Report of the

Mayor's Advisory Committee

(Blue Ribbon Committee)

on

Landfill Site Selection

December 1, 2003

EXHIBIT K58

Report of the
Mayor's Advisory Committee (Blue Ribbon Committee)
on Landfill Site Selection
Final

December 1, 2003

Prepared by
The Committee's Report Subcommittee
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Pacific Waste Consulting Group

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1 EXECUTIVE SUMMARY

This report summarizes the efforts of the Mayor's Advisory Committee on Landfill Selection (Committee) to identify potential landfill site(s) for consideration by the Mayor and City Council when it prepares an Environmental Impact Statement for a new landfill site.

1.1 Need for a New Landfill

The Committee was convened by the Mayor pursuant to a proposal by the City and in response to a decision by the State Land Use Commission (LUC) which extended the use of the Waimanalo Gulch Sanitary Landfill until 2008 (**Attachment A.**) A major condition of the LUC, as part of the amendment to the City's State Special Use Permit, required that the City identify a new landfill site prior to closure of the existing site. Several Committee members noted that representatives of the current City Administration speaking at public meetings for the Waimanalo Gulch Sanitary Landfill Expansion committed to closure and to identify a new site by then.

The provision of municipal solid waste landfill capacity is a critical infrastructure element provided by the City to its citizens. A landfill is necessary for the disposal of non-combustible municipal solid waste and bulky items that cannot be recycled or reused. Further, a landfill provides for the disposal of municipal solid waste in a secure and economic manner. There are limited areas of Oahu where a landfill will have a *lesser* overall impact. Finding these locations and recommending *sites* was the task of the Committee.

1.2 Mayor's Landfill Site Selection Committee

The Mayor appointed a 15–member committee composed of citizens representing various communities on Oahu. Committee members provided experience and expertise from a broad range of backgrounds that included: public and community interests; state and City officials; environmental and health sciences; legal, financial, business, and education professions; and, corporate administration. The Committee was directed by the Mayor to recommend one or more landfill sites. (See **Attachment B** for a list of members and a copy of the Mayor's letter.) The Committee deliberated between June and December 1, 2003, identified four potential sites, and developed recommendations.

1.3 The Process

The process began with an inventory of 45 potential landfill sites identified by the Department of Environmental Services (ENV) and consultant from the City's previous studies and investigations (See Section 2.2 for a list of them). The Committee was also asked for nominations of new potential

sites. No additional viable sites were recommended.

Landfill Siting Criteria to supplement those mandated by state and federal government agencies were developed to enable comparison of key considerations for a new landfill that were important to the Committee (e.g., proximity to residences, groundwater protection, and travel distances).

Various methods and criteria were applied to reduce the number of sites at each step. The methods and criteria included: application of the U.S. Environmental Protection Agency (USEPA) siting criteria; consideration of whether residential or other incompatible land uses had become developed near the proposed site; consideration of the location of the site in relation to potable groundwater resources; the minimum capacity criteria developed by the Committee; and finally, the 31 criteria developed by the Committee (which included the capacity criteria). The Committee evaluation was to review the site-specific factors that were important with respect to each of the site finalists. In this process, the Committee started with a list of eight sites distilled from the list of 45 sites after application of the criteria noted above and the minimum capacity criterion. The Committee reduced the list of eight sites to five as consensus could not be reached to remove any of the five sites from consideration. The five sites were at the last meeting reduced to four through a vote which prompted the resignation of four Committee members. The remaining Committee members are recommending four sites to the Mayor for forwarding to the City Council for further consideration.

The Committee in evaluating the remaining eight sites went through a process called a double blind evaluation. First, the Committee did not know the names of the sites to be evaluated until the criteria were developed and weighting was assigned. Second, the consultant did not know the weighting assigned by the Committee to the 31 criteria until they had finished their analysis and scoring of the sites using the 31 criteria. See Table 2 for a list of the criteria and their weighting factors.

Attachment C, provides the name, tax map key (TMK), and location of each of the 45 potential landfill sites.

1.4 Process Changes

The Committee removed one site from consideration at its December 1, 2003 meeting as a result of a vote, which was a change from the consensus process the Committee had employed up until this meeting. As a result of a successful motion to further limit the number of recommended sites through voting Bruce Anderson, Kathy Bryant-Hunter, Eric Guinther, and Representative Cynthia Thielen resigned from the Committee stating that they did not want to be part of a vote that would remove one or more sites from consideration. They felt that the Committee had done an excellent job and that the original five sites should go forward for the following reasons:

- That this Committee was not constituted to represent the interests of all the residents of the island of Oahu. Indeed, it was heavily weighted with members representing Leeward Oahu communities. Thus, it is inappropriate for the Committee to pretend that they represent these interests by voting to eliminate any site that, based on criteria developed by the

Committee, should be included just as it would be inappropriate to add sites based on a vote. The City Council, the duly elected legislative body representing the interest of all residents of Oahu, should make a final decision based on the best information that is available on all the alternatives.

- The Committee went as far as it could in reducing the list from eight sites to five sites with the limited information that was available to the Committee on each site. Unsolicited comments and information was received from developers and individuals who owned land adjacent to only three of the five sites. Further information is required on environmental, social and economic impacts associated with establishing a landfill at all five sites before a decision should be made to drop any of the sites from consideration. When the Land Use Commission made their decision only to extend the permit at Waimanalo Gulch landfill until 2008, they did not consider alternatives or the impacts at alternative sites. They need this information to make a good decision. Likewise, the City Council should be provided the best available information on all the alternatives to make a decision that best serves residents of the island of Oahu. Therefore, some members of the committee felt it was inappropriate and premature to eliminate any of the sites from further consideration by a vote.

- Waimanalo Gulch got the highest score in the Committee's double blind process

- It is an irresponsible land use decision to walk away from an operating landfill with 20 years of life left

- Some of the members felt that a letter sent by Ko Olina negated the integrity of the Committee's deliberations because it was perceived by some as threatening a lawsuit against individual Committee members (the letter can be found in Attachment E)

- The LUC made its order on the Waimanalo Gulch Landfill without the benefit of all the information the Committee had and without input as to the potential economic and other impacts that might result should a new site be chosen

- Although the City Administration had made a commitment to the Community, this commitment does not bind the City Council and the LUC has a process for revisiting its decision should the Waimanalo Gulch Landfill become the preferred site.

Members of the Committee requesting a vote to remove Waimanalo Gulch felt that the City had not made its commitment to the community lightly as implied by others. They felt strongly that the City had to honor that commitment and therefore the site should not be recommended by the Committee. They noted that the commitment to leave Waimanalo Gulch Landfill resulted from two years of study which occurred during the process to extend the Landfill for 15 years.

Todd Apo moved and Shad Kane seconded the motion to change the process from consensus to voting; the motion carried. Those voting for the motion were: Todd Apo, Shad Kane, Gary Slovin, Michael Chun, Gary Tomita, George Yamamoto, Cynthia Rezentes, Ted Jung, and Robert Tong.

Those opposed to the motion were: Cynthia Thielen, Kathy Bryant-Hunter, Eric Guinther, and Bruce Anderson.

Todd Apo then moved and Shad Kane seconded the motion to remove the Waimanalo Gulch Landfill from the list of sites. Prior to consideration of the motion, several of the members resigned, as noted above. Those voting for the motion were: Todd Apo, Shad Kane, Gary Slovin, Gary Tomita, Ted Jung, Cynthia Rezentes, George Yamamoto, Robert Tong, and Michael Chun. There were no votes in opposition.

1.5 Committee Recommendations

The four sites recommend by the remaining Committee members are listed in **Table ES–1, Recommended Sites**. The location of those sites is shown in **Figure ES-1, Location of Four Recommended Sites**. The sites are listed in alphabetical order and no prioritization of the sites was done by the Committee. The intent was that the sites would be evaluated through an Environmental Impact Statement (EIS) process.

Table ES – 1, Recommended Sites

Site Name	TMK	Acreage	Million Tons Capacity	Years of Capacity
Ameron Quarry	4-2-15:01	391	9	15
Maili	8-7-10:por. 03	200	9	15
Makaiwa	9-2-3: por. 02	338	15	25
Nanakuli B	8-7-9: pors. 1 & 7	432	9	16

The Committee evaluated the sites using a two-step process. The first step was to apply the criteria and weighting factor to come out with a numerical scoring of sites based on the data available to the Committee. The second step was to discuss the various positive and negative attributes of each site to arrive at a list of recommended sites. The summary of the pros and cons is presented in Section 5, Committee Evaluation and Analysis. The pros and cons were not arrived at by consensus but were a compilation of Committee members' individual thoughts and concerns.

The Committee's recommended list of sites started with five, including the existing Waimanalo Gulch Landfill. As part of its deliberations, the Committee considered whether to remove Waimanalo Gulch Landfill. Prior to this time, the Committee had made its determinations by consensus. In coming to a recommendation regarding the Waimanalo Gulch Landfill, the Committee decided to vote as noted in Section 1.4.

Other important recommendations of the entire Committee included: (1) the City Administration and City Council should not zone or permit any site unless a Host Community Benefits package is negotiated with the affected community where a landfill is sited; and, (2) the City is encouraged to Land Bank sites to reduce the potential for future land use conflicts when another landfill is needed.

1.6 Other Considerations of the Entire Committee

The entire Committee during its deliberations spent considerable time discussing costs and benefits of various options. This included discussion on the role of and need for the City to move quickly to develop alternative technologies to landfilling, the impact such technologies could have on the necessary size of the sites, and whether or not it would be appropriate to develop several smaller sites. The Committee strongly feels that whatever site is selected that the City maximize the life of the site through aggressive actions to remove and reduce waste from being disposed in a landfill. Further discussion on these issues can be found in Section 6, Committee Recommendations, and the meeting notes found in **Attachment B**.

With these considerations, the Committee anticipates that the City will prepare an Environmental Impact Statement to evaluate in detail the benefits and constraints of each site and determine which site should be the preferred alternative for a new landfill.

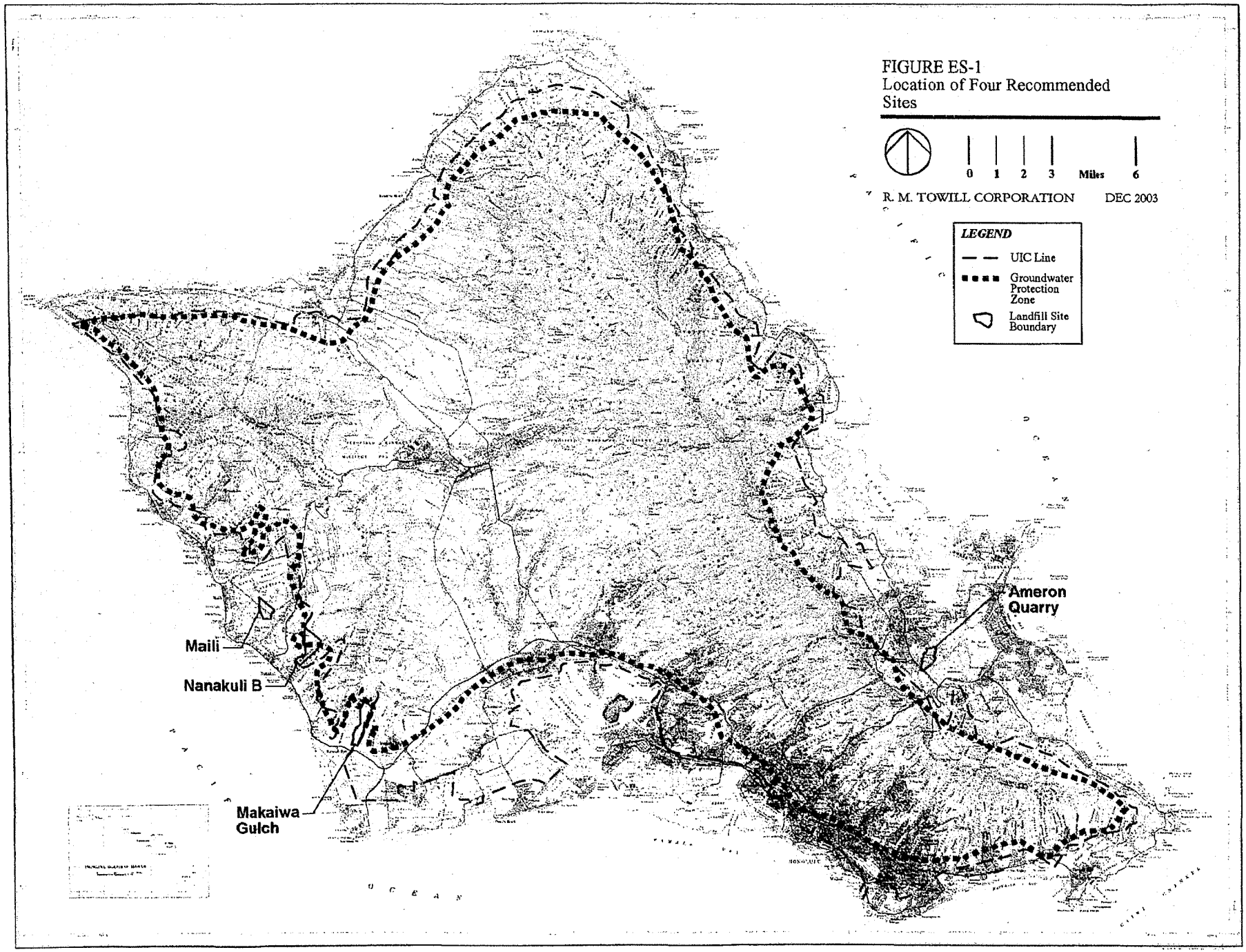
FIGURE ES-1
Location of Four Recommended Sites
0 1 2 3 Miles 6
R. M. TOWILL CORPORATION DEC 2003
LEGEND
UIC Line
Groundwater Protection Zone
Landfill Site Boundary
Ameron Quarry
Maili
Nanakuli B
Makaiwa Gulch
OCEAN

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2 INTRODUCTION

2.1 Background and Purpose of Committee

On June 5, 2003, the State Land Use Commission (LUC) approved an amendment to the Special Use Permit for the Waimanalo Gulch Sanitary Landfill Expansion, the only municipal solid waste landfill disposal site on Oahu. According to those attending, the City made a promise to close the Waimanalo Gulch Landfill within that timeframe. Based on this and community input, the LUC decision allows landfilling at the site for a period of five years, which will expire on May 1, 2008. The LUC decision also directed the City to achieve certain milestones in siting a new landfill. The LUC and Planning Commission decisions are in **Attachment A**.

The provision of disposal is one of the City's health and safety responsibilities. While H–POWER provides disposal capacity for the majority of the waste produced (generating electricity in the process), landfill disposal capacity is needed for municipal solid waste that cannot be further recycled or reused. The Mayor convened the Advisory Committee on Landfill Selection (Committee) in June 2003 to forward a recommendation for one or more potential sites to the Mayor before December 1, 2003. The Mayor's letter to the Committee is in **Attachment B**.

The Committee was made up of 15 appointed members. Participation was excellent from a majority of the members, with very few exceptions. The Committee consisted of representation from each geographic area of the Island with a possible municipal solid waste landfill site (see **Attachment B** for a list of members). The Committee worked by consensus until the December 1, 2003, meeting, at which point they voted to reduce the number of recommended sites resulting in the resignation of four Committee members. The Committee was assisted by the Department of Environmental Services (ENV), R.M. Towill Corporation as consultant, and a neutral facilitator. The group memories from each of the meetings, the meeting schedule, and the attendance lists are also in **Attachment B**.

An initial list of 45 sites was identified from a previous City EIS and other reports and processes completed between 1977 and 2002. The Committee was asked to nominate other sites that should be considered. No additional viable sites were suggested.

From the beginning the Committee had three concerns about the process. First, they recognized that no ideal site would be found and that any site would have community impacts. The Committee agreed that any site that was ultimately chosen would have to include a Host Community Benefits package (see **Attachment F**), and that the package should be negotiated with the affected community prior to the permitting of the site.

Second, the LUC decision created several problems. Some read the decision as requiring the Committee to forward only one site, while others felt that the decision allowed the Committee to

forward more than one site for further analysis through an Environmental Impact Statement process. The City verbally requested that the Committee select from three to five sites as the basis for further evaluation. The City also agreed that if it was determined that the Committee was required to forward no more than one site, the Committee would be reconvened to identify that site.

Third, the LUC decision raised the question of whether or not the Committee could consider a new or second expansion of the Waimanalo Gulch Sanitary Landfill as a potential site. Some felt it was clear that they could not, and others felt that it was a viable or the best site under the criteria developed by the Committee, and that it should be considered. Some Committee members went so far as to say it would be irresponsible to not consider it. The Committee chose to keep a possible second expansion on the list of sites it reviewed, because consensus could not be reached to remove it or any of the other sites on the list. At the last Committee meeting, the Waimanalo Gulch Landfill was removed from the recommended list by vote. Four Committee members resigned because they did not wish to participate in a process (voting) which was not consensus based. The section on recommendations discusses the positive and negative features of the final sites and provides the reader a more complete analysis regarding the five consensus sites including the four recommended sites.

The Committee chose to work by consensus through some very difficult and potentially polarizing issues. It chose a two-step process. In the first step, the Committee developed and applied 31 siting criteria to sites remaining after EPA, developed areas, groundwater, and the Committee's capacity criteria were applied. The second step determined the recommended sites after a discussion of the positive and negative aspects of each of the finalist sites. This process is described in further detail within this document.

It is important to recognize that the Committee focused on evaluating the potential sites from the perspective of the community. Therefore, many of the criteria developed reflect community–based considerations. Technical issues were also considered, but the Committee placed most of its emphasis on those impacts of a landfill that have the greatest effect on the community in which the site is located.

As the Committee progressed to the most difficult part of their charge (i.e., determining the final recommended sites), there was agreement that the time spent by the Committee and the objectivity with which they developed the criteria and applied the site analyses provided a high degree of confidence in the Committee's recommendations. It also recognized that its final recommendations would be based more importantly on its deliberations and not solely on the application of the siting criteria. The Committee's decision to forward four sites is the result of careful deliberation and a final vote to reduce the number of recommended sites to four. This vote led to polarization among some Committee members. Four members resigned from the Committee preferring to send a consensus report forward rather than a report that used voting to narrow the sites.

With this report the Committee concludes its charge.

2.2 Work Plan

The identification of sites selected for evaluation started with a review of prior work completed by the City in the siting and evaluation of municipal solid waste landfills. ENV and the consultant assembled a list of 45 sites from the following City sources:

1. *Inventory of Potential Sanitary and Demolition Landfill Sites*, August 1977.
2. *Supplement to Inventory of Potential Sanitary and Demolition Landfill Sites*, November 1979.
3. *Revised Environmental Impact Statement for Leeward Sanitary Landfill at Waimanalo Gulch Site and Ohikilolo Site*, 1984.
4. *Solid Waste Integrated Management Plan Update, Final Report*, 1995.
5. *Final Supplemental Environmental Impact Statement, Waimanalo Gulch Sanitary Landfill Expansion*, December 2002.

The Committee was next asked to nominate additional sites. Since no additional viable sites were nominated, the sites initially evaluated were the 45 identified from the sources indicated. The names and location of sites are provided in **Attachment C**.

After identification of the list of sites to evaluate, ENV and the consultant reviewed the sites against the most restrictive siting criteria. These criteria included: Environmental Protection Agency (USEPA) siting criteria as promulgated in the rules of the Resource and Conservation Recovery Act Subtitle D (RCRAD); sites located in areas which have since been developed or are closed landfills with no further expansion potential; Honolulu Board of Water Supply evaluation governing whether a site should be protected in consideration of proximity to the Groundwater Protection Zone and Underground Injection Control Line (UIC) zone; and, the Committee's capacity criterion that the site have a minimum life of more than 10 years.

During the preliminary evaluation by ENV and the consultant, the Committee undertook extensive discussion and deliberation to develop 31 Siting Criteria and Weighting Factors to be applied following the ENV and consultant evaluation of remaining sites (Section 3 provides more detail about the process). After applying the criteria, the Committee used the numerically weighted scores for the sites that enabled comparison of one site to another on the basis of community, economic, land use, and technical considerations. Finally, the Committee applied its own insights regarding each site to develop the list recommended to the Mayor. The reduction in the number of sites at each step is shown in **Table 1, Attrition of Sites During the Evaluation Process.**

Table 1, Attrition of Sites During the Evaluation Process

Phase of Evaluation	Number of Sites Before Application of Criteria	Number of Sites After Application of Criteria
ENV/Consultant Evaluation Process		
RCRA Subtitle D Criteria	45	40
Sites in Developed Areas or Closed Landfills w/No Expansion Potential	40	34
Board of Water Supply Staff Review and Evaluation	34	16
Committee Evaluation Process		
Landfill Capacity Requirement 1	16	8
31 Criteria	8	8
Committee Consensus Deliberations	8	5
Committee Vote (four members resigned in protest over voting)	5	4

2.3 Considerations Regarding the Waimanalo Gulch Landfill and This Process

Some of the Committee members recognized that the City committed to no further expansion of the Waimanalo Gulch Sanitary Landfill and that the LUC decision required the City to close the landfill by 2008. Other members felt: the landfill had significant remaining capacity (20 years); the landfill was a known usable resource; the landfill should be used to its fullest capacity to conserve Oahu's precious and finite land resources; and, that it would be irresponsible to not continue with further examination of the site.

The Committee removed one site from consideration at its December 1, 2003 meeting as a result of a vote, which was a change from the consensus process the Committee had employed up until this meeting. As a result of a successful motion to further limit the number of recommended sites through voting Bruce Anderson, Kathy Bryant-Hunter, Eric Guinther, and Representative Cynthia Thielen resigned from the Committee stating that they did not want to be part of a vote that would remove one or more sites from consideration. They felt that the Committee had done an excellent job and that the original five sites should go forward for the following reasons:

1 The capacity evaluation was completed before the Committee's site evaluations.

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- That this Committee was not constituted to represent the interests of all the residents of the island of Oahu should be a consideration. Indeed, it was heavily weighted with members representing Leeward Oahu communities. Thus, it is inappropriate for the Committee to pretend that they represent these interests by voting to eliminate any site that, based on criteria developed by the Committee, should be included just as it would be inappropriate to add sites based on a vote. The City Council, the duly elected legislative body representing the interest of all residents of Oahu, should make a final decision based on the best information that is available on all the alternatives.

- The Committee went as far as it could in reducing the list from eight sites to five sites with the limited information that was available to the Committee on each site. Unsolicited comments and information was received from developers and individuals who owned land adjacent to only three of the five sites. Further information is required on environmental, social and economic impacts associated with establishing a landfill at all five sites before a decision should be made to drop any of the sites from consideration. When the Land Use Commission made their decision only to extend the permit at Waimanalo Gulch landfill until 2008, they did not consider alternatives or the impacts at alternative sites. They need this information to make a good decision. Likewise, the City Council should be provided the best available information on all the alternatives to make a decision that best serves residents of the island of Oahu. Therefore, some members of the committee felt it was inappropriate and premature to eliminate any of the sites from further consideration by a vote.

- Waimanalo Gulch got the highest score in the Committee's double blind process

- It is an irresponsible land use decision to walk away from an operating landfill with 20 years of life left

- Some of these members felt that a letter sent by Ko Olina negated the integrity of the Committee's deliberations because it was perceived by some members as threatening a lawsuit against individual Committee members (the letter can be found in **Attachment E**)

- That the LUC made its order on the Waimanalo Gulch Landfill without the benefit of all the information the Committee had and without input as to the potential economic and other impacts that might result should a new site be chosen

- That although the City Administration had made a commitment to the Community, this commitment does not bind the City Council and that the LUC has a process for revisiting its decision should the Waimanalo Gulch Landfill become the preferred site.

Members of the Committee requesting a vote to remove the Waimanalo Gulch landfill felt that the City had not made its commitment to the community lightly as implied by others. They felt strongly that the City had to honor that commitment and therefore the site should not go forward. They noted that the commitment to leave the Waimanalo Gulch Landfill resulted from two years of study that occurred during the process to extend the Landfill for 15 years.

Todd Apo moved and Shad Kane seconded to change the process from consensus to voting the motion carried. Those voting for the motion were: Todd Apo, Shad Kane, Gary Slovin, Michael Chun, Gary Tomita, George Yamamoto, Cynthia Rezentes, Ted Jung, and Robert Tong. Those opposed to the motion were: Cynthia Thielen, Kathy Bryant-Hunter, Eric Guinther, and Bruce Anderson.

Todd Apo then moved and Shad Kane seconded the motion to remove the Waimanalo Gulch landfill from the list of sites. Several of the members resigned from the Committee, prior to the vote, as noted above. Those voting for the motion were: Todd Apo, Shad Kane, Gary Slovin, Gary Tomita, Ted Jung, Cynthia Rezentes, George Yamamoto, Robert Tong, and Michael Chun. No votes were cast opposing the motion.

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3 CONSULTANT'S APPLICATION OF PRELIMINARY SITING CRITERIA

This section includes a description of preliminary siting criteria. The preliminary siting criteria were applied by ENV and the consultant to the initial list of 45 potential landfill sites. The results of application of these criteria are provided in **Attachment C.**

The preliminary siting criteria includes: Environmental Protection Agency (USEPA) exclusionary criteria; restrictions on developed areas where a new landfill cannot be sited (included in these criteria are closed landfills with no further capacity); ground water restrictions as identified by the Board of Water Supply (BWS); and, the Committee's minimum capacity requirement of more than 10 years for a new landfill.

3.1 Environmental Protection Agency (USEPA) Exclusionary Criteria

The USEPA enforces six siting criteria that were adopted as part of the Resource Conservation and Recovery Act, subpart D (RCRAD). The six criteria are:

1. Airport Restriction — If a proposed landfill is located within 10,000 feet of the end of any airport runway used by turbojet aircraft, or within 5,000 feet of any airport runway used only by piston driven aircraft, the proponent must demonstrate that the landfill will not constitute a bird hazard and must notify the Federal Aviation Administration.

2. Floodplains — Potential landfill sites located within a 100-year floodplain cannot restrict storm flows within the floodplain, reduce the temporary water storage capacity of the floodplain, or allow the washout of solid waste.

3. Wetlands — Proposed landfills may not be built or expanded into wetlands; exceptions are allowed.

4. Fault Areas — New landfills or landfill expansions are generally prohibited within 200 feet of fault areas that have shifted since the last Ice Age; exceptions are allowed.

5. Seismic Impact Zones — If a landfill is to be located in a seismic impact zone, the proponent must demonstrate that the facility and its environmental and engineering features have been designed to resist the effects of ground motion due to earthquakes.

6. Unstable Areas — All owners/operators must demonstrate that the structure of their units will not be compromised during geologically destabilizing events.

A total of five sites were eliminated by application of the RCRAD criteria, which brought the potential site list from 45 to 40.

3.2 Developed Areas

In the 30 years that have elapsed since most of the sites on the list were identified, many of original landfill locations have been developed, primarily with residential housing. Some locations that were previously considered possible landfill sites may either have buildings on-site, or are so close to developed areas that a landfill would now be an incompatible land use. The City therefore determined in these instances that it would not propose new landfills within developed areas.

The City also reviewed potential sites that were expansions of closed landfills. Landfills on the original list that have been filled to capacity and closed were removed from further consideration.

This step brought the potential site list from 40 to 34.

3.3 Ground Water Restrictions

The State Department of Health has established an Underground Injection Control (UIC) Line and the BWS established a Ground Water Protection Zone (No Pass Line) around the island of Oahu that preclude the siting of certain types of facilities mauka of these areas. The lines were developed to identify inappropriate locations for injection wells and septic or cesspool development. The City Council in 2003 by Resolution 03-09, applied these criteria to protect Oahu's groundwater, by precluding the siting of landfills in these areas. However, the delineation of lines shown on a map is not as useful as having input from the BWS on the water development potential of these locations.

ENV and the consultant chose a less conservative, but more accurate approach to determining whether a potential site was appropriate by interviewing BWS staff responsible for ensuring future safety and sufficiency of Oahu's water supply. BWS staff identified sites, which they believe are important for future potable water supply or which are critical to protection of the groundwater resource. Sites, which did not meet BWS review, were eliminated from further consideration.

This step brought the site list from 34 to 16 sites remaining for further evaluation.

3.4 Committee Decision on Minimum Capacity

The Committee decided to limit its consideration to sites that had more than 10 years of capacity based on: the assumption that demand projections from the City remain unchanged; the City's experience with the length of time needed to implement new and feasible waste reduction technologies; and the cost and time required to identify and permit a new landfill site. The annual capacity demand was determined based on the amount of municipal solid waste disposed at the Waimanalo Gulch Landfill in fiscal year 2002/2003, adding the amount of cover material needed,

and including an allowance for growth in municipal solid waste disposal demand.2 The capacity needed was divided into the expected disposal volume at the site, as determined in earlier studies. The result was the number of years of landfilling capacity available at the site.

Of the 16 sites at the beginning of the minimum capacity analysis, 8 remained for further evaluation.

2 The capacity calculation did not assume the addition of another unit to H–POWER, implementation of alternative technologies, or implementation of additional recycling programs.

4 COMMITTEE SITING CRITERIA

The criteria discussed in Section 3 related to general limitations on locating landfills. The Committee recognized that there are local community concerns that may not be adequately reflected in the criteria in Section 3. The Committee Siting Criteria were employed to numerically compare potential sites using factors considered important to the Committee. The evaluation of the Criteria had two parts and the Criteria themselves were in five categories. This Section summarizes the Committee Siting Criteria to measure community, environmental, engineering, and cost considerations related to a landfill site. The Committee developed these criteria and weighting factors independent of knowledge of the identity of the sites. During this time, the remaining eight sites were only identified by number. The purpose was to avoid influencing the evaluation of any specific sites.

4.1 Methodology

The general approach to developing local Siting Criteria involved identifying the impacts a landfill could have on a region and then developing measures to enable the Committee to compare the magnitude of local impacts for each of the potential landfill sites. The Siting Criteria also included operational and economic considerations.

The site evaluations were done with a "double blind" process. That is, the Committee assigned the Weighting Factors without the City or consultant's knowledge and the consultants evaluated the sites and assigned point values without the Committee's knowledge of which sites were being evaluated. When the two parts of the evaluation were combined, the resulting site scores were insulated from undue influence or bias from any party.

The Committee recognized that the data needed to evaluate all factors thoroughly was not readily available and that the time schedule precluded additional data collection and analysis. As a result, the Siting Criteria used existing data. All potential sites were evaluated with data of the same age and extent although some of the data used were not as recent as the Committee would have preferred. The evaluations were all fairly and evenly done.

No site was subjected to a different level of analysis or evaluated with a different quality of data than another.

The Committee also recognized that further detailed evaluation would be done on the sites recommended in the Environmental Impact Statement (EIS) that is to be prepared. The EIS has specific requirements for assessing the environmental and social impacts of sites, and those evaluations are subjected to extensive public scrutiny.

It is important to restate that the Committee Siting Criteria were developed by the Committee independent of the consultant's site elimination process outlined in Section 3.

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4.2 Development of Siting Criteria

The Committee's Siting Criteria were organized in two parts:

- The measure of how well a potential site satisfied the criterion. This measure was the Point Value assigned to a site for a criterion.
- The Committee's assessment of how important one criterion was compared to the others. This measure was the Weighting Factor, which was multiplied by the Point Value to arrive at the score for each site and each criterion.

Each criterion included Point Values between one and three. The point values assigned were completed after the range of possible conditions across each of the sites were determined. The higher the number of points the better a site met the needs for a municipal solid waste landfill. For example, a good landfill should be in an area with low rainfall. A site with annual rainfall of more than 60 inches received one point; a site with 20 to 60 inches of rain received two points; and a site with less than 20 inches of rain received three points. For the criteria that measured physical parameters such as rainfall, the measure used was the range found on the island for the criterion; the values used were specific to this situation.

The Point Value was multiplied by a Weighting Factor to obtain a final score for a criterion. The higher the final scores received for a site, the more appropriate it was for a landfill site.

4.3 Weighting Factors

All Siting Criteria are not equally important. The difference in importance is reflected in the Weighting Factor, which varied from one to three.

The Weighting Factors were determined by the Committee members. Each member had ten votes to assign to the criteria they felt were most important. There were 31 criteria. Criteria that received the most votes were assigned a Weighting Factor of three. The votes fell into three distinct groupings. Six criteria received the most votes and were assigned a Weighting Factor of three; seven had a Weighting Factor of two; and 18 had the fewest votes and a Weighting Factor of one. Several criteria received no votes and were assigned a Weighting Factor of one. The higher the product of the Weighting Factor and the Point Value, the better the site's characteristics are for use as a landfill.

It is also important to acknowledge that the Committee requested that the City and the consultant team that supported the evaluation be excused while the Weighting Factors were developed. The Committee did not want more analytical effort to be devoted to a criterion with a greater Weighting Factor than to one that had a lesser Factor.

The final Siting Criteria with the Weighting Factors are listed in **Table 2, Siting Criteria**. The Siting Criteria were divided into categories as a convenience to the Committee. The number of criteria in any category was not selected, but the number of criteria within categories does indicate the Committee's general focus in this process. The higher the value of the site score, which is the

Weighting Factor multiplied by the Point Value, the better a site is for use as a landfill.

Table 2, Siting Criteria

	Criterion	Weighting Factor
	Community	
1	Displacement of residences and businesses	1
2	Distance to nearest residence, school or business	3
3	Wind direction relative to populated areas	2
4	Population density near the site	3
5	Proximity to parks and recreational facilities	1
	Environmental and Land Use	
6	Zoning	1
7	Compatibility with/distance to existing land uses	1
8	Visibility from a general use public road	1
9	Visibility from residences and/or schools.	2
10	Groundwater	3
11	Wetlands	3
12	Flora and fauna habitat	2
13	Site aesthetics	1
14	Residential units along access road	1
15	Schools or hospitals along access road	1
16	Final use of the site when the landfill is closed	1
17	Archeological and/or historical significance	3
	Economic	
18	Cost of site acquisition	3
19	Cost of development	3
20	Cost of operations	3
21	Impact of removal of site on tax base	1
22	Haul distance from H–POWER	2
	Technical	
23	Landfill capacity or site life	3
24	Annual precipitation	2
25	Adequacy of drainage	1
26	Access to fire protection	1
27	Length of haul	2
28	Geology	1
29	Closure and post-closure cost	1
	Other Considerations	
30	Employment	1
31	Access	2

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4.4 Committee Siting Criteria Application

The Committee Siting Criteria was applied to the list of remaining sites following application of the Preliminary Siting Criteria. At this point in the evaluation, the Committee did not know the name of the sites.

The evaluation of the eight sites required extensive time to review the factors relevant to each criterion and to assemble the results. A compendium of data was prepared for each site detailing the evaluation for each criterion and, in many cases, included the back-up information used to determine the point value for the criterion. The individual site compendia with the details of the evaluations are in **Attachment D**.

4.5 Results of Committee's Application of Siting Criteria

Table 3, Sites for Committee Consideration, lists the sites to which the Siting Criteria were applied. The scores for each of the criteria and for each of the sites are shown in **Table 4, Site Scores**. These scores are the result of multiplying the Weighting Factors (shown in Table 2) and the point values for the criterion. The possible values for one site for one criterion ranged from one to nine, depending on the point value assigned (ranging from one to three) and the Weighting Factor (ranging from one to three). As noted, the higher the site's score, the better the site characteristics are for a municipal solid waste sanitary landfill.

Table 3, Sites for Committee Consideration

Site Name	TMK	Acreage	Million Tons Capacity	Years of Capacity
Ameron Quarry	4-2-15:01	391	9	15
Bellows	4-1-15: por. 01	173	8	12
Maili	8-7-10:por. 03	200	9	15
Makaiwa	9-2-3: por. 02	338	15	25
Nanakuli B	8-7-9: pors. 1 & 7	432	9	15
Ohikilolo	8-3-1: 13	353	8	13
Waimanalo Gulch New Exp.	9-2-3: 72 & 73	60	12	20
Waimanalo North	4-1-8: 13	171	10	16

Table 4, Site Scores 1

	Criterion	Ameron	Bellows	Maili	Makaiwa	Nanakuli B	Ohikilolo	Waimanalo Gulch	Waimanalo North
	Community								
1	Displacement of residences and businesses	3	1	3	3	3	3	3	3
2	Distance to nearest residence, school or business	3	3	3	3	3	3	3	3
3	Wind direction relative to populated areas	6	2	2	2	2	2	2	6
4	Population density near the site	3	3	3	3	6	9	6	3
5	Proximity to parks and recreational facilities	2	1	2	1	2	1	2	1
	Environmental and Land Use								
6	Zoning	1	1	3	3	3	3	3	3
7	Compatibility with/distance to existing land uses	2	1	1	1	1	3	2	1
8	Visibility from a general use public road	2	3	3	2	1	3	3	3
9	Visibility from residences and/or schools.	6	6	2	2	2	6	2	4
10	Groundwater	9	9	9	9	9	9	9	9
11	Wetlands	3	6	3	6	6	9	3	9
12	Flora and fauna habitat	6	6	6	6	2	2	6	6
13	Site aesthetics	2	2	1	1	2	3	3	2
14	Residential units along access road	3	1	1	3	3	3	3	3
15	Schools or hospitals along access road	3	3	2	3	3	3	3	3
16	Final use of the site when the landfill is closed	1	1	1	1	1	1	1	1
17	Archeological and/or historical significance	6	3	6	3	6	3	6	3
	Economic								
18	Cost of site acquisition	6	3	6	6	9	9	9	6
19	Cost of development	6	3	6	6	6	3	9	3
20	Cost of operations	3	3	6	9	3	3	9	6
21	Impact of removal of site on tax base	1	3	1	1	1	2	3	3
22	Haul distance from H-POWER	4	2	4	6	6	4	6	2
	Technical								
23	Landfill capacity or site life	6	6	6	9	6	6	6	6
24	Annual precipitation	2	4	6	4	4	6	6	4
25	Adequacy of drainage	1	1	2	2	2	2	1	1
26	Access to fire protection	1	1	2	2	3	1	2	1
27	Length of haul	4	2	2	6	4	2	6	4
28	Geology	2	3	2	2	2	2	3	3
29	Closure and post-closure cost	3	2	3	2	1	1	3	3
	Other Considerations								
30	Employment	1	2	3	2	3	3	2	2
31	Access	6	2	2	4	4	4	6	2
	Total Site Score	107	89	102	113	109	114	131	109

1 The higher the score a site receives, the better its characteristics are for use as a landfill.

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5 COMMITTEE EVALUATION AND ANALYSIS

5.1 Committee's Brainstorming Positive and Negative Features of Sites

After evaluating the eight sites using the Committee Siting Criteria, the Committee reviewed each to identify features that may or may not have been measured by the criteria and to reflect other local concerns and considerations relative to the sites.

A summary of positive and negative site attributes listed by the individual Committee members is provided below. It is important to note that the comments are not the consensus of the Committee, but a compilation of the brainstorming efforts of the various individual Committee member's thoughts and concerns. There was no discussion or evaluation of the listed site attributes. Further information regarding these comments is in **Attachment B** (see Group Memory of November 7, 2003).

AMERON QUARRY

Positives

- Pretty good access
- Has existing ground cover
- Proximity to former landfill
- The quarry operation has created a hole in the ground that will need to be filled
- Potentially compatible for co-existence of landfill and quarry

Negatives

- Site not viable given its importance as rock quarry, cost of acquisition, and relatively limited capacity
- Increased operational cost if it coexists with landfill
- Economic impacts
    - 59 years lost lease revenue to landowner
    - Phase 1 – active for next 10-20 years
    - Loss of income and excise taxes paid to State and County, plus income taxes paid to

Federal government

- Environmental consequences – existing permits and stormwater retention lost
- Difficult to resite quarry
- Impacts construction industry/other businesses/government projects including roads and government building
- Distance from population centers / H-POWER
- Proximity to Kawainui Marsh; federal protection issues
- Highest level of precipitation of any sites on the list
- Access road substandard; private owners
- Visibility from Kailua town

BELLOWS AFB

Positives

- Federal land – use of government land is cheap if the government entity cooperates
- High unemployment area
- Two access routes to landfill
- Not super environmentally sensitive area – no wetlands

Negatives

- Federal land – cannot be condemned
- Bellows is an environmentally protected area
- Relatively small capacity – 12 ½ years
- Two access routes poor – two lane road
- Coastal area; probably was wetland

MAILI

Positives

- Approximately 20 years life
- Onsite cover
- Onsite brackish well for dust control
- Consistent zoning

- Utilities onsite
- Low precipitation

Negatives

- Traffic
- Hazardous rockfalls on highway to site (#11 out of 117 potential rockfall sites studied by DOT)
- Planned highway/drainage projects
- Traffic accidents cause major delays; one road
- Significant pedestrian cross-traffic
- Access road privately owned – Lonestar- use by farmers only
- Upwind of Maili Elementary School and major subdivision
- Schools and medical facilities along the route
- Only coral quarry on island
- Loss of taxes – income and excise

MAKAIWA GULCH

Positives

- Potential access available off main highway
- Large capacity – 25 years
- Zoning consistent
- Property currently not being used
- Shortest distance from H-POWER and close to service population (short haul distance)
- Extensive archeological/flora/fauna surveys completed
- Low precipitation

Negatives

- Acquisition Costs (see letter in **Attachment E**)
- Upwind from heavily populated residential and resort area
- No onsite utilities or access road
- Not consistent with development plan, planned for upscale residential development
- Close to transition between H-1 and Farrington Highway

- Power lines (138 KV) transit site
- View planes readily seen
- Major economic impact that would close down residential and resort development according to developer's representative
- Close to center of population growth
- Archeological information (i.e., Hawaiian cultural sites)

NANAKULI B

Positives

- Zoning Consistent
- Low precipitation
- Proximity to existing C&D landfill
- Utilities readily accessible
- Currently not being used
- Site acquisition costs relatively low
- Brackish wells for dust control
- 22.3 year life span

Negatives

- Traffic, planned highway and drainage projects
- Bad access
- Hazardous rockfalls on highway to site (#11 out of 117 potential rockfall sites studied by DOT)
- Traffic accidents cause major delays
- Pedestrian cross traffic
- Ownership of NAV-MAG road may necessitate the City paying for access
- Upwind of Maili Elementary School and residences behind Pacific Mall – potential odors could wipe out businesses

- Dust problems
- Pass schools, medical facilities to get there

OHIKILOLO

Positives

- Low precipitation
- Far removed from most residences
- Large acreage
- Access road already onsite
- Utilities onsite
- Zoning consistent
- Acquisition cost low

Negatives

- Most remote – one of the last remote coastal areas on Oahu
- Access will be bad; numerous churches, schools, medical facilities along the route
- Hazardous rockfalls on highway to site
- Numerous known archeological sites
- Traffic
- Pedestrian cross traffic
- Construction and planned future highway improvements
- 13-year lifespan – smaller capacity site
- Operation cost high
- Potential Native Hawaiian land title issue

WAIMANALO GULCH

Positives

- Least cost site to acquire and operate
- Lifespan of 20+ years
- Proximity to existing landfill; H-POWER
- All factors of site are known

- Road access reasonably good
- Close to the service population centers – short haul distance
- Low precipitation

Negatives

- Land Use Commission, Planning Commission and current City Administration are on record as not supporting continued use of the site (see **Attachment A**)
- Upwind and visible from major resort area
- Control of operations/management improved, but need further improvement (escaping waste)
- Based on past experience and slope makes site hard to hide
- Major economic impact that would close down residential development at resort and resort development, according to developer's representative
- Truck visibility – lineups onsite and along Farrington Highway
- Traffic – projected increase in traffic
- Road access problem
- Close to center of population growth

WAIMANALO NORTH

Positives

- Life capacity higher then other sites
- Moderate precipitation

Negatives

- City can not condemn state land (See **Attachment E**, DLNR letter)
- Traffic problems
- Long haul distance

5.2 Final List of Sites

The Committee decided that the following four sites should be eliminated from further consideration; three were eliminated by consensus and one by voting. The letters and other correspondence related to the sites are in **Attachment E**. The Committee decided by consensus to remove the following sites.

- The Bellows AFB site is in federal control and cannot be condemned. A reply from the Marine Corps further indicated that the site is not available.

- The Ohikilolo site has the strong possibility of significant archeological and cultural resources (although the studies have not yet been done to confirm the resources), is remote, and would require trucks to pass through a long stretches of road through the Leeward Coast Communities (where frequent accidents have occurred) to get to the site. The potential for Native Hawaiian title issues regarding use of this site was also a reason for its removal. It is also one of very few remote coastal areas left on Oahu.

- The Waimanalo North site has been designated as a State Forest Preserve, according to a letter the City received from the State Department of Natural Resources. The State will not support its use for landfill and the City cannot condemn state land.

The Committee voted to eliminate the Waimanalo Gulch Landfill from the list of recommended sites. As a result of the voting on the final site list (other than voting on procedural matters, all other Committee decisions were made by consensus), four of the 15 Committee members resigned (prior to the vote).

6 COMMITTEE RECOMMENDATIONS

6.1 List of Sites Recommended

The Committee evaluated the remaining five sites to determine if any of them should be removed from the list recommended to the Mayor for forwarding to the City Council. The final determination was made at the last Committee meeting. The members of the Committee present at the last meeting were Anderson, Apo , Bryant-Hunter, Chun, Guinther, Jung, Kane, Rezentes, Slovin, Thielen, Tomita, Tong, and Yamamoto. Holmes and Paty were not present. The Committee's earlier determinations had all been arrived at by consensus. A motion was made by Todd Apo and seconded by Kane to move the process from consensus to voting. The motion passed with Todd Apo, Chun, Jung, Kane, Rezentes, Slovin, Tomita, Tong, and Yamamoto voting in favor. Anderson, Bryant-Hunter, Guinther, and Thielen voted against.

Another motion was made by Todd Apo and seconded by Kane to remove the Waimanalo Gulch Landfill from the list of recommended sites. Prior to a vote, four Committee members (Anderson, Bryant-Hunter, Guinther, and Thielen) resigned because they did not want to be part of a recommendation that was decided by voting rather than by consensus. There were nine votes in favor of removing the Waimanalo Gulch Landfill from the list of recommended sites (Todd Apo, Chun, Jung, Kane, Rezentes, Slovin, Tomita, Tong, and Yamamoto). There were no votes against the motion.

Table 5, Sites Recommended to the Mayor, lists the four sites forwarded by the Committee to the Mayor.

Table 5, Sites Recommended to the Mayor

Site Name	TMK	Acreage	Million Tons Capacity	Years of Capacity
Ameron Quarry	4-2-15:01	391	9	15
Maili	8-7-10:por. 03	200	9	15
Makaiwa	9-2-3: por. 02	338	15	25
Nanakuli B	8-7-9: pors. 1 & 7	432	9	16

6.2 Other Recommendations of the Entire Committee

6.2.1 Host Community Benefits

Host Community Benefits (HCB) is a benefits package designed to address local impacts to the siting of landfills, which are essential to meet the City and County's future infrastructure needs. This section discusses the concept and summarizes the Committee's feelings regarding the use of such

benefits in siting a new landfill for Oahu. **Attachment F** provides more information about the use of HCB in other jurisdictions on the mainland. These points include:

- HCB can generate a significant amount of revenue to help meet local needs.
- HCB can be used for any type of project, in addition to landfill impact mitigation projects.
- HCB are not unusual. States that have them include New Jersey, Pennsylvania, Illinois, Iowa, Georgia, Michigan, West Virginia, Tennessee, California, and North Carolina.

The Committee recommends that the City Administration and City Council should not zone or permit any site unless a Host Community Benefits package is negotiated with the affected community where a landfill is sited. These benefits should be an integral part of the mitigation measures included in the EIS for the site.

The Committee further notes that HCB should not be mistaken for basic improvements that must be completed prior to operating a landfill, e.g., necessary highway or infrastructure improvements.

6.2.2 Land Banking Sites

The Committee agreed that the selection of the next landfill site will serve a critical public purpose. At the same time, the effort needed to select and develop a landfill site is high, and the list of potential sites so short, that future landfill sites should be land-banked well in advance of their need. Land banking has the potential to reduce land use conflicts and minimize siting difficulties.

The Committee recommends that the City Council take steps to identify sites that address future landfill needs taking into consideration: the development of new technologies; the reduction in the waste stream that may result from such technologies and from current technologies; and the demand for landfill space. The Committee further recommends that land banking should be part of a process separate from the work of this Committee, and not limit the sites considered to those identified in this report.

6.2.3 Underground Injection Control Line and Groundwater Protection Zone

The evaluation done for the criterion related to groundwater illustrates a potential concern with the application of the UIC line and the Groundwater Protection Zone to the siting of landfills. These delineations are not precise enough to clearly identify areas that are appropriate or inappropriate for siting a landfill, nor were they intended to be used for this purpose when introduced. As previously noted, the City Council in 2003 by Resolution 03-09, applied these criteria to protect Oahu's groundwater, by precluding the siting of landfills in these areas. In this site evaluation, the Committee consultants relied on BWS staff expertise to accurately determine whether a potential site might be a problem with respect to current or future groundwater considerations.

The Committee expressed that there may be a need for the State and the City to revisit the protection that the UIC line and the Groundwater Protection Zone provide.

6.3 Continued Gathering of Information

The Committee recognized that the time allowed for gathering information was limited and that more information is needed for each site before a final decision is made. The Committee suggested direct contact with the landowners or facility operators. Those parties will have important information that needs to be considered in locating the landfill that will serve the City in the future. The Committee recommends that these parties be contacted and their input be considered.

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7 OTHER ENTIRE COMMITTEE CONSIDERATIONS

The entire Committee spent considerable time and effort in its deliberations discussing the following issues.

7.1 Landfill Costs

The Committee noted that while landfill associated costs were a very important issue, and should be given significant attention in the siting process, the Committee focused on community related criteria. The Committee also noted that host community impacts were important. They recognized that the siting and EIS processes both involve a cost/benefit analysis. However, these processes do not always apply the same importance and depth of consideration to host community impacts.

After reviewing the Siting Criteria, the Committee noted that the economic costs had been weighted low compared to other factors. While the committee eventually agreed not to make any changes to the weighting factors, the Committee agreed that costs are a very significant factor and have a larger impact on the taxpayer. The Committee considered these issues in the brainstorming deliberations on the strengths and weaknesses of each site.

7.2 Alternative Technologies

The Committee strongly feels that the City Administration must pursue all viable alternative technologies, existing technologies, and landfill reduction strategies as expeditiously as possible to reduce the volume of material requiring landfill disposal. The Committee adds that as alternative technologies are identified and brought on-line, some of the factors that were considered key in the current landfill siting process might change. These factors included the anticipated annual volume of waste generated and its relationship to the amount of landfill space that will be needed in the future. The Committee urges the City Administration to regularly and diligently examine the need for municipal sanitary landfills in this light and to identify viable sites to preserve for future use.

7.3 Multiple Sites

Although the Committee's focus was on locating a single municipal solid waste landfill site, it is noted that advances in technology and reductions in the waste stream could have the potential for making smaller landfill sites economically viable. This could allow for the development of more than one site to handle the municipal waste disposal needs of the many communities on Oahu.