4.0 PRELIMINARY ENGINEERING EVALUATION

4.1 INTRODUCTION AND PURPOSE
The PREE compares the eight previously identified potential MSWLF sites being considered for a new County landfill, provides conceptual site schematics, and provides planning level estimates of the engineering potential of each site in terms of size, quantity, estimated useful lifetimes, and costs. Schematics and costs are provided at the initial phase (development required prior to accepting waste), and at the final phase (at the end of the landfill’s useful lifetime).

During the previous evaluation of sites conducted by the MACLS (RMTC 2009), it was determined that engineering analysis and inputs were required to quantify several parameters of the potential sites, mostly related to useful lifetime and acquisition, development, and operation cost factors. This PREE provides a more rigorous (though still planning level) evaluation of several of the ranking criteria developed during the MACLS study, which is in turn updated in the CCE contained in this report.

This PREE provides preliminary estimates of the following:

- 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 (which are estimated in Section 5.0, below)

4.2 CONCEPTUAL LANDFILL SCHEMATICS AND OVERALL ENGINEERING DATA ESTIMATES
In developing the site conceptual schematics and engineering data estimates, several uniform assumptions were applied to each site:

- A 150-foot setback from all site borders was observed for the limit of waste (LOW)
- All sites were assumed to be excavated to 10 ft 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
- Sideslopes: 3:1 (H:V) (typical)
- Waste to Soil Ratio: 4:1 (based on information from WM, the current operator of the Kekaha Phase II landfill)
- Annual MSW Tonnage (tons): approximately 82,000 (this is a design value, not the actual value, and is forecast based on recent operating data and estimated future increases)
- Waste Mass Density (pounds per cubic yard \(\text{lbs/cy}\)): 1,320 (based on information from WM)
- 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 Landfill as near 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 LOW setback, and the side slopes. Table 4-1 summarizes these and related engineering data associated with the conceptual design, and ranks the sites in terms of useful lifetime. Figure 4-1 through Figure 4-8 show the conceptual site layouts of the eight potential landfill sites at final buildout conditions, presented at the same scale for ease of comparison, and showing major grades and the ultimate limits of waste.
Figure 4-1 (continued)
Kalepa Site Schematic (Offsite)
New Kaua‘i Landfill Siting Study Report

- Widen Ma‘alo Road, Provide Turn Lanes
- Provide Sound Wall (1,369 LF)
- Paved Access Road and Utility Lines (9,223 LF)
- Widen Kuhio Highway, Provide Turn Lanes and Signalization

KEY MAP

LEGEND
- Kalepa Site
- Road/Street/Highway
- Topographic Contour (feet)
Figure 4-2
Kekaha Mauka Site Schematic
New Kaua‘i Landfill Siting Study Report
Figure 4-3
Kipu Site Schematic
New Kaua‘i Landfill Siting Study Report
Figure 4-4
Koloa Site Schematic
New Kaua’i Landfill Siting Study Report
Figure 4-4 (continued)
Koloa Site Schematic (Offsite)
New Kaua‘i Landfill Siting Study Report
Figure 4-5
Kumukumu Site Schematic
New Kaua’i Landfill Siting Study Report
Figure 4-6
Ma'alo Site Schematic
New Kaua'i Landfill Siting Study Report
Figure 4-6 (continued)
Ma’alo Site Schematic (Offsite)
New Kaua’i Landfill Siting Study Report

*LEGEND*

- **Ma’alo Site**
- **Road/Street/Highway**
- **Topographic Contour (feet)**

- Widen Ma’alo Road, Provide Acceleration/Deceleration and Turn Lanes
- Paved Access Road and Utilities Lines (8,666 LF)
- Widen Kuhio Highway, Provide Acceleration/Deceleration and Turn Lanes

*Figure 4-6* (continued)
Ma’alo Site Schematic (Offsite)
New Kaua’i Landfill Siting Study Report