

SOLID WASTE MANAGEMENT DIVISION

DEPARTMENT OF PUBLIC WORKS

TROY TANIGAWA, P.E., COUNTY ENGINEER

BOYD GAYAGAS, DEPUTY COUNTY ENGINEER



DEREK S.K. KAWAKAMI, MAYOR
REIKO MATSUYAMA, MANAGING DIRECTOR

August 30, 2024

Mr. Glenn Haae
Environmental Management Division
Hawai'i Department of Health
Solid & Hazardous Waste Branch
2827 Waimano Home Road, Room 225
Pearl City, HI 96782

Subject: RY2023-2024 Annual Update of the Surface Water Management Plan (SWMP), Kekaha Municipal Solid Waste Landfill, Phase II, County of Kaua'i, HI, Solid Waste Management Permit No. LF-0042-16

Dear Mr. Haae:

The enclosed Surface Water Management Plan (SWMP) Annual Update has been prepared for the Kekaha Municipal Solid Waste Landfill (Landfill), Phase II, located at 6900-D Kaumuali'i Highway in Kekaha, on the island of Kaua'i. The Landfill is owned and operated by the County of Kaua'i Department of Public Works (County).

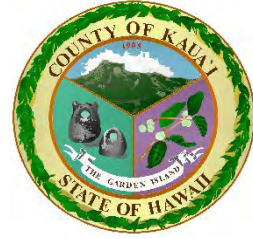
The SWMP Annual Update was prepared in accordance Solid Waste Management Permit No. LF-0042-16, which was issued on September 13, 2019, by the State of Hawai'i Department of Health (DOH) Solid and Hazardous Waste Branch. Section E, *Surface Water Management* requires a submittal of a SWMP and annual updates to the SWMP, which must be filed with the Department of Health (DOH) by September 1 of each year.

If you have any questions or require additional information, please contact me at (808) 241-4837.

Sincerely,

Allison Fraley

Environmental Services Manager



SURFACE WATER MANAGEMENT PLAN (SWMP) 2023-2024 ANNUAL UPDATE

**KEKAHA MUNICIPAL SOLID WASTE LANDFILL –
PHASE II
6900 KAUMUALI'I HWY
KEKAHA, KAUA'I 96752**

Prepared for

County of Kaua'i
County of Kaua'i Solid Waste Division
4444 Rice Street, Suite 295
Lihue, Hawai'i 96766

Prepared by

Geosyntec Consultants, Inc.
1111 Broadway, 6th Floor
Oakland, California 94607

Project Number: WG3074

August 30, 2024

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ACRONYMS AND ABBREVIATIONS

BMP	Best Management Practices
CWA	Clean Water Branch, Department of Health
DOH	Department of Health, State of Hawai‘i
DPW	Department of Public Works
ft	feet
HAR	Hawai‘i Administrative Rules
KLF	Kekaha Municipal Solid Waste Landfill – Phase II
MDOF	Materials Drop-Off Facility
msl	mean sea level
MSW	Municipal Solid Waste
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
SHWB	Solid Hazardous Waste Branch, Department of Health
SPCC	Spill Prevention, Control, and Countermeasure
SWMP	Surface Water Management Plan
U.S.	United States

1. INTRODUCTION

This Surface Water Management Plan (SWMP) has been prepared for the Kekaha Municipal Solid Waste Landfill (Landfill), Phase II, located at 6900-D Kaumuali‘i Highway in Kekaha, on the island of Kaua‘i. The Landfill is owned and operated by the County of Kaua‘i Department of Public Works (County).

This SWMP has been prepared in accordance Solid Waste Management Permit No. LF-0042-16 (Permit), which was issued on September 13, 2019, by the State of Hawai‘i Department of Health (DOH) Solid and Hazardous Waste Branch. Section E, Surface Water Management requires a submittal of a SWMP and annual updates to the SWMP, which must be filed with the Department of Health (DOH) by September 1 of each year. This 2023-2024 Annual Update includes an Annual Inspection Report (see Appendix A), as required by the Permit.

The existing surface water management system includes an infiltration basin at the north corner of the Landfill near the site entrance, two perimeter infiltration ditches on the northwest and southeast sides of the Landfill to infiltrate stormwater sheet flow, earthen berms and grades slope to divert stormwater from around active workface areas, and down drains convey stormwater to the perimeter surface water collection and infiltration features.

The figures show the following surface water management features and facilities:

- Figure 1 – Site Location Map
- Figure 2 – Site Plan and 06-15-2024 Topography.
- Figure 3 – Surface Water Management System shows the surface drainage pathways (blue arrows) and conveyances (down drains, infiltration ditches, and infiltration basin), and the active (Phase II and Cell 2) and inactive areas (Phase I) of the Landfill.
- Figure 4 – Observations and Recommendations show the areas where corrective actions are recommended and have occurred.

Additionally, Appendix B includes an Annual Inspection Photographic Log corresponding to Figure 4.

1.1 Purpose of Surface Water Management Plan

The purpose of the SWMP is the following:

- To describe the design basis and storm used to estimate surface water run-on and run-off at the Landfill.
- To describe the surface water features to direct and manage surface water run-on and run-off at the Landfill.
- To describe how run-off from the active portion of the Landfill will be handled so as not to cause a discharge of pollutants into Waters of the United States (US), including wetlands that violates any requirements of the Clean Water Act (CWA), including,

but not limited to, the National Pollutant Discharge Elimination System (NPDES) requirements, pursuant to Section 402.

Other requirements in the Solid Waste Management Permit are:

- Control site run-off from a 24-hour storm, 25-year design storm.
- Minimize soil erosion and exposure of waste due to soil erosion.
- Prevent discharge of pollutants into Waters of the US, and comply with the requirements of the federal CWA or statewide water quality management plan.
- Prevent stormwater from coming into contact with the geosynthetic clay liner in the Landfill and leachate evaporation pond.
- Manage stormwater that comes in contact with solid waste as leachate.

1.2 Solid Waste Regulations

Solid Waste Regulations HAR 11-58.1-15(g) provides requirements to ensure adequate control of stormwater events at landfills. The regulation requirements for run-on or run-off control systems and surface water management are listed below.

1.2.1 Requirements for Run-On or Run-Off Control Systems

Owners or operators of all municipal solid waste (MSW) landfill units must design, construct, and maintain the following:

- A run-on control system to prevent flow onto the active portion of the landfill during the peak discharge from a 24-hour, 25-year storm.
- A run-off control system from the active portion of the landfill to collect and control at least the water volume resulting from a 24-hour, 25-year storm.
- Run-off from the active portion of the landfill unit must be handled in accordance with surface water requirements.

Surface water management for the Landfill is designed for a 25-year return frequency, 24-hour duration rainfall event as well as the 100-year, 1-hr storm event. Historically, AECOM designed many of the existing stormwater features using an 8-inch 25-year, 24-hour storm event and a 3-inch 100-year, 1-hr storm (AECOM, 2017). The more recent calculations associated with the future proposed vertical expansion of Phase II use updated rainfall data with a 7.39-inch 25-year, 24-hour storm event and a 3-inch 100-year, 1-hr storm (Tetra Tech, 2023). The Tetra Tech engineering calculations for the proposed vertical expansion of Phase II are described in Section 4 below and included in Appendix C.

1.2.2 Requirements for Surface Water Management

MSW landfill units shall not:

- Cause a discharge of pollutants into Waters of the US, including wetlands, which violates any requirement of the CWA, including, but not limited to, the NPDES requirements, pursuant to Section 402 of the CWA.
- Cause the discharge of a non-point source of pollution to Waters of the US, including wetlands, which violates any requirement of an area-wide or state-wide water quality management plan that has been approved under Sections 208 or 319 of the CWA, as amended.

1.2.3 National Pollutant Discharge Elimination System

A NPDES Industrial General Permit for the Landfill is not required as there is no planned discharge of stormwater from the Landfill. Matt Kurano from DOH reiterated this to Dustin Moises, County Staff, during an DOH NPDES inspection in June 2021 (Moises, 2021).

The DOH determined that the NPDES determination only applies to the surface water requirements of HAR 11-58.1-15(h). As such, a SWMP is still required for the Landfill.

1.2.4 Spill Prevention, Control, and Countermeasures Plan

A revised Spill Prevention, Control, and Countermeasures (SPCC) Plan is included in Appendix D (Geosyntec, 2024). The SPCC Plan must comply with Title 40 Code of Federal Regulations Part 112 and addresses measures for prevention and control of fuel and oil related spills.

2. SITE INFORMATION

2.1 Site Description

The Landfill is located near the southwest coast of the island of Kaua‘i, approximately 1.5 miles northwest of the town of Kekaha, and approximately 2,000 feet (ft) from the Pacific Ocean shoreline. The Landfill is bounded to the northeast by Kaumuali‘i Highway, an unpaved access road and agricultural land to the southeast, Federal Reserve land and aquaculture facilities, to the northwest, and Hawai‘i National Guard facilities to the southwest. The site location and topography are shown on Figures 1 and 2.

The current permitted waste footprint, covers approximately 75 acres, is roughly rectangular, and includes the inactive Phase I, Phase II, and Cells 1 and 2 expansion disposal cells (see Figure 1). The inactive Phase I is approximately 33 acres. The original Phase II consists of approximately 32.1 acres subdivided into 14 smaller waste disposal sub-cells each about 2acres, the Cell 1 expansion, 6.4 acres subdivided into four smaller waste disposal sub-cells (1A though 1D), and the Cell 2 lateral expansion which is approximately 5.9 acres divided into two cells (2A and 2B), both of which “piggy-back” partially over existing Phase I (see Figure 2).

The Landfill office, maintenance building, scale house, Landfill gas flare facility, leachate evaporation pond (formerly known as the new leachate evaporation pond, or NLEP), and stormwater infiltration basin are located along the northeast property line (see Figure 3). A

public drop-off area is located between the leachate evaporation pond and the office. The public drop-off area provides the public a location to drop-off of green waste, recyclables, e-waste, tires, white goods, and municipal solid waste. A used oil drop-off is located in the maintenance building. The site layout is shown on Figure 3.

2.2 Surface Water Management System

The surface water system design at time of closure includes diversion berms located on the final cover of the Landfill slopes and along the perimeter road that direct surface water to downdrains and culverts which carry runoff to the infiltration ditches. Surface water diversion berms, ditches, downchutes, and culverts were designed to convey run-off from the 100-year, 1-hour storm event and the 25-year, 24-hour storm event with minimal freeboard in place (AECOM, 2017).

Since Phase II has not been filled to final grade and a final cover has not yet been built, the current stormwater drainage features on Phase II include interim diversion berms, geomembrane-lined downdrains, perimeter infiltration ditches, and an infiltration basin. Each downdrain has a trapezoidal cross-section with each downdrain conveying water to a perimeter channel or a culvert in select locations. The infiltration drainage ditch conveys surface water to the infiltration basin located near the entrance of the facility. The current surface water management system is shown on Figure 3.

The infiltration basin is large enough to accommodate both design storms and associated surface water from the entire Phase II landfill, including Cell 1 and Cell 2 (AECOM, 2017). The infiltration rate from the bottom of the basin has a design rate of 1 inch per 6 minutes (AECOM, 2017). The infiltration basin has a bottom elevation of 7.5 ft (local datum), which correlates to the invert elevation of the infiltration ditches (AECOM, 2017). With the Cell 2 expansion, the existing 2.2-acre infiltration basin is expected to perform in the same manner and in conjunction with the existing infiltration ditches (AECOM, 2017).

The current Phase II Landfill (including the Cell 2 expansion) is expected to reach capacity by 2027 (County, 2023). Therefore the County is pursuing a vertical expansion of Phase II. The Solid Waste Management Permit for the Landfill expires on September 12, 2024. The County submitted a permit application on November 22, 2023, to the DOH for Permit renewal and modification to include a proposed Kekaha Landfill Phase II Vertical Expansion Project. The County is proposing a vertical expansion to extend Phase II upward from the currently permitted maximum elevation of 120 feet above mean sea level (msl) to a new permitted maximum elevation of 171.5 feet above msl, which will add approximately 405,300 cubic yards of new airspace for waste disposal (County, 2023). Currently, the proposed permit modification is pending review from DOH.

As part of the proposed vertical expansion, the surface water management features of Phase II were revised and included in the permit application. The 2023 Engineering Report, included as Attachment P-3.2 in the permit application, proposes to tie into the exiting permitted surface water management system by extending the existing downdrains upward and tying into proposed diversion berms and bench channels (TetraTech, 2023). The engineering calculations for the proposed surface water design are described in Section 4 below and included in Appendix C.

3. SWMP IMPLEMENTATION

3.1 Best Management Practices

Best Management Practices (BMPs) for erosion and sediment controls are implemented in conjunction with the surface water management features described in Section 2.0. BMP measures include geosynthetic lined downdrains, perimeter infiltration ditches, gravel resurfacing of access roads, diversion berms, and vegetative growth and the placement of mulch on the side slopes. In addition, fiber rolls and silt fences may be used for sediment control and geosynthetic tarps and riprapped lined downdrains may be used for erosion control.

3.2 Inspections

The Annual Inspection Report is included in Appendix A.

Additionally, after all major rainstorm events (i.e., greater than 1.0 inch of rainfall), post-rain inspections of the drainage system, infiltration basin, and erosion and sediment measures should be performed to identify failures, breaches, or sediment deposition requiring repair or cleanout.

3.3 Recordkeeping

Records of the inspections and follow-up actions should be maintained in the landfill operating files.

3.4 Reporting

The effectiveness of the landfill stormwater run-on and run-off drainage systems is reviewed on an annual basis and an SWMP Annual Update is submitted to the DOH no later than September 1 of each year. The Annual Inspection Log is used to document the effectiveness and appropriateness of the existing erosion and sediment control measures and drainage system features for current site conditions. The SWMP Annual Update contains the following information:

- Report of an annual inspection of surface water management features and facilities, together with a description of required maintenance and changes.
- Updated drawings showing current topography of the landfill, surface water drainage paths and conveyances, and drainage system modifications planned for the next year in response to waste filling, as applicable.
- Engineering calculations documenting the capability of the surface water management system to comply with the run-on and run-off requirements outlined in the KLF Solid Waste Permit, as applicable.
- Any updates to the SPCC Plan prepared pursuant to federal requirements under the CWA.

4. 2023-2024 ANNUAL UPDATE

This 2023-2024 SWMP Annual Update contains the following information per SWMP Special Conditions E.5:

E.5.a: *An annual inspection report of surface water management features and facilities, together with a description of required maintenance and changes.*

The Annual Inspection of the Phase II surface water management features was conducted on July 11, 2024 by Adrienne Miller of Geosyntec Consultants. On July 11, Ms. Miller met with Renee Palmer, Principal Project Manager, and John Bostick, TA Landfill Supervisor, from the County of Kaua‘i. The Annual Inspection consisted of a review of the permit requirements, a review of the current site conditions at the Landfill, and a site visit of the Landfill. Follow-up or action items will be implemented prior to the rainy season and are listed in both Appendix A (Annual Inspection Report) and in Appendix B (Annual Inspection Photographic Log), and also shown on Figure 4. (Observations and Recommendations). This Annual Update will be placed in an accessible location on-site as a hardcopy and with the County electronically.

There have been no significant modifications to the surface water management system since the 2022-2023 SWMP Annual Update was submitted to DOH on September 1, 2023. The active Cell 2 module continues to be filled per approved design.

E.5.b: *Updated drawings showing current topography of the landfill, surface water drainage paths and conveyances, and drainage system modifications planned for the next year in response to waste filling.*

Per discussions with County staff, no significant drainage system modifications are planned in the next year in response to waste filling other than routine maintenance.

Figure 1. Site Location Map, shows the general site location, Figure 2. Site Plan and 06-15-2024 Topography, shows the current topography, Figure 3. Surface Water Management System, shows the surface drainage pathways and conveyances, as well as the active and inactive areas of the Landfill. Figure 4. Observations and Recommendations show the areas where corrective actions are recommended and have occurred. Appendix B. Annual Inspection Photographic Log, provides photographs of the corresponding areas.

E.5.c: *A statement that all areas with intermediate cover were graded to direct stormwater away from the workface and towards the stormwater collection system.*

The areas with intermediate cover, which consist of Phase II, have been graded to allow stormwater to be directed away from the working face and towards the surface water management system that includes the stormwater infiltration basin and the infiltration ditches (see Figure 2). The County constructed an earthen diversion berm along the east access road to divert stormwater from Phase II away from Cell 2 and along the east property boundary to retain stormwater on-site and prevent discharge off-site.

Per the approved design, Cell 2 will continue to be graded to allow stormwater to be directed away from the working face and towards the surface water system. Any commingled stormwater will be handled as leachate and sent to the leachate evaporation pond (see Figure 2).

E.5.d: *Engineering calculations documenting the capability of the surface water management system to comply with the run-on and run-off requirements listed under Special Conditions, Section E.1. Top deck areas shall have minimum slopes 3% to promote drainage. Side slopes shall not exceed 3.5 horizontal to 1 vertical (final slope design).*

Engineering calculations for the surface water management system design were included in Appendix C of the Cell 2 Engineering Report (AECOM, 2017). That design was approved as part of the Cell 2 lateral expansion by the DOH on September 13, 2019. Subsequent to that design, minor down drain modifications were made to the flow from a portion of the Phase I top deck. In 2019, AECOM provided engineering calculations corresponding to these modifications which were included in Attachment D of the 2020-2021 Annual Update, submitted on September 2, 2021. There were no significant changes since the 2020-2021 Annual Update. Therefore, no engineering calculations were included in the 2021-2022 Annual Update or in the 2022-2023 Annual Update.

As noted above, engineering calculations for the proposed Kekaha Landfill Phase II Vertical Expansion Project were included as part of the permit application submitted to DOH on November 22, 2023, and are included in Appendix C. Tetra Tech analyzed the runoff which will occur from the areas with revised grading. The new design was based on extending the upper end of the existing downdrains in each of four existing watersheds affected by the vertical expansion and tying the drains into proposed diversion berms and channel benches at the limits of vertical expansion (Tetra Tech, 2023). No changes to the existing perimeter infiltration ditches or stormwater infiltration basin were proposed.

Tetra Tech analyzed stormwater flows using similar input assumptions and modeling methodology to that of the existing permitted design conducted by AECOM in 2017 (Tetra Tech, 2023). Similar to the AECOM analysis, runoff was calculated for the 100-year and 25-year return interval events. Tetra Tech concluded that the proposed design configuration can still meet the permit design criteria (Tetra Tech, 2023). The engineering calculations for the proposed surface water design are included in Appendix C.

E.5.e: *Any updates to the Storm Water Pollution Control Plan (SWPCP) or Spill Prevention, Control, and Countermeasures Plan (SPCC) prepared pursuant to federal requirements under the Clean Water Act.*

After a review of the SPCC Plan dated September 1, 2023, the following SPCC sections were updated:

- Section 6.2.4: General Description of Petroleum Storage Areas [112.7(a)(3)(i)]
- Section 6.4.3: Drum Storage in Maintenance Shop Area
- Table 3: Petroleum Products - Service Truck and Aboveground Storage Tank
- Table 4: Potential Spill Scenarios
- 7.2.2: Secondary Containment [112.8(c)(2)]

- Appendix A – Inspection Forms
- Figures 1 through 4

SWMP Appendix D provides the revised SPCC with the above sections updated.

5. REFERENCES

AECOM, 2017. Engineering Report, Kekaha Sanitary Landfill Phase II, Cell 2 Lateral Expansion, Kekaha, Kaua‘i, Hawai‘i. October.

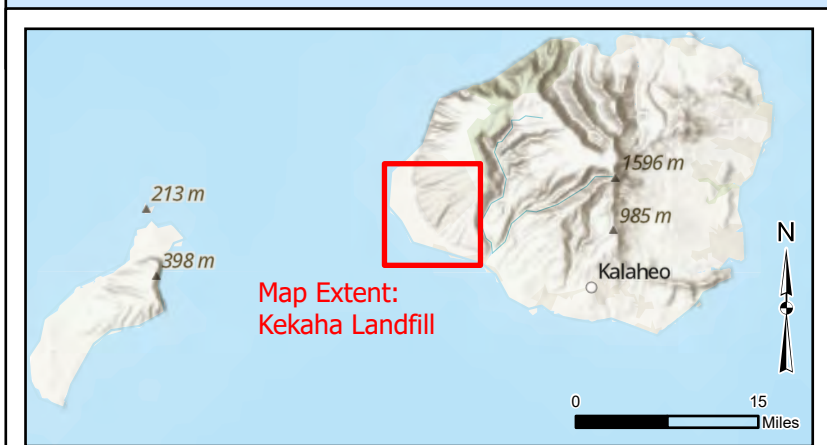
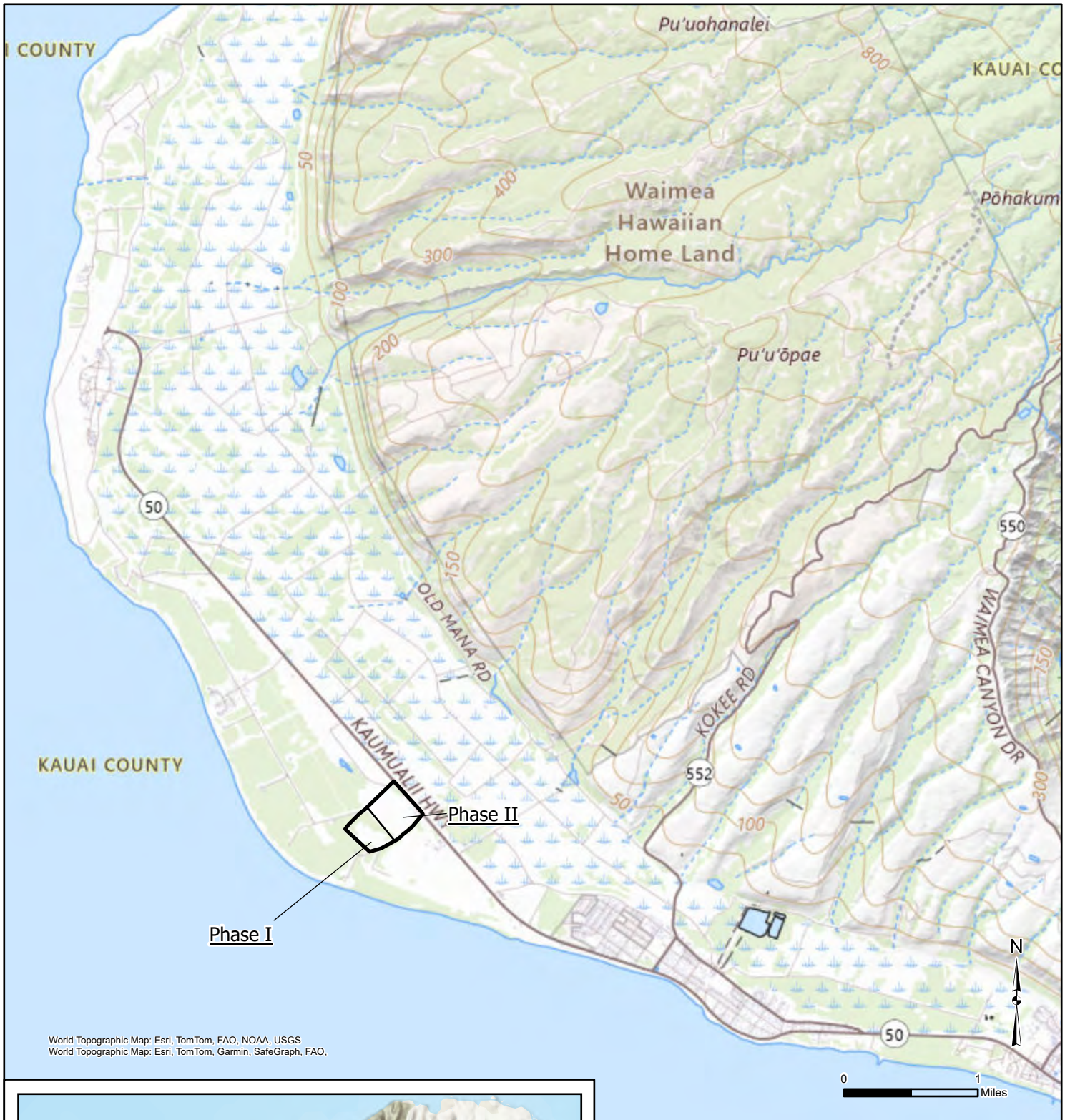
Geosyntec Consultants, Inc., 2024. Spill Prevention Control and Countermeasure Plan, Kekaha Landfill, Kekaha, Kaua‘i, Hawai‘i. September.


County of Kaua‘i, 2023. Kekaha Municipal Solid Waste Landfill – Permit Application for Solid Waste Facility – Permit Number (LF-0042-16), Kekaha, Kaua‘i, Hawai‘i. November.

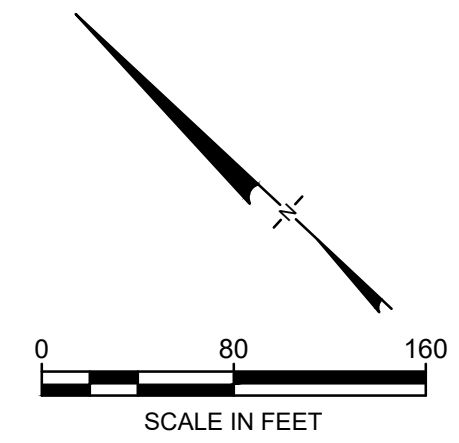
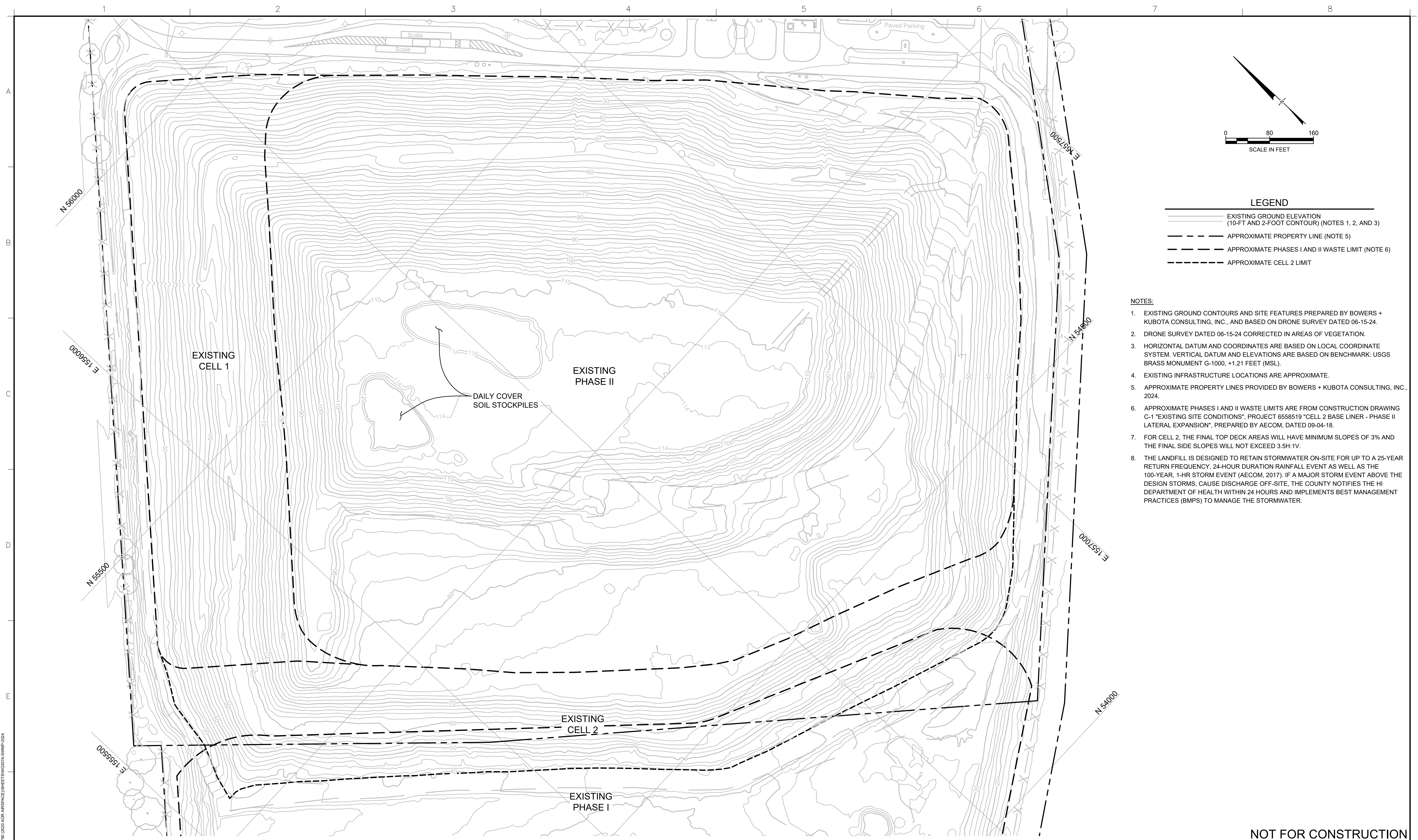
Moises, Dustin, County of Kaua‘i, 2021. “RE: Kekaha Landfill NPDES exempt.” Email received by Allison Fraley, Troy Tanigawa, John Ruiz, Rick Renaud, Zahid Khan, Keola Aki, Sherri Yasutake, Ron Boyle, and Mark Hofferbert., 6 July, 2021.

Tetra Tech BAS, Inc. 2023. Engineering Report, Kekaha Municipal Solid Waste Landfill, Phase II Vertical Expansion, Kekaha, Kaua‘i, Hawai‘i. November.

FIGURES



<p>Kekaha Municipal Solid Waste Landfill County of Kaua'i Site Location Map</p> <p>6900 Kaumuali'i Hwy, Kekaha, HI 96752</p>		<p>Figure 1</p>
 <p>Geosyntec consultants</p>	<p>WG3074</p> <p>August 2024</p>	



LEGEND

	EXISTING GROUND ELEVATION (10-FT AND 2-FOOT CONTOUR) (NOTES 1, 2, AND 3)
	APPROXIMATE PROPERTY LINE (NOTE 5)
	APPROXIMATE PHASES I AND II WASTE LIMIT (NOTE 6)
	APPROXIMATE CELL 2 LIMIT

- NOTES:**
- EXISTING GROUND CONTOURS AND SITE FEATURES PREPARED BY BOWERS + KUBOTA CONSULTING, INC., AND BASED ON DRONE SURVEY DATED 06-15-24.
 - DRONE SURVEY DATED 06-15-24 CORRECTED IN AREAS OF VEGETATION.
 - HORIZONTAL DATUM AND COORDINATES ARE BASED ON LOCAL COORDINATE SYSTEM. VERTICAL DATUM AND ELEVATIONS ARE BASED ON BENCHMARK: USGS BRASS MONUMENT G-1000, +1.21 FEET (MSL).
 - EXISTING INFRASTRUCTURE LOCATIONS ARE APPROXIMATE.
 - APPROXIMATE PROPERTY LINES PROVIDED BY BOWERS + KUBOTA CONSULTING, INC., 2024.
 - APPROXIMATE PHASES I AND II WASTE LIMITS ARE FROM CONSTRUCTION DRAWING C-1 "EXISTING SITE CONDITIONS", PROJECT 6558519 "CELL 2 BASE LINER - PHASE II LATERAL EXPANSION", PREPARED BY AECOM, DATED 09-04-18.
 - FOR CELL 2, THE FINAL TOP DECK AREAS WILL HAVE MINIMUM SLOPES OF 3% AND THE FINAL SIDE SLOPES WILL NOT EXCEED 3.5H:1V.
 - THE LANDFILL IS DESIGNED TO RETAIN STORMWATER ON-SITE FOR UP TO A 25-YEAR RETURN FREQUENCY, 24-HOUR DURATION RAINFALL EVENT AS WELL AS THE 100-YEAR, 1-HR STORM EVENT (AECOM, 2017). IF A MAJOR STORM EVENT ABOVE THE DESIGN STORMS, CAUSE DISCHARGE OFF-SITE, THE COUNTY NOTIFIES THE HI DEPARTMENT OF HEALTH WITHIN 24 HOURS AND IMPLEMENTS BEST MANAGEMENT PRACTICES (BMPS) TO MANAGE THE STORMWATER.

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

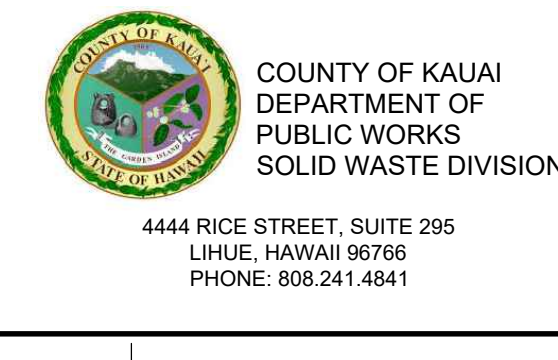
DATE

DESIGN BY: AVM
 DRAWN BY: ABK
 CHECKED BY: JHL
 REVIEWED BY: MJM
 APPROVED BY: MJM

TITLE: **SITE PLAN AND 06-15-24 TOPOGRAPHY**

PROJECT: **2023-2024 SWMP ANNUAL UPDATE**

SITE: **KEKAHA MUNICIPAL SOLID WASTE LANDFILL
KEKAHA, COUNTY OF KAUAI, HAWAII**



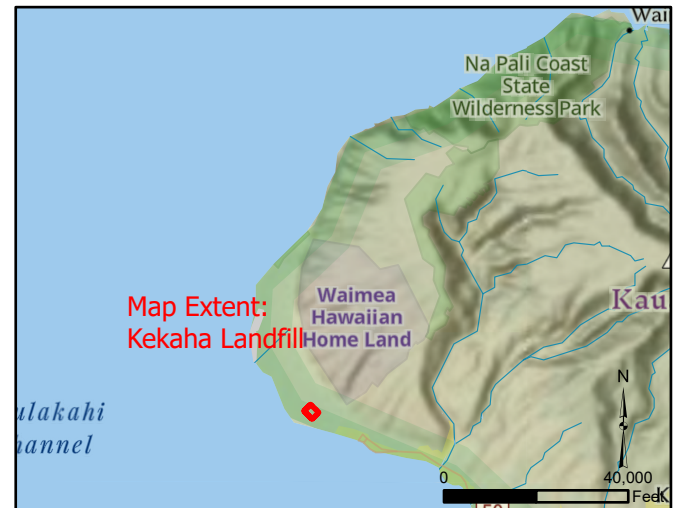
DATE: JULY 2024

PROJECT NO.: WG3074

FILE: WG3074-SWMP-2024

DRAWING NO.: **1** OF **1**

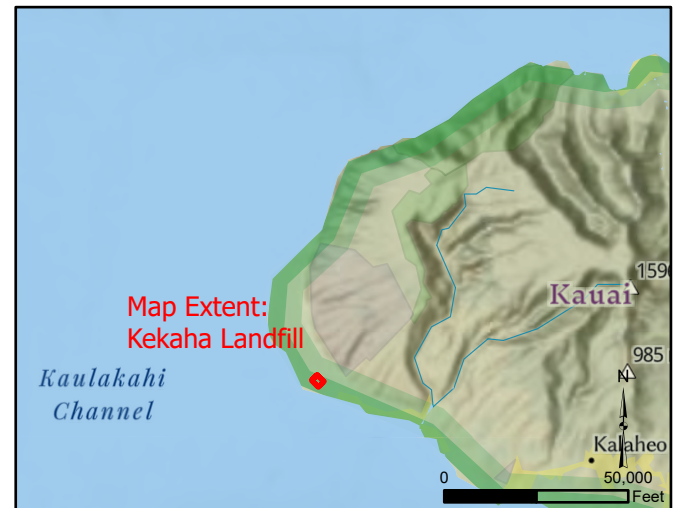
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- Legend**
- Label
 - Leachate Structures
 - Flow Arrows
 - Access Road
 - - - Down Drain
 - Diversion Berm
 - Infiltration Ditch
 - Drainage Ditch
 - Infiltration Basin
 - Leachate Evaporation Pond
 - - - Permitted Limit of Waste
 - ▭ Property Line

Map Source:
 Esri Community Maps Contributors, ©
 OpenStreetMap, Microsoft, Esri, TomTom,
 Garmin, SafeGraph, METI/NASA, USGS,
 EPA, US Census Bureau, USDA, USFWS,
 Esri, CGIAR, USGS, Sources: Esri, USGS,
 Esri, TomTom, Garmin, SafeGraph, FAO,
 METI/NASA, USGS, EPA, USFWS, Resource
 Mapping Hawaii

Kekaha Municipal Solid Waste Landfill County of Kaua'i Surface Water Management System <small>6900 Kaumualii Hwy, Kekaha, HI 96752</small>	
 Geosyntec consultants	Figure 3
WG3074	August 2024



- Legend**
- Label
 - Leachate Structures
 - Flow Arrows
 - Access Road
 - - - - Down Drain
 - ▬ Diversion Berm
 - ▬ Infiltration Ditch
 - ▬ Drainage Ditch
 - ▬ Infiltration Basin
 - ▬ Leachate Evaporation Pond
 - - - - Permitted Limit of Waste
 - ▬ Property Line

Map Source:
 Resource Mapping Hawaii, Maxar, Esri
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 OpenStreetMap, Microsoft, Esri, TomTom,
 Garmin, SafeGraph, METI/NASA, USGS,
 EPA, US Census Bureau, USDA, USFWS,
 Esri, CGIAR, USGS, Sources: Esri, USGS,
 Esri, TomTom, Garmin, SafeGraph, FAO,
 METI/NASA, USGS, EPA, USFWS

Kekaha Municipal Solid Waste Landfill County of Kaua'i Observations and Corrective Actions 6900 Kaumuali'i Hwy, Kekaha, HI 96752	
 Geosyntec consultants	Figure 4
WG3074	August 2024

APPENDIX A
Annual Inspection Report

Annual Inspection Report
Kekaha Municipal Solid Waste Landfill
Surface Water Management Plan



General Information			
Project Name: Kekaha Municipal Solid Waste Landfill	Address: 6900 Kaumuali'i Hwy		
Project Location: Kekaha, Kaua'i HI	Kekaha, HI 96752		
Date of Inspection: 7/11/24	Personnel: Adrienne Miller, Geosyntec Consultants		
Weather: Partly Sunny	Runoff: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Raining: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flow Observed: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Time Since Last Rainfall: 89 d	Type of Flow: <input type="checkbox"/> Sheet <input type="checkbox"/> Rill <input type="checkbox"/> Concentrated <input checked="" type="checkbox"/> N/A		
Inspection of Active Areas			
Inspect the following areas and note whether there was evidence of or the potential for pollutants to enter the stormwater conveyance system: (If yes, describe corrective action(s) that will be taken.)			
Area	Inspection	Observed during inspection?	Observations / Corrective Actions
Landfill Cover (Phase II)	Gullies caused by erosion	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The Phase II side slopes had been mowed and track-walked with little to no sign of gullies caused by erosion at the time of inspection. (see Photo 1). Soil actively being used as intermediate cover is temporarily being stockpiled on top of the Phase II top deck (see Photo 2). No action needed.
	Indicator of leachate seepage	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	There was no indication of leachate seepage at the time of inspection. No action needed.
Active Area (Cell 2)	Properly graded and bermed	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Along the west access road near the Phase II/Cell 2 boundary, the area has been filled and graded to the edge of the Cell 2 liner (see Photo 3). Some erosion on the face and berm (see Photo 4). Recommend designing and building a conveyance system to effectively convey the runoff from this slope, across the access road, and to the stormwater infiltration ditch along the property boundary. At a minimum, repair minor erosion. Recommend creating a discrete channel lined with rock/rip rap, along the side slope immediately downgradient of the lowpoint of the access road, where blowout of the berm and erosion during heavy rains have previously occurred. On August 29, 2024, the County confirmed repairing the minor erosion and reinforcing the upgradient berm and downgradient slope to the infiltration ditch (see Photos 5 and 6).
Surface Drainage System	Sediment in down drains	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	No sediment and some cut grass were observed in down drains at the time of inspection (see Photo 7). Recommend continue to inspect for sediment in down drains.
	Down drains can contain runoff	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	There was no runoff at the time of inspection.
	Sediment in infiltration trenches	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Continuous berm covered with vegetation along the east property boundary (see Photo 8). Raised slope and heavy vegetation along the west property boundary (see Photo 9). Recommend continued inspection that the property boundary is bermed and intact.

Annual Inspection Report
Kekaha Municipal Solid Waste Landfill
Surface Water Management Plan



Area	Inspection	Observed during inspection?	Observations / Corrective Actions
Infiltration Basin	Sediment in infiltration basin	__Yes <input checked="" type="checkbox"/> No	Stormwater either sheet flows or flows through culverts under the main access road to the vegetated infiltration basin. No standing water or obstructions to flow observed at the time of inspection (see Photo 10). No action needed.
Site Facilities	Sediment on pavement	<input checked="" type="checkbox"/> Yes __No	The site is mostly unpaved. Some sediment on pavement throughout site. No tracking off-site observed at time of inspection (see Photo 11).
	Exposure of other pollutants	<input checked="" type="checkbox"/> Yes __No	Liquids were either undercover in the maintenance shop and on top of secondary containment pallets (see Photo 12). Spill kits with absorbent pads/booms were observed next to the above ground tank and in the Maintenance Building. Recommend cleaning the oil leaks on the sediment near the Maintenance Building where the mobile fuel truck is parked (see Photo 13). On August 14, 2024, the County confirmed cleanup of the leaks (see Photo 14).
	Oil Water Separator (OWS) operating properly	<input checked="" type="checkbox"/> Yes __No	Some sediment and standing water in the oil water separator (OWS) (see Photo 15). Recommend clearing sediment and debris from around the OWS and pumping it out quarterly. On August 29, 2024, the County confirmed cleanout of the OWS and concrete pad (see Photo 16).
Access Roads	Evidence of erosion	<input checked="" type="checkbox"/> Yes __No	Along the east access road along Phase II and Cell 2, County staff have built up the berm on the downgradient side of the access road (see Photo 17). This area is where blowout of the access road berm during heavy rains have previously occurred and cut an erosive channel to the infiltration ditch. Recommend designing and building a conveyance system to effectively convey runoff from the interim cover, along the access road, and to the stormwater infiltration ditch along the property boundary. At a minimum, recommend cutting the berm and creating a discrete channel lined with rock/rip rap along the cut channel immediately downgradient of the access road, where blowout of the berm previously occurred. On August 29, 2024, the County provided an update and plans on building two to three diversion berms in the north/south direction to divert runoff using a soil and gravel mixture, which will take a few weeks to construct. The County is waiting for the delivery of the rock to mix with the soil to create the diversion berms.

APPENDIX B
Annual Inspection Photographic Log

DRAFT Annual Inspection Photographic Log
Conducted on July 11, 2024



Photo No.	Location	Observations and Recommendations (see SWMP Figure 4)	Photos
1	Top Deck of Phase II Area	<p>Observation: The Phase II side slopes had been mowed and track-walked with little to no sign of gullies caused by erosion at the time of inspection.</p> <p>Recommendation: None at this time.</p>	
2	Top Deck of Phase II Area	<p>Observation: Soil actively being used as intermediate cover is temporarily being stockpiled on top of the Phase II top deck.</p> <p>Recommendation: None at this time.</p>	



Photo No.	Location	Observations and Recommendations (see SWMP Figure 4)	Photos
3	West Active Area (Cell 2)	<p>Observation:</p> <p>Along the west access road near the Phase II/ Cell 2 boundary, the area has been filled and graded to the edge of the Cell 2 liner.</p>	
4	West Active Area (Cell 2)	<p>Observation:</p> <p>Some erosion on the face and berm.</p> <p>Recommendations:</p> <p>Recommend designing and building a conveyance system to effectively convey the runoff from this slope, across the access road, and to the stormwater infiltration ditch along the property boundary. At a minimum, repair minor erosion.</p> <p>Recommend creating a discrete channel lined with rock/rip rap, along the side slope immediately downgradient of the lowpoint of the access road, where blowout of the berm and erosion during heavy rains have previously occurred.</p>	

Photo No.	Location	Observations and Recommendations (see SWMP Figure 4)	Photos
5	West Active Area (Cell 2)	<p>Implemented Corrective Action: County confirmed repairing the minor erosion and reinforcing the upgradient berm on August 29, 2024.</p>	
6	West Active Area (Cell 2)	<p>Implemented Corrective Action: County confirmed repairing the minor erosion and reinforcing the downgradient slope to the infiltration ditch on August 29, 2024.</p>	



Photo No.	Location	Observations and Recommendations (see SWMP Figure 4)	Photos
7	Down Drains	<p>Observation: No sediment and some cut grass were observed in down drains at the time of inspection. There was no runoff at the time of inspection.</p> <p>Recommendation: Continued inspection for sediment in down drains.</p>	
8	Infiltration Trench Along East Property Boundary	<p>Observation: Continuous berm covered with vegetation along the east property boundary.</p> <p>Recommendation: Continued inspection that the property boundary is bermed and intact.</p>	



Photo No.	Location	Observations and Recommendations (see SWMP Figure 4)	Photos
9	Infiltration Trench Along West Property Boundary	<p>Observation: Raised slope and heavy vegetation along the west property boundary.</p> <p>Recommendation: Continued inspection that the property boundary is bermed and intact.</p>	
10	Storm water Infiltration Basin	<p>Observation: Stormwater either sheet flows or flows through a culvert under the main access road to the vegetated infiltration basin. No standing water or obstructions to flow observed at the time of inspection.</p> <p>Recommendations: None at this time.</p>	



Photo No.	Location	Observations and Recommendations (see SWMP Figure 4)	Photos
11	Site Entrance	<p>Observation: The site is mostly unpaved. Some sediment on pavement throughout site. No tracking off-site observed at time of inspection.</p> <p>Recommendations: Continue to inspect for track-out.</p>	
12	Maintenance Building	<p>Observation: Liquids were either undercover in the maintenance shop and on top of secondary containment pallets. Spill kits with absorbent pads/booms were observed next to the above ground tank and in the Maintenance Building.</p>	



Photo No.	Location	Observations and Recommendations (see SWMP Figure 4)	Photos
13	Outside Maintenance Building	<p>Observation: Oil leaks observed on the sediment near the Maintenance Building where the mobile fuel truck is parked.</p> <p>Recommendations: Recommend cleaning the oil leaks on the sediment.</p>	
14	Outside Maintenance Building	<p>Implemented Corrective Action: County confirmed cleanup on August 14, 2024.</p>	




Photo No.	Location	Observations and Recommendations (see SWMP Figure 4)	Photos
15	OWS on Wash Rack	<p>Observation: Some sediment and standing water in the oil water separator (OWS).</p> <p>Recommendation: Recommend clearing sediment and debris from around the OWS and pumping it out quarterly.</p>	
16	OWS on Wash Rack	<p>Implemented Corrective Action: County confirmed cleanout of OWS and concrete pad on August 29, 2024.</p>	

Photo No.	Location	Observations and Recommendations (see SWMP Figure 4)	Photos
17	Along East Access Road	<p>Observation: Along the east access road along Phase II and Cell 2, County staff have built up the berm on the downgradient side of the access road. This area is where blowout of the access road berm during heavy rains have previously occurred and cut an erosive channel to the infiltration ditch.</p> <p>Recommendation: Recommend designing and building a conveyance system to effectively convey runoff from the interim cover, along the access road, and to the stormwater infiltration ditch along the property boundary. At a minimum, recommend cutting the berm and creating a discrete channel lined with rock/rip rap along the cut channel immediately downgradient of the access road, where blowout of the berm previously occurred.</p> <p>Planned Corrective Action: In an update on August 29, 2024, the County plans on building two to three diversion berms in the north/south direction to divert runoff using a soil and gravel mixture, which will take a few weeks to construct. The County is waiting for the delivery of the rock to mix with the soil to create the diversion berms.</p>	

APPENDIX C
Engineering Calculations (Tetra Tech, 2023)

Engineering Report

Kekaha Municipal Solid Waste Landfill, Phase II Vertical Expansion

Kekaha, Kaua'i, Hawai'i

NOVEMBER 29, 2023

PROJECT NUMBER 197-220048

PRESENTED TO

County of Kaua'i Solid Waste Division

4444 Rice Street, Suite 295
Lihue HI 96766

SUBMITTED BY

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REPORT CERTIFICATION

The material and data in this report were prepared under the supervision and direction of the undersigned.

Not for Construction



Garth R. Bowers, P.E.
Technical Director/Senior Operations
Director

11/29/2023

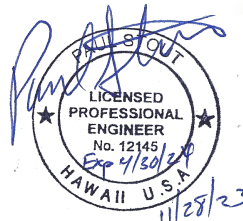


Not for Construction



Paul J. Stout, P.E.
Vice President

11/29/2023



4.0 SURFACE WATER MANAGEMENT

The surface water management system for the vertical expansion is shown on Sheet C-103 of the Permit Design Drawings. The proposed surface water management system has been revised to accommodate the flow directions and grade changes from the proposed vertical expansion and will tie into the existing permitted surface water management system at the limits of the vertical expansion (i.e., at the diversion berms at the upper end of the sideslopes in the permitted design).

Tetra Tech has analyzed the runoff which will occur from the areas with revised grading. The new design was based on the design concept for the existing permitted design with diversion berms and benches conveying runoff to riprapped downdrains. Drainage area delineations were developed and named to match the larger watershed nomenclature from the existing permitted design. The upper end of the downdrains in each of the four existing watersheds affected by the vertical expansion (watersheds A, B, C and F) will be extended upward as necessary and tied into the proposed diversion berms and benches from the proposed vertical expansion.

4.1 STORMWATER HYDROLOGY

Tetra Tech analyzed stormwater flows using similar input assumptions and modeling methodology to that of the existing permitted design. The existing permitted design was modeled in SEDCAD+ using a TR-55 modeling methodology for estimating runoff volumes (AECOM, 2017). Since the model files for the AECOM analysis were not available, Tetra Tech utilized the WinTR55 software developed by the Natural Resources Conservation Service (NRCS) to determine runoff in each of the subwatershed drainage areas shown on Sheet C-103. Similar to the AECOM analysis for the existing permitted design, a runoff curve number of 79 was utilized for all drainage areas within the landfill and a Type I storm distribution was utilized to develop the precipitation hyetograph.

Similar to the AECOM analysis, runoff was calculated for the 100-year and 25-year return interval events. Although the AECOM analysis utilized estimated rainfall totals from isopleth maps for the 100-year, 1 hour storm event and the 25-year, 24-hour events, more precise location-specific rainfall information is now available for Kaua'i from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, which provides design rainfall totals for storm return intervals ranging from 1 year through 1000 years and storm durations ranging from 5 minutes through 60 days. Atlas 14 data for the weather station KEKAHA 944 (51-2161) was selected which is adjacent to the site. Storm data from Atlas 14 for the 1-yr through 100-yr return intervals (24-hour duration) were entered into the WinTR-55 model and the model developed a storm intensity for the duration of the time of concentration for each subwatershed using the SCS Type I rainfall distribution. Since the subwatershed areas in the vertical expansion area are small and connected to each other by relatively short, steep downdrains, times of concentration and travel times were all near or under the 5-minute duration peak intensity inherent in the TR-55 methodology. In two of the watersheds (C and F), time of concentrations varied enough between subwatersheds that the peak flows from the subwatersheds were not coincident and minor attenuation from subwatershed lag is predicted (therefore the peak flow from the watershed outlet is slightly less than the sum of the peak flows from each subwatershed). However, since travel times were all less than 5 minutes, no attenuation of peak flows due to routing lag was assumed to develop conservative estimates of peak flows in each of the hydraulic structures (diversion berms, benches, and downchute flumes) in the vertical expansion area.

Atlas 14 data and WinTR-55 model results are provided in Appendix B. The modeled peak flow rates for each of the subwatersheds within the vertical expansion area are summarized in Table 4-1 below:

Table 4-1. Subwatershed Hydrology Summary.

Subwatershed	25-yr peak flowrate (Q ₂₅) (cfs)	100-yr peak flowrate (Q ₁₀₀)(cfs)
A1-1	1.52	2.07
A1-2	6.66	9.04
A1-3	3.79	5.05
A1-4	1.54	2.10
A1 Outlet	13.50	18.34
B1-1	2.62	3.56
B1-2	0.42	0.58
B1-3	2.22	3.01
B1-4	0.82	1.12
B1 Outlet	6.08	8.27
C2-1	3.32	4.51
C2-2	14.58	19.81
C2-3	4.07	5.53
C2-4	4.03	5.47
C2 Outlet	25.35	34.44
F2-1	1.25	1.69
F2-2	3.35	4.55
F2-3	8.23	11.18
F2-4	2.53	3.44
F2 Outlet	14.34	19.47

4.2 STORMWATER HYDRAULICS

For permit-level design, it was assumed that a single diversion berm and bench channel design would be utilized throughout the vertical expansion area sized to the largest peak flow that would be experienced by any of the diversion berms or bench channels under the design storm. For diversion berms, with a longitudinal slope of 3%, the largest modelled flow was that from subwatershed C2-2, with a 100-year peak flow of 19.81 cubic feet per second (cfs). For bench channels with a longitudinal slope of 1%, the largest modeled flow was from subwatershed F2-3, with a 100-year peak flow of 11.18 cfs.

Because of the variability of flows and contributing areas for each individual downchute flume, they were sized individually based on the 100-year flow anticipated to contribute to each flume section.

Flows were analyzed based on a Manning's equation methodology and assuming a minimum of 0.5 feet of freeboard for channels and 0.9 feet of freeboard for diversion berms (since flows overtopping a diversion berm would be directed away from the designed flow path due to the downward slope of the landfill beyond the berm). Freeboard of 1 foot or more for downchute flumes is recommended due to the high flow velocities and resulting strongly supercritical flows predicted.

The resulting design for diversion berms is a 2-foot high, 2:1 sideslope berm as depicted on Permit Design Drawing Sheet C-506, Detail 4, Type C.

The resulting design for bench channels is a 2-foot deep, 2-foot bottom width channel with 2:1 sideslopes as depicted on Permit Design Drawing Sheet C-506, Detail 4, Type A.

The resulting design sizes for the downchute flumes are shown below in Table 4-2:

Table 4-2. Downchute/Flume Dimensions Summary.

Downchute/Flume ID	Bottom Width (B)(ft)	Depth (D)(ft)	Top Width (W)(ft)
A0	1	1.5	7
A1	1	2.0	9
B1	1	1.5	7
C0	1	1.5	7
C1	1	1.5	7
C2	2	2.0	10
F1	1	1.5	7
F2	2	2.0	10

A culvert will also be required to convey the flows from downchute/flume C1 into downchute/flume C2, along with the flows from the road ditch above the watershed C flume alignment (which drains subwatershed C2-2). This could be accomplished with a single 18-inch corrugated HDPE culvert installed at a 10% longitudinal slope. Alternative configurations of pipe diameter, longitudinal slope, pipe material, and numbers of pipes could be utilized based on the final construction-level design for this culvert.

Hydraulic calculations for these structures are provided in Appendix B.

The proposed design configuration shown on the Permit Design Drawings meets these design criteria and a detailed design of the stormwater management system will be completed during construction-level design of the final cover of the KLF.

APPENDIX B

STORMWATER CALCULATIONS



General Information

- Homepage
- Progress Reports
- FAQ
- Glossary

Precipitation Frequency

- Data Server
- GIS Grids
- Maps
- Time Series
- Temporals
- Documents

Probable Maximum Precipitation

- Documents

Miscellaneous

- Publications
- Storm Analysis
- Record Precipitation

Contact Us

- Inquiries



NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES

Data description

Data type: Units: Time series type:

Select location

1. Manually:

- a) **By location** (decimal degrees, use "-" for S and W) Latitude: Longitude:
- b) **By station** (list of HI stations):
- c) **By address**

2. Use map:

a) Select location
Move crosshair or double click

b) Click on station icon
 Show stations on map

Map bookmarks:

- [Project area](#)
- [Hawaii](#)
- [Maui, Molokai, Lanai, Kahoolawe](#)
- [Oahu](#)
- [Kauai, Niihau](#)

Location information:
Name: Kekaha, Hawaii, USA*
Station name: KEKAHA 944
Site ID: 51-2161
Latitude: 21.9703°
Longitude: -159.7111°
Elevation: 9 ft

* Source: ESRI Maps
 ** Source: USGS

POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
 NOAA Atlas 14, Volume 4, Version 3

[PF tabular](#) [PF graphical](#) [Supplementary information](#) [Print page](#)

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.316 (0.288-0.350)	0.403 (0.367-0.450)	0.521 (0.470-0.581)	0.604 (0.542-0.679)	0.713 (0.628-0.808)	0.794 (0.686-0.905)	0.869 (0.736-1.00)	0.947 (0.780-1.10)	1.05 (0.826-1.24)	1.12 (0.851-1.35)
10-min	0.468 (0.427-0.519)	0.598 (0.545-0.667)	0.772 (0.697-0.862)	0.896 (0.804-1.01)	1.06 (0.932-1.20)	1.18 (1.02-1.34)	1.29 (1.09-1.49)	1.40 (1.16-1.64)	1.55 (1.23-1.84)	1.66 (1.26-2.00)
15-min	0.588 (0.537-0.651)	0.751 (0.684-0.838)	0.969 (0.875-1.08)	1.13 (1.01-1.26)	1.33 (1.17-1.50)	1.48 (1.28-1.69)	1.62 (1.37-1.87)	1.76 (1.45-2.06)	1.95 (1.54-2.31)	2.08 (1.58-2.51)
30-min	0.827 (0.755-0.917)	1.06 (0.963-1.18)	1.36 (1.23-1.52)	1.58 (1.42-1.78)	1.87 (1.65-2.12)	2.08 (1.80-2.37)	2.28 (1.93-2.63)	2.48 (2.04-2.89)	2.74 (2.17-3.25)	2.93 (2.23-3.53)
60-min	1.09 (0.994-1.21)	1.39 (1.27-1.55)	1.80 (1.62-2.00)	2.08 (1.87-2.34)	2.46 (2.17-2.79)	2.74 (2.37-3.12)	3.00 (2.54-3.46)	3.27 (2.69-3.81)	3.61 (2.85-4.28)	3.86 (2.93-4.64)
2-hr	1.38 (1.26-1.53)	1.76 (1.61-1.97)	2.26 (2.04-2.52)	2.62 (2.35-2.94)	3.08 (2.71-3.49)	3.42 (2.97-3.91)	3.74 (3.17-4.32)	4.05 (3.34-4.73)	4.46 (3.53-5.29)	4.75 (3.63-5.73)
3-hr	1.59	2.04	2.63	3.04	3.58	3.96	4.33	4.70	5.15	5.48

	(1.45-1.77)	(1.86-2.29)	(2.37-2.95)	(2.72-3.44)	(3.14-4.07)	(3.41-4.54)	(3.66-5.02)	(3.86-5.50)	(4.06-6.14)	(4.16-6.63)
6-hr	1.97 (1.80-2.20)	2.57 (2.33-2.88)	3.34 (3.00-3.75)	3.88 (3.46-4.38)	4.57 (4.00-5.20)	5.06 (4.36-5.81)	5.54 (4.67-6.41)	5.98 (4.92-7.01)	6.56 (5.16-7.82)	6.97 (5.29-8.43)
12-hr	2.42 (2.20-2.71)	3.20 (2.90-3.58)	4.19 (3.77-4.70)	4.90 (4.37-5.52)	5.80 (5.08-6.59)	6.45 (5.55-7.38)	7.07 (5.95-8.17)	7.67 (6.30-8.97)	8.44 (6.64-10.0)	8.98 (6.81-10.8)
24-hr	2.98 (2.66-3.33)	3.94 (3.52-4.40)	5.20 (4.63-5.82)	6.15 (5.46-6.90)	7.39 (6.53-8.32)	8.33 (7.32-9.43)	9.27 (8.10-10.5)	10.2 (8.85-11.7)	11.4 (9.81-13.2)	12.4 (10.5-14.4)
2-day	3.62 (3.28-3.98)	4.74 (4.29-5.22)	6.30 (5.69-6.95)	7.53 (6.79-8.33)	9.23 (8.27-10.3)	10.6 (9.43-11.8)	11.9 (10.6-13.4)	13.4 (11.8-15.1)	15.4 (13.4-17.5)	17.0 (14.6-19.5)
3-day	3.91 (3.54-4.30)	5.14 (4.66-5.67)	6.86 (6.20-7.58)	8.22 (7.41-9.10)	10.1 (9.05-11.2)	11.6 (10.3-12.9)	13.1 (11.6-14.7)	14.7 (12.9-16.6)	16.9 (14.7-19.3)	18.7 (16.0-21.5)
4-day	4.20 (3.81-4.62)	5.54 (5.02-6.12)	7.42 (6.70-8.20)	8.90 (8.02-9.86)	11.0 (9.83-12.2)	12.6 (11.2-14.1)	14.3 (12.6-16.0)	16.1 (14.1-18.1)	18.5 (16.0-21.1)	20.4 (17.5-23.5)
7-day	4.69 (4.26-5.18)	6.24 (5.65-6.88)	8.37 (7.56-9.24)	10.1 (9.06-11.1)	12.4 (11.1-13.8)	14.2 (12.7-15.9)	16.1 (14.2-18.1)	18.1 (15.9-20.5)	20.8 (18.0-23.8)	23.0 (19.7-26.4)
10-day	5.10 (4.63-5.63)	6.79 (6.16-7.51)	9.12 (8.25-10.1)	11.0 (9.88-12.1)	13.5 (12.1-15.0)	15.5 (13.8-17.3)	17.5 (15.4-19.7)	19.6 (17.2-22.2)	22.5 (19.5-25.7)	24.7 (21.2-28.5)
20-day	6.02 (5.46-6.65)	8.07 (7.29-8.89)	10.9 (9.77-12.0)	13.0 (11.7-14.4)	15.9 (14.2-17.7)	18.2 (16.1-20.3)	20.4 (18.0-22.9)	22.8 (19.9-25.7)	26.0 (22.4-29.6)	28.4 (24.2-32.6)
30-day	6.94 (6.27-7.64)	9.28 (8.39-10.2)	12.5 (11.2-13.7)	14.9 (13.3-16.5)	18.2 (16.2-20.2)	20.7 (18.3-23.1)	23.2 (20.4-26.1)	25.8 (22.5-29.2)	29.2 (25.2-33.4)	31.9 (27.2-36.8)
45-day	8.07 (7.31-8.91)	10.8 (9.78-11.9)	14.5 (13.0-16.0)	17.3 (15.5-19.1)	21.0 (18.7-23.3)	23.8 (21.1-26.6)	26.7 (23.5-29.9)	29.5 (25.9-33.4)	33.4 (28.9-38.1)	36.3 (31.1-41.7)
60-day	9.23 (8.34-10.2)	12.3 (11.1-13.6)	16.4 (14.8-18.2)	19.6 (17.6-21.7)	23.8 (21.3-26.5)	27.0 (24.0-30.2)	30.2 (26.7-33.9)	33.5 (29.3-37.8)	37.9 (32.8-43.2)	41.2 (35.3-47.4)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Estimates from the table in CSV format:

Main Link Categories:

[Home](#) | [OWP](#)

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Office of Water Prediction (OWP)
1325 East West Highway
Silver Spring, MD 20910
Page Author: [HDSC webmaster](#)
Page last modified: April 21, 2017

[Map Disclaimer](#)
[Disclaimer](#)
[Credits](#)
[Glossary](#)

[Privacy Policy](#)
[About](#)
[Career Opportunity](#)

WinTR-55 Current Data Description

--- Identification Data ---

User: CEB Date: 10/26/2022
 Project: Units: English
 SubTitle: Areal Units: Acres
 State: Hawaii
 County: Kauai
 Filename: \\tt.local\gfs\USVolume2\Legacy\tts619fs2\PROJECTS\KAUAI COUNTY\197-220048 - Kekaha Vertical Ex

--- Sub-Area Data ---

Name	Description	Reach	Area (ac)	RCN	Tc
DAA1-1		Outlet	0.39	79	0.100
DAA1-2		Outlet	1.71	79	0.100
DAA1-3		Outlet	0.97	79	0.100
DAA1-4		Outlet	0.41	79	0.120

Total area: 3.48 (ac)

--- Storm Data ---

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.94	5.2	6.15	7.39	8.33	9.27	2.98

Storm Data Source: User-provided custom storm data
 Rainfall Distribution Type: Type I
 Dimensionless Unit Hydrograph: <standard>

CEB

Kauai County, Hawaii

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period	
	25-Yr (cfs) (hr)	100-Yr (cfs) (hr)

SUBAREAS

DAA1-1	1.52 9.93	2.07 9.93
--------	--------------	--------------

DAA1-2	6.66 9.93	9.04 9.93
--------	--------------	--------------

DAA1-3	3.79 9.93	5.15 9.93
--------	--------------	--------------

DAA1-4	1.54 9.94	2.10 9.94
--------	--------------	--------------

REACHES

OUTLET	13.50	18.34
--------	-------	-------

CEB

Kauai County, Hawaii

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period	
	25-Yr (cfs)	100-Yr (cfs)

SUBAREAS		
DAA1-1	1.52	2.07
DAA1-2	6.66	9.04
DAA1-3	3.79	5.15
DAA1-4	1.54	2.10
REACHES		
OUTLET	13.50	18.34

WinTR-55 Current Data Description

--- Identification Data ---

User: CEB Date: 10/26/2022
 Project: Units: English
 SubTitle: Areal Units: Acres
 State: Hawaii
 County: Kauai
 Filename: \\tt.local\gfs\USVolume2\Legacy\tts619fs2\PROJECTS\KAUAI COUNTY\197-220048 - Kekaha Vertical Ex

--- Sub-Area Data ---

Name	Description	Reach	Area (ac)	RCN	Tc
DAB1_1		Outlet	0.67	79	0.100
DAB1_2		Outlet	0.11	79	0.100
DAB1_3		Outlet	0.57	79	0.100
DAB1_4		Outlet	0.21	79	0.100

Total area: 1.56 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.94	5.2	6.15	7.39	8.33	9.27	2.98

Storm Data Source: User-provided custom storm data
 Rainfall Distribution Type: Type I
 Dimensionless Unit Hydrograph: <standard>

CEB

Kauai County, Hawaii

Hydrograph Peak/Peak Time Table

Sub-Area Peak Flow and Peak Time (hr) by Rainfall Return Period
or Reach 25-Yr 100-Yr
Identifier (cfs) (cfs)
(hr) (hr)

SUBAREAS

DAB1_1 2.62 3.56
9.93 9.93

DAB1_2 0.42 0.58
9.93 9.93

DAB1_3 2.22 3.01
9.93 9.93

DAB1_4 0.82 1.12
9.93 9.93

REACHES

OUTLET 6.08 8.27

CEB

Kauai County, Hawaii

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period	
	25-Yr (cfs)	100-Yr (cfs)

SUBAREAS		
DAB1_1	2.62	3.56
DAB1_2	0.42	0.58
DAB1_3	2.22	3.01
DAB1_4	0.82	1.12
REACHES		
OUTLET	6.08	8.27

WinTR-55 Current Data Description

--- Identification Data ---

User: CEB Date: 10/26/2022
 Project: Units: English
 SubTitle: Areal Units: Acres
 State: Hawaii
 County: Kauai
 Filename: \\tt.local\gfs\USVolume2\Legacy\tts619fs2\PROJECTS\KAUAI COUNTY\197-220048 - Kekaha Vertical Ex

--- Sub-Area Data ---

Name	Description	Reach	Area (ac)	RCN	Tc
DAC3_1		Outlet	0.85	79	0.100
DAC3_2		Outlet	4.36	79	0.202
DAC3_3		Outlet	1.13	79	0.149
DAC3_4		Outlet	1.18	79	0.184

Total area: 7.52 (ac)

--- Storm Data ---

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.94	5.2	6.15	7.39	8.33	9.27	2.98

Storm Data Source: User-provided custom storm data
 Rainfall Distribution Type: Type I
 Dimensionless Unit Hydrograph: <standard>

CEB

Kauai County, Hawaii

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period	
	25-Yr (cfs)	100-Yr (cfs)

SUBAREAS		
DAC3_1	3.32	4.51
DAC3_2	14.58	19.81
DAC3_3	4.07	5.53
DAC3_4	4.03	5.47
REACHES		
OUTLET	25.35	34.44

WinTR-55 Current Data Description

--- Identification Data ---

User: CEB Date: 10/26/2022
 Project: Units: English
 SubTitle: Areal Units: Acres
 State: Hawaii
 County: Kauai
 Filename: \\tt.local\gfs\USVolume2\Legacy\tts619fs2\PROJECTS\KAUAI COUNTY\197-220048 - Kekaha Vertical Ex

--- Sub-Area Data ---

Name	Description	Reach	Area (ac)	RCN	Tc
DAF2-1		Outlet	0.32	79	0.100
DAF2-2		Outlet	0.91	79	0.133
DAF2-3		Outlet	2.65	79	0.262
DAF2-4		Outlet	0.68	79	0.125

Total area: 4.56 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.94	5.2	6.15	7.39	8.33	9.27	2.98

Storm Data Source: User-provided custom storm data
 Rainfall Distribution Type: Type I
 Dimensionless Unit Hydrograph: <standard>

CEB

Kauai County, Hawaii

Hydrograph Peak/Peak Time Table

Sub-Area Peak Flow and Peak Time (hr) by Rainfall Return Period
or Reach 25-Yr 100-Yr
Identifier (cfs) (cfs)
 (hr) (hr)

SUBAREAS

DAF2-1 1.25 1.69
 9.93 9.93

DAF2-2 3.35 4.55
 9.95 9.95

DAF2-3 8.23 11.18
 10.05 10.04

DAF2-4 2.53 3.44
 9.94 9.94

REACHES

OUTLET 14.34 19.47

CEB

Kauai County, Hawaii

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period	
	25-Yr (cfs)	100-Yr (cfs)

SUBAREAS		
DAF2-1	1.25	1.69
DAF2-2	3.35	4.55
DAF2-3	8.23	11.18
DAF2-4	2.53	3.44
REACHES		
OUTLET	14.34	19.47

Mannings Equation Calculator for Trapezoidal Channels with known Q

Project Name: Kekaha Landfill Vertical Expansion
Project Number:
Description: Diversion Berms and Bench Flows

$$Q = \frac{1.486 R^{2/3} S_o^{1/2} A}{n}$$

$$\frac{b}{V_{p100} Y_{p100}} \leq 1.15$$

Prepared by: CEB
 Date: 11/15/2022
 Checked by:
 Date: 11/18/2022

(Note: Triangular Channels are a special case with bottom width = 0)
 (Note: For rectangular channels enter negative number for sideslopes)

Where: Q = Flow Rate (cfs)
 n = Manning's n
 A = Flow Area (ft²)
 R = Hydraulic Radius (ft)
 So = Sf = Bed Slope (ft/ft)

b = Channel Bottom Width (ft)
 V_{p100} = Peak Velocity for 100-yr Event
 Y_{p100} = Peak Flow Depth for 100-yr Event

Enter Data in Blue Text Cells

Reach	Slope (ft/ft)	n	Bottom Width (ft)	Sideslope1 (x:1)	Sideslope2 (x:1)	Depth (ft)	V (fps)	Q (cfs)	Regime	Low Flow Problems?	Area (SF)	WP (ft)	Hyd. Rad. (ft)	Top Width (ft)	Hyd. Depth (ft)	Nf	Act. Sideslope1	Act. Sideslope2	Low Flow Check Result
Berm C2-2	0.03	0.027	0	3.5	2	1.089	6.08	19.83	Super	No Low-Flow Channel Incision Predicted	3.2613	6.3991	0.5096	5.9895	0.5445	1.4522	3.5	2	0.9044782
Berm F2-3	0.01	0.027	1	2	2	1.005	3.70	11.18	Sub	Low Flow Channel Incision Predicted	3.0251	5.4945	0.5506	5.02	0.6026	0.8391	2	2	1.351344
Road	0.07	0.027	2	2	2	0.67	8.52	19.07	Super	No Low-Flow Channel Incision Predicted	2.2378	4.9963	0.4479	4.68	0.4782	2.1718	2	2	0.8196653

Reference: Chow, Ven Ti. Open-Channel Hydraulics. New York: McGraw-Hill Inc. 1959.
 City of Tucson, Drainage Design and Floodplain Management Manual. 1989.

Mannings Equation Calculator for Trapezoidal Channels with known Q

Project Name: Kekaha Landfill Vertical Expansion
Project Number:
Description: Diversion Berms and Bench Flows

$$Q = \frac{1.486 R^{2/3} S_o^{1/2} A}{n}$$

$$\frac{b}{V_{p100} Y_{p100}} \leq 1.15$$

Prepared by: CEB
 Date: 11/15/2022
 Checked by: GRB
 Date: 11/18/2022

(Note: Triangular Channels are a special case with bottom width = 0)
 (Note: For rectangular channels enter negative number for sideslopes)

Where: Q = Flow Rate (cfs)
 n = Manning's n
 A = Flow Area (ft²)
 R = Hydraulic Radius (ft)
 So = Sf = Bed Slope (ft/ft)

b = Channel Bottom Width (ft)
 V_{p100} = Peak Velocity for 100-yr Event
 Y_{p100} = Peak Flow Depth for 100-yr Event

Enter Data in Blue Text Cells

Reach	Slope (ft/ft)	n	Bottom Width (ft)	Sideslope1 (x:1)	Sideslope2 (x:1)	Depth (ft)	V (fps)	Q (cfs)	Regime	Low Flow Problems?	Area (SF)	WP (ft)	Hyd. Rad. (ft)	Top Width (ft)	Hyd. Depth (ft)	Nf	Act. Sideslope1	Act. Sideslope2	Low Flow Check Result
A0	0.285	0.035	1	2	2	0.35	8.55	5.09	Super	No Low-Flow Channel Incision Predicted	0.5950	2.5652	0.2319	2.4	0.2479	3.0270	2	2	0.8017822
A1	0.285	0.035	1	2	2	0.66	12.04	18.44	Super	No Low-Flow Channel Incision Predicted	1.5312	3.9516	0.3875	3.64	0.4207	3.2723	2	2	0.4579481
A1 Pmt	0.285	0.035	1	2	2	0.66	12.04	18.44	Super	No Low-Flow Channel Incision Predicted	1.5312	3.9516	0.3875	3.64	0.4207	3.2723	2	2	0.4579481
B1	0.285	0.035	1	2	2	0.45	9.78	8.37	Super	No Low-Flow Channel Incision Predicted	0.8550	3.0125	0.2838	2.8	0.3054	3.1205	2	2	0.635904
B1 Pmt	0.285	0.035	2	2	2	0.34	9.20	8.38	Super	No Low-Flow Channel Incision Predicted	0.9112	3.5205	0.2588	3.36	0.2712	3.1137	2	2	1.0740193
C0	0.285	0.035	1	2	2	0.33	8.29	4.54	Super	No Low-Flow Channel Incision Predicted	0.5478	2.4758	0.2213	2.32	0.2361	3.0056	2	2	0.8482987
C1	0.285	0.035	1	2	2	0.5	10.36	10.36	Super	No Low-Flow Channel Incision Predicted	1.0000	3.2361	0.3090	3	0.3333	3.1610	2	2	0.5793751
C2	0.285	0.035	2	2	2	0.73	13.89	35.08	Super	No Low-Flow Channel Incision Predicted	2.5258	5.2647	0.4798	4.92	0.5134	3.4157	2	2	0.4853141
C2 Pmt	0.285	0.035	1	2	2	0.89	14.21	35.17	Super	No Low-Flow Channel Incision Predicted	2.4742	4.9802	0.4968	4.56	0.5426	3.4007	2	2	0.3604494
F1	0.207	0.035	1	2	2	0.32	6.95	3.65	Super	No Low-Flow Channel Incision Predicted	0.5248	2.4311	0.2159	2.28	0.2302	2.5520	2	2	1.0255139
F2	0.255	0.035	2	2	2	0.56	11.40	19.92	Super	No Low-Flow Channel Incision Predicted	1.7472	4.5044	0.3879	4.24	0.4121	3.1295	2	2	0.6641865
F2 Pmt	0.255	0.035	1	2	2	0.7	11.77	19.77	Super	No Low-Flow Channel Incision Predicted	1.6800	4.1305	0.4067	3.8	0.4421	3.1184	2	2	0.4613779

Reference: Chow, Ven Ti. Open-Channel Hydraulics. New York: McGraw-Hill Inc. 1959.
 City of Tucson, Drainage Design and Floodplain Management Manual. 1989.

Mannings Equation Calculator for Circular Channels flowing at any depth up to full (invalid for pressure flow)

Project Name: Kekaha Vertical Expansion
Project Number: 220048
Description: Culvert at road crossing

Prep by: CEB
 Date: 11/15/2022
 Chkd by: GRB
 Date: 11/18/2022

Enter Data in Blue Text Cells

Reach	Bed Slope	n	Pipe Diameter	Flow Depth	Velocity	Volumetric Flow Rate	Regime	Flow Area	Wetted Perimeter	Hydraulic Radius	Average Width	Froude Number
Description	(ft/ft)	(unitless)	(ft)	(ft)	(ft/s)	(ft ³ /s)		(ft ²)	(ft)	(ft)	(ft)	(unitless)
1	0.10000	0.010	1.500	0.92	26.389	29.988	Super	1.136	2.699	0.421	1.235	4.848

Notes:

- Based on Mannings Equation - $Q=(1.49/n)*R^{2/3}*S^{1/2}*A$
- Calculation of flow area and wetted perimeter for given diameter and flow depth from geometric analysis of circular form

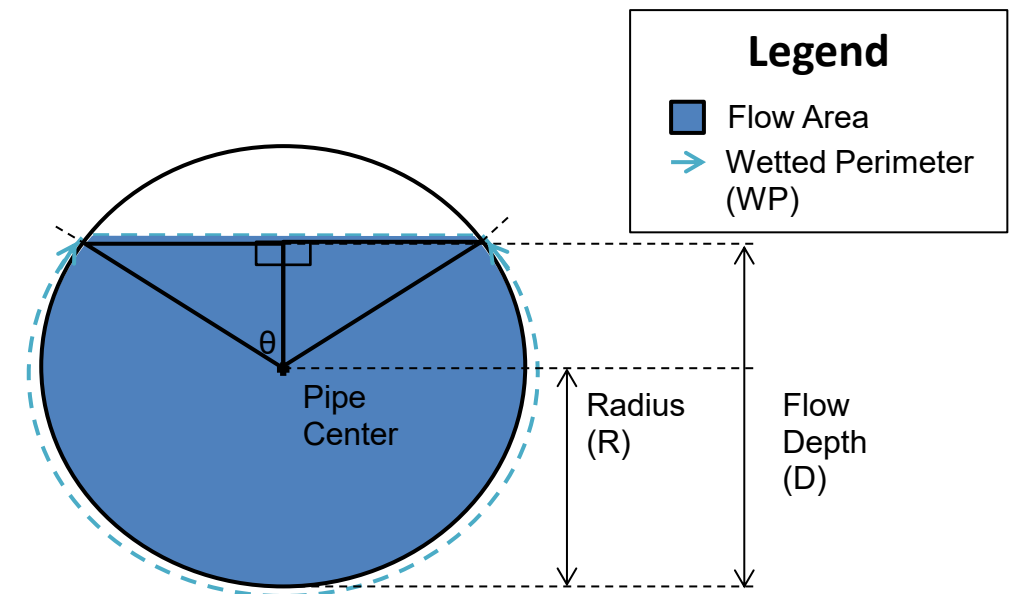
$$\text{Froude Number } (N_f) = \frac{\left(\frac{Q}{b_{avg}}\right)}{\sqrt{g*\left(\frac{A}{b_{avg}}\right)^3}}$$

Mannings Equation:

$$\text{Volumetric Flow Rate } (Q) = \frac{1.486*A*R^{2/3}*\sqrt{S_o}}{n}$$

Where:

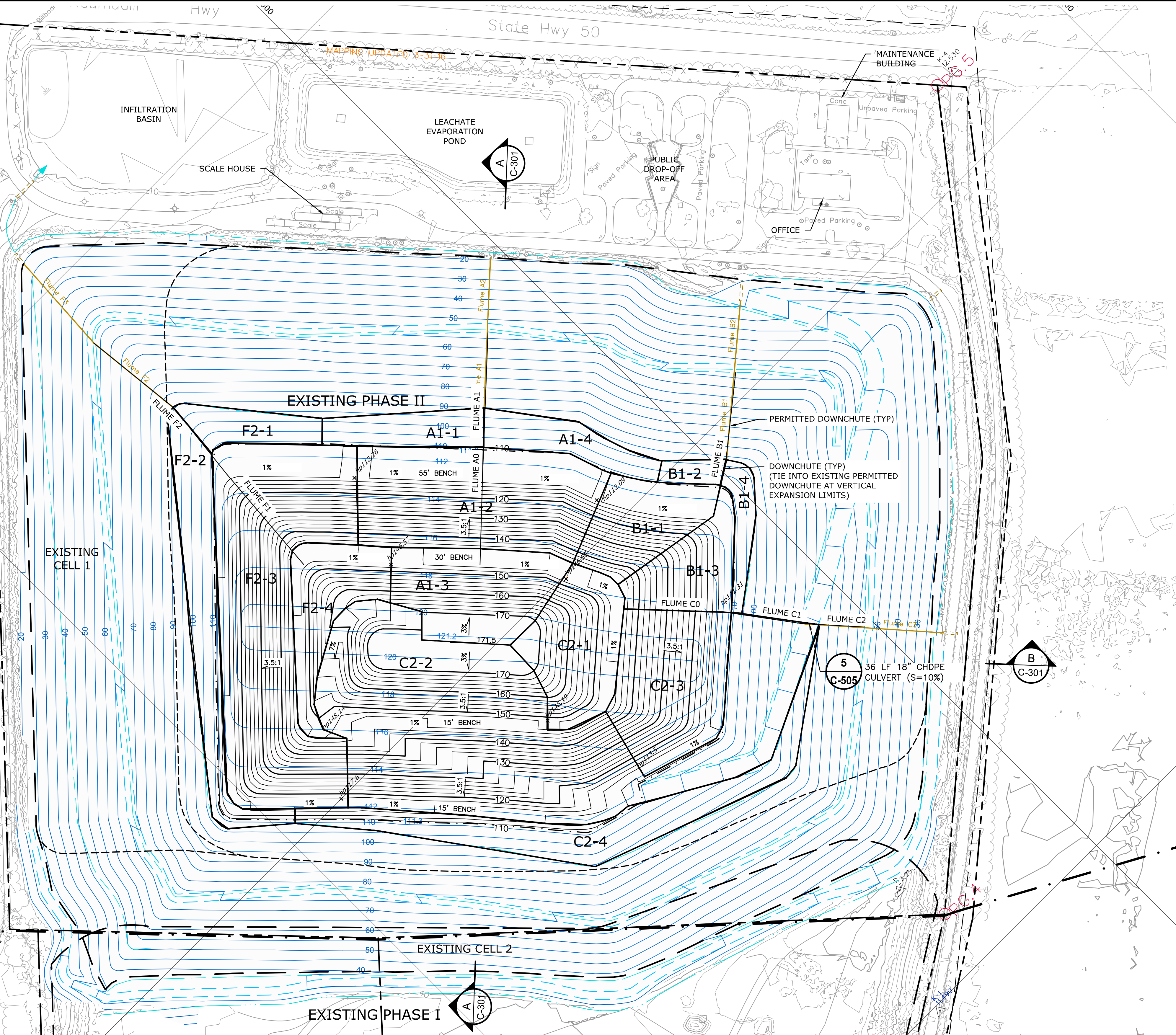
- n = Manning's Roughness Coefficient
- Q = Volumetric Flow Rate = Flow Area*Velocity (ft³/s)
- b_{avg} = Average Width = Flow Area/Flow Depth (ft)
- A = Flow Area = Total Area - Saggita Area (ft²)
- g = Gravitational Acceleration (32.2 ft/s²)
- R = Hydraulic Radius = Flow Area/Wetted Perimeter (ft)
- S_o = Bed Slope (ft/ft)



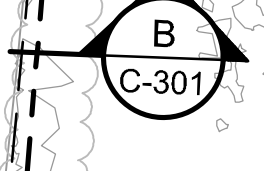
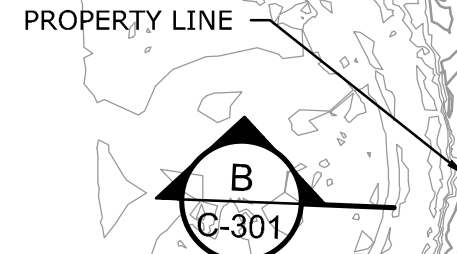
Reference: Lindeburg, M.R. 2008. Professional Publications, Inc. Belmont, CA.



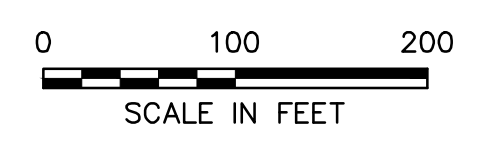
E 1556000
N 56000



- LEGEND:**
- PROPERTY LINE
 - - - EASEMENT
 - - - PHASE LIMIT
 - - - CELL LIMIT
 - - - PROJECT LIMIT
 - 50 EXISTING INDEX CONTOUR (10FT INTERVAL)
 - EXISTING INTERMEDIATE CONTOUR (2FT INTERVAL)
 - 50 PERMITTED FINAL COVER CONTOUR (10FT INTERVAL) (BY OTHERS)
 - PERMITTED FINAL COVER CONTOUR (5FT INTERVAL) (BY OTHERS)
 - PERMITTED EDGE OF ACCESS ROAD/BENCH
 - PERMITTED STORMWATER FLOW
 - 50 PROPOSED FINAL COVER CONTOUR (10FT INTERVAL)
 - PROPOSED FINAL COVER CONTOUR (2FT INTERVAL)
 - SPECIAL MAINTENANCE AREA (SMA) / CONSERVATION DISTRICT BOUNDARY

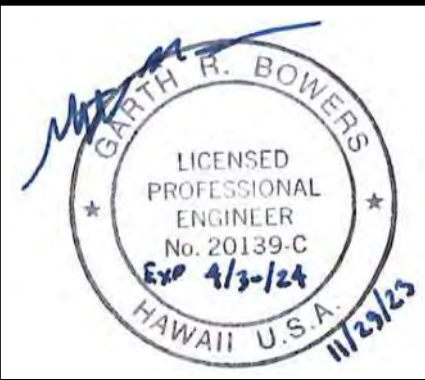


- NOTES:**
- TOPOGRAPHIC CONTOURS PREPARED BY WALKER ASSOCIATES. DATE OF PHOTOGRAPHY: OCTOBER 2022.
 - PHASE II AREA TOPOGRAPHY UPDATED BY AIRFRAME LLC , MAY 5, 2021.
 - HORIZONTAL DATUM IS BASED ON NAD83 (1986) HAWAII STATE PLANE ZONE 4. VERTICAL DATUM BASED ON LOCAL TIDAL, WHICH IS SITE-SPECIFIC AND CORRELATES TO DESIGNATED USGS BRASS MONUMENT G1000 PLUS 1.21 FEET (AECOM, 2018).



REV	REVISION DESCRIPTION	DATE

TETRA TECH
21700 Copley Drive, Suite 200
Diamond Bar, CA 91765
TEL 909.860.7777 FAX 909.860.8017



KEKAHA MUNICIPAL SOLID WASTE LANDFILL
PHASE II - VERTICAL EXPANSION

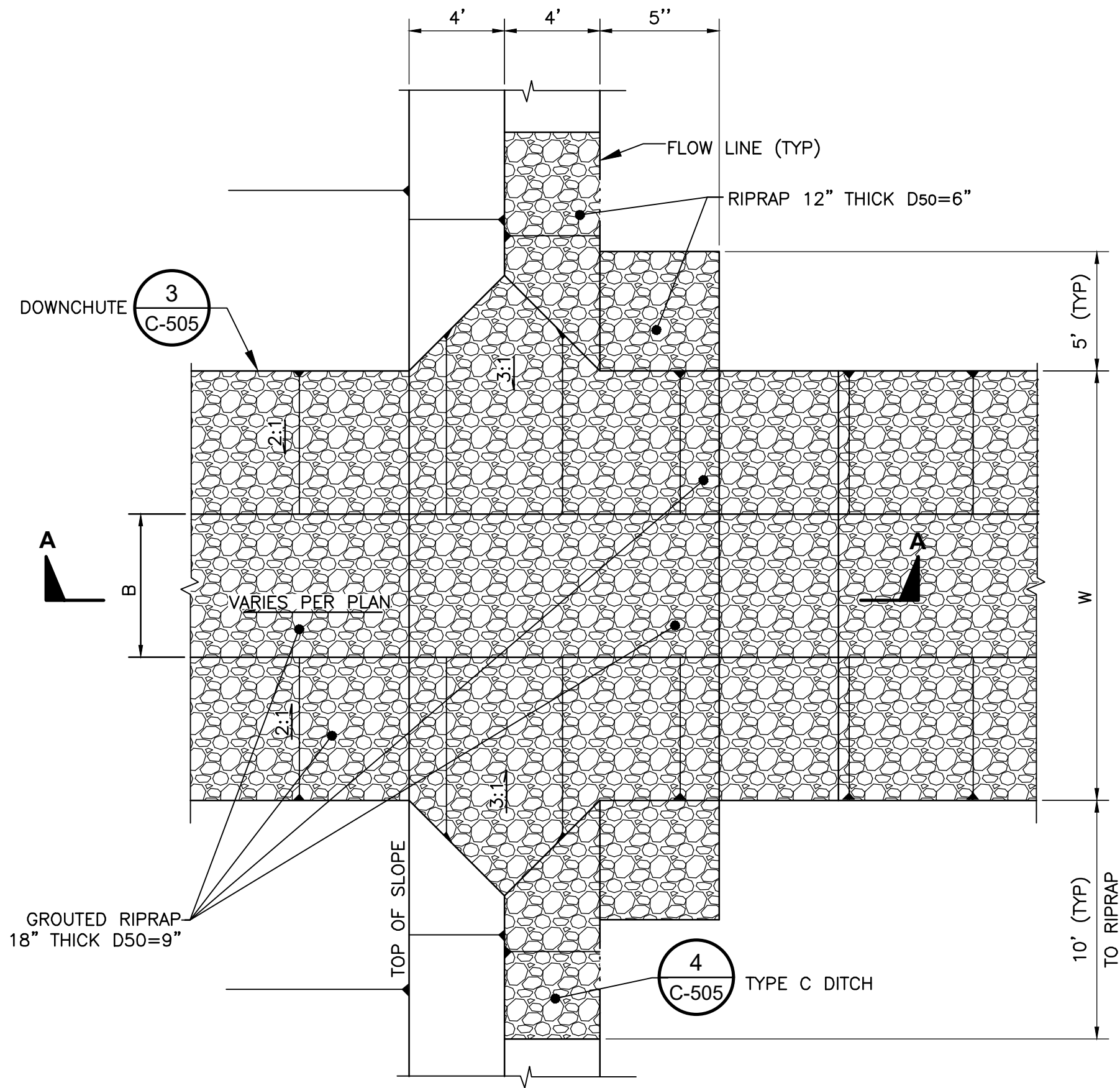
SURFACE WATER MANAGEMENT PLAN

DESIGNED BY: GRB CHECKED BY: CHM DATE: NOV 2023
DRAWN BY: MDC/GVP APPROVED BY: GRB FILE: 220048-C-103_SURF WTR.PLAN.dwg

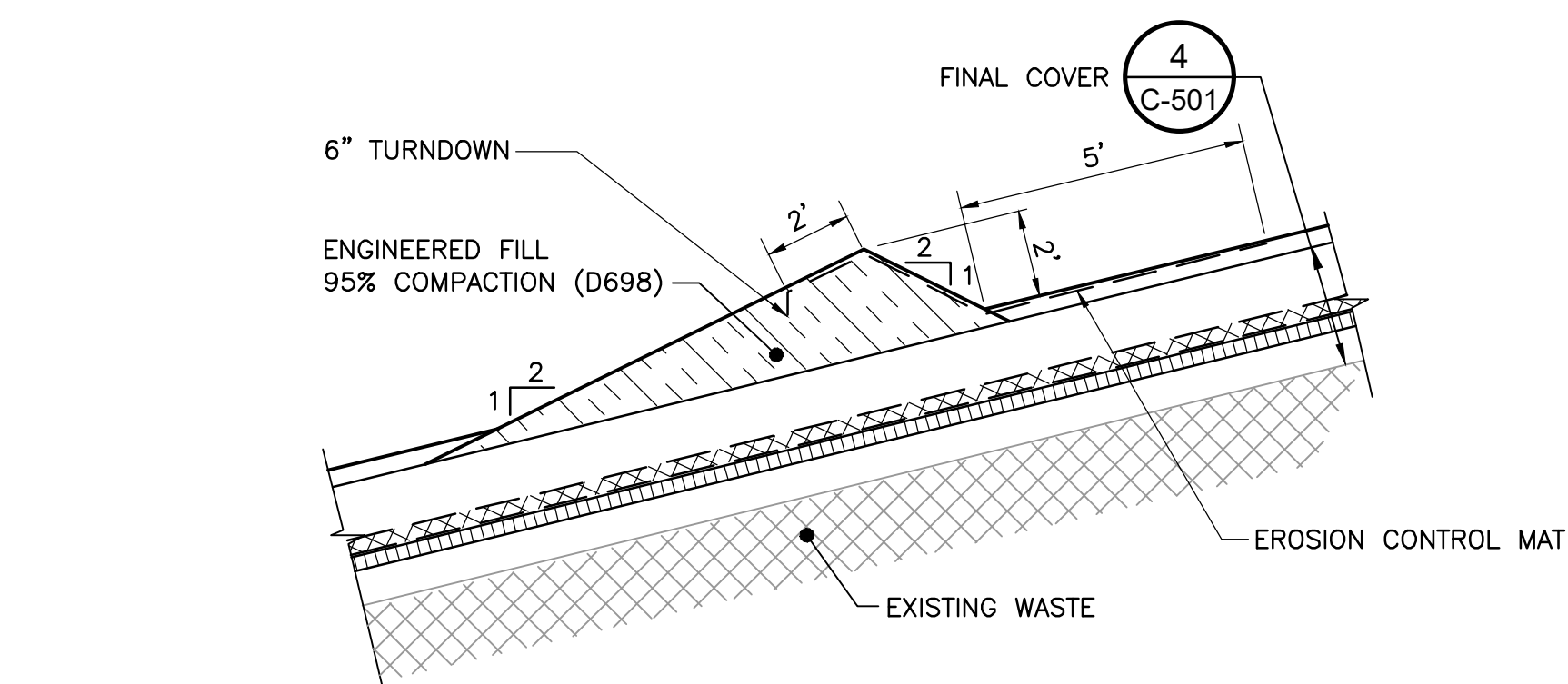
SHEET
C-103

X:\PROJECTS\KAUAI COUNTY\197-220048 - Kekaha Vertical Expansion\Project Drawings\220048-C-103_SURF WTR.PLAN.dwg 11/28/2023 3:54 PM

ISSUED FOR PERMITTING - NOT FOR CONSTRUCTION



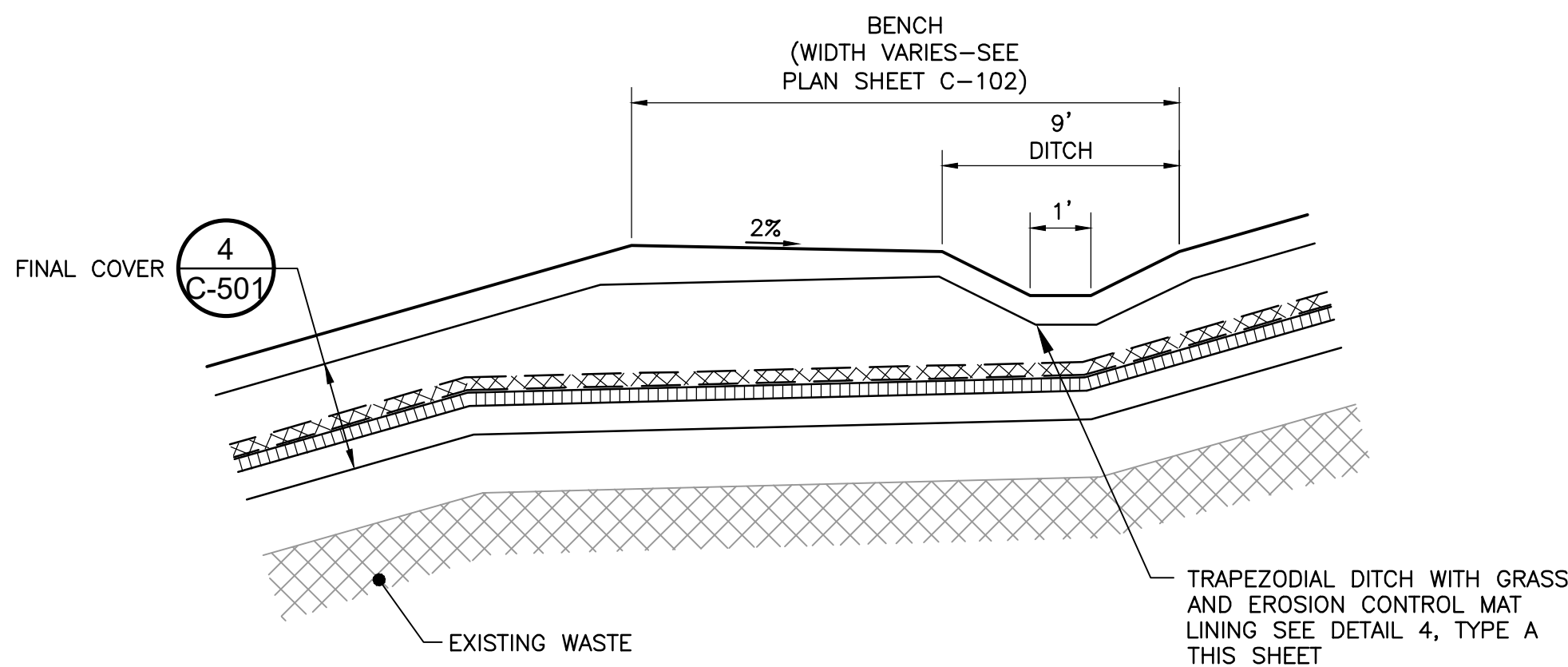
PLAN



SECTION A-A

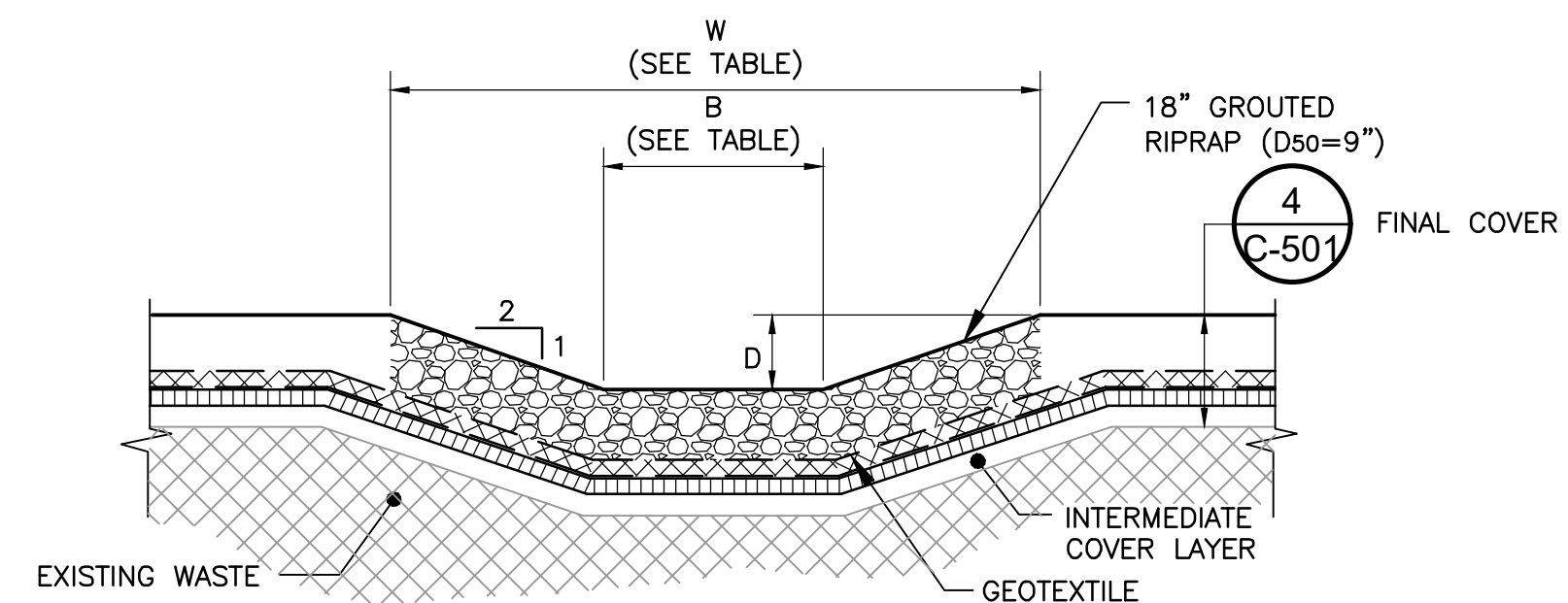
DOWNCHUTE FLUME/DIVERSION BERM JUNCTION

DETAIL 1
SCALE: NOT TO SCALE C-505



FINAL COVER BENCH PROFILE

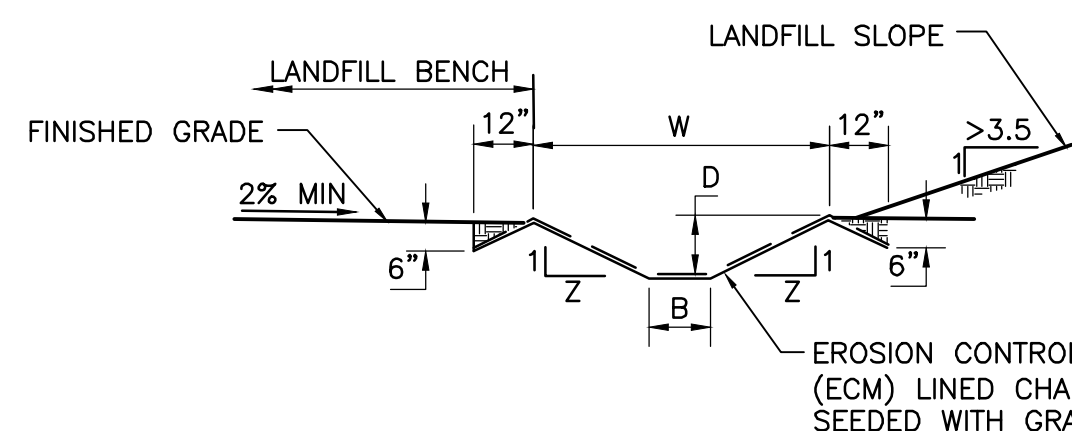
DETAIL 2
SCALE: NOT TO SCALE C-505



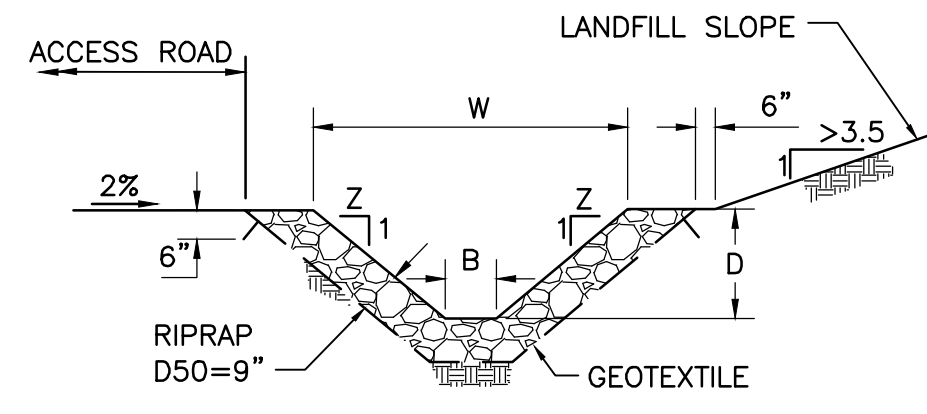
DOWNCHUTE

DETAIL 3
SCALE: NOT TO SCALE C-505

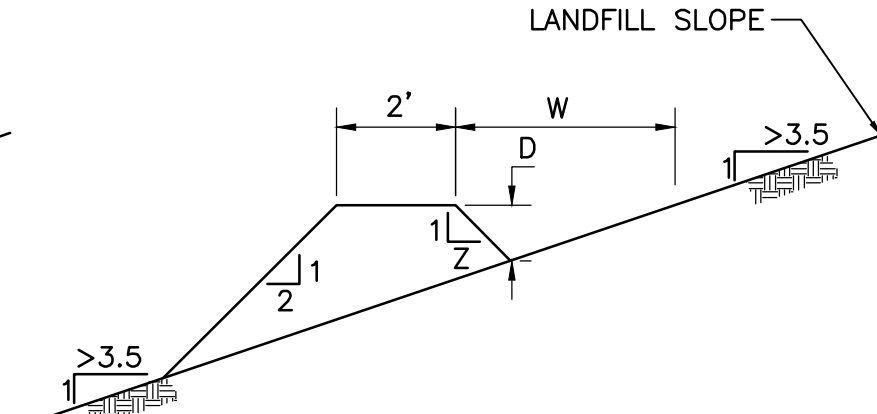
DOWNCHUTE/FLUME ID	DIMENSION		
	TOP WIDTH W (FT)	BOTTOM WIDTH B (FT)	DEPTH D (FT)
A0	7	1	1.5
A1	9	1	2
B1	7	1	1.5
C0	7	1	1.5
C1	7	1	1.5
C2	10	2	2
F1	7	1	1.5
F2	10	2	2



TYPE A DITCH, BENCH/TERRACE



TYPE B DITCH, ACCESS ROAD

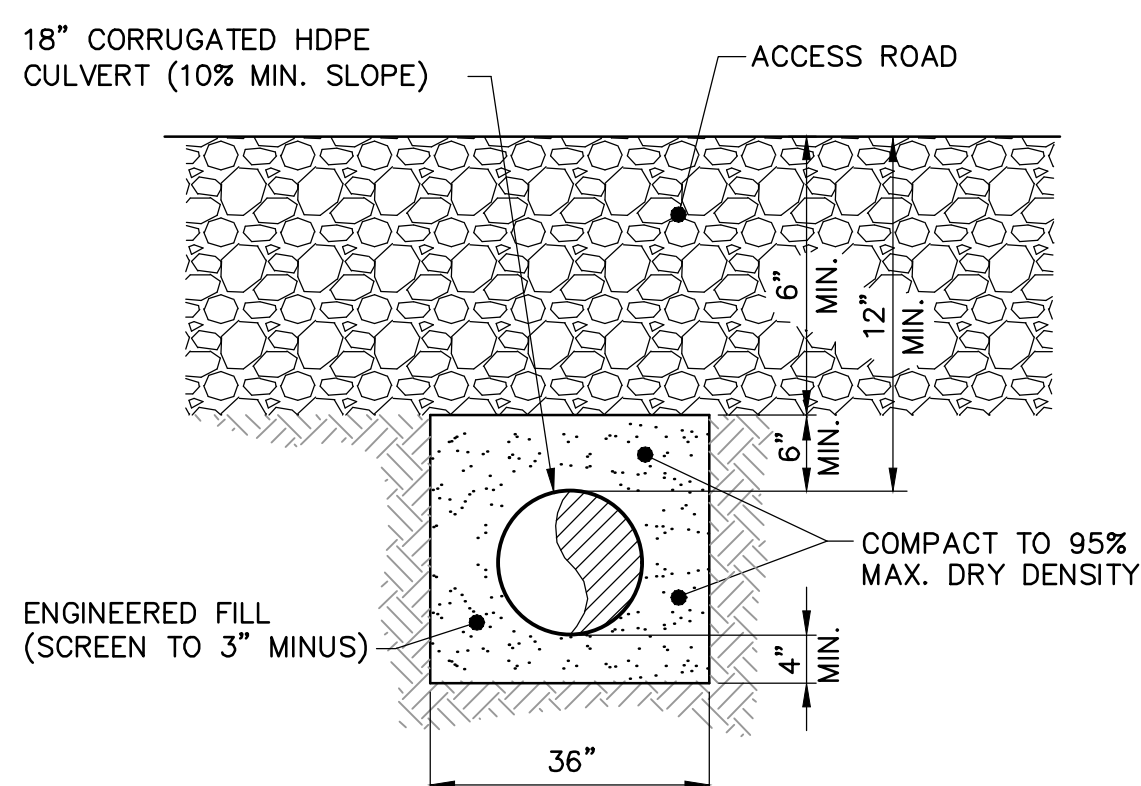


TYPE C DITCH, SIDESLOPE DIVERSION BERM

TYPE	DIMENSION			SIDE SLOPE Z	SHAPE	LINING
	W (FT)	B (FT)	D (FT)			
A	9	1	2	2.0	TRAPEZOIDAL	GRASS LINED WITH ECM
B	8	2	1.5	2.0	TRAPEZOIDAL	ROCK RIPRAP
C	11	0	2	2.0	V-SHAPED	GRASS LINED WITH ECM

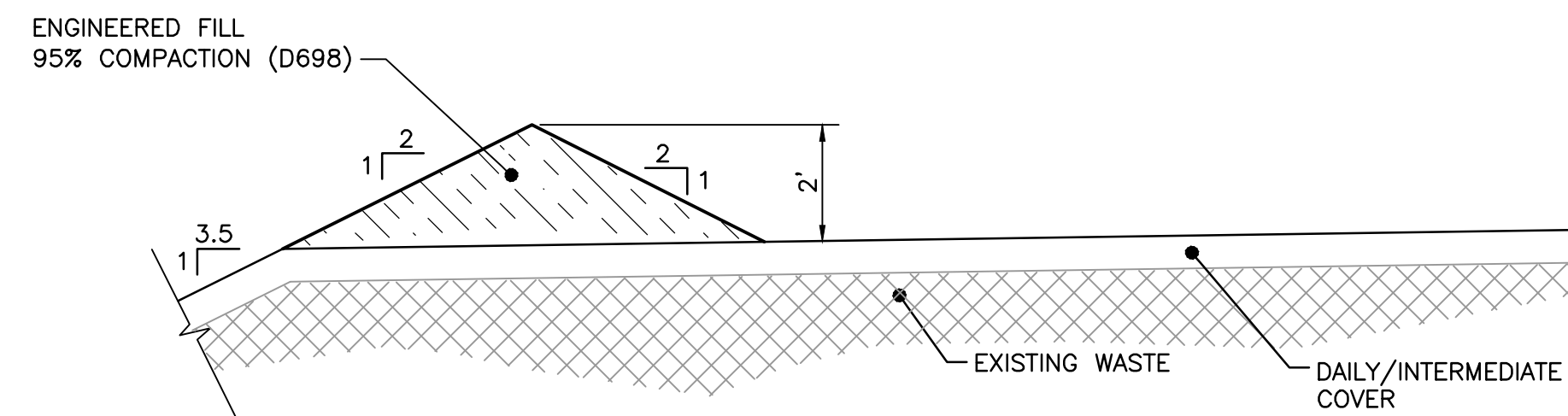
DRAINAGE DITCH DETAIL

DETAIL 4
SCALE: NOT TO SCALE C-505



CULVERT TRENCH

DETAIL 5
SCALE: NOT TO SCALE C-505



SAFETY BERM

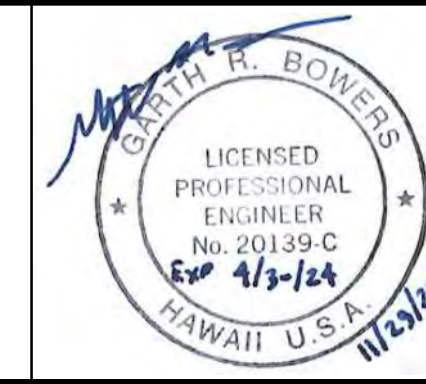
DETAIL 6
SCALE: NOT TO SCALE C-505

X:\PROJECTS\KAHALA COUNTY\197-220048 - Kekaha Vertical Expansion\Project Drawings\220048-C-506_LF DETAILS.dwg 1/28/2023 4:08 PM



REV	REVISION DESCRIPTION	DATE

TETRA TECH
21700 Copley Drive, Suite 200
Diamond Bar, CA 91765
TEL 909.860.7777 FAX 909.860.8017



KEKAHA MUNICIPAL SOLID WASTE LANDFILL
PHASE II - VERTICAL EXPANSION

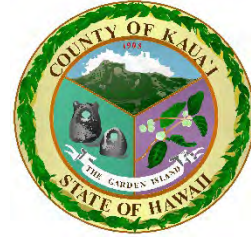
STORMWATER DETAILS

DESIGNED BY: GRB CHECKED BY: CHM DATE: NOV 2023
DRAWN BY: MDC/GVP APPROVED BY: GRB FILE: 220048-C-506_LF DETAILS.dwg

SHEET
C-505

ISSUED FOR PERMITTING - NOT FOR CONSTRUCTION

APPENDIX D
Spill Prevention, Control, and
Countermeasures Plan
(Geosyntec Consultants, 2024)



SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN

**KEKAHA MUNICIPAL SOLID WASTE LANDFILL –
PHASE II
6900 KAUMUALI'I HWY
KEKAHA, KAUA'I 96752**

Prepared for

County of Kaua'i
County of Kaua'i Solid Waste Division
4444 Rice Street, Suite 295
Lihue, Hawai'i 96766

Prepared by

Geosyntec Consultants, Inc.
1111 Broadway, 6th Floor
Oakland, California 94607

Project Number: WG3074

August 30, 2024

GENERAL INFORMATION

Facility Name: Kekaha Municipal Solid Waste Landfill Phase II

Facility Address: 6900-D Kaumuali'i Highway, Kekaha, Kaua'i, Hawai'i 96752

Facility Phone Number: (808) 337-1416

Designated Person Responsible for Spill Prevention: John Ruiz

Types of Operations: Municipal Solid Waste Landfill

Date of Last Plan Review: September 1, 2023

EMERGENCY NOTIFICATION [40 CFR 112.7(a)(3)(vi)]

FACILITY CONTACT

Name: John Ruiz Cell Number: (808) 346-4393
Title: Landfill Supervisor

ENVIRONMENTAL CONTACT

Name: Justin Lottig Cell Number: (808) 479-0749
Title: Senior Scientist, Geosyntec Consultants

SPILL RESPONSE CONTACT

Pacific Commercial Services, Inc. (808) 545-4599

AGENCY CONTACTS

National Response Center: (800) 424-8802

EPA Region 9: (866) 372-9378

To report an environmental emergency: (800) 300-2193

State of Hawai'i Department of Health

Hazard Evaluation and Emergency Response Office (808) 586-4249

After Hours: (808) 236-8200

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1. GENERAL APPLICABILITY [40 CFR 112.1]

This Spill Prevention, Control, and Countermeasure (SPCC) Plan has been prepared for the Kekaha Municipal Solid Waste Landfill (Landfill) Phase II, pursuant to Federal Regulations promulgated in 1973 [Code of Federal Regulations (CFR), Title 40, Chapter I, Subchapter D, Part 112 – Oil Pollution Prevention]. The objective of this SPCC Plan is to describe the measures to be employed to prevent the discharge of oil from non-transportation related onshore facilities into or upon the navigable waters of the United States or adjoining shorelines.

For the purpose of this SPCC Plan, the following are defined in 40 CFR 112.2:

- “Oil” means oil of any kind or in any form, including, but not limited to: fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and, other oils and greases, including petroleum, fuel oil, sludge, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredged spoil.
- “Discharge” includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping of oil.
- “Navigable Waters” of the United States means “navigable waters” as defined in section 502(7) of the Federal Water Pollution Control Act, (FWPCA) (Pub. L. 92-500) also known as the Clean Water Act (CWA), and includes:
 - All navigable waters of the United States, as defined in judicial decisions prior to the passage of the 1972 FWPCA (Pub. L. 92-500) also known as the CWA, and tributaries of such waters as:
 - Interstate waters, including interstate wetland.
 - Intrastate lakes, rivers, and streams (including intermittent streams) which are utilized by interstate travelers for recreational or other purposes; and mudflats, sand flats, and wetlands, the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce.
 - Intrastate lakes, rivers, and streams from which fish or shellfish are taken and sold in interstate commerce.
 - Waters of the United States, including the territorial seas.
 - All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide. (40 CFR 110.2).
- “Oil-filled Operational Equipment” means equipment that includes an oil storage container (or multiple containers) in which the oil is present solely to support the function of the apparatus or the device. Oil-filled operational equipment is not considered a bulk storage container, and does not include oil-filled manufacturing equipment (flow-through process). Examples of oil-filled operational equipment include, but are not limited to, hydraulic systems, lubricating systems (e.g., those for

pumps, compressors and other rotating equipment, including pump jack lubrication systems), gear boxes, machining coolant systems, heat transfer systems, transformers, circuit breakers, electrical switches, and other systems containing oil solely to enable the operation of the device.

- “Mobile Tank” is a bulk storage container onboard a vehicle or being towed that is designed or used solely to store and transport fuel for transfer into or from an aircraft, motor vehicle, locomotive vessel, ground service equipment, or other oil storage container.

The SPCC Plan regulations apply to any owner or operator of a non-transportation related onshore and offshore facility engaged in drilling, producing, gathering, storing, processing, refining, transferring, distributing, using, or consuming oil and oil products, which due to its location, could reasonably be expected to discharge oil in quantities that may be harmful as described in Part 110 into or upon navigable waters or adjoining shorelines.

Harmful quantities include discharges of oil that:

- Violate applicable water quality standards.
- Cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.

More specifically, the SPCC Plan regulations apply to:

- All facilities that have an above ground aggregate storage capacity exceeding 1,320 gallons of oil.
- All containers with volumes less than 55 gallons and motive power containers (i.e. fuel and hydraulic tanks on moving vehicles) are exempt. This does not include tanker trucks that are used as mobile refuelers.
- All facilities that have a completely buried storage capacity greater than 42,000 gallons of oil, excluding containers that are “permanently closed.”

Table 1, below, cross references the requirements of 40 CFR 112 with the Sections of the SPCC Plan which address them.

Table 1: SPCC Plan Cross-Reference

Provision	Plan Section
112.3(d)	2.0 Professional Engineer Certification
112.3(e)	5.0 Location of SPCC Plan
112.5	4.0. SPCC Plan Amendment
112.7	5.0 Management Approval and Designated Person
112.7	1.0 Table 1: SPCC Plan Cross-Reference
112.7(a)(3)	6.2-6.7 Facility Information Figures 1 - 3: Facility Maps
112.7(a)(4)	6.8 Discharge Notification
112.7(a)(5)	6.5 Discharge Response
112.7(b)	6.10 Potential Discharge Volumes and Direction of Flow
112.7(c)	6.11 Containment and Diversionary Structures
112.7(d)	Not applicable
112.7(e)	6.12 Inspections, Tests, and Records
112.7(f)	6.13 Personnel, Training and Discharge Prevention Procedures 9.0 Record of Annual Discharge Prevention Briefings and Training
112.7(g)	6.13 Security
112.7(h)	6.14 Tank Truck Loading/Unloading Rack Requirements
112.7(i)	6.15 Field Constructed Aboveground Storage Tank
112.7(j)	Conformance With Applicable Standards State Specific Requirements
112.8(b)	7.1 Facility Drainage
112.8(c)(1)	7.2.1 Construction
112.8(c)(2)	7.2.2 Secondary Containment
112.8(c)(3)	7.1 Drainage of Diked Areas
112.8(c)(4)	7.2.4 Corrosion Protection
112.8(c)(5)	7.2.5 Partially Buried and Bunkered Storage Tanks
112.8(c)(6)	7.2.6 Inspections and Tests 10.0 Annual SPCC Plan Applicability Review Checklist Appendix A: Monthly and Annual Inspection Forms
112.8(c)(7)	7.2.7 Heating Coils
112.8(c)(8)	7.2.8 Overfill Prevention Systems
112.8(c)(9)	7.2.9 Effluent Treatment Facilities
112.8(c)(10)	7.2.10 Visible Discharges
112.8(c)(11)	7.2.11 Mobile and Portable Containers
112.8(d)	7.3 Transfer Operations, Pumping and In-Plant Processes
112.20(e)	8.0 Certification of Substantial Harm Determination

Note:

* Only selected excerpts of relevant rule text are provided. For a complete list of SPCC requirements, refer to the full text of 40 CFR 112.

2. PROFESSIONAL ENGINEER CERTIFICATION [40 CFR 112.3 (D)]

By means of this Certification/Re-Certification, I attest that I am familiar with the requirements of provisions of 40 CFR 112, that I or my designated agent have visited and examined the Landfill along with County personnel, that this SPCC Plan has been prepared in accordance with good engineering practices, including consideration of applicable industry standards, and with the requirements of 40 CFR 112, that procedures for required inspections and testing have been established and that the Plan is adequate for the Landfill.



Engineer: Adrienne V. Miller, PE
Registration Number: 21105
State: Hawai'i

August 30, 2024
Date

3. WRITTEN REPORTS [40 CFR 112.4]

A written report is required to be sent to the Region 9 Administrator of the United States Environmental Protection Agency (EPA Region 9) and the appropriate state agencies in charge of oil pollution control activities, State of Hawai‘i Department of Health (DOH) Hazard Evaluation and Emergency Response Office (HEER), within 30 days of any spill event.

Reportable spill events are defined by multiple sections of the Act:

- 40 CFR 112.4(a)—The following amounts of oil that, if reaching navigable waters or adjoining shoreline, are reportable under 40 CFR 110.
 - A discharge of over 1,000 U.S. gallons of oil occurs in a single spill.
 - It is the second spill event occurring within any 12-month period of more than 42 U.S. gallons of oil.
- 40 CFR 110.3—Discharge of oil in such quantities as “may be harmful” pursuant to section 311(b)(4) of the Act.
- IMPORTANT NOTE: State Reporting Requirements are more stringent, see below.
- For purposes of 40 CFR 311(b)(4) of the Act, discharges of oil in such quantities that the Administrator has determined may be harmful to the public health or welfare or the environment of the United States include discharges of oil that:
 - Violate applicable water quality standards, local, state, or federal.
 - Cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.
- 40 CFR 110.1—Sheen means an iridescent appearance on the surface of water.

The written report is to contain the following information (a Spill Report Form is provided in Section of this Plan):

- Name of the facility.
- Name(s) of the person reporting.
- Location of the facility.
- Maximum storage or handling capacity of the facility and normal daily throughput.
- Corrective action and countermeasures taken, including a description of equipment repairs and replacements.
- An adequate description of the facility including maps, flow diagrams, and topographical maps as necessary.
- The cause of such discharge as described in 40 CFR 112.1(b), including a failure analysis of the system or subsystem in which the failure occurred.

- Additional preventive measures taken or contemplated to minimize the possibility of recurrence.
- Such other information as the Regional Administrator may reasonably require pertinent to the Plan or discharge.

Hawai‘i Administrative Rules (HAR) §11-451 imposes additional requirements on a written report. In addition to the above, reportable quantities are defined as follows: (1) Any amount of oil which, when released into the environment, causes a sheen to appear on surface water, or any navigable waters of the State; (2) Discharge of more than 25 gallons of oil in a single spill event; (3) Any amount of oil that is less than 25 gallons, but which is not contained and remediated within 72 hours. State requirements also dictate written notification within 30-days (HAR §11-451-7[e]).

Section 13.0, below, includes a written report form. Table 2, below, summarizes the historical oil discharges reported at the site.

Table 2: Oil Discharge History

Description of Discharge	Corrective Actions Taken	Plan for Preventing Recurrence
According to facility personnel, no major spill events have occurred since operations at the site began in 1993.		

4. SPCC PLAN AMENDMENT [40 CFR 112.5(B)]

Amendments to this SPCC Plan will be prepared within six months following any change, and implemented as soon as possible following any technical amendment, but no later than 6 months from the date of the amendment. A review and evaluation of this SPCC Plan also should be conducted at least once every five (5) years by the manager or their designee. The development of a Cycle Task for an annual review is recommended. As a result of this review and evaluation, the Landfill will amend the SPCC Plan within six months of the review to include more effective prevention and control technology if:

- Such technology will significantly reduce the likelihood of a spill event from the facility.
- Such technology has been field-proven at the time of the review.

In accordance with 40 CFR 112.5(a), the Landfill periodically reviews and evaluates this SPCC Plan for any change in the Landfill design, construction, operation, or maintenance that materially affects the Landfill's potential for an oil discharge, including, but not limited to:

- Commissioning or decommissioning of containers.
- Replacement, reconstruction, or movement of containers.
- Reconstruction, replacement, or installation of piping systems.
- Construction or demolition that might alter secondary containment structures.
- Changes of product or service.
- Revision of standard operation or maintenance procedures.

Amendments to the Plan made to address changes of this nature are referred to as technical amendments, and must be certified by a Professional Engineer (PE). Non-technical amendments can be done, (and must be documented in this section), by the Landfill owner and/or operator. Non- technical amendments include the following:

- Change in the name or contact information (i.e., telephone numbers) of individuals responsible for the implementation of this Plan.
- Change in the name or contact information of spill response or cleanup contractors.

Any technical amendment to the SPCC Plan will be certified by a PE in accordance with 40 CFR 112.3(d). Completion of the review and evaluation is documented in Section 11.0.

5. MANAGEMENT APPROVAL [40 CFR 112.7]

This SPCC Plan establishes preparedness, prevention, planning, spill response, and spill notification procedures as set forth in applicable state and federal regulations. This Plan has been compiled by an agent of and reviewed and certified by a professional engineer (internal or third party) following the sequence specified in 40 CFR 112. Any future updates that require the Plan to deviate from that sequence will include a cross reference in the Plan.

As specified in 40 CFR 112.3(e), a copy of this Plan will be maintained at the Landfill and made available upon request for on-site review by the Regional Administrator of the EPA during normal business hours. If the Landfill is attended less than 4 hours a day, the plan may be kept at the nearest field office.

The Landfill is committed to the prevention of discharges of oil to navigable waters and the environment and maintains the highest standards for spill prevention control and countermeasures through regular review, updating, and implementation of the SPCC Plan. This Plan has the full approval of management at a level of authority to commit the necessary resources to fully implement the Plan.

Allison Fraley, Environmental Services Manager

	8/30/24
_____ Signature	_____ Date

Plan Distribution

Copies of the Spill Prevention, Control and Countermeasures Plan are kept on file at the following locations:

- Main Office of Landfill

6. GENERAL REQUIREMENTS [40 CFR 112.7]

There are no additional facilities or procedures, methods, or equipment not yet fully operational identified in the SPCC Plan that require details of installation and operational start-up. The Landfill is in conformance with section 112.7(a)(1).

6.1 Compliance With Applicable Requirements [40 CFR 112.7(a)(2)]

This SPCC Plan is in conformance with all applicable requirements of 40 CFR Part 112, except for minor deviations, as allowed by section 112.7(a)(2) of the regulation. The deviations, and the equivalent environmental protection provided, are described below:

- 40 CFR 112.8(b)(3) requires designing drainage systems from un-diked areas with a potential for a discharge (such as where piping is located outside containment walls or where tank truck discharges may occur outside the loading area) to flow into ponds, lagoons, or catchment basins designed to retain oil or return it to the Landfill.

Mobiles 1 & 2 (aka. Portable #2) contain single-walled tanks that are mounted on the respective refueling/servicing trucks. During operational hours, the mobile refueling/servicing truck is temporarily staged throughout the Landfill. The operational and emergency oil storage capacity of the Landfill liner system is sufficient to handle the maximum quantity of oil expected to be discharged in un-diked areas from overfills or transfer. The bermed wash rack and Landfill liner system, in combination with monitoring of all product transfers, provides environmental protection equivalent to the requirements under 112.8(b)(3).

- 40 CFR 112.8(c)(6) - Smaller oil storage containers and drums are not integrity tested (per the Steel Tank Institute (STI) standard); instead, they are stored off the ground on spill containment pallets and visually inspected on a regular basis. This is further discussed in Section 6.18 of this SPCC Plan.

EPA has issued guidance stating that “for well-designed shop-built containers with a shell capacity of 30,000 gallons or under,” a program of visual inspections for the container(s) may provide equivalent environmental protection. In accordance with that guideline, the oil storage containers and drums at the Landfill are not integrity tested; instead, the Landfill has implemented a program of visual inspection for these containers and drums, to ensure that any leaks are readily detected.

During site inspections, the containers and drums should be clean and well-maintained with no signs of deterioration or leaks. The tanks and drums will be maintained clean so that any bottom leaks can be readily observed, and the exterior of the tanks and drums will be maintained clean and in good condition so that any shell leaks can be readily detected. If cracks develop in the concrete floor of the containment area, they will be repaired within one (1) week of detection.

If the visual inspections indicate signs of deterioration or leaks of a tank or drum, then the tank or drum will either be replaced or integrity tested, in accordance with STI SP001, to verify the appropriateness of continuing the visual inspection program. As discussed in Section 6.4, spill response equipment is available in the maintenance

shop in close proximity to fuel tanks, and an Oil Contingency Plan has been implemented at the Landfill.

- 40 CFR 112.8(d)(5) requires warning all vehicles entering the Landfill to be sure that no vehicle will endanger aboveground piping or other oil transfer operations. As an environmental equivalence to the driver warning requirement in 112.8(d)(5), alternative methods of protecting equipment from the possibility of a collision such as installing fences, barriers, curbing or other physical obstacles are employed.

Aboveground piping runs from the diesel fuel AST#1, to day tank and pump, and to an emergency generator engine. As an environmental equivalence to the driver warning requirement in 112.8(d)(5), the diesel fuel AST#1, emergency generator, and aboveground piping connecting the AST to the emergency generator are all surrounded by concrete-filled steel traffic bollards to prevent damage from vehicle traffic. Temporary physical obstacles and monitoring by trained staff will be used to protect equipment from the possibility of a collision during any other temporary oil transfer operations.

6.2 Facility Information [40 CFR 112.7(a)(3)]

Facility Owner, Address and Telephone:

County of Kaua‘i
Department of Public Works – Solid Waste Division
4444 Rice Street, Mo‘ikeha Building, Suite 275
Lihu‘e, Hawai‘i 96766
Phone: (808) 241-4993

Contact: Troy Tanigawa, County Engineer

Facility Operator, Address and Telephone:

County of Kaua‘i
Department of Public Works – Solid Waste Division
4444 Rice Street, Mo‘ikeha Building, Suite 275
Lihu‘e, Hawai‘i 96766
Phone: (808) 346-4393

Contact: John Ruiz, Landfill Supervisor

6.2.1 Location of Facility

The Kekaha Municipal Solid Waste Landfill (Landfill) Phase II, is located near the southwest coast of the Island of Kaua‘i, approximately 1.5 miles northwest of the town of Kekaha, and approximately 2,000 feet (ft) from the Pacific Ocean shoreline. The Landfill is bounded by Kaumuali‘i Highway to the northeast, an unpaved access road and agricultural land to the southeast, aquaculture facilities to the northwest, and the Phase I area to the southwest. Figure 1 provides the Site Location Map, Figure 2 provides the Surface Water Management System, and Figure 3 provides the Oil Storage Area.

6.2.2 General Description of Facility

The Landfill is a municipal solid waste (MSW) landfill, permitted by DOH for disposal of non-hazardous solid wastes. The Landfill is owned and operated by the County of Kaua‘i. The Landfill is located at 6900-D Kaunuali‘i Highway Kaua‘i, Hawai‘i 96752. The Landfill is permitted under Solid Waste Management Permit No. LF-0042-16 (Permit), which was issued on September 13, 2019, by the State of Hawai‘i Department of Health (DOH) Solid and Hazardous Waste Branch.

The current permitted waste footprint, covers approximately 75 acres, is roughly rectangular, and includes the inactive Phase I, Phase II, and Cells 1 and 2 expansion disposal cells (see Figure 2). The inactive Phase I is approximately 33 acres. The original Phase II consists of approximately 32.1 acres subdivided into 14 smaller waste disposal sub-cells each about two acres, the Cell 1 expansion, 6.4 acres subdivided into four smaller waste disposal sub-cells (1A through 1D), and the Cell 2 lateral expansion which is approximately 5.9 acres divided into two cells (2A and 2B), both of which “piggy-back” partially over existing Phase I.

The site also includes an office, scale house, landfill gas flare facility, wash rack area, maintenance shop, leachate evaporation pond (formerly known as the New Leachate Evaporation Pond, or NLEP), and infiltration basin, which are located along the northeast property line. A materials drop-off facility (MDOF) is located between the leachate evaporation pond and the landfill office. The MDOF provides public drop-offs (green waste, recyclables, tires, and white goods, etc.). A used oil drop-off is located within the maintenance shop. The site layout is shown on Figure 2 and 3.

The Landfill is open 7 days per week from 8:00 a.m. to 4:00 p.m., 12-12:30 (lunch break), except for the following holidays: New Year’s Day, Martin Luther King Junior Day, President’s Day, Prince Kuhio Day, Good Friday, Memorial Day, King Kamehameha Day, Independence Day, Admission Day, Labor Day, Veteran’s Day, General Election Day, Thanksgiving Day, and Christmas Day. If the holidays fall on Monday through Thursday, the Landfill is open a half day from 7:00 a.m. to 11:00 a.m. If the holidays fall on Friday through Sunday, the Landfill is closed.

The Landfill is not located in or near a wetland, and the Landfill is outside any designated 100-year floodplain. All site drainage flows to on-site infiltration ditches, and no offsite drainage occurs.

The Landfill stores and uses petroleum products such as diesel fuel, lubricating oils, and waste oil. This SPCC Plan specifically addresses the fuel and oil storage and use facilities that exist at the Landfill:

- Maintenance shop and equipment fueling areas.
- Stationary aboveground storage tank (AST).
- Mobile refueling service truck.
- Other containers (e.g., 55-gallon drums).

This SPCC Plan has been updated to reflect changes to the Landfill that occurred since the last SPCC Plan Revision dated August 30, 2024.

Figure 3 shows the location and contents of fixed oil storage containers and the storage area where mobile or portable containers are located, transfer areas, and connecting piping. The diagrams may also show secondary containment, storm drains inlets and surface waters, direction of flow in the event of a discharge, location of spill response equipment, and location of valves or drainage controls.

6.2.3 Topography and Surface Water Flow

The existing surface water management system on the Landfill include diversion berms, downdrains, perimeter infiltration ditches, and an infiltration basin. The Phase II downdrains are temporary, geomembrane-lined trapezoidal ditches conveying water to a perimeter channel or a culvert in select locations. The infiltration drainage ditch conveys surface water to the infiltration basin located near the entrance of the facility. The Surface Water Management System is shown on Figure 2.

The Landfill's topography around the maintenance/equipment fueling area generally slopes to the northeast. Should secondary containment systems (curbing and berm) for the maintenance / equipment fueling area be breached, stormwater could drain via sheet flow to the shoulder drainage swale along Kaumuali'i Highway. However, considering the potential volume of rainwater and the high permeability of the sandy on-site soils, it is likely that the rainwater would infiltrate the ground surface before flowing offsite. Tank locations and stormwater drainage patterns in the vicinity of AST#1 are shown on Figure 3.

6.2.4 General Description of Petroleum Storage Areas [112.7(a)(3)(i)]

Table 3 details the various types of oil products stored at the Landfill. Oil storage areas are listed and described by location, container type, contents, storage device, oil amount and whether it is an above or a below ground container. For purposes of this inventory, only containers that have a capacity of 55-gallons and greater are listed. Refer to Figure 3 for locations of oil handling activities.

One mobile refueling service truck is used for daily fueling and servicing of Landfill equipment. When not in use, the mobile refueling service truck is maintained and parked near the Maintenance Building wash rack that is equipped with an oil water separator. A spill kit for minor spills is located on/near the mobile refueling service truck.

Table 3: Petroleum Products – Service Truck and Aboveground Storage Tank

Tank ID	Tank Size (gal)	Tank Type	Contents	Transfer Mechanism	Secondary Containment	Overfill/Spill Protection
Mobile #1	115	Steel Single-Wall Horizontal	Diesel Fuel	Pneumatic Pump	Spill Kit	Visual Inspections/Attended Transfers
AST #1	2,000	Double-Walled Horizontal	Diesel Fuel	Fuel Pump	Containment structure (Dual wall)	Visual Inspections, Visual Gauge, Attended Transfers, and tertiary containment dike structure (1,475 gallon)
Drum Area	55 (8) and 300 (2) ¹	Single Walled Drum	Misc. Hydrocarbons	Manual	Spill Pallets & Garage	Spill Kits

Notes:

(1) Eight (8) 55 gallon drums and two (2) 300-gallon totes are located in the Maintenance Building and are owned by the County.

All small containers, 55 gallon drums, and 300 gallon totes are stored inside the maintenance shop on spill control pallets or other devices that provide secondary containment. A spill kit containing materials to properly absorb spills (absorbent pads, socks, pillows, and bags) is located in the maintenance building and between the backup generator and AST#1 (2,000 gallon diesel fuel).

The maximum potential quantities of liquid that could be released in a single incident are:

- 115 gallons (mobile truck-mounted tank capacity).
- 2,000 gallons (maximum double-walled AST capacity), assuming the containment was breached).
- 985 gallons (8 x 55 gallon drums and 2 x 300 gallons totes in maintenance shop).
- Total Oil Storage: Approximately 3,155 gallons

Any third-party (contractor) tanks that may be located on-site are subject to the Landfill SPCC rules. Landfill staff will notify contractors that they are subject to and must have/provide Landfill staff with the following:

- Secondary containment at all times for any tank.
- Documentation of training.
- Adequate spill response materials at the location of the tank.
- A copy of their SPCC Plan/Spill Response Plan.

6.3 Discharge Prevention Measures [40 CFR 112.7(a)(3)(ii)]

This section discusses procedures for routine handling of oil products at the Landfill, including loading, unloading, and fuel transfers. These activities occur primarily at the maintenance shop area and areas over the landfill liner system. Drums are stored in the maintenance shop area. In general, the system of structural and non-structural control measures consists of spill containment structures, operating procedures that are specifically designed to minimize potential for a release of oil, training of personnel, Landfill security measures, routine inspections and record keeping, and regular SPCC Plan review (Review and Evaluation Log is presented in Section 11.0).

6.3.1 Fuel Storage in Stationary AST

The AST#1, a stationary, double-walled, 2,000-gallon capacity tank used to store diesel fuel is filled by contractors from tanker trucks. Prior to transferring fuel, it is determined whether adequate storage is available to receive the entire contents of the compartment on the delivery vehicle. The 2,000-gallon AST is equipped with a visual gauge, and ports are available for manual gauging. If the Landfill's storage tank cannot receive the entire contents, the surplus portion of the shipment is not transferred. Additionally, trained personnel are present during the filling of the diesel fuel tank to monitor the transfer and ensure overfilling does not occur.

6.3.2 Fuel Storage in Mobile/ Portable Tanks

The Mobile 1 diesel fuel tank are mounted onto a mobile refueling service truck. The tank is manually gauged before filling. Transfer operations occur as needed, and the fuel is off-loaded from the tank in small quantities to on-site Landfill equipment. Trained personnel are present during transfers from tank to monitor against overfilling.

6.3.3 Drum Storage in the Maintenance Shop Area

Drums of various oils (e.g., gear, motor, and hydraulic) are stored inside the covered maintenance shop. All drums inside the shop are stored on spill containment pallets capable of containing the full contents of a 55 gallon drum. The County of Kaua'i accepts waste motor oil at the Landfill from individual homeowners. Waste oil is dropped off by homeowners and transferred via a drum funnel into 55 gallon drums by County of Kaua'i personnel. When the drums are full, they are removed from the Landfill by an outside vendor. Additionally, drums of new gear, motor, and hydraulic oil are brought in full by vendors, for use at the Landfill. Oil is manually removed from the drums by use of spigots or similar device, in small quantities as needed.

6.4 Discharge and Drainage Controls [40 CFR 112.7(a)(3)(iii)]

This section discusses discharge and drainage control such as secondary containment around oil storage containers and other structures, equipment, and procedures for the control of a discharge. Oil storage containment activities occur primarily at the stationary diesel fuel AST, the mobile refueling service truck parking area, and the drum storage area at the maintenance shop.

The AST, associated containment structure, and the mobile refueling service truck with its tank are the only exterior storage units of oil and are checked weekly for stormwater that has collected

or for any leaks from the tanks. Any accumulation of oils or other liquid in the containment areas or spill pallets in the maintenance shop would be pumped out into another container, and properly disposed of.

6.4.1 Fuel Storage in Stationary AST

The 2,000-gallon capacity AST secondary containment structure that can contain 100 percent of the tank's rated capacity and can fully support the loaded fuel tank and pumping system. In the event of a moderate oil spill (tank leak, overflow, etc.) there is a tertiary containment system, which consists of a low concrete dike built around the perimeter of the tank. This containment system is capable of holding approximately 1,475 gallons (i.e., roughly 75 percent of the tank capacity). The tertiary containment system would contain the spill until detection and spill response actions are initiated.

A spill kit is located adjacent to the backup generator. An outside contractor will be called in to control and clean up spills greater than 50 gallons. Additionally, an oil contingency plan is in place (Section 16 of the record keeping binder) such that spills are quickly responded to and cleaned up.

6.4.2 Fuel Storage in Mobile Tanks

Mobile Tank 1 is mounted on a mobile refueling service truck. While refueling on the Landfill areas, the transfer procedures used are drip pans and attended transfers; as well as the Landfill liner system. In the event of an oil spill from one the tank, the Landfill liner system would contain the spill until detection and spill response actions are initiated. When Mobile 1 is not refueling, it is parked at the Maintenance Building near the wash pad that is equipped with an oil water separator. A spill kit for minor spills is located on/near the mobile refueling service truck.

6.4.3 Drum Storage in Maintenance Shop Area

The maintenance shop area contains 55-gallon drums, 300 gallon totes, and other smaller containers containing various oils. Drums are stored on spill pallets capable of containing a minimum of 55 gallons each. A spill kit is located within the maintenance shop area to clean up minor spills. An outside contractor would be called in to control and clean up larger spills.

6.5 Spill Response and Countermeasures [40 CFR 112.7(a)(3)(iv)]

Upon discovery of an oil spill, the person making the discovery should immediately notify the Landfill Supervisor. Any and all response equipment and staff at the Landfill's disposal will be used as needed to contain the spill and prevent oil from discharging offsite or into a navigable waterway. Personnel will consult with the District Manager to determine if outside spill response contractors are required. If management determines that outside resources are necessary, Spill Response Contractors, listed in the front of this report, may be utilized.

Any discharge will be contained and cleaned up using appropriate spill response equipment which may include shovels, pumps, and absorbent materials (pads, booms, oil-dry, etc.). Response equipment (i.e., spill kits) is located in the maintenance shop area as indicated on the site map and near the backup generator. Response equipment locations will be identified to all Landfill personnel upon employment and during SPCC training. The supply of response

equipment will be replenished as needed. Copies of material safety data sheets (MSDS) for all petroleum products and other relevant material are located at the Landfill.

6.6 Recovery and Disposal Of Material Spilled [40 CFR 112.7(a)(3)(v)]

All material will be recovered into appropriate containers such as 55 gallon drums, or if the size of the spill warrants, into leak-proof roll-off container(s). When containers are filled after a cleanup, the containers will be secured and the container appropriately labeled identifying the substance(s), the date of the spill/clean up, and the location. Waste material generated during cleanup activities will be characterized in accordance with federal and state regulations. The spill residual will be characterized and disposed of by a licensed waste handler or disposed of on-site if appropriate.

6.7 Emergency Contact List [40 CFR 112.7(a)(3)(vi)]

The Emergency Contact List includes emergency contact names and phone numbers for Landfill personnel, division environmental personnel, and appropriate agencies, and is included in the front of this SPCC Plan. A Spill Response Contractor List including phone numbers is also included in the front of this SPCC Plan.

6.8 Spill Reporting Procedures [40 CFR 112.7(a)(4)]

Any spill with an estimated volume of greater than 10 gallons should be reported to the Landfill Supervisor. Records of each spill event should be documented using the Spill Investigation and Spill Documentation Forms in Sections 8.0. This information will facilitate the proper reporting of a discharge to the appropriate individuals and agencies.

Any spill that results in the discharge of oil, petroleum based product, or hazardous material into navigable or contiguous waters must immediately be reported to the District Manager and to the agencies listed below. The National Response Center should be contacted first.

National Response Center: (800) 424-8802

EPA Region 9 Number: (866) EPA-WEST or (866) 372-9378

To report an environmental emergency (800) 300-2193

State of Hawai'i Department of Health (808) 586-4249

Hazard Evaluation and Emergency Response Office After Hours: (808) 236-8200

This information is also provided in the Emergency Contact List in the front of this report. For written reporting requirements, refer to Section 3.0 of this Plan.

6.9 Spill Response Procedures [40 CFR 112.7(a)(5)]

Landfill personnel are properly trained to immediately respond to oil spills. Only trained personnel shall perform cleanup activities. Spill response contractors will be responsible for cleanup activities as a result of spills or leaks when the Landfill does not have the necessary training, equipment, or materials to clean up the spill.

The Landfill standard approach toward “incidental release,” as defined in 29 CFR 1910.120, spill response is as follows:

- Assess hazards:
 - Assess the quantity of substance spilled and integrity of containment.
 - Stop operations if necessary.
 - Secure the area.
 - Determine if the spill could potentially impact waterways or leave the site.
- Close open valves and deactivate pumps contributing to the discharge.
- Immediately notify supervisory personnel (person responsible for spill prevention).
- Use all equipment and staff at Landfill’s disposal to minimize the amount of oil discharged and to prevent it from entering any navigable waterways.
- Ensure proper PPE is used during cleanup activities (consult Landfill’s PPE plan for more information).
- Once the discharge is stopped and contained, use absorbent materials to absorb the spilled oil. The oil-soaked material must be disposed of according to federal, state, and local regulations. (For a spill greater than 10 gallons, notify the Landfill Supervisor).
- If spill is reportable (i.e., greater than 25 gallons on land or a sheen on water), immediately notify authorities listed on Emergency Contact List in the front of this SPCC Plan.
- In the event a spill reaches a waterway:
 - Notify the National Response Center and local and state spill response agencies.
 - Notify spill response contractor if necessary.
 - Stop the source of the spill immediately.
 - Shut down all equipment and ignition sources in the area.
 - Deploy booms, damming materials, and absorbents to contain the spill.
 - Restore habitat if necessary.
 - Decontaminate the affected area, equipment, and surfaces that have contacted the spilled material.
- Complete Spill Investigation and Spill Documentation Forms (Sections 12.0 and 13.0)

6.10 Spill/Release Scenarios [40 CFR 112.7(b)]

Based on how and where oil and other petroleum products are used and stored at this Landfill, Table 4 describes potential types of spill/release scenarios; estimated release volumes, based on the volume of the largest oil tank in the area; and the predicted spill rate.

Table 4: Potential Spill Scenarios

Potential type Failure	Spill Flow Direction	Maximum Volume	Spill Rate
Leak in Mobile 1, Diesel Fuel	Diesel Fuel would infiltrate into underlying soils and MSW or into the oil water separator.	Ounces to 115 gallons	Minutes to hours
Rupture in Mobile 1, Diesel Fuel	Diesel Fuel would infiltrate into underlying soils and MSW or into the oil water separator.	115 gallons	Seconds to minutes
Leak in AST#1, Diesel Fuel	Diesel Fuel would spill into secondary containment.	Ounces to 2,000 gallons	Minutes to hours
Rupture in AST#1, Diesel Fuel	Diesel Fuel would spill into secondary containment.	2,000 gallons	Seconds to minutes
Breach in secondary containment system for AST#1, Diesel Fuel	Diesel Fuel would be contained by the tertiary containment system (up to 1,475 gallons), then would migrate onto the facility ground surface.	Ounces to 2,000 gallons	Seconds to hours
Leak in 55 gallon Drum or 300 gallon Tote, Oil	Oil would leak into the spill containment pallet and would be cleaned up.	Ounces to 300 gallons	Minutes to hours
Rupture in 55 gallon Drum or 300 gallon Tote, Oil	Oil would spill into the spill containment pallet and would be cleaned up.	300 gallons	Seconds to minutes
Spillage during attended transfers (i.e. transfer hose leak/failure)	Petroleum products would flow onto the adjacent ground surface and infiltrate into the soil.	Gallons up to capacity of source tank	Up to 50 gallons/minute

6.11 Containment And Diversionary Structures [40 CFR 112.7(c)]

Appropriate containment and/or diversionary structures or equipment to prevent a discharge as described in 40 CFR 112.1(b) has been provided for the Landfill. The entire containment systems, including walls and floor, are capable of containing oil and are constructed so that any discharge from a primary containment system, such as a tank, will not escape the containment system before cleanup occurs.

Approved prevention systems include:

- Dikes, berms, or retaining walls sufficiently impervious to contain oil.
- Curbing or drip pans.
- Sumps and collection systems.
- Culverts, gutters, or other drainage systems.
- Weirs, booms, or other barriers.
- Spill diversion ponds.
- Retention ponds.
- Sorbent materials.

Systems utilized at the Landfill are described below.

6.11.1 Dikes, Berms, or Retaining Walls Sufficiently Impervious to Contain Spilled Oil [112.7(c)(1)(i)]

A concrete dike surrounds the 2,000-gallon, double-walled AST acting as a partial tertiary containment system, able to contain up to 1,475 gallons.

An earthen perimeter berm around the AST#1 fueling area will prevent and/or slow down potential spills from draining offsite.

The Landfill is a permitted MSW landfill, and all of the Phase II landfill cells have bottom-liners. The mobile refueling service truck, which service landfill equipment operate within the lined area of the Landfill; therefore, secondary containment for the mobile tank is provided by the landfill liner during re-fueling.

6.11.2 Curbing [112.7(c)(1)(ii)]

The tertiary containment system consists of a dike around the perimeter of the 2,000-gallon, double-walled AST and can contain 1,475 gallons.

6.11.3 Culverts, Gutters, or Other Drainage Systems [112.7(c)(1)(iii)]

No culverts, gutters or drainage systems are used at the Landfill other than those intended to manage stormwater. Stormwater does not discharge from the Landfill and is managed on-site by infiltration.

Along, the western, southern, and eastern boundaries of the Landfill, an infiltration ditch is in place to receive stormwater runoff from the landfill surfaces. On the northern boundary (facing the highway), runoff is directed to the infiltration basin via sheet flow and shallow swales. A drainage ditch is present immediately north of the Landfill outside the perimeter fence, along the highway.

6.11.4 Weirs, Booms, and Other Barriers [112.7(c)(1)(iv)]

No weirs, booms, or other barriers are used or stored at the Landfill.

6.11.5 Spill Diversion Ponds [112.7(c)(1)(v)]

No spill diversion ponds exist at the Landfill.

6.11.6 Retention Ponds [112.7(c)(1)(vi)]

No retention ponds exist at the Landfill.

6.11.7 Sorbent Materials [112.7(c)(1)(vii)]

Sorbent materials (absorbent pads, socks, and pillows) and hand tools are stored onsite to assist in containing small spills. Spill cleanup materials are supplied and kept in the maintenance area near the AST at all times.

6.12 Inspections, Tests, And Records [40 CFR 112.7(e)]

A December 5, 2008 amendment to the SPCC regulations includes integrity testing requirements. A facility owner or operator is required to:

- Test/inspect each aboveground container for integrity on a regular schedule and whenever material repairs are made.
- Determine, in accordance with industry standards, the appropriate qualifications of personnel performing tests and inspections and the frequency and type of testing and inspections, which take into account container size, configuration, and design.

Inspections and integrity testing are conducted in accordance with good engineering practices, as described in more detail below.

As stated above, visual inspections and/or integrity testing of bulk storage tanks at the Landfill must be conducted in accordance with applicable industry standards. The applicable industry standard for shop-built containers is the STI Standard SP001. All of the shop-built containers at the Landfill will be inspected and integrity tested (if applicable) in accordance with this standard. Records of visual inspections and integrity tests (if applicable); as well as problems and any corrective actions taken, will be kept in Sections 8 and 9 of the record-keeping binder, for a minimum of three (3) years.

6.12.1 Visual Inspections

All oil storage tanks and containers at the Landfill must be visually inspected on a monthly and annual basis, and documented on the forms included in Section 9 of the record-keeping binder. These checklists incorporate the requirements of STI SP001. In accordance with SP001, the individual at the Landfill who is responsible for oil spill prevention (or a designated representative) must conduct the visual inspections. Documentation of the inspections, and any corrective actions taken as a result of the inspections, are maintained in Section 9 of the record-keeping binder and will be kept for at least three (3) years. Additionally, Landfill employees and/or contractors visually inspect the status of Landfill equipment for signs of spills or other issues during the course of their normal workday.

The oil storage containers and Landfill shall be visually surveyed to discover conditions, if any, which indicate problems that could contribute to an oil leak or spill. It is appropriate to include the inspection with other activities performed by assigned personnel when they are in the tank storage area or at product transfer areas. As indicated on the inspection checklists, the following inspection procedures are followed:

- For all oil storage tanks and containers, inspect the containment area, tank shell, supports, and foundation for structural integrity.
- Check all associated piping for dripping, loose joints, damage to supports, and pipe deflection.
- Inspect all pumps, valves, hoses, and piping for cracks, leaks, and abnormal wear.
- For double-walled tanks, inspect the interstice for the presence of fuel, an indication of leaks in the primary tank.
- Inspect all containment bins for excess accumulation of water and the presence of oil (accumulations of oil must be promptly removed).

- Inspect the area surrounding the containment areas for signs of oil spills and stained soil.
- Inspect the containment area drain valve (if one is present) to assure the integrity and utility of the valve and locking device.
- Correct any deficiencies that are identified as soon as possible.

Attention should be directed to emergency shutdowns, high-level alarms, tank monitoring equipment, and communication systems to verify proper operating capabilities.

Problems are to be reported to the individual designated at the Landfill who is responsible for oil spill prevention (i.e., District Manager). Corrective action must be taken as soon as possible.

6.12.2 Daily Inspection

A Landfill person or qualified representative performs a complete walk-through of the Landfill each day. This daily visual inspection involves: examine perimeter fences for unauthorized entry and locked gates, testing leak alarms, looking for tank/piping damage or leakage, stained or discolored pavement, or excessive accumulation of water in the storm drain.

6.12.3 Monthly Inspection

The checklist provided within this plan is used for monthly inspections by authorized facilities maintenance personnel. The monthly inspections are consistent with Steel Tank Institute (STI) Standard SP-001. All problems regarding tanks, piping, containment, or response equipment must immediately be reported to the Facility Manager. Visible oil leaks from tank walls, piping, or other components must be repaired as soon as possible to prevent a larger spill or a discharge to navigable waters, adjoining shorelines, storm drains, or the environment. Pooled oil is removed immediately upon discovery.

Written monthly inspection records are signed by the inspector or supervisor and maintained for a period of three (3) years.

6.12.4 Annual Inspection

Landfill personnel perform a more thorough inspection of Landfill equipment on an annual basis. This annual inspection complements the monthly inspection described above and is performed in each year using either the checklist provided in Appendix A of this SPCC or an equivalent. The annual inspection may be performed after a large storm event in order to verify the imperviousness and/or proper functioning of drainage control systems but is normally performed in conjunction with annual preventative maintenance. Written annual inspection records are signed by the inspector or supervisor and maintained in a labeled binder in the office for a period of three (3) years. Annual inspections are consistent with the STI Standard SP-001.

6.12.5 Periodic Integrity Testing

Periodic Inspections are conducted by the owner's inspectors using inspection form procedures that follow the Standard for the Inspection of Aboveground Storage Tanks, SP-001 manual. Since no ASTs at the Landfill exceed 5,001 gallons (STI: Category#1), a formal outside inspection is not required, but the operator may commission such an inspection should an

internal periodic AST inspection warrant such action. In addition, drums are not considered a bulk storage tank and are not subject to the STI guidance for inspections of bulk storage tanks and are to be visually inspected routinely, per the Landfill oil storage inspections.

6.13 Spill Prevention Training [40 CFR 112.7(f)]

Upon beginning employment, all oil handling personnel are instructed by management in: the operation and maintenance of equipment to prevent discharges; discharge procedure protocols; applicable pollution control laws, rules, and regulations; general facility operations; and, the contents of the Landfill SPCC Plan. Existing employees will receive training within three months of the issuance of this amended SPCC Plan.

The Landfill Supervisor is responsible for spill prevention training at this Landfill.

Management will provide annual spill prevention briefings for all oil handling personnel to ensure adequate understanding of the SPCC Plan. These briefings highlight any past spill events or failures and recently developed precautionary measures. Training includes inspection methods, oil spill prevention, containment, and retrieval methods. The Spill Prevention Briefing Log is available in Section 9.0. Records of spill prevention training are kept in Section 4 of the record-keeping binder located at the Landfill office, and will be kept for at least three (3) years.

Topics discussed during all training sessions will include the following:

- Operation and maintenance of equipment to prevent oil discharges.
- Discharge procedure protocols.
- Applicable pollution control laws, rules, and regulations.
- General facility operations.
- Contents of the SPCC Plan.
- SPCC Plan procedures.
- Locations of spill and fire control equipment.
- Inspection and record keeping procedures.

In addition to training required in the SPCC regulations, Awareness Training for Response to Incidental Releases will be conducted. Incidental Release as defined in the Emergency Response definition under 29 CFR 1910.120 (a)(3) means, “Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel are not considered to be emergency responses within the scope of this [HAZWOPER] standard.”

Employees who are anticipated to participate in any incidental release response and all other employees regularly working with or around oils that are likely to witness or discover an oil spill will be given awareness training.

Some employees may be required to respond to a spill of oil as follows:

- Employees may stop a leak at the source only if a spill would be considered an “incidental release” under 29 CFR 1910.120 and only if the spill is located in the employees’ work area.
- Employees may contain a spill that is incidental in the employees’ work area.
- Employees will call for help.
- Employees may cleanup the spilled oil if the spill could be considered an “incidental release” and only if the spill is located in an employee’ work area.

Employees who will participate in emergency response to a hazardous materials release at the Landfill will be given training corresponding to their role within the Landfill emergency response program.

6.14 Security [40 CFR 112.7(g)]

Oil handling, processing, and storage areas are required to be secure with controlled access to prevent vandalism and prevent unauthorized access. Methods utilized at the Landfill are presented below.

6.14.1 Fencing and Gates [112.7(g)(1)]

The Landfill has gated access to exit roads, perimeter fencing, and other natural barriers to deter access. This security meets the criteria set forth by 40 CFR 112.7.g.1 to deter vandals and unwanted entry into the site. The fence limits access to the site from adjacent roadways, highways, and neighboring properties. The security gates are kept locked at night and when the Landfill is closed.

6.14.2 Flow and Drain Valve Locks [112.7(g)(2)]

No flow or drain valve locks are used on-site.

6.14.3 Pump Control Locks [112.7(g)(3)]

No pump control locks are used on-site.

6.14.4 Out-of-Service Piping Secured [112.7(g)(4)]

There is no out-of-service piping at the Landfill.

6.14.5 Facility Lighting [112.7(g)(5)]

Security lights are located around the office/administration building, and portable lights are available on-site, if needed, for night work. During hours of darkness, non-operating personnel would not be in the vicinity unless accompanied by operating personnel with vehicles and lighting. Additional lighting is provided by vehicles onsite, as needed. Lighting of coastal facilities at night on the island of Kaua‘i is limited due to endangered species concerns.

6.14.6 Security for Oil Flow Devices

During the workday, all oil flow devices are under the direct control of Landfill personnel. The storage tanks and internal equipment are under the direct control of Landfill personnel during

operation and standby status. When the Landfill is shut down for the day, all equipment will remain within the locked Landfill area.

6.14.7 Security for Oil Starter Devices

For the Landfill, only the diesel fuel AST is fitted with an oil starter pumping device. The diesel fuel station fuel pump is fitted with a locking mechanism. The Landfill secures and locks the fuel pump dispenser handle when not in use. At this time, all other pumps are hand-powered.

6.14.8 Security for Loading/Unloading Devices

During the workday, all oil loading and unloading devices are under the direct control of Landfill personnel. The storage tanks and internal equipment are under the direct control of Landfill personnel during operation and standby status. When the Landfill is shut down for the day, all equipment will remain within the locked Landfill area.

6.15 Tank Truck Loading/Unloading Rack Requirements [40 CFR 112.7(h)]

Offsite contract delivery tanker trucks periodically fill the diesel storage tank (Tank 1). Deliveries typically occur on a weekly basis, consistent with the site's fuel consumption of approximately 750 gallons per week, and the need to maintain approximately 1,000 gallons of diesel fuel in the tank for potential emergency generator use. Tanker trucks that deliver diesel fuel are typically single- cylinder tankers with 3,000 gallon capacities. Transfer of the diesel fuel to the AST occurs on an asphalt pad adjacent to the tank. The AST is located in a remote, low-traffic area of the site with limited potential for contact from other site vehicles. All transfers are attended by trained personnel.

6.15.1 Loading/Unloading Area Drainage Containment System [112.7(h)(1)]

Under the EPA Settlement Agreement with the American Petroleum Institute and Marathon Oil Company, this section is not applicable to the Landfill, which does not have a truck loading/unloading rack. The EPA notices related to this settlement have not yet been published in the Federal Register. If changes are required to this SPCC Plan as a result of these notices, it will be revised within six months of publication of the notices.

6.15.2 Prevention of Vehicles Moving Before Disconnected [112.7(h)(2)]

Delivery vehicle operators are trained by their employers in the use of the unloading equipment associated with his/her truck, and are responsible for its proper use in accordance with U.S. Department of Transportation regulations. Contractors are required to have the following items at all times:

- Secondary containment for any tank.
- Adequate spill response materials at the location of the tank.

Vendors/delivery vehicle operators are required to provide the Landfill with copies of:

- Documentation of training for a company's operators.

- A copy of the vendor's SPCC Plan/Spill Response Plan (or equivalent).

6.15.3 Inspection of Vehicle to Prevent Leakage in Transit [112.7(h)(3)]

The fuel delivery truck operator is responsible for assuring that all fittings are tightly closed in order to prevent leakage from the vehicle. Tank filling is performed at the tank fill-port by qualified vendors.

During the transfer to the AST, the following procedures shall be followed to protect against overfilling of the storage tank:

- A fuel vendor is dispatched to the Landfill based upon product inventory information obtained from the electronic monitoring system or based upon available, periodic fuel delivery.
- Prior to filling the tank, the tanker truck operator verifies fuel/oil needs based upon electronic level and manual gauge readings to confirm adequate capacity.
- The fuel tanker truck operator is present the entire time the AST is being filled. During tank loading and unloading operations, the tanker truck operator is required to be out of the truck to monitor the operations. The operator is also involved in connecting and disconnecting the fuel transfer lines, so an interlocking warning system is not necessary to prevent departure before complete disconnection of transfer lines.
- Before the fuel tanker truck operator leaves the site, he/she is required to examine the lower- most drain in addition to their outlets for any sign of leakage. When necessary, outlets are adjusted to prevent leakage while in transit.
- In the event that the diesel fuel AST is overfilled, an automatic shut-off valve would halt additional pumping. The fuel delivery tanker truck operator will ensure that all appropriate valves and connections are secured once fueling is complete.
- Transferring diesel fuel from the AST to the Landfill equipment is also conducted on the asphalt pad. Site vehicles/equipment are fueled directly from this tank only when the mobile refueling service truck(s) is unavailable.

6.16 Field Constructed Aboveground Storage Tanks [40 CFR 112.7(i)]

There are no field-constructed ASTs at the Landfill.

6.17 Qualified Oil-Filled Operational Equipment [40 CFR 112.7(k)]

Oil-filled operational equipment means equipment that includes an oil storage container (or multiple containers) in which the oil is present solely to support the function of the apparatus or the device. Oil-filled operational equipment is not considered a bulk storage container, and does not include oil- filled manufacturing equipment (flow through process). No oil-filled operational equipment at is presently in use at the Landfill.

6.18 Conformance With Applicable Standards [40 CFR 112.7(j)]

This SPCC Plan is in conformance with all applicable requirements of 40 CFR Part 112, except for minor deviations, as allowed by section 112.7(a)(2) of the regulation. The deviations, and the equivalent environmental protection provided, are described below.

[112.8(c)(6)] Smaller oil storage containers and drums are not integrity tested; instead, they are stored off the ground or on impermeable liners or in secondary containment areas and visually inspected on a regular basis. This is further discussed in Section 6.12 of this Plan.

Drainage of all un-diked areas with a potential for an oil discharge does not flow into a pond, lagoon, or catch basin designed to retain oil or return it to the Landfill. The original site drainage design did not consider the location of oil storage facilities. As discussed in Section 6.3, spill response equipment is available at the Landfill in close proximity to the petroleum tanks.

6.19 State Specific Requirements [40 CFR 112.7(j)]

This plan has been prepared in accordance with State of Hawai‘i and local rules. The Hawai‘i Department of Health (DOH), Environmental Health Administration, Hazard Evaluation and Emergency Response Office (HEER), has primary responsibility for regulation of oil and petroleum spill prevention activities in Hawai‘i.

The State of Hawai‘i has included oil in the Hawai‘i Emergency Planning and Right-to-Know Act (HEPCRA). The reportable quantities limits are defined in Chapter 11-451, Hawai‘i Administrative Rules, entitled "State Contingency Plan" adopted August 2, 1995. Chapter 11-451-5 designates oil as a hazardous substance. Chapter 11-451-6 (b)(5) defines the reportable quantity for releases of oil:

- Any amount of oil which when released into the environment causes a sheen to appear on surface water, or any navigable water of the State.
- Any free product that appears on groundwater.
- Any amount of oil released to the environment greater than 25 gallons.
- Any amount of oil released to the environment, which is less than 25 gallons, but which is not contained and remediated within 72 hours.

Facilities subject to SPCC Plan and Facility Response Plan (FRP) requirements also fall directly under the jurisdiction of the EPA Region 9 Oil Spill Prevention and Response Program.

6.19.1 Contingency Plan

The petroleum AST at the Landfill are maintained in full compliance with applicable federal regulations. Hawai‘i State regulations define oil as a hazardous substance subject to notification requirements under HAR §11-451-5.

HAR §11-451-6(5) defines reportable quantities, as any amount of oil that when released causes a sheen on surface water, or any navigable water of the State; any free product that appears on ground water; any amount of oil released greater than 25 gallons; and any amount of oil less than

25 gallons that is not contained and remedied within 72 hours requires immediate verbal reporting, followed by written notification within 30 days per HAR §11-451-7.

7. SPECIFIC REQUIREMENTS [40 CFR 112.8]

In accordance with 40 CFR 112.8(a), the Landfill has met the general requirements for this SPCC Plan listed under 40 CFR 112.7 and the specific discharge prevention and containment procedures listed in 40 CFR 112.8.

7.1 Facility Drainage [40 CFR 112.8(b)]

Surface water management for the Landfill is designed for a 25-year return frequency, 24-hour duration rainfall event. The 25-year, 24-hour storm event at Kekaha is 8 inches (AECOM, 2017). The Landfill includes diversion berms at the perimeter of the Landfill top deck and side slopes that direct surface water to down-drains. Each down-drain conveys water to a culvert or swale, which then conveys the surface water to either infiltration ditches along the perimeter of the Landfill, or the infiltration basin located near the main entrance to the Landfill. Drainage in the area of the fueling tank generally flows in a northeastern direction into the southern shoulder of the Kaumuali'i Highway, and then drains towards the east. An earthen perimeter berm has been placed around the fueling area to contain any potential spills from draining off site.

7.2 Bulk Storage Containers [40 CFR 112.8(c)]

An on-site review of oil storage and handling areas was performed at the Landfill. This review identified bulk oil storage containers located within the Maintenance Building drum area (locations noted on Figure 3). This section discusses the conformance of these containers with federal guidelines.

Any visible discharge resulting in a loss of oil from container, including but not limited to seams, gaskets, piping, pumps, valves, rivets, and bolts is promptly corrected. Any accumulations of oil in the containment areas are promptly removed. Uncontaminated rainwater will not be pumped or discharged from the containment bins into an open watercourse, lake, or pond.

No areas with a potential for discharge that are not in containment or do not have a dike system (such as haul roads, pipes, valves, dispensers, etc.) have been identified. There are no effluent treatment systems at the Landfill.

As defined in 40 CFR 112.2, oil-filled electrical equipment, operating, or manufacturing equipment are not bulk storage containers. There is no equipment of this type present or in use at the Landfill.

There are no partially buried or bunkered oil storage tanks at the Landfill. Any buried oil storage tanks that are installed in the future will be protected from corrosion by coatings or cathodic protection that is compatible with local soil conditions. No bulk oil containers at the Landfill are equipped with internal heating coils. No field-constructed aboveground storage tanks are located at the Landfill.

Each bulk storage container installation is engineered or updated in accordance with good engineering practice to avoid discharge. Before filling any tank, a Landfill employee verifies with the fuel vendor the level of the tank and the amount to be unloaded.

7.2.1 Construction [112.8(c)(1)]

The bulk storage containers and the secondary containment systems at the Landfill are compatible with all grades of gasoline, distillates, and lubricant oils. A copy of MSDSs for stored oils are located onsite.

7.2.2 Secondary Containment [112.8(c)(2)]

40 CFR 112.8(c)(2) requires constructing all bulk storage tank installations (except mobile refuelers and other non-transportation-related tank trucks) so a secondary means of containment is provided for the entire capacity of the largest single container and sufficient freeboard to contain precipitation. Diked areas must be sufficiently impervious to contain discharged oil. Dikes, containment curbs, and pits are commonly employed for this purpose. An alternative system consisting of a drainage trench enclosure may also be used so that any discharge will terminate and be safely confined in a Landfill catchment basin or holding pond.

Federal Register Vol. 74, No 218 states *“In the December 2008 amendments, EPA extended the exemption from the sized secondary containment requirements provided to mobile refuelers in the December 2006 amendments (71 FR 77266, December 26, 2006) to non-transportation-related tank trucks at a facility subject to the SPCC rule. Other non-transportation related tanker trucks may be transferring non-fuel oils (i.e., transformer oils, lubrication oils, or certain AFVOs) and operate similarly to mobile refuelers; therefore, they may not be able to comply with the sized secondary containment requirements. Specifically, EPA amended §§112.6(a)(3)(ii), 112.8(c)(2), 112.8(c)(11), 112.12(c)(2), and 112.12(c)(11) to include the phrase “except mobile refuelers and other nontransportation-related tank trucks.” Such non-transportation-related tank trucks include those used to store and transport fuel, crude oil, condensate, non-petroleum, or other oils for transfer to or from bulk storage containers; for example, a truck used to refill oil-filled equipment at an electrical substation or a pump truck at an oil production facility. Under this approach, the general secondary containment requirements at §112.7(c) still apply”*.

AST#1 is a double-walled tank that can contain 100 percent of the tank’s rated capacity and can fully support the loaded fuel tank and pumping system. In addition to this concrete structure, there is a tertiary containment system that consists of a low concrete dike built around the perimeter of the tank; this containment system is capable of holding 1,475 gallons. The entire fueling area is protected from accidental traffic collisions by bollards, spaced at approximately 6-foot intervals.

When not in operation, Mobile 1 is maintained and parked within close proximity to the Maintenance Building wash pad. The drainage system is in the bermed wash rack that is connected to an OWS. During re-fueling operations, the emergency oil storage capacity of the landfill liner system is sufficient to handle the quantity of oil expected to be discharged in undiked areas from overfills or transfer. The bermed wash rack and landfill liner system, along with monitoring all product transfers, provides environmental protection equivalent to the requirements under 112.8(b)(3).

Miscellaneous containers storing various oil products are also located at the Landfill. Typically, these containers are 55 gallon drums or 300 gallon totes located in or around the

maintenance/equipment fueling area. These containers are stored on spill control pallets (plastic “poly-spill” secondary containment pallets). Should secondary containment be breached, oil product would spill onto the ground surface where it would be contained and cleaned-up with sorbent materials.

7.2.3 Drainage of Diked Areas [112.8(c)(3)]

AST#1 has a tertiary containment system consisting of a dike. Spills within diked area will be cleaned up with absorbent material. The bypass valve for the diked area is kept sealed closed. Accumulated rainwater is drained; If opening the valve is required, the rainwater must be inspected to ensure it will not cause a discharge as described in §112.1(b) or applicable state regulations. The opening, drainage and resealing of the valve will be conducted under the direction of responsible supervision (District Manager or his delegate). Records of these events must be documented on the Record of Containment Dike Drainage form in Section 14.0 of this plan and maintained at the Landfill for at least three (3) years.

7.2.4 Corrosion Protection [112.8(c)(4)]

This section is not applicable, as there are no buried tanks at the Landfill.

7.2.5 Partially Buried and Bunkered Storage Tanks [112.8(c)(5)]

This section is not applicable as there are no partially buried or bunkered storage tanks at the Landfill.

7.2.6 Inspections and Tests [112.8(c)(6)]

As required by the SPCC rule, Landfill staff performs the inspections, tests, and evaluations listed in the following table. Table 5 summarizes the various types of inspections and tests performed at the Landfill. The inspections and tests are described later in this section, and in the respective sections that describe different parts of the Landfill.

It is recommended that periodic inspections be conducted of exposed fiberglass piping, rubber, and other material that may deteriorate when exposed to ultraviolet light and weathering be inspected for deterioration.

Table 5: Inspection and Testing Program

Facility Component	Action	Frequency/Circumstances
Aboveground Tanks and associated piping	Combine visual inspection with another non-destructive tank integrity testing technique. Inspect outside of container for signs of deterioration and discharges.	Follow a regular schedule Daily undocumented visual facility inspections Monthly documented inspections for tanks
AST supports and foundation	Inspect container's supports and foundations.	Following a regular schedule (monthly, annual, and during scheduled inspections) and whenever material repairs are made.
Liquid level sensing devices, electronic (overfill)	Test for proper operation.	Annually
Liquid level sensing devices, positive shut down (overfill)	Test for proper operation. Document initial testing.	Annually
All aboveground valves, piping, and appurtenances	Assess general condition of items, such as flange joints, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces.	Monthly
Underground piping	No buried underground oil piping is located onsite.	n/a

Visual inspections of AST by Landfill personnel are performed according to the procedure described in this SPCC Plan. Leaks from tank seams, gaskets, and bolts are promptly corrected. Records of inspections and tests are signed by the inspector and kept at the Landfill for at least three (3) years.

The scope and schedule of certified inspections and tests performed on the Landfill's AST are specified in Steel Tank Institute (STI) Standard SP-001. The external inspections, as specified in the standard, would be conducted by a certified tank inspector to assess the integrity of the tank for continued oil storage, or per the recommendations of the tank manufacturer.

In regard to the proceeding sections: Continuous Release Detection Method (CRDM) – means of detecting liquid through inherent design. It is passive. Liquid releases are visually detected by Landfill operators.

- Release Detection Barrier (RPB)
- Secondary Containment (AST – double wall tank)
- Elevated AST

Release Prevention Barrier (RPB) - A liquid-containment barrier installed underneath an aboveground storage tank that is sufficiently impervious to the liquid being stored. Its purpose is to divert a product release toward an area where it can be easily detected and to prevent liquid from contaminating the environment. Release prevention barriers are composed of materials that are compatible with the liquid being stored in the aboveground storage tank and that meet proper

engineering standards. Examples include DW tanks, steel, concrete, elastometric liners or other suitable materials that meet the criteria described above.

Inspections

- Periodic Inspections are to be conducted by owner's inspectors.
- Formal External Inspections are to be performed by certified inspectors.

Tank damaged or corroded

- To be determined by a certified STI tank inspector.

At a minimum, the following tank components shall be inspected (as applicable)

- Primary tank
- Secondary tank
- Tank supports
- Tank anchors
- Tank foundation and external supports
- Tank gauges and alarms
- Insulation covering
- Tank appurtenances
- Normal vents
- Emergency vents
- Release prevention barriers
- Spill control systems
- OWS

Record keeping

- Retain each AST record for the life of the AST.
- Retain each monthly inspection checklist for at least 36 months.
- Retain each annual inspection checklist for at least 36 months.
- Retain all certified inspection reports for the life of the AST.

Standards for AST inspections

STI SP001 shop fabricated ASTs:

- < 50,000 gallons

- Limited to max shell height of 50’ and a max diameter of 30’.
- An AST without a nameplate < 50,000 gallons plus max height 50’ and max diameter of 30’.

AST inspection categories:

- Cat 1 = AST with spill control and CRDM
- Cat 2 = AST with spill control and no CRDM
- Cat 3 = AST without spill control and CRDM

Four types of inspections:

- P = Periodic AST inspection
- E = Formal external inspection by a certified AST inspector
- I = Formal internal inspection by a certified AST inspector
- L = Leak test by owner

Table 6: STI Standard for Bulk Storage Containers Inspections and Tests

Gal	Cat 1	Cat 2	Cat 3
0-1100	P	P	P,E & L (10)
1101-5000	P	P,E & L (10)	P,E & L (5) I (10) or P,L (2),E (5)
5001-30000	P,E (20)	P,E (10) ,I (20) or P,E (5),L (10)	P,E & L (5) I (10) or P,L (1), E (5)
30001-50000	P,E (20)	P,E &L (5), I (15)	P,E &L (5), I (10)

Table 7: Scope and Frequency of Bulk Storage Containers Inspections and Tests

AST #	Approx. Quantity (Gallons)	Double or Single Walled	STI Category	STI Inspection Required
1	2,000	DW	1	P = Periodic AST inspection
Oil Filled Equipment	n/a			
Drums	Not a bulk storage tank and not subject to the STI guidance for inspections of bulk storage tanks. Visually inspected routinely, per the facility oil storage inspections.			
Transformers	n/a			

7.2.7 Heating Coils [112.8(c)(7)]

This section is not applicable because the AST is not equipped with internal heating coils.

7.2.8 Overfill Prevention System [112.8(c)(8)]

Overfill prevention devices are required for all bulk tanks. Approved devices include:

- High liquid level alarms with an audible or visual signal at a constantly attended operation or surveillance station. In smaller facilities an audible air vent may suffice.
- High liquid level pump cutoff devices set to stop flow at a predetermined container content level.
- Direct audible or code signal communication between the container gauge and the pumping station.
- A fast response system for determining the liquid level of each bulk storage container such as digital computers, telepulse, or direct vision gauges. If you use this alternative, a person must be present to monitor gauges and the overall filling of bulk storage containers.

AST#1 at the Landfill is equipped with a direct vision gauge and spill bucket. All tanks require continuous presence of personnel to monitor filling operations for overflow protection. Venting capacity is suitable for the fill and withdrawal rates. General secondary containment is provided in the event of overfills, as described in this SPCC Plan.

Landfill personnel are present throughout the filling operations to monitor the product level in the tanks. Liquid level sensing devices must be regularly tested to ensure proper operation.

7.2.9 Effluent Treatment Facilities [112.8(c)(9)]

This section is not applicable as there are no regulated, routine plant effluent discharges to navigable waters.

7.2.10 Visible Discharges [112.8(c)(10)]

Tanks and equipment with visible oil leaks or deficiencies that could result in a leak are repaired or replaced as soon as practicable. Any oil accumulation or stained soils in the area are promptly remediated and materials used during clean-up are properly disposed of in accordance with good engineering practices.

7.2.11 Mobile and Portable Containers [112.8(c)(11)]

The mobile refueling truck equipped with a fuel tank (Mobile 1) and are used for daily refueling of landfill equipment.

All oil tanks used at the Landfill are constructed of steel, in accordance with industry specifications as described previously. The design and construction of all bulk storage containers are compatible with the characteristics of the oil product they contain, and with temperature and pressure conditions.

7.3 Facility Transfer Operations [40 CFR 112.8(d)]

Transfer operations at the Landfill include:

- The transfer of diesel fuel from third party vendor tanker trucks into the double-walled AST located near the maintenance shop.

- The transfer of diesel fuel from the AST to fill machinery and the mobile service truck is conducted via pneumatic suction pumps to dispenser hoses.
- The transfer of used oil from portable used oil drain pans via drum funnels into 55-gallon used oil drums in the maintenance shop.
- The filling of Landfill trucks and equipment using the diesel fuel dispenser at the AST. The suction pump uses a rubber dispenser hose.
- The filling of Landfill trucks and equipment using the diesel fuel dispenser on the mobile refueling service truck. The tank-mounted suction pump uses a rubber dispenser hose.

7.3.1 Buried Piping Protection [112.8(d)(1)]

This section is not applicable as there is no buried piping at the Landfill.

7.3.2 Out-of-Service Piping [112.8(d)(2)]

This section is not applicable as there is no out-of-service piping at the Landfill.

7.3.3 Pipe Supports [112.8(d)(3)]

This section is not applicable as there are no pipe supports used at the Landfill.

7.3.4 Inspection of Aboveground Valves, Piping, and Appurtenances [112.8(d)(4)]

All aboveground piping and valves are examined monthly to assess their condition. Inspection includes aboveground valves, piping, appurtenances, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces. Observations are noted on the monthly inspection checklist provided in this SPCC Plan.

7.3.5 Overhead Pipe Clearance [112.8(d)(5)]

All of the aboveground piping is located within areas that are not accessible to vehicular traffic (e.g., inside building, protected by vehicle barrier posts). Brightly painted bollards are placed where needed to prevent vehicular collisions with equipment.

8. CERTIFICATION OF THE APPLICABILITY OF THE SUBSTANTIAL HARM CRITERIA [40 CFR 112.20(E)]

The intent of this form is to determine if the Landfill for which this SPCC Plan is written must prepare a Facility Response Plan as defined by 40 CFR 112.20.

Facility Name: Kekaha Municipal Solid Waste Landfill Phase II

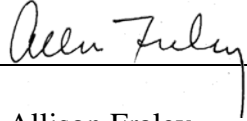
Facility Address: 6900-D Kaumuali'i Highway, Kekaha, Kaua'i, Hawai'i 96752

1. Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?
 YES NO
2. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest above ground oil storage tank plus sufficient freeboard to allow for precipitation within any above ground storage tank area?
 YES NO
3. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Attachment C-III to this appendix or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments? For further description of fish and wildlife and sensitive environments see Appendices I, II, and III to DOC/NOAA's "Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments" (see appendix E to this part, section 10, for availability) and the applicable Area Contingency Plan.
 YES NO
4. Does the facility have a total oil storage capacity of greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Attachment C-III to this appendix or a comparable formula) such that a discharge from the facility would shut down a public drinking water intake?
 YES NO
5. Does the facility have a total oil storage capacity of greater than or equal to 1 million gallons and has the facility experienced a reportable spill in an amount greater than or equal to 10,000 gallons within the last 5 years?
 YES NO

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

Signature



Name (type or print)

Allison Fraley

Title

Environmental Services
Manager

9. SPILL PREVENTION BRIEFING LOG

Date of briefing: _____

Briefing conducted by: _____

In accordance with 40 CFR 112.7(f), and in order to ensure adequate understanding of the SPCC Plan for this facility, spill prevention briefings must be conducted at least once per year for all oil-handling personnel, and should include at least the topics listed below. Use this form to document attendance at the spill prevention briefing.

The following topics were discussed at the meeting (check all that apply):

- SPCC Plan, including the contact list and telephone numbers, and including potential spill flow routes and strategic barricading points
- Facility operations, especially those pertaining to oil storage and handling
- Applicable pollution control laws, rules and regulations
- Spill events or failures at this or other sites
- Operation and maintenance of equipment to prevent oil spills
- Spill response and reporting procedures
- Other _____

Facility personnel in attendance:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Completed copies of this briefing log shall be kept with the SPCC Plan for a minimum of 3 years.

10. ANNUAL SPCC PLAN APPLICABILITY REVIEW CHECKLIST

Date Reviewed: _____ Reviewed by: _____

Date Last Reviewed: _____

On an annual basis, review the following items to evaluate if they are still accurate for your facility. If there is a change in the Landfill design, construction, operation, or maintenance that materially affects the potential for a discharge from the Landfill, you must prepare an amendment to this SPCC Plan within six months of the change, and implement the amendment as soon as possible, but not later than six months following preparation of the amendment [40 CFR 112.5(a)].

Examples of changes that may require amendment of the SPCC Plan include, but are not limited to:

- Commissioning or decommissioning of containers or tanks.
- Replacement, reconstruction, or movement of containers or tanks.
- Reconstruction, replacement, or installation of piping systems.
- Construction or demolition that alter secondary containment structures.
- Changes of product or service.
- Revision of standard operation of maintenance procedures at the facility.

ADMINISTRATIVE

Are the following documents available for use at the facility?

Yes	No	NA	
_____	_____	_____	SPCC Plan
_____	_____	_____	Oil Spill Contingency Plan

Are the site-specific sections of the above reports accurate?

Yes	No	NA	
_____	_____	_____	Area Descriptions
_____	_____	_____	Oil Storage
_____	_____	_____	Have facility/tank inspection checklists been completed and filed?
_____	_____	_____	Are spill response numbers posted?

Have employees received appropriate training/briefings including:

Yes **No** **NA**

_____ _____ _____ SPCC Plan Briefings (oil handling personnel)

SPILL RESPONSE EQUIPMENT

Yes **No** **NA**

_____ _____ _____ Is spill response equipment available as indicated in the
SPCC Plan?

_____ _____ _____ Is all spill response equipment in good working order?

Additional equipment/materials that are needed?

GENERAL

Yes **No** **NA**

_____ _____ _____ Are all areas free of unnecessary clutter?
_____ _____ _____ Are small oil containers kept in flammable lockers or other
acceptable locations?

DRUM STORAGE AND HANDLING AREAS

Yes **No** **NA**

_____ _____ _____ Are containers free of signs of leakage, rust, or other
deterioration?
_____ _____ _____ Are containers kept closed when not in use?
_____ _____ _____ Are containers stored off the floor/ground, in containment
areas?
_____ _____ _____ Are drip pans provided under spigots?
_____ _____ _____ Are spigots and valves free of leaks?
_____ _____ _____ Are containers labeled?

CONTAINMENT BERMS/STRUCTURES

Yes	No	NA	
_____	_____	_____	Are containment areas free of debris and liquid accumulations?
_____	_____	_____	Are containment/draining structures intact, and free of cracks, breaches, etc.?
_____	_____	_____	If present, are drainage valves secured?

ABOVEGROUND STORAGE TANKS

Yes	No	NA	
_____	_____	_____	Are fuel hoses, pumps, and valves drained and properly secured when not in use?
_____	_____	_____	Are valves, flanges, and gauges free of signs of leakage?
_____	_____	_____	Is monitoring equipment operational?

WASTE OIL STORAGE AREA

Yes	No	NA	
_____	_____	_____	Are all waste oil storage areas maintained in a neat and tidy fashion?
_____	_____	_____	Are all drums and other hazardous substance containers located within designated areas?
_____	_____	_____	Are all containers properly marked and dated?

DRAINAGE

Yes	No	NA	
_____	_____	_____	Are drainage ditches and culverts free of debris, trash, etc.?
_____	_____	_____	Are storm drain outlets adequately protected from erosion?

Remarks (Describe other problems or potential problems that may pose a hazard)

Completed copies of this form shall be kept with the SPCC Plan for a minimum of 3 years.

11. SPCC PLAN REVIEW AND EVALUATION LOG

The table below logs the review and evaluation of the SPCC Plan and documents amendments and/or P.E. certification that has been required.

“I have completed my review and evaluation of the SPCC Plan for the Kekaha Municipal Solid Waste Landfill Phase II on the date indicated, and as a result, will or will not amend the Plan as indicated below.”

1	Reviewer Name	Date	Plan Amended?		Nature of Changes Made	P.E. Cert Required?		Date Certified
			Yes	No		Yes	No	
1	Eddie Pettit, Waste Management	10/2015	Yes	No		Yes	No	10/2015
2	Tina Alder, Waste Management	03/2016	Yes	No		Yes	No	03/2016
3	Tina Alder, Waste Management	07/2016	Yes	No		Yes	No	07/2016
4	Adrienne Miller, Geosyntec Consultants	09/2021	Yes	No	Removed references to former Operator, Waste Management, and update contact information.	Yes	No	09/2021
5	Adrienne Miller, Geosyntec Consultants	09/2022	Yes	No	Updated petroleum storage inventory and figures.	Yes	No	09/2022
6	Adrienne Miller, Geosyntec Consultants	09/2023	Yes	No	Updated petroleum storage inventory and figures.	Yes	No	09/2023
7	Adrienne Miller, Geosyntec Consultants	09/2024	Yes	No	Updated petroleum storage inventory and figures.	Yes	No	09/2024

Each time an amendment to this plan occurs, a new Management Approval signoff in Section 5 needs to be completed.

12. SPILL INVESTIGATION FORM

1. When did the Incident occur? Date: _____ Time: _____

2. Where did the Incident occur? _____

3. How did the Incident occur (Describe the Cause)? _____

4. Under whose control was the material (chemical, petroleum, ash) at the time of the Incident?

Name: _____

Mailing Address and Street: _____

Town: _____ State: _____ Zip: _____ Telephone: _____

5. What was spilled or discharged? Give an exact description of each of the materials involved in the incident, including chemical names, percent concentrations, trade names, etc.

If the Chemicals are Extremely Hazardous substances or CERCLA hazardous substances they must be identified as such and include the reportable quantity (RQ). Please attach a Material Safety Data Sheet (MSDS) for each chemical involved.

6. What were the quantities (chemicals, petroleum, cooling water, lime, ash etc.) that were released, spilled or discharged to each environmental medium (air, surface water, soil, groundwater)?

7. Did any of the chemical or petroleum travel beyond the property line? [Note: materials that enter the groundwater are considered to have gone beyond the property line.]

8. What actions were taken to respond to and contain the release, spill or discharge?

9. What actions are being taken to prevent reoccurrence of an incident of this type?

10. Was the Incident verbally reported to Management? (Contact EHS Manager, 25 gallons or more)

Contacted/Title: _____

Date: _____ Time: _____

11. Who reported the incident?

Name/Title: _____

Mailing Address and Street: _____

Town: _____ State: _____ Zip: _____ Telephone: _____

12. Were there any injuries as a result of the Incident? If so, list the names of exposed individuals, their addresses, and phone numbers and describe their injuries. (Attach Additional Sheets if Necessary)

Name: _____

Mailing Address and Street: _____

Town: _____ State: _____ Zip: _____ Telephone: _____

13. What is the appropriate advice regarding medical attention necessary for exposed individuals?

14. Are there known or anticipated health risks, acute or chronic, associated with the release of this chemical or medical advice that should be communicated?

15. Was the incident completely cleaned up by the time this report was submitted? If not, what are the anticipated remedial actions and their duration?

16. Completed by:

Signature

Title

Date

13. SPILL DOCUMENTATION

(Date: _____)

FACILITY (DIVISION) ORIGINATING REPORT

Name: _____ Address: _____

City: _____ State: _____ Zip: _____

Phone: _____

Contact: _____

Other Responsible Persons: _____

INCIDENT DESCRIPTION

Location where spill occurred and cause (address; include description of area, i.e. industrial park, subdivision, etc.): _____

Weather Conditions (temperature, windy, sunny, rain, snow, etc.): _____

SPILL Date Began: _____ Date Ended: _____

Time Began: _____ Time Ended: _____

CLEANUP Date Began: _____ Date Ended: _____

Time Began: _____ Time Ended: _____

Material Spilled/Released: _____

Amount(s) Spilled/Released: _____

Spill/Release onto (type of soil [sand, clay, etc.]): _____

Soil Asphalt Concrete Other (describe)

Ability of the spill to spread (where did spill end up and how fast did it flow?): _____

Distance to closest water body: _____

Distance to: drains, sewers, ditches. _____

Agencies on site of spill (police, fire, etc.): _____

Contact name and number: _____

Spill/Release: Potential exposure to water wells, plants, animals, humans, sensitive environments.

NOTIFICATIONS (must Notify Emergency Government and DNR)

Agency	Phone Number	Contact Name	Date and Time
DOH-HEER Office	808-586-4249		
DOH-After Hours	808-236-8200		
National Response Center	800-424-8802		
EPA Region 9	800-300-2193		

Instruction given by agencies: _____

Evidence of contamination, visual & odor (describe): _____

Impacts on the environment: _____

Corrective action taken: _____

Volume and Disposal of waste generated by spill: _____

Signature

Date

Printed/Typed Name

Title

INSTRUCTIONS FOR COMPLETION OF SPILL REPORT DOCUMENTATION

Facility Originating Report: Identify the division including physical address (not Post Office Box).

Other Parties/Persons Responsible for Discharge: (Example) If a collision ruptures a fuel tank, name of driver of other vehicle.

Incident Description: Describe incident.

Location and Cause: Identify address of spill, description of area where spill occurred. Description to include zoning, distance to residences, etc. Identify cause of spill (hose ruptured, etc.)

Weather Conditions: Summary of temperature, wind direction and speed, precipitation, any other weather conditions of importance. Include any weather issues until spill clean-up is completed.

Spill: Approximate time spill started, duration of spill.

Cleanup: Approximate time clean-up began, how long it takes to complete clean-up.

Material Spilled and Amount: What was spilled and physical state (solid, liquid). The physical, chemical, hazardous, and toxicological characteristics of the substance spilled (off MSDS).

Amount Spilled/Released: Volume of substance spilled, and amount of absorbent used to clean up.

Spilled: Identify what spill came in contact with. If soil, identify soil type.

Ability of Spill to Spread: Is the weather (rain) washing the spill into a larger area? Is the surface sloping which is spreading the spill, wind blowing scattering material over greater distance? Where did spill end up going and how fast did it flow? Did other actions effect spill, i.e. fire hose washing contaminant?

Distance to closest water body: Is there a stream, river, pond or lake in close proximity, potential for contamination, identify distance?

Distance to drains, sewers, ditches: Is there a ditch or drain in close proximity to the spill. Identify distance to drain, ditch, etc.?

Agencies on site: If any agency responded (police and fire) list: contact and phone number and attach copy of any report issued by agency.

Spill/Release Potential Exposure to Water Wells, Plants, etc.: Are there any areas of special concern by the spill, such as wetlands, environmental corridors, trout streams, wildlife management areas, water wells, endangered plants, animals, etc.? If so, identify and contact Regional EMD.

Notifications: DOH must be notified when a spill occurs. NRC must be notified if a reportable quantity of a hazardous material is spilled. The only hazardous material we routinely haul is friable asbestos. Be sure to document time and date contacts were made.

Instructions Given by Agencies: When the spill was reported, was any information provided by the agencies on to how to manage, collect or remediate the spill?

Evidence of Contamination: The spill normally has an odor and visual appearance. Was the spill able to be removed? Any indicators of contamination remain after remedial activity.

Impacts on the Environment: Has cleanup been successful in removing any contaminants which would affect the environment?

Volume and Disposal of Waste Generated by Spill: Identify volume of residue and disposal of waste. Attach copies of manifest documenting disposal.

Corrective action taken: What was done to clean up the spill? Explain any unusual items of cleanup operation.

Signature: Signed by person supervising clean-up.

14. RECORD OF CONTAINMENT DIKE DRAINAGE

This record must be completed when rainwater from diked areas is drained into a storm drain or into an open watercourse, lake, or pond, and bypasses the water treatment system. The bypass valve must normally be sealed/locked in closed position. It must be opened and resealed/re-locked following drainage under responsible supervision.

IMPORTANT: If the area has an oil sheen present, rainwater cannot be drained until contamination has been removed.

Date	Diked Area Name	Presence of Oil Sheen	Time Started	Time Finished	Signature
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			
		<input type="checkbox"/> Yes <input type="checkbox"/> No			

15. COMPLIANCE PLAN/SCHEDULE

The following action items have been identified at the Landfill as needing to be addressed in order to fully comply with the applicable requirements of 40 CFR Part 112, et seq., as currently promulgated and interpreted by U.S. Environmental Protection Agency (EPA):

No action items have been identified at the Landfill as needing to be addressed in order to fully comply with the applicable requirements of 40 CFR Part 112, et seq., as currently promulgated and interpreted by U.S. Environmental Protection Agency (EPA). The SPCC regulations regarding 5-year Plan reviews requiring changes be made within six months of the completion of this amended Plan are therefore not applicable.

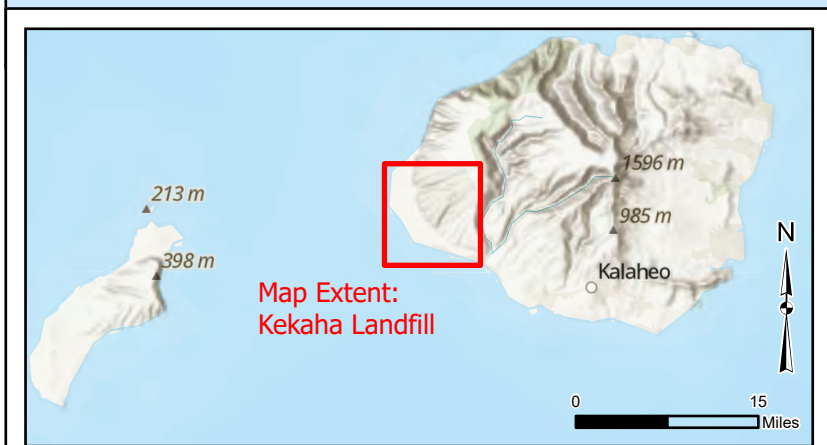
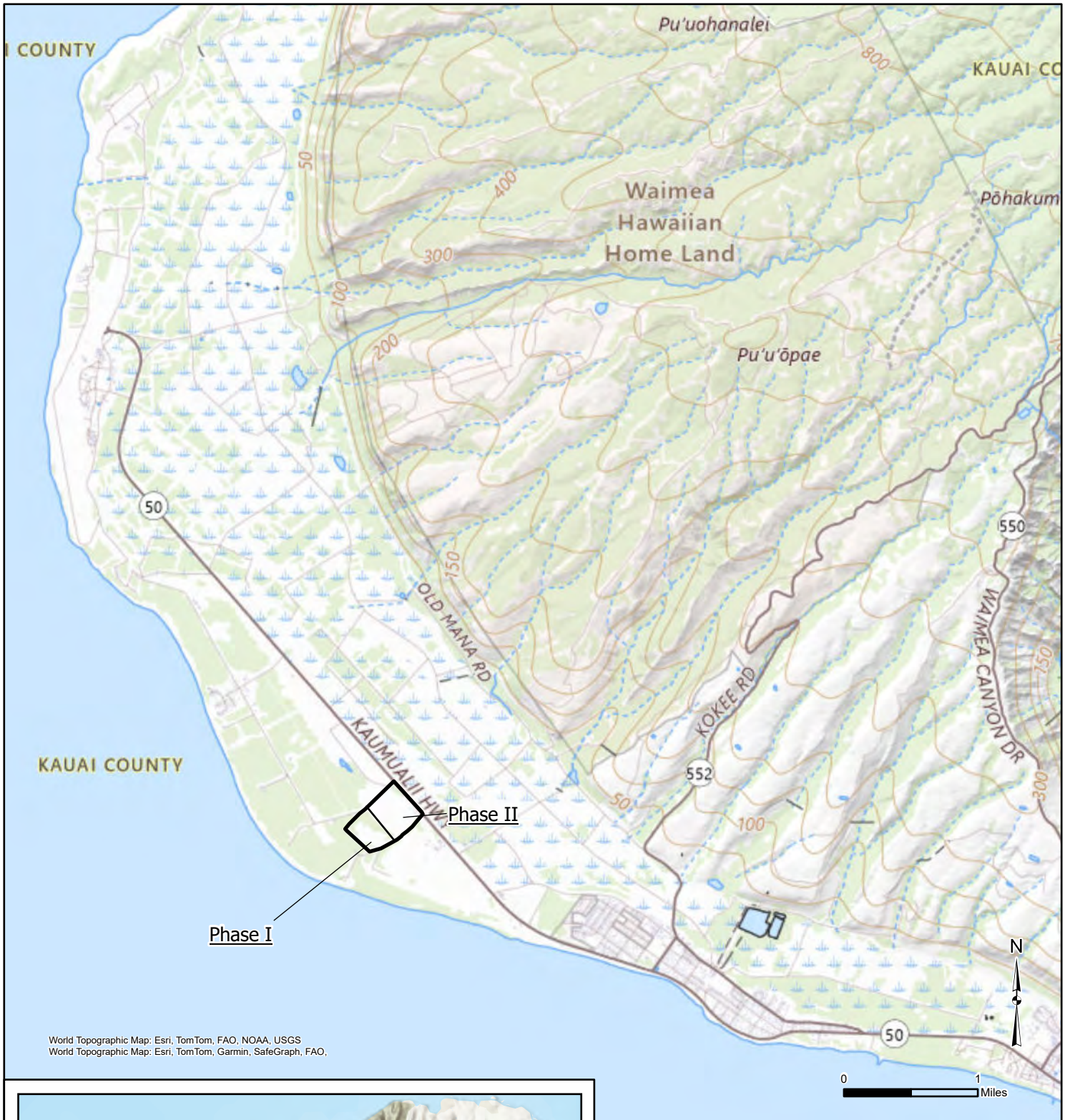
Adrienne V. Miller
Adrienne V. Miller, PE

August 30, 2024
Date

I certify that I am familiar with the action items identified in this Compliance Plan/Schedule, and agree to implement them as soon as possible, but not later than six months following the completion of this 5-year Plan review.

TABLES

FIGURES



**Kekaha Municipal Solid Waste Landfill
 County of Kaua'i
 Site Location Map**

6900 Kaumuali'i Hwy,
 Kekaha, HI 96752



**Figure
 1**

WG3074 August 2024



LEGEND

	EXISTING GROUND ELEVATION (10-FT AND 2-FOOT CONTOUR) (NOTES 1, 2, AND 3)
	APPROXIMATE PROPERTY LINE (NOTE 5)
	APPROXIMATE PHASES I AND II WASTE LIMIT (NOTE 6)
	APPROXIMATE CELL 2 LIMIT

- NOTES:**
- EXISTING GROUND CONTOURS AND SITE FEATURES PREPARED BY BOWERS + KUBOTA CONSULTING, INC., AND BASED ON DRONE SURVEY DATED 06-15-24.
 - DRONE SURVEY DATED 06-15-24 CORRECTED IN AREAS OF VEGETATION.
 - HORIZONTAL DATUM AND COORDINATES ARE BASED ON LOCAL COORDINATE SYSTEM. VERTICAL DATUM AND ELEVATIONS ARE BASED ON BENCHMARK: USGS BRASS MONUMENT G-1000, +1.21 FEET (MSL).
 - EXISTING INFRASTRUCTURE LOCATIONS ARE APPROXIMATE.
 - APPROXIMATE PROPERTY LINES PROVIDED BY BOWERS + KUBOTA CONSULTING, INC., 2024.
 - APPROXIMATE PHASES I AND II WASTE LIMITS ARE FROM CONSTRUCTION DRAWING C-1 "EXISTING SITE CONDITIONS", PROJECT 6558519 "CELL 2 BASE LINER - PHASE II LATERAL EXPANSION", PREPARED BY AECOM, DATED 09-04-18.
 - FOR CELL 2, THE FINAL TOP DECK AREAS WILL HAVE MINIMUM SLOPES OF 3% AND THE FINAL SIDE SLOPES WILL NOT EXCEED 3.5H:1V.
 - THE LANDFILL IS DESIGNED TO RETAIN STORMWATER ON-SITE FOR UP TO A 25-YEAR RETURN FREQUENCY, 24-HOUR DURATION RAINFALL EVENT AS WELL AS THE 100-YEAR, 1-HR STORM EVENT (AECOM, 2017). IF A MAJOR STORM EVENT ABOVE THE DESIGN STORMS, CAUSE DISCHARGE OFF-SITE, THE COUNTY NOTIFIES THE HI DEPARTMENT OF HEALTH WITHIN 24 HOURS AND IMPLEMENTS BEST MANAGEMENT PRACTICES (BMPS) TO MANAGE THE STORMWATER.

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

DESIGN BY:	AVM
DRAWN BY:	ABK
CHECKED BY:	JHL
REVIEWED BY:	MJM
APPROVED BY:	MJM

TITLE: **SITE PLAN AND 06-15-24 TOPOGRAPHY**

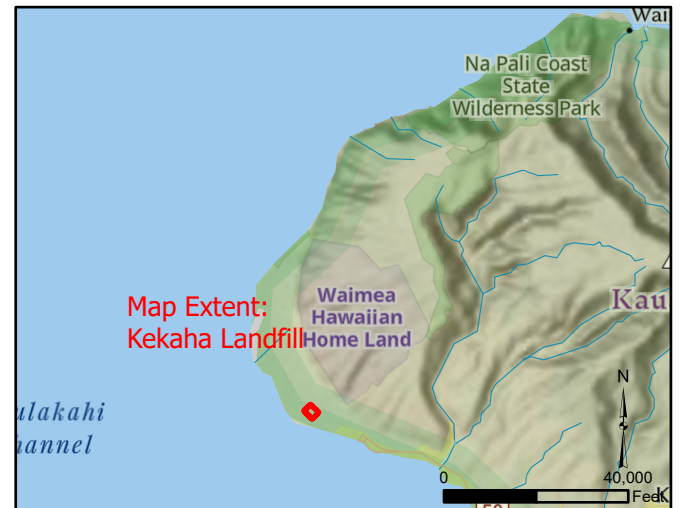
PROJECT: **2023-2024 SWMP ANNUAL UPDATE**

SITE: **KEKAHA MUNICIPAL SOLID WASTE LANDFILL
KEKAHA, COUNTY OF KAUAI, HAWAII**



DATE:	JULY 2024
PROJECT NO.:	WG3074
FILE:	WG3074-SWMP-2024
DRAWING NO.:	1 OF 1

P:\00\CIVIL\00\COUNTY OF KAUAI\2023\2023 SWMP\06-15-24\06-15-24 SWMP-2024



Legend

- Label
- Leachate Structures
- Flow Arrows
- Access Road
- - - - Down Drain
- Diversion Berm
- Infiltration Ditch
- Drainage Ditch
- Infiltration Basin
- Leachate Evaporation Pond
- - - - Permitted Limit of Waste
- ▭ Property Line

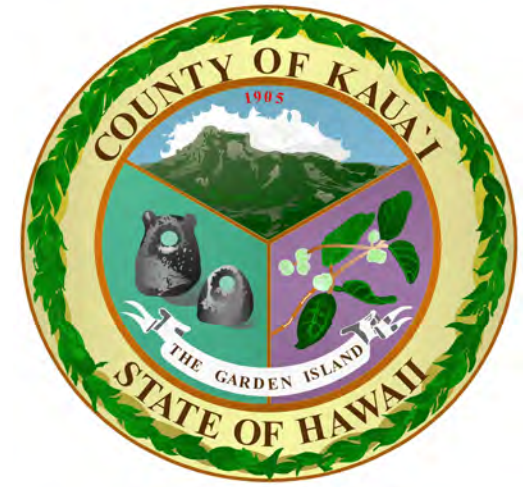
Map Source:
 Esri Community Maps Contributors, ©
 OpenStreetMap, Microsoft, Esri, TomTom,
 Garmin, SafeGraph, METI/NASA, USGS,
 EPA, US Census Bureau, USDA, USFWS,
 Esri, CGIAR, USGS, Sources: Esri, USGS,
 Esri, TomTom, Garmin, SafeGraph, FAO,
 METI/NASA, USGS, EPA, USFWS, Resource
 Mapping Hawaii

Kekaha Municipal Solid Waste Landfill
County of Kaua'i
Surface Water Management System
 6900 Kaumualii Hwy,
 Kekaha, HI 96752

Geosyntec
 consultants

WG3074 August 2024

Figure
3



Legend
 ~ Flow Arrows
 o Label

Notes:
 1. Wash Rack has 600-gallon capacity oil/water separator.
 2. AST #1 is 2,000 gallon diesel.
 3. Generator equipped with a 25-gallon day Tank and fuel transfer pump.
 4. Concrete Containment berm surrounds AST #1: (1,475 gallons).
 5. Maintenance shop drum area contains:
 a. (11) 55 gallon drums, county owned
 b. Misc. Hydrocarbons

Map Source:
 Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS

Kekaha Municipal Solid Waste Landfill
County of Kaua'i
Oil Storage Areas
 6900 Kaunualii Hwy,
 Kekaha, HI 96752

Geosyntec
 consultants

Figure
4

WG3074 August 2024

APPENDIX A

Inspection Forms

MONTHLY AST INSPECTION CHECKLIST

Kekaha Municipal Solid Waste Landfill

Inspection Area	No Action Needed (Check)	Observations	Description/Action Taken	Initial/Date After Action Completed
BULK STORAGE TANKS				
AST #1 <ul style="list-style-type: none"> • 2,000 gallon diesel 	<input type="checkbox"/>	1.1 1.2 1.3 1.4 2.1 3.1 3.2 3.3 4.1		
MOBILE TANKS				
Mobile 1 (aka Portable #1) <ul style="list-style-type: none"> • 115 gallons diesel 	<input type="checkbox"/>	1.1 1.2 1.3 1.4 4.1		
DRUMS				
Drum Area: Maintenance Shop <ul style="list-style-type: none"> • 55*(7) 300*(2)² gallon misc. hydrocarbons <small>²Eight (8) of the drums and two (2) of the totes are owned by the County.</small>	<input type="checkbox"/>	1.1 1.2 1.3 1.4 2.1 3.1 3.2 3.3 4.1		

Inspector's Name _____ Date _____ Time _____

Inspector's Signature _____

MONTHLY AST INSPECTION CHECKLIST

Kekaha Municipal Solid Waste Landfill

Inspection Guidance:

- For equipment not included in this standard, follow the manufacturer recommended inspection/testing schedules and procedures.
- The periodic AST Inspection is intended for monitoring the external AST condition and its containment structure. This visual inspection does not require a certified inspector. It shall be performed by an owner's inspector who is familiar with the site and can identify changes and developing problems.
- Upon discovery of water in the primary tank, secondary containment area, interstice, or spill container, remove promptly or take other corrective action. Before discharge to the environment, inspect the liquid for regulated products or other contaminants and disposed of it properly.
- Non-conforming items important to tank or containment integrity require evaluation by an engineer experienced in AST design, a certified inspector, or a tank manufacturer who will determine the corrective action. Note the non-conformance and corresponding corrective action in the comment section.
- Retain the completed checklists for 36 months.
- **In the event of severe weather (snow, ice, windstorms) or maintenance (such as painting) that could affect the operation of critical components (normal and emergency vents, valves), an inspection of these components is required immediately following the event.**

Legend:

1.0 Tank Containment	
1.1 Water in primary tank, secondary containment, interstice, or spill containers?	1.3 Drain valves operable and in a closed position?
1.2 Debris or fire hazard in containment?	1.4 Containment egress pathways clear and gates/doors operable?
2.0 Leak Detection	
2.1 Visible signs of leakage around the tank, concrete pad, containment, ring wall or ground?	
3.0 Tank Attachments and Appurtenances	
3.1 Ladder and platform structure secure with no sign of severe corrosion or damage?	3.3 All tank openings are properly sealed?
3.2 Tank Liquid level gauge readable and in good condition?	
4.0 Other Conditions	
4.1 Are there other conditions that should be addressed for continued safe operation or that may affect the site SPCC Plan?	

Inspector Notes:

ANNUAL AST INSPECTION CHECKLIST

Kekaha Municipal Solid Waste Landfill

Inspection Area	No Action Needed (Check)	Observations	Description/Action Taken	Initial/Date After Action Completed
BULK STORAGE TANKS				
AST #1 <ul style="list-style-type: none"> • 2,000 gallon diesel 	<input type="checkbox"/>	1.1 1.2 2.1 2.2 2.3 2.4 2.5 4.1 5.1 5.2 6.1 7.1 7.2 7.3 8.1 8.2 10.1 10.2 10.3 11.1 11.2		
MOBILE TANKS				
Mobile 1 (aka Portable #1) <ul style="list-style-type: none"> • 115 gallons diesel 	<input checked="" type="checkbox"/>	1.1 1.2 2.1 2.2 2.3 2.4 2.5 4.1 5.1 5.2 6.1 7.1 7.2 7.3 8.1 8.2 10.1 10.2 10.3		

Inspector's Name _____ Date _____ Time _____

Inspector's Signature _____

ANNUAL AST INSPECTION CHECKLIST

Kekaha Municipal Solid Waste Landfill

Inspection Guidance:

- For equipment not included in this standard, follow the manufacturer recommended inspection/testing schedules and procedures.
- The periodic AST Inspection is intended for monitoring the external AST condition and its containment structure. This visual inspection does not require a certified inspector. It shall be performed by an owner’s inspector who is familiar with the site and can identify changes and developing problems.
- Inspect the AST shell and associated piping, valves, and pumps including inspection of the coating for Paint Failure.
- Inspect:
- Earthen containment structures including examination for holes, washout, and cracking in addition to liner degradation and tank settling.
- Concrete containment structures and tank foundations/supports including examination for holes, washout, settling, paint failure, in addition to examination for corrosion and leakage.
- Steel containment structures and tank foundations/supports including examination for washout, settling, cracking, and for paint failure, in addition to examination for corrosion and leakage.
- Inspection of cathodic protection system, if applicable, includes the wire connections for galvanic systems and visual inspection of the operational components (power switch, meters, and alarms) of impressed current systems.
- Remove promptly upon discovery standing water or liquid in the primary tank, secondary containment area, interstice, or spill container. Before discharge to the environment, inspect the liquid for regulated products or other contaminants and disposed of it properly.
- In order to comply with EPA SPCC (Spill Prevention, Control and Countermeasure) rules, a facility must regularly test liquid level sensing devices to ensure proper operation (40 CFR 112.8(c)(8)(v)).
- Non-conforming items important to tank or containment integrity require evaluation by an engineer experienced in AST design, a certified inspector, or a tank manufacturer who will determine the corrective action. Note the non-conformance and corresponding corrective action in the comment section.
- Retain the completed checklists for 36 months.
- Complete this checklist on an annual basis supplemental to the owner monthly-performed inspection checklists.
- Note: If a change has occurred to the tank system or containment that may affect the SPCC plan, the condition should be evaluated against the current plan requirement by a Professional Engineer knowledgeable in SPCC development and implementation.

Legend:

Item	Status			Comment
1.0 Tank Containment				
1.1 Containment structure in satisfactory condition?	Yes	No	N/A	
1.2 Drainage pipes/valves fit for continued service	Yes	No	N/A	
2.0 Tank Foundation and Supports				
2.1 Evidence of tank settlement or foundation washout?	Yes	No	N/A	

2.2 Cracking or spalling of concrete pad or ring wall?	Yes	No	N/A	
2.3 Tank supports in satisfactory condition?	Yes	No	N/A	
2.4 Water able to drain away from tank?	Yes	No	N/A	
2.5 Grounding strap secured and in good condition?	Yes	No	N/A	
3.0 Cathodic Protection				
3.1 CP system functional?	Yes	No	N/A	
3.2 Rectifier Reading:	Yes	No	N/A	
4.0 Tank External Coating				
4.1 Evidence of paint failure?	Yes	No	N/A	
5.0 Tank Shell/Heads				
5.1 Noticeable shell/head distortions, buckling, denting, or bulging?	Yes	No	N/A	
5.2 Evidence of shell/head corrosion or cracking?	Yes	No	N/A	
6.0 Tank Manways, Piping and Equipment within Secondary Containment				
6.1 Flanged connection bolts tight and fully engaged with no sign of wear or corrosion?	Yes	No	N/A	
7.0 Tank Roof				
7.1 Standing water on roof?	Yes	No	N/A	
7.2 Evidence of coating cracking, crazing, peeling, blistering?	Yes	No	N/A	
7.3 Holes in roof?	Yes	No	N/A	
8.0 Venting				
8.1 Vents free of obstructions?	Yes	No	N/A	
8.2 Emergency vent operable? Lift as required?	Yes	No	N/A	
9.0 Insulated Tanks				
9.1 Insulation missing?	Yes	No	N/A	
9.2 Are there noticeable areas of moisture on the insulation?	Yes	No	N/A	
9.3 Mold on insulation?	Yes	No	N/A	
9.4 Insulation exhibiting damage?	Yes	No	N/A	
9.5 Is the insulation sufficiently protected from water intrusion?	Yes	No	N/A	
10.0 Level and Overfill Prevention Instrumentation of Shop-Fabricated Tanks				
10.1 Has the tank liquid level sensing device been tested to ensure proper operation?	Yes	No	N/A	
10.2 Does the tank liquid level sensing device operate as required?	Yes	No	N/A	
10.3 Are overfill prevention devices in proper working condition?	Yes	No	N/A	
11.0 Electrical Equipment				
11.1 Are tank grounding lines in good condition?	Yes	No	N/A	
11.2 Is electrical wiring for control boxes/lights in good condition?	Yes	No	N/A	

