SECTION I - PART A

GENERAL INFORMATION

GENERAL INFORMATION

WEST HAWAI`I SANITARY LANDFILL

WAIKOLOA, HAWAI`I

PREPARED BY

WASTE MANAGEMENT OF HAWAII, INC.

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1 INTRODUCTION

The purpose of this Site Operations Manual is to establish and standardize the procedures needed to conduct daily operations at the West Hawai`i Sanitary Landfill (WHSL) an active solid waste landfill, which began operations in 1993. The WHSL is owned by the County of Hawai`i Department of Environmental Management (DEM) and operated by Waste Management of Hawaii (WMH). This Site Operations Manual has been prepared in accordance with the requirements of the following:

- Federal Regulations (Federal Register, Code of Federal Regulations [CFR] Title 40 – Protection of the Environment)
- State of Hawai`i Regulations:
  - ✓ Hawai`i Revised Statutes (HRS)
  - ✓ Hawai`i Administrative Rules (HAR):

    §11-54 & 55, Water Quality Standards & Water Pollution Control
    §11-58.1, Solid Waste Management Control
    §11-60.1, Air Pollution Control
- Permits issued by the State of Hawai`i Department of Health (DOH):
  - ✓ Solid Waste Operating Permit No.LF-0072-93 (Solid Waste Section [SWS])
  - ✓ Non-Covered Source Permit (CSP) No. 0653-01-N (Clean Air Branch [CAB])
  - ✓ Termination of National Pollutant Discharge Elimination System (NPDES) General Permit File No. HI R50A543 (Clean Water Branch [CWB])
- Internal Policies of Waste Management, Inc. (WM)
- Environmentally sound operating practices & effective safety programs.

The Manual is intended to be a "living" document and will be reviewed at least annually by WMH / WHSL staff and updated as necessary to reflect current operations at the WHSL. The WMH Environmental Protection (EP) Manager is responsible for coordinating and implementing manual updates, including distributing copies to holders of controlled copies of the manual. Keeping the manual current through updates is an on-going process. As updates are proposed, the EP Manager will assess whether an alteration requires notification of the DOH or can be handled/submitted as part of the annual update. This manual is a controlled document and copies are assigned as follows:

Controlled Copy Number	Assigned
1 & 2	WHSL
3	Waimanalo Gulch Sanitary Landfill
4	DOH SWS
5	County of Hawai`i, DEM, Solid Waste Division

It is the responsibility of each manual holder to keep their copy current by inserting all changes into the manual and destroying/archiving the obsolete pages. The WHSL Site Manager and WMH Management are responsible for ensuring that WHSL personnel understand and adhere to the policies and procedures established in this Manual.

2 SITE INFORMATION

The WHSL covers a total area of approximately 300 acres. The permitted waste footprint, which covers approximately 150 acres, is roughly square and is divided into a series of smaller waste disposal cells (see Figures 1 and 2). Waste disposal began in the northern portion of the permitted waste footprint (Cell No. 1) and has since extended toward the east and south.

2.1 Site Description

The administration building and scale house are located on the northwest portion of the site, just south of the entrance to the site. A maintenance shop and fueling area are located south of the administration building. Due to the lack of county or private water systems in the vicinity of the WHSL, a pumping station and water tank located in the northeast corner of the site provide non-potable water for fire protection, dust control, and other operating requirements.

The WHSL is surrounded on all sides by rugged, open terrain characteristic of recent lava flows. The Queen Kaahumanu Highway is approximately 0.6 miles west of the WHSL, near the 79-mile marker. The nearest residential area is located approximately 1.25 miles west of the WHSL adjacent to Keawaiki Bay. The Waikoloa Beach Resort and Mauna Lani Resort are located approximately 1.5 miles northwest of the WHSL (see Figures 1 and 2).

2.2 Climate and Topography

The WHSL is located on the leeward side of the island of Hawai`i, a region that is relatively arid when compared to the windward side of the island. Average annual rainfall in the area of the WHSL is approximately 10 inches (Mink and Lua 1993). The topography at WHSL ranges from approximately 200 feet msl to approximately 160 feet msl.

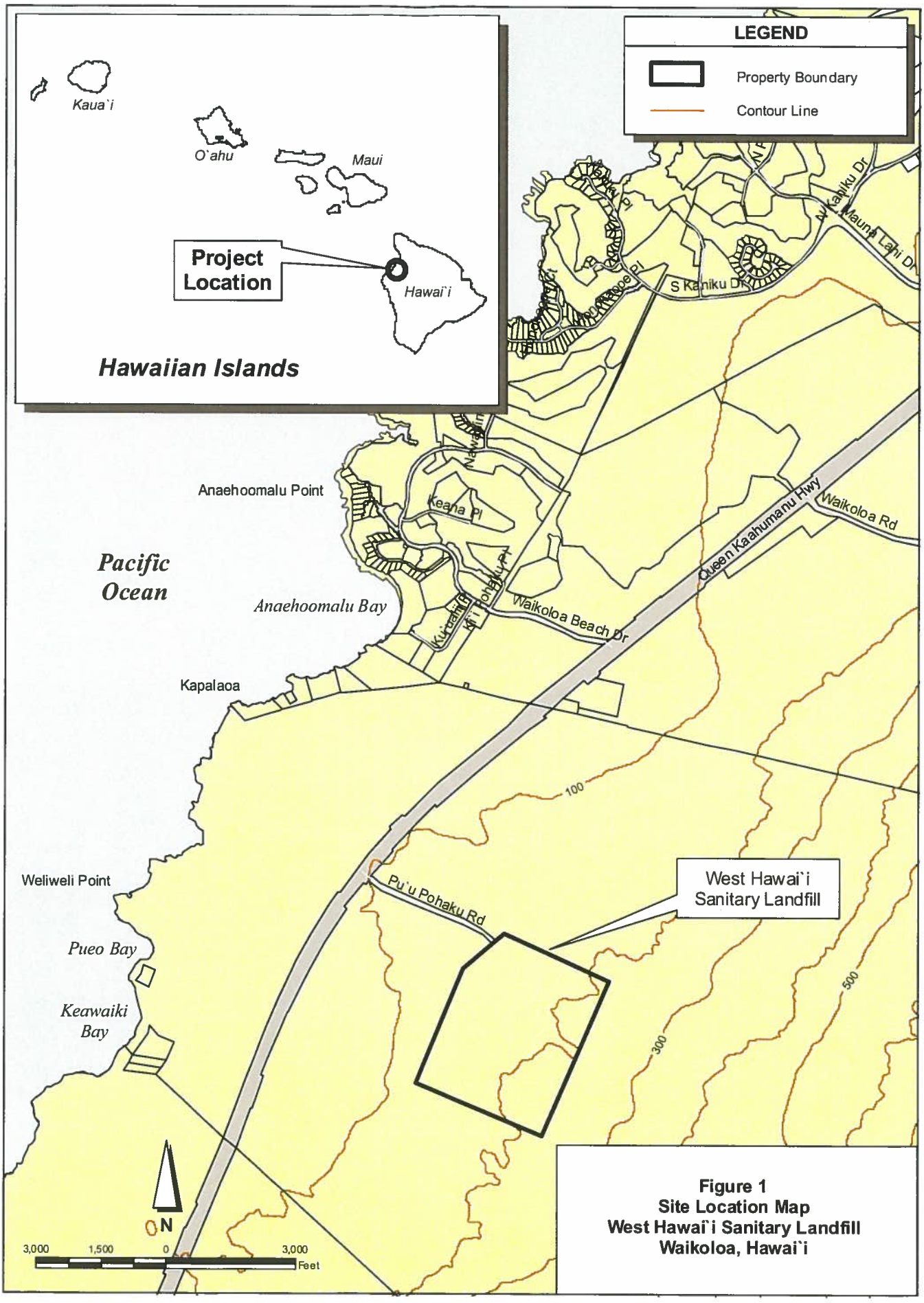

Figure 1
Site Location Map
West Hawai`i Sanitary Landfill
Waikoloa, Hawai`i

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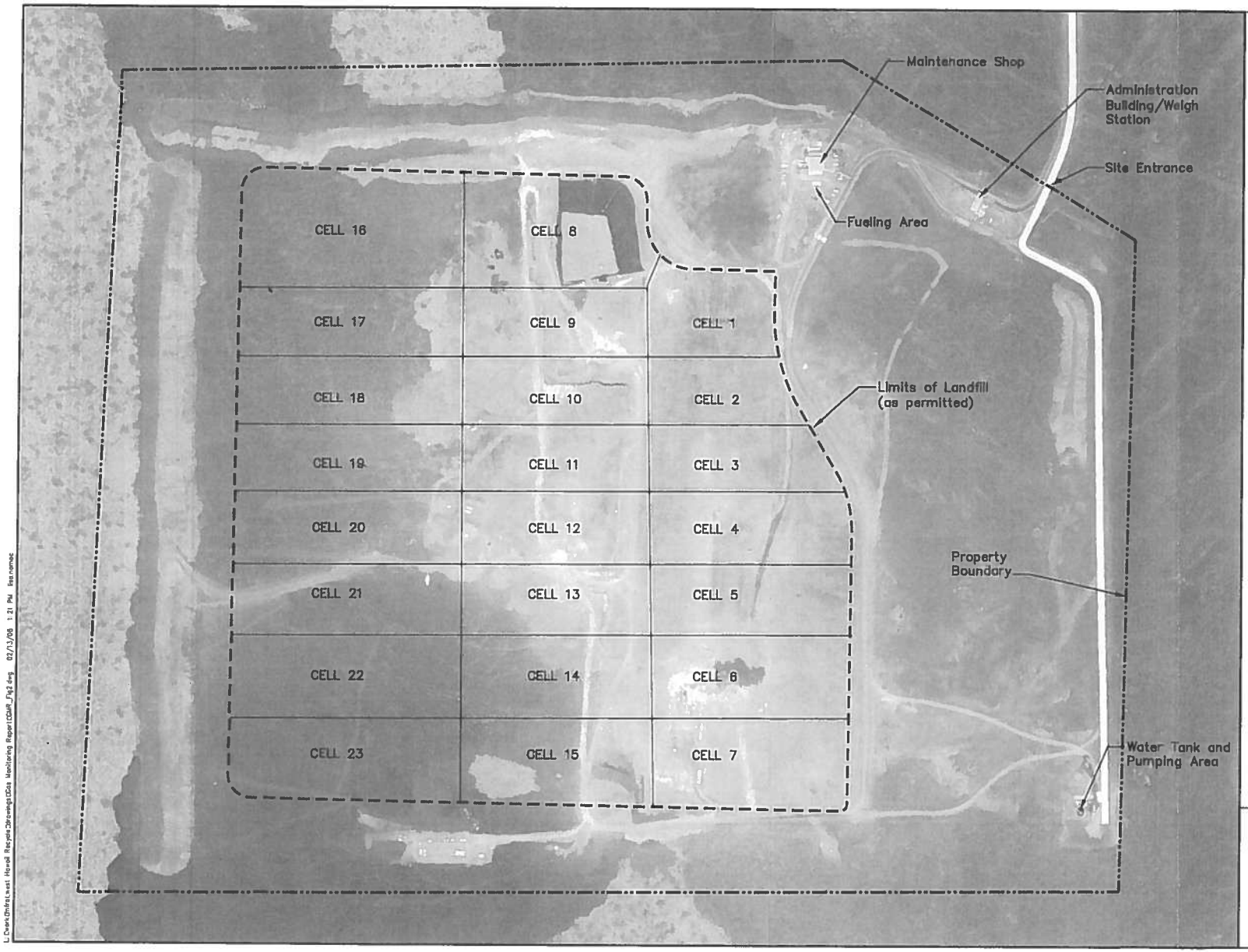

Figure 2
Site Layout Map
West Hawai`i Sanitary Landfill
Waikoloa, Hawai`i

2.3 Regional Geology

The island of Hawai`i is comprised of five shield volcanoes in various stages of development and erosion. These volcanoes include: Kohala, Mauna Kea, Hualalai, Manua Loa, and Kilauea. The oldest volcano is Kohala with shield lavas dated at approximately 460,000 years old. Kohala is an extinct volcano, which has formed the Waipio and Pololu Valleys. Mauna Kea is a dormant volcano in its postshield stage with its last eruption about 4,500 years ago. While Mauna Kea has the potential to erupt again, it is unlikely due to the decline in the frequency of previous eruptions. Hualalai is an active volcano in its postsheild stage with the most recent eruption 200 years ago and it is likely to erupt again within the next 100 years. Mauna Loa is also an active volcano, which is nearing the end of its shield stage. The last eruption at Mauna Loa was in 1984. Kilauea is an active volcano in the explosive phase of the shield stage. Eruptions from Kilauea have been discharging lava continuously since 1983 (Juvik 1998).

2.4 Regional Hydrogeology

Groundwater can be generally described as either basal or high-level water. Basal water is a lens of fresh to brackish water that floats on seawater and occurs in thin lava layers of the volcanic flanks. High-level water is freshwater that does not rest on seawater and occurs in the dike complexes of rift zones. Due to the abundance of flanks in the geology of the Hawaiian Islands, basal water is the most common form of groundwater in Hawai`i (Juvik 1998). The island of Hawai`i is divided into 9 general aquifer sectors and 24 aquifer systems (Mink and Lua 1993).

2.5 Site Geology

The site is situated on the historic lava flow of 1859 from Mauna Loa and is deposited with little ash cover. Basaltic boulders, cobbles, and gravel (clinker) cover the ground with localized exposures of very hard basalt rock formation. There are sparse areas of vegetation (grasses and kiawe trees), however the site is generally barren and rocky.

The geology beneath the landfill consists largely of hard, gray vesicular basalt (fractured bluerock). Thin intermittent layers of reddish gray basalt fragments (clinker) lie widely spaced between the dense bluerock layers. Lava tubes, holes, and large cracks are known to exist in the region.

Previous geotechnical field explorations encountered a surface layer 1.5 to 6.5 feet in thickness, of loose to medium-dense gravel and cobble-sized basalt fragments (clinker). Dense to very dense volcanic basalt were encountered below the clinker layer to maximum depths explored (approximately 40 feet) (Geolabs-Hawai`i, 1992).

2.6 Site Hydrogeology

The northern portion of the WHSL is underlain by the Anaehoomalu Aquifer System, which is part of the Northwest Mauna Loa Aquifer Sector. The southern portion of the WHSL is underlain by the Kiholo Aquifer System, which is part of the Hualalai Aquifter Sector. Both aquifer systems are described as basal water, unconfined in volcanic flanks. This status of the groundwater under the WHSL is described as currently and/or potentially used for

drinking water with a low salinity (250-1,000 mg/L CL-), irreplaceable and highly vulnerable to contamination (Mink and Lau, 1993).

Groundwater beneath the WHSL site is encountered at depths ranging from approximately 150 feet to 230 feet below ground surface (bgs) (0.5 to 2.5 ft above mean sea level [msl]), and occurs within fractured basalt and clinker. Historical water level data indicate that groundwater flow has generally been directed toward the west-southwest, indicating that the groundwater discharges to the ocean in the vicinity of Pueo and Keawaiki Bays. The hydraulic gradient is very gentle (generally less than 0.0005 feet per foot), and estimated groundwater flow velocities are on the order of 2 to 3 feet per day (RUST, 1997). Water levels observed in the monitoring wells at the WHSL fluctuate moderately due to tidal effects, however the predominant groundwater flow at the site is to the southwest (WMI, 2002).

2.7 Surrounding Area

The WHSL is surrounded on all sides by rugged, open terrain, characteristic of recent lava flows. The Queen Kaahumanu Highway is approximately 0.6 miles west of the WHSL, near the 79-mile marker. The nearest residential area is located approximately 1.25 miles west of the WSLF adjacent to Keawaiki Bay. The Waikoloa Beach Resort and Mauna Lani Resort are located approximately 1.5 miles northwest of the WHSL.

3 LOCATION RESTRICTIONS

As detailed in 40 CFR 258 (Location Restrictions) and HAR §11-58.1-13 (Site Analysis), new, existing, and laterally expanded Municipal Solid Waste (MSW) landfill units must comply with certain location restrictions. The original site analysis, completed in 1991 (R.M. Towill) as part of an environmental impact assessment, demonstrated that the WHSL is in compliance with federal and state location restriction regulations. Results of the analysis showed that the WHSL site is not located:

- within 10,000 feet of any runway used by turbojet aircraft or 5,000 feet of an airport runway used by piston-type aircraft (Airport Safety).
- within a 100-year floodplain area as delineated by the Federal Emergency Management Agency (FEMA) of the Federal Insurance Administration (Floodplains).
- in or near a wetland, as defined by the U.S. Interior Department of Fish and Wildlife (Wetlands).
- within 200 feet of a fault zone having had displacement in Holocene times (Fault Areas).
- in a seismic impact zone (Seismic Impact Zones).
- near any known geologic faults or rifts (Unstable Areas).
- within a tsunami hazard or floodway (Tsunami Zones).

Detailed location restriction documentation is kept on-site at the WHSL in the Site Operating Record/Files.

4 OPERATING HOURS

The WHSL is open to receive waste seven days per week from 7:00 a.m. to 4:15 p.m., 362 days per year (closed Thanksgiving Day, Christmas Day, and New Years Day). During the annual Ironman Triathlon, which is held on the island of Hawai`i during October, the WHSL is open on that day from 6:30 a.m. to 9:30 a.m.

The normal operating hours are posted at the WHSL entrance on the Queen Kaahumanu Highway. Pre-disposal activities including, but not limited to, equipment fueling/lubing, prior day daily cover removal/active face preparation may occur before the scale house is opened. Post-disposal activities including, but not limited to, equipment cleaning/maintenance, daily cover placement and litter management may occur after the scale house is closed. At least one WHSL equipment operator shall be present at the landfill whenever loads are dumped, placed, or covered.

5 PERSONNEL

Duties for managing and operating the WHSL are assigned to a variety of staff positions, both on and off-site. WMH and the County of Hawai`i provide trained personnel and appropriate equipment in order to safely and efficiently manage the incoming waste volume at the WHSL. The staff and equipment, as listed below are adequate to handle the daily volume of waste accepted for disposal at the site.

Personnel	Number of Personnel
Foreman/Working Supervisor	3 (1 WMH and 2 County)
Equipment Operators	5 (3 WMH and 2 County)
Traffic Controller/Laborer	4 (4 County)
Mechanic	1 (1 WMH)
Operations Specialist	1 (1 WHM)
Scale Attendant(s)*	2 (2 County)
Total	**16**

The WHSL Site Manager has overall responsibility for all operational, administrative, environmental, and fiscal activities conducted at the site. Specific activities for which the Site Manager is responsible include; site safety, financial management, ensuring proper operational practices are maintained, and that the site is operating in compliance with Federal, State, and local rules, regulations, and permits. The Site Manager directly oversees and manages the following WHSL operations personnel, involved in the daily operation of the landfill.

The WHSL Foreman/Working Supervisor directs the day-to-day activities at the site and supervises the equipment operators. The Foreman/Working Supervisor is given operations authority when the Site Manager is not on-site.

WHSL equipment operators and traffic controllers work under the direct supervision of the Foreman, and are responsible for the safe and efficient operation of heavy or specialized equipment. Principal duties performed consist of the following:

- Waste screening at the landfill working face;
- Random load checks;
- Directing the unloading of waste at designated locations;
- Spreading and compacting refuse at the landfill working face;
- Placing daily cover at the end of each day; and
- Keeping the unloading area accessible.

Additionally, WMH personnel provide operational, managerial, engineering, and compliance support to the WHSL and are listed below.

- **General Manager**– Responsible for overall planning, operations, environmental and contract compliance, business development, customer relations, engineering support and financial management for WMH. Develops the capability of managers and other staff to meet or exceed objectives.
- **Environmental Protection Manager**– Responsible for overall environmental management, and monitoring and reporting of environmental control systems and networks of the WMH landfills. Provides leadership, communication, and training on topics such as waste acceptance, permit compliance, regulatory requirements, landfill environmental control plans, Operating Plans, and environmental audits. Monitors compliance status of WMH landfills with applicable Federal, State, and local regulations, and company policies. Also acts as the point of contact for regulatory agencies.
- **Community Affairs Manager**– Responsible for community outreach for WMH. Works with community leaders and government officials to develop programs to increase recycling and supports community groups with outreach programs, charitable giving and partnerships.
- **Fleet Manager**- Responsible for ensuring the heavy equipment fleet is maintained cost effectively and at the highest level for the three Hawai`i landfills. Ensures that preventative maintenance programs and general repairs conform to WM Standards. Coordinate, assist and follow-up review of primary equipment condition for annual budgeting of major component repairs and new equipment purchases. Oversees COMPASS Maintenance Program for WMH.

6 EQUIPMENT

The equipment at the WHSL is adequate to handle the daily volume of waste accepted for disposal at the site, to provide support for routine and non-routine related tasks, and to conduct the ongoing excavation and construction activity needed for cell development and generation of cover soil. The current inventory (includes WMH and County of Hawai'i equipment) is as follows:

- Two (2) compactors (two CAT 826's) – used to push and compact MSW.
- Three (3) bulldozers (CAT D7R-2, D8R, and D9R) – used to push/cover MSW, and for excavation and construction activities.
- Two (2) dump trucks (CAT 796C & Volvo A40E) – used to move cover material from the soil stockpile to the fill area, or excavated rock and soil to the processing area.
- Two (2) wheel loaders (CAT 966D and 988F) – used for loading cover material, handling excavated materials, site maintenance.
- One (1) backhoe (CAT 416D) – used for construction of leachate trenches, drainage ditches, and other site development and maintenance requirements.
- One (1) motor grader (CAT 14G) – used for maintenance of roads, drainage ditches, berms, and other site features.
- One (1) off-highway 5,000-gallon water truck (CAT 613C) – used for application of water on landfill roads for dust control, moisture conditioning of soil liner materials during liner construction, and fire control.
- One (1) mobile service flatbed - used for daily fueling & servicing of equipment; holds 500-gallons of diesel fuel.
- One (1) screen-plant (Extec CE98) - used to screen material into the various fractions required for cell construction and daily/interim cover.

The number of compactors, bulldozers, and traffic controllers at the working face during a typical workday is shown in Table 1.

Table 1: Working Face Staffing and Equipment Guideline

Average Volume (tpd)	Compactors	Bulldozers	Traffic Controllers
360	1	1	1

7 ACCESS CONTROL

In accordance with HAR 11-58.1-15(f), public access to the WHSL is controlled by fencing and natural barriers which prevent unauthorized vehicular traffic and illegal dumping of wastes and protect human health and the environment. Scavenging is not allowed. An eight-foot chain link fence with a locking gate provides a barrier at the entrance of the WHSL property during non-operating hours. A sign labeled "Private Property - No Trespassing – Violators Will Be Prosecuted" is posted on the chain link fence near the front entrance gate. The rugged terrain makes fence installation unnecessary in other portions of the landfill property boundary.

Only WHSL personnel have unrestricted access to the site and only authorized vehicles have access beyond the scale house. All trucks/vehicles enter the facility from the Queen Kaahumanu Highway. Waste haulers proceed directly to the scale house, check in with the scale house attendant and have their loads weighed prior to proceeding to the disposal area. All visitors that come on-site must proceed to the main office to sign in.

The attendant in the scale house (during working hours) provides security to prevent unauthorized access or illegal dumping at the WHSL.

8 WASTE ACCEPTED AT THE WHSL

8.1 Types and Quantities of Waste

8.1.1 Municipal Solid Waste

The landfill receives an average of approximately 360 tpd of non-hazardous MSW from residential, commercial, and industrials sources on the island of Hawai`i.

8.1.2 Other

The WHSL receives certain "special wastes" that must be managed under special operating procedures for disposal, including but not limited to wastewater treatment sludge, septic tank and cesspool pumpings, petroleum-contaminated soil, treated medical waste, dead animals, and asbestos-containing materials. A solidifications pit is available at the WHSL for the disposal of non hazardous solid waste material that is determined to contain "free liquids" as defined by Method 9095 (Paint Filter Liquids Test), as described in *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*. A copy of the letter from DOH regarding the operation of a solidification pit at the WHSL is included in Section IX of this Site Operations Manual.

Refer to Section I – Part B, *Waste Acceptance & Hazardous Waste Exclusion Program,* for a detailed description of the WHSL's waste acceptance policy and methods used to prevent and detect the disposal of unacceptable waste at the landfill.

9 TRAINING

WHSL / WMH management conduct weekly, monthly, and annual training sessions for all WHSL personnel in order to establish and maintain a high level of employee knowledge of safety and emergency procedures, as well as compliance and waste acceptance policies at the WHSL. Annual training for supervisors, equipment operators, traffic controllers, and other personnel involved with site operations and maintenance includes sessions to familiarize them with the contents of this Site Operations Manual. Training topics and modules are discussed in more detail throughout the various sections of this Manual. Copies of applicable portions of the Manual may be handed out during training sessions for WHSL personnel to review and refer to as needed. In addition, employees are informed of their responsibilities to implement procedures specified in the Manual. Records of personnel attending each training session and the topics covered are maintained on-site as part of the WHSL Operating Record/Files.

10 RECORDKEEPING REQUIREMENTS

The following records are maintained on-site at the WHSL as part of the Site Operating Record/Files in accordance with State (HAR §11-58.1-15[j]) and Federal (40 CFR §258) requirements:

(A) Location restriction demonstration;

(B) Inspection records, training procedures, and notification procedures;

(C) Perimeter gas monitoring results and any associated remediation plans;

(D) Any MSW landfill unit design documentation for placement of leachate in a MSW landfill unit;

(E) Any demonstration, certification, finding, monitoring, testing, or analytical data relating to groundwater protection (including calibration & maintenance records & original recordings of monitoring instrumentation);

(F) Closure and post-closure care plans and any associated monitoring, testing, or analytical data; and

(G) Cost estimates and financial assurance documentation.

10.1 WHSL Operational Records

In addition to the record keeping requirements outlined above, the WHSL also maintains records of operational information as part of the Site Operating Record/Files that include, but are not limited to:

- Type, volume/weight, and origin/source of waste received/rejected/disposed.
- Type & quantity of cover material used.
- Number of vehicles disposing of waste.
- Asbestos waste disposal locations.
- Random load checks (waste accepted & rejected).
- Facility (vector control) and environmental (SPCC) inspections.
- Special waste loads/handling, waste manifest forms, and special waste profile sheets.
- Equipment breakdowns causing interruption of services.
- Equipment repairs.
- Incident reports (spills, fires, accidents, natural disasters, odorous loads, complaints).
- Climatic data (temperature, wind speed & direction, humidity, rainfall, solar radiation, evaporation, etc.)
- Leachate levels, quantity pumped/used for dust control onsite.
- Personnel training records.

The Site Operating Record/Files are maintained in various forms such as spreadsheets, logbooks, scale house tickets, files/filing system, binders, etc. that allow the information to be easily located and retrieved. Any information, records, or plans contained in the Site Operating Record/Files that must be kept under the conditions of the WHSL Solid Waste Permit must be furnished upon request to the DOH and/or made available for inspection by authorized DOH personnel.

The WHSL Solid Waste Permit, Air (Non-Covered Source) Permit, this Site Operations Manual, and any other required plans or reports (e.g. Groundwater & Leachate Monitoring Reports; Annual Operating Reports, etc.) are maintained on-site at the WHSL as part of the Site Operating Record/Files for a minimum of five (5) years. Refer to Section IX – *WHSL Facility Permits* for copies of the above-listed WHSL permits.

11 INCIDENTAL AND ANNUAL OPERATING REPORTS

11.1 Incident Reports

The WHSL must submit to the DOH a written Incident Report when the landfill is unable to comply with the conditions of the WHSL solid waste permit. Verbal notification must be given to the DOH within 24 hours of the occurrence, and the written Incident Report must be filed within 7 days of the occurrence.

- Each Incident Report contains the following information (at a minimum):
  - ✓ A description/cause of the issue/occurrence;
  - ✓ The period of non-compliance (dates and times), or the length of time the period of non-compliance is expected to last; and
  - ✓ Steps being taken to reduce, eliminate, and prevent recurrence of the issue.
- Incident Reports are submitted to the DOH via fax, and a hard copy is subsequently mailed.
- The above reporting requirements do not apply if the following conditions are met:
  a. Failure to comply does not create an immediate or significant risk to anyone's health or safety, or the environment;
  b. The WHSL is using its best efforts to comply; and
  c. The WHSL will be able to comply within 30 days.
- Any fire, release, or spill (over 25 gallons) that occurs on-site must be reported.

11.2 Annual Operating Reports

The Annual Operating Report is due 30 days after June 30 of each year and contains the following information:

1) Types of solid waste received (MSW, green waste, industrial/commercial, tires, wood, metals, metal containers of 20 gallons or larger capacity, asbestos, other special wastes);
2) Quantities of solid wastes received, by type;
3) Quantities of semi-solid received (if any) and how it was handled or disposed;
4) Quantities of leachate generated and how it was handled or disposed;
5) Types (municipal, industrial, or commercial);
6) Quantities of filled airspace for the present year, past filled airspace, and remaining airspace;
7) An annual topographic survey showing the vertical and horizontal dimensions of the landfilled area;

8) A Sequencing Plan, including a drawing identifying the cell areas planned to be filled in the coming year. The square footage or acreage of cells will be computed and shown on the plan;

9) Final fill areas, intermediate fill areas, and future unused fill areas will be identified for the projected year.

12 REFERENCES

Juvik, S. and J. Juvik. 1998. Atlas of Hawai`i. Third Edition. University of Hawai`i Press, Honolulu.

Mink, J. and L. Lau. 1993. Aquifer Identification and Classification For the Island of Hawai`i: Groundwater Protection Strategy for Hawai`i. May.

RUST E&I. (RUST) 1997. Groundwater and Leachate Monitoring Plan for West Hawai`i Sanitary Landfill, Puuanahulu, North Kona, Hawai`i. October 7, 1995, revised June 1997.