilize shoulders and provide erosion control.
- Provide chain-link fence on both sides of the driveway.
- Provide noise barrier on side fronting residential housing. (Note: see Section 4.7 for further information concerning the need for this measure).
- Establish utility corridors to bring water, electricity, and phones to the proposed project site.
- Provide new pavement (including road widening): 2 inches of ACP, 6 inches of ACB, and 6 inches of aggregate subbase.
- Acquire additional ROW land (including survey maps).

The proposed roadway improvements would conform to State DOT and County of Kauaʻi requirements. As identified above, with the implementation of appropriate intersection improvements, the Kauaʻi Beach Drive / Kūhiō Highway intersection would continue to operate at LOS F, but would provide acceptable intersection operations and the third-most-direct access route to the proposed
MSWLF site, while directing some traffic away from the core of Hanamā‘ulu and Līhu‘e residences and businesses, as requested by local residents (AECOM, 2016).

5.1.3 Mitigation Measures

No mitigation measures are necessary or recommended.

5.2 UTILITIES

5.2.1 Affected Environment

The proposed MSWLF site requires electricity, telephone service, potable water and wastewater service. The nearest connection to electrical, telephone, and telecommunications services is at the intersection of Laulima Street and Kūhiō Highway. The nearest connection to the County water system is the 12-inch main along Kūhiō Highway at the intersection of Laulima Street. The nearest connection for wastewater service is along the Kūhiō Highway.

5.2.2 Potential Project Effects

Construction. During the construction of the proposed MSWLF access roads and utility corridors would be established to bring electric, telephone, telecommunications, and potable water to the proposed MSWLF site. Wastewater service is planned to be provided with an individual on-site wastewater system.

The electrical supply, telephone, telecommunications, potable water, and wastewater services would involve the following:

Electricity, telephone, and telecommunications services would connect at the intersection of Laulima Street and Kūhiō Highway. Utility poles carrying services would be constructed along Laulima Street and the site access road to the site entrance.

Water service would connect to the existing main at the intersection of Laulima Street and Kūhiō Highway. A 12-inch waterline would connect to the existing main and be installed along the access road to the MSWLF site.

An onsite septic system would be constructed including an individual wastewater system septic tank and absorption bed. The septic tank system would be designed and constructed in accordance with applicable regulations, and would periodically be pumped out for maintenance.

As required by the DOH, two septic treatment systems and absorption beds would be installed on the Ma‘alo parcel to handle uses from the proposed MSWLF and future RRP. The proposed MSWLF and future potential RRP wastewater systems would be designed to accommodate a maximum wastewater flow rate of 11,000 gallons per day (gpd) (based on DWM 1993), which equates to 2,200 gpd / 200 gpd per equivalent bedroom, or 55 equivalent bedrooms. Since flow would be more than 800 gpd, the required septic tank volume is:

\[ 1,000 + (Q - 800) \times 1.25 = 13,750 \text{ gallons} \]

Therefore, each system would include three 5,000-gallon concrete septic tanks in parallel. Assuming a low soil percolation rate of 60 minutes per inch, an absorption area of 330 ft² per equivalent bedroom would be required. Thus, the required absorption area is 18,150 ft². The allowable credit for leaching chambers (DOH offers absorption area credit for storage) is excluded for conservative design. Each system could consist of two roughly 70-ft × 130-ft beds in parallel, split by a distribution box.

See Conceptual Design Report (AECOM 2016; Appendix D) for further detail.
With the planned development and designs, no significant adverse impacts on utility systems, including wastewater systems, are expected from the construction of the proposed utilities.

**Operations.** All utility systems would comply with applicable codes. All buildings would be provided with sufficient power supply for the proposed building use and electrical equipment requirements. Electrical service panels would be provided with circuit breakers. An uninterruptable power supply system would be provided as emergency backup where required. An emergency generator would have sufficient capacity for operation of main buildings and scale house interior lighting, computers and communication systems, and pumping systems during a power failure. Shielded mast lighting compatible with Kaua‘i guidelines would be provided for emergency use on all roadways and parking areas, but would not be regularly turned on at night unless required by an emergency. The fire detection, alarm, and firefighting systems would be provided in accordance with local fire code requirements.

Onsite electrical and telephone lines and internet access would be provided to scale houses, offices, and buildings. Potable water would be provided to all buildings with working staff during operating hours. Development and operation of the onsite septic system would be for the proposed MSWLF and future RRP and would not affect exiting wastewater systems. Design requirements would avoid adverse environmental effects and include the following:

- Designing wastewater facilities in accordance with the requirements of the County of Kaua‘i and State DOH
- Ensuring that wastewater would not feed into the existing municipal treatment facilities

Development and operation of the proposed utilities would support the proposed MSWLF site and would not affect exiting utility systems.

**5.2.3 Mitigation Measures**

No mitigation measures are necessary or recommended.

**5.3 OTHER PUBLIC FACILITIES AND SERVICES**

Potential impacts of the proposed project on public facilities and services are presented herein. Information sources used include published annual reports and direct discussion conducted by SMS Research with governmental agency personnel. See Figure 5-1 for locations of the particular features and facilities discussed below.

**5.3.1 Affected Environment**

**Police Protection**

The Kaua‘i Police Department’s Līhu’e District runs along the county’s east and southern coasts, and extends from Kapa‘a in the north to the Maluhia Tree Tunnel in the south. The Kaua‘i Police Department does not fully staff the Ma‘alolo site at present. This situation is unlikely to change in the near future (SMS Research 2017).

**Fire Protection**

The Kaua‘i Fire Department’s Līhu’e Battalion serves Līhu’e and surrounding areas, including Hanamā‘ulu. The Līhu’e station houses an engine, a ladder truck, and maritime rescue vessel. No change in services is expected over the course of the next few years (SMS Research 2017).
Figure 5-1: Public Services Potentially Impacted by the Proposed Project
Source: SMS (2017)
Education

Three schools are located in the general vicinity of the proposed project. These include one public school, King Kaumuali‘i Elementary School (K-6); and two private schools, Hongwanji Preschool and Immaculate Conception School (Pre-school-9). The schools are all at least 1.3 miles from the proposed facilities (SMS Research 2017). The area’s rate of growth is on par with the overall County rate of growth. Current plans do not call for an additional school in the area.

Parks and Recreation

Local area parks include Isenberg Park, Lau Kona Park, Peter Rayno Park, Līhu‘e Park, Hanamā‘ulu Beach Park, and Nukoli‘i Beach Park, among others. The Kālepa Ridge Trail and other hiking opportunities are also located near the proposed project site. No planned parks or recreation changes have been identified in the general project area (SMS Research 2017).

Medical Services

Hanamā‘ulu and surrounding communities are served by three medical facilities: Wilcox Memorial Hospital, a Level III trauma center and the medical hub for Kaua‘i; Kaua‘i Medical Clinic and Ho‘ola Lahui Kaua‘i Community Health Center. Wilcox Hospital is located approximately 2 miles south of the Ma‘alo landfill site. SMS Research knows of no major changes in medical services planned for the study area (SMS Research 2017).

5.3.2 Potential Project Effects

Construction. The construction of the proposed MSWLF and future potential RRP would not result in an increase in demand for police or fire protection, education, library, parks or recreation, or medical services. No direct, secondary or cumulative impacts on these public resources are expected.

Operations. No changes in existing or additional public facilities and services are expected.

Police Protection. Implementing the proposed project should not result in any additional burden to the Kaua‘i Police Department. Unlike large residential or commercial developments, a MSWLF is not expected to increase population growth or other need for police protection.

Fire Protection. The potential for adverse impacts to the delivery or provision of fire fighting services is not expected. The Kaua‘i Fire Department indicated that they have no set standards for increasing services for landfill operations, and that they do not foresee the need to change level of services because of a new MSWLF and future RRP at the proposed location.

Planned landfill operational activities would include the compaction and covering of refuse with soil material that has proven effective in fire prevention. The cover material reduces oxygen from penetrating the landfill and reduces the opportunity for combustion. Further landfill preventative practices would include the use of earth stockpiles near the working face of active MSWLF cells to smother fires, fire breaks to serve as a buffer zone, and an on-site water truck as needed.

Site personnel for the proposed project would be instructed in proper fire fighting procedures and trained to notice smoldering or burning material from incoming waste loads. If smoldering or burning material from an incoming waste load is spotted, site personnel would dump the load out in an area located away from the working face, spread it out, and extinguish it. Equipment storage and maintenance fires would be handled with fire extinguishers. Fire extinguishers would be supplied on landfill work vehicles and all on-site fire fighting equipment would be regularly inspected and maintained to ensure optimum operating effectiveness. If a fire occurs at the working face of the landfill, the waste would be covered with soil to smother the burning material.
The material would then be excavated and completely extinguished with water. If site personnel and equipment cannot extinguish the fire the Kaua‘i Fire Department would be called to respond based on dispatches from the 911 emergency number.

**Education.** The proposed project is not expected to generate population increase and therefore will not generate the need for new school facilities. The proposed project is not expected to affect the existing schools nor to create a need for additional schools in the area.

**Parks and Recreation.** No additional park space is required by the existence of the MSWLF and future RRP. No project-related impacts are expected on the users of local parks listed above. Hikers using the Kålépa Ridge Trail may encounter some noise pollution, odors, and affected view planes from landfill operations. Some community members suggested that additional park space and improvements to local parks might be offered as part of a community benefits package (SMS Research 2017). Operational measures include the following:

- Muffling facility vehicles and internal-combustion equipment to minimize noise
- Implementing daily landfill cover and compost covers to minimize odors
- Installing landscaping to minimize affected view planes

**Medical Services.** No change in medical service levels would be required due to the proposed project and no impact is expected (SMS Research 2017).

### 5.3.3 Mitigation Measures

No mitigation measures are necessary or recommended.
6.0 POTENTIAL PROJECT EFFECTS AND MITIGATION MEASURES—MANMADE ENVIRONMENT

6.1 LAND USE AND OWNERSHIP

6.1.1 Affected Environment

The County proposes to develop and operate the new MSWLF on a 270-acre site near Ma'alō Road in Kaua‘i. The proposed MSWLF site (Ma'alō) is designated as TMK: (4) 3-9-002: 020, owned by the State of Hawai‘i, and comprises 2,162.78 acres. The future potential RRP would be established on the MSWLF site at a later date. This is because the use of the site requires the development of further detail in order for the site to be evaluated. A separate HRS, Chapter 343 document will be prepared for the RRP when this is completed.

The MSWLF site is located in the State Agricultural District, approximately 4 miles north of Līhu‘e, east of Ma'alō Road, mauka (west) of, and across Kālepa Ridge from Kūhiō Highway, and more than 1 mile inland from the Pacific Ocean. The site is not designated as Important Agricultural Land (IAL). Currently the project area is used for agricultural land uses mostly involving grazing with several areas that have been fallowed.

The proposed MSWLF site is located in the County Zoned Agricultural and Open Districts.

The County of Kaua‘i is presently in active discussions with the State for the use of TMK: (4) 3-9-002: 020, for the MSWLF. Both the County and State have agreed in principal for the use of the site for landfill purposes, contingent on further discussion and agreement on the details.

6.1.2 Potential Project Effects

**Construction.** Upon finalization and acceptance of the FEIS for this project, land rights would have to be acquired and the proposed facilities designed, permitted, approved, and constructed before the new MSWLF is ready to accept refuse. Although this process is expected to take several years, the proposed project is time-critical due to the need to maintain proper management of waste given the pending closure of the Kekaha MSWLF in approximately 10 to 12 years.

The proposed MSWLF site is the only site evaluated by the County that has a landowner willing to consider the use of the property for a landfill. While the County does have the option of condemning private land to create a landfill, the County greatly prefers to identify a willing landowner. The County would potentially save significant legal and related compensatory expenses (the value of which cannot currently be quantified), the delay to the project from a contested condemnation action, and would be able to avoid an undesirable situation if it has a willing landowner. The State has agreed in principal for the potential use of the Ma'alō site, contingent on the outcome of the EIS, further discussion, and agreement on details. Current land uses are not expected to be adversely affected due to the relative ease of relocation of tenants to nearby locations within the site over the projected 264-year life of the landfill.

Due to the location of the proposed Ma'alō site within the State Agricultural District, a State Special Use Permit may be required for development.

An alternative to the State Special Use Permit that is under consideration involves filing a State Land Use District Boundary Amendment (SLUDBA) petition for a change in the State Land Use District designation from Agricultural to Urban. If selected, the State Special Use Permit would not be required. The requirement for a County Change of Zone from Agriculture and Open to the General Industrial zone would also be required following the filing and approval of the SLUDBA in accordance with Article 6 of the County’s Comprehensive Zoning Ordinance. All permits and approvals for the proposed project would comply with the required regulations set forth by the County of Kaua‘i, Planning...
Department and State Land Use Commission. No adverse effects with the construction of the MSWLF on this State property, or land use or ownership would occur.

The proposed project would change 270 acres out of a total of 2,162.78 acres of the State owned parcel from agriculture/pasture to a public infrastructure facility serving the County. While the proposed Ma’alo MSWLF would change approximately 270 acres from agriculture/pasture uses, the site is not designated as IAL and the area removed would serve to prevent other areas of Kaua’i from being subject to potential use for a landfill for a period of approximately 264 years.

**Operations.** No adverse effects associated with the use of State land for the operations of the MSWLF would occur with the proper land use permits and approvals identified above.

### 6.1.3 Mitigation Measures

No mitigation measures are necessary or recommended.

### 6.2 Aircraft Wildlife/Bird Strike Hazard

#### 6.2.1 Affected Environment

The Līhu’e Airport (LIH) operations area is approximately 12,200 feet (2.3 miles) from the proposed landfill. Because exposed putrescible waste and other food materials at landfills attract wildlife, specifically birds that can increase the risk of aircraft bird strikes, the State Department of Transportation (DOT) and the Federal Aviation Administration (FAA) have expressed their opposition to the proximity of the proposed landfill to the existing LIH (See Appendices G and H containing correspondence from DOT/FAA).

No applicable laws or regulations were identified that restrict the siting or operation of the proposed landfill relative to the LIH. FAA Advisory Circular Number 150/5200-34A (AC-34A), _Construction or Establishment of Landfills near Public Airports_, 26 January 2006, restricts the siting of landfills within six miles of a category of airport that generally serves smaller aircraft (i.e., not LIH). The FAA AC-33B, _Hazardous Wildlife Attractants on or Near Airports_, 28 August 2007, identifies land use practices on or near airports that potentially attract hazardous wildlife and recommends against new MSWLFs within five statute miles from the farthest edge of the airport’s area of operation, if the attractant (new MSWLF) could cause hazardous wildlife movement into or across the approach or departure airspace. For this reason, the County has assessed wildlife hazards and has incorporated design modifications, and has prepared a wildlife management plan (operational procedures) in its proposed action. These actions will minimize wildlife attraction to the site and therefore the risk of aircraft bird strikes associated with the proposed landfill.

At LIH, 25 bird strikes were recorded during the calendar year of 2015, the most recent full reporting year available from the FAA Wildlife Strike Database (FAA, accessed June 29, 2017). Other than death or injury to birds, no damage to aircraft or injuries or fatalities to people occurred.

#### 6.2.2 Potential Project Effects

**Construction.** During construction, no wildlife attractants such as putrescible waste and standing water will be present; therefore, no increase in risk of aircraft bird strikes would occur.

**Operations.** In response to DOT and FAA’s concern over the increase in risk of bird air strike that could result from the proposed landfill, a LWHA, Appendix G of this EIS, was prepared in general accordance with _Wildlife Hazard Management at Airports: A Manual for Airport Personnel_ (Clearly and Dolbeer, 2005). The LWHA included 24 wildlife surveys over a 12-month period in the vicinities of the existing Kekaha Landfill and the proposed Ma’alo landfill site. These surveys were used to identify avian species, roosting and foraging behaviors, and avian flight patterns. These data were used to
assess the avian species likely attracted to the proposed landfill and the likelihood of the increased risk of airspace conflict with LIH aircraft operations. Findings include (Appendix G, Section 3.4, Summary of Avian Survey Results):

- **Cattle egret** are attracted to the existing Kekaha Landfill and adjacent shrimp ponds. They are abundant in the proposed Ma’alo MSWLF area and make routine flights through the area to access roosting areas. It is expected that cattle egret would likely forage at the proposed Ma’alo MSWLF site. Based on their flocking behavior and tendency to make long flights at high altitudes, they could cross LIH aircraft flight paths to access the proposed landfill site. For these reasons, design elements and operational procedures to deter cattle egret from the proposed landfill are recommended and are made part of the proposed action.

- **Common myna** are attracted to the existing Kekaha Landfill, but do not travel long distances. They are widely distributed in the proposed landfill area and, consistent with the observations at Kekaha Landfill, are rarely observed making long flights in the area. While common myna are not expected to cross LIH flight paths to access the proposed landfill site, common myna could interfere with low-flying (less than 100 feet in altitude) helicopter travel in the proposed landfill area. For these reasons, design elements and operational procedures to deter common myna from the proposed landfill are recommended and are made part of the proposed action.

- **Pacific golden plover, ruddy turnstone, Hawaiian stilt, black-crowned night heron, and other water birds** may have limited attraction to a leachate pond, stormwater basin, or short grass areas at the proposed landfill. They were not observed to be attracted to the active face of the Kekaha Landfill, but are known to make long flights that could interfere with aircraft. For these reasons, design elements and operational procedures to deter these species from the proposed landfill are recommended and are made part of the proposed action.

- **Owls** are attracted to the existing Kekaha Landfill and present at the proposed landfill site. For these reasons, design elements and operational procedures to deter owls from the proposed landfill are recommended and are made part of the proposed action.

- **Hawaiian geese** are attracted to the green waste pile at the closed Phase I part of the Kekaha Landfill, but there is no indication that they are attracted to the active face of the existing Kekaha Landfill. At the proposed landfill site, Hawaiian geese were observed using an irrigation ditch, flying, and using agricultural areas in the vicinity for roosting. For these reasons, and because of their size and flocking behavior, design elements and operational procedures to deter Hawaiian geese from the proposed landfill are recommended and are made part of the proposed action. To avoid impacts to Hawaiian geese (Nēnē) during operations of the proposed MSWLF, a biologist familiar with the nesting behavior of the Hawaiian goose should survey the project area prior to the initiation of any work, or after any subsequent delay in work of three or more days (during which birds may attempt nesting). If a nest is discovered, work should cease immediately and USFWS should be contacted for further guidance. In addition, all on-site project personnel should be apprised that Hawaiian geese may be in the vicinity of the project at any time during the year. If a Hawaiian goose (or geese) appears within 100 feet of ongoing work, all activity should be temporarily suspended until the Hawaiian goose (or geese) leaves the area of its own accord.

- **Other species** were observed at the existing Kekaha Landfill site and the proposed landfill site, but are considered less likely to present a risk to airport operations. Such species include: spotted doves and zebra doves. The design elements and operational procedures identified above for other avian species will also help to deter these species.

- **Last**, based on survey data and species behaviors, the following are not expected to fly through LIH flight paths to access the proposed landfill site: sparrows, finches, munias, gleaning birds, and ground feeding birds.
The recommendations presented in the LWHA were evaluated and prioritized by the County based on feasibility with respect to effectiveness, personnel availability, permitting requirements, cost, and/or available resources. A coordinated strategy to mitigate potential attractants and resulting wildlife that could pose hazards to LIH operations was identified and documented in the County’s Landfill Wildlife Management Plan (LWMP). The coordinated strategy involves multiple stakeholders (e.g., USDAWS, USFWS, DOT) and will evolve as plans and site conditions change. As such, the LWMP will be evaluated, reviewed, and revised as appropriate on an annual basis. The landfill Wildlife Coordinator (WC) will be key in this process and will consult with USDAWS, USFWS, DOT, and other agencies as needed in future revisions. This effort is expected to be finalized after the completion of the Final EIS for this project.

The WC will be responsible for the following:

- Form and maintain a working group consisting of LIH, USDAWS, and DOT staff who are responsible for airport wildlife hazard management on Kaua‘i. The working group will establish lines of communication and meet regularly to discuss wildlife hazard abatement activities, trends in wildlife movements, and other topics related to wildlife damage control.
- Coordinate wildlife management activities at the proposed landfill.
- Obtain and maintain all appropriate wildlife control permits and supplies, as necessary.
- Ensure that all individuals responsible for wildlife hazard management are properly trained.
- Ensure that all landfill personnel are familiar with the requirements and procedures of abating wildlife at the landfill.
- Maintain responsibility for continued wildlife monitoring to ensure the effectiveness of management actions. Identify and implement adjustments to the wildlife control measures, as appropriate.
- Keep detailed records of wildlife management activities.
- Monitor the LIH Air Traffic Control Tower (ATCT) radio communications to be informed of incoming helicopter traffic prior to hazing.
- Identify and coordinate cattle egret population reduction efforts at active roosts near the proposed landfill.
- Identify and designate safe “shooter positions” for cattle egret lethal control efforts.
- Coordinate with neighboring land managers, such as tree plantation managers, to address wildlife issues outside the proposed landfill boundaries.

The design elements and operational procedures are identified in the LWMP, provided as Appendix H. Costs associated with implementing the LWMP will be determined following the completion of the EIS process.

**Surface Water Design.** The proposed landfill site receives substantially more rainfall than the existing Kekaha Landfill. To minimize the potential for standing water that can attract Pacific golden plover, Hawaiian stilt, Hawaiian coot, or other wading and water bird species, water features at the proposed landfill will be designed and managed to limit their size and accessibility to wildlife. All surface water drainage ditches will be designed to remain dry except during rain events. Steep sides constructed of rock or concrete will be incorporated where feasible. Drainpipes, culverts, and screens will be designed for easy maintenance (e.g., removal of debris). The stormwater basin will be designed to remain dry between storms and standing water is not expected to remain in the basin for more than 48 hours. Netting or grid wire will be designed and installed above the high-level water line across the entire surface of the stormwater basin and the leachate evaporation pond. This nearly impenetrable form will deter wildlife that may initially be attracted to the features. This deterrent is an industry practice used to deter both wading birds and water birds from being attracted to the site (Cleary and Dolbeer, 2018).
2005). And as recommended by the U.S. Fish and Wildlife Service, the deterrent will be designed to prevent bird entanglement of protected bird species, such as Hawaiian waterbirds and Hawaiian geese, should they attempt to land on the deterrent (USFWS, 2016).

**Landscape Design.** To reduce vegetation that attracts birds, the proposed landfill will include placement of shrubs, ornamental trees, or hedgerows at least 1,000 feet outside of the working face and will avoid use of fruit and berry producing species. Because avian species observed at the Kekaha Landfill use adjacent trees and shrubs for roosting and shelter, the vegetation at the proposed landfill will be maintained to prevent overlap and closed canopies.

In other areas of the proposed landfill, landscaping will be minimal. Instead of traditional landscaping, geo-fabric and decorative gravel will be used around the office, administrative, and parking areas. Regular maintenance of these areas will occur to keep weeds under control.

**Buildings/Structures Design.** Buildings/structures associated with the proposed landfill will be designed to avoid over-hanging ledges or tall objects for roosting and perching. Accessory items to further reduce roosting and perching, such as bird spikes, will also be used.

**Lighting Design.** To minimize lighting that attracts birds, the proposed landfill will use the following recommendations from the USFWS and Kaua’i Seabird Habitat Conservation Program:

- Avoid up-lighting by shielding light fixtures and aiming fixtures downward; and
- Use full cutoff fixtures, fully shielded wall-pack and wall-mount fixtures, fully shielded walkway bollards, or other fully shielded light designs that meet the project needs.

**Putrescent Waste Control Operations.** To reduce exposure of putrescibles at the active face of the proposed landfill, the active face will be kept as small as practicable and covered whenever not actively receiving waste. In addition to the daily soil cover, an alternative daily cover will include a binding agent such as Posi-Shell®. Posi-Shell or an equivalent (a blend of clay binders, reinforcing fibers, and polymers) creates a mortar, when mixed with water or leachate, that can be spray-applied to the landfill active face. When used as an alternative daily cover, it can increase the life of the landfill as it is thinner than conventional daily soil cover. Frequent use of the binding agent throughout the day will minimize waste exposure and odors, thereby reducing the wildlife/bird attraction to the active landfill face.

In addition to the above, the County is in the process of evaluating the Līhu‘e Waste Water Treatment Plant (WWTP) anaerobic digesters to determine the feasibility of accepting all of Kaua‘i island sludge and food waste. Depending on the outcome of the evaluation and the feasibility of developing a WWTP-based gas to energy solution, the County could legislate banning food wastes from MSWLFs and divert these forms of putrescible waste to the Līhu‘e WWTP (County of Kaua‘i, Solid Waste Division, March 25, 2018).

**Vegetative Cover Control Operations.** To control vegetation that attracts birds, geo-fabric and decorative gravel will be used around the office, administrative, and parking areas. Vegetative cover on other inactive portions of the landfill facility will be controlled as follows:

- Depending on the observations by the WC and seasonal vegetation growth, the grasses within a buffer zone around the active landfill cell will be maintained at appropriate heights to reduce birds. For example, the Hawaiian goose, Pacific golden plover, cattle egret, and other species are often attracted to short grasses, while tall grasses may attract the Hawaiian goose and other species for nesting. Grasses and other herbaceous plants will be moved before they develop seed heads, which provide food for wildlife and insects.
- The stormwater basin and leachate pond (covered with netting or grid wire) will be maintained free of vegetation. Trees and shrubs will not be permitted to become established in waterbodies or drainage ways at or around the proposed landfill.
• County-managed lands that are not being used for landfill purposes will not be used for agricultural or grazing purposes.

• If mowing proves to be ineffective at reducing wildlife attraction to the unused areas, or creates a wildlife hazard by attracting cattle egret, the County may consider using goats for vegetation control. If goats or other grazing animals are used, they will be actively rotated and monitored by the WC to ensure they do not create a new potential hazard from overgrazing which could lead to increased susceptibility of the ground to erosion from storm water runoff.

Active Wildlife Control Operations. A variety of active wildlife controls will be used to deter birds and wildlife that attract birds. Such controls are described below and include pyrotechnics, long-range acoustic devices (LRAD), bioacoustics, lethal control, reduction of small mammal prey, and wildlife control on neighboring properties.

• Pyrotechnics, such as hand-held/launched 15-millimeter screamers and bangers or 12-gauge shell-crackers, will be used for hazing operations. They can be used to flush and direct flocks of birds in a desired direction, and will be used as needed during the day, year-round. While pyrotechnics have been found to be the most effective bird harassment method, they need to be varied to maintain their effectiveness.

• A LRAD will be installed and used at the proposed landfill to project tones that are considered by the wildlife to signify danger (e.g., loud reports, a human voice, or predator wildlife calls). The tones would be directed toward a targeted receptor. LRADs have a longer range and higher degree of accuracy over pyrotechnics.

• Bioacoustic deterrents broadcast recorded bird distress alarm calls. They will be appropriately placed so that birds will fly away from the landfill.

• Lethal control, with a shot gun, is expected to be needed for individual birds that become habituated to pyrotechnics and other deterrents.

• Reduction of small mammal prey will in turn reduce the attraction of owls at the proposed landfill. The method of small mammal prey control (e.g., trapping, fumigation, habitat modification, and use of toxic baits) will be dependent on the seasonal life cycle of the prey population.

• Wildlife control on neighboring properties will involve coordination with neighboring land managers/owners. The existing neighboring properties, consisting of agricultural fields, grazing lands, and a eucalyptus plantation, are wildlife attractants. The WC, as practicable, will make efforts to include cattle egret lethal control efforts at nearby roosts on neighboring properties. Such efforts should help to reduce cattle egrets at the proposed landfill and serve to promote native species conservation efforts in the area.

While the County is responsible for implementing the the LWMP, wildlife hazard control operations will be carried out through a Cooperative Service Agreement with the USDAWS and the DOT Airports Division. The County will also work with USDAWS to cover the proposed landfill wildlife controls under USDAWS’ existing permits or seek to obtain a Migratory Bird Treaty Act (MBTA) Depredation Permit from USFWS and the State. Such permit coverage is needed to allow hazing and lethal removal of protected species such as the cattle egret. To harass or conduct lethal take of other protected bird species, an Incidental Take Permit from the USFWS and/or an Incidental Take License from the State will be required. Last, the use of herbicides, pesticides or a rodenticide to eradicate small mammals will require compliance with the Federal Insecticide, Fungicide, and Rodenticide Act. These acts, permits, and licenses are discussed in Section 7.0 and Section 8.0.

All active controls need to be planned and implemented in consideration of helicopter flights in the area, as bird hazing can result in inadvertent dispersal in a flight path. In general, the WC will monitor LIH Air Traffic Control Tower and pilot communications through radio channel(s). Additionally, the WC will coordinate with helicopter companies to: encourage the use of altitudes greater than 1,500 feet in
the vicinity of the proposed landfill, possible minimization of their use of the saddle area of Kālepa Ridge near the proposed landfill, and planned bird hazing operations.

6.2.3 Mitigation Measures

Mitigation includes all operational wildlife control measures identified in the LWMP that will be monitored and revised as landfill and wildlife conditions evolve. Mitigation will reduce the risk of aircraft wildlife/bird strike hazards.

6.3 Socioeconomics

The potential social and economic impacts of the proposed project (construction and operation of a new MSWLF at Ma'alo) on the community are presented herein. Further details are provided in Socioeconomic Impact Assessment, New Kaua'i Landfill and Resource Recovery Park, Ma'alo, Kaua'i, Hawai'i (SMS Research 2017; Appendix L).

6.3.1 Affected Environment

The construction and operation of a MSWLF or future potential RRP on Kaua'i would affect the communities around the site and the entire island. A new landfill would have implications for all Kaua'i residents by providing a management system for the disposal of MSW that cannot otherwise practicably be reduced, re-used, or recycled. All of Kaua'i’s residents and businesses would be affected by the proposed action. The neighborhood most affected by the daily operations of the MSWLF and future RRP would be Hanamā'ulu, since it is nearest to the project site.

Island of Kaua'i

The island of Kaua'i is geologically the oldest of the major Hawaiian islands, politically the westernmost of Hawai'i's four counties, and demographically the fourth most populated island after O'ahu, Hawai'i, and Maui. According to the 2016 American Community Survey (ACS), the estimated population of Kaua'i was 72,029, representing a 23.2 percent increase from 2000. The most recent population projection (DBEDT 2012b) suggests that growth may slow somewhat from approximately 14.8 percent per decade between 2000 and 2010 to approximately 11 percent per decade between 2010 and 2040 (see Table 6-1) (SMS Research 2017).

Table 6-1: Kaua'i Population Forecasts, 2010–2040

<table>
<thead>
<tr>
<th>Parameter</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>2040</th>
</tr>
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<tbody>
<tr>
<td>Resident population</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>67,226</td>
<td>71,380</td>
<td>75,640</td>
<td>80,000</td>
<td>84,380</td>
<td>88,730</td>
<td>93,020</td>
</tr>
<tr>
<td>0–4 years</td>
<td>4,337</td>
<td>4,700</td>
<td>5,020</td>
<td>5,400</td>
<td>5,770</td>
<td>6,140</td>
<td>6,500</td>
</tr>
<tr>
<td>School-age children</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5–11 years</td>
<td>5,876</td>
<td>6,210</td>
<td>6,660</td>
<td>7,130</td>
<td>7,640</td>
<td>8,160</td>
<td>8,680</td>
</tr>
<tr>
<td>12–13 years</td>
<td>1,608</td>
<td>1,710</td>
<td>1,820</td>
<td>1,960</td>
<td>2,080</td>
<td>2,240</td>
<td>2,380</td>
</tr>
<tr>
<td>14–17 years</td>
<td>3,285</td>
<td>3,370</td>
<td>3,580</td>
<td>3,800</td>
<td>4,070</td>
<td>4,340</td>
<td>4,650</td>
</tr>
<tr>
<td>18–64 years</td>
<td>42,026</td>
<td>42,560</td>
<td>42,620</td>
<td>43,100</td>
<td>44,390</td>
<td>46,390</td>
<td>48,950</td>
</tr>
<tr>
<td>65 years and older</td>
<td>10,095</td>
<td>12,830</td>
<td>15,940</td>
<td>18,620</td>
<td>20,430</td>
<td>21,470</td>
<td>21,870</td>
</tr>
<tr>
<td>Average daily visitor census</td>
<td>16,126</td>
<td>18,160</td>
<td>18,880</td>
<td>19,770</td>
<td>20,640</td>
<td>21,440</td>
<td>22,210</td>
</tr>
<tr>
<td>De facto population</td>
<td>83,352</td>
<td>89,540</td>
<td>94,520</td>
<td>99,770</td>
<td>105,020</td>
<td>110,170</td>
<td>115,230</td>
</tr>
</tbody>
</table>

Source: DBEDT (2012b) Projections 2040; for details, see DEIS Appendix L, Table A-2.

Hawai'i has witnessed rapid tourism since statehood that has supplanted agriculture and military spending as the major source of jobs and income. However, due to Kaua'i’s relatively small economy, tourism has and continues to have a large impact on the island. According to the 2010 census, Kaua'i had 16,126 average daily visitors (DBEDT 2012b). Kaua'i’s visitor population is expected to grow at rates similar to that of the resident population (DBEDT 2012b). Expected total growth between 2010
through 2040 is approximately 38 percent. The average daily visitor census is expected to grow between 13 and 10 percent per decade from 2010 to 2040 (Table 6-1) (SMS Research 2017).

Population forecasts for the island of Kaua‘i over the next few decades show continued growth of population and housing. Updated population forecasts are being prepared for the Kaua‘i General Plan Update 2040 but have not been released as of this writing. Preliminary discussion with the County Planning Department suggests they will not differ significantly from those shown in Table 6-1. The expected resident and visitor population increases will increase demand for recycling, landfilling, and other waste management strategies and facilities. Greater numbers of people on the island require, and will continue to require, a suitable location to dispose of existing and future MSW.

Hanamā‘ulu

The proposed Ma'alo MSWLF site would be located in the Hanamā‘ulu ahupua'a on the mauka side of Kālepa Ridge more than a mile north of the community of Hanamā‘ulu. The property on which the MSWLF and future RRP would be located is currently owned by the State of Hawai‘i, which is leasing the proposed site to ranchers. The parcel is classified as agricultural and is not located near residential or developed areas.

The current village of Hanamā‘ulu takes its name from the sugar mill that was built in the area and named for the ahupua‘a in which it was located. Sugar cane cultivation was the dominant influence on Hanamā‘ulu’s social and economic life for 150 years. Līhu‘e Plantation was in full operation with the completion of the Līhu‘e Mill in 1851. Completion of the Hanamā‘ulu irrigation ditch in 1856 brought water to the Hanamā‘ulu area, and Hanamā‘ulu’s first sugar crop was harvested a year later. Līhu‘e Plantation leased the entire Hanamā‘ulu ahupua‘a in 1863, and purchased 9,177 acres of prime sugar land in 1870. The Hanamā‘ulu Mill, the plantation’s second mill, operated between 1877 and 1920, after which cane was hauled to the Līhu‘e Mill for processing. In 1951, the plantation initiated the use of trucking to transport cane from the fields to the Līhu‘e Mill. For the next 50 years until its closing in 2000, Hanamā‘ulu grew and harvested sugar crops.

From the beginning, the plantation was at the center of social and economic life of the mill town. It provided employment, housing, commercial and retail operations, and other services to residents. In the decade before statehood, Līhu‘e Plantation made an important change in the way it provided housing, by phasing out old camps, and developing housing subdivisions where plantation workers could own their own homes. The process continued through the early 1980s when the last camp, Kealia, closed and the last homes at Wiliko II subdivision sold. The plantation also donated land for the Hanamā‘ulu elementary school and additional acres for a community park.

In November 2000, Līhu‘e Plantation ceased all operations at Hanamā‘ulu. The immediate result was the loss of over 400 jobs in the area. Less economic opportunity exists now because no industry has replaced sugar cultivation. Jobs are few for those with agricultural skills, and the available jobs are farther away from home. That means higher transportation costs and more traffic problems.

According to the ACS 2015, the Hanamā‘ulu Census Designated Place (CDP) consists of around 4,946 residents in approximately 1,129 households, and has a younger population than that of Kaua‘i County as a whole. The median age of its residents (36.4) is younger than the median age of the county as a whole (41.6). The average household size (4.35) is larger than the county average (3.07). Of the 1,129 occupied housing units, 57.1 percent are owner-occupied, which is lower than the county average of 61.6 percent.

Employment status in the Hanamā‘ulu CDP is similar to that of Kaua‘i County. Approximately 68.2 percent of the population over 16 years of age is in the labor force (compared to 64.9 percent for the island). Approximately 96.5 percent of those in the Hanamā‘ulu labor force is employed (compared to 94 percent for the island). The mean travel time to work (21.3 minutes) is essentially equal to the county average (22.4 minutes), but a larger share of Hanamā‘ulu residents either carpool (16.6 percent versus 10.2 percent) or take public transportation (2.3 percent versus 1.0 percent).
The largest industry in Hanamāʻulu is arts, entertainment, recreation, accommodation, and food services, followed by retail trade, educational services, and health care and social assistance. These are also the top industries for the County, albeit in different order. According to the ACS 2015, the mean and median household incomes ($74,705 and $60,568, respectively) are less than that of the County ($79,608 and $65,101, respectively). Likewise, the median earnings for workers in Hanamāʻulu ($26,142) are less than that of the County ($31,940).

6.3.2 Potential Project Effects

6.3.2.1 Economic Effects

This subsection reviews the impacts that this project will contribute to the economic environment. The technical terms make a distinction between different types of impacts. First, in economic analysis, a distinction is made between impacts of the actual construction and operation of a project, and the effects of project-related spending throughout the local economy. In discussion of jobs, earnings, and taxes, three broad types are distinguished (SMS Research 2017):

- Direct jobs/earnings/taxes are immediately involved with construction of a project or with its operations. Direct jobs are not necessarily on site: construction supports company personnel in offices and base yards, as well as on site.
- Indirect jobs/earnings/taxes are created as businesses directly involved with a project purchase goods and services in the local economy.
- Induced jobs/earnings/taxes are created as workers spend their income for goods and services.

Direct, indirect, and induced economic impacts in Hawai‘i can be estimated using multipliers from a model of input-output relations developed and refined by State of Hawai‘i researchers (SMS Research 2017).

To estimate the net impact of the proposed project an economic analysis was completed for construction spending and operating costs for Phase I of the proposed project using model parameters from the Inter-County Input-Output (I-O) Model, State of Hawai‘i 2007 (DBEDT 2012a). This DEIS provides projections for the use of the Phase 1 area with an estimated lifespan of 36 years. Beyond this period, the projections become increasingly unreliable. This is because future projections are based on multiple factors such as historical performance, and projected economic and population conditions. Individual errors inherent in projections for each of these measures become compounded and increase in magnitude as the data is combined and multiplied to obtain estimates in future years. In addition, the I-O models used to estimate indirect and induced impacts of the project rarely extend beyond 10 or 20 years. Preparers understand the reliability problem with such projections, and users are unwilling to present results of analysis based on long forecasts, as making project decisions based on extended forecasts may lead to incorrect conclusions (SMS Research 2017).

Although construction expenditures are expected to be substantial for the new MSWLF, operating expenditures will be marginal since the proposed project would replace the existing Kekaha MSWLF. Therefore, operating expenditures for the MSWLF were conservatively excluded. The future potential RRP component, however, would be a new facility with substantial construction and new operating expenditures (SMS Research 2017).

Cost estimates are prepared for Cell 1.1 within the Phase 1 area. The lifespan of Cell 1.1 is approximately 9 years. Future costs of the remaining Phase 1 area are anticipated to be roughly similar but subject to price escalation, inflation, and other future factors.
Although construction has a positive impact on the County economy, funds for the proposed project would be generated from the tip fees assessed to haulers for the use of the MSWLF. These tip fees are translated to the consumers and businesses through maintenance fees and collection fees. As a result, financial resources for construction would come from reallocation of funds that are already a part of the County economy rather than newly generated wealth or external investment. The reallocation of government monies results in a negative impact on jobs, earnings and taxes. These positive and negative impacts must be considered to gain a clear picture of the economic impact of the proposed project (SMS Research 2017).

Employment

Table 6-2 shows the estimated number of jobs (direct, indirect, and induced) that would be created by the proposed project for the MSWLF located on the Ma'alo parcel. The landfill component would produce 311 person-years of employment (person-years of employment is the number of full-time equivalent positions required to complete the work defined by the estimated cost of construction during a specified period). The proposed MSWLF project would also produce a net 57 jobs over the course of Phase I (SMS Research 2017).

Construction spending for access roads and utilities would be approximately $16,565,500 which would produce 124 person-years of employment offset by the displacement of 102 jobs due to reduced personal consumption spending. A net 23 new jobs will be generated for a total 79 new jobs (SMS Research 2017).

Table 6-2: Proposed Action Economic Impact on Jobs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Project Phase</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MSWLF</td>
</tr>
<tr>
<td>Construction spending</td>
<td>Total</td>
<td>$41,371,784</td>
</tr>
<tr>
<td></td>
<td>Multipliers</td>
<td>7.51355609</td>
</tr>
<tr>
<td></td>
<td>All jobs created</td>
<td>311</td>
</tr>
<tr>
<td>Personal consumer spending</td>
<td>Total</td>
<td>$41,371,784</td>
</tr>
<tr>
<td></td>
<td>Multipliers</td>
<td>6.129177694</td>
</tr>
<tr>
<td></td>
<td>All jobs created</td>
<td>254</td>
</tr>
<tr>
<td>Net job impact</td>
<td>57</td>
<td>22</td>
</tr>
</tbody>
</table>

Sources: MSWLF and Access Road spending estimates from Conceptual Design Report (AECOM 2016; Appendix D); multipliers from Hawai’i Inter-County I-O Model 2007 (DBEDT 2012a)

Not all new jobs are necessarily be located on site. As a rule of thumb, approximately 20 percent of direct construction jobs are off-site (e.g., in base yards and offices). Indirect and induced jobs are created throughout the state, with most of them on Kaua'i. They are likely to be concentrated in commercial and/or industrial centers, rather than near a job site (SMS Research 2017).

Earnings

Table 6-3 shows the estimated earnings impact (direct, indirect, and induced) that would be created by the proposed project. Positive workforce earnings associated with constructing the proposed project’s MSWLF component would amount to $19.8 million in direct, indirect, and induced earnings. An equivalent expenditure in consumer spending would produce approximately $8.9 million in all earnings. On balance, the net positive impact of MSWLF construction expenditures on earnings in the County would be approximately $10.9 million over the course of Phase I (SMS Research 2017).
Table 6-3: Proposed Action Economic Impact on Earnings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Project Phase</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MSWLF</td>
<td>Access Roads and Utilities</td>
</tr>
<tr>
<td>Construction spending</td>
<td>Total</td>
<td>$41,371,784</td>
</tr>
<tr>
<td></td>
<td>Multipliers</td>
<td>0.47851897</td>
</tr>
<tr>
<td></td>
<td>Earnings impact</td>
<td>$19,797,183</td>
</tr>
<tr>
<td>Personal consumer spending</td>
<td>Total</td>
<td>$41,371,784</td>
</tr>
<tr>
<td></td>
<td>Multipliers</td>
<td>0.21552125</td>
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<tr>
<td></td>
<td>Earnings impact</td>
<td>$8,916,498</td>
</tr>
<tr>
<td>Net earnings impact</td>
<td></td>
<td>$10,880,685</td>
</tr>
</tbody>
</table>

Sources: MSWLF and Access Road spending estimates from Conceptual Design Report (AECOM 2016; DEIS Appendix D); multipliers from Hawai‘i Inter-County I-O Model 2007 (DBEDT 2012a)

Construction of the access roads and utilities component is estimated at $11.7 million and would produce $5.6 million in workforce earnings (direct, indirect, and induced). The personal consumer spending offset would amount to approximately $2.5 million, leaving a net earnings impact of $3.1 million for the roads and utilities components in Phase I (SMS Research 2017).

These earnings would boost the local economy, as many of the dollars would be used to purchase goods and services from other industries. Housing costs such as shelter and utilities account for more than 33 percent of consumer expenditures. Food and transportation also account for a large amount of consumer spending (14–18 percent). It can be expected these patterns will continue in the future, creating economic growth in several industries (SMS Research 2017).

Fiscal Impacts

Table 6-4 shows the estimated fiscal impact (direct, indirect, and induced) that would be created by the proposed project. For the MSWLF component, spending $41.4 million in Phase I would result in a State tax increase of approximately $2.8 million. The average ratio of County of Kaua‘i tax revenues to State of Hawai‘i tax revenues from all sources is 0.024. Applying that ratio to the State tax base estimate, the MSWLF construction expenditure would generate an increase of approximately $67,578 in Phase I. The personal consumer expenditure offset, however, would generate approximately $37,238 in new tax revenues from personal consumer spending for the same expenditure. In total, construction spending for the MSWLF component of the proposed project would result in an estimated positive impact of $30,340 in Kaua‘i County tax revenues (SMS Research 2017).

The analysis for the access roads and utilities component also requires an adjustment for government spending, and produces approximately $12,148 in new tax revenues for Kaua‘i County (SMS Research 2017).

In total, for all three project components, there would be a small positive impact in Kaua‘i County tax revenues of approximately $42,488 during Phase I (SMS Research 2017).
Table 6-4: Proposed Action Economic Impact on Taxes

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Project Phase</th>
<th></th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MSWLF</td>
<td>Access Roads and Utilities</td>
</tr>
<tr>
<td>Construction spending</td>
<td>Total</td>
<td>$41,371,784</td>
<td>$15,565,500</td>
</tr>
<tr>
<td></td>
<td>Multipliers</td>
<td>0.06805967</td>
<td>0.06805967</td>
</tr>
<tr>
<td></td>
<td>All State taxes</td>
<td>$2,815,750</td>
<td>$1,127,443</td>
</tr>
<tr>
<td></td>
<td>Est. County taxes</td>
<td>$67.578</td>
<td>$27,059</td>
</tr>
<tr>
<td>Personal consumer spending</td>
<td>Total</td>
<td>$41,371,784</td>
<td>$16,565,500</td>
</tr>
<tr>
<td></td>
<td>Multipliers</td>
<td>0.03750338</td>
<td>0.03750338</td>
</tr>
<tr>
<td></td>
<td>All State taxes</td>
<td>$1,551,582</td>
<td>$621,262</td>
</tr>
<tr>
<td></td>
<td>Est. County taxes</td>
<td>$37,238</td>
<td>$14,910</td>
</tr>
<tr>
<td>Net fiscal impact (Kauaʻi County Taxes)</td>
<td>$30,340</td>
<td>$12,148</td>
<td>$42,488</td>
</tr>
</tbody>
</table>

Sources: MSWLF and Access Road spending estimates from Conceptual Design Report (AECOM 2016; DEIS Appendix D); multipliers from Hawaiʻi Inter-County I-O Model 2007 (DBEDT 2012a)

Construction. The economic impacts of construction at the proposed project site are modest and positive. Construction of the proposed MSWLF would create 79 new jobs (person-years of employment). Construction of the MSWLF would generate approximately $15.2 million in local earnings and approximately $42.5 thousand in taxes. All of these estimates include the direct, indirect, and induced impacts of the proposed MSWLF.

Operations. The economic impacts of operations would be marginal since the proposed project would replace the existing Kekaha MSWLF.

6.3.2.2 Community Issues and Concerns

Information used to prepare the assessment of the proposed project’s issues and concerns included the following:

- Community meetings conducted by the County of Kauaʻi in 2012 for the EIS for the proposed Maʻalo MSWLF and future RRP site
- Interviews with selected persons who SMS Research knew to be knowledgeable about the affected communities and activities related to the proposed action, and public concerns from the 2016 New Kauaʻi Landfill Traffic and Roadways Engineering Feasibility Study conducted by the County of Kauaʻi to assess public concerns regarding the proposed project’s access route, which included: additional interviews in 2012, 2013, and 2014 with selected persons known to be knowledgeable about the affected communities and activities related to the proposed action; public outreach via the mailing of fact sheets and public comment sheets in 2014; and a public meeting to gather opinions and comments in 2014 and 2016 (AECOM 2016; Appendix F).

Information from existing data sources was also used and are referenced in Appendix F and Appendix L.

For several years, Hawaiʻi residents have responded to polls on the major issues facing the community by pointing to the economy and education as the most important issues for the State (Figure 6-1). Environmental issues (e.g., environmental protection, recycling) do not achieve the same salience.
6.3.2.2.1 Issues and Concerns Identified from 2012 Public Meetings

In 2012, the County of Kaua’i conducted four community meetings about the proposed MSWLF and future RRP site. The most frequently mentioned and urgently stated concerns were for the treatment of access roads and driveways. Other issues of particular prominence were flooding and run-off, land use concerns, and the future RRP. Specific concerns included the following (SMS Research 2017):

- **Access road:** Many residents expressed concern about increased traffic because of the new landfill. In particular, residents were worried about the possibility of more traffic jams, the lack of a bypass road to alleviate the additional traffic generated by a new landfill in the area, and the safety implications of combining a mix of small and large vehicles in the same vicinity with greater frequency.

- **Flooding and run-off:** Residents were concerned about the detrimental impact of flooding at the landfill and the possibility of wastewater run-off entering streams and drinking wells. Residents were also concerned about the impact of wastewater run-off affecting local area wildlife.

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9 One issue identified during the community meetings was the choice of access route, which emerged as a significant public concern. These meetings, along with other feedback gathered during interviews, alerted the County to the public’s concerns about the access routes. In response to these concerns, the County conducted the TREFS, including the social impacts assessment for it, to analyze potential access routes and solicit public comments and feedback on the various alternatives that can connect Kūhiō Highway to the proposed project site.
• **Land use concerns:** Residents expressed concern that the proposed Ma’alo landfill will be built on land classified for agricultural use. Some residents questioned how building a commercial operation on land designated as agricultural could be possible, while others questioned the utility of sacrificing agricultural land for non-agricultural use.

• **Future Proposed RRP:** Residents had questions about the specific activities and services that would take place at the RRP, as well as questions about its location vis-à-vis the landfill. Residents wanted more information about the RRP capacity to generate electricity and other tangible goods.

### 6.3.2.2.2 Issues and Concerns Identified from Interviews and the 2016 New Kauai’i Landfill Traffic and Roadways Engineering Feasibility Study

Interviews with community leaders, individuals, and community groups solicited strong and wide-ranging reactions to the proposed project. Presented below is a synthesis of responses to questions about the nature of the Ma’alo community, the advantages and disadvantages of the proposed project, and potential mitigation measures proposed by interviewees (SMS Research 2017).10

**The Nature of the Ma’alo Community**

The proposed project site and immediate vicinity is currently in use as pasture and agricultural land. The Ma’alo site is visually separated from major residential areas and nearby public roadways by natural features like Kālepa Ridge and the natural topography of the area. The geography is such that the exact definition of a “Ma’alo Community” or even the community nearest the proposed project site is not immediately obvious. As a result, interviewees were asked to identify the “Ma’alo Community” and those that would be most affected by the proposed project. The majority view was that, geographically and socially, the Ma’alo Community consists primarily of the residents of Hanamāʻulu.

Other minority views of the Ma’alo Community included the residents of North Līhu’e, farmers and ranchers, and hikers.

**Advantages of the Ma’alo Landfill**

The three prominent advantages identified by interviewees include the following:

**Location.** Nearly all interviewees mentioned the location of the proposed landfill as an advantage of the site. Interviewees thought that its central location within the county would be beneficial in reducing costs associated with hauling trash from communities across the island. Many thought it would reduce travel times and costs for private citizens who need to travel to the site to get rid of waste. One interviewee thought Ma’alo’s location was advantageous because it provided easy access from Līhu’e Airport and Nāwiliwili Harbor. In addition, interviewees thought that the location was suitable because it was out of the sight of almost everyone on the island.

**Future Proposed RRP.** A handful of interviewees reported that the addition of a RRP was an advantage of the proposed landfill. These individuals believed the RRP facilities would help extend the life and usefulness of the proposed project, and that the RRP offers consolidated solutions for solid waste management.

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10 In the course of the interviews, interviewees were assured anonymity and confidentiality by SMS Research. This allowed for free and frank conversations. As such, the names of interviewees are not presented.
**Economic Growth.** Some interviewees cited economic growth as an advantage of the proposed project. These individuals believe jobs created because of the construction and maintenance of the facilities would be a boost to the economy, especially in the Hanamāʻulu community.

**Disadvantages of the Maʻalo Landfill**

Perceived disadvantages of the proposed project by the interviewees varied, but focused on eight themes:

**Water Contamination.** Another concern raised was the possibility of water contamination from the landfill. Residents were worried about heavy rains that could result in flooding at the landfill site. They were concerned that overflow of water and waste could run off the site and seep into drinking water wells, reservoirs, or into the Wailua River. They were concerned that such infrequent but catastrophic events could have deleterious effects on health, the environment, wildlife, and commerce, and would be costly to clean up and restore. Interviewees reiterated that Maʻalo lies in an area more prone to heavy rain than the existing landfill in Kekaha, and is therefore more susceptible to water-related problems.

**Pollution and Nuisance.** Several expressed concern about the possibility of air pollution caused by the landfill. They stated that waste particulates could cause respiratory complications for residents in nearby neighborhoods. One interviewee suggested that medical issues were experienced by members of the Kekaha community because of the landfill there. Some also mentioned that the proposed project could create dust and odor nuisances, as they stated the existing Kekaha landfill does, and expressed that these issues could be worsened during Kona winds. Although not as prevalent, concern was raised about noise pollution. However, concerns were not so much about noise at the landfill or RRP; rather, that the large trucks transporting waste would produce more unwanted noise in the community. Most admitted that, with the exception of the water run-off issue, these other nuisances would be associated with any landfill site. Most also felt that the County would certainly be aware of these issues and that any reasonable landfill design and operating plan would include safeguards against dust, odor, noise, and run-off.

**Agriculture Issues.** The proposed project’s location on land zoned for agricultural use was problematic for several interviewees. Some felt that building a landfill on agricultural lands would place undue economic burden on existing lessees. Farmers and ranchers currently leasing the land could be displaced and lose the value of improvements made to the land. Some were concerned that lessees may lose their livelihood and may be unable to find other locations at similar rents. Some worried that any reduction in agricultural land limited Kauaʻi’s agricultural capacity and threatened its agricultural heritage. To address the concern that farmers and ranchers would be displaced, some suggested providing farmers irrigation water to offset the disruption of their operations, preserving existing irrigation ditches so that farmers and ranchers can continue to use them, compensating any displaced lessees for improvements they made to the land, assisting them in locating suitable new land for their operation, and offsetting the cost of higher rents for those new leases.

**Cultural Issues.** One interviewee noted that the proposed landfill is located in the Wailua ahupuaʻa, which is sacred and must be protected from development. Others noted that any culturally relevant site in the area had likely been destroyed by 150 years of cane farming in the area.

**Visitors and View Planes.** Some mentioned that the construction of a landfill at this location would seriously compromise views from the Kālepa Ridge Trail. A smaller number were concerned with the impact on residents taking Maʻalo Road to the Wailua Falls area, and a few thought the site may be visible to those who live on or use Kuamoʻo Road.

Note: Views of the landfill site from Kuamoʻo Road would not be readily visible due to the existing Kālepa Ridge, heavy vegetation, tall trees, and approximately 1.3 mile distance at the closest point between the road and the north boundary of the landfill site.
Resource Recovery and Centralization. Some were concerned that a landfill operation at Ma’alo may divert the County from its pursuit of a decentralized waste management and resource recovery plan. Because of its very large capacity, the Ma’alo site could divert popular and political attention from Kauaʻi’s drive toward resource recovery as a solid waste management tool. Similarly, because of its central location, the site could take the energy out of Kauaʻi’s plans to decentralized resource recovery facilities.

Environmental Justice. Environmental Justice is defined as a condition marked by environmental risks or hazards that disproportionately affect specific groups of people inhabiting an area near a proposed project. Such groups usually include economically disadvantaged persons and ethnic minorities. They may also include other persons with minority status in the community. Other definitions could potentially include those who suffer disproportionately from violations of fundamental human rights because of environmental factors, and those denied access to environmental investments, benefits, and/or natural resources, and/or are denied access to information; and/or participation in decision-making; and/or access to justice in environment-related matters.

Several interviewees felt that constructing the landfill at Ma’alo would constitute environmental injustice for Hanamāʻulu or North Lihuʻe communities because of existing burdens that have already been placed on the residents. Interviewees pointed to the power plant located on Ma’alo Road and the group home proposed for North Lihuʻe. They felt that adding the truck traffic, congestion, nuisance factors, and stigma associated with the landfill was an unjust imposition on the host community.

The proposed project however, while not required to address the mandate for environmental justice, would provide a new MSWLF facility that would benefit virtually all of Kauaʻi’s population, regardless of race, ethnicity or socioeconomic status. The decision to undertake this project was not biased by race or income, but was based on an objective evaluation that indicated a new MSWLF facility is necessary and essential to the future health and safety requirements of the island. See also Section 6.3.3.2.

Access Roads. Many echoed sentiments put forth at community meetings when they expressed concern about the roads that would provide access to the MSWLF and RRP. They were concerned about large trucks and small cars on the same roadway and the possibility of a greater number of accidents that might result from increased traffic. Some voiced concern about the impact of truck traffic on the neighborhoods they would pass on their way to the facilities. One stakeholder noted that the community had to live with constant large sugar cane truck traffic in the past and was wary of another influx of large trucks passing through the community on a regular basis.

Another road-related concern was increased traffic and the delays it may cause. They commented that unless alternatives routes provide relief, traffic in the area would increase, thereby diminishing the quality of life for local residents and increasing traffic times for tourists and other residents of the county. One interviewee warned about the possibility of a single traffic accident shutting down commerce and movement.

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8 One issue identified by the interviewees was the choice of access route, which emerged as a significant public concern. These interviews, along with other feedback gathered during community meetings, alerted the County to the public’s concerns about the access routes. In response to these concerns, the County conducted the TREFS, including the social impacts assessment for it, to analyze potential access routes and solicit public comments and feedback on the various alternatives that can connect Kūhiō Highway to the proposed project site.
Several were interested in reducing costs by choosing the shortest routes, avoiding roadways that would require major construction or right-of-way acquisition, and using existing sugar cane roadbeds to reduce costs.

A few were concerned about building access roads that would divide agricultural land. Those new routes would limit land use and interrupt agricultural processes. These interviewees preferred the use of existing roadways.

6.3.2.3 Other Social Effects

Although several interviewees felt that a landfill at Ma'alo would contribute to added truck traffic, congestion, nuisance factors, and stigma, they understood that a landfill operation at any site would have at least some negative impact on nearby communities. Many noted that the Ma'alo site would have lesser impact on nearby residents and other sites that might have been selected (SMS Research 2017).

Reduced Impact on Other Kaua‘i Communities

The proposed project would reduce the burden of Kekaha residents because future refuse, waste management, and associated traffic would no longer be concentrated in their community, which they feel has shouldered the burden for decades. In addition, the proposed location is more centrally located than the current MSWLF, which would reduce the overall transportation of MSW throughout the island, resulting in overall lesser traffic impacts, reduced emissions, and greater sustainability (SMS Research 2017).

Health Issues

Given the site’s distance from the nearest business and residential areas, the geological and other buffers that surround it, and the management and monitoring requirements, no deleterious health issues are expected to arise from construction and operation of the proposed project (SMS Research 2017).

Property Values

Land adjacent to the proposed project may experience diminished value because of the proposed facilities; however, there is no certainty that this would occur, and adjacent land is owned by the State of Hawai‘i and one private owner, Grove Farm, Inc. Property values of residences and businesses in the Hanamā‘ulu community are not expected to fluctuate greatly given the distance and obstructions between the community and the proposed project (SMS Research 2017).

Diminishing Community Trust

There is no indication that the proposed project has, or may have, a diminishing effect on community trust. In fact, several of the interviewees mentioned that they had followed the landfill siting process and agreed that the Ma’alo location was the best choice of all alternatives. Some interviewees felt that community benefits should be offered to affected community members to offset any negative repercussions of locating the landfill near Hanamā‘ulu (SMS Research 2017).

6.3.3 Mitigation Measures

6.3.3.1 Economic Effects

No mitigation measures are necessary or recommended.
6.3.3.2 Community Issues and Concerns

Water Contamination

As part of the landfill design and operations, the potential for flooding will be considered and monitoring will be conducted to identify any migration of contaminants that could affect ground or surface water. See Section 4.4 and Section 4.5.

Pollution and Nuisance

As part of the landfill design and operations, landscaping will be used to minimize visual impacts while minimizing wildlife attractants. Landfill operations will include minimizing the open face of the landfill and therefore the putrescible waste, which causes odors and is a wildlife attractant.

See Section 2.0 regarding landfill design and operating practices and Section 4.10 regarding viewplane and visual impacts.

Agriculture Issues

Although no compensation to address effects to existing farmers and ranchers leasing land on the subject property are currently planned, the phased implementation of the project would result in major portions of land remaining unused for extended periods of time of up to 100 or more years resulting in no expected adverse impact to existing farming and ranching uses. At such time that the planned area of Phase 1 is developed for landfill associated purposes, other areas of the site would be made available through further discussion and cooperative arrangement between the State and County to allow for continued farming/ranching activities by the existing tenant(s). This coordination to permit agricultural uses on the remaining areas of the site would continue until such time that it is required for landfilling purposes.

Cultural Issues

A Cultural Impact Assessment was performed for the subject project to investigate, identify, and address concerns regarding traditional cultural practices specifically related to the project site at Ma'alo (Cultural Surveys Hawai'i 2013; Appendix K).

Personnel involved in construction activities for the proposed project should be informed of the possibility of inadvertent cultural finds, including human remains. Should any burials or other cultural finds be identified during ground disturbance, the construction contractor would immediately cease all work, while the State Historic Preservation Division is notified pursuant to applicable law (HRS, Chapter 6E) (Cultural Surveys Hawai'i 2013).

Visitors and View Planes

Landscaping will be provided as needed to address potential viewplane impacts with the use of tall trees or other appropriate vegetation to provide some shielding of public views toward the landfill site, while helping to control dust and particulate matter. See Section 4.10.
Resource Recovery and Centralization

The RRP is not subject to development as a part of the proposed project. However, the County has stated its intention for future development of the facility. This will require further study of the specific services that would be provided and involve consultation and input from the community when it is proposed to be developed. See AECOM 2013: Appendix C for further detail on possible recycling and reuse technologies that are under consideration.

Environmental Justice

The proposed project was designed by the County to incorporate extensive community discussion over the period 2012 through 2016 to consult with and obtain input on the proposed development of the new Ma'alo MSWLF. A Socioeconomic Impact Assessment (SIA) of the proposed project and surrounding region indicated there were no concerns with regard to environmental justice (SMS Research 2017: Appendix L). This is based on many minorities which together comprise the majority of the population of the island of Kaua‘i, and the Hanamā‘ulu host community, where the proposed action is located.

According to SMS Research, over the past decade the ethnic mix of the estimated 72,029 persons residing on Kaua‘i has changed very little. Approximately eight out of ten Kaua‘i residents reported only one race. Among these single-race individuals, those who identified themselves as Asian accounted for 35.6 percent of the population. An additional one-third of the population identified themselves as White and 10 percent identified themselves as Native Hawaiian or Other Pacific Islander.

The American Community Survey (ACS) indicates the Hanamā‘ulu Census Designated Place (CDP) resident population was approximately 4,946 persons in 2015, the latest year for which data is available. When the ethnic makeup of the island of Kaua‘i is compared against the Hanamā‘ulu CDP, the distribution of ethnicities indicates a larger Asian population (66 percent), a smaller White population (8.4 percent), and a comparable Native Hawaiian or Other Pacific Islander population (9.6 percent) (https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF).

As indicated in Section 6.3.2.2.2, the proposed project provides a new MSWLF facility that would benefit Kaua‘i’s population, regardless of race, ethnicity or socioeconomic status. In addition, the proposed project was not biased by race or income, but is the result of an objective evaluation that indicates the need for a new MSWLF facility to address the health and safety requirements of the island. No mitigation measures with regard to environmental justice are required.

Access Roads

In response to public concerns regarding the proposed project’s access route, the County conducted the New Kaua‘i Landfill TREFS (AECOM 2016; Appendix F), which analyzed five potential access route alternatives for the proposed project. Each alternative access route consists of a “road” (labelled A–E) and up to two “driveway” alternatives (labelled 1–3 representing three different alignments) and connects to regional access at one of five intersections (see Figure 6-2):

- **Route A1/A2**: via Ma'alo Road and Driveway 1 or Driveway 2. The intersection is Ma'alo Road/Kūhiō Highway, a stop-sign-controlled T-intersection. Total route length is 4.7–4.8 miles.
- **Route B1/B2**: via ‘Ehiku Street, Ma'alo Road, and Driveway 1 or 2. The intersection is ‘Ehiku Street/Kūhiō Highway, a signalized intersection. Total route length is 5.6–5.7 miles.
- **Route C3**: via Laulima Street and Driveway 3. The intersection is Laulima Street /Kūhiō Highway, a stop-sign-controlled four-legged intersection. Total route length is 1.7 miles.
Figure 6-2: Potential Access Routes A – E
Route D3: via Roberts Hawai‘i Driveway and Driveway 3. The intersection is Roberts Hawai‘i Driveway/Kūhiō Highway (a stop-sign-controlled T-intersection). Total route length is 2.2 miles.

Route E3: Via Kaua‘i Beach Drive and Driveway 3. The study intersection is Kaua‘i Beach Drive/Kūhiō Highway (a stop-sign-controlled T-intersection). Total route length is 2.5 miles.

Public comments regarding the alternative access routes were obtained from selected persons known to be knowledgeable about the affected communities and activities related to the proposed action, property owners with properties located near the alternative access routes, the public meeting, and public outreach activities. Based on all the outreach efforts, the following comments were obtained:

- Comments made during the January 16, 2014 public outreach meeting
- Nine written responses via completed forms and emails during the 2014 comment period.
- Comments during interviews
- Comments made during the September 22, 2016 public meeting

Twelve written comments via completed forms and emails during the 2016 public comment period.

The comments received were grouped by route and are summarized below. While some comments stand on their own for County consideration (and do not require a response), responses are provided where appropriate. The origin of each comment is denoted as follows:

- Pre = pre-public meeting comments gathered from landowner interviews and interviews with selected persons knowledgeable about the affected communities
- PM = comments gathered at the public meetings
- OR = comments from outreach activities conducted after the public meetings

Access Route A (Ma‘alo Road) Comments and Responses

Route A Perceived Advantages:

6. Some felt that Ma‘alo Road is preferable because it already exists and may be the least expensive route to the site. (Pre, PM, OR)
   **Response:** The estimated cost of preparing Ma‘alo Road for service as the access road is between $41.4 and $42.8 million, which is the second highest of the four routes under investigation, and significantly more expensive than Routes C or D.

7. Ma‘alo Road does not pass through or near any residential neighborhood. (Pre, PM, OR)

8. Owners of non-residential properties near the makai end of the road have not registered any objections. (Pre)

9. Roadway improvements will benefit other users of Ma‘alo Road. (Pre, PM, OR)
   **Response:** Roadway improvements planned include improvements to the highway intersection (including signalization), widening of both Ma‘alo Road and the small bridge, and straightening a sharp curve.

Route A Perceived Disadvantages:

10. Impacts to traffic conditions at the intersection of Ma‘alo Road and Kūhiō Highway, including delays, safety, limited visibility, congestion (Pre, OR)
   **Response:** The TREFS report (AECOM 2014; Appendix F) describes recommended mitigation measures to address these concerns, including signalization and lane relocation.
11. The cost of improvements to the Kūhiō Highway intersection (Pre, OR)
   **Response:** The overall estimated cost of preparing Ma'alo Road for service as a landfill access road is between $41.4 and $42.8 million, which is the second highest of the four routes under investigation, and significantly more expensive than Routes C or D.

12. Possible development delays due to traffic improvements at that intersection. (Pre)

13. Making the road safe and functional for truck traffic may require the acquisition of rights of way and that may add substantial cost and delays in the proposed project schedule. (Pre)
   **Response:** Section 2 of the TREFS report describes those areas in which rights-of-way may need to be acquired, and the cost estimates reflect these requirements.

14. Signalization would be required. (Pre)
   **Response:** Signalization of the Ma'alo Road-Kūhiō Highway intersection is recommended should Route A be selected as the proposed access route.

15. Dust at the makai end of the road may affect commercial operations in that area. (Pre)
   **Response:** All roadways would be paved, waste-hauling trucks are required to cover loads, and the landfill would have truck-tire cleaning devices near the exit. Unusual levels of dust are therefore not expected.

16. Truck traffic along Ma'alo Road might negatively affect the visitor experience of those riding a tour bus to Wailua Falls. (Pre, OR)
   **Response:** No study of visitor reactions to the access routes was conducted.

Access Route B (‘Ehiku Street) Comments and Responses

*Route B Perceived Advantages:*

17. ‘Ehiku Street avoids the cost of improvements along lower Ma'alo Road. (Pre, OR)
   **Response:** Route B would require improvements to ‘Ehiku Street, offsetting the gain by avoiding improvements to lower Ma'alo Road.

18. Fewer improvements would be required for the intersection at ‘Ehiku Street and Kūhiō Highway, reducing cost and delay. (Pre)
   **Response:** Although minor improvements would be required at the Kūhiō Highway intersection, the overall cost estimate for Route B is estimated at $41.8–$43.3 million, the highest cost estimate among the four alternative access routes.

19. Required roadway improvements will benefit other users of ‘Ehiku Street. (Pre)

20. Visitor traffic to Wailua Falls could make use of ‘Ehiku, enhancing the visitor experience. (Pre)

*Route B Perceived Disadvantages:*

21. ‘Ehiku Street runs through the Isenberg residential neighborhood, and is immediately adjacent to homes, churches, and businesses. Neighborhood opposition has been voiced. The neighborhood has expressed concerns regarding dust, odor, noise, safety issues for children, and difficulty accessing ‘Ehiku Street from their driveways. (Pre, PM, OR)
   **Response:** The County acknowledges the impacts to nearby properties if this route were chosen. In order to mitigate impacts, noise dampening and dust suppression measures can be implemented, and safety precautions could be undertaken.

22. Truck traffic at the intersection of ‘Ehiku Street and Kūhiō Highway could cause delays at a problem-free intersection. (Pre, OR)
   **Response:** Improvements to the ‘Ehiku Street / Kūhiō Highway intersection, including extra lanes and turn-radius widening, are recommended if this access route is chosen. The traffic
study performed in the TREFS, which included data collection and traffic impacts analysis, did not suggest a change in the level of service (AECOM 2014, Section 2; Appendix F).

23. If additional lanes were needed, it may be necessary to acquire rights of way. (Pre)

Response: Section 2 of the TREFS report describes those areas in which rights-of-way may need to be acquired, and the cost estimates reflect these requirements.

24. Some felt ‘Ehiku Street would be the most expensive of the alternative access routes. (Pre, OR)

Response: Although minor improvements would be required at the Kūhiō Highway intersection, the overall cost estimate for Route B is estimated at $41.8 to $43.3 million, the highest cost estimate among the four alternative access routes.

25. Enhancing the visitor experience would be offset by the need to mix solid waste hauling and tour bus traffic along ‘Ehiku Street and upper Ma’alo Road. (Pre)

Response: No study of visitor reactions to the access routes was conducted.

Access Route C (Laulima Street) Comments and Responses

Route C Perceived Advantages:

26. Laulima Street is the shortest and most direct route to the site. (Pre, PM, OR)

27. Route C is the least expensive of the alternative routes. (Pre, PM, OR)

Response: Route C has the lowest estimated development cost, $12.7 million.

28. Laulima Street does not pass through any residential neighborhood. (Pre, PM)

Response: Laulima Street does not pass through any residential neighborhood. It does pass behind the backyards of some residential properties along Laukona Street.

29. Much of the route along Laulima is not visible from Kūhiō Highway. (Pre)

30. Required improvements to the intersection at Laulima and Kūhiō Highway, including the traffic signal, once warranted, would benefit local residents and all drivers using Kūhiō Highway during peak traffic periods. (Pre, PM, OR)

Response: As described in the Traffic Analysis, signalization of the intersection would be expected to improve the level of service at the intersection.

31. There is ample land along Kūhiō Highway to add turn lanes. (Pre)

Route C Perceived Disadvantages:

32. The impact of truck traffic at the intersection of Laulima Street and Kūhiō Highway, already a congested area, would cause major traffic problems. (Pre, PM)

Response: Improvements to the intersection at Laulima Street and Kūhiō Highway, including turn lanes, roadway widening, and signalization are expected to mitigate impacts to the intersection, and even result in net improvements for some approaches (see Section 2.0 of the TREFS).

33. Bringing trucks to the center of Hanamā‘ulu town would cause problems with dust, odor, and noise even with the best improvements to the intersection. (Pre, PM)

Response: Provisions for reducing noise, odor, and dust associated with solid waste transport will be implemented, as discussed in responses above, and are not expected to significantly change existing conditions along the highway (which already is used by many waste haulers today). Some of the roadway improvements have the potential to improve existing conditions, e.g., paving the existing cane haul roads. Finally, mitigation measures can be implemented to further reduce noise, odor, and dust impacts.
34. Trucks may raise dust that would affect operations in the commercial area. (Pre)

Response: Provisions for reducing dust associated with solid waste transport will be implemented, as discussed in responses above, and are not expected to significantly change existing conditions along the highway (which already is used by many waste haulers today). Some of the roadway improvements have the potential to improve existing conditions, e.g., paving the existing cane haul roads.

35. The part of Route C that runs parallel to Laukona Street is adjacent to the property of homeowners along that street. Dust, noise, and odor may be problems for residents there. (Pre, PM, OR)

Response: A portion of Access Route C passes behind the backyards of some residential properties along Laukona Street. Mitigation measures to address dust, noise, and odor (for example, paving the existing cane haul road) could be implemented.

36. Some felt that the Laulima Street route would be expensive to develop. (Pre)

Response: The cost estimate for developing Route C is $12.7 million, the lowest estimate among the four alternative routes.

37. Route C will decrease property values on Laukona Street. (PM)

Response: Route C does not run along Laukona Street, it runs 200 feet or more from Laukona Street properties’ back yards. With appropriate landscaping and roadway paving, the impact of property values could be mitigated.

38. Laukona Street is an area particularly affected by excessive run-off or flooding. (PM, OR)

Laukona Street is affected by flooding due to the breakdown or blockage of the stream/ditch between Laukona and the cane haul road that would become Route C. (PM)

Response: The detailed design of the access route would investigate and account for run-off and flooding, in accordance with County and other requirements. If any current drainage problems are caused by features near the roadways, then the drainage improvements associated with roadway development may alleviate existing problems.

Access Route D (Roberts Hawai‘i Driveway) Comments and Responses

Routes C and D share the same “driveway” (i.e., Driveway 3), which runs from the intersection of Laulima Street and the Roberts Hawai‘i Driveway to the site. Therefore, the two routes share many of the same advantages and disadvantages, and many of the comments and responses above also apply to Route D.

Route D Perceived Advantages:

39. Roberts Hawai‘i Driveway avoids putting further pressure on the intersection at Laulima Street and Kūhiō Highway. (Pre, OR)

40. Route D has no negative impact on visitor traffic to Wailua Falls. (Pre)

41. Route D bypasses the commercial area, reducing or limiting problems for businesses there. (Pre)

42. Required improvements to Route D may benefit other residents and businesses in Hanamāʻulu. (Pre, OR)

43. Route D is farthest from Hanamāʻulu town and has less foot traffic than other routes.

Route D Perceived Disadvantages:

44. The intersection of Roberts Hawai‘i Driveway and Kūhiō Highway is very near the intersection of Kūhiō Highway and Kapule Highway. That may cause major traffic delays in peak periods. (Pre, OR)
Response: Improvements to the intersection, including additional lanes and signalization are recommended if this route is chosen. Additionally, pending State of Hawai'i DOT concurrence with the analysis presented in the TREFS, there appears to be sufficient distance to coordinate the signals at the two intersections.

45. The Roberts Hawai'i Driveway runs along the back side of Kālepa Villages and may cause dust, noise, or odor problems for residents there. (Pre, OR)
Response: Landscaping or other mitigation measures could reduce the impact of truck traffic behind Kālepa Village residences.

46. The part of the route that runs parallel to Laukona Street is adjacent to the property of homeowners along that street. Dust, noise, and odor may be a problem for residents there. (Pre, PM)
Response: A portion of Access Route D passes behind the backyards of some residential properties along Laukona Street. Mitigation measures to address dust, noise, and odor could be implemented (for example, paving the existing cane haul road, requiring trucks to cover loads, installing a vegetative barrier).

47. Some felt that, with the addition of Roberts Hawai'i Driveway to Route C, the new Route D would make it one of the most costly to develop.
Response: The estimated cost for preparing Route D is $14.6 million, the second lowest of the four alternative access routes.

Access Route E (Kaua'i Beach Drive/Kūhiō Highway)

Route E Perceived Advantages

1. Route E will improve the intersection at the Kauai Beach Resort. (PM, OR)
2. Increased traffic through Līhu'e and Hanamā'ulu will be minimized because the landfill bound traffic from Kapaa/North Kauai will access the route prior to reaching Hanamā'ulu. (OR, PM)
3. The new intersection at Kuhio and Kauai Beach Drive will be signalized. This will make this stretch of Kuhio Hwy more manageable from a traffic standpoint and safer by slowing down the speeding that is currently occurring. (OR)
4. Traffic from Kapaa and North Kauai will not have to travel through Hanamā'ulu or Līhu'e to access the landfill or future RRP site. (OR)
5. Cost of road way improvements for Route E is much lower compared to Routes A & B; only $5 million higher than for Route C and $3 million higher than for Route D but much more advantageous than any of those routes. (OR)
6. The route bypasses the town of Hanamā'ulu. (OR)

Route E Perceived Disadvantages

48. Increased noise from traffic for Hanamā'ulu residents especially where Route E passes around the base of Kālepa Hill in the vicinity of the old Hanamā'ulu Shop area and the Kālepa Village area. (OR, PM)
Response: A noise barrier was previously recommended for the houses on Laukona Street. These are cane haul roads now, but they will be paved so the dust will decrease. (Note: See Section 4.7 for further information concerning the need for this measure).

49. Landfill/Future RRP bound traffic will have a longer distance to travel. (OR)
50. Increased traffic especially with contraflow hours/days (OR, PM)
Response: The conceptual plans in this report describe the proposed intersection improvements. The improvements proposed at Kaua'i Beach Drive took the current counter-flow into consideration. Currently, when the counter-flow is implemented, Kaua'i Beach Drive
remains open. It is left open to preserve the left turn lane. In the design, the turn lane into Kaua‘i Beach Drive is maintained to accommodate the left–turn lane needed in the opposite direction for the landfill access. The improvements proposed at the Kaua‘i Beach Drive intersection do not preclude future State DOT plans to improve Kūhiō Hwy to a full four-lane facility.

Driveway-Related Comments and Responses

**Comments Specific to Driveway 1:**

51. Driveway 1 is straight and less expensive; Driveway 2 will be more expensive. (Pre)

   **Response:** Driveway 1 may be the more expensive route because it must pass through a wetlands area.

52. Driveway 1 is shorter; Driveway 2 will add unacceptable lengths to drive times. (Pre)

53. Driveway 1 is less intrusive to agricultural operations in the area; Driveway 2 breaks up the current land use patterns and future land use possibilities. (Pre)

**Comments Specific to Driveway 2:**

54. Driveway 1 traverses wetland areas; Driveway 2 is designed to avoid the wetlands. (Pre)

55. Driveway 1 may require lengthy and difficult negotiations with the Federal government; Driveway 2 may avoid those negotiations. (Pre)

   **Response:** Driveway 1 would likely require consultation, and possibly a Section 404 permit, from the USACE.

56. Driveway 1 may be less popular among members of the community who are sensitive to wetlands issues; Driveway 2 would avoid potential controversy regarding wetlands.

**Comments Specific to Driveway 3:**

57. Driveway 3 is straight, direct, and simple in design (PM)

58. Driveway 3 divides the landowner’s property and limits flexibility of use Driveways 1 and 2 avoid these problems. (Pre)

59. Driveway 3 is not directly involved with wetland areas. (Pre)

   **Response:** Driveway 3 does not pass through wetlands areas. However, if the future RRP were to be located on the alternate site, then a road between the proposed landfill and the alternate RRP site would require a portion of either Driveway 1 (which traverses the wetland) or Driveway 2. (Note: The RRP is no longer a part of the subject project).

**Comments and Responses Related to All Alternatives**

**Perceived Common Advantages:**

(None noted.)

**Perceived Common Disadvantages:**

60. Combining Routes: Access Routes A and B approach the landfill from the west, and Access Routes C and D approach from the east. By joining the two, the loop would be completed creating a fifth alternative access route. (Pre, PM, OR)

   **Response:** The proposed project, establishment of the MSWLF and RRP, is already an expensive and complicated project, and the proposed facilities do not require more than one access point. Because providing such would introduce unnecessary complication and expense into the proposed project, this approach is not recommended at this time. Should future conditions warrant, this could then be considered.

61. Hanamāʻulu Bypass Road: Completing the loop produces a route that is similar to some proposals for a Hanamāʻulu Bypass Road. Although people were informed that the bypass
road and landfill siting issues were separate issues, many still felt they were the same issues and should be treated as such. (Pre, PM, OR)

Response: The County is still considering how to best pursue the Hanamāʻulu Bypass Road. However, because it is not required by the landfill or RRP, and would introduce unnecessary complication and expense into this proposed project, the Hanamāʻulu Bypass Road is not part of the proposed project.

62. Alternative Route: An additional route was suggested that runs from the highway along Ma‘alo Road to the intersection with ‘Ehiku Street, and then turns east along a cane haul road to Driveway 3. (Pre, PM, OR)

Response: The TREFS presented this additional potential route (“Access Route F”) and a brief assessment of its advantages and disadvantages (AECOM 2014b). Although the route may be feasible, it is generally not recommended, as it includes many of the disadvantages of Routes A and B but lacks the advantages associated with Routes C, D, and E (see Figure 6-3).

6.3.3.3 HOST COMMUNITY BENEFITS

The proposed MSWLF would benefit all of the communities of Kauaʻi with a safe, secure, and well-regulated means of handling on-island MSW. However, the community in which the landfill would be located will necessarily be impacted by its presence, even though such impacts are not expected to be significant. Impacts could include an increase in traffic and noise, evidence of landfill related activities, and other landfill concerns that have been expressed by residents at previous community meetings for the project. For these reasons, the County intends to work with the community to address potential concerns and further discussions of a Host Community Benefits (HCB) Program with features similar to the on-going Kekaha HCB program.

The main elements of HCB could include the County’s establishment of a fund for the purpose of compensating the Hanamāʻulu community for hosting the proposed MSWLF and a Citizens Advisory Committee (CAC) to recommend community benefit projects that would be funded through a HCB fund. The establishment of the HCB program and its details, however, would need to be determined at the appropriate time by the County Administration.

The use of the HCB Program would be considered as a way to recognize and take proactive steps to help address public concerns of the community most affected by the siting of a landfill. Further information on the use of the County’s HCB Program can be found at: http://www.kekahahcb.net/.
Figure 6-3: Potential Access Route F
6.4 HISTORIC AND ARCHAEOLOGICAL RESOURCES

6.4.1 Introduction

An Archaeological Inventory Survey (AIS) of the proposed project site was conducted by Cultural Surveys Hawai‘i (CSH) in 2016 (Appendix J). The purpose of the AIS was to document all historic properties within the project area, which at one time included the approximately 270-acre Ma‘alo MSWLF site owned by the State of Hawai‘i, an approximately 80-acre alternate RRP site located on a parcel owned by Grove Farms (discontinued from consideration), four potential driveway alignments (1 and 2, 1, 2, and 3) and six potential access roads (A, B, C, D, E, and F). The study area of the AIS encompassed approximately 432.1 acres and is depicted on the United States Geological Survey (USGS) 7.5-minute topographic map, Līhu‘e quadrangle (1996) (Figure 6-4) and in an aerial photograph (Figure 6-5).

The area of effect for the proposed action includes the approximately 270-acre Ma‘alo MSWLF site, driveway 3, and access roads C (utility corridor only), D, and E, as depicted on the USGS topographic map (Figure 6-6) and in an aerial photograph (Figure 6-7). Utility corridors to the project site will generally follow the alignment of access road D and driveway 3. Electricity, telephone, and telecommunications services would connect at the intersection of Laulima Street (access road C) and Kūhiō Highway. Utility poles carrying services would be constructed along Laulima Street (access road C) and the site access road D and driveway 3 to the site entrance. Water service would connect to the existing main at the intersection of Laulima Street (access road C) and Kūhiō Highway. A 12-inch waterline would connect to the existing main and be installed along the access road D and driveway 3 to the MSWLF site.

The following scope of work was identified to meet State of Hawai‘i requirements for AIS documentation in accordance with HAR §13-13-276 and §13-275/284, and included coordination with the SHPD to address archaeological concerns:

1. Research on historical and archaeological background, including search of historical maps, written records, and Land Commission Award documents. This research focused on the specific area with general background on the ahupua‘a and district, and emphasized settlement patterns.

2. A complete ground survey of the entire project area for the purpose of site inventory was completed. All sites were located, described, and mapped with an evaluation of function, interrelationships, and significance. Documentation included photographs and scale drawings of selected sites and complexes. All sites were assigned State Inventory of Historic Properties (SIHP) numbers.

3. Subsurface testing was conducted to identify and document subsurface historic properties that would not be located by surface pedestrian inspection (particularly in potential archaeological sites). All subsurface historic properties identified were documented to the extent possible, including geographic extent, content, function/derivation, age, interrelationships and significance.

4. As appropriate, consultation with knowledgeable individuals regarding the project area’s history, past land use, and the function and age of the historic properties documented within the project area.

5. As appropriate, laboratory work to process and gather relevant environmental and/or archaeological information from collected samples.

6. Preparation of the inventory survey report included:
   a. A project description
   b. A section of a USGS topographic map showing the project area boundaries and the location of all recorded historic properties
   c. Historical and archaeological background sections summarizing prehistoric and historic land use of the project area and its vicinity
Figure 6-4: USGS 7.5 Minute Series Topographic Map, Līhuʻe Quadrangle (1996), AIS Study Area including the Proposed MSWLF Project Area, Access Roads A, B, C, D, and E, and Driveways 1 and 2, 1, 2, and 3

Source: CSH (2016), as modified by RMTC
Figure 6-5: Aerial Photograph, AIS Study Area including the Proposed MSWLF Project Area, Access Roads A, B, C, D, and E, and Driveways 1 and 2, 1, 2, and 3

Source: CSH (2016), as modified by RMTC
Figure 6-6: USGS Topographic Map, Proposed MSWLF site, driveway 3, and access roads C (utility corridor only), D, and E.
Figure 6-7: Aerial Photograph, Proposed MSWLF site, driveway 3, and access roads C (utility corridor only), D, and E
d. Descriptions of all historic properties, including selected photographs, scale drawings, and discussions of age, function, laboratory results, and significance, per the requirements of HAR §13-276

e. A section concerning cultural consultations [per the requirements of HAR §13-276-5(g) and HAR §13-275/284-8(a)(2)]

f. A summary of historic property categories, integrity, and significance based upon the Hawai‘i Register of Historic Places criteria

g. A project effect recommendation

Treatment recommendations to mitigate the project’s adverse effect on any historic properties identified in the project area that are recommended eligible to the Hawai‘i Register of Historic Places

6.4.2 Methodology

6.4.2.1 Field Methods


The fieldwork consisted of 100% coverage pedestrian inspection of the study area and subsurface testing at select locations. The pedestrian inspection of the study area was accomplished through systematic sweeps (transects). The spacing interval between archaeologists was 5 meters. All potential historic properties encountered were recorded and documented with a written field description, site map, photographs, and located using Global Positioning System (GPS) instruments.

6.4.2.2 Document Review

Background research included a review of previous archaeological studies on file at SHPD; review of documents at Hamilton Library of the University of Hawai‘i at Mānoa, the Hawai‘i State Archives, the Mission Houses Museum Library, the Hawai‘i Public Library, and the Archives of the Bishop Museum; study of historical photographs at the Hawai‘i State Archives and the Archives of the Bishop Museum; and study of historical maps at the Survey Office of the Hawai‘i Department of Land and Natural Resources (DLNR). Historical maps and photographs from the CSH library were also consulted. In addition, information on Land Court Awards (LCAs) was accessed through the Waihona ‘Āina Corporation’s Māhele Data Base (www.waihona.com).

The research provided environmental, cultural, historical, and archaeological background for the project area. The sources studied were used to formulate a predictive model regarding the expected types and locations of historic properties in the project area.

6.4.2.3 Consultation

CSH worked with the Office of Hawaiian Affairs (OHA), SHPD, and knowledgeable cultural consultants pursuant to the requirements of HAR §13-276-5(g) and HAR §13-275/284-8(a)(2). This effort is dovetailed with the cultural consultation effort currently underway for the project’s Cultural Impact Assessment (CIA), which CSH is also preparing pursuant to HRS, Chapter 343, and the OEQC’s guidelines for assessing cultural impacts. Table 6-5: Cultural and/or Agency Consultations summarizes the individuals and organizations/agencies that have been consulted.
Table 6-5: Cultural and/or Agency Consultations

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
</tr>
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<tbody>
<tr>
<td>Ahuna, Dan</td>
<td>OHA, Kaua‘i Island Trustee</td>
</tr>
<tr>
<td>Aipolani, Kunane</td>
<td>Chairperson, Kaua‘i Island Burial Council</td>
</tr>
<tr>
<td>Albao, Liberta Hussey</td>
<td>President, Queen Deborah Kapule Hawaiian Civic Club</td>
</tr>
<tr>
<td>Ako, Val</td>
<td>Long-time resident of Wailua</td>
</tr>
<tr>
<td>Ayau, Halealoha</td>
<td>Hui Mālama O Nā Kūpuna O Hawai‘i Nei</td>
</tr>
<tr>
<td>Burgess, James</td>
<td>Niumalu/Nāwiliwi cultural descendent</td>
</tr>
<tr>
<td>Cataluna, Donald</td>
<td>OHA Trustee for Kaua‘i‘i Ni‘ihau</td>
</tr>
<tr>
<td>Cayan, Phyllis “Cocchie”</td>
<td>SHPD Intake Specialist, former SHPD History and Culture Branch Manager</td>
</tr>
<tr>
<td>Chang, Pi’ilani</td>
<td>Former SHPD History and Culture Branch Chief, Cultural Historian</td>
</tr>
<tr>
<td>Crabbe, Kamana‘opono</td>
<td>OHA CEO and Administrator</td>
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<tr>
<td>Durant, Butch ”Leopold”</td>
<td>Lo‘i farmer, owns land in Hanamā‘ulu area</td>
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<tr>
<td>Esaki, Godwin</td>
<td>Wailua Farmer</td>
</tr>
<tr>
<td>Flores, Kalani</td>
<td>Cultural practitioner, educator, researcher</td>
</tr>
<tr>
<td>Fernandez, Lynette Haulani</td>
<td>Kaua‘i Director, Kui Kāko‘o ‘Āina Ho‘opulapula</td>
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<td>Fujita, James</td>
<td>Kaua‘i Island Burial Council</td>
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<tr>
<td>Gray, Jane Kamahaokalani</td>
<td>Director, Kaua‘i Museum</td>
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<tr>
<td>Hubbard, Mark</td>
<td>Former Kaua‘i Island Burial Council</td>
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<tr>
<td>Huff, Kauaulani</td>
<td>KKCR Community Radio; works with kūpuna; cultural practitioner</td>
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<tr>
<td>Ida, Ron</td>
<td>Royal Order of Kamehameha, Kaumuali‘i’s Chapter No. 3</td>
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<tr>
<td>Josselin, Noelani</td>
<td>Cultural practitioner</td>
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<tr>
<td>Kaholokula, Robbie</td>
<td>Administrator, Kaua‘i Museum</td>
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<td>Kalama, Nathan</td>
<td>Kumu Hula</td>
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<tr>
<td>Kaluahine ‘Ohana</td>
<td>Long-time residents of Hanamā‘ulu</td>
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<tr>
<td>Kaohi, Lionel</td>
<td>President, Kaumuali‘i Hawaiian Civic Club</td>
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<tr>
<td>Kauka, Sabra</td>
<td>Hawaiian cultural educator</td>
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<tr>
<td>Kauwe, Christopher</td>
<td>Native Hawaiian Historic Preservation Council, Kaua‘i Representative</td>
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<tr>
<td>Kealoha, Keone</td>
<td>Executive Director, Mālama Kaua‘i</td>
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<tr>
<td>Kekua, Kehaulani</td>
<td>Director of the Kaua‘i Heritage Center; Kumu hula</td>
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<td>Kelekoma ‘Ohana</td>
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<td>Khan, Leimomi</td>
<td>President, Association of Hawaiian Civic Clubs</td>
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<tr>
<td>Kī‘ulu ‘Ohana</td>
<td>Long-time residents of Hanamā‘ulu</td>
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<tr>
<td>Kruse, John</td>
<td>Former Kaua‘i Island Burial Council and Kaua‘i Island Burial Council County Planner</td>
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<td>Loo, Michael</td>
<td>Kaua‘i Island Burial Council</td>
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<td>Lovell-Obatake, Cheryl</td>
<td>Resident of Wailua</td>
</tr>
<tr>
<td>Matsushima, Lester</td>
<td>Long-time resident of Hanamā‘ulu/Wailua area, fisherman</td>
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<tr>
<td>Moriguchi, Laraine</td>
<td>Kapaa Foundation Director</td>
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<tr>
<td>Muraoka, Beverly</td>
<td>Kumu hula (hula teacher), cultural practitioner, and former entertainer at Coco Palms Hotel</td>
</tr>
<tr>
<td>Palmeira, Waldeen</td>
<td>Knowledgeable about Wailua; resident</td>
</tr>
<tr>
<td>Perreira, Charlie</td>
<td>Master net maker</td>
</tr>
<tr>
<td>Perry, Warren</td>
<td>Royal Order of Kamehameha, Kaumuali‘i’s Chapter No. 3</td>
</tr>
<tr>
<td>Punohu, Anne</td>
<td>Cultural historian, cultural practitioner, and community activist</td>
</tr>
<tr>
<td>Quinsat, Sandra</td>
<td>Kaua‘i Island Burial Council</td>
</tr>
<tr>
<td>Robinson, Leiana</td>
<td>Kaua‘i Island Burial Council</td>
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<tr>
<td>Robinson, Nadine and Rob</td>
<td>Nāwiliwi residents</td>
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<td>Rodrigues, Hinano</td>
<td>Interim History and Culture Branch Chief, SHPD-Maui Office</td>
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<tr>
<td>Rogers, Nani</td>
<td>Ho‘okipa Network member, Kapa’a resident</td>
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<tr>
<td>Rosa, Joe</td>
<td>Historian for plantation era in Hanamā‘ulu area</td>
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<td>Ruiz, Debra</td>
<td>Kaua‘i Island Burial Council</td>
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<td>Santos, Kaliko</td>
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<td>Say, Barbara</td>
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<td>Trembath, Healani</td>
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<tr>
<td>Wann, Presley</td>
<td>Kaua‘i Island Burial Council</td>
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<td>Wichman, Randy</td>
<td>Kaua‘i Historical Society, Queen Deborah Kapule Hawaiian Civic Club</td>
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<tr>
<td>Yap, Keith</td>
<td>Kaua‘i Island Burial Council</td>
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6.4.3 Summary of Background Research and Predictive Model

The project area straddles Hanamāʻulu and Wailua ahupuaʻa (land division extending from the uplands to the sea). Traditional and historical accounts of Hanamāʻulu suggest the inland areas were forested and cultivated largely with kalo (taro). The presence of heiau, notably Kalauokamanu Heiau south of the project area, indicates aliʻi (chief, ruler) may have lived in the general vicinity (see Figure 6-8) (CSH 2016).

Archaeological, historical, and ethnographic evidence regarding Wailua indicate it was the religious and political center of Kauaʻi during ancient times. The inland floodplains were cultivated with loʻi (ponded fields) parcels that stretched far mauka along the Wailua River and its tributaries. Archival records mention other inland resources, including bananas, wood for canoes and housing, and kukui (candlenuts; Aleurites moluccana) for lights (CSH 2016).

Following Western Contact, the population centers of Wailua, and presumably Hanamāʻulu, largely decreased. This was a result of increased trade in Waimea, as well as the abolishment of the kapu (taboo) system, which ultimately diminished the importance of the heiau. While land documents specify the agricultural use of the lands in Hanamāʻulu and Wailua, there are no kuleana LCAs near or within the project area (CSH 2016).

In 1870, the project area, along with the surrounding land, was purchased by the Līhuʻe Plantation and cultivated with sugar cane. Field systems irrigated with a complex network of ditches and waterways were established across the landscape. As sugar production at the Hanamāʻulu and Līhuʻe Plantations...
increased, a railroad traversing the project area was constructed at the end of the nineteenth century. Sugar cane production within the project area continued until 2000; the land was subleased for pasture and agriculture by 2002 (CSH 2016).

While extensive archaeological work has been conducted in both Hanamā’ulu and Wailua ahupua’a, little work has been conducted near the current project area, mauka of the Kālepa Ridge. The sites identified nearest the current project area consist primarily of historical features and agricultural sites including terraces and ‘auwai (irrigation canals). Nearly all archaeological reports in the vicinity of the project area note land disturbance associated with extensive rice and/or sugar fields dating from the late 1800s (CSH 2016).

Based on background research, anticipated finds within the project area consist of plantation-era features. Due to the extensive use of the land for the cultivation and processing of sugar cane, the potential for encountering traditional Hawaiian cultural remains in the project areas is low. Any pre-plantation features or deposits were likely destroyed by sugar cane production (CSH 2016).

6.4.4 Results of Fieldwork

Fieldwork for the archaeological investigation was accomplished over 55 person-days from November 12th to November 14th 2012, September 9th to September 20th 2013, and October 27th 2015. Fieldwork involved a 100% pedestrian inspection of the study area and subsurface testing (CSH 2016).

6.4.4.1 Survey Findings

Pedestrian inspection of the AIS study area identified one historic property, SIHP # 50-30-11-2218. SIHP # 2218 is one historic property consisting of 82 archaeological features identified within the proposed MSWLF site, an Alternative RRP site (discontinued from consideration), along Potential Driveways 1 and 2, 1, 2, and 3, and along Access Roads A, B, C, D, E, and F. A description of this historic property is presented below (see Historic Property Description in CSH 2016, Appendix J).

Historic Property Description

| Designation and Formal Type | SIHP # 50-30-11-2218, Complex |
| Function:                  | Water control / Transportation / Agriculture |
| No. of Features:           | 82 |
| Age:                       | Historic (plantation era) |
| Distribution:              | Point features within current project area |
| Tax Map Key:               | TMKs: [4] 3-7, 3-8, and 3-9 (various plats and parcels) |
| Land Jurisdiction:         | Private and State of Hawai‘i |

Of the 82 archaeological features identified in the AIS study area, 44 features are located within the proposed action area (Ma’alo MSWLF site, driveway 3, and access roads C [utility corridor only], D, and E). Figure 6-9 depicts the 44 archaeological features of SIHP # 2218 located within the action area for the proposed MSWLF site, driveway 3, and access roads C (utility corridor only), D, and E.
Figure 6-9: USGS topographic map depicting the 44 features of SIHP # 2218 identified in the action area for the proposed MSWLF site, driveway 3, and access roads C (utility corridor only), D, and E.
Table 6-6 lists the 44 historical plantation features identified in the action area for the proposed MSWLF site, driveway 3, and access roads C (utility corridor only), D, and E. The AIS includes a detailed description of each feature within the action area as well as the additional 38 features located outside the action area (CSH 2014; Appendix J).

**Table 6-6: Archaeological Features of SIHP # 50-30-11-2218 Identified and Recommended Treatment**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Probable Age</th>
<th>Type</th>
<th>Functional Interpretation</th>
<th>Recommended Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Historic plantation</td>
<td>Two culverts</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>3</td>
<td>Historic plantation</td>
<td>Irrigation pipe</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>4</td>
<td>Historic plantation</td>
<td>Earthen ditch</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>5</td>
<td>Historic plantation</td>
<td>Earthen ditch</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>6</td>
<td>Historic plantation</td>
<td>Two culvers</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>7</td>
<td>Historic plantation</td>
<td>Earthen ditch</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>8</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>10</td>
<td>Historic plantation</td>
<td>Earthen ditch</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>11</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>12</td>
<td>Historic plantation</td>
<td>Fragmented culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>13</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>14</td>
<td>Historic plantation</td>
<td>Two culverts</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>15</td>
<td>Historic plantation</td>
<td>Earthen ditch</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>16</td>
<td>Historic plantation</td>
<td>Roadway</td>
<td>Transportation</td>
<td>No further work</td>
</tr>
<tr>
<td>17</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>18</td>
<td>Historic plantation</td>
<td>Three sluice gates</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>29</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>30</td>
<td>Historic plantation</td>
<td>One culvert and one sluice gate</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>31</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>32</td>
<td>Historic plantation</td>
<td>Earthen ditch</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>33</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>34</td>
<td>Historic plantation</td>
<td>Earthen ditch</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>35</td>
<td>Historic plantation</td>
<td>Retaining wall</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>36</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>37</td>
<td>Historic plantation</td>
<td>Siphon</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>38</td>
<td>Historic plantation</td>
<td>Earthen ditch</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>39</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>40</td>
<td>Historic plantation</td>
<td>Earthen ditch</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>41</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>42</td>
<td>Historic plantation</td>
<td>Siphon</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>43</td>
<td>Historic plantation</td>
<td>Earthen ditch</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>44</td>
<td>Historic plantation</td>
<td>Two sluice gates</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>53</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>54</td>
<td>Historic plantation</td>
<td>Sluice gate</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>55</td>
<td>Historic plantation</td>
<td>Drain box/ditch</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>56</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>57</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>58</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>59</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>60</td>
<td>Historic plantation</td>
<td>Siphon</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>79</td>
<td>Historic plantation</td>
<td>Earthen ditch</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>80</td>
<td>Historic plantation</td>
<td>Two culverts</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>81</td>
<td>Historic plantation</td>
<td>Three culverts</td>
<td>Water control</td>
<td>No further work</td>
</tr>
<tr>
<td>82</td>
<td>Historic plantation</td>
<td>Culvert</td>
<td>Water control</td>
<td>No further work</td>
</tr>
</tbody>
</table>
6.4.5 Summary and Interpretation of the AIS

The AIS was completed in compliance with applicable State of Hawai‘i historic preservation legislation. The project area is the proposed location for a MSWLF in the Hanamā‘ulu and Wailua ahupua‘a. Fieldwork for the current investigation was conducted between November 12th through November 14th 2012, September 9th through September 20th 2013, and October 27th 2015 under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator). Archaeological investigations involved a pedestrian inspection and subsurface testing.

The surface survey of the project action area for the proposed MSWLF site, driveway 3, and access roads C (utility corridor only), D, and E, identified 44 features designated as components of SIHP # - 2218. The features consist of culverts, sluice gates, earthen ditches, siphons, drains, irrigation pipes, roads, and irrigation pipe. Based on background research, the project area was cultivated with sugar cane between 1870 and 2000. The archaeological features identified during the current investigation date to the mid-twentieth century and are considered part of the Līhu‘e and Hanamā‘ulu Plantations' irrigation and transport system (CSH 2016).

6.4.6 Significance Assessment

The AIS investigation provides sufficient information for an evaluation of significance in accordance with the Hawai‘i State Registers of Historic Places (HAR, Chapter 13-275-6). The criteria used to establish significance include:

- **Criterion A:** Historic property reflects major trends or events in the history of the state or nation.
- **Criterion B:** Historic property is associated with the lives of persons significant in our past.
- **Criterion C:** Historic property is an excellent example of a site type.
- **Criterion D:** Historic property has yielded or may be likely to yield information important in prehistory or history.

SIHP # 50-30-11-2218, a plantation-era complex, possesses information important for research on prehistory or history and is recommended by CSH as eligible to the Hawai‘i Register under Criterion D.

6.4.7 Potential Project Effects

The project-specific effect recommendation is “no historic properties affected.” Sufficient information regarding the location, function, age, and construction methods of the archaeological features has been generated by the archaeological inventory survey investigation to mitigate any adverse effect caused by proposed development activities.

6.4.8 Mitigation Measures

No further historical preservation is recommended for SIHP # 50-30-11-2218 within the project area. However, if additional construction is anticipated, AIS-level documentation would be performed for any components of SIHP # 50-30-11-2218 outside the current project area (CSH 2016). Should any burials or other cultural finds be identified during ground disturbance, the construction contractor should immediately cease all work while the appropriate agencies are notified pursuant to applicable law (HRS, Chapter 6E).
6.5 TRADITIONAL CULTURAL PRACTICES AND RESOURCES

6.5.1 Introduction

The Cultural Impact Assessment (CIA) for the proposed project site was conducted by CSH in 2013 (Appendix K). The purpose of the CIA is to consider the effects the proposed project may have on traditional cultural practices and resources and: (1) comply with the Hawai‘i environmental review process (HRS, Chapter 343), which requires consideration of a proposed project’s effect on cultural practices; (2) provide an assessment of the proposed project’s impacts to cultural practices in accordance with the OEQC, Guidelines for Assessing Cultural Impacts; and (3) support the project’s historic preservation review under HRS, Chapter 6E-8 and HAR, Chapter 13-275. Act 50, Session Laws of Hawai‘i 2000 requires the consideration of effects on cultural practices when making a determination of significance effects.

6.5.2 Methodology

Historical documents, maps and existing archaeological information pertaining to the sites in the vicinity of this project were researched by CSH at the CSH library. Information on LCAs was accessed through Waihana ‘Āina Corporation’s Māhele Data Base (www.waihona.com) and the OHA Papakilo Database (www.papakilodatabase.com). The SHPD, OHA, Kaua‘i-Ni‘ihau Island Burial Council (KNIBC), the Kaua‘i Historic Preservation Commission and community and cultural organizations were contacted in order to identify potentially knowledgeable individuals with cultural expertise, information and/or history of the project area and the surrounding vicinity (CSH 2013).

6.5.3 Results of Background Research

The project area of the proposed MSWLF site is located in the Wailua and Hanamā‘ulu Ahupua‘a in the old moku (or district) of Puna on Kaua‘i. The project area within the Wailua Ahupua‘a is located over one mile inland from the east shore of Kaua‘i, mauka of Kālepa Ridge, and approximately one mile southwest of the south fork of the Wailua River. Today, Wailua Ahupua‘a is split into two districts. North of the Wailua River is in the district of Kawaihau and south of the river is considered the district of Līhu‘e. Hanamā‘ulu Ahupua‘a is also in the district of Līhu‘e (CSH 2013).

Wailua Ahupua‘a is the largest ahupua‘a in both district systems, totaling 20,255 acres. Stretching from the shoreline to its mauka (toward the mountains) extent at Wa‘ia‘ale‘ale (elevation 5,080 ft), the ahupua‘a encompasses most of the small streams and tributaries that flow into the Wailua River, the largest and singular navigable river in the state of Hawai‘i (Handy and Handy 1972:425). The Wailua River and its tributaries constitute the major drainage system for the central area of the Līhu‘e basin. The Līhu‘e basin is bound by the Hā‘upu Mountains to the south, Wa‘ia‘ale‘ale to the west, and the Makaleha Mountains to the north (CSH 2013).

Hanamā‘ulu and Wailua Ahupua‘a comprise a vast system of freshwater resources. Kilohana Crater is the main source for several streams including Waiahi and Waika (Soehren 2002:182-183). These streams eventually feed into Kapaia Reservoir and Hanamā‘ulu Stream. Hanamā‘ulu Stream eventually empties into Hanamā‘ulu Bay. During the early 1970s, water flowing from Hanamā‘ulu Stream was not only dirty, but extremely polluted. On June 9, 1972, the beach at Hanamā‘ulu was closed due to high bacterial levels stemming from fecal matter from pasture animals located in the valley. The fecal matter was spread by run-off into the stream from plantation irrigation water. The beach was closed for 2 years and was reopened after pollution problems were corrected (Clark 1990:6) (CSH 2013).

The most popular and literal translation of Wailua is “two waters,” supposedly referring to the two main forks (north and south) that constitute the Wailua River. The main source that feeds the river is Mount Wa‘ia‘ale‘ale, the highest mountain on Kaua‘i. The mauka waterfalls, Kapakanui and Kapakaiki, literally refer to “big” and “little raindrop” (Pukui et al. 1974:187). Ōpaeka‘a (“rolling shrimp”) Stream also flows
into Wailua River (Pukui et al. 1974:171). Streams of the north fork of Wailua River include Kawi, Uhau 'iole, and Keāhua. Streams of the south fork of the river include 'Ili'ili'ula and Hālī'i (CSH 2013).

Hanamāʻulu Ahupua'a is home to Kalauokamanu Heiau which was a large walled heiau (pre-Christian place of worship) of po'okanaka (sacrificial) class (Site 103; Bennett 1931:125). In 1855, a large section of a wall was destroyed to make room for the sugar mill of the Līhu'e Plantation. Kalauokamanu Heiau is located approximately 2 miles south of the proposed MSWLF site (CSH 2013).

Wailua Ahupua'a was believed to be the political epicenter of Kaua‘i during ancient times. At least seven major heiau have been recorded in a relatively small portion of Wailua Ahupua'a, Pōhaku'ele'ele Heiau, Hikinaakalā Heiau, Holoholokū Heiau, Pōhaku Ho'ohānau, Malae Heiau, Poli'ahu Heiau, and the Pōhaku kani Bellstone. The complex of heiau was declared a National Historic Landmark in 1962 and designated as SIHP # 50-30-08-502. The heiau complex is located approximately 2 miles north of the proposed project area (CSH 2013).

According to some kama‘āina of the area, Wailua Ahupua’a was known as a pu'uhonua or place of refuge (Smith 1955:15). Pu'uhonua were places of peace and safety for transgressors and non-combatants in times of strife. Historian John Papa 'Īlī specifically notes Holoholokū Heiau as a pu'uhonua. Author and historian Frederick B. Wichman asserts Hikina-a-ka-lā was the pu'uhonua (Wichman 1985:70). Judge Lyle A. Dickey maintains the pu'uhonua was Hauola (Dickey 1917:15) (CSH 2013).

Other points of interest in Wailua Ahupua'a include the Pae-ki'i-māhū-o-Wailua petroglyphs and the footprints at Wailua Bay. The petroglyphs are carved on a number of boulders on the south side of the mouth of the Wailua River. On the north side of Wailua Bay at Malohua lies a rock with large footprints. A second footprint is said to be on a rock below the water (Dickey 1917:20). There are five different accounts of how the footprints were created, the theories include a magician on the hunt for Kamapua'a making the mark; a second account includes a chief leaping across the Wailua River marking the spot; a third account is of a brother who waited for his brother so long that his foot created the footprints; another account is of a famous riddler who stepped here; the last is associated with a warrior from Maui who defeated a Wailua champion who attempted to jump back to his homeland from the area, but fell into the sea (Dickey 1917:21). No petroglyphs or footprint rocks were located within or in the vicinity of the proposed project area (CSH 2013).

The ahupua'a of Wailua was once the main residence of Debora Ha'akūlou Kapule, the former wife of Kaua‘i ruler Kaumuali‘i and arguably the most powerful person on Kaua‘i in 1820. She was given the ahupua’a by Ka‘ahumanu where she served as the haku‘aina or landlord. After Kaumuali‘i’s death in May 1824, the people of Kaua‘i were in turmoil regarding land tenure distribution. Kaumuali‘i’s reign was subservient to Kamehameha II (Liholiho) (Stauffer 1994:52–54). Liholiho announced he would not take Kaumuali‘i’s land. Traditionally, upon the death of a sovereign the land titles of ali‘i would be arranged and maka‘aina lands fixed. This rearrangement was known as the kālai‘aina. Kaumuali‘i orally stated that he wanted the lands to remain “as is” for the ali‘i and maka‘aina. The last time this arrangement was done was upon Kamehameha I’s death (Stauffer 1994:53). Kaumuali‘i’s son, George Humehume, led a revolt in August 1824. George Humehume’s intention was to have a kālai‘aina, a redistribution of lands amongst ali‘i, hoping to be appointed as governor and successor to his father and claiming lands (Stauffer 1994:55). A brutal battle broke out leaving men, women, and children dead from Kōlōa to Līhu‘e (Stauffer 1994:61). Kalanimoku, a Big Island ali‘i and Ka‘ahumanu’s main partner in government decisions, returned to O‘ahu, convening a council of Big Island ali‘i who decided Kaua‘i should be given to the new king, Kamehameha III (Kauikeaouli), since Liholihō had perished on his trip to Great Britain (Stauffer 1994:62-63). Because Kauikeaouli was underage, Kahalai‘a, nephew to Kalanimoku, was appointed as his guardian as a consolation and Kalanimoku was appointed governor of Kaua‘i (CSH 2013).

Twenty years later, a final kālai‘aina would be established in the form of the Māhele. Because of the change in powers stemming from the revolt, no land shares existed for claims prior to 1824. All claims began from 1824 when Kalanimoku became governor of Kaua‘i (Stauffer 1994:67). Although
Ka‘ahumanu gave Debora the ahupua‘a, her claim was moot. The thousands of acres she once possessed were now Crown Lands. Debora was awarded a handful of acres including the area now known as Coco Palms, located over a mile and a half northeast of the proposed project area. Debora stayed in Wailua until 1835 and eventually moved to Waimea. Debora Kapule died in 1853.

The ahupua‘a of Hanamā‘ulu was purchased by Paul Isenberg, the manager of Līhu‘e Plantation (Damon 1931:742-747). By 1870, the plantation owned 17,000 acres of undeveloped land in Hanamā‘ulu. Albert Spencer Wilcox started the first sugar cane plantation in Hanamā‘ulu called the Hanamā‘ulu Plantation (Dorrance and Morgan 2000:28). A mill was erected in 1877. A railroad was constructed to connect the fields to the mill. In 1898, Hanamā‘ulu Plantation merged into Līhu‘e Plantation. Hanamā‘ulu Mill operated until 1920 and was later converted into housing for workers (CSH 2013).

Southeast of the proposed project area was a plantation camp called Kapaia. Plantation camps housed various plantation operators in discrete ethnic communities. In 1948, a footbridge that once crossed the Hanamā‘ulu Stream was replaced by the Kapaia Swinging Bridge. This 125-ft suspension footbridge enabled Chinese, Filipino, and Portuguese laborers and their families to go back and forth from work, school, shopping, and play to their respective camps on opposite sides of the stream (Voorhis 2011). After years of exposure, the blank board and steel rope structure had deteriorated to such an extent that Kaua‘i County closed and barricaded the bridge in 2006 for safety reasons. As a historical crossroad, the Kapaia Swinging Bridge was listed on the State Register of Historic Places in 2008 (SIHP # 50-30-11-9077) (Voorhis 2011) (CSH 2013). The ownership of the bridge was since transferred from the County to the non-profit Kapaia Swinging Bridge Foundation for its use, restoration, maintenance, and ownership (County of Kaua‘i, Solid Waste Division, March 25, 2018).

A previous oral history written in 1985 by Jeffrey Agader, who grew up in Hanamā‘ulu during the 1950s, depicts the cultural and historical background of the ahupua‘a with nuanced recollections:

Mr. Agader describes the plantation store as a small wooden structure. He recalls a butcher counter in the rear, bottled sodas for a nickel, a freezer containing ice cream and popsicles, and a glass case with sundry items. His mother would shop for household items and would charge them to his father’s plantation number. This number was once referred to as a “bango” number to make accounting and tracking of plantation laborers easier as it was likely difficult to learn the various spellings involved in the names of laborers from around the world (http://www.yourislandroutes.com/articles/bango.shtml).

Mr. Agader states that growing vegetables was a necessity. The plantation store only sold onions, potatoes, and carrots. The only other source was a Japanese man who peddled his vegetables from a truck once a week. The Agader’s garden consisted of vegetables such as eggplant, lima bean, bittermelon, pumpkin, squash, and other plants.

Mr. Agader recalls fishing with his father in Wailua and Hanamā‘ulu. He would catch mullet in the ponds above Wailua and ‘opae (shrimp) in nets at night in Hanamā‘ulu River. Mr. Agader remembers his father eating the ‘opae raw with lemon juice. Mr. Agader enjoyed the ‘opae fried. Another favored fishing area was the mountain streams and reservoir behind Kālepā Ridge.

Mr. Agader recalls Kālepā Ridge as “a popular playground.” He remembers the mountain range being “covered with ironwood trees and lantana brush.” From the top of the range you could see all of Hanamā‘ulu including the bay where the movie Donovan’s Reef starring John Wayne was filmed.

6.5.4 Results of Community Consultation

In preparing the CIA, CSH contacted Hawaiian organizations, agencies and community members to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the project area and vicinity. Organizations and members/representatives of the organizations consulted included the SHPD, OHA, KNIBC, the Kaua‘i Historic Preservation Commission.
Consultation with Hawaiian cultural organizations, government agencies, and individuals who might have knowledge of and/or concerns about traditional cultural practices specifically related to the Hanamāʻulu and/or Wailua Ahupuaʻa was undertaken by CSH by letter, e-mail, and telephone or in-person contact. In the majority of cases, letters—including a map of the project area—were mailed. The specific language requesting the information included the following (CSH 2013):

“The purpose of the CIA is to gather information about the Project area and its surroundings through research and interviews with individuals who are knowledgeable about this area in order to assess potential impacts on the cultural resources, cultural practices and beliefs identified as a result of the planned Project. We are seeking your kōkua (assistance) and guidance regarding the following aspects of our study:

General history and present and past land use of the Project area. Although the redevelopment will be within the boundaries as stated above, this study will include the entire ahupuaʻa of Hanamāʻulu and Wailua.

Knowledge of cultural sites which may be impacted by future development of the project area—for example, historic sites and/or archaeological sites.

Knowledge of traditional gathering practices in the project area vicinity, both past and ongoing.

Cultural associations of the project area, such as legends and traditional uses.

Referrals of kūpuna or elders and kamaʻāina who might be willing to share their cultural knowledge of the project area and the surrounding ahupuaʻa lands.

Any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the project area.”

CSH attempted to contact 58 individuals for the CIA (Appendix K, see Table 3), of which four responded via e-mail, three responded by phone, two individuals were interviewed, and one group interview (consisting of three family members) was conducted (the participants of the group interview later declined to participate in the study). Presented below are salient themes and concerns that emerged from participants’ interviews regarding the proposed project area:

Liberta Hussey Albao is concerned that ‘opala (trash) is disturbing and that a landfill will affect the water quality.

Hanamāʻulu resident Leopold “Butch” Durant states that his biggest concern is run-off water. Every year there is a large storm. Last year a storm forced him to evacuate his home and ruined a couple of his taro patches.

Presley Wann of the KNIBC states the project area is “pretty safe culturally-wise” because it was primarily plantation land. He noted that the island of Kauaʻi is in need of some kind of landfill. Kupuna Val Ako states that the proposed location for the project is “not okay” and raises the concern of run-off with the project area being near Hanamāʻulu Stream and Wailua Falls. In addition, the presence of streams and ditches from former plantation use still exist in the area contributing to run-off. However, he acknowledges that proper disposal of garbage is important.

Hanamāʻulu resident Joe Rosa was born and raised on the grounds of the former Līhuʻe Plantation. Many plantation camps once dotted both sides of Maʻalo Road and were segregated by ethnic groups. Japanese camps included Abe Camp, Nagao Camp, Aii Camp, and Tanaka Camp. Pukaki Camp consisted of Portuguese workers but later had a mix of Puerto Rican workers. Westle Camp and Christian Camp were German camps located in the mauka region of Wailua Ahupuaʻa. Camps cultivated other crops besides sugarcane including cucumbers and bell peppers (CSH 2013).

Mr. Rosa states that the main water source for the Wailua River is Waiʻaleʻale. A trail from the Wailua Falls lookout leads to a pool down below. Mr. Rosa recalls mullet, yellow fin pāpio (juvenile crevalle, jack, or pompano), and ʻāholehole (juvenile Hawaiian flagtail) swimming upstream from Wailua Bay. He recalls people throwing net at the base of the falls. Other types of aquatic life include funa, a timid
hybrid of koi fish. Due to the introduction of bass and tilapia at the base of the falls. Koi could also be found at the falls. Mr. Rosa notes that people would use the blood of the koi to treat asthma. ‘Ōpae (shrimp), ‘o’opu (general name for fishes included in the families Eleotridae, Gobiidae, and Blennidae), and scorpion ‘ōpae could also be found at the base of the falls.

Mr. Rosa recalls pake opu (catfish) inhabiting Kapaaia Stream, Hanamā‘ulu Stream, and neighboring reservoirs. Mud turtle could be found at the Rego Turtle Farm in Hanamā‘ulu and in watercress patches. Prawns could be found in the back of the Coco Palms where they eventually made way to Kapaaia Stream. Samoan crab could also be found in Hanamā‘ulu Stream.

Mr. Rosa notes that the Hanamā‘ulu area was rich with plants including guava, hāpu‘u fern, and pepeiao (tree fungus). Pepeiao was gathered from the hau (beach hibiscus) tree.

In addition to aquatic life and plants, hunting played a large role in gathering food. Mr. Rosa states permits needed to be obtained to hunt pheasant, pigs, and quail. Mr. Rosa recalls hunting mauka of Kūhio Highway. Pheasant and quail were prepared teriyaki style. Pig was seasoned well to take out the gaminess and then roasted. Frogs could be found in streams and were consumed. Some would fry the frogs like chicken, others would make a stew. Deer could be found on the western mauka lands of Koke‘e. Prior to the closing of Līhu‘e Plantation, deer were spotted in the Kilohana area.

Mr. Rosa shared many concerns regarding the proposed project:

- Flumes and ditches are still present on the lands mauka of Kālepa Ridge.
- The proposed site currently sits on land zoned for agriculture. In order for the landfill to come to fruition, the land would need to be rezoned.
- If there is a landfill, waste would eventually make its way to Wailua Falls, polluting the valleys along the way, affecting the water table, and the entire water system around the proposed project area.
- Hulē‘ia National Wildlife Refuge is located southwest of the proposed project area. The refuge is home to eight types of waterbirds, five of which are endangered. The endangered species include the ae‘o (Hawaiian stilt), ‘alae ke‘oke‘o (Hawaiian coot), ‘alae‘ula (Hawaiian moorhen), koloa maoli (Hawaiian duck), and the nēnē (Hawaiian goose). Other birds that consider the refuge home include the kōlea (Pacific golden plover), ‘akekeke (Ruddy turnstone), and ‘ūlili (Wandering tattler) (U.S. Fish & Wildlife Service 2013). Mr. Rosa is concerned that the proposed landfill will draw the nēnē and other birds to the site as scavengers, thus being prey to cats, rats, and dogs who would gather in the area also looking for food.

Mr. Rosa points out that traffic safety is an issue. If the main point of entry to the proposed landfill is via Ma‘alo Road at the foot of Kapaaia Bridge, the road curves from both sides which could cause brake failures leading to accidents and possibly death. In addition to safety precautions, he adds that Ma‘alo Road would need to be widened. The single lane road was “not built to take the heavy weights of trucks” and he notes that tour buses do not access Ma‘alo Road.

The CIA identified community concerns regarding the potential for cultural impacts associated with the proposed project. According to research by CSH, during the 1970s Hanamā‘ulu Stream discharged silty and polluted water, eventually emptying into Hanamā‘ulu Bay. The pollution stemmed from fecal matter from pasture animals located in the valley and was later spread by run-off into the stream from plantation irrigation water (Clark 1990:6). In addition, two community members raised concerns regarding this problem:

Mr. Leopold “Butch” Durant is concerned with run-off. In addition, his property is southeast of the project area and sits adjacent to Hanamā‘ulu Stream.

Kupuna Val Ako is also concerned with run-off. He has raised the concern that the project area is adjacent to Hanamā‘ulu Stream and Wailua Falls; and that other streams and ditches from the plantation era still exist in the vicinity.
6.5.5 Potential Project Effects

**Construction.** The potential for direct adverse effects to surface waters are not expected from the construction of the proposed project, as there are no perennial or intermittent streams located within the proposed MSWLF footprint. However, there is the potential for short-term construction related impacts resulting from the discharge of sediments and turbidity in construction stormwater run-off. Measures and BMPs as described in Section 4.4 would be implemented to ensure the protection of nearby surface waters as they relate to traditional cultural practices/resources.

**Operations.** No streams classified as perennial or intermittent, no lakes, and no reservoirs are contained within the proposed project boundaries containing the proposed MSWLF site. There is the potential however for indirect or cumulative effects to nearby surface waters from MSWLF operations, including the potential discharge of sediments and turbidity or other material in stormwater run-off due to facility operations. No significant adverse effect to surface water resources relating to cultural and traditional practices are expected as run-on from offsite sources and run-off from onsite sources would be prevented. To address potential surface water impacts measures as described in Section 4.4 would be implemented.

The potential for pollution to surface waters from the inadvertent or accidental release of landfill leachate was also considered. See Section 4.4.2.

6.5.6 Mitigation Measures

No further historical preservation is recommended for SIHP # 50-30-11-2218 within the project area. However, if additional construction is anticipated, AIS-level documentation would be performed for any components of SIHP # 50-30-11-2218 outside the current project area (CSH 2016). Should any burials or other cultural finds be identified during ground disturbance, the construction contractor should immediately cease all work while the appropriate agencies including the SHPD, are notified pursuant to applicable law (HRS, Chapter 6E).
7.0 PERMITS AND REGULATORY APPROVALS THAT MAY BE REQUIRED

Permitting, consultation, and approval requirements for the proposed MSWLF facility are described below.

7.1 LANDFILL PERMITS AND APPROVALS

Table 7-1 summarizes the Federal, State, and County permits and approvals that may be required in order to implement the proposed MSWLF at Ma’alo.

Table 7-1: Landfill Permits, Regulatory Approvals, and Related Requirements

<table>
<thead>
<tr>
<th>Permit or Approval</th>
<th>Description</th>
<th>Regulation(s)</th>
<th>Administrative Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIS</td>
<td>The site of the proposed Ma’alo MSWLF is located on State of Hawai’i land, and the proposed Project would use County of Kaua’i funds; therefore, the proposed Project would trigger the State environmental review process. As part of the environmental review process, an EIS is currently being prepared for the proposed Project, and this conceptual design informs that analysis.</td>
<td>HRS §343</td>
<td>DOH Office of Environmental Quality Control</td>
</tr>
<tr>
<td>Solid Waste Management Permit</td>
<td>A MSWLF must be authorized under a Solid Waste Management Permit.</td>
<td>HAR §11-58.1-04</td>
<td>DOH SHWB</td>
</tr>
<tr>
<td>Historic Preservation Review</td>
<td>State and county projects that may affect a historic property must obtain a concurrence of “no historic properties affected” from the State of Hawai’i DLNR, State Historic Preservation Division (SHPD) prior to commencement.</td>
<td>HRS §6E-8; HAR §13-275</td>
<td>SHPD</td>
</tr>
<tr>
<td>Endangered and Threatened Species Review</td>
<td>State and County projects that may affect species of aquatic life, wildlife, or land plant that has been determined to be endangered or threatened must obtain a concurrence of “no affect” from DLNR prior to commencement.</td>
<td>HRS §195D-4</td>
<td>DLNR</td>
</tr>
<tr>
<td>Wildlife Control Program</td>
<td>Under the Animal Control Act of 1931, the USDA can manage wildlife injurious to agricultural interests, other wildlife, or human health and safety, including wildlife hazards to aircraft. The County will discuss and negotiate with USDA to perform the recommended wildlife control program.</td>
<td>7 U.S.C. 426-426c</td>
<td>USDA Wildlife Services (USDAWS)</td>
</tr>
<tr>
<td>Endangered Species Act (ESA) Incidental Take Permit</td>
<td>Section 9 of the ESA prohibits the “take” of any federally listed endangered species. The ESA defines “take” as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” (16 U.S.C. 1532(19)). If it is not possible to design an otherwise lawful land use activity in a manner that avoids take of a listed species, either directly or through habitat modification, Section 10(a)(1)(B) of the federal ESA (16 U.S.C. 1539(a)(1)(B)) authorizes USFWS to issue an “incidental take permit,” allowing take that is “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.” As part of the take permit application, a HCP will be prepared. The Hawaiian goose, Hawaiian stilt, Hawaiian coot, Hawaiian duck, and Hawaiian moorhen have been observed in the vicinity of the proposed Ma’alo Landfill site. Implementation of wildlife attraction deterrents should be sufficient to avoid the need for take permits to cover harassment activities. However, the County will continue to coordinate with USFWS regarding an Incidental Take Permit.</td>
<td>16 U.S.C. 1538(a); 16 U.S.C. 1539(a)(1)(B)</td>
<td>USFWS</td>
</tr>
</tbody>
</table>


<table>
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</tr>
</thead>
<tbody>
<tr>
<td>State Incidental Take License for Species Recognized by the Federal ESA</td>
<td>The unauthorized “take” of endangered or threatened species is prohibited (HRS Section 195D-4(e)). Under HRS Section 195D-4(g), the Board of Land and Natural Resources, after consultation with the state’s Endangered Species Recovery Committee, may issue a temporary Incidental Take License to allow a take otherwise prohibited if the take is incidental to the carrying out of an otherwise lawful activity. The Hawaiian goose, Hawaiian stilt, Hawaiian coot, Hawaiian duck, and Hawaiian moorhen have been observed in the vicinity of the proposed landfill site. Implementation of wildlife attraction deterrents should be sufficient to avoid the need for take license to cover harassment activities. However, the County will continue to coordinate with the DLNR regarding an Incidental Take License.</td>
<td>HRS §195D</td>
<td>DLNR</td>
</tr>
<tr>
<td>Migratory Bird Treaty Act (MBTA) Depredation Permit</td>
<td>The MBTA of 1918 prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by USFWS. The County will work with USDA to negotiate a scenario where the landfill wildlife controls will be covered under the USDA’s existing permits or seek to obtain a MBTA Depredation Permit from USFWS and the State.</td>
<td>16 U.S.C. 703-712</td>
<td>USFWS</td>
</tr>
<tr>
<td>State Take Permit for Wild Birds</td>
<td>Except as provided in Section 183D-61 (take permits), no person shall intentionally, knowingly, or recklessly take, catch, injure, kill, or destroy, or attempt to take, catch, injure, kill, or destroy, any wild bird, or to keep or have possession of any wild bird, dead or alive, or to damage or destroy a nest of any wild bird.” Cattle egrets and other bird species that may be subject to lethal removal under the recommended wildlife control program will need both a Federal permit (ESA or MBTA) and a State permit, the latter under HRS §183D-61. HRS §183D-62 prohibits the taking, injuring, or destroying of wild birds.</td>
<td>HRS §183D-61; HRS §183D-62</td>
<td>DLNR Division of Forestry and Wildlife (DOFAW)</td>
</tr>
<tr>
<td>Clean Water Act (CWA) §402 National Pollutant Discharge Elimination System (NPDES) Permit(s)</td>
<td>Section 402 of the federal CWA establishes the NPDES program regulating the discharge of pollutants to waters of the United States. NPDES permits would be required to authorize discharges of surface water associated with construction activities that result in disturbance of 1 acre or more of total land area, and also for the facilities’ operational surface water management system discharges.</td>
<td>CWA (33 U.S.C. Section 1251 et seq); HRS §342D; HAR §11-55, Appendix C</td>
<td>DOH Clean Water Branch (CWB)</td>
</tr>
<tr>
<td>Grading Permit, Grubbing Permit</td>
<td>Per County of Kaua’i Ordinance 808, §22-7.6(b), a grading permit is not required for a sanitary landfill, subject to applicable County, State, or Federal government regulations or laws.</td>
<td>Ordinance No. 808</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Building Permit</td>
<td>A building permit would be required for MSWLF facility buildings.</td>
<td>Ordinance No. 929</td>
<td>County of Kaua’i DPW, Engineering Division</td>
</tr>
<tr>
<td>State Special Use Permit</td>
<td>The proposed Ma’alo site is in a State Agricultural District and therefore may require a State Special Use Permit.</td>
<td>HRS §205</td>
<td>County of Kaua’i Planning Department and State Land Use Commission</td>
</tr>
<tr>
<td>State Land Use District Boundary Amendment (SLUDBA)</td>
<td>An alternative to the State Special Use Permit that is under consideration involves filing a SLUDBA petition for a change in the State Land Use District designation from Agricultural to Urban. If selected, the State Special Use Permit would not be required.</td>
<td>HRS §205</td>
<td>State Land Use Commission</td>
</tr>
</tbody>
</table>
### Permit or Approval

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>County Change of Zone Application</td>
<td>The requirement for a Change of Zone from Agriculture (A) to the General Industrial (IG) zone would be required following the filing and approval of the SLUDBA in accordance with Article 6 of the County's Comprehensive Zoning Ordinance.</td>
<td>Comprehensive Zoning Ordinance</td>
<td>County of Kaua‘i Planning Department</td>
</tr>
</tbody>
</table>

#### 7.2 ACCESS ROUTE PERMITTING, LAND USE, AND LAND ACQUISITION

The parcels containing the proposed E3 Access Route (Access Road E and Driveway 3) are zoned as Residential and Industrial. ROW acquisitions, described in Section 2.3, would need to be secured. The property owners of the ROW acquisition areas are Visionary LLC and Grove Farm Co., Inc. Estimated time for rezoning and ROW acquisition is a minimum of 12 months. Access road and related construction (Section 2.3) would require an NPDES NOI Form C Construction Storm Water permit from the State DOH.
8.0 RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS FOR THE POTENTIALLY EFFECTED AREA

Federal, State, and County regulations, land use plans, policies, and controls are established to guide development to enhance the overall environment to meet long-term social, economic, environmental, and land use needs of the people of Hawai‘i are met. The proposed project (a new MSWLF at Ma‘alo) and its applicable laws, policies, and controls are presented in this section.

8.1 FEDERAL

8.1.1 Resource Conservation and Recovery Act (RCRA)

RCRA (P.L. 94-580), an amendment to the Solid Waste Disposal Act of 1965, was enacted in 1976 to address the safe management and disposal of MSW (and industrial waste). RCRA defines a municipality as a “county… with responsibility for the planning or administration of solid waste management” (42 U.S.C. §6903). RCRA defines solid waste as:

Any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act…, or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954…. (42 U.S.C. §6903)

The goals established under RCRA (42 U.S.C. §6902) include the following:

- Promoting the protection of health and environment and conserving valuable material and energy resources.
- Promoting improved solid waste management techniques, including improving methods of collection, separation, and recovery of solid waste, and the environmentally safe disposal of non-recoverable residues.
- Promoting the application of solid waste management, resource recovery, and resource conservation systems that preserve and enhance the quality of air, water, and land resources.
- Reducing and eliminating the generation of hazardous waste as expeditiously as possible.

The national solid waste management program established under RCRA Subtitle D encourages states to develop comprehensive plans to manage nonhazardous industrial solid waste and MSW. The EPA sets criteria for MSWLF facilities and other solid waste disposal facilities, and prohibits the open dumping of solid waste. According to the EPA (www3.epa.gov/region02/waste/dsummary.htm):

“RCRA Subtitle D focuses on state and local governments as the primary planning, regulating, and implementing entities for the management of non-hazardous solid waste, such as household garbage and non-hazardous industrial solid waste. EPA provides these state and local agencies with information, guidance, policy and regulations through workshops and publications to help states and the regulated community make better decisions in dealing with waste issues, to reap the environmental and economic benefits of source reduction and recycling of solid wastes, and to require upgrading or closure of all environmentally unsound disposal units. In order to promote the use of safer units for solid waste disposal, EPA developed federal criteria for the proper design and operation of municipal solid waste landfills (MSWLFs) and other solid waste disposal facilities. Many states have adopted these criteria into their solid waste programs.”
Planning, development and operation of the proposed MSWLF at Ma'alolo would comply with the applicable requirements of RCRA Subtitle D.

8.1.2 Clean Air Act (CAA)

Ambient air quality, which refers to the purity of the general outdoor atmosphere, is regulated under the Clean Air Act (CAA) and the EPA National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50). The DOH also regulates air quality and established ambient air quality standards (HAR Title 11, Chapter 59-4) that are as strict as or, in some cases, stricter than the NAAQS. The State of Hawai`i has also established standards for fugitive dust emissions emanating from construction activities (HAR Title 11, Chapter 60.1-33). These standards prohibit any visible release of fugitive dust from construction sources without taking reasonable precautions. Section 4.2 discusses the County's efforts to maintain air quality during construction and operations of the proposed MSWLF.

The EPA issued its final New Source Performance Standards, 40 CFR Part 60, to reduce emissions of methane, a potent LFG, updating the earlier 1996 standards. This action is part of the President's Climate Action Plan: Strategy to Reduce Methane Emissions. Section 4.1 discusses the County's efforts to capture and reduce methane gas and other greenhouse gas emissions produced from the proposed MSWLF.

8.1.3 Clean Water Act (CWA)

The Federal Water Pollution Control Act was enacted in 1948, and later reorganized and expanded in 1972 with the passage of the Clean Water Act (CWA) (33 U.S.C. Section 1251, et seq.) and its amendments. The purpose of the CWA is to protect surface water quality in the United States. The Act does not directly address groundwater or water quality issues (addressed by the Safe Drinking Water Act). The CWA establishes the basic structure for regulating discharges of pollutants into waters of the United States and provides for the regulation of quality standards for surface waters.

Section 402 of the CWA is applicable to this project. This section makes it unlawful to discharge any pollutant from a point source into navigable waters, unless a National Pollutant Discharge Elimination System (NPDES) permit is obtained. Point sources are discrete conveyances such as pipes or man-made ditches. The CWA is administered in Hawai‘i through the CWB under HAR, Chapter 11-55, Water Pollution Control.

8.1.4 Safe Drinking Water Act (SDWA)

The Safe Drinking Water Act (SDWA) (42 U.S.C. Section 300f, et seq.) was established in 1974 to protect the quality of drinking water in the United States. The SDWA covers all waters actually or potentially designed for drinking use, whether from aboveground (surface) or underground sources. Under SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers that implement its standards.

Under the SDWA, the County must demonstrate that the development and operation of a MSWLF at Ma‘alo would not result in adverse effects to drinking water sources on the island of Kaua‘i, and must monitor the continued protection of groundwater via a groundwater monitoring program. In Hawai‘i, oversight for the provisions of the SDWA are delegated from the EPA to the DOH SDWB through the UIC Program. A UIC permit will be required to address the use of groundwater monitoring wells. A Groundwater Monitoring Plan will also be prepared in accordance with HAR §11-58.1-16, 40 CFR 258 Subpart E, and the State of Hawai‘i Landfill Groundwater Monitoring Guidance Document (DOH 2002) (see also Section 4.5).
8.1.5  Endangered Species Act

Section 9 of the federal ESA prohibits the “take” of any federally listed endangered species (16 U.S. Code [U.S.C.] 1538(a)). The federal ESA defines “take” as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” (16 U.S.C. 1532(19)). If it is not possible to design an otherwise lawful land use activity in a manner that avoids take of a listed species, either directly or through habitat modification, Section 10(a)(1)(B) of the federal ESA (16 U.S.C. 1539(a)(1)(B)) authorizes USFWS to issue an “incidental take permit,” allowing take that is “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.” As part of the take permit application, a Habitat Conservation Plan (HCP) would also be required. HCPs are planning documents that describe the anticipated effects of the proposed taking; how those impacts will be minimized or mitigated; and how the HCP is to be funded (USFWS 2011).

The potential impact to federally listed species during construction activities would be to Hawaiian Petrels and Newell’s Shearwaters from the potential threat of loss to birds that are downed after becoming disoriented by exterior lighting or construction activities at night. However, the proposed project is planned for construction during daylight hours with no night work planned. No impacts to seabirds are therefore expected (see also Section 4.8).

The Hawaiian goose, Hawaiian stilt, Hawaiian coot, Hawaiian duck, and Hawaiian moorhen have been observed in the vicinity of the proposed Ma’alo Landfill site (SWCA 2016). Although they are not attracted to the active face of the Kekaha Landfill, these species could be attracted to various other features of the proposed Ma’alo MSWLF when it is operational and could be subject to hazing or “harassment” under the wildlife control program (SWCA 2016). Since the recommended habitat management activities would reduce the potential of these species to occupy the area in large numbers, the lethal take of these species should not be necessary. Implementation of wildlife attraction deterrents should be sufficient to avoid the need for take permits to cover harassment activities. The County will continue to coordinate with USFWS regarding an Incidental Take Permit See also Appendix G and Appendix H.

8.1.6  Migratory Bird Treaty Act

The MBTA of 1918 (implemented by 16 U.S.C. 703–712) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by USFWS. Even though the MBTA does not have provisions for allowing unauthorized take, the MBTA recognizes that some migratory birds may be killed by aircraft despite implementing measures to avoid take of birds. Acknowledging that certain bird species can cause damage to aircraft and threaten human safety, USFWS, by regulation and permit, has provided for controlled take of certain species in specific areas at specified times. The County will either work with USDA to negotiate a scenario where the landfill wildlife controls will be covered under USDA’s existing permits, or seek to obtain a MBTA Depredation Permit from USFWS and the State.

8.1.7  Animal Control Act of 1931

Under this act, the USDA can manage wildlife injurious to agricultural interests, other wildlife, or human health and safety, including wildlife hazards to aircraft. This act permits USDA to manage wildlife that may pose hazards to aviation. The County will discuss and negotiate with USDA to perform the recommended wildlife control program.

8.1.8  Federal Insecticide, Fungicide, and Rodenticide Act

The U.S. Environmental Protection Agency oversees the registration, labeling, classification, and use of pesticides, as stated in the Federal Insecticide, Fungicide, and Rodenticide Act. Persons using restricted-use pesticides, applying any pesticides to the land of another, or applying any pesticides for hire, must be a Certified Applicator, or working under the direct supervision of a Certified Applicator,
and then may only use pesticides covered by the Certified Applicator’s certification. Use of a rodenticide to eradicate small mammals or an herbicide to manage the vegetation will require compliance with this act.

8.2 STATE OF HAWAI‘I

8.2.1 Hawai‘i State Plan

The Hawai‘i State Plan (HRS, Chapter 226) serves as a written guide for the future long-range development of the State. The Plan identifies goals, objectives, policies, and priorities for the State. The proposed new MSWLF and future potential RRP at Ma‘alo is consistent with Section 226-14, Objectives and Policies for Facility Systems, in General, which states:

(a) Planning for the State’s facility systems in general shall be directed toward achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.

(b) To achieve the general facility systems objective, it shall be the policy of this State to:
   (1) Accommodate the needs of Hawai‘i’s people through coordination of facility systems and capital improvement priorities in consonance with State and County plans.
   (2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.
   (3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.
   (4) Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction, and maintenance of facility systems.

The proposed project supports the safe disposal of MSW resulting from the use of goods, products, and materials that are no longer feasible to be further reused, recycled, or reclaimed, under existing conditions. The disposal of this refuse in an environmentally safe manner allows for greater focus on statewide systems that support social, economic, and physical objectives.

The proposed project addresses the fundamental need for the disposal of MDW. The proposed MSWLF would promote maintenance of basic public health and sanitation standards by providing a site that is specifically developed for the safe disposal of MSW generated on the island.

The proposed project would support the State’s facility systems with regard to solid and liquid wastes, which states:

(a) Planning for the State’s facility systems with regard to solid and liquid wastes shall be directed toward the achievement of the following objectives:
   (1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes….

(b) To achieve solid and liquid waste objectives, it shall be the policy of this State to: …
   (2) Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.
   (3) Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.

The proposed project addresses the fundamental need for the disposal of MDW. The proposed MSWLF would promote maintenance of basic public health and sanitation standards by providing a site that is specifically developed for the safe disposal of MSW generated on the island.
8.2.2 State Land Use Law

HRS, Chapter 205, also known as the “State Land Use Law,” contains statutes governing land use in the State of Hawai‘i. Chapter 205 is intended to preserve and protect Hawai‘i lands and to encourage uses to which the lands are best suited. All lands in Hawai‘i are classified as Urban, Rural, Agricultural, or Conservation. The proposed MSWLF site at Ma‘alo is within the State Agricultural District (see Figure 8-1) (Note: all eight potential new-MSWLF sites identified are within the Agricultural District). Because the project is in the State Agricultural District, a State Special Use Permit or SLUD Boundary Amendment must be obtained. The Ma‘alo site is within the County-zoned Agricultural and Open Districts.

In the event the County pursues a petition for a State Special Permit pursuant to HRS, Section 205-6, two approvals would be required: (1) from the County Planning Commission; and (2) from the Land Use Commission (LUC). If a petition for a boundary amendment is pursued instead, two approvals would be required: (1) from the LUC to re-district the land from SLUD Agricultural to Urban; and (2) from the County Council to rezone the land from the County-zoned Agricultural and Open Districts to the General Industrial District. Under both scenarios a petition for Class IV Zoning Permit and Use Permit are required. Further consultation is needed to determine the preferred land use entitlement process or combination of processes for the Ma‘alo MSWLF site.

8.2.3 Important Agricultural Lands

The State Land Use Law contains the following definition of important agricultural lands (IAL) (HRS §205-42):

(a) As used in this part, unless the context otherwise requires, “important agricultural lands” means those lands, identified pursuant to this part, that: (1) Are capable of producing sustained high agricultural yields when treated and managed according to accepted farming methods and technology; (2) Contribute to the State’s economic base and produce agricultural commodities for export or local consumption; or (3) Are needed to promote the expansion of agricultural activities and income for the future, even if currently not in production.

The County of Kaua‘i’s Department of Planning Kaua‘i Important Agricultural Lands Study\(^{12}\) draft report was prepared to identify potential IAL designations pursuant to the County-specific directives of Act 183, Session Laws of Hawai‘i 2005. In consideration of broad-based discussions, recommendations, research and analysis conducted in regard to the identification and designation of IAL on Kaua‘i, in particular toward the increase of food and primary resources, the following criteria for County-led designations were recommended:

1. Review the potential for IAL on a variety of lands island wide, refer to “Overview Map of Agricultural Lands Meeting the Threshold for County Designation”;
2. Prioritize those lands of fifteen (15) acres or more;
3. Prioritize those lands that meet a threshold of 28 or more first; followed by those lands that at least meet the criteria for water availability (through parcel score and evidence);
4. Prioritize lands already in production of food first, or if not, currently being farmed; and
5. Work with landowners and other stakeholders to further develop a County-Level IAL Incentives/Support Program.

\(^{12}\) Source: https://sites.google.com/site/kauaiial/
Figure 8-1: State Land Use Districts in the Project Vicinity
The proposed MSWLF site at Ma'alo is not identified as IAL designated lands; they are however, identified as grazing lands meeting the threshold for County-led designations. The proposed criteria for County-led designations provides a strategy for the County to prepare designation maps, and is not a requirement for the immediate designation of all candidate lands as they may conflict with lands slated for public projects. The proposed Ma'alo site is not expected to be designated as IAL due to the pending consideration as use as a MSWLF and future RRP site.

8.2.4 Coastal Zone Management

Special controls on development in coastal areas are established to avoid permanent loss of valuable coastal resources and loss of potential management options that may otherwise protect and preserve Hawai'i's coastal areas. SMA boundaries are established by the County of Kaua'i to delineate coastal zone areas subject to such controls. The State of Hawai'i designates a Coastal Zone Management (CZM) Program to manage the intent, purpose, and provisions of HRS §205A-2, as amended, and federal regulations (15 CFR §930.32) for the areas from the shoreline to the seaward limit of the State's jurisdiction and any other area that a lead agency may designate for the purpose of administering the CZM Program.

The proposed MSWLF site is located well mauka of the coastline, outside of the SMA.

The following is an assessment of the project with respect to the CZMP objectives and policies set forth in HRS, Section 205(A)-2.

1. **Recreational resources.** The proposed project is not located on the coastline or shoreline, and does not involve the use or exploitation of coastal resources. The site is not in a location that would lead to the development of new shoreline recreational opportunities or to the dedication of new shoreline areas with recreational value.

2. **Historic resources.** Archaeological investigation of the site in 2014 resulted in a project-specific effect recommendation is "no historic properties affected." The proposed project site has been subject to extensive prior agricultural land uses and would not negatively impact historic resources of the coastline.

3. **Scenic and open space resources.** The majority of the proposed project would not be visible from most vantage points along the Kūhiō Highway. Views of the project site from the highway are mostly blocked by the Kālepa Ridge to the west. North of the site is a fork of the Waipoo River. The banks above this fork are green and lush with vegetation, and obstruct views of the site. Southward and westward are other agricultural fields and the Aīi Reservoir. The Pukaki Reservoir is located approximately 0.25 mile to the south, and the Kapaa Reservoir is situated further west, more than 0.5 mile from the Ma'alo site.

   Views into the project site would be primarily along the network of rudimentary agricultural roadways and Ma'alo Road serving the uplands surrounding the project site. Mitigation to reduce visual impacts will utilize landscaping based on the use of existing vegetation to mitigate views of the landfill.

4. **Coastal ecosystems.** The proposed project is not expected to have any adverse effects on coastal or marine coastal ecosystems. The location of the project is mauka of the shoreline and the Kūhiō Highway (and the Kālepa ridge).

5. **Economic uses.** Although the proposed project is not a coastal dependent facility, the location of the project site was based on selection criteria and governmental regulations that establish the suitability of the site for use as a landfill. This land use is not expected to affect the location or expansion of future coastal dependent developments.

6. **Coastal hazards.** The potential for hazards from storm wave, tsunami, hurricane, wind, flood erosion, subsidence, and point and nonpoint source pollution would be addressed through adherence to the landfill site operating manual and all required regulatory permits. Coastal
flooding is not expected based on the location of the project inland and upgradient of the Kūhiō Highway (and the Kālepa ridge).

7. **Managing development.** The proposed MSWLF site is located in the Agriculture District (A). Land uses are subject to regulation by the State and County. All improvement activities would comply with State and County environmental rules and regulations.

8. **Public participation.** Public involvement will consist of public notification of the project as provided in the OEQC Bulletin. See Section 10.3, Organizations, Agencies, Public Parties, and Individuals to be Consulted for the the DEIS. All written public comments to this DEIS will be provided with a written response and as appropriate, mitigation measures will be developed to address issues and concerns.

9. **Beach protection.** The proposed project is not located along the shoreline or beach. No structures are proposed seaward of the shoreline. Control of erosion would be based on conformance to standards of the County regulating the control of erosion.

10. **Marine resources.** The proposed project does not involve or utilize marine resources.

### 8.2.5 Water Pollution Control

The State of Hawai‘i DOH is delegated by the EPA to administer the NPDES Permit program in Hawai‘i. The NPDES permit program is described in and administered through Chapter 55, HAR, *Water Pollution Control*.

The development of the MSWLF at Ma‘alo would likely require two permits under the Clean Water Act, Section 402: (1) NPDES Form C, for discharges of stormwater associated with construction activity; and (2) NPDES Form B, for discharges of stormwater associated with industrial activities.

### 8.2.6 Solid Waste and Solid Waste Management Control

The state’s management of solid waste is subject to the provisions of Chapter 342H, HRS, *Solid Waste Pollution*, and is regulated by Chapter 58, HAR, *Solid Waste Management Control*.

Under HAR §11-58.1-01:

The purpose of this chapter is to establish minimum standards governing the design, construction, installation, operation, and maintenance of solid waste disposal, recycling, reclamation, and transfer systems. Such standards are intended to:

1. Prevent pollution of the drinking water supply or waters of the State;
2. Prevent air pollution;
3. Prevent the spread of disease and the creation of nuisances;
4. Protect the public health and safety;
5. Conserve natural resources; and
6. Preserve and enhance the beauty and quality of the environment.

According to the regulations [HAR §11-58.1-04(a)]:

It shall be unlawful for any person to establish, modify, or operate any solid waste management facility or a part thereof or any extension or addition thereto without a permit issued in accordance with this chapter, HRS, Chapter 342H, and the integrated solid waste management plan for the State of Hawai‘i.
The exclusionary criteria used to delineate areas where it is best not to site a MSWLF are contained in HAR §11-58.1-13. The following criteria were used to determine if potential landfill sites could be included in the analysis for a new MSWLF site:

- Areas within 10,000 feet of airport runways
- 100-year floodplains and floodways
- Wetlands
- Fault areas
- Seismic impact zones
- Unstable areas
- Tsunami inundation areas

The proposed MSWLF site is located within seismic zone 1, a designation indicating minimal seismic hazard and where MSWLFS are permitted. This would require that the proposed facilities be designed and operated in accordance with the State’s Solid Waste and Solid Waste Management Control provisions. The facilities, including their design, maintenance, monitoring, closure and post-closure plans, would require review and approval by the SHWB prior to construction.

8.2.7 HRS Chapter 195D

The purpose of Chapter 195D of the HRS is “to insure the continued perpetuation of indigenous aquatic life, wildlife, and land plants, and their habitats for human enjoyment, for scientific purposes, and as members of ecosystems…” (HRS Section 195D-1). HRS Section 195D-4 states that any endangered or threatened species of fish or wildlife recognized by the federal ESA shall be so deemed by state statute. As under the federal ESA, the unauthorized “take” of such endangered or threatened species is prohibited (HRS Section 195D-4(e)). Under HRS Section 195D-4(g), the Board of Land and Natural Resources, after consultation with the state’s Endangered Species Recovery Committee, may issue a temporary Incidental Take License to allow a take otherwise prohibited if the take is incidental to the carrying out of an otherwise lawful activity.

The Hawaiian goose, Hawaiian stilt, Hawaiian coot, Hawaiian duck, and Hawaiian moorhen have been observed in the vicinity of the proposed landfill site. These species may be attracted to various features of the proposed landfill and could be subject to hazing or “harassment” under the wildlife control program. An Incidental Take License will be required if there is “harassment” to these species (SWCA 2016). The County will continue to coordinate with USFWS and the State regarding any federal incidental take permit and State incidental take license.

8.2.8 HRS Chapter 183D-62

Chapter 183D-62 of the HRS states, “Taking, injuring, or destroying wild birds [is] prohibited. Except as provided in Section 183D-61 (take permits), no person shall intentionally, knowingly, or recklessly take, catch, injure, kill, or destroy, or attempt to take, catch, injure, kill, or destroy, any wild bird, or to keep or have possession of any wild bird, dead or alive, or to damage or destroy a nest of any wild bird.” Cattle egrets and other bird species that may be subject to lethal removal under the recommended wildlife control program are protected under HRS Section 183D-62. The County will obtain the appropriate state permit before implementing the lethal control program.
8.3 COUNTY OF KAU‘I

8.3.1 Kaua‘i County General Plan

Section 7 of the County of Kaua‘i General Plan (County of Kaua‘i 2012), Building Public Facilities and Services, identifies solid waste management as a public responsibility of the County of Kaua‘i DPW. “General Policies” relevant to MSWLF siting include the following:

(a) Using long-range integrated resource planning, the County shall manage an island-wide system of solid waste collection, reuse, recycling and disposal that (1) is environmentally sound and cost-effective; (2) increases diversion of waste from the island’s landfill(s); and (3) provides for the timely and orderly expansion of solid waste facilities.

The County has engaged in a 12-year effort to identify a feasible site for a new MSWLF. Included in the effort was the 2009 County of Kaua‘i ISWMP (R. W. Beck 2009), which contributes to the decision-making framework for site selection:

The County shall incorporate entrepreneurial principles in managing solid waste, involve private businesses, and support market-oriented innovations and initiatives. Among other options, the County shall consider opportunities for utilizing the waste stream for energy generation.

The development of a potential future RRP within the Ma‘alo site addresses this item, which encourages use of “entrepreneurial principles” by the County to manage solid waste and involve the private sector in such efforts.

Section 7.8.5 of the General Plan, “Implementing Actions,” also refers to the ISWMP:

The County government shall:

(a) Prepare a long-range Solid Waste Integrated Management Plan, to be adopted by the County Council and updated every five years. The SWMP shall set policies to guide solid waste programs, facility planning, capital improvements, operations, user fees, and financing.

(b) Commit the necessary funding and staff resources to implement the County Integrated Solid Waste Management Plan.

(c) Increase the effectiveness of the County’s solid waste system by maximizing the convenience of reuse and recycling centers for users.

(d) Establish a set of measurable goals to evaluate County efforts to divert solid waste from the island’s landfill.

(e) Develop a proactive process for siting and designing sanitary landfills and other facilities that incorporates early and detailed consultation and negotiation among the utility, the County government, community stakeholders, and the general public.

The County’s response to the General Plan, Implementing Actions, as cited above, was the preparation of the updated ISWMP (R. W. Beck 2009). Section 11 of the 2009 plan proposes a four-stage siting strategy for site selection:

(1) Establish a siting task force.
(2) Identify excluded sites and develop county-specific siting criteria.
(3) Define ranking criteria and rank available sites.
(4) Select a proposed site.
The general principles that emphasize flexibility to resolve conflicts, disputes, and impasses are included in the strategy. The actions taken by the County to identify the Ma'alo site as the proposed new Kaua'i MSWLF site are in general accordance with the processes outlined in the ISWMP (R. W. Beck 2009).

8.3.2 Chapter 8, Kaua'i County Code, Comprehensive Zoning Ordinance

The stated purpose of Kaua'i’s Comprehensive Zoning Ordinance is to provide regulations and standards for land development and the construction of buildings and other structures. Based on the findings and analysis of the General Plan, the zoning ordinance establishes several land districts and delineates the respective types of permitted uses and development that can take place in those districts.

The proposed MSWLF site is located in the Agriculture and Open Districts. The proposed construction and operation of the new MSWLF may require a Use Permit from the County of Kaua'i, Department of Planning under Section 8.7.3 of the County’s Comprehensive Zoning Ordinance, “Uses and Structures That Require a Use Permit.” The provision likely to trigger this requirement is item “(11), Private and public utility facilities.” See Section 7.0 for further discussion of County approvals possibly required for the proposed project.
9.0 OTHER CONSIDERATIONS

HAR §11-200-17 requires a description of the proposed action’s potential impacts with respect to the following considerations:

- Section 9.1 addresses the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity of the proposed action.
- Section 9.2 describes all irreversible and irretrievable commitments of resources involved with the proposed action.
- Section 9.43 details the secondary and cumulative effects of the project.
- Section 9.4 summarizes the unresolved issues related to the design and future of the proposed MSWLF.

9.1 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The proposed use of State agricultural land for a MSWLF would remove approximately 270 acres from possible future grazing – a use designated by the County in its Kaua‘i Important Agricultural Lands Study. None of the land is considered IAL as defined under HRS §205-42. Short-term uses associated with construction would be temporary and would not significantly impact the environment.

Once developed for initial use, the MSWLF would be managed in accordance with Federal and State requirements for solid waste landfills, and would provide a safe and sanitary means for the island’s MSW disposition. Moreover, it would reduce illegal dumping and the significant safety and environmental impacts that would result, which would include threats to human health, wildlife, soil, water, groundwater, marine water, and the spread of vectors (rats, mice, flies, and other pests). The MSWLF’s estimated life of approximately 264 years would allow the County to manage public services and support economic growth over a long term without having to commit and divert resources, including staff and money, to identify and plan for another MSWLF location in the nearer term. The proposed action would thus enhance long-term productivity.

The potential for negative adverse impacts to the community and environmental resources will be addressed through the use of appropriate mitigation measures as described in this document. Mitigation to address potential for impacts to area residents will include operational procedures and practices, use of equipment and management measures, and consultation with the community that was initiated as a part of this EIS process.

The County, in considering the future development of a RRP facility, has already expended effort and intends to develop feasible new technologies and practices to further reduce the volume of waste requiring disposal in a MSWLF.

The potential for contamination of groundwater resources is a long-term concern since leachate migration could occur during landfill operations as well as during post closure of the landfill. The concern is that the underlying non-potable brackish water supply may be withdrawn in the future and utilized for other purposes. However, water quality monitoring will be implemented as a part of the project and regulated by the State Department of Health through the required Solid Waste Management Permit. In addition, the facility is designed and located to eliminate or minimize any potential impact to groundwater resources.

The proposed project will not result in the significant loss of environmental resources. Although implementation of the project will preclude the use of the site for other purposes for the duration of the project, surrounding land uses involving agricultural practices are intended to be maintained.
The proposed project will require the irretrievable use of the land from other purposes for the duration of the project. As a result, other potentially feasible uses will be limited. However, the project will promote the maintenance and enhancement of long-term productivity through maximizing the use of an existing public land resource presently owned by the State for future use as a MSWLF. The project will fulfill an essential public service and provide for the desired social and economic growth of the broader islandwide County of Kaua‘i.

9.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

A commitment of resources is irreversible when its primary or secondary impacts limit the future options for a resource. The term applies primarily to non-renewable resources, such as cultural resources and biological species. Irreversible commitments required by the proposed MSWLF would include materials, capital, manpower, and energy needed to plan, engineer, design, construct, operate, and maintain the proposed facility.

Irretrievable commitments refer to the use or consumption of a resource that is neither renewable nor recoverable for use for a period of time. The proposed loss of approximately 270 acres from possible future grazing for landfill use for more approximately 264 years represents an irreversible commitment. Upon landfill closure, stabilization of the site and landfill gas would further preclude other uses. It is possible, however, that with future long-term stabilization, uses such as parkland and recreation are possible and have been proven, e.g., Kaka‘ako Waterfront Park and the Sand Island State Recreational Park on O‘ahu.

9.3 SECONDARY AND CUMULATIVE EFFECTS

HAR 11-200-2 defines secondary effects as those “effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.” A cumulative impact is defined as an “impact on the environment which results from the incremental impact of the action when added other other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions”.

The potential for secondary and cumulative effects considered for this project are discussed below.

9.3.1 Potential Environmental Impacts

Climate and GHGs

The potential for secondary and cumulative effects to climate due to the release of GHGs are not expected. While the proposed scope and scale of the project are not sufficient by itself to significantly influence the climate, GHGs, such as methane and carbon dioxide, generated from the landfill could be a potential contributing factor to global warming. Methane, carbon dioxide, and non-methane organic compounds are some of the LFG constituents. LFG would be mitigated through the use of an active gas collection and control system, where it can be: vented, if it is determined to be safe to do so based on regular air quality monitoring; flared, which would destroy the ability of LFG to interact with the atmosphere causing air quality impacts associated with GHGs; or collected, for future use in energy generation. The use of cover maintained across the landfill will also be employed to increase the efficiency of controlling any LFGs that are generated.

See also Section 4.1 for discussion on GHGs.

Air Quality

The potential for secondary and cumulative impacts to air quality from construction of the proposed MSWLF are not expected. The only other major source of MSWLF associated with impacts to air quality is the Kekaha MSWLF, scheduled for closure within an approximately 10 to12 year period.
Near the end of this period the proposed Maʻalo MSWLF is planned to begin operations for the disposal of MSW. While the potential for air quality impacts from operation of the Kekaha MSWLF are expected to diminish with its closure, the potential for longer term air quality impacts would be present at the Maʻalo MSWLF as it is constructed and used for landfilling. The proposed project, therefore, does not provide an impetus or trigger conditions where further landfill development would affect air quality.

If developed in the future, the RRP would constitute a beneficial secondary impact as it would contribute to reducing dependency on landfilling and the potential for generating air quality impacts (See RRP FS in Appendix C).

**Topography, Geology and Soils**

All work proposed for the project will be limited to the site boundary and access roadway system. While changes will be made to the site topography, the impact of the project to geology and soils are not expected to lead to secondary or cumulative adverse impacts.

**Surface Water Resources**

No streams classified as perennial or intermittent, no lakes, and no reservoirs are contained within the proposed project boundaries containing the MSWLF site.

**Groundwater and Hydrology**

Secondary or cumulative impacts to groundwater and hydrology are not expected. The proposed project will incorporate a site surface drainage system designed to control surface water flows over the landfill site and minimize infiltration of rainfall into the waste mass. In addition to the use of the measures described above in Surface Waters, the potential for leachate migration into groundwater will be controlled by the use of final cover and grades to address the long-term impact of rainfall infiltration into the landfill waste mass.

**Wetlands**

Potential secondary or cumulative effects associated with wetlands are not expected. Consultation with the USACE confirmed that the project boundaries do not contain wetland resources as delineated in the USFWS NWI (see Section 4.6).

**Acoustic Characteristics**

Potential secondary and cumulative impacts associated with construction and operation of the Maalo MSWLF and E3 access roadway are not expected. The area surrounding the proposed MSWLF site has few noise receptors as the project site is bounded by the Kālepa Ridge to the east and to the north, west and south much of the land and terrain consists of agricultural parcels. The closest residences to the MSWLF site are located along Laukona Street and Kālepa Circle to the south at distances of approximately +1 miles away which are not expected to be affected by landfill operational noise.

A portion of the E3 access roadway would traverse past residences along north facing segments of Kālepa Circle and Laukona Street located in the Hanamāʻulu area, before it bends northward to the entry of the MSWLF. During operations of the landfill there is the potential that these areas could be affected from noise generated by refuse vehicles using the E3 access route.

An acoustic study was undertaken in 2018 by Y. Ebisu & Associates to assess the potential for adverse effects due to noise. The following would be used as mitigation measures to address the potential for adverse effects (Y. Ebisu & Associates 2018). Construction and landfill operating activities will be conducted in accordance with requirements in HRS Chapter 342F – *Noise Pollution*; HAR Chapter 11-
42 – *Vehicular Noise Control for Oahu*, establishing noise level limits for light and heavy vehicles. This would mitigate noise from construction and landfill operating equipment and vehicles, with the use of properly muffled internal combustion engines.

Severe noise impacts are not expected inside air conditioned structures beyond 100 to 500 feet from active project construction sites. Inside naturally ventilated structures, doors and windows facing the construction site are recommended to be closed during work hours if it is necessary to further reduce interior noise levels. This would result in a general noise reduction of an additional 5 to 10 dBA.

Construction and MSWLF operations are planned to take place during the normal work day with no night work planned. HAR, Chapter 11-46 – *Community Noise Control*, generally identifies the normal work day, with Sundays and holidays not included and therefore prohibited from the generation of excessive noise. Adherence to the use of normal work days and curfew times is a form of mitigation to further reduce the potential for adverse acoustic effects.

The Hawai`i Occupational Safety and Health (HIOSH) Division has set the permissible occupational noise exposure. If workers experience noise exceeding HIOSH standards, administrative or engineering controls would be implemented. Use of personal protective equipment such as earplugs or muffs may also be required.

With the use of the proposed mitigation measures and practices no negative adverse acoustic impacts are expected.

**Flora and Fauna**

Long term, secondary, or cumulative impacts to flora and fauna resources are not expected.

**Natural Hazards**

The potential for impacts associated with earthquakes, hurricanes, floods, and tsunamis have been considered in the design and operating practices for the proposed MSWLF. The potential for secondary and cumulative impacts are not expected.

**Scenic and Aesthetic Environment**

No other future anticipated projects affecting the scenic and aesthetic environment in the vicinity of the proposed project have been identified. The future development of the RRP could be considered a secondary or cumulative effect of development as it is intended to be pursued by the County once it can be successfully demonstrated to meet the County’s requirements for waste reuse and recycling using a combination of different feasible and practical facility types. The potential for visual impacts would be subject to a separate HRS, Chapter 343 document, providing appropriate mitigation measures such as landscaping and other practices to reduce the possible effect to the area viewplane; however, the cumulative impacts on view planes are expected to be insignificant, considering the relatively low profile expected for the RRP. With the exception of the RRP, no other secondary or cumulative effects to scenic and aesthetic resources are expected.

**9.3.2 Potential Public Service Impacts**

**Traffic and Circulation**

Secondary and cumulative impacts associated with traffic and circulation are expected with the proposed project and have been incorporated in the traffic evaluation of LOS summarized in Section 5.1 and Section 6.3. Future anticipated growth of the area from other projects have also been considered and include projections of vehicular use. When completed, the access road would direct some traffic away from the core of Hanamā‘ulu, as requested by local residents, and provide
consideration for traffic signalization at the intersection of the access road with Kūhiō Highway and the Kaua‘i Beach Driveway. See also Appendix F.

Utilities

The potential for secondary or cumulative impacts associated with wastewater are not expected. The site is not currently served by wastewater services. An onsite septic system will be installed comprised of two septic treatment systems and absorption beds, installed at the proposed MSWLF site. See Section 5.2.

The potential for secondary or cumulative impacts associated with the connection to utilities, including electricity, telephone service, and potable water are not expected. These services will be planned and designed in the context of regional, cumulative project needs and therefore, will not represent a significant impact.

Public Facilities and Services

The proposed action will result in a new and larger MSWLF facility, but will have little to no direct effects on public facilities (police, fire, emergency and medical services, education, and parks and recreation) and no indirect, secondary or cumulative impacts.

9.3.3 Potential Manmade Environmental Impacts

Land Use and Ownership

The proposed project would change 270 acres out of a total of 2,162.78 acres from agriculture/pasture to a public infrastructure facility serving the County. While the proposed Ma‘alo MSWLF would change approximately 270 acres from agriculture/pasture uses, the site is not designated as Important Agricultural Land (IAL). The future designation of the site to IAL is not expected due to the County’s pending consideration for the use of the site for a MSWLF and potential future RRP.

The proposed project would not result in significant secondary impacts on land use ownership as the surrounding remaining approximately 1,893 acres of the State owned parcel would continue to be used for pasture and agricultural purposes. The area removed would serve to prevent other areas of Kaua‘i from being subject to potential use for a landfill for a period of approximately 264 years.

See also Section 6.3.3.2 for discussion on a cooperative agreement between the State and County to allow continued use by tenants for an extended period of time of up to 100 or more years.

Aircraft Wildlife/Bird Strike Hazard

The potential for secondary or cumulative effects exist from wildlife strikes on or near the Līhu‘e Airport from the operational use of the site without the long term use of the mitigative measures provided in Section 6.2. Mitigation to address these concerns will serve to avoid potential secondary and cumulative impacts through on-going monitoring and operational practices that maintain the existing environmental safety of the site, such that it would avoid the opportunity for other larger impacts to occur.

Socioeconomics

The potential secondary or cumulative impacts to the socioeconomic resources of the area and region will be mitigated through the implementation of measures outlined in Section 6.3. The project will result in a new and larger MSWLF facility, and therefore directly improve public solid waste facilities, while enabling the necessary timely closure of the current Kekaha MSWLF. The proposed project will not
stimulate unexpected changes to the population, but will accommodate the current and anticipated future needs of the population of the Island of Kaua‘i for a MSWLF.

**Historical and Archaeological Resources**

Secondary or cumulative impacts to historical and archaeological resources associated with the use of the proposed MSWLF site are not expected. Although there is the potential for impacts to historic and archaeological resources with the inadvertent discovery of human remains or cultural artifacts of ancient Hawaiian origin, mitigation to address this possibility has been provided in Section 6.4.8 which states: “Should any burials or other cultural finds be identified during ground disturbance, the construction contractor should immediately cease all work while the appropriate agencies including the SHPD, are notified pursuant to applicable law (HRS, Chapter 6E).”

**Traditional Cultural Practices and Resources (Cultural Impact Assessment)**

Secondary and cumulative impacts to cultural resources associated with the use of the proposed MSWLF site are not expected. As noted above in Historical and Archaeological Resources, appropriate notification to appropriate agencies including the SHPD will be made. See also Section 6.5.

**9.4 UNRESOLVED ISSUES**

The proposed project and the subject of this EIS document is to seek the development of a new MSWLF at Ma‘alo to handle and receive solid waste that cannot presently be further recycled, reused, or combusted for the generation of energy. However, the County’s ultimate goal is to seek to reduce its dependency on landfilling, and to one day avoid the future need for a landfill. The development of a future RRP is considered to be an important part of reducing landfill dependency by seeking to use proven, environmentally safe, and economically feasible methods and technologies to reduce and recycle Kaua‘i’s MSW stream.

The timing and development of the RRP is presently unknown but is planned to be pursued by the County at a later date. The RRP is intended to be based on the identification of a mix of MSW handling technologies that can: (1) address the types of solid waste generated on-island that currently requires landfilling; and (2) have a proven operational history of use in a municipality that is of similar size and with similar logistical characteristics as the County of Kaua‘i. For reference, see Appendix C, Final RRP Feasibility Study (AECOM, 2013) of this EIS document.
10.0 ORGANIZATIONS, AGENCIES, PUBLIC PARTIES, AND INDIVIDUALS CONSULTED IN THE ENVIRONMENTAL IMPACT STATEMENT PROCESS

A number of organizations, agencies, public parties, and individuals were notified that an EIS is under preparation for the project. The notified organizations, agencies, public parties, and individuals were requested to provide input on relevant issues that should be reviewed during the EIS process.

The following sections are provided to describe the County’s effort to notify interested organizations, agencies, public parties, and individuals, concerning the environmental impacts of the proposed action:

- Section 10.1 – provides a summary of the seven community meetings the County undertook to advise the public of its efforts for the selection of a new MSWLF and RRP and initiate early discussion with interested organizations, agencies, public parties, and individuals, concerning the proposed project.
- Section 10.2 – provides a summary of the FEA/EISPN HRS, Chapter 343 EIS notification process to inform interested organizations, agencies, public parties, and individuals of the proposed project, and seek public comment on subjects that should be addressed in the EIS documentation.

10.1 COMMUNITY MEETINGS

10.1.1 Introduction

The County initiated a series of community meetings to advise the public of its efforts for the selection of a new MSWLF and RRP. The meetings were designed to inform and solicit public comments. A total of seven community meetings were held from May 2012 through February 2013 and included six community meetings and one site visit to the proposed project site at Ma’alo.

The dates and locations of the community meetings include:

- Tuesday, May 22, 2012, 6:00–8:00 pm, King Kaumuali’i Elementary School, Hanamā‘ulu
- Wednesday, May 23, 2012, 6:00–8:00 pm, Kekaha Neighborhood Center, Kekaha
- Tuesday, May 29, 2012, 6:00–8:00 pm, Kīlauea Elementary School, Kīlauea
- Wednesday, May 30, 2012, 6:00–8:00 pm, Kōloa Courthouse/Neighborhood Center, Kōloa
- Tuesday, February 5, 2013, 6:00–8:00 pm, King Kaumuali’i Elementary School, Hanamā‘ulu
- Wednesday, February 6, 2013, 6:00–8:00 pm, Kekaha Neighborhood Center, Kekaha

The seventh community meeting, a site visit, was held:

- Saturday, February 16, 2013, 10:00 am, Proposed Ma’alo Landfill Site, Ma’alo

The County of Kaua‘i arranged for members of the public to visit the proposed Ma’alo landfill site based on requests received during the public meetings. Two announcements for the site visit were presented at the public meetings on Tuesday, February 5, 2013, at the King Kaumuali‘i Elementary School, and Wednesday, February 6, 2013, at the Kekaha Neighborhood Center. The purpose of the tour was to allow interested individuals to see the proposed project site. A total of 15 members of the public attended the site visit tour. Appendix A, Public Information Meetings, contains a summary of the Ma’alo site tour and presents the printed documents used for the handouts and comment form provided to the public at the tour.
Table 10-1 provides a summary of the effort by the County of Kaua‘i to notify the public in advance of the meetings using multiple media sources. Appendix A, Public Information Meetings, presents the printed documents used for the public notifications.

### Table 10-1: Public Notification of Community Meetings

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<tbody>
<tr>
<td><strong>2012</strong></td>
<td></td>
</tr>
<tr>
<td>First News Release</td>
<td>Announced purpose, time and date of meetings. News release was issued by the County approximately 2 weeks prior to the start of the first meeting on May 22, 2012.</td>
</tr>
<tr>
<td>KONG Radio</td>
<td>Four (4) radio announcements per day were made for six (6) days (24 total announcements). The announcements ran from May 11 to 13 and from May 19 to 21, 2012.</td>
</tr>
<tr>
<td>KKCR Radio</td>
<td>Four (4) radio announcements per day were made for seven (7) days (28 total announcements). The announcements ran from May 15 to 21, 2012.</td>
</tr>
<tr>
<td>Meeting Notification Flyer</td>
<td>A flyer announcing the meetings were disseminated with the assistance of the Mayor’s Public Information Office. The flyer was distributed to community and trade associations and incorporated into the Chamber of Commerce newsletter. The Hanamā‘ulu Community organization also requested 500 copies for their delivery door-to-door. The flyer was completed on May 7th, and distributed after that date.</td>
</tr>
<tr>
<td>Meeting Notices</td>
<td>The County of Kaua‘i posted a Notice of Public Meetings at its County buildings. The notices were posted on May 14, 2012.</td>
</tr>
<tr>
<td>The Garden Island (Legal Section)</td>
<td>A 2-column by 7-inch meeting advertisement was published for six (6) days on May 11, 13, 14, 17, 18, and 20, 2012.</td>
</tr>
<tr>
<td>Mid-Week Kaua‘i</td>
<td>The meeting advertisement was published on May 14, 2012.</td>
</tr>
<tr>
<td><strong>2013</strong></td>
<td></td>
</tr>
<tr>
<td>First News Release</td>
<td>Announced purpose, time and date of meetings. News release was issued by the County of Kaua‘i on January 11, 2013, approximately 3-weeks prior to the start of the first meeting on February 5, 2013.</td>
</tr>
<tr>
<td>KONG Radio</td>
<td>Four (4) sixty (60) second radio announcements per day were made for five (5) days (20 total announcements). The announcements ran from January 18 to 22, January 25 to 26, and January 30 to February 3, 2013.</td>
</tr>
<tr>
<td>FM 97 Radio Ads</td>
<td>Four (4) sixty (60) second radio announcements per day were made for seven (7) days (28 total announcements). The announcements ran from January 18 to 22, January 25 to 26, and January 30 to February 3, 2013.</td>
</tr>
<tr>
<td>Meeting Notification Flyer</td>
<td>A flyer announcing the meetings was disseminated with the assistance of the Mayor’s Public Information Office. The Hanamā‘ulu Community organization also requested 500 copies to deliver door-to-door.</td>
</tr>
<tr>
<td>Meeting Notices</td>
<td>The County of Kaua‘i posted a Notice of Public Meetings at its County buildings at least seven (7) days prior to the first meeting date of February 5, 2013.</td>
</tr>
<tr>
<td>The Garden Island (Legal Section)</td>
<td>A 2 column by 7 inch meeting advertisement was published for eleven (11) days (The announcements ran on January 17, 18, January 20 to 22, January 25, 27, January 30 to February 1, and February 3, 2013.)</td>
</tr>
<tr>
<td>Mid-Week Kaua‘i</td>
<td>The meeting advertisement was published in the January 16 and January 23, 2013 issues.</td>
</tr>
</tbody>
</table>

The public was also informed of the County’s website for the new MSWLF and RRP project (www.kauai.gov/newlandfillsite/), where announcements and documents would be made available.

### 10.1.2 Meeting Process

The agenda for all meetings included (1) Introduction and Meeting Overview; (2) Presentation; and (3) Public Comments. All meetings were moderated by the meeting facilitator, Resolutions Hawai‘i, who introduced members of the County Administration and the consultants AECOM and RMTC. Mayor Bernard P. Carvalho, Jr. welcomed the audience, thanking all for their patience and attendance at the first (May 22) meeting at the King Kaumuali‘i Elementary School.

The facilitator followed the same format for all meetings and prepared a meeting summary of the major concerns raised by the community for use by the consultants in preparing future project documents. Appendix A, Public Information Meetings, presents the printed documents used for the PowerPoint presentations, handouts provided to the public at the meetings, and sign-in sheets for each meeting.
10.1.3 Public Comments Received and Response to Comments

The public comments received were organized into eight categories based on the following subjects:

1. Environment (Section 10.1.3.11)
2. Resource Recovery Park (RRP) Design and Operations (Section 10.1.3.3)
3. Roadways and Traffic (Section 10.1.3.4)
4. Landfill Design and Operations (Section 10.1.3.14)
5. Reuse and Recycling (Section 10.1.3.5)
6. Socioeconomic and Cultural Impacts (Section 10.1.3.6)
7. EIS Process (Section 10.1.3.7)
8. Other Comments (Section 10.1.3.8)

Responses to the comments received during the course of public meetings, site tour, and FEA/EISPN (AECOM 2013b) for the proposed project were prepared according to the categories above, and are described below. See Appendix A for a complete record of the comments received.

10.1.3.1 Environment

Responses to comments received regarding the potential for impacts to the environment associated with the proposed project have been arranged into the following categories:

- Groundwater
- Surface Water
- Leachate Management
- Wildlife
- Air Quality
- Excavated Soil
- Environmental Monitoring
- General Environmental Protection

Groundwater Comments and Response

- Proximity to drinking wells needs to be addressed (Mtg. 1, 5/22/12).
- Drinking water issues (Mtg. 1, 5/22/12).
- Water table protection needs to be assured (Mtg. 2, 5/23/12).
- Groundwater impacts should be addressed (Mtg. 1, 5/22/12).
- What does cell mean? Need to define the term and talk about how cells will be developed and any potential impacts on the water table (Mtg. 4, 5/30/12).
- Impacts on the pump house by the prison also need to be addressed (Mtg. 1, 5/22/12).
- Impacts on drinking water need to be looked at (Mtg. 4, 5/30/12).
- How much water flows in and through the Hanamāʻulu Watershed – how much is diverted – will wells be impacted and how can we increase the capture and flow of water through the watershed i.e. increase forest runoff etc. – if we do not look at this it will be a lost opportunity (Mtg. 5, 2/5/13).
• Are you taking into account the proposed horizontal water well (Consultant answered Yes) (Mtg. 5, 2/5/13).
• Groundwater impacts were criteria number 1 [for choosing the landfill location]– how has that been factored into decision making (Mtg. 1, 2/5/13).
• If you contaminate the water what [other drinking water] resource is available to the public (Mtg. 5, 2/5/13).
• Need to do a complete groundwater study mauka to makai (Mtg. 6, 2/6/13).
• Need to set a baseline on groundwater quality prior to beginning construction work so you can measure the impact of the project on groundwater quality pre[construction], during and post project [construction] (Mtg. 5, 2/5/13).

Groundwater Response: The 2012 Siting Study included “proximity to surface water” and “location of site relative to the UIC Line” as two community-based criteria (AECOM 2012, pg. 6-1). It was found that the proposed MSWLF site lies above the State of Hawai’i UIC Line, which means that the groundwater below the site is designated as a potential groundwater drinking water source by the DOH. However, the DOH SDWB performed an internal analysis of GIS files and confirmed that the proposed Ma’alo MSWLF site is more than 1,000 feet from regulated drinking water sources. In addition, the County of Kaua’i DOW has reviewed the location of the proposed MSWLF site and determined that there are no active wells and no current plans for the DOW to develop any wells within 1,000 feet of the proposed sites (Eddy 2011).

The County has also coordinated with the DOH SDWB, DOH SHWB, and County DOW to maintain the protection of groundwater resources within the UIC zone. Mitigation measures to protect groundwater resources would include, but are not limited to, the following:

1. A landfill liner system employing landfill cells lined with high-density geosynthetic plastic, bentonite, and crushed rock;
2. The site surface drainage system would be designed to control surface water flows in order to limit percolation of stormwater through the landfill liner system. This would serve to reduce the generation of leachate.
3. A leachate management system would collect and monitor the generation of leachate. The monitoring of leachate in combination with the monitoring of other landfill controls would measure landfill performance and allow the County and operator to make periodic improvements to maintain the efficiency and safety of the facility.
4. A semi-annual groundwater detection monitoring program would also be used to monitor and ensure the performance of the landfill.

Further discussion of the potential for adverse environmental effects to groundwater resources is presented in Section 4.5. The 2012 Siting Study (AECOM 2012) is available to the public on the County’s New Landfill website (www.kauai.gov/newlandfillsite/) and is provided in Appendix B.

Surface Water Comments and Response

• Watersheds and ocean reefs are dying, putting the landfill in a water catchment area is not a good idea, not just for the near shore waters and reefs, but for our fisheries – these issues need to be addressed (Mtg. 1, 5/22/12).
• The impacts of flooding on the site and any runoff issues that could occur, especially how to prevent toxic runoff in view of wetness of the area and the potential for global warming to make it even wetter and increase the frequency and severity of storms (Mtg. 1, 5/22/12).
• Impacts on the Tanaka Pond need to be addressed (Mtg. 1, 5/22/12).
• Rainfall impacts need to be looked at (Mtg. 4, 5/30/12).
• It is too close to viable fresh water (Written Comment, 6/2012).
• The downstream toxicity cannot be prevented or fixed once there’s spill over (Written Comments, 6/2012).
• It is totally unacceptable to even consider putting a landfill anywhere near fresh water – as the propose Ma’alo site is (Written Comment, 6/2012).
• Do you anticipate having to install a massive curtain drain to divert water flow from the landfill site (Mtg. 5, 2/5/13)?
• Increasing the stream flow in the area to dilute any hazardous runoff should be looked at (Mtg. 5, 2/5/13).
• How many existing water features (irrigation and natural) would be impacted by the project – i.e. [will there be] the need for diversions etc. (Mtg. 5, 2/5/13).
• How far is it [the proposed landfill site] from streams in the area – currently there are no fish by the lighthouse – may be because of pollution coming through the watershed via the streams – need to look at why this is happening and deal with it or make sure you do not make it worse (Mtg. 5, 2/5/13).

**Surface Water Response:** The proposed project site was evaluated against the USFWS NWI database, and consultations were held with the USACE and EPA to ascertain the potential for adverse effects to wetlands or other regulated bodies of water.

The proposed MSWLF project boundary contains no streams classified as perennial or intermittent, no lakes, and no reservoirs. Surface water resources are not present on site, but are located nearby and include the Ai’i Reservoir, located west of the proposed MSWLF site at a distance of approximately 1.3 miles; the Kapaia Reservoir located further west, at a distance of approximately 2 miles, and the Pukaki Reservoir located southwest at a distance of 1.3 miles; the South Fork of the Wailua River, which runs roughly parallel to the north and northwest boundary of the proposed site; and the Hanamā‘ulu Stream, are located southwest of the proposed sites.

The proposed MSWLF would be developed outside of the floodplain exclusion zone, and are not expected to exacerbate flood conditions or be adversely affected by flooding. Onsite flooding by rainfall run-on and potential hazardous run-off would be prevented by a drainage control system engineered according to State and County of Kaua‘i standards. The types of drainage control features and structures that would be used would be determined at a later date, when the detailed engineering design is performed. Post-construction BMPs would be installed to prevent the comingling of run-off with excavated landfill materials from entering nearby surface waters.

Further discussion of the potential for adverse environmental effects to surface water, including detail on landfill mitigative controls, measures, and practices is presented in Section 4.44.

**Leachate Management Comments and Response**

• The EIS needs to describe the way all potential contaminants will be dealt with (Mtg. 2, 5/23/12).
• Toxic fluids produced by the landfill need to be addressed (Mtg. 1, 5/22/12).
• If we achieve our goals of landfilling as little as possible the result might be a more toxic landfill. How do we deal with this (Mtg. 3, 5/29/12).
• From what has happened on Oahu....A plastic-lined hole would create toxic fluids that will run off in heavy rains and wind. Global warming will only increase precipitation on the wettest place on earth (Written Comment, 6/2012).
• How is the leachate processed and where does it go after it is processed (Mtg. 5, 2/5/13).
• Need to pay attention to the liquid byproducts of the landfill – gas is easy to deal with liquids are not (Mtg. 5, 2/5/13).
• RCRA “C” hazardous, “D” non-hazardous – Kekaha and the new site are class “D” sites (Mtg. 6, 2/6/13).
• They [The State of Hawai’i] should legislate so that toxic materials are not allowed to come into the State (Mtg. 6, 2/6/13).

Leachate Management Response: The proposed MSWLF is designed to address the requirements of the RCRA Subtitle D federal regulations prohibiting the acceptance of hazard waste for disposal. Adherence to RCRA Subtitle D is already employed at the existing Kekaha MSWLF and will be employed for the proposed project. The County and landfill operator utilizes a tiered approach to ensure acceptability of waste for landfilling. All loads entering the landfill are screened and if the waste is found to be unacceptable the waste hauler is turned away from the landfill. Further screening is performed at the landfill scale house and at the working face to segregate unacceptable materials not initially identified as hazardous. These materials include auto batteries, liquid petroleum waste in barrels or containers, or other items defined as hazardous by the EPA and DOH. The hazardous waste materials are temporarily stored for later disposal or handling and treatment at an acceptable DOH and EPA site that accepts hazardous waste.

Leachate management control systems are a critical part of any properly designed and engineered modern landfill. Leachate that is generated at existing Kekaha MSWLF is processed using a leachate evaporation pond and it is anticipated that a similar system will be employed for the proposed Ma’alo MSWLF. The County’s new MSWLF will employ a modern effective leachate management system.

RCRA Subtitle D federal regulations require the landfill owner and operator to implement a landfill leachate and gas monitoring and collection system and a groundwater monitoring and corrective action plan, for a minimum of 30 years after the landfill has ceased accepting waste. The County will thereafter be responsible for cleaning up any contamination associated spills or releases that may occur. Detailed discussion on the MSWLF leachate management system is presented in Section 2.1.3.

The potential for tears or punctures to the landfill liner system is addressed through preventative practices that include, but are not limited to:

1. Multiple layers of protection against punctures are employed in the landfill liner system: geosynthetic plastic, bentonite, and crushed rock. The geosynthetic plastic liner provides an impermeable barrier to moisture. The bentonite layer provides further protection by absorbing and swelling to also form a barrier to moisture in the event that the geosynthetic plastic liner is compromised. The crushed rock provides a cushion and barrier to heavy and/or sharp objects that could otherwise penetrate the liner.

2. The groundwater, leachate, and gas collection monitoring systems together provide a comprehensive picture of the performance of the landfill. In the event of data spikes or abnormal data the liner system can be investigated for integrity, and if required, repaired by thermal fusion of the plastic liner and replacement of the other liner materials.

3. Management practices are employed when filling the landfill cells. Materials for disposal are placed carefully into landfill cells to minimize punctures or tears that would otherwise compromise the structural integrity of the liner system.

Further discussion on groundwater and leachate monitoring and alternative designs for the leachate management system is presented in Appendix D.
Wildlife Comments and Response

- Flora and fauna studies need to occur (Mtg. 1, 5/22/12).
- What are the wildlife impacts (Mtg. 4, 5/30/12)?
- How will it impact the oceans – upstream pollution is the main cause of reef damage – healthy oceans and reefs are a 800 million dollar a year business and thousands of jobs – no species survives without the ocean – pollutants into the ocean impact the health of all ecosystems and biodiversity (Mtg. 5, 2/5/13).

Wildlife Response: Botanical and faunal resources were preliminarily evaluated in the 2012 Siting Study (AECOM 2012). In addition, a Biological Survey Report for the Proposed Municipal Landfill and Resource Recovery Park at Ma’alo, Kaua’i was conducted by AECOS, Inc. in April 2013 (Appendix M). In short, no threatened or endangered botanical plant species or mammalian species were identified on or near the project site. In addition, there were no federal delineated Critical Habitats present on the project site. Of the avian species detected, were several endemic endangered species, native and indigenous bird species. Recommended mitigation measures included shielding work lights during night construction and permanent light installations, to reduce the potential interactions of nocturnal flying seabirds with manmade structures (AECOS, Inc. 2013, pg. 16–19). A leachate management system and drainage control system engineered according to State and County of Kaua’i standards will be implemented for the purpose of preventing coral reefs or other ocean resources downstream from pollution.

Further discussion of the potential direct, indirect and cumulative effects from the proposed MSWLF and potential future RRP on flora and fauna resources are discussed in Section 4.8. The biological resources survey is presented in Appendix M.

In addition a Wildlife Hazard Assessment and a Wildlife Management Plan are further described in Section 6.2. These studies are also presented in Appendix G and Appendix H, respectively. These studies are designed to ensure that the operation of the proposed Ma’alo MSWLF would not adversely attract wildlife that could affect the operations of the Līhu’e Airport.

Air Quality Comments and Response

- Odor issues need to be addressed (Mtg. 1, 5/22/12).
- Dust issues should be addressed (Mtg. 1, 5/22/12).

Air Quality Response: Air quality in the Līhu’e area is generally good; all pollutants are below the Hawai’i State Standard and the Federal and Primary and Secondary Standards. There is the potential for short-term localized effects on air quality during site construction activities which will be mitigated by the implementation of dust control practices in accordance with HAR, Chapter 60.1, Air Pollution Control. In addition, there is a potential for long-term effects on air quality due to odor, which will be addressed by the provisions of the landfill operation plan. A discussion on the potential effects to air quality and proposed mitigation measures are in Section 4.2.

Excavated Soil Comments and Response

- What will happen to the dirt that is dug out at the site (Mtg. 4, 5/30/12)?
- Polluted soil from Kilauea was disposed of at Kekaha – this needs to be addressed (Consultant [stated that]: Kilauea soil was screened by EPA and declared non-hazardous) (Mtg. 6, 2/6/13).

Excavated Soil Response: Soils that are planned to be excavated from the project site are considered to be a valuable resource. The excavated soils will be stockpiled for future use as cover material which is consistent with the requirements of RCRA Subtitle D. The stockpiled soil will be
reused as daily and intermediate cover to (1) reduce the exposure of refuse to the elements, (2) reduce the attractiveness of the landfill to vectors such as rats, mice, and flies, and (3) reduce the release of landfill associated odor. The reuse of soils will also reduce the need and cost of importing cover material from offsite locations.

Environmental Monitoring Comments and Response

- The EIS needs to include a scenario for monitoring for the life of the site if indeed it is 264 years (Mtg. 2, 5/23/12).
- Need to have monitoring systems along water routes (Mtg. 5, 2/5/13).

Environmental Monitoring Response: A number of environmental monitoring systems would be employed to manage the landfill site as required by RCRA Subtitle D federal regulations. These monitoring systems would include a groundwater monitoring and corrective action plan as well as a landfill leachate and gas monitoring and collection system. The monitoring plans would be subject to DOH SHWB approval for the life of the facility and for a minimum of 30 years after the landfill has ceased accepting waste.

General Environmental Protection Comments and Response

- The EIS needs to show and assure that the landfill will be properly developed and lined (Mtg. 2, 5/23/12).
- Who is liable if the experts are wrong and things go wrong (Mtg. 1, 5/22/12).

General Environmental Protection Response: The conceptual design of the MSWLF will employ modern engineering environmental protective measures as required by the EPA and State of Hawai’i (the new MSWLF will not be an old-fashioned “dump site”). Ultimately, the County is liable for its public facilities.

10.1.3.2 LANDFILL DESIGN AND OPERATIONS

Responses to comments received regarding landfill design and operation associated with the proposed project have been arranged into the following categories:

- Landfill Location
- Waste-to-Energy Technologies
- Landfill Technical Design
- Landfill Size
- Overall Costs
- Tipping Fees and Zero Waste
- Soil Cover
- General

Landfill Location Comments (siting study related) and Response

- I want to see these studies show that this landfill is in the smartest place on the island for it and I want the smartest people assuring me that there will not be any adverse impacts (Mtg. 1, 5/22/12).
- Maps showing the complete project and maps for all alternative sites need to be included (Mtg. 3, 5/29/12).
• Documents need to consider that this might not be the right site (Mtg. 1, 5/22/12).
• Best site in my opinion is to go back to Kekaha (Mtg. 1, 5/22/12).
• Is Ma’alo going to be the site and nothing we say will change that (Mtg. 1, 5/22/12)?
• Alternative sites need to be evaluated (Mtg. 4, 5/30/12).
• Mitigation and alternatives to the proposed project and location of MRF need to be looked at (Mtg. 4, 5/30/12).
• The Kapaa Foundation are unanimously opposed to the Ma’alo Landfill location mauka of Kālepā Ridge (Written Comment, 6/2012).
• I propose using the land from Hanamā‘ulu Bay as the current Transfer station to the Kapule Hwy. or the land North of Hanamā‘ulu Bay along that Ridge (Written Comment, 6/2012).
• I think a much better site for landfill is in the Puhi/Kīpū area – just south and inland from the Humane Society. This is away from neighborhoods & freshwater source (Written Comment, 6/2012).
• I am adamantly opposed to the New Kaua‘i Landfill proposed site called Ma’alo located behind Kālepā Ridge (mauka) (Written Comment, 6/2012).
• How far from the ocean is the [landfill] site – (Consultant [said it was] about 1.5 miles as the crow flies) – that is not that far with climate change (Mtg. 5, 2/5/13).
• Need to address alternative sites – need an in depth comparison of all sites that were identified for the landfill – same level of detail should be available on the other sites as will be available on the preferred site (Mtg. 6, 2/6/13).
• Possible problem [: is the proposed landfill site within the] new tsunami zone [and does this present] issues (Mtg. 6, 2/6/13).
• Look at developing two landfill areas on site each with a life of thirty year[s] and move [waste] back a forth between the two sites[, so] when one [landfill] is full go to the other and then come back to the first [landfill] (Mtg. 5, 2/5/13).
• How does the value of a willing landowner for this site equate to the water resource proximity issue when making your decision (Mtg. 5, 2/5/13).

**Landfill Location Response (siting study related):** The basis for the proposed project and the reason for the selection of the Ma‘alo site as the preferred alternative is documented in Sections 1.0 and 3.0. The County evaluated each of the sites, weighing the pros and cons of the various site rankings, identified the important decision-making criteria, and other measures that were presented in the 2012 Siting Study. The 2012 Siting Study (AECOM 2012) is the culmination of the County’s efforts over the previous years to identify the preferred site for the proposed new landfill. The Siting Study looked at recent data, and concluded that all eight previously identified sites were viable for use as the new MSWLF. All sites had pros and cons, but for several reasons Ma‘alo was identified as the proposed MSWLF and is considered the most practicable and feasible alternative.

The 2012 Siting Study is available to the public on the County’s New Landfill website (www.kauai.gov/newlandfillsite/); the Executive Summary and Overall Site Comparison and Recommendation sections are presented in Appendix B.

The following is in response to other concerns expressed above:

• The DEIS provides the basis for the selection of the Ma‘alo site and discusses both the potential for adverse effects and the mitigative measures planned to either eliminate or reduce environmental effects to insignificant levels. A summary of the major factors supportive of the Ma‘alo site include:
The Ma'alo site is the only site identified by the County that currently has a potentially willing landowner.

The Ma'alo site is the most economical site over the life of the landfill and ranks 1st in the Community Criteria Evaluation (CCE) system as initiated by the Mayor’s Advisory Committee on Landfill Site Selection (MACLS).

The Ma'alo site is centrally located which will save costs associated with fuels, resulting in less waste-related traffic, and has positive sustainability effects on the ability of the County to manage its own municipal solid waste disposal requirements.

Finally, the Ma'alo site has an estimated site life of 264 years and can potentially be extended even further with the operation of a future RRP, making Ma'alo a near-permanent potential solution as long as there is the need for the disposal of refuse in a municipal sanitary landfill. (AECOM 2012, pg. ii).

Maps, exhibits, and detailed discussion on alternatives considered for a new MSWLF are presented in Section 3.0.

The County understands there will always be the possibility that some community members may not agree with the reasons for the selection of the Ma'alo site as the preferred alternative for this project. These comments of opposition or disagreement, however, will be included in the EIS to fully document an open and transparent process of public consultation.

Climate change and the generation of greenhouse gases are of concern to all governmental agencies and the public. Although the project is not expected to be adversely affected by sea level rise, the effort to increase recycling and reuse through current County efforts and the establishment of a future RRP can have a beneficial environmental effect by reducing energy demand and the generation of greenhouse associated gases.

The project DEIS will not evaluate all alternative landfill sites for potential impacts to the environment. However, reasonable alternatives that meet the County’s purpose, need, and objectives for a new MSWLF will be subject to further evaluation.

Waste-to-Energy Technologies Comments and Response

- Alternative sites need to be evaluated (Mtg. 4, 5/30/12).
- An incineration alternative should be looked at (Mtg. 1, 5/22/12).
- There should be discussion as to whether the site can accommodate a facility like H-POWER [a waste to energy facility on O'ahu] (Mtg. 3, 5/29/12).
- What are the plans for the methane gas – will you collect and sell – these need to be addressed (Mtg. 1, 5/22/12).
- How will the methane be recovered – this needs to be discussed. Will it be considered a resource (Mtg. 3, 5/29/12)?
- Ways to minimize the methane production need to be discussed, it would be best if we could design a landfill with no or minimal methane production (Mtg. 3, 5/29/12).
- The EIS should look at state of the art development for this site (Ma'alo) (Mtg. 2, 5/23/12).
- Are their plans for capturing methane for making energy (Written Comment, 6/2012)?
- Providing for a waste to energy facility at the RRP means we have failed to recycle adequately – so the waste to energy plant should not be an option. [If the island recycled more the new proposed landfill would not be needed.] (Mtg. 1, 2/5/13).
- Need to address a system to use the gas from the beginning and not plan to vent and flare (Mtg. 6, 2/6/13).
• Examples [of] modern landfills [should be explored when developing the] Phase II [at] Kekaha (Mtg. 6, 2/6/13).


Waste-to-Energy Technologies Response: The RRP FS evaluated (among other technologies) the feasibility of various waste-to-energy technologies that the County could pursue. WtE technology was determined to be incapable of processing the County’s entire MSW stream, as some types of waste cannot be incinerated (e.g., C&D waste). The Final RRP FS is available on the County’s New Landfill website (www.kauai.gov/newlandfillsite/), and is presented in Appendix C.

The following is in response to the other concerns expressed above:

• Discussion on the alternative sites selected for investigation of a new MSWLF are further discussed in the DEIS and the New Kauaʻi Landfill Siting Study (AECOM 2012; Executive Summary and Overall Site Comparison and Recommendation sections are presented in Appendix B). A summary of the Siting Study and discussion of the alternatives analysis for selection of the preferred site for a MSWLF is included in Section 3.0.

• Technologies that include landfill gas to energy, waste to energy, and waste to fuel, have been considered and are further described in Section 3.0 and Appendix I. These include non-thermal and thermal technologies, and others.

• The decomposition of organic material in a MSWLF generates LFG, usually methane and carbon dioxide, which is combustible and may be used to generate energy. LFG, however, takes several years to develop before it is of sufficient quality and quantity to make recovery feasible. Until then, any LFG that cannot be reused is flared to reduce its impact to the atmosphere and environment.

For these reasons, a MSWLF requires a LFG extraction system to prevent buildup of flammable gas (principally methane) produced by the microbial digestion of organic waste over time. The LFG extraction system would include extraction wells, extraction piping, and a control device to extract the gas for flaring off, or for collection and treatment as a fuel if the gas is of sufficient quality and quantity for use.

The detailed design, which would include component sizing calculations and equipment selection, would be accomplished at a later date, based on (1) the likelihood that the LFG extraction system would not be required until approximately 6 years after initial waste acceptance (the anticipated period when landfill associated gases would be of sufficient volume to require control), and (2) in the event there are major modifications to the landfill design, the LFG extraction system would not need to be redesigned to comply with regulations.

A future RRP facility may include the construction and operation of a LFGtE facility on the Maʻalo site to manage LFG. This facility would beneficially use the methane generated in the Maʻalo MSWLF for electricity production, combining methane destruction with green power generation, with both activities mitigating the impacts of GHGs released into the atmosphere.

• The proposed landfill will be of modern construction designed to address current EPA, Resource Conservation and Recovery Act (RCRA) Subtitle D, and State of Hawaiʻi regulatory requirements. The principal requirements include ensuring that the location and design of the facility is geologically stable and away from faultlines, wetlands, floodplains, and other areas that are restricted from use for a landfill; the use of liner materials capable of protecting groundwater and the underlying soil from leachate spills; the use of operating practices that reduce odor, windblown litter, and the control of vectors (insects and rodents); groundwater monitoring; installation of a landfill gas collection and control system; closure and post-closure care to provide the final landfill cover and monitoring of the site for not less than a 30 year period; and financial assurance to ensure that the landfill operator (County) can pay for the final landfill cover and 30 years of monitoring, and corrective action(s) that may be required in
the event that there is a release of contaminants or other problems associated with the safety or stability of the landfill.

**Landfill Technical Design Comments and Response**

- Need to address the length of time liners maintain their integrity if the life of the landfill is going to be this long (Mtg. 2, 5/23/12).
- Is the liner system adequate – how many years (Written Comment, 6/2012)?
- Need to know liner life – I called Hawai‘i County and they said it was 30 years (consultant later in the meeting clarified that it depends on conditions but 50 to 75 is average) (Mtg. 5, 2/5/13).
- What is the expected lifetime of the entire [landfill] safety system you discussed including the liners (Mtg. 5, 2/5/13).
- [What] May impact [the landfill] site life (Mtg. 6, 2/6/13).

**Landfill Technical Design Response:** Modern landfills are well-engineered facilities that include the use of a landfill liner system to prevent groundwater contamination. The liner system planned for the proposed MSWLF will be evaluated and approved by the EPA and State DOH prior to use. It will be composed of multiple layers, including geosynthetic high-density geosynthetic plastic, bentonite, and crushed rock (to cushion and protect the plastic layer). This robust liner system is expected to remain functional throughout the active life of the landfill, including the post-closure period after the landfill stops accepting waste.

The projected lifespan of the Ma'alo site is approximately 264 years based on current rates of MSW being disposed of at the County’s existing Kekaha MSWLF site. Major factors that can greatly influence this would include an unexpected natural disaster (increase the use of space for MSW) or the further advancement of new technologies (reduce the use of space for MSW) for the handling, treatment, and processing of MSW that can be applied to a municipality with characteristics similar to the County of Kaua‘i. However, because there are no easy solutions presently available for the disposal of MSW, the County must continue to rely on the use of a properly engineered and operated MSWLF in conjunction with solid waste reuse, recycling, and waste reduction to meet the County’s needs.

Further information on the proposed concept for the landfill design is discussed in Section 2.0.

**Landfill Size Comments and Response**

- Why such a large site [commenter referring to the Ma'alo landfill site] (Mtg. 1, 5/22/12)?
- Look at a smaller landfill footprint based on the push for recycling and reuse – how big do we really need this site to be (Mtg. 1, 5/22/12)?
- Need to make sure that the information used for these studies and landfill planning is based on current waste stream data reflecting the increase in recycling and reuse and our change in lifestyle (Mtg. 1, 5/22/12).
- Need to assume in design that we continue to do better in recycling and reuse and therefore our landfill needs decrease (Mtg. 1, 5/22/12).
- What are your assumptions on diversion rates over the years (Mtg. 4, 5/30/12)?
- Is county zero waste policy being considered in project (Mtg. 4, 5/30/12)?

**Landfill Size Response:** The size and capacity of the preferred MSWLF and RRP site is acknowledged. However, the County evaluated the size of the site as only one of several critical factors. These factors, noted above in the response to “Landfill Location (siting study related),” include: the willingness of the landowner to consider the use of the site for landfilling; the evaluation of the site relative to the community-based criteria established by the MACLS, and the location of the site relative
to where most of the on-island waste is generated. The projected lifespan of the Ma'alo site at 264 years, is an important factor, but not the sole reason underlying the selection of the site as the preferred alternative; however, it would relieve the burden on future generations. Additionally, the phasing of the proposed MSWLF site is planned to allow for continued use of portions of the site for other productive uses until such time that those portions are needed for landfill or related operations.

A smaller site was also considered based on the County’s ongoing plans and policies in general support of the Zero Waste Resolution (adopted in October 2011; KCC 2011), which attempts to achieve a waste diversion goal of 70% by 2023, and recent increases in the rate of waste diversion. However, a smaller landfill would not serve the interests of the island of Kaua‘i and will not be pursued because: (1) the disposal of MSW is not the only purpose for the new landfill, and (2) it is inherently difficult to select and develop a new landfill site:

Unexpected natural disasters: The Kekaha MSWLF Phase I portion of the landfill reached its capacity years sooner than anticipated due to a sharp increase in solid waste disposal following Hurricane 'Iniki in 1992 (AECOM 2012, pg. 2-1).

Logistical issues: Given the difficulties in siting the new landfill over the past decade and a half, and the years still required to site, analyze, plan, design, permit, build, and operate the new landfill, site life is a critical basis upon which the County may wish to choose a proposed site (AECOM 2012, pg. ii). Developing too small a site would require this effort to be repeated in the near future.

For planning purposes, the County is using current rates of waste disposal from the Kekaha MSWLF, which received approximately 75,000 tons of solid waste per year (AECOM 2012, pg. 2-1). This projection is used as the conservative basis for projecting future demand.

The County has advanced its efforts to reduce the generation of solid waste requiring disposal in landfills through initiatives such as “zero waste” and its intention to develop a new RRP in the future. At the same time, it is prudent for the County to consider any number of contingencies that would still require the disposal of MSW and other forms of solid waste in a landfill. This could occur from a natural disaster, a shipping strike (whereby the transit of recyclable materials to mainland U.S. or foreign markets could be temporarily halted), or from a breakdown in the technology used for the processing of waste.13 For these types of events, it is vital that a fully operational and capable MSWLF be available to address public health and welfare requirements for the disposal of solid waste.

Further discussion on landfill site selection process and related detail is presented in Sections 1.3 and Section 1.4.

Overall Cost Comments and Response

- Documents should clearly discuss costs (Mtg. 1, 5/22/12).
- You said the County must set aside funds in case there is an accident or something happens at the landfill – need to know what safeguards are in place to keep those funds from being used elsewhere and/or disappearing (Mtg. 5, 2/5/13).
- What is the cost of the facility and will it increase the tax burden on residents (Mtg. 5, 2/5/13).

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13This is in reference to the H-POWER solid waste to energy facility, City and County of Honolulu. Previous to the upgrading of the facility with an additional third boiler in the 2012 timeframe, deliveries of refuse to H-POWER were temporarily halted during periods of emergency repair, or when maintenance of equipment and plant machinery was required. Solid waste normally processed by H-POWER was required to instead be disposed of at the Waimanalo Gulch Sanitary Landfill, Kahe, O‘ahu.
• Kaua‘i County could have had funding from both FEMA and the federal Economic Development Administration (EDA) […] it would have been an excellent funding opportunity and sensible placement of a Resource Recovery Park (RRP) […] we could’ve had something viable now ‘if’ Kaua‘i County had acted on that excellent funding opportunity & sensible placement of a Resource Recovery Park (RRP) and Municipal Solid Waste Landfill (Written Comment, 2/2013).

• [For] Twenty-one years there was an excellent opportunity to have the ultimate in funding to build a Resource Recovery Park (RRP). Now, Kaua‘i County wants to turn the revered Wallua Falls, the Wallua River, the Heiau Complex, and ultimately add to the sewage stink & contamination down [in the] Lydgate…Landfill liners last thirty (30) years not two-hundred. Aloha ‘Aina from 21 years ago was turned into: $20 million or more to turn Gem Department Store into the grandiose ‘showcase’ of Līhu‘e Civic Center – to get camping permits & $6 million to refurbish the Historic County Building (Written Comment, 2/2013).

• Does the price include or exclude the credited work that was not done on the Traffic study. Also there seems to be a difference between work done of 40% and 50% (Written Comment, 2/2013).

**Overall Cost Response:** The 2012 Siting Study (AECOM 2012) includes a cost comparison between the eight alternative MSWLF sites. The planning level cost estimates for each site consisted of acquisition, development, and operation costs (AECOM 2012, pg. 5-1). The overall cost per year of construction over the entire landfill life was one of the community based criteria (“cost of development”) (AECOM 2012, pg. 5-31). Section 5.0 of the 2012 Siting Study summarizes and compares the cost estimates for each site. The site with the lowest estimated cost of total site development, in terms of dollars per year of site life was Ma‘alo (the proposed project), followed by Kumukumu and Pu‘u o Papa‘i (AECOM 2012, pg. 5-19). Cost estimates for the proposed project are also discussed. The 2012 Siting Study is available to the public on the County’s New Landfill website (www.kauai.gov/newlandfillsite/).

The County considers the present time to be an excellent opportunity to develop the proposed Ma‘alo MSWLF. Other possibilities for the handling of solid waste (including recycling and reuse), such as from FEMA and EDA, may have been proposed during a prior administration which would not necessarily be available today. In general, new opportunities, such as may be provided by federal agencies, will be investigated and if found to be viable will be pursued if there is an advantage to the County in doing so. Some of the major issues or questions for the evaluation of such possibilities would include:

1. What is the source of the funding and whether there are any conditions with the use of federal monies for the project;
2. Whether the proposal for the handling or management of solid waste has a proven and demonstrated record of successful operation in a municipality of similar size, scale, and general conditions as the County of Kaua‘i; and
3. Whether the County has any recourse in the event that the proposal for the handling or management of solid waste is unsuccessful. This would extend to whether there would be: (a) liability to County of Kaua‘i taxpayers should the proposal fail; and (b) the potential for adverse environmental, social, and economic impacts if the proposal should fail and the County is placed in a situation where there is insufficient access to land and/or financial resources should it be required to immediately develop a new landfill site.

The cost for the proposed MSWLF is expected to be paid for through tipping fees, and are not expected to be a burden to taxpayers. Contingency funds for the MSWLF are protected under Subtitle D of the RCRA; specific requirements for financial assurance responsibility are found in 40 CFR Part 257 and Part 258 of the Code of Federal Regulations. These funds cannot be diverted for other purposes.
Tipping Fees and Zero Waste Comments and Response

- Tipping fees aimed at promoting recycling should be addressed. The County should continue its action and support for zero waste (Mtg. 3, 5/29/12).
- Move toward zero waste management (Written Comment, 6/2012).
- Focus on County of Kaua‘i “Zero Waste Resolution” (Written Comment, 2/2013).
- Consider “Pay-As-You-Throw” (PAYT) System to incentivize waste minimization (Written Comment, 2/2013).

Tipping Fees and Zero Waste Response: The County has ongoing plans and policies in general support of the County’s “Zero Waste Resolution” to pursue a waste diversion goal of 70% by 2023, and will continue its support for the initiative. The hope is that the creation the proposed RRP will further reinforce the concept of an integrated waste management system, promote the act of recycling, and provide an opportunity to recover valuable resources from the waste stream. Tipping fees play an integral role in the effort to curb waste production and are an attempt to place a price tag on waste. Appropriate tipping fees for the proposed MSWLF will be established at a future date.

Soil Cover Comments and Response

- Cover material issues need to be discussed such as if the cover material is transported to the site what contaminants might it have, i.e., is it going to be "dirty" dirt [contaminated soils] – if it is, how will it be cleaned up – if it has GMO (Genetically Modified Organism) contaminants what steps will be taken to make sure that dust does not fly off the trucks during transport and affect farmers along the transport route (Mtg. 2, 5/23/12).

Soil Cover Response: The DOH regulates the type of soil that may be used for cover material, and will impose restrictions as part of the solid waste permit. Generally, contaminated soil is not allowed. The County will maximize the use of onsite soils, to the extent available and feasible, to minimize the importation of cover soil. Estimates of available and required soil for the proposed project are discussed in Section 2.2.5. The delivery of refuse to landfills will be controlled with appropriate measures including the use of covered refuse trucks and the cleaning of refuse truck beds at the landfill, as appropriate, when the vehicles leave the site.

General Comments and Response

- List of types of buildings, hours of operation and cost impacts needs to be in the studies (Mtg. 4, 5/30/12).
- Studies should note the benefits of a landfill (Mtg. 1, 5/22/12).
- When I toured Kekaha, I was surprised, I expected it to be smelly – it was not smelly and they had a system to catch the leachate and it seemed to operate well (Mtg. 1, 5/22/12).
- How much old [previous] research was done on old dump sites – are there others [/] old dump sites that could be mined – what is impact [of mining other, older dump sites?] (Mtg. 6, 2/6/13).
- The TMKs for the properties should be noted in the study along with the zoning on the parcels (Mtg. 6, 2/6/13).

General Response: A description of the proposed project including types of facilities, hours of operation, and costs are presented in Section 2.0.

The buildings planned for the Ma’alo MSWLF are expected to consist of an office/administrative building, shop building, and scale house. Other support buildings may also be provided as part of the final design of the project. Hours of operation are expected to be similar to the County’s Kekaha MSWLF: 7:00 AM to 5:00 PM, seven days per week, except during unusual circumstances when the
County will issue notification to the community of the temporary need for a shutdown. Planning level cost estimates for the proposed Ma'alo MSWLF are provided in Appendix D.

The design and operation of the proposed Ma'alo MSWLF will benefit from experience gained over many years by the EPA and State of Hawai'i in providing regulatory oversight for monitoring and improving the performance of MSWLFs. Another principal benefit of a properly operated MSWLF is its contribution to the County of Kaua'i in promoting the responsible and sustainable handling of solid waste. The proposed project promotes this objective with a site that possesses a long lifespan. In future years with the intended development of the RRP, new forms of solid waste handling, recycling, and reuse that are not now practical or feasible may be become available.

All required improvements associated with the operation of a modern landfill will be employed including: the use of daily and intermediate cover; the installation of landfill liner, gas recovery, and leachate management systems; and, operating practices and measures to minimize and mitigate against the potential for adverse effects.

Currently, the County of Kaua'i has only one operating MSWLF, the Kekaha MSWLF in the southwest part of the island, which is currently approaching its design capacity. The Kekaha MSWLF Phase II is projected to soon reach capacity, thus the County must develop a replacement facility to accommodate the solid waste generated by residents and visitors on Kaua'i. The 2012 Siting Study (AECOM 2012) includes Tax Map Key information for all of the eight potential MSWLF sites. Further information concerning landfill mining is described in Section 3.3.2 and further detail is provided in Appendix I.

### 10.1.3.3 RESOURCE RECOVERY PARK (RRP) DESIGN AND OPERATIONS

As noted above in the Introduction, the RRP is intended to be implemented by the County at a future date and is therefore not part of the proposed EIS action. The following comments and responses are provided for information only.

Responses to comments received regarding the RRP design and operations associated with the proposed project have been arranged into the following categories:

- Current Proposed RRP Location
- RRP Location(s)
- Kaua'i Resource Recovery Park Feasibility Study (AECOM 2013; Appendix C)
- RRP Design
- Education

#### Current Proposed RRP Location Comments and Response

- RRP needs to be in the EIS – is Grove Farm building it, donating the land – how many acres is the site and what will be in the RRP (Mtg. 4, 5/30/12)?
- Why is the RRP not on state land next to the landfill (Mtg. 1, 5/22/12)?
- Why are the RRP site and the landfill site separated and why is RRP not also on state land (Mtg. 4, 5/30/12).
- It sets up a scam to pay Grove Farm (Ma'alo Site) (Written Comment, 6/2012).
- Why isn't the entire site on state land (Written Comment, 6/2012)?

#### Current Proposed RRP Location Response:

A description of the RRP including potential sizes and types of facilities under consideration, is provided in Appendix C. The Grove Farm property is no longer
under consideration and should a future RRP be developed, it would be collocated within the Maalo MSWLF site. The Ma'alo MSWLF and future intended RRP would be on state land.

**RRP Location(s) Comments and Response**

- Shouldn’t the RRP be sited closer to an area where things can be shipped out since we do not process on this island — should address this in the EIS (Mtg. 1, 5/22/12).
- There needs to be discussion on whether all recycling facilities will be located at the RRP or will some be appropriately located in geographic areas outside of the RRP to be more convenient to communities such as green waste facilities (Mtg. 3, 5/29/12).
- Look at appropriate decentralization of resource recovery especially green waste. (Mtg. 3, 5/29/12).
- MRF should be located close to the harbor (Mtg. 3, 5/29/12).
- What kinds of efficiencies would you get if the MRF were closer to the harbor? – need to look at number of trips, gas consumed, and carbon loading issues – what are differences in these issues if it were located at the harbor instead of inland? – need to look at efficiencies of all elements of a MRF with relation to centralizing, decentralizing and all other alternatives
  - need to take into account convenience of location areas for users in order to increase use
  - look at places people frequent (Mtg. 4, 5/30/12).
- There needs to be a discussion of the connection to the Harbor for shipping collected materials out (Mtg. 4, 5/30/12).
- Does having a central location more inland for recycling, etc., mean that there will be less shipping cost to transport (Mtg. 4, 5/30/12)?
- Siting study needs to include where things will be located, travel measures and cost including calculations from trip origin to destination and how many trips (Mtg. 4, 5/30/12).
- Decentralized consideration for these facilities is not just about convenience but also about carbon loading, fossil fuel use and traffic impacts and these need to be considered (Mtg. 4, 5/30/12).
- Yes decentralizing these sites would provide better accessibility and convenience to residents which means they would be more likely to recycle (Mtg. 5, 2/5/13).
- This is the preferred site but the [EIS] document should still look at alternative sites (Mtg. 5, 2/5/13).
- Need to look at multiple RRP sites to make it convenient for the public to recycle including the harbor area (Mtg. 5, 2/5/13).

**RRP Location(s) Response:** The idea of a centralized RRP is to encourage waste diversion and recycling by creating a “one stop shop,” to try to maximize the amount of material diverted from the landfill. However, the creation of the RRP does not preclude the County from having similar or duplicate services elsewhere.

According to the data in the County’s ISWMP, the island’s waste generation centroid is estimated to lie between the Līhu'e/Kapa’a and Kōloa/Po’ipū areas (R. W. Beck 2009). The closer the MSWLF and RRP are to the centroid, the shorter the average distance of material shipment (and re-shipment). Table 7-1 in the 2012 Siting Study (AECOM 2012; reproduced in Appendix C compares the amount and distance of waste transported from the County’s four transfer stations to the eight potential landfill sites. The four sites with the lowest ton-miles per year (total amount and distance of waste shipped) and hauling costs were Ma'a'alo, Kālepa, Kumukumu, and Kīpū. These sites are also the closest sites to Nāwiliwili Harbor, and are thus preferable for potential off-island shipment of recovered material. The decision to co-locate a future RRP within the current proposed Ma'a'alo site will further enhance the
Kaua‘i Resource Recovery Park Feasibility Study (RRP FS) Comments and Response

- What is the status on the RRP feasibility study (Mtg. 1, 5/22/12)?
- The County needs to set the [waste] recovery rate higher than the current 70% (Mtg. 6, 2/6/13).
- RR Park vs RR System should be addressed more closely (Written Comment, 2/2013).
- PLEASE address these above bullet point ‘concerns’ in the Feasibility Study: How will RRP materials be brought from residents, Hotel Industry, Costco, e-waste, Public and Private Schools, restaurants, gated communities, and etc.?
  - How many new roadways will need to be built to accommodate the substantial numbers of semi trucks?
  - As the Public Works Roads Division is in the process of implementing U.S. Army Corps of Engineers MicroPaver road maintenance software; which is based on the American Association of State Highway and Transportation Offices standards of measurement; will the U.S. Army Corps of Engineers be consulted in the excavation of adjacent land owned by Grove Farm Company, Inc. owner, Steve Case founder of America Online (AOL)?
  - It would be considerate for Kaua‘i County to contact the numerous helicopter, aerial, airplane tour business’ operators to receive their testimony of how this proposal: MSWLF will affect their cliental [SIC]
  - The Kea‘au Recycling and Reuse Center – employs people with developmental disabilities. Will Kaua‘i County consider this option to employ the incredible work ethic amongst this population?
  - Thrift shops placing tons of discarded donations into dumpsters – I have witnessed this extensive contribution to the landfill. This practice is wasteful... Ever notice the price of a package of buttons at Wal-Mart or Līhu‘e Housemart & ACE Hardware and Crafts. As well, there are plenty mechanic businesses on BEAUTIFUL Kaua‘i – bags of rags – are sold at various stores for BIG money.
  - Enforcement: that’s where planning will come in to keep this kind of waste from happening.
  - Also, at the various businesses and schools that have tons of recycled paper that isn’t being ‘recycled.’
  - Enforcement is a necessary component that would be win/win – [it would lead to] the creation of jobs and to raise public awareness.
  - There is tons of discarded food waste at schools – what happened to the pig farmers that would pick up the slop? Ten (10) billion people go to bed hungry every day. There isn’t any viable composting at any public schools – that [discarded food waste] contributes immensely to the landfill problem.
  - Green waste at schools on our island...?? What happened to the USDA 4-H program on Kaua‘i? (Written Comment, 2/2013).

Kaua‘i Resource Recovery Park Feasibility Study (RRP FS) Response: Efforts to increase the County of Kaua‘i’s Zero Waste Resolution (KCC 2011) waste diversion goal of 70% by 2023 are beyond the scope of this EIS; however, it will be considered by the County. Similarly, while mandated policies or incentivized initiatives that streamline the composting of paper and green, and food waste at public schools and businesses would increase landfill waste diversion, the suggestion for a mandatory policy is also beyond the scope of this EIS. Likewise, while enforcing recycling practices might be effective, the hope is that the creation of the future RRP will raise public awareness for waste
diversion and promote voluntary action. The Final RRP FS (AECOM 2013) is available for review on the County’s New Landfill website (www.kauai.gov/newlandfillsite/) and in Appendix C.

The following is in response to the other concerns expressed above:

- The method for how materials will be obtained for a future RRP will be determined at a later date when the individual types of recycling and waste reclamation facilities are selected. This will depend on many factors including the ability of the facility to process such materials on island, and the market for the sale of these materials either on island or offshore, from O'ahu or from mainland U.S. and/or foreign markets.
- Further detail concerning the access roadway system serving the Ma'alo MSWLF site where the future RRP project site is intended is identified as part of the TREFS study in Appendix F.
- The USACE will be consulted for the future development of the RRP project.
- The County is aware that visitor-related businesses have the potential to be affected by the proposed project. The major potential project effect is expected to be changes to the area viewplane from Ma'alo Road. See Section 4.10.
- The County will consider the use of developmentally disabled individuals in the operation of the MSWLF and future RRP facility as provided by law. However, this consideration for employment will be within the context of maintaining public safety, since much of labor involved in the operation of a landfill or refuse recovery operation employs the use of heavy equipment and/or machinery, sometimes in potentially hazardous conditions.
- The County recognizes that there are many potential sources of feedstock, including discarded or expended materials that could be recycled. Exploiting presently unused or underutilized resources is an important part of the reason why the County proposes to further investigate all viable and feasible options before deciding on the proper mix of facilities in a new RRP facility.

RRP Design Comments and Response

- Need to discuss a MRF (materials recycling facility) (Mtg. 1, 5/22/12).
- What types of services and activities will be in the resource recovery park needs to be discussed. (Mtg. 2, 5/23/12).
- How does it work between the RRP and landfill as regards timing, and materials flow etc. – this needs to be addressed (Mtg. 1, 5/22/12).
- How will alternatives be identified for each RRP element? What are the criteria for siting each element that lead to optimum operation of the element? – the description must have sufficient detail to allow comparison between the alternative placement being discussed and the placement at the proposed RRP (Mtg. 4, 5/30/12).
- The EIS should address the alternative of developing an integrated Resource Recovery System (i.e. siting complementary facilities at various locations other than the Resource Recovery Park where appropriate) rather than locating all the diversion activities at a Resource Recovery Park (a single location adjacent to the landfill) (Written Comment, 3/2013).
- What are the failure points for the pump system i.e. level of flooding etc. and how will these be backed up (Mtg. 5, 2/5/13).
- [What] May impact [the landfill] site life and [the] RRP [site life?] (Mtg. 6, 2/6/13).

RRP Design Response: Presently, the County is employing a decentralized approach to support waste diversion through the use of County and private contractor operated facilities, such as the Kaua‘i Resource Center, the existing green waste composting facilities, waste transfer stations, and the Kaua‘i Recycles Drop Bin Program. In the future, as the RRP is planned for development it would be
prepared to adapt to support these existing decentralized facilities, as well as the planned curbside collection of recyclables and green waste, and other waste diversion policies. However, some potential problems or insufficiencies of decentralized waste management facilities include requiring the public and commercial entities to drive to several facilities to recycle, which creates obstacles for the public to maximize their waste diversion. The future RRP would be a “one-stop service center” for reuse, recycling, and other compatible activities that promote maximizing waste reduction by accepting a broad range of materials that might otherwise be disposed of in the landfill. Providing a single centralized location where residential and commercial entities are able to conduct all of their recycling and waste diversion activities can provide a synergistic effect, and help promote reuse, recycling, and reduction of waste disposal. The RRP is intended to supplement the County’s existing decentralized waste management facilities, not replace, nor be in opposition to, a decentralized approach; instead, the RRP can enhance such an approach (AECOM 2013, pg. 1-3; Appendix C).

The RRP FS presents best estimates of diversion potential for each technology or process under consideration for use at the RRP, and costs for developing, operating, and maintaining that technology or process. Table 38 in the RRP FS summarizes the costs and benefits of the potential RRP components and facilities, and makes recommendations for facilities that are considered feasible for implementation. The Final RRP FS includes a discussion on developing an integrated resource recovery system and is available for review on the County’s New Landfill website (www.kauai.gov/newlandfillsite/) and is presented in Appendix C.

The sustainability of any future RRP is largely dependent on the success of the waste diversion programs; the commodity prices for recycled material, and the capture of a sufficient quantity of waste must prove to be economically viable.

The handling of stormwater would be based on the use of engineered drainage controls that rely on gravity and properly graded surfaces to direct storm flows to detention facilities and/or a drainage conveyance (e.g., culverts and drainage swales). The design of grading and drainage plans are regulated by the County of Kaua‘i through the review of construction documents, such as would be prepared for the Ma'alo MSWLF project.

The events that can affect the lifespan of the landfill will involve whether there are unforeseen natural or man-induced events that would more quickly utilize space normally set aside for the disposal of MSW. These potential events may include, but are not limited to:

- A natural disaster such as experienced in the past from hurricanes such as ‘Iniki in 1992.
- Maintenance or unexpected equipment failure from the use of technology-based solutions for the processing or handling of solid waste that would otherwise be diverted from landfilling.
- A shipping strike or other loss of capacity for the transshipment of recyclable materials or waste by-products not normally requiring landfilling to other off-island locations.

**Education Comments and Response**

- Is there a communication/education aspect at RRP to develop and efficiently manage the site and to maximize the use (Mtg. 4, 5/30/12).
- Education needs to be a component of the RRP (Mtg. 4, 5/30/12).
- More education on how to reduce the waste stream needs to be a priority (Mtg. 1, 5/22/12).
- Clearly, the general public needs an immeasurable and immense education... people are lazy... Hawaiian seat covers and bumper stickers galore. Green bottles litter the roadways; choke packaging material from Mainland Developers, DOT (Department of Transportation – State of Hawai‘i), Wal-Mart, Home Depot, Costco, PMRF, tons of E-waste, the solution is to implement mandatory ‘over sight’ programs in businesses and schools on our island (Written Comment, 2/2013).
**Education Response:** The Final RRP FS recommends an educational center as an important component of the future RRP, as it would provide an opportunity for residents, businesses, trade associations, community groups, schools, visitors, legislators, and others to discuss the benefits of waste diversion programs that are offered. The education center would support interactive discussions and training related to recycling and waste diversion, and support facility tours to provide residents with a better understanding of the programs and facilities available and how they work. Education and promotion is essential to the overall success of the RRP, and will help to maximize the capture and diversion of all recyclable materials (AECOM 2013, pg. 47; Appendix C).

10.1.3.4 ROADWAYS AND TRAFFIC

Responses to comments received regarding roadways and traffic associated with the proposed project are addressed below.

Access Roadway Issues Comments and Response

- What is the estimated cost of road infrastructure (Mtg. 4, 5/30/12)?
- Who pays for the roads, needs to be addressed (Mtg. 1, 5/22/12).
- All road routes need to be looked at (Mtg. 1, 5/22/12).
- Traffic flow needs to be discussed especially at the river intersect (Mtg. 3, 5/29/12).
- Road and traffic issues need to be looked at – will it use an existing road or a new one (Mtg. 4, 5/30/12)?
- Will there be a County use bypass road from Puhi behind Līhu'e to the site? (Mtg. 4, 5/30/12)
- Roadway behind Hanamā'ulu should be discussed to take traffic off the main road (Mtg. 4, 5/30/12).
- What type of road infrastructure will be involved? – what are the development pressures created by access proposals? – who pays for roads and who benefits from the road construction (Mtg. 4, 5/30/12)?
- If Ma'alo is the chosen site the studies need to look at the road issues and any positives the project might have for the community (Mtg. 1, 5/22/12).
- Roads must be part of the process and include all access issues – should also look at the growth potential that the road would create for other public facilities and uses within the corridor (Mtg. 1, 5/22/12).
- Recreational aspect that could be developed and served through providing new access route(s) for the landfill need to be discussed such as public access to Kālepa Ridge and Wailua River (Mtg. 4, 5/30/12).
- I am disappointed that the road is in a separate EIS from the landfill, they need to be discussed together (Mtg. 1, 5/22/12).
- Traffic impacts need to be addressed (Mtg. 3, 5/29/12)
- Traffic will affect the residents close by-in the Hanamā'ulu area-the flow pattern (Written Comments, 6/2012).
- The EIS should address the traffic impacts on Ma'alono Rd, especially at the intersection with Kūhiō Hwy. In addition, there should be a discussion of the mix of residential and small commercial vehicles with the larger commercial haulers and County trucks. As an alternative: It seems more efficient, safer, and more logical to locate elements of the RRP such as the MRF, the Center for Hard to Recycle Material, and residential and small commercial waste and green waste drop sites in a more convenient location with better access to the harbor (Written Comment, 3/2013).
• Access road issues need to be addressed – need traffic studies – need to look at bypass road
option and especially the primary access impacts (Mtg. 5, 2/5/13).

• Bypass road needs to be included and should be built prior to building the landfill – the road
should come first (Mtg. 6, 2/6/13).

• All three elements the landfill, the RRP, and the access road need to be addressed in the EIS
– need to look at the bypass road and [provide] a full traffic analysis [which] needs to be in the
EIS (Mtg. 6, 2/6/13).

• I would like the Traffic Impact study to also consider one more phasing:
  – Impact of only the Landfill Traffic (Commercial haulers only) on the required improvements
    as compared to with the RRP traffic.
  – Should have add one more analysis to items 5 and 6: after landfill opening (alone), another
    analysis landfill and RRP traffic, and then future traffic (Written Comment, 2/2013).

Under the Traffic Signal Warrants:
  – Just want to clarify that the Ehiku/Kūhiō Hwy intersection will need to be looked at as the
    adequacy of the present design (Holding lanes extended, etc.) based on projected
    increased traffic of:
      o Landfill Commercial Traffic only
      o Landfill with RRP traffic
      o Future Traffic (Written Comment, 2/2013).

Access Roadway Issues Response: A TREFS has been prepared to study the existing traffic and
circulation of the proposed project site and the potential traffic impacts associated with the
development of the MSWLF and RRP. A number of alternative access routes to the MSWLF and RRP
are under consideration, and impacts to all intersections and associated streets are evaluated based
on the approximate projection of vehicle trips per day generated by the project. The TREFS assesses
the requirements for various traffic controls to address safety and congestion issues as well as
mitigation measures such as the potential need for a signalized intersection, the use of
acceleration/deceleration lanes, and associated signage and striping improvements.

The following is in response to other concerns expressed above:

• The access roadway would be funded and constructed by the County, unless other funding
  sources should become available. Inasmuch as the access roadway provides access to the
  MSWLF and RRP, and these facilities are essential in meeting a public need, the beneficiaries
  of this project will be all communities on Kaua‘i that require a safe, sanitary and efficient
  location for the handling and disposal of MSW.

• The TREFS report investigates several alternative roadways and the related factors that
  should be considered in providing safe and efficient access to the RRP and MSWLF. These
  factors include traffic volumes, local roadway conditions, residents and/or businesses that may
  be affected, and the traffic controls that would be needed to maintain public safety.

• The concern that the access roadway could create additional traffic for other public facilities
  and uses within the corridor are discussed in Section 2.3.

• The access roadway system is intended to provide access to the MSWLF and future RRP site
  and is not designed to facilitate the development of recreational resources in the area. The
  proposed access route that was selected was based on balancing multiple concerns including
  feasibility, directness of route, mitigation of potential traffic impacts, cost requirements, and
  related factors. The alternatives considered in the TREFS were also discussed with the
  community, and the resulting dialog became a key consideration in the selection process. See
  Section 2.3.1.
• The EIS for the proposed project includes the MSWLF and access roadway system as a complete project. As previously noted, the future development of a RRP at the landfill site would require a separate HRS, Chapter 343 document.

• The proposed New Kaua‘i MSWLF project is separate from the proposed bypass road project, which is intended to provide relief from traffic along the Kūhiō Highway. The County anticipates the separate bypass road project will not affect, nor be adversely affected by, the MSWLF project.

• A summary of the TREFS is presented in Appendix F.

10.1.3.5 REUSE AND RECYCLING

Responses to comments received regarding reuse and recycling associated with the proposed project have been arranged into the following categories:

• General Reuse and Recycling
• Non-Recyclables
• Electronics

General Reuse and Recycling Comments and Response

• There needs to be discussion how and what are the best ways to separate out the recyclables and recoverables to make sure that all are recovered and none end up in the landfill (Mtg. 3, 5/29/12).

• If we continue with the focus of reuse and recycling of waste, we may not need a landfill – this alternative should be considered in the EIS (Mtg. 1, 5/22/12).

• What is the cost benefit of maximum diversion of waste from the landfill (Mtg. 4, 5/30/12)?

• Cost benefit of banning all wet and dry organic matter from the landfill needs to be looked at what are cost differences and the differences in potential environmental impacts if we do one or both of these (Mtg. 4, 5/30/12)?

• Discussion on diversion policies and their impacts need to be in the document (Mtg. 4, 5/30/12).

• Kaua‘i’s Solid Waste Management Plan is quite good. I urge us to follow it quickly (Written Comments, 6/2012).

• With a diversion goal of 70% in 10 years established in the recently passed Zero Waste Resolution, what are the design assumptions for annual disposal and ultimate capacity? If we can move aggressively to achieve a 50% or 60% diversion rate by the time the landfill is completed, Will we really require all that space? It seems it may be more appropriate to locate those elements of the Resource. Recovery Park, which are appropriate, on the actual landfill site as it is State land. This would simplify integration of operations, reduce capital and operating costs and give the County more control over the operations of the various diversion options (Written Comment, 6/2012).

• The EIS should include a discussion of diversion policies and the County’s commitment to achieving the goals of the Zero Waste Resolution at the new landfill as part of the landfill design and construction, and operations (Written Comment, 6/2012).

• The EIS should also address “external” County policies and programs necessary to maximize diversion and reduce the environmental impacts of the landfill. Programs such as: Pay As You Throw; Banning all wet organics; Commercial and Construction recycling mandates; and Bans on the sale, specific materials such as styrofoam containers and disposable plastic water
bottles should be an essential part of the approval of any disposal site (Written Comment, 6/2012).

- An evaluation should be made of the costs and benefits of maximizing diversion, while minimizing environmental and nuisance Impacts by establishing a policy of banning (maximizing the diversion of) all wet organic material, thereby minimizing methane generation and leachate toxicity. (see www.cool2012.com) with the goal of creating an Inert Residue Fill (Written Comment, 6/2012).

- The EIS should address providing funding and staff resources to achieve our diversion goals at a level comparable to what is to be spent on creating a new disposal facility. A tipping fee surcharge on all disposal should be established to generate funds for an aggressive outreach and education campaign (Written Comment, 6/2012).

- At the last Kekaha meeting someone from Samoa shared that they use a system of incentives for reducing your waste production – we should look at this – it would need both incentives and enforcement elements (Mtg. 5, 2/5/13).

- Need to look at providing more areas to bring composting waste not just one centralized one (Mtg. 5, 2/5/13).

- Recycling? There are some dedicated individuals that ‘walk their walk’ but for the most part – we’re in the dark (Written Comment, 2/2013).

- We need regional drop off spots for green-waste (Written Comment, 2/2013).

- Establish “Materials Recovery Facility” (MRF) (Written Comment, 2/2013).

- We need a MRF now- please do not tie this into acceptance of this RRP EIS. Ideally this is placed closer to shipping areas (Mtg. 6, 2/6/13).

- "This" comment is also directed to: Kaua‘i County; I commend the county on their mandatory recycling of cardboard (Written Comment, 2/2013).

- Get the organics out [of the landfill]- compost[ing areas are] a must (Written Comment, 2/2013).

- The County needs to set the [waste] recovery rate higher than the current 70% (Mtg. 6, 2/6/13).

**General Reuse and Recycling Response:** The County will continue its plans and policies in support of the County’s “Zero Waste Resolution” goal of 70% waste diversion by 2023. Such practices and policies are regularly reviewed, and are often detailed on the Solid Waste Division website (www.kauai.gov/publicworks/solidwaste).

The following is in response to other concerns expressed above:

- The County’s efforts to promote waste recycling and recovery are contained in its Integrated Solid Waste Management Plan (ISWMP) which is available on the Solid Waste Division website (http://www.kauai.gov/ISWMP). Further information on County projects and programs can be found on the Solid Waste Division website identified above. The County’s intention to pursue the future development of a RRP will further advance the integration of the County’s solid waste management system by promoting new opportunities for reuse and recycling through the recovery of valuable resources from the waste stream.

- The intention to develop a centralized future RRP is to encourage waste diversion and recycling by creating a “one stop shop,” to maximize the amount of material diverted from the landfill. As indicated above in the response to ‘RRP Location(s),’ the future creation of the RRP does not preclude the County from having similar or duplicate decentralized services elsewhere.

- The County’s ultimate goal is to one day eliminate the need for a MSWLF. However, as indicated above in the response to ‘Landfill Size,’ there are important reasons why a MSWLF
is required at this time. These reasons include the potential for an unexpected natural disaster such as a hurricane, a shipping strike, or a breakdown in the technology used for the processing of waste.

- It is acknowledged that there are environmental benefits to increasing waste diversion through policies for reuse and recycling. The Final RRP FS has evaluated all appropriate waste diversion technologies and processes, and includes a cost benefit analysis.

- The consideration for a MRF is presented in the Final RRP FS. The Final RRP FS is available for review on the County’s New Landfill website (www.kauai.gov/newlandfillsite/) and is presented in Appendix C.

- As noted above in the response to “Kaua’i Resource Recovery Park Feasibility Study (RRP FS),” increasing the County’s “Zero Waste” diversion goal of 70% by 2023 is beyond the scope of this project; however, it will be considered by the County.

Non-Recyclables Comments and Response

- How do we deal with combustibles that cannot be recycled (Mtg. 3, 5/29/12)?

- There have been concerns voiced regarding the toxicity of certain wastes. Especially what is left after the easily recyclable material is diverted. Reducing the impacts of potentially toxic leachate could be managed in a number of ways: First, Including a Hazardous Waste collection system for small commercial generators as part of the RRP; Second, working with other communities and organizations nationwide to reduce the toxicity of many everyday products, and Finally, Implementing Extended Producer Responsibility legislation that would require the manufacturers to develop programs to take back their products. All these issues need to be discussed as alternatives to simply continuing to bury this material (Written Comment, 6/2012).

- How do we make sure that household hazardous waste is properly recycled or collected instead of ending up in the landfill – decentralization of RRP sites would help and needs to be looked at (Mtg. 5, 2/5/13).

- Will recovery center take hazardous waste – not just household waste ([The] Consultant will provide a list of the differences between class “C” and “D” landfills]) (Mtg. 6, 2/6/13).

- The CHARM needs some work- where do bulky items go (Written Comment, 2/2013)?

- Promulgate local regulation to reduce sources of problematic waste, e.g. elimination of Styrofoam containers, and require vendors to accept the return of packaging materials from consumer. Businesses (vendors) would be required to manage all returned packaging materials through the RRP (Written Comment, 2/2013).

- Initiate “deconstruction” legislation, i.e. regulate waste material generated from demolition facilities (Written Comment, 2/2013).

Non-Recyclables Response: The County currently offers an annual Household Hazardous Waste (HHW) collection event for a wide range of non-regulated residentially generated HHW [including combustible waste] materials, such as oil-based paints and solvents, non-regulated liquid wastes, household batteries, lead-acid batteries, mercury, and fluorescent light bulbs. Commercial and institutional hazardous wastes must be managed through a private hazardous waste disposal contractor (AECOM 2013, pg. 10; Appendix C).

The purpose of the proposed future RRP is to provide a facility where the public can dispose of bulky or large-volume non-hazardous waste materials, and small-volume difficult-to-manage or hazardous waste materials. Central to the RRP is an Integrated Public Drop-off and Reuse Facility, where materials would be inventoried, segregated, and packaged as appropriate. This facility can potentially include a Household Hazardous Waste Depot (HHWD), an Electronic Waste Depot, a Metals Recycling Facility, a Construction and Demolition Material Processing and Recycling Facility, a Used
Tire Processing Facility and a Center for Hard-to-Recycle Materials (AECOM 2013, pg. iii; Appendix C). The Final RRP FS is available for review on the County’s New Landfill website (www.kauai.gov/newlandfillsite/).

Although requiring stores to take back electronic waste and enforcing it is not within the scope of this project, the County will consider the support of legislation that encourages manufacturers to offer recycling programs, as it continues its efforts to reduce the waste stream.

Electronics Comments and Response

• Requirements such as stores taking back electronic waste should be strongly enforced to reduce the waste stream. Also more education on waste stream reduction for the public needs to be provided by the County (Mtg. 1, 5/22/12).

• After watching someone throw a TV in the trash yesterday… we need regional electronic drop off spots… OR at least one open more regularly… we need this NOW (Written Comment, 2/2013).

Electronics Response: As noted above, requiring stores take back electronic waste and enforcing it is not within the scope of this project. However, the County will consider this and other suggestions as it continues its efforts to reduce the waste stream. County policy changes and the promulgation of new requirements are evaluated on an ongoing basis, and are considered in the RRP FS recommendations to achieve a more holistic approach to diverting the waste stream. The RRP FS discusses the inclusion of an educational facility into the RRP as a means of further educating the public on how to best dispose of special waste, such electronic equipment.

The Final RRP FS is available for public review on the County’s New Landfill website (www.kauai.gov/newlandfillsite/).

10.1.3.6 SOCIOECONOMIC AND CULTURAL IMPACTS

Responses to comments received regarding the potential for socioeconomic and cultural impacts associated with the proposed project have been arranged into the following categories:

• Land Ownership
• Hawaiian Homelands
• Cultural Resources
• Effect on Residences
• Effect on Agriculture
• Visual Impacts
• Consistency with County Zoning Plans
• Socioeconomic and Cumulative Impacts

Land Ownership Comments and Response

• Don’t agree that the land is owned by the State and Grove Farm, my family has a claim to the land so the EIS needs to look at land ownership issues – DLNR (Department of Land and Natural Resources) needs to act on the claim I filed (Mtg. 4, 5/30/12).

• Again, I do not agree on the ownership of the land and what we are discussing tonight is only the County's plan for the site – my family as owners would like to see a graveyard for Native Hawaiians on the site (Mtg. 4, 5/30/12).
• How did the State acquire the land and whether or not it is Crown Land or Hawaiian Homes
needs to be discussed (Mtg. 5, 2/5/13).

• Who approves the sites – the legal landowner has to sign off and the State and Grove Farms
are not the legal landowner – go to www.ikanakahui.com for the history of these lands
(Mtg. 6, 2/6/13).

• Fee simple ownership needs to be clearly established (Mtg. 6, 2/6/13).

• True owner [of the landfill site] needs to be consulted with (Mtg. 6, 2/6/13).

• Landownership was raised – an attendee felt his family had a claim to the land and wanted
the consultant to clarify their understanding of the ownership (The Consultant [stated that
the] proposed landfill site is owned by the State –this State owned site is one of the possible
sites for the RRP, the other possible site for the RRP is owned by Grove Farm) (Mtg. 6, 2/6/13).

• I am very concerned about this project being on ceded lands. I am also concerned that this
project may affect future water resources – beyond the 30+ years that the landfill liner may
last – given there is an aquifer in area (Site Visit, 2/16/13).

Land Ownership Response: The County respects all comments made by the community. However,
in accordance with law, negotiations for the use of land, including ceded lands or crown lands, will be
conducted only with the current, legally listed landowners. The County of Kaua’i is presently in active
discussions with the State for the use of tax map key (TMK): (4) 3-9-002: 020, for the MSWLF site.

A CIA was prepared by Cultural Surveys Hawai’i, which included consultations with Native Hawaiian
organizations (NHOs) and individuals. Historical documents, maps and archaeological information of
the project area, including Crown Lands, were identified through various sources including Land Court
Awards (LCA), the Office of Hawaiian Affairs (OHA) Papakilo Database (www.papakilodatabase.com),
the State Historic Preservation Division (SHPD), OHA, the Kaua’i- Ni’ihau Island Burial Council
(KNIBC), the Kaua’i Historic Preservation Commission, and others (CSH 2013, pg. 10). A summary of
the CIA including a history of land ownership is discussed in Section 6.5, and the complete CIA is
presented in Appendix K.

Hawaiian Homelands Comments and Response

• What impacts does the landfill development have on Hawaiian Home Lands (Mtg. 4, 5/30/12)

• It steals crown lands from the Hawaiian people (Ma’alo Site) (Written Comment, 6/2012).

Hawaiian Homelands Response: According to 2017 data from the Hawai’i Office of Planning
(http://files.hawaii.gov/dbedt/op/gis/maps/hhl10.jpg), there are no Hawaiian Homelands located in the
vicinity of the proposed landfill. Any potential effects to Hawaiian Homelands will be addressed through
consultation with the the Department of Hawaiian Home Lands (DHHL) as a part of the EIS process.
As required, appropriate actions will be taken to address the potential for impacts.

See the response above concerning the use of ceded and crown lands.

Cultural Resources Comments and Response

• Cultural impacts need to be carefully addressed (Mtg. 1, 5/22/12).

• Cultural resource issues that were raised in the siting study meeting should be addressed
(Mtg. 1, 5/22/12).

Cultural Resources Response: Cultural resources present at the project site are discussed in the
project’s CIA, as indicated above, in the response to “Land Ownership.” A summary of the CIA
including a history of land ownership is discussed in Section 6.5 and the complete CIA is presented in
Appendix K.
Effect on Residences Comments and Response

- Impact on property values should be addressed (Mtg. 1, 5/22/12).
- The EIS should show that it will not impact any neighborhood negatively (Mtg. 1, 5/22/12).
- Neighborhood groups in potential siting areas should be contacted (Mtg. 1, 5/22/12).
- Show the residences on your maps so we can see the distances – this is an issue that needs to be addressed in the EIS (Mtg. 1, 5/22/12).
- Concerned about the road and its closeness to residences with the type of traffic it will have – those impacts need to be addressed (Mtg. 1, 5/22/12).
- This proposed site will have a very negative impact on the Hanamāʻulu neighborhood (Written Comment, 6/2012).

Effect on Residences Response: Residential communities surrounding the project area are not expected to be adversely affected, since no displacement of properties or residences will be required to support the proposed project. The proposed MSWLF is not expected to adversely impact property values. The County has made effort to actively engage all willing members of the community in the planning process, has held more public meetings than are typical for an EIS, and will continue to address community concerns, including those of nearby neighborhoods and community associations.

The potential for adverse effects to nearby communities and residents are presented in Section 6.13.

Effect on Agriculture Comments and Response

- Impacts on agricultural crops, their water supply and farmer access needs to be addressed (Mtg. 1, 5/22/12).
- Need to look at impacts on important or potentially important agricultural lands (Mtg. 4, 5/30/12).
- A discussion of the Kālepa Agricultural Park including number of acres and any impact this project will have on it or its expansion – as well as the delivery of pressurized water to the farmers (Mtg. 4, 5/30/12).
- Where is Kālepa Agricultural Park in relation to the site? – what impact does the landfill have on it and future expansion plans (Mtg. 4, 5/30/12).
- It is on arable land – farmable land (Ma’alo Site) (Written Comment, 6/2012).
- The Ma’alo site is Ag. land and should be used and or available as Ag. land (Written Comments, 6/2012).

Effect on Agriculture Response: The 2012 Siting Study has investigated agricultural land use and the rating of agricultural lands at each of the proposed siting alternatives. Two agricultural land rating systems were examined: the Agricultural Lands of Importance to the State of Hawai’i (ALISH) and the (Important Agricultural Land) IAL systems. ALISH is an agricultural land rating system developed by the Hawai’i Department of Agriculture (DOA), USDA, Soil Conservation Service (SCS), and others, and was adopted by the Board of Agriculture on January 28, 1977. Most of the sites are predominantly or significantly classified as “prime” or “unique” agricultural land by the State under the ALISH system (AECOM 2012, pg. 7-2). The IAL designation is one of five state land use districts assigned by the State LUC. These districts are: (1) Agricultural, (2) Urban, (3) Conservation, (4) Rural, and (5) IAL.

Each of the eight alternative sites evaluated for the proposed project possess varying degrees of agricultural or related land uses (e.g., livestock grazing).
Discussions with land owners and interests in the vicinity of the proposed project site are ongoing and further discussion of the potential for adverse effects to agricultural lands is discussed in Section 8.2.3.

**Visual Impacts Comments and Response**

- Impacts of the site on tourism and view plains (Mtg. 1, 5/22/12).

**Visual Impacts Response:** The potential for adverse effects to visual resources in relation to the potential for viewplane impacts to visitors and residents is discussed and addressed in Section 4.10.

**Consistency with County Zoning Plans Comments and Response**

- Need to look at any inconsistencies between the proposal and the County General Plan or Regional Plans (Mtg. 4, 5/30/12).
- Discussion on any inconsistencies between the proposed action and the existing County General Plan and Regional Plans needs to be addressed (Mtg. 3, 5/29/12).

**Consistency with County Zoning Plans Response:** The County of Kaua‘i General Plan (County of Kaua‘i 2012), Building Public Facilities and Services, Section 7, identifies solid waste management as a public responsibility of the County DPW. The General Plan, general policies, states that the: County shall manage an island-wide system of solid waste collection, reuse, recycling and disposal that (1) is environmentally sound and cost-effective; (2) increases diversion of waste from the island’s landfill(s); and (3) provides for the timely and orderly expansion of solid waste facilities. In this regard the proposed project maintains consistency with the General Plan.

Discussion of the proposed project's consistency with County General and Zoning Plans is discussed in Section 8.3.1 and Section 8.3.2.

**Socioeconomic and Cumulative Impacts Comments and Response**

- Socioeconomic impacts need to be addressed (Mtg. 4, 5/30/12).
- Social and economic impacts (Mtg. 1, 5/22/12).
- Discussion on both direct and indirect impacts as well as cumulative and growth inducing impacts needs to be in the EIS (Mtg. 3, 5/29/12).

**Socioeconomic and Cumulative Impacts Response:** The Mayor’s Advisory Committee on Landfill Site Selection (MACLS) preliminarily investigated socioeconomic impacts in 2009 (RMTC 2009). The work started by the MACLS was later used as the basis for further evaluation of community concerns in the 2012 Siting Study (AECOM 2012). In addition, the County prepared a Socioeconomic Impact Assessment (SIA) as part of the EIS effort to further describe and assess the potential for adverse socioeconomic effects. The results of these studies are presented in Section 6.13; the complete 2012 Siting Study is available at the County’s New Landfill website (www.kauai.gov/newlandfillsite/), and its Executive Summary and Overall Site Comparison and Recommendation sections are presented in Appendix B; the SIA is presented in Appendix L.

10.1.3.7 **EIS PROCESS**

Responses to comments received regarding the EIS process for the proposed project have been arranged into the following categories:

- Community Outreach
- Enhancing On-line Access to the EIS Process
- Addressing Public Concerns
• Future EIS Meetings
• General EIS Process

Community Outreach Comments and Response

• There needs to be more outreach to non-English speakers at all levels of the community – persons with appropriate language skills should go door-to-door with handouts in the appropriate languages (Mtg. 1, 5/22/12).
• How do we know that what we say tonight will change anything (Mtg. 1, 5/22/12)?
• This feels like last meetings and that we are just doing it over again (Mtg. 1, 5/22/12).
• Will there be public tours of the site? Can we get access to see for ourselves what the site is like (Mtg. 1, 5/22/12)?
• Have you consulted with Native Hawaiians about this site (Written Comment, 6/2012)?
• Would it be possible to have a ‘dedicated’ outreach to Native Hawaiian communities of this project as this process may be unfamiliar to them (Site Visit, 2/16/13)?

Community Outreach Response: The comments provided by the community are an important part of the EIS process in documenting and ensuring that all relevant concerns and issues are addressed. The record of public and community consultation undertaken is provided in this Section 10.0 and Appendix A, Public Information Meetings.

The County has provided notification of the project to the public and community, which includes Native Hawaiians, through the use of radio public service announcements, press releases, flyers, and meeting advertisements published in The Garden Isle and Mid-Week. Public meetings for the RRP and the EIS Preparation Notice were also held in various locations of Kaua‘i in 2012 and 2013, and a field visit to the proposed project site was held in 2013. Additional opportunities for public review and comment into the EIS process are planned. The County appreciates the suggestions offered on community outreach.

Enhancing On-line Access to the EIS Process Comments and Response

• Consider accepting comments by e-mail (Mtg. 1, 5/22/12).
• Future press releases should include the website (Mtg. 1, 5/22/12).

Enhancing On-line Access to the EIS Process Response: The County will implement these suggestions and notes that e-mailed comments were received for the February 2013 public meetings held for the project. The County also appreciates the suggestion for the inclusion of the website address for future press releases.

Addressing Public Concerns Comments and Response

• Need to see all of these questions answered in a way that the answers are easily connected to the questions not buried in a document and hard to find or link to the questions (Mtg. 1, 5/22/12).
• The EIS needs to address what manner and style the County will use to address community concerns and these have to be addressed in a meaningful way (Mtg. 2, 5/23/12).
• All of the statements made in the handout for this evening’s meeting need to be addressed and the methodology behind the statements needs to be explained (Mtg. 4, 5/30/12).
• What is being done with the prior comments (Consultant noted that they were used in the preparation of the EIS Preparation Notice and would be further considered in the EIS process) (Mtg. 6, 2/6/13).

**Addressing Public Concerns Response:** The responses to initial public questions and comments to meetings held for the EIS Preparation Notice (EISPAN) were posted to the County website (www.kauai.gov/newlandfillsite/) and were included as an appendix to the EISPAN (AECOM and RMTC 2013). Comments and questions received from public meetings and the site visit for the EISPAN and DEIS are presented in this section.

The County has convened more public meetings than are typical for the preparation of an EIS with approximately six pre-consultation public meetings, one public site visit, and two public meetings for the Draft RRP FS, held to date:

**Public Meetings for Consultation:**
- May 22, 2012, King Kaumuali‘i Elementary School
- May 23, 2012, Kekaha Neighborhood Center
- May 29, 2012, Kilauea Elementary School
- May 30, 2012, Kōloa Courthouse
- February 5, 2013, King Kaumuali‘i Elementary School
- February 6, 2013, Kekaha Neighborhood Center

**Public Site Visit to Ma‘alo MSWLF Site, February 16, 2013**

**Public Meetings for Resource Recovery Park Draft Feasibility Study:**
- January 28, 2013, Kekaha Neighborhood Center
- January 29, 2013, King Kaumuali‘i Elementary School

Comments and questions generated from the next round of public input (following publication of this DEIS) will be documented and addressed in the Final EIS.

The comments received during the EIS process are reviewed for relevancy. In many cases the comments received help to direct the EIS process leading the County to further consider whether there is the potential for adverse effects not previously considered, and/or whether there are appropriate mitigation measures to address the potential adverse effect. Other comments help to identify whether additional information on the project could reasonably be provided to clarify the project description or other parts of the EIS documentation. All comments received have been identified in this EIS document and have been helpful to the County in moving forward with the EIS process.

**Future EIS Meetings Comments and Response**

- You need to bring large topographic maps to the meetings so we can really see the site and the topography (Mtg. 1, 5/22/12).
- Please include the list of all sites looked at in your documents for meetings (Mtg. 1, 5/22/12).
- These meetings were held in two locations [but] they should have been held in more locations such as Lihue, Kapa’a, and the North Shore (Mtg. 6, 2/6/13).
- Should look at the feasibility for using “citrix” or “Go to Meeting” to allow broader participation [for the landfill development process] (Mtg. 6, 2/6/13).

**Future EIS Meetings Response:** These suggestions will be adopted as appropriate for future meetings. As noted above in the response to “Addressing Public Comments,” there have been eight public meetings held in various parts of the island.
To address the concern for review of the proposed project, the 2012 Siting Study (AECOM 2012) includes information on all of the eight potential landfill sites as well as topographic information, and is available to the public on the County’s New Landfill website (www.kauai.gov/newlandfillsite/).

**General EIS Process Comments and Response**

- Technical, economic and environmental aspects as well as a no-project alternative need to be discussed (Mtg. 4, 5/30/12).
- The full range of potential health impacts need to be addressed (Mtg. 1, 5/22/12).
- The EIS needs to address cultural impacts, groundwater, surface water, flood plains, visual resources, ambient noise issues and biological resources (Mtg. 3, 5/29/12).
- Direct and indirect environmental and cumulative impacts as well as growth inducing impacts need to be looked at (Mtg. 4, 5/30/12).
- Groundwater, surface water, floodplains, cultural and biological resources, noise and cumulative impacts need to be addressed (Mtg. 4, 5/30/12).
- Need to discuss lost use opportunities for the land the landfill is developed on (Mtg. 4, 5/30/12).
- Need to know who is the accepting authority for the EIS document – Mayor or Governor (Mtg. 5, 2/5/13).
- Section 10 of the EISPN – mentions uncontrolled dumping and the difference – where is there an uncontrolled one on island? (Consultant noted that Kekaha Phase 1 was more of an uncontrolled dump site). Should mine phase 1 and transfer what you find into later safer phases on site (Mtg. 6, 2/6/13).
- Look at mainland recovery of earlier dump site[s] – look at mining phase 1 to clear it out and reline that area for another 40 years of capacity and therefore would not have to build new landfill – this is an alternative that needs to be looked at (Mtg. 6, 2/6/13).

**General EIS Process Response:** The EIS for the proposed project is being prepared in accordance with HRS, Chapter 343, *Environmental Impact Statement*. This requires that the County provide a project description and environmental review of all relevant aspects of the project such as described above, which may result in the potential for adverse effects. Where appropriate, mitigative measures are provided to eliminate or minimize the potential for adverse environmental effects. The No Action and other alternatives to the proposed project are also provided.

The *Big Island Reuse Feasibility Analysis, Final Report*, prepared in January 2000 by the Rural Community Assistance Corporation (RCAC), will be reviewed for specific applicability to a future RRP facility. The basic recommendations for establishing any Big Island reuse program would be applicable to the development of reuse programs elsewhere. These recommendations are that the program:

- Be simple, low cost, and easy to implement.
- Respect the efforts of existing reuse businesses, and seek to cooperate rather than compete with them.
- Derive maximum diversion impact from program expenditures.
- Ensure that all categories of materials are diverted from landfills to the greatest practical degree.
- Focus on truly useful items that will provide new owners with cost-effective, energy-efficient, reliable service.
• Provide incentives for both potential suppliers and buyers of reusable items to participate.

The accepting authority for the EIS is Office of the Mayor of Kaua’i, delegated by the Office of the Governor, State of Hawai’i.

The potential for the alternative of mining earlier landfills to recover reusable or recyclable materials is examined in Section 3.3.2 and in Appendix I.

10.1.3.8 OTHER COMMENTS

Responses to other comments received regarding the proposed project are provided below and have been arranged into the following categories:

• Integrated Solid Waste Management Plan
• Kekaha Landfill

Integrated Solid Waste Management Plan Comments and Response

• Kaua’i’s Solid Waste Management Plan is quite good, I urge us to follow it quickly (Written Comment, 6/2012).

Integrated Solid Waste Management Plan Response: The MSWLF site selection, design, and review processes are all being conducted in general accordance with the ISWMP (R. W. Beck 2009).

Kekaha Landfill Comments and Response

• The public was told that the County will respond to an issue not related to this project that was raised by the community during the meeting involving a request for follow-up by the County of Kaua’i: The County needs to come talk to the Kekaha community regarding how liability issues get handled after the Kekaha landfill closes (Mtg. 2, 5/23/12).

• It’s 2013 ~ we’re using BEAUTUFUL Kaua’i as a massive, toxic disgusting playground for the rich & famous – residents & people that live here just keep piling their overflowing rubbish cans by the side of the road (Written Comment, 2/2013).

• I’ve been blessed to live in Hawai’i Nei for near four (4) decades, when you could buy local eggs not mainland ‘shell treated’ sure you can buy local, organic eggs, but I can’t afford them. Everything is imported in tons of plastic packaging; gotta sacrifice Wailua Falls & Wailua River for Mainland/Global consumerism (Written Comment, 2/2013).

• Regarding rescuing clay, our hosts pointed out that their understanding of Kaua’i’s clay is that it is not old enough and has too much organic material in it to be useful. They may be parroting that message from a potter, Renee Johnston, aka Clay Renee, who told me that this was her experience with the clay from Alika’i Swamp. Shrinkage is HUGE, due to the loss of organic material burning out. One would expect that from a swampy clay. However, the genesis and age of the pure clay in the center of the proposed landfill site is quite different. We won’t know without a “biopsy,” if you will. I believe our host said that the clay is beneath a 2 foot layer of overburden. Could you arrange for a backhoe to dig out a test sample for firing in a kiln? This was Clay Renee’s suggestion. It would be wonderful if this would spawn a greater interest in purely local pottery. I have seen such a phenomenon at Gay Head, Martha’s Vineyard. Gay Head gets its name from the red, blue, white and green clays, exposed and gathered for coveted pottery. Visitors feel they must go home with a sample of Gay Head Pottery. (Google it.) and so something similar might happen for Kaua’i. We’ll never know unless we test the sample (Site Visit, Written Comment, 2/16/13).
Kekaha Landfill Response: The County’s details on post-closure of the Kekaha MSWLF, involving future uses or specific activities, is ongoing and will include discussion with the community. The County remains committed to the proper management of its landfill facilities, whether at Kekaha or Ma’alo, and will continue to actively seek feedback from the community.

Concerning comments on the disposal of refuse and the use of plastic packaging, the County notes in its response above to “Tipping Fees and Zero Waste,” that there are ongoing plans and policies in general support of the “Zero Waste Resolution,” and the County will continue its support for the initiative. The success of this initiative will require that the community provide backing and assistance as the County moves forward in its goal to one day eliminate the generation of solid waste requiring landfilling.

The County is willing to consider the possible provision of some excavated material that may be used for pottery. Some of the issues that would need to be considered include: whether there will be sufficient material available given that the excavated soils are a valuable material for the establishment of proper grades at the MSWLF and for use as daily and intermediate cover; whether there would be legal issues and/or liabilities associated with the provision of materials from a County facility; and, the short and long-term costs associated with the recovery of the materials and who would be the appropriate party responsible for undertaking this effort.

10.2 FEA/EISPN HRS, CHAPTER 343 NOTIFICATION PROCESS

Following the 2012 and 2013 community meetings, the FEA/EISPN New Kaua‘i Landfill and Resource Recovery Park (County of Kaua‘i 2013) was published by the State OEQC on February 8, 2013; a copy of the publication is shown in Figure 10-1, below. The purpose of the FEA/EISPN was to provide notification of the County’s start of the HRS, Chapter 343 EIS process, inform interested organizations, agencies, public parties, and individuals of the proposed project, and seek public comment on subjects that should be addressed in the EIS documentation.

Figure 10-1. The Environmental Notice, February 8, 2013, Publication of the New Kaua‘i Landfill and Resource Recovery Park, Ma’alo, Kaua‘i FEA/EISPN
10.2.1 Organizations, Agencies, Public Parties, and Individuals Consulted for the FEA/EISPN

Simultaneous with the publication of the FEA/EISPN in the State OEQC Environmental Notice, a number of interested organizations, agencies, public parties, and individuals were notified by mail of the proposed project and the County’s start of the HRS, Chapter 343 EIS process in an effort to seek public comment on subjects that should be addressed in the EIS documentation. A copy of the notification letter sent to interested organizations, agencies, public parties, and individuals is shown in Figure 10-2, below.

Final Environmental Assessment/
Environmental Impact Statement Preparation Notice (FEA/EISPN)

New Kauaʻi Landfill and Resource Recovery Park (RRP)
Maʻalohao, Island of Kauaʻi, Hawaiʻi

Dear Recipient:

Introduction
A courtesy copy of the subject document is attached for your information and use from the Department of Public Works, County of Kauaʻi. This document can also be read and downloaded directly from the OEQC website or the County of Kauaʻi’s website at the following addresses:


Or,

www.kauai.gov/NewLandfillSite. You will find the document under the section heading: EIS Preparation Notice.

Proposed Project Description
The County of Kauaʻi, Dept. of Public Works, Solid Waste Division, proposes the development of a new Municipal Solid Waste Landfill (MSWLF) and Resource Recovery Park (RRP) in Maʻalohao, to properly manage the island’s municipal solid waste (MSW) in the safest and most efficient manner practicable.

The existing Kekaha MSWLF is projected to reach capacity in the coming years. Therefore, a new landfill facility will be required for the proper disposal of all forms of MSW that cannot practically be further reused, recycled, or otherwise recovered. The proposed project includes the development of a RRP which is planned to include reuse, recycling, and waste reduction facilities to encourage diversion of waste from the landfill, thereby maximizing the use of Kauaʻi’s limited resources.

Upon finalization and acceptance of the EIS, the County will proceed with its next steps for eventual development of the MSWLF and RRP. The entire process is anticipated to take several years.

The County DPW Solid Waste Division is the proposing agency. Based on the proposed use of County funds in conjunction with the use of state land, the Governor of the State of Hawaiʻi has delegated the accepting authority for this EIS to the Office of the Mayor of Kauai (HAR §11-200-4).

Thank you

Figure 10-2. Notification of Publication of the New Kauaʻi Landfill and Resource Recovery Park, Maʻalohao, Kauaʻi FEA/EISPN
The following sections list the organizations, agencies, and persons notified of the FEA/EISPN publication:

10.2.1.1 COUNTY OF KAUA’I

Fire Department
Department of Planning
Police Department
Department of Public Works
Transportation Agency
Department of Water
Office of Economic Development

10.2.1.2 STATE OF HAWAI’I

Department of Agriculture
Department of Accounting and General Services
  - Archives Division
Dept. of Business, Economic Development & Tourism
  - Research Division
  - Strategic Industries Division
  - Office of Planning
Department of Defense
Department of Education
  - Hawai‘i Documents Center
  - Lihu’e Regional Library
  - Hanapepe Regional Library
  - Kapa‘a Regional Library
  - Princeville Regional Library
  - Waimea Regional Library
  - Koloa Regional Library
Department of Hawaiian Home Lands
Department of Health
  - Clean Air Branch
  - Clean Water Branch
  - Office of Environmental Quality Control
  - Safe Drinking Water Branch
  - Environmental Health Administration
  - Solid and Hazardous Waste Branch
Dept. of Land and Natural Resources
  - Land Division
  - State Historic Preservation Division
  - Office of Conservation and Coastal Lands
  - Division of Forestry and Wildlife
Department of Transportation
University of Hawai‘i
  - Water Resources Research Center
  - Environmental Center
  - Thomas H. Hamilton Library
  - Kaua‘i Community College Library
Office of Hawaiian Affairs  
Legislative Reference Bureau Library  
Office of the Governor  

10.2.1.3  
Federal Government  

Department of the Interior, Geological Survey, Pacific Islands Water Science Center  
Department of the Interior U. S. Fish and Wildlife Service  
Department of Commerce National Marine Fisheries Service  
Department of the Interior National Parks Service  
Department of Agriculture National Resources Conservation Service  
Department of the Army Corps of Engineers Honolulu District  
U. S. Department of Transportation Federal Aviation Administration  
U. S. Department of Transportation Federal Transit Administration  
Department of Homeland Security Coast Guard  

10.2.1.4  
News Media  

Honolulu Star-Advertiser  
The Garden Island  

10.2.1.5  
Elected and Other Officials  

Kaua’i County Council (2012-2014)  
Mayor Bernard P. Carvalho, Jr.  
Jay Furfaro, Council Chair  
Nadine K. Nakamura, Council Vice Chair  
Tim Bynum, Councilmember  
Gary L. Hooser, Councilmember  
Ross Kagawa, Councilmember  
Mel Rapozo, Councilmember  
JoAnn A. Yukimura, Councilmember  

State Legislators  
Senator Ronald D. Kouchi (7th Sen. District)  
Representative Derek S.K. Kawama, (14th Rep. District)  
Representative James Kunane Tokioka (15th Rep. District)  
Representative Dee Morikawa (16th Rep. District)  

Federal Legislators  
U. S. Senator Brian Schatz  
U. S. Senator Mazie Hirono  
U. S. Congresswoman Tulsi Tamayo Gabbard
10.2.1.6 OTHER COMMUNITY GROUPS, ORGANIZATIONS AND INDIVIDUALS

Kaua‘i Eclectic, Joan Conrow
The Nature Conservancy, Trae Menard
Kaua‘i Island Utility Cooperative
Kaua‘i Chamber of Commerce
Contractors Association of Kaua‘i
Līhu‘e Business Association
Kaua‘i County Farm Bureau
Michael H. Tresler, Senior V.P., Grove Farm Company, Inc.
Agribusiness Development Corporation
Jerry Ornellas, President, East Kaua‘i Water Users Cooperative
Kalepa Koalition
Hanamā‘ulu Community Association

Ruby Pap
Bonnie Bator
Ken Taylor
Bruce Pleas
Brian Morgenroth
Laura Kelly
John Harder
Ann Takahashi
Donela Monasevitch
Earl J. Wilhelm
Pamela Burrell

10.2.2 Comments Received During the FEA/EISPN Public Comment Period and Responses

Comments were received during the public comment period ending on March 9, 2013. A list of the comment letters received for the FEA/EISPN is provided in Table 10-2 below. The comments received and written responses addressing the comments are attached and included in this section.

Table 10-2. Comments Received During the FEA/EISPN Public Comment Period

<table>
<thead>
<tr>
<th>No.</th>
<th>Commentor</th>
<th>Date of Letter/Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Earl J. Wilhelm</td>
<td>February 7, 2013</td>
</tr>
<tr>
<td>2</td>
<td>Pamela Burrell</td>
<td>February 10, 2013</td>
</tr>
<tr>
<td>3</td>
<td>Jose Bulatao, Jr.</td>
<td>February 19, 2013</td>
</tr>
<tr>
<td>4</td>
<td>John Hoff</td>
<td>February 26, 2013</td>
</tr>
<tr>
<td>5</td>
<td>Bonnie P. Bator</td>
<td>March 7, 2013</td>
</tr>
<tr>
<td>6</td>
<td>Pat Gegen, Zero Waste Kaua‘i</td>
<td>March 11, 2013</td>
</tr>
<tr>
<td>7</td>
<td>Rayne Regush</td>
<td>March 11, 2013</td>
</tr>
<tr>
<td>8</td>
<td>Office of Environmental Quality Control, State of Hawai‘i</td>
<td>March 11, 2013</td>
</tr>
<tr>
<td>9</td>
<td>Hui Na Makaiwa o Wailuanuiahoano</td>
<td>March 11, 2013</td>
</tr>
<tr>
<td>10</td>
<td>Wendy Raebeck</td>
<td>March 11, 2013</td>
</tr>
<tr>
<td>11</td>
<td>Dept. of Health, Solid and Hazardous Waste Branch, State of Hawai‘i</td>
<td>June 10, 2013</td>
</tr>
</tbody>
</table>

This DEIS has been prepared to address comments received during the 30-day public comment period for the FEA/EISPN. A future opportunity for public comments will be made available following publication of this DEIS with the OEQC. All relevant written public comments received during the 45-day public comment period will receive a written response for inclusion and use in the preparation in the project’s forthcoming FEIS.
My name is Earl J. Wilhelm, a former employee of Aqua Engineers. Certified, both as a Wastewater and Potable Water Operator, I have some knowledge in the disposal of Solid Waste and want to share my expertise in the field of Wastewater and Potable Water Treatment. After 8 years, as the Operator for Grove Farms Water Production Plant Waialua, situated just above your proposed Landfill Recovery and Resource Park. Surface Water is drawn from Taneke Reservoir and goes through a process known as Submersed Ultra Filtration and distributed throughout Kualoa, Hanamalu and Clients leading to Waialua River. Future plans are for Puhi and Grove Farms future expansion. Plant production averages 2.2mgd. Design 4.5mgd and dependent on water plant.

The Department of Water also has Wells above us, that utilize ground water, dependent on the water table as the source to the yield (gpm) that it can produce. These were prior to the plantations going out, could produce about 800-1,000gpm. Now, it is down to about 200gpm. No surface or overhead irrigation to 1971. We have to re-charge aquifer. Both systems contribute to the transmission waterline and regulated at a valve control station.

Question: Is the Landfill liquid discharge into the ground going to re-energize the water table and contaminate the water source?

1st Comment / Roadway

1. Miraio Road. DO NOT USE AS PRIMARY MEANS OF ENTRY AND EXIT

1. 14" water main distribution line runs under road.
2. Utilized heavily by both tourist and mountain activities.
3. A mountain activity van carry about 10-15 passengers ea.
4. A rate of about 40-50 a day.
5. Elevation difference
6. Descending from gateway entrance to bottom of road is about 80 to 100 feet.
7. Elevation change from these refuse trucks will be a disaster.
8. What Tonoa's rating is the bridge as you enter and exit, Miraio rd.

2. What possible alternatives

1. Use Ehiiku St, entering into Kauai
2. Some opposition has been voiced.
3. Street lights are already in place for safety.
4. Hulei St, Hanamahu
5. Next to Waialua Village
6. The street by Roberts base yard.
7. One that leads up to the old maintenance shop

Name: Earl J. Wilhelm
Address: 3208 Pali St
Lihue, Kauai 96766
Phone: 245-6257
Fax: 346-3170
Email: dede@hawaiilink.net

KUIC uses Ehiiki St, daily to haul 40-45,000 gallons of fuel to their facility.

2nd Comment / Tourist Attractions

1. Waialua Falls
2. Waialua Fern Grotto
   a. Ferns in cave at Waialua Fern Grotto died after Plantations went out and stopped irrigation
   b. Grove Farm re-directed water to re-charge aquifer and started fern growth again. Allan Smith from Grove Farm.
   c. Will the liner cut off water supply to farms?

3rd Comment / Landfill / Liner

1. Phase II
2. How close is phase II to the Grotto?

4th Comment / Sustainability

Mayor Bernard Carvalho Jr. mentioned Hydro and Methane usage.

a. Any data collected from the old Hanamahu Land fill re: The harnessing of Methane usage. This would be valuable information for the public's knowledge. This could be harvested and utilized as an alternative power source.
Mr. Earl J. Wilhelm
3208 Palani Street
Lihue, Hawaii 96766

Dear Mr. Wilhelm:

Subject: Final Environmental Assessment and Environmental Impact Statement Preparation Notice (FEA/EISPN) New Kaua’i Landfill and Resource Recovery Park Ma’alo, Kaua’i, Hawaii

Thank you for your letter dated February 7, 2013, concerning the subject project. Since the FEA/EISPN was published on February 8, 2013, the County of Kaua’i (County) has been conducting long-term wildlife surveys at the proposed Ma’alo Municipal Solid Waste Landfill (MSWLF) site to address concerns identified by the State of Hawai’i Department of Transportation and Federal Aviation Administration. The County has also been reviewing the design components of the Resource Recovery Park (RRP). Based on the results of the RRP evaluation the County has determined that further study is required prior to its implementation and has removed the RRP from the proposed project. This change will be reflected in the subsequent Hawai’i Revised Statutes (HRS), Chapter 343, Draft EIS (DEIS), anticipated to be published in 2018.

The following is prepared in response to your comments (as appropriate your comments have been italicized for reference):

1. Surface Water is drawn from Tanaka Reservoir and goes through a process known as Submersed Ultra Filtration and distributed throughout Lihue, Hanamaulu and Clients leading to Walla River. Future plans are for Pahii and Grove Farm's future expansion. Plant production averages 2.2mpd. Design 4.5mpd.
   The Department of Water also has Wells above us that utilize ground water, dependent on the water table as the source to the yield (gpm) that it can produce. These wells prior to the plantations going out, could produce about 800-1,000gpm. Now, it is down to about 200gpm. No surface or overhead irrigation to recharge the aquifer [SIC]. Both systems contribute to the transmission waterline and regulated at a valve control station.
   Question...Is the Landfill liquid discharge into the ground going to reenergize the water table and contaminate the water source?

An Equal Opportunity Employer
The State Department of Health (DOH), Safe Drinking Water Branch (SDWB) performed an internal analysis of Geographic Information System (GIS) files and confirmed that the proposed Ma’alo MSWLF and RRP sites are more than 1,000 feet from any current or proposed drinking water sources. In addition, the County Department of Water (DOW) has reviewed the location of the proposed MSWLF and RRP sites and determined that there are no active wells and no current plans for the DOW to develop any wells within 1,000 feet of the proposed sites.

Secondly, modern landfills are heavily regulated and well-engineered facilities that include the use of a landfill liner and leachate collection system to prevent groundwater contamination. Regulatory requirements ensure that the site and design of the facility is geologically stable and that appropriate landfill liner materials are used to protect the underlying soils and groundwater, from exposure to landfill associated leachate. The liner system planned for the proposed MSWLF will be evaluated and approved by the U. S. Environmental Protection Agency (EPA) and DOH prior to use to ensure its suitability for the design life and post-closure period of the facility. The liner will be composed of multiple layers, including geosynthetic high-density geosynthetic plastic, clay, and crushed rock (to cushion and protect the plastic layer). This robust liner system is expected to remain functional throughout the active life of the landfill, including the post-closure period, after the landfill stops accepting waste.

Finally, apart from installing a robust landfill liner system, additional mitigation measures to protect groundwater resources may include, but are not limited to, the following:

1. The site surface drainage system designed to control surface water flows in order to limit percolation of storm water through the landfill liner system. This will serve to reduce the generation of leachate.

2. A leachate collection system will collect and monitor the generation of leachate. The monitoring of leachate in combination with the monitoring of other landfill controls, will measure landfill performance and allow the County and operator to make periodic improvements to maintain the efficiency and safety of the facility.

3. A groundwater detection monitoring program would be used to monitor and ensure the performance of the landfill before, during, and after operation of the proposed landfill.

The potential for adverse environmental effects to groundwater resources will be addressed in the DEIS.

2. **Comment I: Roadway**
   Ma’alo Road. DO NOT USE AS PRIMARY MEANS OF ENTRY AND EXIT
   1. 14 water main distribution line runs under road
   2. utilized heavily by both tourist and mountain activities
      a. mountain activity vans carry about 10-15 passengers at a rate of about 40 -50 a day
   3. elevation difference
      a. descending from graveyard entrance to bottom of road is about 80 to a 100 ft. or more.
Mr. Earl Wilhelm  
Final EA and EIISP New Landfill and Resource Recovery Park  
April 8, 2018  
Page 3 of 4

4. Brake failure from these refuse trucks will be a disaster.
5. What Tonnage rating is the bridge as you enter and exit Malaøo rd.
a. What possible alternatives
   1. Utilize Eihiku St., entering into Isanberg
      a. some opposition has been voiced
      b. street lights are already in place for safety
   2. Hulek St Hanamaulu
      a. next to Kilauea Village
   3. The street by Roberts base yard
   4. One that leads up to the old maintenance shop

**I'm sure the willing landowner will go along with the use of the old existing cane haul roads, KUJC uses Eihiku St. daily to haul 40-45,000 gallons of fuel to their facility.**

The County appreciates these comments related to traffic, and the need for safe and efficient roadway access from Maãalo Road. In response to the number of comments received concerning the use of potential access routes, the County prepared a Traffic and Roadways Engineering Feasibility Study (TREFS) to study the existing traffic and potential traffic impacts associated with the development of the MSWLF. A number of alternative access routes to the MSWLF are under consideration, and impacts to all intersections and associated streets are evaluated based on the approximate projection of vehicle trips per day generated by the project. The TREFS report investigates several factors that should be considered in providing safe and efficient access. These factors include traffic volumes, congestion issues, local roadway conditions, residents and/or businesses that may be affected, and the traffic controls that would be needed to maintain public safety, such as mitigation measures such as the potential need for a signalized intersection, the use of acceleration/deceleration lanes and associated signage and striping improvements. The TREFS will be included in the DEIS.

3. Comment II: Tourist Attractions
   1. Wallua Falls
      a. Use Malaøo for the ride to the falls. Many stop along the way and take pictures.
   2. Wallua Fern Grotto
      a. Ferns in cave at Wallua Fern Grotto died after Plantations went out and stopped irrigation
         1. no irrigation to percolate.
      b. Grove Fern redirected water to recharge aquafer and started fern growth again. Allen Smith from Grove Farm.
      c. Will the liner cut off water supply to ferns?

The County is aware that a number of tourist related vendors and support businesses have the potential to be affected by the proposed project. Such socioeconomic effects including impacts to scenic views will addressed in the DEIS.

The potential for effects to surface and ground water resources that could be affected will also be addressed in the DEIS.

4. Comment III: Landfill / Liner
   1. Phase II
How close is phase II to the Grotto?

The northernmost boundary of the proposed project is located approximately plus 0.8 miles from the Fern Grotto and cannot be seen from this location due to the location of the Grotto along the northernmost base of the Kalepa Ridge.

5. Comment IV: Sustainability
   Mayor Bernard Carvalho Jr. mentioned Hydro and Methane usage.
   a. any data collected from the old Halehaku Landfill re: The harnessing of Methane usage? This would be valuable information for the public’s knowledge. This could be harvested and utilized as an alternative power source.

There are no hydrologic resources present at the proposed Ma’alo MSWLF site for the generation of energy. Landfills directly produce landfill gas (LFG) by naturally occurring processes associated with the decomposition of waste. Several years of landfilling will be required before the LFG is of sufficient quality and quantity to make recovery feasible for the generation of power. Until then, any landfill gases that cannot be reused will likely be flared to reduce their impact to the atmosphere and environment. A LFG-to-energy facility may be recommended for future implementation. We are unaware of any data concerning the use of the Halehaku Landfill for the recovery of LFG.

We appreciate this opportunity to respond to your comments. Any further written comments may be directed to my office.

Very truly yours,

Lyue Tabata, Acting County Engineer
Department of Public Works

cc: AECOM Professional Services/R. M. Town Corporation
Pamela Burrell

Brian Takeda

From: PAMELA BURRELL <pamelaburrell2me.com>
Sent: Sunday, February 10, 2013 10:56 AM
To: Kauai-if-eis@hawaii.rr.com
Subject: comments

Issues:

- We need regional drop off spots for green-waste.
- After watching someone throw a TV in the trash yesterday...we need regional electronics drop off spots.
- OR at least one open more regularly...we need this NOW.
- RR Park vs RR System should be addressed more closely.
- We need a MRF now- please do not tie this into acceptance of this RRF eis.Ideally this is placed closer to shipping areas.
- Get the organics out- compost a must.
- the CHARM needs some work- where do bulky items go?
Ms. Pamela Burrell
pamelaburrell@im.com

Dear Ms. Burrell:

Subject: Final Environmental Assessment and Environmental Impact Statement Preparation Notice (FEA/EISPN) New Kaua'i Landfill and Resource Recovery Park Ma'alo, Kaua'i, Hawai'i

Thank you for your letter dated February 10, 2013, concerning the subject project. Since the FEA/EISPN was published on February 8, 2013, the County of Kaua'i (County) has been conducting long-term wildlife surveys at the proposed Ma'alo Municipal Solid Waste Landfill (MSWLF) site to address concerns identified by the State of Hawai'i Department of Transportation and Federal Aviation Administration. The County has also been reviewing the design components of the Resource Recovery Park (RRP). Based on the results of the RRP evaluation the County has determined that further study is required prior to its implementation and has removed the RRP from the proposed project. This change will be reflected in the subsequent Hawai'i Revised Statutes (HRS), Chapter 343, Draft EIS (DEIS), anticipated to be published in 2018.

The following is prepared in response to your comments (your comments have been italicized for reference):

The EIS must address the following:

1. We need regional drop off spots for green-waste.

Presently, there are five existing green waste composting facilities (Hanalei, Kapa'a, Lihue, Hanapepe and Kekaha) on the island of Kaua'i; residents can drop off green waste, free of charge. In addition, there are two private green waste composting facilities (Lihue, Moloa'a) that are open to the public. Together, these facilities are intended to provide sufficient coverage on the island of Kaua'i.


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2. After watching someone throw a TV in the trash yesterday, we need regional electronic drop off spots... OR at least one open more regularly... we need this NOW.

The County acknowledges the need to provide the public with increased facilities and opportunities to recycle electronic waste. Electronic waste is accepted at the Pu`u Metals Recycling Center. The program is free for residents and businesses, and there are no restrictions on quantity. Electronic waste is accepted Monday - Saturday from 8:00am - 4:00pm. For additional information visit the County website http://www.kaui.gov/eWaste.

3. RR Park vs RR System should be addressed more closely.  
4. We need a MRF now, please do not tie this into acceptance of the RRP eis. Ideally this is placed closer to shipping areas.  
5. Get the organics out—compost a must.  
6. the CHARM needs some work—where do bulky items go?

The County appreciates these comments. Please see our introductory comments above concerning the RRP. The County intends that any future proposed RRP include the consideration for a Composting Facility, Center for Hard to Recycle Materials (CHARM), as well as other types of recycling and reuse facilities that are appropriate for Kaua`i. The County maintains its desire for an RRP, as the concept has been successfully implemented in many municipalities where it can encourage waste diversion and recycling.

We appreciate this opportunity to respond to your comments. Any further written comments may be directed to my office.

Very truly yours,

Lye Tabata, Acting County Engineer  
Department of Public Works

cc: AECOM Professional Services/R. M. Towill Corporation
Jose Bulatao, Jr.

The County of Kauai has determined that it is necessary to prepare an Environmental Impact Statement (EIS) for the proposed new Kauai landfill, known as the Kapaa Landfill, located at Kapaa in the Lihu'e District. The purpose of the EIS is to examine the environment in which the project will be developed and to assess the potential environmental impacts of the project. The EIS will be developed in accordance with the requirements of the Hawaii State Environmental Policy Act (HSEPA) and the National Environmental Policy Act (NEPA).

In this proposal, we recommend that the County of Kauai take the following actions:

1. Conduct a comprehensive assessment of the current and potential future environmental impacts of the proposed landfill.
2. Develop a plan to minimize the environmental impacts of the proposed landfill.
3. Engage the community in the planning process to ensure that the needs and concerns of all stakeholders are addressed.
4. Implement measures to mitigate any adverse environmental impacts of the proposed landfill.
5. Ensure that the landfill is designed and operated in accordance with the best available scientific and management practices.

We invite the public to provide comments and suggestions on this proposal. Your input is valued and will be considered in the development of the EIS.

Thank you for your interest and support.

Jose Bulatao, Jr.
Kauai County Administrator
Mr. Jose Bulatao, Jr.
mrb@hawaii.gov

Dear Mr. Bulatao, Jr.:  

Subject: Final Environmental Assessment and Environmental Impact Statement Preparation Notice (FEA/EISPN) New Kaua‘i Landfill and Resource Recovery Park Ma‘alo, Kaua‘i, Hawai‘i

Thank you for your letter dated February 19, 2013, concerning the subject project. Since the FEA/EISPN was published on February 8, 2013, the County of Kaua‘i (County) has been conducting long-term wildlife surveys at the proposed Ma‘alo Municipal Solid Waste Landfill (MSWLF) site to address concerns identified by the State of Hawai‘i Department of Transportation and Federal Aviation Administration. The County has also been reviewing the design components of the Resource Recovery Park (RRP). Based on the results of the RRP evaluation the County has determined that further study is required prior to its implementation and has removed the RRP from the proposed project. This change will be reflected in the subsequent Hawai‘i Revised Statutes (HRS), Chapter 343, Draft EIS (DEIS), anticipated to be published in 2018.

The following is prepared in response to your comments (as appropriate your comments have been italicized for reference):

The EIS must address the following:

1. Maintain public health and environmental integrity with clarity, transparency, and accountability in all phases of construction and throughout the lifetime. It is extremely important to closely monitor the intrusion in the relationships of water resources; water contamination; water distribution (both natural and non-natural); access and control of contaminants entering into all aspects in the relationships of water resources, etc. Likewise, the extent to which air and soil remediation of contaminants need to be addressed and clarified with regard to systems which can monitor quality-control must be consistent and thorough.

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The County appreciates this comment and the importance of transparency in the planning of the proposed project. To this end the County has provided a number of opportunities for public comment and participation through community meetings which have included the following:

Public Meetings for Consultation:
- May 22, 2012, King Kaumualii Elementary School
- May 23, 2012, Kekaha Neighborhood Center
- May 29, 2012, Kilauea Elementary School
- May 30, 2012, Koloa Courthouse
- February 5, 2013, King Kaumualii Elementary School
- February 6, 2013, Kekaha Neighborhood Center

Public Site Visit to Ma'alo MSWLF and RRP Site, February 16, 2013

Public Meetings for Resource Recovery Park Draft Feasibility Study:
- January 28, 2013, Kekaha Neighborhood Center
- January 29, 2013, King Kaumualii Elementary School
- January 16, 2014, King Kaumualii Elementary School

The County has added a number of the environmental concerns expressed from these meetings to the EIS discussion. These environmental concerns include many of those you describe, including the need to protect our air, water, and soil resources. Further discussion of the potential for adverse environmental effects to groundwater, surface water resources, air quality, geology and topography, including details on mitigation measures, will be provided in the DEIS.

2. *Do what is wise to protect and preserve our finite resources.*
   - We cannot maintain the “business-as-usual” approach by dumping anything and everything in a hodge-podge fashion. This, along with this proposal, there needs to be the concurrent methodologies in place to prepare the public (residents and visitors) to inter-relate successfully with new approaches in handling our trash.

The County is proposing the subject project in a far from “business-as-usual” manner. The County recognizes that we must learn to promote better handling and management of Kaua‘i’s solid waste, and will continue to advance actions contributing to integrated solid waste management planning.

   - "It may be well worth the time and effort to utilize Public Access Community Television (Ho‘ike) in providing a conduit in presenting regular informational presentations in handling our trash more effectively.

This is a positive comment that could help to further educate the public about waste diversion. Although this is beyond the scope of the Project’s EIS, it will be considered by the County as a potential future possibility.

4. *Possibility of establishing in regional substations.*
"The input and participation of the public-at-large, and perhaps, the business community and/or entrepreneurial efforts to work WITH the County government should be considered to establish ways in which collaborative endeavors may be sought and fortified.

This comment identifies the establishment of “regional substations”, but does not provide a definition of how it might be integrated into the County’s existing solid waste management system. Should you wish to provide further elaboration please address your comment to the undersigned.

5. Clearly, in moving forward, we will need to take the time and make the effort to bring about effective changes that will, in the long run, benefit all of us. We all need to be a part of the SOLUTION. Otherwise, we will simply remain to be a part of the PROBLEM.

The County appreciates this statement of encouragement as we move forward with the proposed Ma’alo MSWLF that would benefit all the communities of Kaua’i.

We acknowledge your concerns about the proposed Project and have included you as a consulting party to the EIS process for this Project.

We appreciate this opportunity to respond to your comments. Any further written comments may be directed to my office.

Very truly yours,

[Signature]

Lyric Tabata, Acting County Engineer
Department of Public Works

cc: AECOM Professional Services/R. M. Towill Corporation