

Golf Course Development in Hawaii

Impacts & Policy Recommendations

Office of State Planning
State of Hawaii
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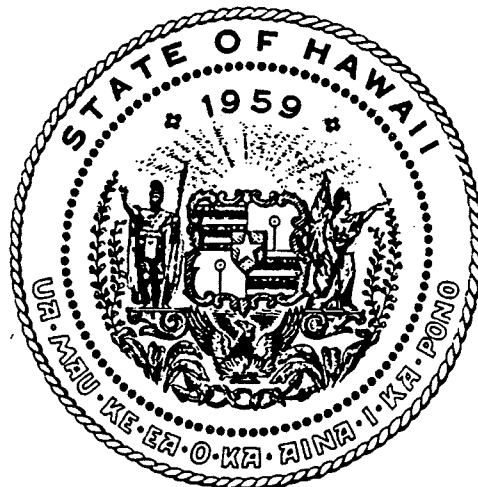


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GOLF COURSE DEVELOPMENT CRITERIA

ENVIRONMENTAL CONSIDERATIONS

NO GO

- Over irreplaceable potable aquifer
- Requiring construction on slopes over 20%
- Areas with highly erodible soils
- Significant wetlands and watersheds

CONDITIONS, WHERE APPROPRIATE

- Use non-potable water
- Erosion control plan
- Preserve wildlife and habitat
- Sensitive area buffers
- Flood retention capability
- Preserve historical and cultural sites

ECONOMIC CONSIDERATIONS

- Resort course
- Planned residential development
- Property values and taxes of adjacent land
- Employment opportunities

LAND USE CONSIDERATIONS

LAND USE DISTRICT GO ONLY IN:

- Urban
- Ag and Rural - special permit (except Oahu)
- Open Space (proposed) - special permit
- Conservation - special subzone or must reclassify to urban

COUNTY

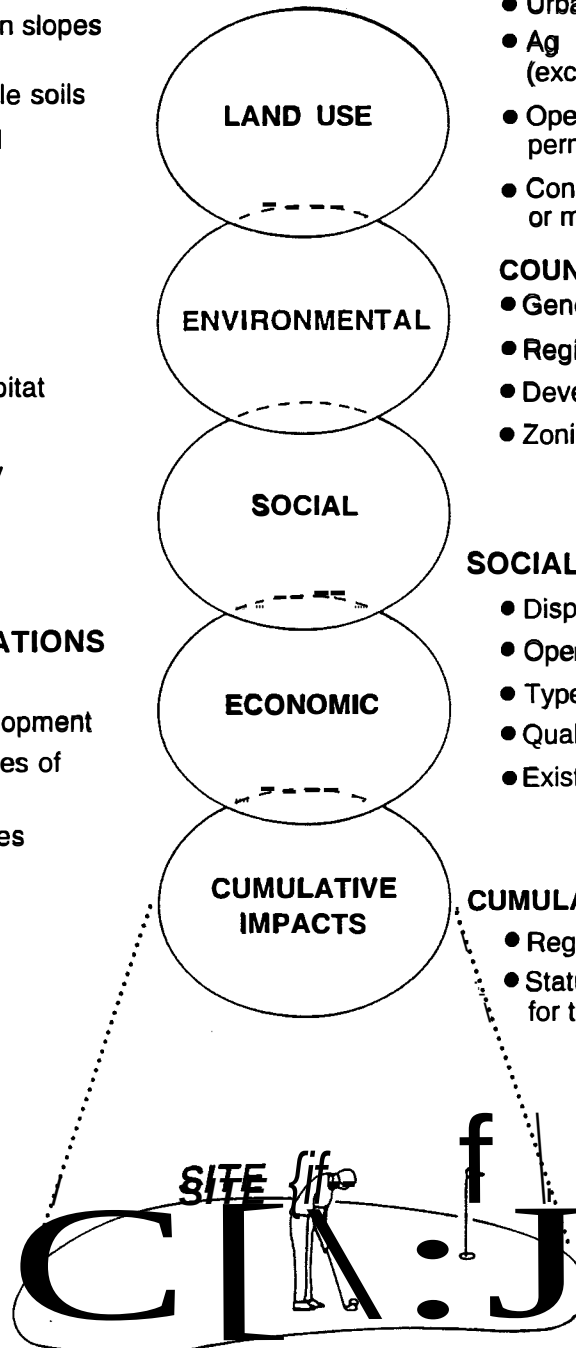
- General plans
- Regional Comprehensive Plans
- Development Plans
- Zoning ordinances

SOCIAL CONSIDERATIONS

- Displacement of existing uses
- Open space/visual quality
- Types of course
- Quality of jobs
- Existing surrounding community

CUMULATIVE IMPACTS

- Regional 5-10 year review
- Status of wildlife and habitat for the region



GOLF COURSE DEVELOPMENT IN HAWAII

EXECUTIVE SUMMARY

INTRODUCTION

Senate Concurrent Resolution No. 192, 1991, requests the Office of State Planning (OSP) to study golf course development in Hawaii, including the cumulative environmental, social, and economic impacts. Additionally, the Legislature asked OSP to recommend a policy on compensatory fees to mitigate negative impacts of golf courses.

In the course of preparing this report, OSP conducted scoping workshops, a public forum on golf course development, and held a series of statewide meetings to solicit public comments on the draft report. The Office of State Planning was assisted by a steering committee of government and private sector representatives, as well as several consultants. While it would have been far easier -- and quicker -- to confine this to an in-house study, the wide range of public participation has been invaluable.

Response has come primarily from two sectors: community groups and environmentalists who strongly oppose the development of golf courses; and developers and users of golf courses who support golf course development, but are generally less vocal. As expected, their responses have been quite different and, on certain issues, there appears to be little common ground for compromise. On the other hand, public participation has resulted in better understanding and more acceptance of certain issues, and many of the concerns from both sides reflect the real problem symbolized by golf course development: growth management. As Maggy Hurchalla, a Martin County, Florida, Commissioner speaking at the OSP golf course forum put it, "[Environmental concerns] are real issues and ... real concerns, but if golf courses were created from astroturf and used no water and pesticides you would still be here."

Hawaii's land use laws were developed to address growth. But they have not resolved many concerns that surface when a land-intensive use, such as golf course development, enters the picture in the magnitude it has in recent years. Under current law, golf and many other land uses can be placed in any of our land use districts by special permit or right. The primary objectives of Hawaii's land use regulations should be to protect resources, to promote appropriate and compatible land uses, and to provide predictability and fairness in the allocation of land resources. Much of the controversy over golf courses stems from the fact that our regulatory scheme does not meet one or more of its basic objectives in the eyes of many sectors of the community.

The report's recommendations for regulating golf course development are based in part on the proposed changes to Chapter 205, HRS, as outlined in Senate Bill 1342, 1991, Relating to Land Use (the administration's so called LESA bill). The proposed amendments include boundary changes so that land use districts include only lands which meet the district criteria, and creation of a new district -- the Open Space District -- to hold lands not currently classifiable in other districts. Once district boundaries are rationalized, golf courses should be restricted to the Urban District, and by special use permit only if consistent with the purposes of the Agricultural and Open Districts, or if a special subzone is created in the Conservation District.

Although the Land Use Law's intent is to classify lands according to their resources, this has not been consistently applied nor does the current land use classification system adequately recognized the multiple values of the land. For example, some lands classified in the Agricultural District have conservation value, while other lands currently in the Conservation District have limited or no conservation resources and values. The recommendations in this report take these facts into consideration.

OVERALL RECOMMENDATIONS

Any landowner or potential landowner should expect to pass two "screens" in order to develop a golf course.

The first is essentially a "go/no go" decision based on the development's compatibility with three criteria:

- State Land Use District Classifications;
- County Planning, Zoning, and Ordinances; and
- Physical resources, such as aquifers, watersheds, wetlands, critical habitats, etc.

If the proposed golf course is an appropriate land use, in essence a "go" based on the above, the second screen would consist of any conditions that may be appropriate for the site, such as:

- Permanent buffers around streams, wetlands, and coastal waters;
- Inspection and monitoring of pesticide and fertilizer use;
- Preservation of archaeological and cultural sites;
- Community benefits such as jobs for local residents, public play times, etc.

LAND USE DISTRICTS

Conservation District. *Golf courses should not be allowed in the Conservation District.* The Hawaii State Constitution requires the State to conserve and protect Hawaii's natural beauty and natural resources, and to support water resource planning by providing protection to watersheds and groundwater resources. A golf course is not generally consistent with these requirements and is thus an inappropriate use in the Conservation District.

Ideally, if the land in question does not possess conservation values, it should be reclassified to a more appropriate district. This would be in keeping with the movement to more restrictive and protective policies governing permitted uses in this district. An alternative would be the placement of a golf course, on a case-by-case basis, within a special subzone in the Conservation District where the parcel of land has certain conservation values; for example, open space, view plains, etc, and where a golf course would not detract from such values. This would be accomplished through both Chapter 91 rule-making procedures and a conservation district use application (CDUA) which will require extensive public review akin to reclassification, but through the Board of Land and Natural Resources rather than the Land Use Commission.

Agricultural District. The Hawaii State Constitution requires the State to conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands. The primary purpose of the Agriculture District is to protect lands valued for cultivation. While some people argue that golf courses are agriculture--the cultivation of turf--in general, golf courses are considered recreation only. Based on the nature of the land use, golf courses are recognized as recreational land uses by Maui County's ordinances designating them in park districts, and by Oahu's ordinances that use golf courses as a preservation district. Protecting agricultural lands may be accomplished in two ways:

- ***Alternative A: Golf course development should be allowed by special use permit in the new Open Space District, but not in Agricultural, Rural, or Conservation Districts.*** S.B. 1342, Relating to Land Use, would create a new land use district -- an Open Space District. The decline of large-scale agriculture threatens open space vistas, just as the growing demands of urbanization create a need for buffers of green between communities. The Open Space District would include agriculture as a permissible use, as well as open area recreational uses and other low intensity uses, excluding golf courses except by special permit.

- *Alternative B: Golf course development should not be a permissible use in the Agricultural District, except in counties with populations below 200,000, by special permit in exceptional situations. The Land Use Law should be amended to remove golf courses as a permissible use in the Agricultural District, with the exception of golf courses with low intensity uses through special use permit. Low intensity use golf courses are those where the golf course is the major attraction, with only ancillary uses such as a small restaurant, golf pro shop, cart barns, and a club house. Such stand-alone type golf courses may be a permissible use in isolated areas where reclassification to the Urban District would be inappropriate.*

Rural District. The Rural District should be governed the same as the Agricultural District for golf course development.

Urban District. A golf course that serves as an accessory facility to major uses such as hotels, commercial complexes, and housing should be permissible only in the Urban District.

COUNTY PLANNING, ZONING, AND ORDINANCES

General Plans, Development Plans, Comprehensive Regional Plans, and zoning provide guidance and control of development at the county level. In addition the City and County of Honolulu and the County of Maui have ordinances which specifically address golf course development. The Counties of Kauai and Hawaii regulate golf courses on a case-by-case basis in the same manner as other developments.

Honolulu's golf course ordinance provides specific procedures that a developer is required to follow and other measures that mitigate economic, social, and physical impacts. Additionally, a developer may submit a community integration program to address both social and economic impacts including but not limited to job training, affordable public play, public availability of golf course facilities, creation of paths, etc.

The Maui County ordinance does not permit golf courses in the interim zoning within Wailuku, Makawao, Lahaina, Hana, Lanai, or Molokai; residential; hotel; and agricultural zoning districts. Furthermore, the County created a new park district especially for golf courses in the State Urban and Agricultural Districts. This ordinance also provides for minimum development standards to mitigate physical impacts.

The Financing Measures section of this report (pp. 9-10 of the Executive Summary, pp. 71-91 of the full report) also discusses additional options counties might consider in the regulation of golf course development.

PHYSICAL RESOURCES

Information on the State Land Use Districts and County planning, zoning and ordinances is readily available to anyone interested in possible development of a particular site. Determining whether a site contains critical physical and cultural resources is somewhat more difficult. While much of the pertinent information is available, it is not "packaged" and may be overlooked. Several of the recommendations in this section concern the further development of technology, plans and policies that may eventually be a significant part of the "go/no go" decision process for golf course development. In the interim:

*Do not allow golf course construction in sensitive sites.*¹ Sensitive sites include those with slopes steeper than 20 percent, highly erodible soils, watersheds, intact native forests, areas with concentrations of rare and endangered species, and overlying irreplaceable potable aquifers. County plans should be premised to reflect these sensitive sites.

To address long-range concerns and cumulative impacts of golf course development:

Require each Environmental Impact Statement (EIS) to consider the cumulative impacts of all portions of a golf course development in a regional area for a period of at least five years before the proposed project and projections for five years after its construction. The cumulative impact of a project is generally not addressed in an EIS. Communities also want to feel a sense of predictability in their future, and apprehension about possible urbanization due to golf course development is a reflection of a lack of confidence that current regulations and processes will protect them from urban encroachment. An example of the need for a comprehensive regional review of a development is the Akahi Joint Venture Country Club, a two proposal development in South Kona. One proposal is the development of a 27-hole golf course as a permitted use in the Agricultural District pursuant to §205-2(d). The second proposal is a 54-member lodge on a parcel 15 acres or less either as a special permit pursuant to §205-6 or as a reclassification of the Agricultural District to Urban District pursuant to §205-3.1(c). (This is a statutory delegation by the State to the Counties to reclassify small parcels of 15 acres or less.) Both of these proposals should be reviewed together for their environmental impacts, but are not required to under the law. To ensure adequate consideration of all environmental impacts, the developer should prepare one

EIS to address the impacts for the total development which may cumulatively significantly impact the region.

Amend the law to ensure that all golf course proposals trigger the environmental assessment requirements. Currently, due to variances in the review processes among state and county agencies, golf courses are not always required to prepare an environmental assessment in accordance with Chapter 343, HRS. Nonetheless, development projects of this magnitude and potential for environmental impacts should be required to submit an environmental assessment in accordance with §343-5, HRS.

Finalize and implement the State Ground Water Protection Plan. The plan addresses many of the concerns regarding the degradation of ground water from all chemical uses. Its implementation would assist all users to protect Hawaii's groundwater resources. In addition, there are a number of other ground water recommendations that should be considered in concert with the Ground Water Protection Plan:

- *Coordinate scientific data on ground water in the review and approval of golf courses.* The Water Resource Research Center is identifying and classifying aquifers, and this data provides guidance to determine the potential impacts of a golf course by location based on such factors as the hydrology, geology, and the status of the ground water. As developed, the data needs to be disseminated to both State and County decision makers.
- *Uniformly insure protection of ground water.* The water code adequately governs "threatened" water resources in designated areas. Counties have jurisdiction in non-designated areas, but not all have policies governing the use of their water resources. Decision making on proposed uses in non-designated areas needs to be based on standards developed from empirical data, needs to ensure protection of the sustainable yields, and needs to conform with county development plans.
- *Establish a policy to regulate the quality of ground, surface and coastal waters from all impacts, including irrigation, that applies to all permits and approvals for the development of golf courses; and to monitor the waters and their biota.* Currently, the Department of Health regulates drinking water at its source and impacts from injection wells through its enabling legislation. However, it merely guides the monitoring and regulation of golf course impacts from irrigation, without specific policies or laws.

- *Develop a data base for all pesticides used; develop policy and laws to manage and regulate fertilizers; and provide additional research on the effects of all uses of pesticides and fertilizers.*
- *Establish a policy that protects sustainable yields and quality of water in all locations, as is done for "designated areas" in the water code.*
- *Allow the development of golf courses in areas in need of flood retention and storm water run-off protection. Large grassed areas can serve as drainways and filters for storm water run-off and water retention; however, current floodplains with wildlife habitat should be preserved.*

CONDITIONS, AS APPROPRIATE

Conditions that may be appropriate for approval of a golf course will vary widely with the specific sites. The following are examples of conditions that may be required:

Erosion control plans.

More extensive inspection, monitoring, and enforcement for all construction especially on large tracts of land. Reviewing agencies need to increase the frequency of on-site inspections during construction, especially at sites which have the greatest potential for soil loss problems including all steep slopes.

Permanent buffers between golf courses and streams, wetlands, and coastal waters. While specific impacts of golf courses on sensitive resources will vary based on the topography of an area, soil types, and geology, buffers can assist in protecting the wildlife habitat of rare and endangered species as well as aquatic resources including coral reefs.

- 300 feet for wetlands which serve primarily as wildlife habitat protection.²
- 100 foot corridor for significant streams.³
- 150 feet for shorelines, except in the Urban Land Use District.⁴

Vegetative filter strips for all uses. Biofiltration, or filter strips, protects aquatic resources from nonpoint source pollution.

Continued preservation of significant archaeological sites. Preservation and adequate protection of sites -- as well as the use of signage, brochures, and visitor displays -- will further preserve the physical artifacts as well as the culture. Buffers to sites may be recommended where appropriate. More public input should also be allowed into the preliminary permit review process.

Provide tangible benefits to the community. In communities where a golf course will have a prominent role, or is part of an overall effort to develop the area, community benefits need to be considered. Where appropriate these benefits could be designated impact fees or credited in lieu of an impact fee or tax, or as part of a development agreement, on a cost equivalent basis, in accordance with legal measures governing impact fees, development agreements, or development taxes.⁵ For example:

- Promotion of recreational facilities and uses. The recreational value of golf courses is sometime lost in a host of other community issues and priorities, such as concern over foreign investment and protection of the character of rural communities. Recreation is a vital part of a community, however, and providing days and times open for public play on courses may mitigate some community concerns.
- A portion of greens fees could be used to enhance the area's non-golf recreational resources.
- If the golf course will require in-migration to fill on-site jobs, there should be proportional participation in affordable housing efforts, as well as resident-related services such as education and day care. This community benefit meets the "nexus" test needed for impact fees discussed in this report.
- If the golf course will cause the disruption of food gathering or recreational activities, appropriate off-site non-golf activities or resources of at least equal value should be provided.
- Setting up a trust fund is one way to provide benefits, while remaining flexible enough to address changing community priorities. This benefit could be provided through impact fees similar to the farmland mitigation fee models.⁶

INFORMATION MANAGEMENT

One additional area of concern is the lack of information, or the difficulty in finding information on golf courses and golf course development in Hawai'i. In compiling the inventory on proposed golf courses, available information was inconsistent in content and substance. This presents problems for communities in reviewing studies on environmental impacts, and it is difficult for the lay person to understand cumulative effects without standard information requirements.

Conduct an updated inventory on existing and proposed golf courses, and develop a data base on golf courses to include demographic and economic information for the golf courses and their surrounding communities.

Develop maps in the State Geographic Information System (GIS) to identify sensitive areas. The technology is readily available to combine land use and environmental considerations in one mapping system.

FINANCING MEASURES

As communities and governments grapple with golf course development, one popular response has been to charge the developer for the privilege of building a golf course. There are three basic ways to accomplish this end: impact fees, development agreements, and development taxes. This report recommends development agreements as the financing tool to mitigate the impacts from golf courses; it is the easiest and most legally defensible. (See **Financing Measures**, pp. 89-91 of the full report for specifics regarding possible legislation.)

An *impact fee* is a fee charged to developers to cover their fair share of the cost of any new public facility required, in whole or part, due to the development. It is a regulatory technique because the facility for which it pays (roads, landfills, water and sewer systems) is necessary for the health, safety, and welfare of the people. For example, if a golf course will cause additional traffic requiring road improvements, the developer is charged a fee in the amount of the share of road improvements attributable to the increase in traffic from the golf course. Impact fees must be rationally related to the development and must be spent on the designated improvement. This is called the "rational nexus test"

The impact fee is a well-regarded and useful tool for a community, as it allows development to pay its fair share of new public facilities. However, while Hawaii counties can almost certainly charge such fees under their existing statutory powers without a separate enabling statute, they must do so by means of ordinances tied to comprehensive development plans and demonstrated facility needs. Several California communities have developed agricultural mitigation fee programs that address impacts of development on their agricultural lands that can serve as models for impact fees.⁷

A *development agreement* is a contract between government and the developer which establishes a voluntary exchange: the developer typically agrees to pay money, build community facilities, or provide other community benefits; and the government typically agrees to freeze some or all of the existing zoning and other land use designations at the development site for a set period of time. This technique is voluntary and mutual, with no need to meet a nexus test. Within limits, fees and mitigation measures that exceed the actual impact of the specific development are allowed.

The development agreement is a useful tool, particularly when combined with an impact fee. As long as the developer is given credit for any voluntarily provided benefit against the required impact fee, local government could use both methods.

A *development tax* is an excise tax levied on developers. A development tax is compulsory and is not limited by the nexus test requirement. Government can spend the funds collected through the tax for any legitimate purpose. It is, however, subject to significant limitations, such as the need for a state statute.

The development excise tax is a potentially useful way to fund various governmental activities and projects from moneys collected from the land development process. However, the use of the development excise tax for regulatory rather than revenue-raising purposes will likely result in its characterization as a regulatory measure and subject it to the rational nexus test -- which destroys its usefulness as an alternative to exactions like impact fees.

There must be a rational relationship between the tax and its differential classifications, if any, and indeed the tax itself must be rationally based. If the charge is too high, it may be judged confiscatory and void. If it looks too much like a property tax, then uniformity issues may also result in its invalidation. Lastly, care must be taken to avoid double taxation.

CONCLUSIONS

The Office of State Planning's objective in this report has been to develop a process that compares resources to uses, and provides predictability to development. A developer, real estate agent, community organizer, investor, environmentalist, etc., should be able to use this report to determine where a golf course development is or is not feasible based on its physical impacts. It is the opinion of the Office of State Planning that if these type of measures providing predictability had been available prior to the golf course development "boom," many of the problems facing the state and counties today would not exist.

ENDNOTES

1. The sensitive sites are identified from numerous resources:

WETLANDS

1. Wetlands and Wetland Vegetation of Hawaii: Margaret Elliot and Erin Hall, 1977.
2. State Conservation Lands Functional Plan: Department of Land and Natural Resources, 1991.
3. State Recreational Functional Plan and Technical Reference Document: Department of Land and Natural Resources, 1991.
4. Hawaiian Waterbirds Recovery Plan: United States Fish and Wildlife Service and Department of Land and Natural Resources, 1985.
5. Hawaiian Wetlands National Wildlife Refuge Complex Master Plan (Draft): United States Fish and Wildlife Service, 1985.
6. Regional Wetlands Concept Plan; Emergency Wetlands Resource Act; United States Fish and Wildlife Service, Region I, 1990.
7. Ecologically Sensitive Wetlands on Oahu: Groundwater Protection Strategy for Hawaii. Technical Report No. 184, Draft: Environmental Center, Water Resources Research Center, University of Hawaii, 1989.
8. Discussion with resource personnel at the Department of Land and Natural Resources Division of Forestry and Wildlife and the United States Fish and Wildlife Service.

STREAMS

Special Streams were identified using the Hawaii Stream Assessment Draft Report by the Department of Land and Natural Resources and input from stream experts. Special Streams were identified as having outstanding aquatic or riparian resources or a high quality estuary.

WATERSHEDS

The following areas were selected as high priority areas for review for watershed values by the Department of Land and Natural Resources, Office of State Planning, and the University of Hawaii Water Resources Research Center. Selection was based on areas which are currently subject to increasing development pressures.

1. Watershed Protection Study for the Five Year Boundary Review; Conservation Zone Adjustments Leeward Koolau Range, Oahu (Draft): Water Resources Research Center, University of Hawaii, 1991.
2. Watershed Protection Study for the Five Year Boundary Review; Conservation Zone Adjustments Kona, Hawaii (Draft): Water Resources Research Center, University of Hawaii, 1991.

3. Watershed Protection Study for the Five Year Boundary Review; Conservation Zone Adjustments North Kohala, Hawaii (Draft Pending): Water Resources Research Center, University of Hawaii, 1991.
 4. Watershed Protection Study for the Five Year Boundary Review; Conservation Zone Adjustments East Maui (Draft Pending): Water Resources Research Center, University of Hawaii, 1991.
2. John I. Ford, Land Protection Coordinator, U. S. Fish and Wildlife Service, letter to the Office of State Planning, January 3, 1992.
 3. Based on best management practices noted in the Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, U. S. Environmental Protection Agency, May 1991; and the Office of State Planning's proposed recommendations in the five-year boundary review, based further on technical advice of aquatic biologists.
 4. Office of State Planning, Recommendations for Improving the Hawaii Coastal Zone Management Program, January 1991. Justified to protect against further shoreline encroachment for protection against current erosion, and to provide open space and views, protection of historic trails and sites, and the long-term possibility of sea level rise. More empirical data is needed to ensure the buffer distance is adequate to protect from chemical impacts of golf courses.
 5. Models of impact fees to implement these types of benefits are found in California's farmland mitigation fees that allow urbanizing development to pay an impact fee into a public fund that would be used to acquire land, open space, or conservation easements; that is, the purchase of the development rights, as appropriate. See, Anne E. Mudge, "Protecting Farmland through Impact Fees in California," Land Use Law & Zoning Digest, January 1992; citing the City of Davis with a mitigation fee program to purchase buffer zones between new urban development and agricultural land, Solano County and the City of Fairfield have an farmland/open-space acquisition program, and the County of Alameda imposes fees from \$2,500 to \$35,000 per residential unit to be used to purchase development rights on nearby fertile land under development pressure.
 6. Id.
 7. Id. citing the City of Davis with a mitigation fee program to purchase buffer zones between new urban development and agricultural land, Solano County and the City of Fairfield have a farmland/open-space acquisition program, and the County of Alameda imposes fees from \$2,500 to \$35,000 per residential unit to be used to purchase development rights on nearby fertile land under development pressure.

In preparing this report, the Office of State Planning's objective has been to develop a process that compares resources to uses, and provides predictability to development. A developer, real estate agent, community organizer, investor, environmentalist, etc., should be able to use this report to determine where a golf course development is or is not feasible, based on its physical impacts. It is the opinion of OSP that if these type of measures providing predictability had been available prior to the golf course development "boom," many of the controversies facing the state and counties today would not exist.

The report is divided into five major sections:

1. A general background review of the types of golf courses and an inventory of existing, under construction, and proposed golf courses;
2. A summary of the land use laws that affect golf course development, and recommended changes;
3. Physical, social, and economic impacts and recommendations to mitigate for these impacts;
4. Methods to provide financial benefits to offset the impacts of golf course development; and
5. Recommended development criteria for golf courses.

Appendix B, Golf Course Report Process, includes a summary of the process used to develop the report.

The Office of State Planning would like to acknowledge the assistance of all the people who made this report possible. OSP was assisted by consultants in the drafting of this document: Berna Cabacungan, Earthplan and Associates; David Callies, Professor of Law, Richardson School of Law, University of Hawaii; Eugene Dashiell, AICP; Robert Freilich, Esq., Freilich, Leitner, Carlisle & Shortledge; James Mak, Professor of Economics, University of Hawaii; John Mink, Mink & Yuen; and Marcia Saki, Ph.D. Additionally, the assistance of the staff and directors of the county planning departments, staff and councilmembers of the counties, state and federal staff, staff of the Center for Alternative Dispute Resolution, and many private citizens who participated in the scoping workshops, statewide public meetings, and who provided comments on the draft report.

It should be noted, the recommendations contained in the report reflect the position of the Office of State Planning, and not necessarily the position or opinion of any of the consultants.

INVENTORY OF GOLF COURSE DEVELOPMENT

Before delving into the land use, and physical, social and economic considerations of golf courses, the report provides an inventory and profiles of the types of golf courses within their respective communities in the state, by county. Tables 1-3, Existing Golf Courses by Type, Proposed Golf Courses by Type, and Status of Proposed Courses, (pp. 5-6) include a summary of the existing courses, and the status of those proposed. Additional detailed information is provided in Tables 1 and 2, Profile of Existing Golf Courses by Type and Profile of Proposed Golf Course by Type, in Appendix C of the report.

It should be noted that available inventories of golf courses were often outdated. Further, information categories were inconsistent among the different printed sources and the different counties. The study, therefore, "reconstructed" the various inventories and updated information as available. Sources used included previous studies on golf courses and their impacts in general; Environmental Impact Statements (EIS) on specific proposed golf courses; indicators of community issues, including public testimony and news articles; and major public guidelines regulating golf courses.

GENERAL PROFILE OF GOLF COURSES

There are 68 existing courses, defined as those currently open for play. Oahu has 29 golf courses, Maui County 18, Hawaii County has 13 golf courses, and there are eight courses on Kauai.

Of the 102 proposed golf courses, 14 are under construction or soon to begin construction, and another 13 have received major State and County approvals. ~~Thirty-nine~~ still need to go through county land use approval processes, including obtaining the appropriate designations on local development or community plans and special management area (SMA) permits.

A significant number of the proposed courses have not officially submitted any documentation. They are included because one of the perceived social impacts is based on community concerns about the sheer volume of further golf course development. Furthermore, these "ideas" are indicative of the need to plan for future growth as discussed in the Land Use and Environmental sections of this report. There is, however, insufficient evidence to predict whether or not these golf course development ideas will be reviewed by a regulatory agency, let alone ever be approved for construction.

Finally, the inventory includes nine golf course developments that were denied approval at either the State or County level, or were withdrawn. The future status of these golf course developments is unknown. Some can reapply, some may still appeal the denial, while others are totally foreclosed from developing.

CHARACTERISTICS OF THE DIFFERENT TYPES OF GOLF COURSES

Membership only. These are country clubs whose facilities, including the golf course, clubhouse and meeting rooms, are open only to members and their guests. Five of Hawaii's existing golf courses are membership only, four on Oahu, and one on Maui. There are no additional courses proposed.

Daily fee/public play. These golf courses are generally privately owned and developed, and allow the general public to use the course. Some of these courses also offer limited memberships. Daily fee/public play golf courses are the most popular form of both existing and proposed golf courses. Twenty-one of the existing, and 42 of those proposed golf courses offer unrestricted public play for a daily fee or are membership courses which allow public play.

Military. These golf courses are usually located on a military bases, and are primarily accessible to military personnel and their civilian guests. All of the existing courses are located on Oahu, and no additional military golf course are being proposed at this time.

Municipal. These are publicly owned and operated golf courses opened to residents and visitors. Currently there are nine municipal courses, and six more are proposed.

Resort. Resort courses are functionally similar to the membership/public play courses, except that they are affiliated with a hotel or are part of resort destinations. Virtually all are open to the general public, and hotel and resort guests generally have preferential times and rates. In some cases, the resort courses actually offer memberships to residents of the resort-residential units. Twenty-six golf courses in Hawaii can be categorized as resort courses, and nineteen are proposed.

Information in these tables is used as background, and as supporting data for the remainder of the report.

Table 1

Existing Golf Courses By Type

Type	County							Total
	O'ahu	Maui				Hawai'i	Kaua'i	
		Maui	Moloka'i	Lana'i	Total Maui			
Membership only	4	1	0	0	1	0	0	5
Daily fee/public play	9	3	1	1	5	5	2	21
Military	8	0	0	0	0	0	0	8
Municipal	5	1	0	0	1	1	1	8
Resort	3	9	1	1	11	7	5	26
Total	29	14	2	2	18	13	8	68

Source: Earthplan

Table 2

Proposed Golf Courses By Type

Type	County							Total
	O'ahu	Maui				Hawai'i	Kaua'i	
		Maui	Moloka'i	Lana'i	Total Maui			
Membership only	1	0	0	0	0	0	0	1
Daily fee/public play	24	2	0	0	2	14	7	47
Military	0	0	0	0	0	0	0	0
Municipal	3	1	0	0	1	1	1	6
Resort	1	3	2	1	6	18	0	25
Information not available	11	6	4	0	10	2	0	23
Total	40	12	6	1	19	35	8	102

Source: Earthplan

Table 3

Status of Proposed Golf Courses

Type	County						
	O'ahu	Maui			Hawaii	Kaua'i	Total
		Maui	Moloka'i	Lana'i	Total Maui		
Under construction or soon to begin construction	6	0	0	0	0	7	14
Received major State and County approvals (*)	4	2	0	0	2	7	13
Needs County approvals (**)	11	3	3	1	7	17	39
In State Land Use process (***)	2	0	0	0	0	1	5
No official submittal	8	7	3	0	10	3	22
Application denied or withdrawn	9	0	0	0	0	0	9
Total	40	12	6	1	19	35	102

(*) Or is exempt from these processes

(**) Has either received major State approvals or does not require State approvals.

(***) Includes two golf courses currently in the State Land Use process, one pending litigation and one in CDUA

Source: *Earthplan*

LAND USE CONSIDERATIONS

Hawaii's land use laws were established to provide for growth management, and golf course development is essentially a growth management issue. Therefore it is important to examine Hawaii's State and County land use laws and policies, and which governmental entities have jurisdiction in each district. Recommended changes to the Land Use Law that would affect golf course development are included in the Recommendations section. Table 3, Regulations and Authorities Specific to Golf Courses, in Appendix C summarizes the major actions taken by the respective State and County agencies.

LAND USE LAW, ACT 187

In 1961, the Hawaii State Legislature passed the Land Use Law to address the increase in urban development and the preservation of prime agricultural land during a time when agriculture was "still a mainstay of the state's economy."¹ The Land Use Law divided State lands into four land use district classifications: Urban, five percent; Agriculture, 47 percent; Conservation, 47 percent; and Rural, less than one percent.²

Urban District. The Urban District includes lands presently in urban use and a reserve for foreseeable urban growth. Generally, the Urban District is defined as having proximity to infrastructure, geographically reasonably safe from adverse natural conditions, and is land that may be needed within the next ten year for projected urban growth.³ Uses are permissive only, with the counties issuing permits for development through their ordinances or regulations.⁴

Agricultural District. The Agricultural District includes lands used for cultivation and grazing as well as related uses. The greatest amount of protection is to be provided to land "with a high capacity for intensive cultivation."⁵ The permissible uses in this district are extensive.⁶ The approval process in this district is divided between enumerated permissible uses and all other uses which must obtain a special use permit.⁷ Prior to 1985, golf courses and golf driving ranges were not permitted in the Agricultural District and required a special permit. In 1985, the Land Use Law was amended designating golf courses and golf driving ranges as permissible uses in areas not rated class A and B by the Land Study Bureau's land classification of productivity.⁸

The jurisdiction over special permits in the agricultural district is determined by the size of the parcel under consideration. When the use requires less than fifteen acres, the County may

permit “unusual and reasonable uses... other than those for which the district is classified.” For projects larger than fifteen acres, the Land Use Commission (LUC) must review and approve the County’s permit and may add more conditions or deny the application.⁹ This is the process for a golf course proposed in an area rated A or B, where golf courses are not a permissible use. As an example, the LUC approved a special permit and required that a golf course and its accessory uses and structures on 210 acres in the Agricultural District in Pa’a, Koloa, Kauai, provide mitigation measures for the environmental, economic, and social impacts.¹⁰

Conservation District. The Conservation District includes areas necessary to protect resources specified in the law including:

open space areas whose existing openness, natural condition and present state of use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural or scenic resources; areas of value for recreational purposes...and other permitted uses not detrimental to a multiple use conservation concept.¹¹

The Board of Land and Natural Resources (BLNR or Land Board), through the Office of Conservation and Environmental Affairs, governs the uses in the Conservation District through the conservation district use application (CDUA). Conditions may be added to any permit granted under the CDUA.¹²

The Conservation District is divided into five subzones: protective, limited, resource, general, and special.

- **Protective:** restricted watersheds, plant and animal sanctuaries, and significant historical and geographic features.
- **Limited:** when natural conditions “suggest” constraints.
- **Resource:** sustained use of natural resources to be harvested (timber, future parklands).
- **General:** open space where urban development would be “premature.”¹³
- **Special:** specially designated, and areas named on a case-by-case basis.

The Land Board has approved four golf courses in the Conservation District in the last 25 years: Salt Lake, Oahu (1966), Honolua, Maui (1971), Koolaupoko, Oahu (1987), and Minami, Windward Oahu, (1989). In the permit for Minami, the Land Board added eighteen conditions to mitigate for economic, environmental, and social impacts.¹⁴

Rural District. The Rural District includes a minute portion of the state's land area, primarily on Maui and Kauai for small farms and rural subdivisions that would not be appropriate in either the Agricultural or Urban Districts.¹⁵ These small areas are governed like the Agricultural Districts and will be treated the same in this report.¹⁶

DISTRICT BOUNDARY AMENDMENTS

Should a proposed use not comply with the standards for a specific district, the land may be reclassified to another district through a district boundary amendment. As is the case for special permits within the Agricultural District, the size of the parcel governs State or County jurisdiction for the district boundary amendment. The counties alone determine amendments to parcels fifteen or less, except in the Conservation District.

The LUC determines amendments to all parcels in the Conservation District and to all parcels larger than fifteen acres in all the districts.¹⁷ For example, the LUC is currently reviewing a boundary amendment for a proposed golf course in Waikane to reclassify approximately 300 acres from agricultural to conservation.¹⁸ The City and County of Honolulu, Department of General Planning has stated on the record at the LUC hearing that this is an attempt to bypass the City's regulatory process, since the Land Board regulates uses within the Conservation District.

For reclassification of a district boundary, the LUC must consider six specific impacts, including: the preservation or maintenance of natural systems or habitats; maintenance of valued cultural, historical, or natural resources; maintenance of other natural resources relevant to the economy, including agricultural resources; commitment of state funds and resources; and provisions for jobs, economic development, and housing for all income groups.¹⁹ For example, Haseko, Inc., was granted a district boundary amendment from agricultural to urban for a development that includes 272 acres for a golf course in Ewa. In the part of the order that pertained specifically to the golf course, the LUC ordered Haseko to provide public play with adequate tee times at affordable rates for Hawaii residents on the golf course. The LUC also required Haseko to comply with the Department of Health's (DOH) guidelines for golf course development, and to utilize qualified management in irrigating and in applying chemicals.²⁰

Currently, OSP is conducting a five-year district boundary review and considering its recommendations to the LUC in 1992 for proposed boundary changes.²¹ The draft recommendations in boundary review process recognize three major policies:

- (1) The *urban district* shall reserve areas for urban growth to reduce public costs of scattered development; maximize the infrastructure, giving priority to contiguous existing urban areas; and avoid, when possible, important and unique agricultural lands as well as maintain conservation areas and rural communities and lifestyles.
- (2) The *agricultural district* should be sufficient to assure viability of the sugar and pineapple industries; to foster diversified agriculture; and to provide open space, greenbelts, and buffers between urban areas. Important agricultural land shall be maintained in the agricultural district unless reclassification provides overriding public benefits.
- (3) The *conservation district* shall protect important resources including watershed and forest reserves; endemic plants, fish and wildlife including those which are threatened or endangered; wetlands; beaches and coastal areas; special streams, scenic, historic, and archaeological resources; and open space and natural areas. Areas with steep slopes and natural hazards which may cause harm to lives and property are also included.²²

Upon completion of the boundary review, OSP may petition the LUC to implement the recommended boundary changes. These include recommendations to reclassify Agricultural District lands with high conservation value to the Conservation District.

COUNTY ORDINANCES AND POLICIES

In addition to the State Land Use Law, each of the counties has a planning and zoning process governing golf course development. The formalities vary between counties.

The City and County of Honolulu and the County of Maui have both promulgated ordinances specifically to address golf course development. The Counties of Kauai and Hawaii regulate golf courses on a case-by-case basis, with no special ordinances governing them.

City and County of Honolulu. The City and County of Honolulu (City) initially reacted to the increase in applications for private golf courses by amending the zoning ordinance to place golf courses in the preservation district, subject to Plan Review Use approval, and so long as consistent with the City's Development Plans. Furthermore, the same ordinance provided that approval is based on enumerated criteria which address the physical, social, and economic impacts.²³

After much debate, the City passed another Ordinance (No. 91-82) on November 13, 1991, governing golf courses. It provides more specific procedures that a developer is required to follow and other measures that mitigate economic, social, and physical impacts. Additionally, a developer may submit a community integration program to address both social and economic impacts including but not limited to job training, affordable public play, public availability of golf course facilities, creation of paths, etc. Many of the concerns noted in the impact sections of this report are addressed by the City's ordinances.

County of Maui. In August and September, 1991, the County of Maui amended its ordinances to address concerns over golf course development. Specifically, the County provided that golf courses will not be permitted in the interim zoning within Wailuku, Makawao, Lahaina, Hana, Lanai, or Molokai; residential; hotel; and agricultural zoning districts.²⁴ Furthermore, the County created a new park district especially for golf courses in the State Urban and Agricultural Districts. This ordinance also provides for minimum development standards to mitigate for physical impacts.²⁵

County of Kauai. Kauai regulates golf courses on a case-by-case basis using the same review procedures and policies that apply to a broad range of other projects.²⁶ For example, a third golf course for Kauai Lagoons is being proposed, including development criteria for a wide buffer strip between the coastline and the course that includes public access and camp sites. This proposal is being reviewed in the same manner as other proposed developments in the County's Special Management Area with shoreline access and setbacks being considered.

County of Hawaii. Hawaii County regulates golf courses through the planning and zoning process on a case-by-case basis in the same manner as other developments.²⁷ For example, the Hawaii County Planning Department reviewed the Royal Vista golf course development, adding conditions to mitigate physical impacts including a biological survey, archaeological survey, recreational assessment, and a \$3 million cash payment.²⁸

CONCLUSION

The primary objectives of Hawaii's land use regulations should be to protect resources, to promote appropriate and compatible land uses, and to provide predictability and fairness in the allocation of land resources. Much of the controversy over golf courses stems from the fact that our regulatory scheme does not meet one or more of its basic objectives in the eyes of many sectors of the community.

The report's recommendations for regulating golf course development are based in part on the proposed changes to Chapter 205, HRS, as outlined in Senate Bill 1342, 1991, Relating to Land Use (the administration's so called LESA bill). The proposed amendments include boundary changes so that land use districts include only lands which meet the district criteria, and creation of a new district -- the Open Space District -- to hold lands not currently classifiable in other districts. Once district boundaries are rationalized, golf courses should be appropriately restricted to the Urban District, and by special use permit only if consistent with the purpose of other districts.

Although the Land Use Law's intent is to classify lands according to their resources, this has not been consistently applied nor does the current land use classification system adequately recognize the multiple values of the land. For example, some lands classified in the Agricultural District have conservation value, while other lands currently in the Conservation District have limited or no conservation resources and values. The recommendations at the end of this report take these facts into consideration.

ENDNOTES

1. David L. Callies, Regulating Paradise: Land Use Control in Hawaii, Honolulu, University of Hawaii Press, 1984, page 6.
2. State of Hawaii, Department of Business, Economic Development & Tourism, The State of Hawaii Data Book, 1990.
3. Land Use Commission, Department of Business, Economic Development & Tourism, Hawaii Land Use Commission Rules, §15-15-18.
4. §205-2, HRS.
5. The district may include areas "which are not suitable for agricultural or ancillary activities by reasons of topography, soils, and other related characteristics." §205-2, HRS.
6. Id.
7. §205-4.5, HRS., and §205-5, HRS.
8. Act 298, Section 2, SLH 1985.
9. §205-6, HRS.
10. Land Use Commission, In re the matter of Ainako Resort Associates and Grove Farm Properties, Inc., Docket No. SP88-369, November 23, 1988; appealed at Malona Maha'ulepu v. Land Commission, 790 P.2d 906 (1990 Hawaii).
11. §205-2(e), HRS
12. Chapter 183, HRS.
13. Callies, supra.
14. Department of Land and Natural Resources, Conditions to Granting of Permits Extension Agreed to by Community Representatives and Minami, January 25, 1991.
15. §205-2, HRS.
16. §205-6, HRS.
17. §205-3.1, HRS.
18. Land Use Commission, In re the matter of SMF Enterprise, Inc., Docket No. A91-667, Pending.
19. §205-17, HRS.
20. Land Use Commission, In the Matter of the Petition of Haseko (Hawaii), Inc., Docket No. A89-651, October 17, 1990.
21. §205-18, HRS.

22. Office of State Planning, proposed policies for boundary review report, 1991.
23. City and County of Honolulu, Ordinance No. 90-15, February 23, 1990.
24. County of Maui, Ordinance No. 2030, August 30, 1991.
25. County of Maui, Ordinance No. 2031, September 4, 1991.
26. County of Kauai, personal conservation with Mike Laureta, Planner, Kauai County Planning Department, August 30, 1991.
27. County of Hawaii, Ordinance No. 90-105, September 13, 1990, codified at Section 25-28(a)(1).
28. County of Hawaii, Planning Department, letter to Premier Resort Development, Inc., Royal Vista Golf Course, July 10, 1991.

ENVIRONMENTAL CONSIDERATIONS

Golf course development is essentially a land use issue. Environmental impacts of golf courses are real, however, and are addressed below in three parts. The first part discusses the most controversial issues: water use, effects of chemicals, erosion control, and historical and sensitive areas. Traffic congestion and air quality issues are briefly discussed. Cumulative impact concerns are covered in the context of regional impacts, and improving the environmental impact statement (EIS) process. (Public access and open space are discussed in the Social Considerations section of this report.)

WATER USE

Water use has been in the limelight in the past five years during the creation of the State Water Code. The primary issue that continually surfaces is that Hawaii, like Florida, is "...running out of water, or at least ...cheap, clean water."¹

The Hawaii State Constitution provides that "[t]he State has an obligation to protect, control and regulate the use of Hawaii's water resources for the benefit of its people."² In 1987, the State Legislature passed the State Water Code to protect and manage surface and ground water resources.³ The allocation of water is effectively regulated by the Department of Land and Natural Resources' (DLNR) Division of Water Resources Management on behalf of the Water Commission, through statewide well drilling and pump installation permits, and in designated water management areas through water use permits.⁴ A water management area is "designated" as such after a determination is made that the water resources of an area "may be threatened by existing or proposed withdrawals or diversions of water." Once designated, administrative controls may be placed on withdrawals or diversions "to ensure reasonable-beneficial use of the water resources in the public interest."⁵

Concurrently, the State Department of Health (DOH) is responsible for water quality through the laws governing safe drinking water. The law currently provides protection of drinking water from pollution by injection of waste materials.⁶ DOH has no direct regulations protecting ground water quality, but does provide guidance for the uses of water by golf courses overlying drinking water resources, e.g., potable aquifers. The DOH guidance document "Twelve (12) Conditions Applicable to All New Golf Course Development" has been incorporated into permits for golf course development in each county with the exception of Hawaii, and also into Land Use

Commission decisions relating to golf courses. However, it is guidance only and does not hold the force of law under DOH's laws. (See Appendix D, DOH's Twelve (12) Conditions Applicable to All New Golf Course Development.)

Data on water quantity is currently being developed by scientific studies to determine the amount of water available, called sustainable yields, for each island. Aquifer type and quality are being determined and mapped through a mapping program developed by the University of Hawaii, Water Resources Research Center, and have been completed for all islands except Molokai and Lanai. The project is expected to be completed by 1992. Based on these studies, an aquifer classification system is being developed for DOH. (Appendix C, Table 4, Aquifer Classification Explanation, lists the coded factors used for this system. Appendix E, Water Resources, is an analysis of the impacts of golf courses on ground water resources. Appendix C, Table 5, Aquifer Codes and Water Usage of Golf Courses by Island, lists the codes given to golf course projects that have already been coded under this system. An explanation on how to use the system is included with Appendix F, Understanding the Aquifer Classification Codes.)?

In addition to generating potentially deleterious effects on the quality of surface, ground, and coastal waters, golf course irrigation also competes for water supply in locations where there is a limited supply of exploitable potable water. A typical 18-hole golf course in a dry, but not arid climate in Hawaii requires an average of 0.5 to 1.0 million gallons of water a day (mgd) for irrigation, which is comparable to the domestic demand of 3,000 to 6,000 people.

The competition for scarce potable water supplies is mitigated at many golf courses by irrigation with non-potable water (water having greater than 250 mg/l chloride content). (For best maintenance of grasses, the irrigation supply should not have more than 750 mg/l chloride, but many courses have to use water having salinity as high as 1500 mg/l.) Although irrigation with brackish water mitigates potable water supply problems, when brackish water irrigates courses that overlie fresh water aquifers, the underlying ground water may suffer quality deterioration as the brackish water percolates into the aquifer.

Clearly, a golf course can affect both the quality and quantity of ground water and surface water resources. These effects are substantially affected by course location, construction techniques,⁸ plant material selection (grass types), and maintenance practices. For instance, a course not located over or adjacent to potable water sources which uses brackish water and state-of-the-art irrigation and maintenance techniques may have undetectable or inconsequential effects.

Two counties have through recent ordinances begun to support regulating use of water on golf courses. The City and County of Honolulu (City) passed an ordinance providing that a golf course development application be evaluated in part on whether it “[p]romotes water conservation by using non-potable water sources for irrigation...” including using effluent and brackish groundwater sources. The City has also empowered its Board of Water Supply “to regulate or prohibit introducing lower quality irrigation water above higher quality subsurface water.”⁹

Maui County has established a similar ordinance requiring “[n]on-potable water for irrigation unless otherwise authorized by the council.” Furthermore, golf courses must comply with the instream protection program established by the Hawaii Water Code.¹⁰

Kauai and Hawaii counties govern the use of water on a case-by-case basis in golf course development. Comments at the Kauai public meeting reflected that, due to the island’s extensive amount of both surface and ground water, stringent water conservation methods are not appropriate.¹¹

On Molokai, the general public is concerned about the amount and allocation of available water. Specifically, the Hawaiian community is concerned about the allocation of water for future development of Hawaiian home lands.¹² Currently the community is finalizing its Regional Comprehensive Plan and believes that the priorities selected in the community plan should be followed in any development on Molokai, including the allocation of water.¹³

Water use on golf courses, according to a consultant for golf course development, can be controlled by specific methods including:

- Irrigating based on peak week needs, as well as average needs for water use planning and irrigation system design.
- Minimizing the use of potable water sources for golf course irrigation.
- Encouraging brackish water use, particularly for areas that do not overlie important fresh ground water sources.
- Encouraging the use of effluent water.¹⁴

In sum, Commissioner Hurchalla stated “...that any water use where supply will eventually be limited and demand keeps increasing will effect everyone’s water costs.”¹⁵

CHEMICAL USE

The use of chemicals on golf courses creates considerable debate. People fear contamination of their drinking water supplies, coastal waters, food supplies including limu, fish, and shellfish; destruction of plants and animals; etc.

Conversion of land to golf courses and their maintenance may substantially affect the water resources into which the courses drain. Surface runoff rinses fertilizers and biocides, depositing them in streams and coastal waters, and subsurface percolation of rainfall and surplus irrigation can carry them to ground water. The quantity of contaminants transported either to streams, coastal waters, or ground water depends on the construction and management of the course maintenance, as well as on natural variables such as rainfall, topography, and geology. However, inevitably some amount of the applied chemicals escape into the hydrological environment where they may become detectable pollutants. It should be noted that these same effects may result from the use of chemicals for industrial, agricultural, and residential purposes.

The two major categories of chemicals used on a golf course are pesticides and fertilizers, and each is discussed separately below. (See Appendix G, Comparison of the Use of Pesticides: Golf Courses, Sugarcane, Pineapple, and Urban Applications, for a comparison of amounts of pesticides applied.)

Pesticides. Hawaii is classified by the U.S. Environmental Protection Agency (EPA) as an area highly vulnerable to ground water contamination from agricultural pesticides. Basal ground water is the primary source of fresh water for the public, with 95% of the population obtaining their water from such sources.¹⁶

Pesticides are defined as any substance or mixture of substances intended to prevent, destroy, repel, or mitigate any pest or for use as a plant regulator, defoliant, or desiccant. A pest is defined as a insect, rodent, nematode, fungus, weed or plant or animal life or virus, bacterium, or other microorganism as declared by the State Department of Agriculture (DOA).¹⁷

The DOA manages and regulates pesticides through the Hawaii Pesticides Law.¹⁸ Stated simply, the law consists of licensing pesticides and permitting of any restricted pesticide that is sold, offered for sale, or distributed in the state. "Pesticides" consist of a broad group of chemicals; "restricted pesticides" have more restrictions based on the permitting requirements with higher standards in their application and use.¹⁹ Sanctions for violating the requirements for

restricted pesticides are denial, suspension, or revocation of the permit to sell a pesticide,²⁰ including seizures, "stop-sale," and "removal from sale" of the pesticide.²¹

In addition to these requirements, DOA with the approval of DOH, may cancel, suspend, or restrict pesticide uses "when the usage is determined to have unreasonable adverse effects on the environment" including detection of residues of the pesticide in drinking water, or when EPA has suspended or canceled a use for a special local need.²²

Restricted pesticides may only be applied by a certified applicator or competent person under a certified applicator's direct supervision. DOA certifies an applicator through testing.²³ Golf courses using restricted pesticides are required to have a certified applicator on staff.²⁴

In a draft Groundwater Protection Strategy, DOA has recognized the problems associated with pesticide use and their potential impacts on risk to ground water. "With nearly 700 million pounds of pesticides used in the United States each year, up to 3 percent (21 million pounds) are estimated to reach ground or surface water before degradation."²⁵ Potential pesticide contamination of ground water depends on several factors as discussed in Appendix E, Water Resources. These include chemical properties of the compound, the type of soil, and weather conditions.²⁶

The State is presently developing a Groundwater Protection Management Plan that includes the roles and responsibilities of each agency, authority, prevention actions, public participation, resources, monitoring, enforcement, etc. The prevention measures proposed include pesticide handling, wellhead protection zones, aquifer identification, single purchase permits, practices to reduce the quantity of pesticides used including integrated pest management (IPM) and biological control, and practices that reduce pesticide leaching to groundwater (including drip irrigation, use of leachability pesticides, timing of irrigation, and IPM).²⁷ This plan is currently being review for approval and future implementation.²⁸

In addition, DOH has conditions applicable to golf course development (discussed above). The first three conditions address groundwater monitoring for specific chemicals that may affect drinking water including salt and compounds associated with fertilizers, pesticides, and effluent irrigation. However, as noted previously, these are mere guidelines without force or effect of law and are generally voluntary on the part of the developer. These conditions have been attached to numerous golf course development permits.²⁹

The National Agricultural Pesticide Impact Assessment Program (NAPIAP) funded a recent pesticide use survey to determine which pesticides are being used on golf courses in Hawaii. Golf courses are perceived to be relatively heavy pesticide users. Preliminary survey results indicate this is particularly true in wet areas.³⁰ The survey indicates that the ratio of rainfall to the average use of active ingredient biocides in a survey of 40 golf courses is: eight pounds with less than 30 inches rainfall, 16 pounds between 30 and 60 inches rainfall, and 24 pounds with rainfall in excess of 60 inches a year. These differences are indicative that the wetness factor results in the need for the use of more chemicals.³¹

These preliminary survey results are being used as the supporting data to request further funding to study the environmental fate of pesticides used in agriculture, residential areas, business districts, and golf courses. The proposal notes:

In the absence of such data, EPA and local regulatory bodies are considering restricting or canceling certain pesticide uses. Lack of data has also been used ... to prohibit development of agriculture, housing, and golf courses, all three of which are important components of Hawaii's economy. The investigators propose to: (1) determine the source of (currently registered) pesticides moving in stream waters subject to runoff, and (2) compare different sampling methods for future environmental sampling.³²

The proposal's recommendation is to await this type of data to enable governmental entities "to reach reasonable regulatory decisions and implement planning that considers environmental impacts." As a side note, this same commentator stated that golf courses use the same type of pesticide products found in the active ingredients used on minor agricultural crops. "From an economic standpoint, loss of golf course uses (banning the use of the pesticide by golf courses) could affect future availability (of the pesticide) for other minor (agricultural) uses."³³

Commentators (addressing the OSP draft report on golf course development) have also expressed concern with the use of chemicals on golf courses. A resident of Hawaii County stated that he is intervening in the permit review process of golf course development to prohibit the use of "toxic" chemicals.³⁴ Another Hawaii County resident and golf course consultant with extensive experience in the pesticide industry, stated that golf course development can occur without toxic pesticides.³⁵

Other commentators have supported integrated pest management (IPM), which includes turf grass selection, pest identification, thresholds for chemical uses, drainage, irrigation, etc.³⁶ For example, the EIS for the proposed Manele golf course on Lanai includes in its integrated management plan, a seventy-page document which contains an IPM section.

A study at Kona's Waikoloa golf course resort has not found any quantifiable change or response to, or by, marine life in the anchialine ponds or marine waters. The results suggest that "impacts mediated through changes in ground water chemistry on aquatic communities in the Kona setting ... are minimal to non-existent However, because we have not found any detrimental impact ... does not mean that we should sit idly." Mitigation should be monitoring of both water quality and aquatic communities "to tell us if a problem is appearing." Monitoring should begin before development to provide a base line. Sanctions need to be available to hold the offending party responsible to reverse the detrimental action. To date, the commentator has "not found any pesticide from the golf course in ... samples ... except on one occasion an open pit nursery well had just detectable levels ... due to dust contamination of the sample."³⁷ Another commentator stated that other studies done for golf course developers have found the same results as those on West Hawaii.³⁸

A 1988 study of six site locations in West Hawaii for the effects golf course irrigation on nearshore marine waters concluded that

as long as golf courses are not constructed near enclosed embayments (i.e., Keauhou Bay) and management practices do not include extreme over-irrigation or over-fertilization, there does not appear to be potential for alteration to nearshore marine waters and associated biotic community structure and function.

The study recognized that the cumulative effects at Keauhou Bay Golf Course would be most evident at this site. It is an 18-year-old course, 27 holes (the last 9 holes were added in 1985) and is irrigated with effluent. This study concludes that chemical contamination of nearshore waters is evident with effluent irrigation, no coastal setback buffers, over-irrigation after construction of the last nine holes "to promote lush conditions," and in an embayment.³⁹ However, the waters of Keauhou Bay are less than 500 meters (approximately one-quarter mile) from open ocean with no barrier reefs.⁴⁰

As a side note, Florida's experience indicated that its Department of Agriculture testified that pesticide uses were already over-regulated and that controlling chemical contamination is sophisticated and expensive. "Governmental environmental agencies are never funded adequately to keep up with impacts and changing chemicals."⁴¹

Fertilizers. Fertilizers may also be toxic, depending upon their concentration. Care in use, planning, sampling, and reporting are needed. Appropriate buffers for flowing waters is necessary to prevent the entry of fertilizers into aquatic resources.⁴²

Presently, the State does not manage or regulate the use of fertilizers.⁴³ Nonetheless, the impacts of fertilizers on ground water and other resources is being studied by developers and reviewed by DOH in its Twelve Conditions as being a potential contaminate of drinking water resources.

As can be seen by the range of comments generated by the OSP forum and the draft of this report, chemical use on golf courses is not only controversial but there also appears to be a shortage of scientific data with which to resolve the controversies.

EROSION CONTROL

Golf courses can impact both positively and negatively on erosion control. A golf course can be used as a biofilter and flood control; it can also cause extensive sedimentation and run off during construction.

Each county, pursuant to Chapter 180C, HRS, regulates erosion and sediment resulting from earthmoving. The City and County of Honolulu and Maui County require an engineer to propose an erosion control plan for grading large projects, such as golf courses.⁴⁴ Kauai County requires a developer to contract a soils engineer to establish a program for grading in areas with slopes greater than 20 percent.⁴⁵ Hawaii County requires a soils report for grading of areas with potential for significant impacts.⁴⁶

Generally, the requirements are the same for each county, with plans for drainage and erosion control for the larger projects that would include golf course development. All consider the major factors including rainfall, soil erodibility, slope length, slope gradient, cover, and control. Mitigation measures that are encouraged to minimize soil loss and retain it on site include construction of swales, berms, ponding basins or sediment basins to filter and trap sediment, and plantings are included in those ordinances with erosion control requirements.

Additionally, the Federal government has draft policies pending for states to consider controlling non point source pollution, such as sediment. The State and counties are currently preparing responses to the proposed guidelines that may effect the Counties' erosion and sediment control ordinances as well. The long term impacts of the new law are unknown at this time.

All types of development face problems with erosion control. Golf courses are simply highly visible, and concentrate impact due to their sheer size, averaging 120 to 150 acres.

However, any type of development, such as housing developments, that would clear and grade the same size tracts of land will have to provide for erosion control measures. For example, a commentator reflected that in a field trip of eight general construction sites in the Kaneohe Bay watershed, erosion control measures were ignored or improperly applied and maintained at all sites.⁴⁷

Photos presented by a resident at the Lanai public meeting on golf course development showed a major sediment plume into the Manele Bay fronting the resort after a rainstorm. The resident stated this has occurred since the resort development cleared vegetation from the hillsides on the bay. The Lanai resident is concerned that the concentration of the proposed golf course development will cause more run-off into the bay.⁴⁸

Further evidence of the problems with run-off from sedimentation is reflected in the construction of the Minami golf course in Windward Oahu. The problem illustrates the ineffectiveness of erosion control measures when the construction site has steeper slopes, high rainfall, and erodible soils. Another commentator noted that the sedimentation from the construction of the Turtle Bay golf course expansion on the North Shore of Hawaii has ruined his farm and caused him to file a lawsuit against the developer for the damage.⁴⁹

Ten years ago, Martin County Florida required all golf course development to preserve twenty-five percent in native vegetation on the site. Commissioner Hurchalla noted that:

The change in appreciation of God-given creation has been slow, but heartening. Best of all, it has been a win/win. The developer discovered that with native preserves: he didn't have to pay to bulldoze it or plant it or mow it or fertilize it or get a water allocation for it.

We started with golf courses because of their sheer impact: on native vegetation, on area cleared, on water use, and because of their need for buffers to mitigate toxins and nutrients in run-off. We have since extended that requirement to all development. We added a requirement to landscape with natives.⁵⁰

After construction, golf courses can serve very positive functions as flood control devices and sediment retention areas for large tracts of land adjacent to the course. West Loch golf course in Ewa, Oahu, serves just that function for the West Loch Estates residential area. Waialae golf course also serves as a retention area for upland storm water runoff.⁵¹ This function protects the coastal waters and reefs from fresh water and sediment that are trapped on the golf course. (Fresh water is a pollutant to many marine resources.)

A golf course produces minimal erosion problems after construction. One commentator using the Soil Conservation Service formula developed comparable rates of erosion for different types of land uses.⁵²

<u>Land Use</u>	<u>Soil Erosion Rate (tons/acre/year)</u>
Forest	0.01
Pasture/Golf course	0.04
Cropland	1.47
Construction Site	14.70
Urban	0.02

The golf course developer at Hana, Maui, is proposing to mitigate by constructing only two holes of the course at a time, thus allowing two golf course holes to be covered with vegetation before developing the next two holes.⁵³

Soil mining. Soil mining has increased, especially with golf course construction in West Hawaii. Golf courses in the area have to import soil from other locations because the sites are either mere lava or is too thin to support the needed vegetation. In these instances, the mining site of the soil also needs to be considered. Soil received from the washings from sugar mills is an excellent source, recycling top soil.⁵⁴ However, if the mining location is from prime agriculture land, the transfer of soils to a golf course development may defeat the purpose of protecting agriculture land from other types of development. Currently, the environmental impact statements of golf courses have been silent on the source of the mined soils for golf course development.

SENSITIVE AREAS

Wetlands, streams, watersheds, shorelines, intact native forests, and coastal waters are all recognized as sensitive ecological areas. Historical and cultural sites also need to be preserved and protected. Many of these resources are presently preserved and protected in the more restricted subzones of the Conservation District where golf course development is not permitted. Others are located where residential, agricultural, and golf course development is permissible.

Golf courses have a potential impact on the environment of sensitive areas, during construction from sediment and run-off and after construction from pesticides and fertilizers, as well as from the use of motorized golf carts and golf maintenance equipment.

Golf courses most likely to impact the aquatic environment are those constructed near streams or the shoreline, or in an area with steep slopes and erodible soils, and those that may occupy a significant part of a watershed area.⁵⁵

Pursuant to Section 205-19, HRS, the Office of State Planning is completing its five-year boundary review as specified in the Land Use Law.⁵⁶ As part of the review process, significant resources have been identified, with possible boundary changes recommended to preserve and protect these resources. (See discussion in the Land Use Considerations section.)

Wetlands. Wetlands serve many purposes, including ground water recharge and infiltration, sediment basins, flood control devices, habitat for wildlife, etc. Specific wetlands have been identified and recommended for preservation.⁵⁷ The primary criteria is that wetlands provide habitat for endangered Hawaiian water birds; the secondary criteria is flood retention and sediment control. This recognizes that the two criteria may coexist in many instances. The definition of wetlands is a composite of specific maps and inventories, but is not necessary all inclusive. Should an unmapped or uninventoried wetland be found at a later date, it may be considered a significant wetland if it fits within the identified criteria, i.e., habitat and flood and run-off control.⁵⁸

All development is encouraged to preserve and protect wetlands that provide habitat and flood and run-off control. In addition, buffers of natural vegetation are recommended to protect the habitat from chemicals and human disruption of wildlife feeding areas and nesting sites. The width of buffers is a topic of controversy.

In its conditions at the West Loch Estates, the U.S. Fish and Wildlife Service imposed a 300-foot vegetation buffer between the residential area and the national wildlife refuge to protect the wildlife feeding and nesting sites from human activities including noise and light.⁵⁹ As a side note, West Loch golf course has an approximately 100 to 150 foot buffer between the golf course and the loch near the national wildlife refuge. The area is part of the fairway, however, application of pesticides is by hand to limit their amounts.⁶⁰ The U.S. Fish and Wildlife Service recommends a 300-foot buffer for wetlands.⁶¹

Streams. Streams designated outstanding riparian and aquatic resources supporting native species, both endangered or not endangered, were identified with the assistance of the Hawaii Stream Assessment draft report. A 100-foot buffer on each side of the bank of the stream is being

proposed as a recommendation. In other instances where stream bed slopes are steep, the buffer may be from ridge to ridge of the geography on the stream. These buffers may be recommended for reclassification in the Conservation District in either the protective or restrictive subzones.

Shoreline and Coastal Waters. During the 1990 assessment of the Hawaii Coastal Zone Management program, the setbacks from the shoreline were a controversial topic. Under the present law, the setback is between 20 and 40 feet inland from the shoreline.⁶² The counties have authority to establish greater setbacks. During the assessment, the Office of State Planning recommended that the setback be extended to 150 feet in the Agriculture, Rural, and Conservation Districts to provide for current erosion, open space, views, protection of historic trails, and the long-term possibility of sea level rise.⁶³

Maui County has passed an ordinance that specifies a 200-foot setback from the high water mark for golf courses, with exceptions for lesser setbacks if a golf hole or tee does not encroach upon recreational or traditional shoreline activities and if sandy beaches are protected.⁶⁴

Additionally, as discussed in the section on chemical impacts, golf course development has a potential to affect marine life in coastal waters. Keauhou Bay in West Hawaii has shown increased nutrients from golf course irrigation.⁶⁵

Anchialine ponds. The Island of Hawaii has anchialine ponds, a unique resource located in West Hawaii. The ponds serve as habitat for many native species, and their protection and preservation should be continued. The Waikoloa resort has participated in both the preservation, and the filling of anchialine ponds through the permitting process.

Historical and Cultural Sites. The pre-history, history, and culture are key components of the legacy of Hawaii and a major attraction of the visitor industry. Preservation and restoration of our legacy is vital to our state. Many developers have funded the preservation of Hawaiian history and its culture. Under the auspices of DLNR's State Historic Preservation Division, the law requires archaeological surveys of sites prior to construction. For example, at the Mauna Lanai golf course resort, the developer has established a petroglyph viewing path with signage. Nonetheless, the public is concerned about both the preservation of sites and their participation in the permitting process.⁶⁶

MINOR CONSIDERATIONS

Air Quality. Air quality is not perceived as a significant impact of a golf course. Environmental impact statements (EIS) generally find no significant impacts from golf course construction. In an EIS, the projected impact on air quality of a golf course is usually linked to the increase in vehicular traffic. Supporting studies for EIS's include the results of monitoring of the ambient air quality at the site. These values are compared to the air quality changes predicted by a computer model, using an increased number of vehicles predicted from traffic models. (The air quality computer model may show little change in ambient air quality, and unless State air quality standards are exceeded, which is highly unlikely.) This history justifies the finding of no significant impact by golf courses on air quality.

Traffic. The estimate of traffic impacts caused by construction of a golf course is usually made using a vehicle-trip generation model, based on standard guidelines found in documents such as the Highway Capacity Manual⁶⁷ and Trip Generation⁶⁸. Based on U.S. mainland experience, these provide estimates of the number of vehicles using a golf course. By combining these estimates of trip generation with local traffic counts on roads and at intersections in the vicinity of the proposed golf course, estimates of the impact on traffic volume and density are prepared. The need for roadway, intersection, signal, or access improvements is based on these estimates.

Typical estimates of vehicles using golf courses range between 1,100 and 1,330 vehicles per day for a course of 160 acres. In comparison, on a per-acre basis, trip generation for residential subdivisions with seven units per acre is about ten times greater than that for a golf course.⁶⁹

The impact of a golf course varies depending on the current traffic conditions of the proposed site. In an isolated rural area, an increase in traffic may be significant. In a dense urban area, the impact may be negligible. Cumulatively, where there may be several golf courses proposed along a single access roadway, traffic impacts will be greater. Existing policies governing impacts of traffic on golf course development are adequate. As a side note, U.S. Fish and Wildlife Service recognizes that traffic may impact wildlife habitat.⁷⁰

CUMULATIVE IMPACTS

Cumulative impacts are those impacts from projects which add up over time, and in the future may have adverse consequences, but currently appear to have no significant adverse effect.

Cumulative impacts are difficult to predict due to their additive nature, and planners of today often cannot predict the number of projects in the future.

It may be that cumulative impacts are better addressed by government than by the proponents of individual projects. Generally, government agencies are in a better position to be aware of all the projects being proposed and they are also the one which need to plan for capital improvements, including the infrastructure to support proposed projects.

What time period is considered adequate to review cumulative impacts? As a generalization, five to ten years for infrastructure, although this may depend on the type of impact under discussion. One good example of cumulative impacts of development apparent in Hawaii in recent years is the decaying infrastructure in resort destination areas. Solid waste disposal, water supply, sewage treatment facilities, highway congestion, airport delays, high land costs, and housing shortfalls are all examples of the cumulative effects of growth which were not well identified as the development occurred and for which adequate funds are not now available. Some examples of cumulative impacts are: localized regional impacts in West Hawaii or Kihei-Makena; island-wide impacts on county government services including water or sewer systems; or state-wide impacts on airports, housing, taxes, human services, quality of life, and cultural values. U.S. Fish and Wildlife Service also noted the need to consider cumulative effects on wildlife habitat.⁷¹

These impacts need to be quantified in terms of the growth, looking back five years and forward another five, especially as it relates to the shift from an agriculturally based rural society to one based on tourism in an increasingly urban context. Golf courses are only part of this growth, but they serve as indicators because they are closely linked with resort and residential development.

Geographic Information System. It would be useful to prepare Geographic Information System (GIS) databases using the existing information about ground water and aquifers. By overlaying such information with rainfall, slope, soil type, sensitive resources, existing and proposed courses, and land use districts, useful maps could be derived for golf course siting. This would help planners to review proposals. Preparation of such maps would be a benefit yielded by the basic set of information in the State GIS. This would be a useful product for planners during review of proposals, for it would provide them with instant access to a technical and quantifiable basis for a "go or no go" recommendation. If initial screening proved favorable, then planners could embark on more detailed analyses.

Environmental Impact Statement. The cumulative impact of a project is generally not

addressed in environmental impact statements. Communities also want to feel a sense of predictability in their future, and apprehension about possible urbanization due to golf course development is a reflection of a lack of confidence that current regulations and processes will protect them from urban encroachment. An example of the need for a comprehensive regional review of a development is the Akahi Joint Venture Country Club, a two-proposal development in South Kona. One proposal is the development of a 27-hole golf course as a permitted use in the Agricultural District pursuant to §205-2(d). The second proposal is a 54-unit lodge on a parcel 15 acres or less; land use review of the second proposal is as either a special use permit pursuant to §205-6 or a reclassification of the Agricultural District to Urban District pursuant to §205-3.1(c). (This latter act is a statutory delegation by the State to the counties to reclassify small parcels of 15 acres or less.) Both of these proposals should be reviewed together for their environmental impacts; under the present law, this is not required. To ensure adequate consideration of all environmental impacts, the developer should prepare one EIS to address all aspects of the development which may have significant cumulative impacts on the region.

Under most circumstances, a golf course development is a significant action that requires the preparation of an Environmental Impact Statement (EIS). However, under the present laws not all golf course development triggers an environmental assessment that may lead to an EIS in Chapter 343, HRS. Furthermore, the effectiveness of State law governing EIS has been questioned by the public in preparation of this report. The major concern noted has been the appearance of bias of EIS prepared by consultants paid for by the developer.

In July 1991, the University of Hawaii Environmental Center reviewed in part Hawaii's EIS preparation process. The Center considered several alternatives, including requiring government agencies to prepare the EIS, designating a neutral third party, and licensing preparers. However, no specific changes were recommended. Agency EIS preparation was eliminated because the proposer still has the most crucial information on a project, and third party preparation was not acceptable due to the inability to objectively establish neutral parties.

The report did recommend a better review by all agencies, and by the public, with funds budgeted for this function. Additional recommendations include the preparation of a guide to preparing EIS, more education on the use of the system, audits of EIS, and informal certification of EIS preparers by a professional organization.⁷²

Additionally, the issue of the efficacy of public participation in the process is questioned due to the lack of the public's resources to adequately assess the information contained in an EIS.⁷³

The establishment of a fund to be used for providing technical assistance to the public has been suggested as a solution to the problem.⁷⁴

CONCLUSION

The physical and cumulative impacts from golf courses are being addressed in many State and County laws. Nonetheless, further specific parameters that guide development of golf courses are needed. The recommendations for specific changes are enumerated in the Recommendations section of this report.

ENDNOTES

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10. Maui County, Ordinance No. 2031, 19.615.050 (c)(3) and (4).
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12. Wilma K. Grambusch, Letter to Harold Masumoto, Director, Office of State Planning, December 5, 1991.
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14. Stuart Z. Cohen, Ph.D., President, Environmental & Turf Services, Presentation to Office of State Planning Forum on Golf Course Development in Hawaii, September 16, 1991.
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20. §149A-18, HRS.
21. §149A-20, HRS. Additionally, civil and criminal sanctions apply to violations. §149A-41, HRS.
22. §149A-32.5, HRS.
23. §149-2, HRS.
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SOCIAL CONSIDERATIONS

In addition to land use and environmental considerations, there are also social impacts of golf course development. Social impacts are those likely changes to individuals and groups in their social interrelationships and identities.

To manage the numerous social aspects related to golf courses, the types of golf courses are correlated with types of communities, based on an analysis of actual communities in which golf course are located or proposed. The state's golf courses are described in terms of the number and type, locations, greens fees, length of operation of existing golf courses. This section also provides an analysis of social considerations, and a discussion of community issues, i.e., community reactions and concerns, related to golf courses.

The different types of golf courses and the community types were cross analyzed and cross referenced based on historical community issues, reactions to existing and proposed golf courses, and typical potential social impacts. See Table 6, Historical Community Issues Regarding Golf Courses, in the Appendix C for further detail.

TYPES OF COMMUNITIES

Profiles of affected communities were developed to represent the wide range of communities in which golf course are located or proposed. Four community types are described: rural, suburban/urban fringe, planned for future growth, and urban. Land use designations and population characteristics help distinguish the different types of communities, but even these factors cannot solely determine a community's identity. For example, two communities may have similar population counts, but may be totally different in land use zoning and community values. Therefore, the following community types stress the characteristics of a community, and should not be used as categories exclusive of each other. Further, the community types were chosen to portray obvious characteristics. Tables 7-10, Potential Social Impacts with No Non-Golf Benefits: Rural, Suburban, Planned for Future Growth, and Urban Communities, in Appendix C enumerate the potential social impacts for the major types of communities, based on type of golf course.

Rural. "Rural," as used in this description and throughout the Social Considerations section, is a sociological term as distinguished from the Land Use Law classification of a Rural District. Many areas in the rural community type are not restricted to the Rural District. Rural communities are found in all districts outside of the Urban District.

General characteristics. A rural community or area is generally isolated or far from major urban centers. Rural communities are characterized by a predominant natural environment and an extremely low density of development. The primary supply of residential unit types is single family dwellings. Whether one is a practicing farmer or commutes to other areas for employment, "farming" (as differentiated from "agricultural industry") is an important part of the rural lifestyle. Agriculture is evident by pastures and crop fields and is an integral part of the open space landscape.

Typical land use designations. Public policies generally advocate the maintenance of rural character of these areas, and impose stringent criteria when evaluating new projects. Except for small pockets of commercial or residential areas, rural communities are mostly designated Rural, Conservation, or Agriculture Districts on State land use maps. Local planning designations are generally consistent with State designations for these areas.

Population ranges and trends. Rural communities generally have population counts of less than 5,000 people experience low levels of population growth. For example, Hana, Kahaluu, and Lanai are rural communities, and their population counts and trends for the period from 1980 to 1990 show only small increases.

<u>Community</u>	<u>Population</u>		<u>Average Annual Growth Rate Between 1980 and 1990</u>
	<u>1980</u>	<u>1990</u>	
Hana, Maui ¹	1,423	1,895	2.9 percent
Kahaluu, Oahu ²	2,925	3,068	0.5 percent
Lanai ³	2,119	2,426	1.4 percent

Suburban or Urban Fringe. General characteristics. Suburban or urban fringe areas are generally easily accessible via major thoroughfares to urban centers. Housing is primarily single family residences, but there are increasing numbers of town houses to accommodate different income levels. In these areas, other uses are secondary to and supportive of their residential character. Suburban communities may be near agricultural activities, such as sugarcane fields, but agriculture is an industry rather than an integral part of the community lifestyle.

Typical land use designations. At the State level, suburban and urban fringe areas are generally designated urban allowing for residential development. Public policy limits the amount of commercial and industrial development to ensure that the residential ambience is maintained.

Population ranges and trends. Suburban and urban fringe areas generally have populations of 5,000 and over with steady and moderate levels of growth.⁴ Mililani is a distinct suburban community, and in 1980, 21,365 persons lived in Mililani Town.⁵ The area's population grew to 29,259 persons in 1990,⁶ an average annual growth rate of 3.2 percent.

Planned For Future Growth. General characteristics. Some of Hawaii's suburban areas are currently being targeted for future growth. Public policies have designated certain areas to meet anticipated growth, to encourage new growth, or to redirect growth away from current urban centers. The focus in designating new urban areas is often the creation of new employment generators which will stimulate economic development. The Ewa and West Hawaii communities are expected to be transformed into a more urban landscape with major structural development, greater intensity in commercial activity, and new residential communities. In both communities, there is already evidence of change with an increase of construction activities.

Typical land use designations. Both Ewa and West Hawaii are communities in transition with numerous applications for land use changes and permits for sites. State land use designations in the areas include all districts: rural, agriculture, conservation and urban. County-level land use and zoning designations are equally diverse.

Population ranges and trends. Areas planned for major growth have already undergone population increases at rates above county-wide averages, as follows:

<u>Community</u>	<u>Population</u>		<u>Average Annual Growth Rate Between 1980 and 1990</u>
	<u>1980</u>	<u>1990</u>	
Ewa, Oahu ⁷	36,324	42,983	2.9 percent
North Kona and South Kohala, Hawaii ⁸	18,355	31,424	5.5 percent

Note: the average annual growth rate for the City and County of Honolulu between 1980 and 1990 was 0.9 percent; for Hawaii County, 2.7 percent.

Urban. General characteristics. The urban environment is characterized by a mix of uses in building and land area densities. Residential development ranges from single family homes to low-, mid-, and high-rise apartments. Commercial and industrial activities are major employment sources for residents originating from all over the island.

Typical land use designations. Public policy generally permits and encourages the continuation of these intensive uses and advocates major improvement programs to meet existing and future growth needs. Because these communities are designated urban by the State, the counties determine the specific land uses of urban areas and zone and designate these areas accordingly. (See Land Use Section for further discussion.)

Population ranges and trends. Urban areas are the most populated. Growth rates depend on the development capacity allowed by county land use policies and designations.

<u>Community</u>	<u>Population</u>		<u>Average Annual Growth Rate Between 1980 and 1990</u>
	<u>1980</u>	<u>1990</u>	
Wailuku District, Maui ⁹	32,111	45,685	3.6 percent
Honolulu District, Oahu ¹⁰	365,048	377,059	0.3 percent

ANALYSIS OF SOCIAL CONSIDERATIONS

Social impacts are changes to an individual's or a community's lifestyle and social relationships. Changes which can generate social impacts are new policies, programs, and expanded or introduced facilities, activities, and uses.

This section identifies potential social impacts of golf courses, based on a review and analysis of previous golf course studies¹¹ and social impact assessments on specific proposals.¹² Social impacts of golf course are discussed based on the function of a golf course in development projects, recreational values, effect on property values and further urbanization, environmental, open space, displacement, and employment.

Functions Of Golf Courses In Overall Development. *Amenity to resort uses.* Golf courses serve a major economic function in resort communities. Resort developers have found that an on-site golf course or access to an affiliated golf course is a requirement in promoting the hotels. Resort occupancy levels are directly tied to the presence of or affiliation with a golf course, and retail and food and beverage facilities at golf resorts achieve considerable sales levels with golfers patronizing restaurants and purchasing souvenirs.¹³

Golf also courses provide open space within the resort community, enhancing the resort landscape and providing visual relief from structural development.

The Mauna Lani, Mauna Kea, and Waikoloa are examples of resort golf courses. Others include resorts which offer off-site courses, usually due to limited land resources, such as the Hawaii Prince Golf Club in Ewa, Oahu, that serves the Hawaii Prince Hotel in Waikiki.

Integrated into a planned community. In a planned community, golf courses enhance real estate values of lots around the perimeter of the course. In projects such as the new West Loch community in Ewa, the Lihi Lani Recreational Community on the North Shore of Oahu, and the proposed Maniniowali Residential Community in North Kona, Hawaii, the homes around the golf course are intended as executive homes. These homes generally command the highest prices in the development, and the revenues from the sales of golf course frontage homes help subsidize affordable housing.

Golf courses also provide open space within the residential community, a desirable alternative to more houses. The course generates revenue and provides visual, and likely permanent, relief from structural development.

Recreational Value. The value of a golf course as a recreational resource has varied over time. Market assessments for specific projects indicate that golf is becoming an important activity for a wider range of society. For example, on Oahu, it has been estimated that there may be a demand for 63 golf courses by the year 2010¹⁴ (as compared to the 29 existing courses). The Island of Hawaii may generate a demand for 50 golf courses by 2010¹⁵ (as compared to the current 13 courses).

The recreational value of golf courses is the highest for most people when they are affordable and accessible. As the economic portion of this study indicates, usage of municipal courses are higher than other types of golf courses. Daily fee/public play also have high recreational value, although they are less affordable than the publicly-sponsored courses. Though they may be restricted to military personnel and their guests, the military golf courses are also popular resources for a large number of people.

On the greens fee scale, resort courses generally top the list, as indicated in the economic section and in Appendix C, Tables 1 and 2, Profiles of Existing and Proposed Golf Courses. The courses are often championship courses designed to challenge skills of visitors and residents.

Courses with the least recreational value are the membership-only courses because of the number of limited residents able to play on such courses.

Economic Benefits. Although the recreational value of a golf course continues to be important, it is not the driving force behind golf course development by the private sector. The economic benefits of a resort development and real estate enhancement in a planned community provide the greatest impetus for private golf course development.

The golf course's impact on property is important because of its potential to increase real estate values. Such increases can change the financial situation of adjacent landowners. To deal with increased taxes and other costs, those with limited or fixed incomes may need to either sell their units, further develop their property or relocate. (It is noted that these concerns would be present regardless of the type of development.)

Previous social and economic impact studies have found that real estate value and tax impacts of specific golf course projects are likely to have localized, and not regional or statewide impacts. It was found that Hawaii's golf courses and golf-related communities have very limited impacts on nearby property values. These studies also noted that there may be real estate value increases for a few adjacent properties due to physical improvements. In both the short- and long-term time frame, however, golf courses have been found to have minimal impact on property values.¹⁶

Whereas golf course impact on property values is localized around the perimeter of the golf course, the potential for further urbanization created by golf course development has regional implications. Even though golf courses may not impact adjacent and nearby properties, they may either be part of an urban project (such as a residential planned community or a resort development) or be considered indicators of development interest.

Long-term impacts. Frequently the concern is that a golf course is the first step to urbanizing a rural area, and that eventually luxury homes, visitor condominiums and hotels will develop around the golf course. People also fear that property values will increase and affected property owners will want to develop or sell the nearby land to offset the increased taxes.

For urban areas and areas planned for major future growth, community expectations are consistent with public policy directives. Both the Ewa Development Plan of the City and County of Honolulu and the West Hawaii Regional Plan prepared by the Office of State Planning call for

further growth, ensuring that golf courses would not be the sole indicators of possible development interest and urbanization.

For rural and urban fringe areas, however, a golf course is often a "red flag" indicating possible subsequent real estate interest in the area. This in turn may lead to more land owned and controlled by outsiders, and eventually to a greater loss of control of local resources.

Relationship with Existing Surrounding Communities. A golf course in a small rural community ¹⁷ has a different social role than one in the middle of the city. Whereas the urban golf course is part of a diverse landscape including residential and commercial uses, the rural golf course can be a visually and socially prominent part of that community. The rural golf course will also be one of the few employment sources, and, if open to the public, will be a recreational resource and gathering place for local residents.

If a rural community feels, or is, excluded from a golf course and its facilities, the golf course cannot be a integral or harmonious community element. Instead it becomes a symbol of exclusion and elitism. The problem is further exacerbated if the higher-paying jobs are held by newcomers or outsiders. If these situations occur, the golf course then becomes a participant in economic disparity problems.¹⁸

If, however, the golf course is physically, economically, and socially accessible to the community, it can blend in with the lifestyle of the area. If the golf course is part of a resort destination which employs or is patronized by nearby residents, it is likely that resident access and usage will be allowed. If the golf course is part of a planned community, particularly a recent community, residents use is also highly likely.

Environmental Social impacts may arise from a golf course's environmental impacts when such impacts affect food-gathering and cultural activities and resources. Chemical and other effects on the ecosystem as related to fishing, hunting, and farming have social implications, particularly for rural communities. If, for example, ocean waters are affected by the runoff of golf course fertilizers and pesticides, and fish populations decrease, then fishing activities would decrease. Environmental impacts on recreational activities are also socially-related if one cannot swim or hike in an area because of environmental changes attributable to golf course construction or uses. Essentially, these types of environmental impacts may change the social fabric of the area if residents feel they cannot participate in these activities, or are actually prohibited from doing so.¹⁹

Open Space. Open space is a valuable social resource. It provides visual relief from structural development and often functions as a space which allows leisure time activities, such as a park. Even when an open space area has no specific function for the general community and is used for a specific activity (a pasture or farmland), it is an important resource because it allows people to observe a natural, often peaceful, setting. For many, open space symbolizes an emotional release from stress and intense activity.²⁰

A golf course has open space value and the significance of this value is directly related to the intensity of surrounding uses. If a golf course is in an area which is highly developed or in an urban fringe, then its function as open space is very valuable to the visual landscape. A golf course in an area planned for major growth also has high open space value, since it promises to preserve this openness in the foreseeable future.

Open space is a trademark of rural areas, so the value of a golf course as open space in such an area is dependent on an individual's perception. On one hand, the golf course can be considered an attractive complement to the existing natural setting, since very few structures will be added. On the other hand, the open space quality of a golf course differs from the existing rural spaces such as farmland, pasture, or undisturbed natural environment. And unlike the pasture or natural setting, the golf course must be constantly maintained and manicured. For those who prefer the country atmosphere, the golf course would urbanize the natural setting.²¹

Displacement. Displacement of existing land uses is an impact which may occur with any type of development, golf courses included. The two most common forms are residential and agricultural activity displacement. Both have stimulated major controversies, such as those related to proposed golf courses at Lualualei²² and Maunawili on Oahu.²³ In both instances, the developer displaced lessees or tenants who had no permanent legal right to the site. In both cases, displacement was perceived as an economic disparity issue between the developer and tenant or lessee. Displacement also symbolized a weighing of priorities between the local resident farmer and economic development (the golf course).

Relocation has been the standard form of mitigation, and tenants and lessees have been offered off-site alternatives and compensation ranging from moving expenses to additional funds. In Lualualei, the landowner and the tenant eventually reached a relocation settlement. At Maunawili, settlement was reached with the majority of those occupying the land.

Employment. Increased employment is generally a positive economic impact. Golf courses provide jobs in golf services, grounds maintenance, clubhouse administration, and clubhouse food service, and can provide between 70 to 120 jobs depending on the types of facilities.²⁴

This benefit can be enhanced if local residents are employed in all facets of a golf course development. This helps the golf course become an integral part of the community's identity and contribute to a sense of pride. Local residents can feel frustrated and resentful if they fill only the service and labor-oriented jobs, while outsiders fill the managerial and professional jobs.

If there is low unemployment in a rural community, a new golf course may mean out-of-area workers moving into the community to fill temporary and permanent jobs, generating both population and housing impacts.

The significance of these employment impacts depend on the type of community in which the golf course is located. Employment impacts are significantly more positive or negative for smaller and rural communities because a golf course has more prominence in these settings, and there is a smaller population base from which to draw labor.

Employment impacts are less significant in urban and suburban communities where competition for jobs is more broad-based, and in-migration is less of a problem.

DISCUSSION OF COMMUNITY ISSUES RELATED TO GOLF COURSES

Community issues arise in response to a proposed action, and often evolve as people's priorities, values, environment, and lifestyle change. This is demonstrated in published islandwide polls. For example, in 1987 and 1988, jobs and economic development were high priorities in public opinion polls. As the economy improved, however, values changed so that traffic and education were important priorities in 1989.

Because of the variability of public opinion, it is important to recognize that community issues do not necessarily represent actual impacts. For example, many people testify at hearings related to golf courses that they fear that golf courses will increase nearby property values. In light of the lack of empirical evidence that this actually occurs, this community issue represents opinion, but does not indicate actual impact.

Sources include references used in identifying social impacts (see endnote 12), as well as newspaper articles²⁵ and Analyzing the Market and Environmental Impacts of the Golf Industry in Hawaii (Ordway, 1990).

The issues are discussed in four sections: 1) need and feasibility of the proposed golf courses; 2) community concerns related to urbanization and lifestyle changes; 3) issues related to foreign investment; and 4) environmental concerns. Appendix C, Table 6, Historical Community Issues Regarding Golf Courses, cross-references these concerns to community types.

Need and feasibility of golf courses. Golf courses have been a high profile issue in recent years, and much of the reaction to golf courses is due to the numerous proposals being discussed. In general, many people have a negative attitude towards golf courses. In a 1990 Advertiser-Channel 2 News Hawaii Poll, a random sample of 800 voters were asked the following question:

"Some people think we should build more golf course in Hawaii for green space and recreation. Others say we don't need more courses; or the land should be kept for other uses. What do you think? Are more golf courses good or bad for Hawaii?"

Three-fourths of those interviewed felt that either golf courses are good for Hawaii, but "we have enough of them," or that golf courses were bad for Hawaii.²⁶

Poll results are consistent with studies conducted on individual golf courses. In interviews conducted for specific proposed golf courses, it was found that even though community members may have supported or remained neutral on the individual golf course being proposed, there were nevertheless questions regarding the feasibility of developing the overall number of proposed golf courses.²⁷

Concern about the number of golf courses being proposed is expressed in all four of the community types. For example, in the Ewa area which is slated for major growth and therefore could be expected to be more accepting of golf courses, the Ewa Neighborhood Board supported five golf courses, but recommended that no additional courses be proposed until feasibility is demonstrated.

Urbanization and lifestyle concerns. Communities often fear that a golf course paves the way for further urbanization of the area. This apprehension is most frequently expressed in rural communities, and examples include two golf courses on Maui and one on Oahu.

In Waihee, Maui, some residents supported the project for its employment opportunities. However, others were concerned that the area's lifestyle would be altered by the proposed golf course. Regardless of developer's commitments and plan modifications in response to community concern, some still feel that the project will eventually bring resort cottages and raise property values.²⁸ The Hana community is also split regarding a golf course in their community. While some people feel that the proposed golf course will help the town's hotel become more economically viable, other state that the golf course "would lead to the development of more luxury homes."²⁹ In a study of the Lihi Lani Recreational Community, as well as in testimony on the project presented to the Honolulu City Council, the effect of the project on the rural character of the area was a primary social issue.³⁰

In all of these studies, there were references to the community's doubt or lack of confidence that current land use laws will protect the rural integrity of the surrounding community.

Foreign Investment. Foreign investment has been an issue for many years, with the most recent focus of attention on Japanese-owned hotels and golf courses. The concern stems from apprehension that there is a growing loss of control over local-resources, and is expressed by all of the community types.

Currently, Japanese companies own 120, or two percent, of the United States' 14,000 golf course. Of these 120 Japanese-owned courses, 38 are located in Hawaii.³¹ In 1988, 21 Hawaii golf courses were owned by Japanese companies.³² It has been estimated that, given the current level of interest and the high price of playing golf in Japan, Japanese entities could own 500 to 1,000 golf courses in the United States by the year 2000, and it expected that interest will be intensified in Hawaii.³³

Environmental Concerns. Environmental impacts of golf courses are the most frequently-raised community issues. In a 1990 review of 20 environmental impact statements (EIS) on golf courses, there were comment letters in all of the EIS referring to golf course impacts on water. Ninety-five percent of the EIS contained community comments on archaeological and historic sites, and 90 percent contained comment letters on endangered species and vegetation. By comparison, socioeconomic impacts generated comments in only 35 percent of the EIS.³⁴

All community types expressed concern about potential environmental impacts. For example, the suburban community of Kaneohe has strong concerns about the impacts of the

recently-proposed Bayview Golf Course on Kaneohe Bay. Molokai activists picketed the Hawaiian Open in January 1991 because they felt that the proposed Molokai Highlands course in the rural community would threaten the island's water resources.³⁵ In West Hawaii, a region planned for major growth, there are concerns that nutrients from the fertilizers used on golf courses leach or runoff into the ocean are initiating the chain of events leading to ciguatera fish poisoning.³⁶

CONCLUSION

To address the social concerns, more demographic and economic data is needed, communities need tangible benefits, and land use and zoning designations need to ensure predictability. These concerns are included within the report's Recommendations section.

ENDNOTES

1. U. S. Department of Commerce, Bureau of the Census, "Memorandum to FSCPE Agencies: 1990 Census PL Files Release," February 5, 1991; and Earthplan, Social Impact Assessment for Hana Ranch Country Club, prepared for Keola Hana, January 1991.
2. Community Resources, Inc., Socio-Economic Assessment for Proposed Waikane Valley Golf Course, prepared for Waikane Development Company, October 1988; and U.S. Department of Commerce, 1991.
3. State Department of Business and Economic Development, Table 14, State of Hawaii Data Book, 1990, and U. S. Department of Commerce, 1991.
4. The upper population range for a suburban area is difficult to determine. In many cases, suburban residential communities are adjacent to urban areas. There may not be distinct census or generally acceptable boundaries, which makes it difficult to assess population trends for the specific suburban community.
5. State Department of Business and Economic Development, Table 10, State of Hawaii Data Book, 1990.
6. U. S. Department of Commerce, Bureau of Census, 1990 Census of Population and Housing: Summary Population and Housing Characteristics: 1990 CPH-1 (Proof Copy), April 1991.
7. U. S. Department of Commerce, Bureau of Census, 1980 Census of Population and Housing: Census Tracts, Honolulu, Hawaii: Standard Metropolitan Statistical Area, PHC80-2-183, Issued 1983; and U. S. Department of Commerce, Bureau of Census, "Memorandum to FSCPE Agencies: 1990 Census PL Files Release," February 5, 1991.
8. U. S. Department of Commerce, Bureau of Census, 1970 Census of Population and Housing: Census Tracts, Honolulu, Hawaii: Standard Metropolitan Statistical Area, 1972; and U. S. Department of Commerce, Bureau of Census, "Memorandum to FSCPE Agencies: 1990 Census PL Files Release," February 5, 1991.
9. Hawaii State Department of Business and Economic Development, Housing Unit Estimates for Hawaii, 1988, and U.S. Department of Commerce, Bureau of Census, 1990 Census of Population and Housing: Summary Population and Housing Characteristics: 1990 CPH-1 (Proof Copy), April 1991.
10. A "CDP" is a census designated place as determined by the U.S. Bureau of the Census and the State Department of Business and Economic Development. Information is from Hawaii State Department of Business and Economic Development, Housing Unit Estimates for Hawaii, 1988, and U.S. Department of Commerce, Bureau of Census, 1990 Census of Population and Housing: Summary Population and Housing Characteristics: 1990 CPH-1 (Proof Copy), April 1991.
11. References include Analyzing the Market and Environmental Impacts of the Golf Industry in Hawaii (Ordway et al., 1990; Hawaii Golf Courses: Impacts and Benefit Assessment, Decision Analysts Hawaii, Inc., 1990) and Golf Course Development on Oahu, City and County of Honolulu, 1989.
12. The following social impact assessments on golf courses or projects which contained golf course were reviewed for this study:

- Waikane Golf Course (Community Resources, Inc., October 1988)
 - Waihee Golf Course (Community Resources, Inc. October 1989)
 - Royal Kunia Phase 2 (Earthplan, 1989)
 - Country Courses in Kahuku (Earthplan, October 1989)
 - Ewa Marina Phase 2 (Earthplan, October 1989)
 - Bayview Golf Course Expansion (Kusao, 1990)
 - Ko Olina Phase 2 (Earthplan, October 1990)
 - Manele Golf Course and Golf Residential Project (Community Resources, November 1990)
 - Lihi Lani Recreational Community (Community Resources, January 1991)
 - Hana Golf Course (Earthplan, January 1991)
 - Maniniowali Residential Community (Earthplan, November 1991)
13. Pannell Kerr Forster, Economic Impact Study of the Proposed Hotel Hana Maui Golf Course, July 1990.
14. John Zapotocky, Royal Kunia Phase II Market Assessment, January 1989.
15. John Zapotocky, Manimi'owali Market Assessment, prepared for North Kona Development Group, August 1991.
16. Community Resources, Inc. supra, 1988; and Socio-Economic Impact Assessment of the Proposed Lihi Lani Recreational Community, prepared for Ohbayashi Hawaii, Inc., January 1991.
17. See description of community type within this section of the report.
18. Earthplan, County Courses at Kahuku Social Impact Assessment, October 1989; and Earthplan, supra, January 1991.
19. Earthplan, supra, January 1991.
20. Tony Hiss, The Experience of Place, 1990.
21. Earthplan, Country Courses at Kahuku: Social Impact Assessment, prepared for William E. Wanket, Inc, October 1989; and Earthplan, supra, January 1991.
22. Ken Andrade, "Leeward golf course plan resurfaces," Honolulu Star-Bulletin, February 12, 1991.
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George Fuller, Hawaii Golf, San Francisco, California, Foghorn Press, 1991.

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26. Burris, supra.
27. Earthplan, Ewa Marina Phase 2 Social Impact Assessment, October 1989; and Earthplan, Social Impact Assessment for the Manini'owali Residential Community, prepared for the North Kona Development Group, October 1991.
28. Fujimoto, supra, 1990.
29. Fujimoto, supra, 1991.
30. Community Resources, Inc., supra, 1991.
31. Mead, supra, 1991.
32. Dooley, supra, 1988.
33. Mead, supra, 1991.
34. Ordway, supra, 1990.
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THE ECONOMICS OF THE GOLF INDUSTRY IN HAWAII

Golfing has been enjoyed as an outdoor sport in Hawaii for almost 100 years. The Moanalua Golf Course, which began operations in 1898, is one of the oldest courses in operation west of the Mississippi, second only to the Del Monte Course in Monterey, California.

Activities by local golf associations and televised presentations of Hawaiian golf tournaments promote Hawaii and Hawaii golf courses outside the state. Golf associations coordinate golf tournaments in Hawaii for groups from the U.S. mainland and Alaska. Major golf tournaments in Hawaii include the Hawaiian Open at the Waialae Country Club on Oahu, the Kemper Open, the Kapalua International, the Pearl Open, a Japanese professional open tournament, the Mazda International, the Ping International at Kapalua, and the Seniors Skins at the Mauna Lani.

In Hawaii, both residents and tourists play golf, with an estimated 90% of the play on Oahu by residents. By contrast, most of the play on the Neighbor Islands is by tourists. According to a recent study by the Hawaii Real Estate Research and Education Center (HREREC),¹ existing courses in Hawaii are unable to meet the current demand for golf.

DEMAND FOR GOLF

People of all ages play golf. Golf participation in the United States among the middle age population is the highest (13.8%), relative to participation rates of youths (7.2%), and seniors (9.4%).² Older people, those over 50, contribute 46% of all spending.

There are many determinants of demand for golf in a community: (1) age; (2) sex, men are more likely to play golf than women; (3) whether residents live in a retirement community; (4) size of the city, the larger the city, the lower the golf participation rate; (5) climate; (6) cultural attitudes, southern women in the U.S. are less likely to play golf than northern women; (7) income, demand for golf is greater among high income residents than among low income residents; (8) price, the higher the green fee, the lower the demand for golf and vice-versa; (9) supply and attributes of golf courses, better golfers consider tee time availability, designer of the course, aesthetics, prestige of the course, availability and convenience of getting to the course important; (10) promotion; and (11) presence of tourists in the community.

Price. Price is an important determinant of the demand for golf, with a wide range of fees statewide, based primarily on the type of golf course. Municipal courses in Hawaii charge between \$4-12 per 18-hole round to residents and \$6-20 for tourists. Carts are an additional \$11-12. Discounts are available for senior citizens. Military course fees vary by military rank, ranging from \$7-23. Non-military golfers are typically charged somewhat more and carts are extra.

Stand alone golf courses fees range from \$35-40 for residents, and \$70-75 for nonresidents. Resort courses have the highest fees. On Oahu, hotel guests typically pay from \$65-100; nonresident, non-guests \$90-100; and residents \$40-70. Neighbor Island rates are similar, if not lower. Some resorts do not offer resident rates during peak tourist season.

At some private country clubs there are no greens fees for members. For example, at the private Oahu Country Club members pay monthly dues of \$205, which permit them and their family members unlimited rounds of play. However, the initiation fee is \$43,000, including a \$7,000 transfer fee which is refundable when the member leaves the Club. Guests who play with members are charged \$26 per round, and those who do not play with members are charged \$100 per round to encourage them to play with members.

Private golf clubs with international memberships have significantly higher membership fees for international members. At the Honolulu International Country Club, international memberships are \$200,000, compared to \$40,000 for local memberships. (There are no memberships available at the present time.) The Royal Hawaii Golf Club, scheduled to open in 1992, is reportedly offering nonresident memberships in Japan at a starting price of 25 million yen, or approximately \$190,000. At some private golf clubs (e.g. Wailea Golf Club and Mauna Lani Golf Club) property ownership is a condition of club membership.

Given their low greens fees, it is not surprising that usage at the municipal courses is higher than at other courses, and tee times are hard to get. The three 18 hole courses on Oahu -- Ala Wai, Pali, and Ted Makalena -- averaged 166,000 annual rounds in 1990. The Wailua Municipal Golf Course on Kauai averages 124,000 rounds per year, and the Hilo Municipal Golf Course averages 90,000 rounds per year.

Military courses on Oahu are also highly utilized. The Navy-Marine Golf Course averages over 100,000 rounds per year, while Hickam averages 95,000 rounds.

The remaining nonmilitary 18-hole golf courses average approximately 70,000 to 80,000

rounds per year, while the private Oahu Country Club presently averages between 40,000 to 50,000 rounds per year.

Due to seasonality of the tourist industry, resort courses average far fewer rounds per year than nonresort courses. Neighbor Island resort courses presently average 35,000 to 55,000 annual rounds of play.

Residents vs. tourists. In 1988, 545,547 rounds were played on Oahu's municipal courses and 814,090 rounds were played on private daily fee and resort courses, for a total of 1,359,547 rounds on Oahu.³ Resident play at municipal, private daily fee, and private club courses was estimated at 87% of total rounds played. Residents account for 22% of the total rounds played at Oahu's two resort courses. On Maui, resident play represented 38% of total rounds played in 1989.⁴ At some Neighbor Island resort courses, resident play is estimated at only 3 to 5% of total rounds played.

Resident play is highest at municipal courses -- nearly 98% of total rounds on Oahu's municipal courses. Despite the low greens fees available to tourists, Oahu's first come/first served daily call-in reservation system makes use by tourists difficult. The exception is the nine-hole Kahuku course -- located far away from concentration of local players -- which serves a large number of visitors from the Kuilima/Turtle Bay resort. However, on Kauai, tourists account for 35% of total rounds played at the Wailua Municipal Golf Course. At the Hilo Municipal Golf Course, tourists account for about 25% of total rounds played.

Market for golf. The analysis of greens fees, and resident vs. visitor play at Hawaii's golf courses suggest that there are at least four distinct markets for golf in Hawaii. Because of membership/affiliation requirements, private clubs represent a distinct market. (However, it should be noted that there are private clubs which cater primarily to local residents, and those which cater primarily to international members.)

The same is true of military courses. Because of the large difference in the greens fees at municipal courses versus resort and other daily fee courses, municipal courses represent yet another distinct market for golf. Because resort and daily fee courses serve substantial numbers of tourists and residents, they represent a fourth market. (An alternative view is that residents and tourists represent two distinct markets. This view is supported by the fact that both resort and daily fee courses charge higher green fees to tourists than to residents.)

Trends in greens fees. Greens fees have been rising in Hawaii as they have in the U.S. Between 1987 and 1990, greens fees at municipal courses in the U.S. increased at an annual rate of 11% per year: 14% per year at daily-fee courses, and 16% at resort courses.⁵ By contrast, consumer prices rose 5% per year. Thus, greens fees have been rising much faster than the general inflation rate.

Comparable data are unavailable for Hawaii. For selected courses, see Table 1.

Table 1
Increases in Greens Fees since 1987

Sheraton Makaha Oahu	1987 1991	Guest	\$30 \$70	Non-Guest	\$51 \$135
Turtle Bay Oahu	1987 1991		\$27 \$68		\$29 \$90-99
Kiahuna Kauai	1987 1991		\$45 \$50		\$60/\$70 \$67/\$75
Kaluakoi Molokai	1987 1991		\$30 \$50		\$40 \$70
Hawaii Kai Oahu	1987 1991	Weekday	\$27 \$33	Weekend	\$29 \$37
Mililani Oahu	1988 1991	Resident	\$26 \$33	Nonresident	\$40 \$70
Pukalani Maui	1987 1991	Resident	\$25 \$32	Nonresident	\$30 \$55
Waikoloa Village	1988 1991	Resident	\$32 \$35	Nonresident	\$47 \$62
Municipal Courses: Oahu (residents)	1987 1991	Weekday	\$4 \$8	Weekend	\$6 \$12
Hilo (residents)	1987 1991	Weekday	\$3 \$4	Weekend	\$5 \$6

The annual compound growth rate of greens fees at the two Oahu resort golf courses ranges from 24% to nearly 36%. The increases appear to be much smaller at the Neighbor Island resort courses, perhaps around 10% per year. This suggests that the market for golf is much "tighter" on Oahu than on the Neighbor Islands.

Not only are greens fees lower for local players, they appear to have increased at a slower pace than fees for tourists. For residents, greens fees probably have increased at 7% or less per annum at the nonmunicipal courses.

Price sensitivity. According to tour agents, Japanese visitor demand for golf in Hawaii is price insensitive, but not so for U.S. visitor demand. Since golf courses in Hawaii charge lower greens fees to local residents than to tourists, the implication is that residents' demand for golf is more price sensitive than tourist demand. The slower price increases for resident golfers in recent years further supports this conclusion.

It is interesting to note, however, that in 1989, the City and County of Honolulu (City) doubled its greens fees at its municipal courses. In the first year after the price increase, the number of rounds played fell by 7%. The administrator of the City courses believes that the decline was primarily due to the elimination of the monthly card for nonsenior residents. Monthly card holders who played an average three rounds per week reduced their play to two rounds, since the price of each additional round increased up to \$8 per round as a result of the elimination of the monthly card. Overall, the percentage decline in the number of rounds played was far smaller than the percentage increase in greens fees, after adjusting for inflation. This indicates that, at current fees, overall demand for golf at the municipal courses is price insensitive.

The discussion of price sensitivities suggests that an overall escalation of greens fees at Hawaii's golf courses would have different impacts on residents and tourists.

What if the State were to restrict the development of golf courses in Hawaii? Greens fees (adjusted for inflation) will rise over time to ration the increasingly scarce tee times. If demand for golf by local residents is price sensitive, the number of rounds played by local residents will decline and residents will spend more money on other goods and services and less money on golf, other things being equal. Price sensitive U.S. tourists will also play less and spend less on golf. On the other hand, if the Japanese demand for golf is price insensitive, rising greens fees will still result in a reduction in the number of rounds played, but total spending on golf will rise. Overall, restrictions placed on the development of golf courses would probably have a larger relative impact on local players than on tourists.

Golf participation rates. In the U.S., the current average golf participation rate is 9.7% of the total population, and the average participation rate in Japan is 9.4%. However, recent Hawaii Visitors Bureau (HVB) surveys indicate higher participation rates among visitors to Hawaii --

19.8% of U.S. westbound tourists played golf in Hawaii, while 12% of Japanese tourists played golf in Hawaii.

The National Golf Foundation (NGF) estimates that 25 million American golfers played about 480 million rounds of golf in 1989 and that the golf population grew at an annual rate of 5% through the '80s (ERA, 1990.) Demographic trends are expected to foster continued growth in the U.S. population. The baby boom generation is moving through the 40 to 59 year old age bracket where participation rates and frequency of play are high. As well, more women are playing golf.

In Japan, where golf is rapidly gaining popularity, there are an estimated 11.3 million golfers. Ken Yogi, vice president of the NGF's Far East Division, estimates that the rate of growth for golf in Japan is 12 to 13% per year. This is not surprising, given the increase in incomes and demand for more leisure time by the Japanese. While the golf population of Japan is less than half that of the U.S., the number of golf facilities numbered only 1,558 compared to 12,407 facilities for American golfers in 1987. For Japanese golfers, it is often less expensive to fly to Hawaii to play golf than to play in Japan, where green fees often exceed \$200 per round. A market assessment prepared by Zapotocky as part of the EIS for the Royal Kunia, Phase II development, reported that Japanese visitors accounted for just 8% of the tourists on Maui in 1987, yet played 22.2% of the total rounds.

There are no quantitative data on the trend in golf participation by Hawaii's residents. But with an aging population, it is likely that demand for golf among residents, like that of the U.S. market generally, can also be expected to rise in the future. Residents in Hawaii already have a high golf participation rate. This is not surprising in view of Hawaii's excellent climate and relatively high per capita income. The HREREC study estimates that the average participation rate among residents (excluding the military population but including military retirees) in Hawaii is about 18%. This would place Hawaii first among the 50 states, with Wisconsin at a distant second with an overall participation rate of 15.9%.

Another study suggests an even higher golf participation rate among Hawaii's residents. A statewide telephone survey of 555 Hawaii residents conducted by the Office of State Planning between October 22 and 29, 1991, found that 5.2% of Hawaii's residents aged 18 and over described themselves as "avid golfers" and another 21.2% consider themselves to be "occasional" golfers. Thus, more than 25% of Hawaii's adults play golf, at least occasionally. The distribution of resident golf participation by island is as follows:

<u>Golf Status</u>	<u>Statewide</u>	<u>Oahu</u>	<u>Maui</u>	<u>Big Island</u>	<u>Kauai</u>
Avid golfer	5.2%	5.3%	3.6%	4.9%	8.4%
Occasional golfer	21.2	19.8	30.2	21.3	21.1
Non golfer	73.6	74.9	66.3	73.8	70.4

Among island residents, Maui has the highest percentage of its population that plays golf, and Oahu the lowest.

Characteristics of nonresident golfers. Hawaii's nonresident golfers exhibit different characteristics than non-golfers. A survey conducted by the HVB in 1989 found that among U.S. visitors to Hawaii, a higher proportion of golfers were repeat visitors (67.9% repeat travel for golfers compared to 56.5% for non-golfers). Golfers were more likely to be on business-related trips (nearly 11% of the golfers visiting Hawaii were here for a convention, meeting, or incentive trip, compared to 7% for non-golfers). Golfers were more likely to be male than female, compared to non-golfers (72.7% vs. 64.2%), and golfers also had higher family incomes than non-golfers (\$72,000 vs. \$61,600).

It is widely believed that golfers are "quality" tourists, because they spend more money than non-golfers. In 1989, golfers on package tours spent \$122.21 per day, while non-golfers spent \$121.20 per day, not a large difference. However, golfers not travelling on package tours spent much more money per day than non-golfers -- \$119.42 vs. \$101.35 per day. The HREREC study did not report average length of stay for golfers and non-golfers, so it is not possible to compare their total trip expenditures in Hawaii.

SUPPLY OF GOLF COURSES

At the end of 1991, the total inventory of golf courses open to play across the state numbered 68, with 29 on Oahu, 13 on the Big Island, 14 on Maui, eight on Kauai, two on Molokai, and two on Lanai. Of this total, 55 are available for public play, including 26 resort courses, 21 private daily fee courses, and eight municipal courses. The courses not open to public play include eight military courses and five private courses.

If the golf courses under construction and those still under the permitting process as of year end 1990 are completed, the total number of courses statewide will increase by 130%. Each island will experience a doubling in the number of courses, with the exception of the Big Island, which will experience a tripling in the number of courses.

The large number of new courses being proposed is further indication of strong demand for golf in Hawaii. The HREREC study concludes that existing courses in Hawaii cannot even meet current demand for golf by residents and tourists. The shortage of golf courses is particularly acute on Oahu. Excluding military courses, only 17 golf courses were available for public play on Oahu at the beginning of 1990, compared to 38 golf courses on the Neighbor Islands. This despite the fact that Oahu has more residents and tourists than the Neighbor Islands. The study concludes that an additional 44 golf courses (25 for Oahu, 11 for Maui, four for Kauai, and 11 for the Big Island) would be required just to meet the present excess demand. An additional 14 golf courses will be required to meet future demand until the year 2000. Thus, to eliminate the current shortage of golf courses and to accommodate future demand growth, Hawaii needs to build an additional 58 golf courses before the year 2000.

What if these courses are not permitted to be built? Indeed, if existing courses are at capacity as suggested by HREREC, greens fees will rise to ration the available time slots until demand meets supply. The more likely consequence is that green fees will rise filld there will be more rounds played, but with a depreciation of the quality. In sum, demand will be held down to the available supply by rising greens fees and declining quality. By contrast, if all 58 courses are built greens fees (adjusted for inflation) will undoubtedly fall from present levels. The analysis suggests, however, that not all golf courses presently proposed are likely to be built by the end of the century.

DOLLARS AND CENTS OF GOLF COURSE DEVELOPMENT AND OPERATIONS

Why do developers want to build golf courses? Except for not-for-profit courses, developers build courses to earn profits -- but not necessarily through the operation of the golf course. In Hawaii, golf courses are often built as amenities for resorts and not necessarily as profit centers. It is widely believed that resort golf courses fill hotel rooms. For example, the market study for the proposed Hotel Hana Maui Golf Course anticipates that hotel occupancies will rise from the current 55% to 75% with the addition of the golf course. Similar rationale is employed for the Manele Golf Course on Lanai. Higher hotel occupancy rates will make the entire resort complex more profitable even if the golf operation itself is unprofitable.

Real Estate Premiums. Traditionally, real estate developers have relied on real estate premiums to recover the cost of golf course development. In percentage terms, a golf course's enhancement of land values decreases the higher the base value of the land.⁶ A typical structure of real estate premiums in the U.S. might be as follows:

Table 2
Golf Course Real Estate Premiums

<u>Community</u>	<u>Lot Value</u>
No Golf Homesite	\$50,000
Golf Homesite	
Interior Homesite	\$52,500
Golf View Homesite	60,000
Fairway Frontage	75,000
Prime Golf Frontage	100,000

Source: J. R. McElyea, et al., "Golf's Real Estate Value", Urban Land, February, 1991.

These estimates indicate that in communities with golf courses, properties fronting golf courses can command substantial real estate premiums.

We find similar results in Hawaii. At The Islands at Mauna Lani on the Big Island, where newly developed two and three-bedroom luxury condominiums range in price from \$1.275 million to \$1.75 million per unit, our (multiple regression) analysis finds that golf course frontage units are presently offered at an average 2.9% (or \$43,000) price premium over nongolf course frontage homes, after accounting for unit size and other locational attributes. According to sales personnel, at Mililani, a golf course frontage single family home sells for about 6 to 7% (i.e. \$15,000 to \$20,000) more than an identical home on a similarly sized interior lot. Research has found that golf course frontage single family homes on Oahu generally command a 25% to 30% price premium over homes built on interior lots in masterplanned communities.⁷ The higher prices commanded by golf frontage properties represent the incremental value that home buyers place on the added benefits of on golf course location.

In sum, while golf course operations may not generate a profit, they enhance the financial returns to the overall development. However, developers of daily fee stand-alone courses must earn a profit from golf course operations since there are no real estate premiums to be earned elsewhere. If the market exists, developers can also sell high priced memberships to recoup a golf course's development costs.

Development costs. Developing a golf course is typically more costly in Hawaii than on the U.S. mainland. The cost of building an 18-hole course in Hawaii, excluding the cost of land, is about \$12 million.⁸ On the mainland, the range is \$2 million to \$6 million. Some courses in Hawaii cost much more than \$12 million. For example, the Manele Golf Course on Lanai is expected to cost \$33 million, of which \$6 million is for the club house, furniture, and equipment. The Ko Olina course is reported to have cost \$36 million, and the proposed Hotel Hana Maui Golf Course is estimated to cost \$25 million. The West Loch Municipal Golf Course, which was completed at the end of 1990, cost \$18 million. One local developer suggests that a good rule of thumb for the cost of building a golf course would be \$1 million per hole, plus \$1 to \$5 million for a club house, and another \$10 to \$12 million for the land. A "signature" course would add another \$1 million to the total cost of the golf course. Thus, the cost of developing a golf course, including land, could be at least \$30 million.

There are a number of factors that contribute to the higher cost of golf course development in Hawaii, in addition to higher land costs and the usually higher cost of doing business in Hawaii. Where development occurs on volcanic rock, lava formation hazards and the contrast between lava landscape and lush fairways create aesthetic appeal, but they also create development challenges and increase development costs. Water resource development requirements may also increase development costs. Courses built in some arid areas of Hawaii must develop their own water sources, or use brackish water. In addition, investment in extensive sprinkler systems and salt tolerant foliage are often required. Upscaling of resorts in Hawaii has also resulted in the building of expensive golf courses.

Streamlining of the permitting process has mitigated higher development cost in recent years. In 1985, the State Legislature approved a change in Hawaii's land use law by defining golf courses and golf driving ranges as permissible uses of nonprime agricultural land. As a result, not all golf course development proposals are required to undergo the costly land use reclassification process administered by the State Land Use Commission.

Profitability of golf courses. In the earlier years, golf course fees and demand in Hawaii were low relative to golf course operating and capital costs.⁹ However, during the past five years, demand has increased relative to supply, and fees have increased to allocate scarce playing time. Golf courses have become self supporting, and in a number of cases, profitable.

Typical income statements -- one, for a resort course and the other for a daily fee course are as follows:¹⁰

Table 3

Typical Golf Course Operating Income
(Thousands of 1991 \$)

	<u>Resort Course</u>	<u>Daily Fee Course</u>
Annual Rounds	45,000	75,000
Average Greens Fees	\$80	\$35
Operating Revenue:		
Greens Fee	\$3,600	\$2,625
Car Rentals	-0-	380
Pro Shop	675	300
Practice Range	135	150
Food & Beverage	<u>330</u>	<u>300</u>
Total Sales	\$4,740	\$3,755
Less: Cost of Sales		
Pro Shop	\$440	\$225
Food and Beverage	<u>280</u>	<u>225</u>
Total	\$720	\$480
Total Revenue	\$4,020	\$3,275
Operating Expenses:		
Course Maintenance*	\$750	\$550
Golf Operations	500	400
Undistributed Clubhouse	150	50
Replacement Reserve	200	150
General & Administrative	<u>500</u>	<u>350</u>
Total Expenses	\$2,100	\$1,500
Net Operating Income	\$1,920	\$1,775

Notes: *Before taxes, debt service and depreciation

Source: Economic Research Associates, 1991.

At greens fees of \$35 per round, the daily fee course essentially caters to resident players. By contrast, at average greens fees of \$80 per round, the resort course caters almost exclusively to tourists. The two estimates provide upper and lower bound estimates of operating revenue and costs for the two types of courses. As Table 3 indicates, annual operating revenue (after subtracting the cost of goods sold) will range between \$3.3 million and \$4 million. Net operating income (before taxes, debt service, and depreciation) totals about \$2 million per year per course. If a course costs \$18 million to build (exclusive of the land), the annual interest alone would be nearly \$2 million. This suggests that new golf courses are not likely to be very profitable, at least

initially. However, existing courses, which have benefitted substantially from escalating greens fees in recent years probably earn sizable profits.

It should again be noted that the financial gains from golf course development may be captured in the real estate premiums, and in the higher hotel room and occupancy rates where golf courses are developed as part of master planned resort or residential developments.

ECONOMIC IMPACTS

Spending on golf. There are no precise quantitative data on total resident plus tourist expenditures on golf in Hawaii. Table 3 indicates that a typical public (i.e. daily fee and resort) golf course generates between \$3.3 to \$4 million in annual gross revenues, including greens fees, cart rentals, food and beverage sales, and pro shop sales. Using an estimate of \$3.5 million per course per year,¹¹ the 40 daily fee and resort golf courses in Hawaii generate combined annual revenues of approximately \$140 million. If we include the municipal, military, and private membership courses, the combined annual revenues of all golf courses in Hawaii are probably much less than \$200 million.¹² Hawaii Visitors Bureau collects no specific data on tourist spending on golf related activities. However, if we assume that 90% of all golf related expenditures at the 28 daily fee and resort courses on the Neighbor Islands and 25% of the expenditures on Oahu are attributable to tourists, then tourists account for roughly \$100 million of total annual golf course revenues in Hawaii.

Golf expenditures and Hawaii's economy. Money spent on golf by a Hawaii resident does not have the same impact on the State's economy as money spent by a tourist. To a local golfer, golf is primarily a recreational activity that competes with other goods and services for his discretionary income. Theory of consumer behavior predicts that if he does not spend his money on golf, he would spend it on other goods and services. As long as the money he spends remains in Hawaii, total spending on goods and services in Hawaii remains unchanged. Thus, while the pattern of spending is now different, it is likely to have little differential impact on total income in Hawaii. However, this analysis does not necessarily apply to tourists. If there were no opportunities to play golf in Hawaii, or if golf is too expensive, some tourists may not come to Hawaii, and others may choose to stay fewer days and thus total spending and income in Hawaii would fall.

We now consider what will likely happen if all 58 additional golf courses -- which HREREC predicted will be required to meet the demand for golf by the year 2000 -- were to be

built. Since 44 of the 58 golf courses are required just to meet the current shortage (i.e. excess demand), there will be a sharp decline in real greens fees if all 58 courses were built.¹³

The resident, if his demand for golf is price sensitive, (other things being equal) will choose to play more rounds of golf, spending more money on golf and less money on other goods and services. Overall, a decline in greens fees will make the resident better off than before, although his total spending on all goods and services remains unchanged.

The analysis is more complex for tourists. For tourists whose primary purpose in coming to Hawaii is to play golf, the effect of a decline in (real) greens fees is a reduction in the real cost of vacationing in Hawaii. The lower vacation cost will induce more tourists to vacation in Hawaii rather than elsewhere, resulting in more tourist spending in Hawaii. Note that the revenue gain to Hawaii is measured not only by the amount that these tourists spend on golf, but by their total golf and nongolf related expenditures in Hawaii.

Most tourists do not come to Hawaii strictly to play golf, although golf may be one of many activities they participate in during their vacation in Hawaii. Lower green fees may induce some of these tourists to play more golf while vacationing in Hawaii. If their demand for golf is price insensitive (e.g. Japanese tourists), they will now spend less money on golf despite playing more golf. On the other hand, if their demand for golf is price sensitive (e.g. some U.S. tourists), they will play more and spend more money on golf.

It is difficult to predict whether more or less money in total (i.e. golf and nongolf expenditures) will be spent in Hawaii. Since there are far more price sensitive (i.e. U.S.) players than price insensitive (i.e. Japanese) players, it is most likely that a decrease in greens fees will result in more tourists, an increase in the number of rounds of golf demanded, and higher aggregate tourist spending in Hawaii. Overall, higher volume of visitor spending in Hawaii leads to higher resident incomes, and through the multiplier effect, results in more resident spending and even higher resident incomes. Unfortunately, it is not possible to estimate quantitatively the economic effects of future golf course development in Hawaii with the available data. Indeed, it is not even possible to estimate the current economic contribution of golf to Hawaii's economy with the available data.

Land use. In Hawaii, the controversy over the development of golf courses centers on the issue of optimum land use. The recent Office of State Planning survey found that most of Hawaii's residents oppose the development of more golf courses, and feelings were particularly

strong against private membership golf courses. Presumably, most people in Hawaii prefer to see their land allocated to other uses, such as agriculture and conservation.

The reasons for the strong anti-golf sentiment may be noneconomic ones. However, from an economic perspective, income per person (i.e. the economic standard of living) in an economy will always rise if resources are reallocated from low valued uses to higher valued uses. It is important to compare the relative economic benefits of golf course development versus alternative economic uses of the same land. The comparison here essentially summarizes the results of the recent (1990) study prepared by the Hawaii Real Estate Research and Education Center for the Hawaii Resort Developers Conference.

Golf is a land intensive activity. A typical golf course requires approximately 120 to 150 acres of land. Land intended for golf course development can be left as undeveloped open space, used to grow crops, to develop parks and cemeteries, to build hotels and other tourist facilities, or to build homes, offices, and public facilities. Because land is immobile, the alternative economic uses of a particular parcel of land are often limited by its location as well as its physical attributes and ownership. In other words, not all of the alternative economic uses of golf course land noted here may be suited for a particular parcel of land. The HREREC report notes that golf courses may also be used (1) to buffer resort and residential communities from objectionable neighboring activities such as cane burning, noise from trucks, airborne chemicals, etc.; (2) for drainage control; (3) to provide attractive entry ways; (4) provide land banking, and so forth.

In its study, HREREC noted that 21.5 of the planned and proposed golf courses have affected or would affect sugar, pineapple, or diversified agricultural lands. However, most (66.5) of the planned and proposed courses would be on low-value lands which are either vacant, fallow, in pasture, or in some other low-valued uses. Hence, HREREC compared revenue, employment, and tax revenue consequences of operating a 180-acre golf course, relative to several existing uses. These uses include (1) leaving the land vacant, fallow, or as pasture land; (2) sugar production; (3) pineapple production; and (4) large scale diversified agricultural production. The abbreviated results are summarized in Table 4.

Table 4

Comparative Economic Benefits of Golf Course Development

<u>Item</u>	<u>Golf Course*</u>	<u>Vacant, Fallow or Pasture</u>	<u>Sugar (incl. mill)</u>	<u>Pineapple (incl. mill)</u>	<u>Diversified (large scale)</u>
Annual Revenues (\$ millions)	\$2.7 +	nil	\$45	\$1.6	under \$.9
Site Employment**	29-82	nil	6	36	far fewer
Annual Tax Revenues					
County	\$80-\$175,000		nil	\$3,200	low low
State	over \$100,000	nil	0	\$8,000	low

Notes: * Assumes a 180-acre golf course.

** Does not include off-site employment which are higher in golf course development than in other uses.

Source: HREREC Report, Hawaii Golf Courses: Impacts and Benefits Assessment, Tables 3-6.

In sum, Table 4 shows that a golf course yields higher sales revenues, employment, and net tax revenues than current uses of the same land. Moreover, since both sugar and pineapple are declining industries, the security of golf course employment is far greater than in agriculture. Additionally, while golf courses generate sizable tax revenues for state and county governments, they (by themselves) require few direct public services.

In sum, Hawaii's total income and employment prospects will be much greater if resources were diverted from current uses to golf course development. HREREC concludes that "As long as a golf course does not threaten the economic viability of a plantation or some other large scale agricultural operation, then the golf course will provide substantially more economic and other benefits than would be the case if the land were to remain in agriculture."

It should be noted that in the study, HREREC compared the economic benefits of golf courses against current agricultural uses, and not against other potential commercial uses, such as shopping centers, office buildings, etc. While such uses are physically possible, developers generally concur that most of the land planned for golf courses have few alternative commercial uses other than their current uses.

HREREC also estimated the cumulative impacts of new course developments until the year 2000, by county. The assumption is that 58 new courses will be built between 1990 and the year 2000 to meet the current excess demand and future demand. The total number of courses will rise from 57.5 courses to 115.5 courses. Their estimates of the cumulative impacts of future golf course development are summarized in Table 5:

Table 5
Cumulative Impacts of Golf Courses

<u>Item</u>	<u>Honolulu</u>	<u>Mau</u>	<u>Kaui</u>	<u>Hawaii</u>	<u>Total</u>
Number of courses					
1990	27.5	12.5	7.0	10.5	57.5
New courses to 2000	<u>81.0</u>	<u>14.0</u>	<u>6.0</u>	<u>7.0</u>	<u>58.0</u>
Total	58.5	26.5	13.0	17.5	115.5
Employment (50 jobs/course)					
1990	1,375	625	350	525	2,875
New courses to 2000	<u>1,550</u>	<u>700</u>	<u>300</u>	<u>350</u>	<u>2,900</u>
Total	2,925	1,325	650	875	5,775
Annual Revenues (\$ millions)					
1990	\$41	\$31	\$16	\$26	\$113
New courses to 2000	<u>70</u>	<u>25</u>	<u>15</u>	<u>16</u>	<u>116</u>
Total	\$111	\$66	\$31	\$42	\$250
Annual Taxes (\$ millions)					
1990	\$3.0	\$2.3	\$1.2	\$1.9	\$8.4
New courses to 2000	<u>5.2</u>	<u>2.6</u>	<u>1.1</u>	<u>1.1</u>	<u>10.1</u>
Total	\$8.2	\$4.9	\$2.3	\$3.1	\$18.5

Source: HREREC Report, Hawaii Golf Courses: Impacts and Benefit Assessment, Table 7.

Table 5 indicates that by doubling the number of courses, the projected economic effects of golf courses as measured by sales, employment and tax revenues, are also expected to double.¹⁴

Golf courses and housing. The high cost of housing, particularly in Honolulu, is a serious social problem in Hawaii. Many residents believe that golf courses take away land from housing development and add to the cost of housing for residents. Some land parcels, indeed, can be used for either golf courses or housing development. For instance, a 180-acre golf course parcel would allow about 153 buildable acres. Allowing a range of five to 20 housing units per acre, it is possible to build 765 to over 3000 housing units on the 180-acre parcel of land. The annual rental

value of the housing units (including both land and house/apartment) could be much higher than the annual gross revenues that a golf course could generate.

However, golf courses are not the primary reason why Hawaii has high housing costs. Between 1985 and 1990, the median price of housing in Honolulu roughly doubled while inflation grew by only 29%, yet no new golf courses were added to the inventory until the end of 1990. According to Professors Louis Rose and Sumner LaCroix at the University of Hawaii-Manoa (1991), there are two fundamental reasons for Honolulu's extraordinarily high residential land prices and low home ownership. The first reason is that Honolulu has only half as much land as do typical urban areas on the mainland. The second reason is that government has the zoning (and permitting) power to severely restrict the amount of land in housing use. In sum, golf courses are not the reason for Honolulu's high land prices.

CONCLUSION

More economic data and information on price trends, participation rates, effects on property values and taxes, patterns of spending, percentage of play by visitors and residents, etc., is needed in providing a full analysis of the economic impacts of golf. The Recommendations section includes a specific charge under information management.

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2. J. R. McElyea, and G.P. Krekorian, "Key Issues in Golf Course Feasibility," Economic Research Associates, September, 1991.
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7. Michael Sklarz, Locations, Inc., interview regarding property values.
8. L. Sahling, and J.G. Strubel, "The Golf Course Market," in Merrill Lynch, The Real Estate Markets in Hawaii, May 1991.
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10. Economic Research Associates, 1991.
11. The HREREC report uses \$2.7 million per course per year.
12. For 1990, the HREREC report uses an estimate of \$113 million for total golf course revenues in Hawaii.
13. Hence, we believe that not all 58 courses will be built. Indeed, we would be surprised if half of those courses were built by the year 2000.
14. It should be noted, however, that the estimates of the cumulative economic impacts of future golf course development in Hawaii displayed in Table 5 measure the gross "impacts" of future golf course development only and not the net impacts since the sales, employment, and tax revenue losses of displaced economic activities have not been subtracted from the gross estimates presented in the Table. There is also another source of overestimation. The estimates of sales and tax revenues reported in Table 5 are linear extrapolations of estimates based on single golf courses. If real greens fees fall (as we predict) due to the addition of 58 additional golf courses by the year 2000, the HREREC estimates of future gross sales revenues and tax revenues are overstated. Along with other factors which we have discussed in this report, we believe that there is no way to predict the cumulative quantitative economic impacts of future golf course development in Hawaii.

FINANCING MEASURES

Having surveyed the environmental, social, and economic impacts of golf course development on Hawaii, the report examines various methods to finance the mitigation of impacts by the landowner. The following discussion examines three common techniques: impact fees, development agreements, and development taxes.

An *impact fee* is a fee charged to developers to cover their fair share of the cost of any new public facility required, in whole or part, due to the development. (All references to new facilities also includes expansion of facilities.) It is a regulatory technique because the facility for which it pays (roads, landfills, water and sewer systems) is necessary for the health, safety, and welfare of the people. For example, if a golf course will cause additional traffic requiring road improvements, the developer is charged a fee in the amount of the share of road improvements attributable to the increase in traffic from the golf course. Impact fees must be rationally related to the development and must be spent on the designated improvement. This is called the "rational nexus test."

A *development agreement* is a contract between government and the developer. The contract establishes a voluntary exchange: the developer typically agrees to pay money, build community facilities, or provide other community benefits; and the government typically agrees to freeze some or all of the existing zoning and other land use designations at the development site for a set period of time. This technique is voluntary and mutual. Thus, there is no need to meet a nexus test. Therefore, within limits, fees and mitigation measures that exceed the actual impact of the specific development are allowed.¹

A *development tax* is an excise tax levied on developers. A development tax is compulsory and is not limited by the nexus test requirement. Government can spend the funds collected through the tax for any legitimate purpose. It is, however, subject to significant limitations, such as the need for a state statute.

IMPACT FEE

The impact fee is a fee charged to the developer for the purpose of constructing public facilities, needed due to the new development. It is a regulatory device based on the constitutional power of the government to regulate to protect the general public's health, safety, and welfare. It is called either the police power or regulatory authority. An impact fee is not a revenue-raising

tool, i.e. a tax, though it does generate funds to pay for public facilities. The impact fee is subject to the same test as any other exaction or condition on development, except that it is most commonly used to pay for off-site, rather than on-site, public facilities.²

The use of the impact fee to regulate golf courses and mitigate their impacts on public facilities would be an effective means of providing a large proportion of the funds necessary to construct the necessary public facilities. However, no fees could be collected for facilities only marginally or unrelated to golf course development. To date, Maui County is the only county to pass a limited impact fee ordinance. While it is fairly certain that Hawaii's counties have authority to charge impact fees for a broad range of public facilities -- based upon their statutory responsibilities for planning, regulating for the police power, and provision of various public facilities -- none have.

The lack of formally adopted impact fee ordinances by the counties is explained in part by the successful collection of fees and exactions from the developers. These are either informal (some characterize this as ad hoc),³ or through conditions attached to land use reclassification set out and recorded in so-called "unilateral agreements" running in favor of the County Council. While this process is of doubtful legality,⁴ to date, there have been no lawsuits effectively challenging this practice. The county can, however, legally reach the same result by means of impact fees that satisfy the requirements of the rational nexus test. An impact fee can be further strengthened when coupled with a development agreement.

It has been variously estimated that public facilities needs generated by a golf course alone -- without associated residential, recreational, or commercial development -- would be between \$6 and \$12 million.⁵ These are significant amounts, particularly when compared with average fees charged on the mainland.⁶ However, there are limitations on the use and expenditure of impact fees as well as their collection.

Authority to charge. Since counties regulate actual development in Hawaii, they are the logical entity to charge impact fees. While it is conceivable that the State could charge impact fees, this would require a substantial reorientation of the development control process. Even under its sophisticated system of land use controls anchored by the Land Use Law⁷ and the Hawaii State Plan,⁸ the State currently does little which directly permits development. Therefore impact fees, like other land development exactions, are necessarily charged at the county level.

The fee also should be charged at a stage just preceding land development -- e.g., grading and grubbing permit, building permit, or subdivision approval -- as opposed merely to a change in development plan or zoning classification which may or may not signal impending development. (Indeed, this was the major legal defect in the oft-proposed benefit assessment fee by the City and County of Honolulu in the mid-1980's. The land classification process triggered the charging of a fee. However, actual development could be years away, if for no other reason than the remaining lengthy permit processes.) Exercises of the police power or regulatory authority by local government such as charging impact fees must be authorized by State statutes.⁹

Existing State laws currently provide sufficient regulatory authority to the counties to support impact fees. Impact fees in Hawaii (as on the mainland) would, if charged, be based upon the planning, subdivision, zoning, and provision of infrastructure responsibilities which the State has given to the four counties. For example, the State Zoning Enabling Act extends the power to zone to relate to the location of roads, schools, and recreational areas.¹⁰ Portions of the subdivision law require each county to adopt ordinances requiring a subdivider to provide land in perpetuity, to dedicate land for park and playground purposes, or to provide fees in lieu of land or its dedication.¹¹

Other laws direct the counties to establish and maintain water works and sewer works and to collect fees for and enlarge, develop, and improve the same; and to regulate and require the laying of water and sewer mains in subdivisions of land before the lots are offered for sale.¹² These laws would form the basis for impact fees for roads, parks, school sites, and water and sewer facilities. Based on similar cases allowing impact fees in other jurisdictions,¹³ these examples from the Hawaii statutes support implementing impact fees.

Although a number of jurisdictions have enacted state impact fees statutes (and a few jurisdictions have struck down such fees for lack of such legislation), in many instances the legislation has been limiting, for example, to certain subjects, such as roads in Illinois, or to fix limits to the fees. While these may be salutary from other policy perspectives, such statutes are in all likelihood not necessary in Hawaii.

Basis for charge: the rationale nexus test. As noted, since impact fees are development driven, they must relate to needs generated by a particular development, and that development may only be charged the cost for those newly-needed public facilities. Moreover, no development may be charged more than its pro rata share of the cost of new facilities, and the development must benefit from those facilities.¹⁴ This is the rational nexus test.

The basis of this rational nexus test comes from legal articles and case law.¹⁵ In a leading Florida case, the court struck down a fee for sewer and water facilities for failure to restrict the use of the money to facilities which would benefit the development charged. The court also noted another Florida case in which the fee exceeded the cost of the facility for which it was meant to pay. Clearly impact fees must be closely tied to the cost of the public facility for which the development is generating a need.

In 1987, the U.S. Supreme Court gave the rational nexus test real impetus.¹⁶ The Court struck down a requirement imposed by the California Coastal Commission that a resident dedicate a lateral beach access route on the ocean side of his lot, as a condition for rebuilding a beach house, in order to protect ocean views from the road fronting the house. Noting that it would be reasonable to attach conditions to the building permit protecting the public's view such as height or width limits, or even a viewing spot on the owner's property, the Court observed that "It is quite impossible to understand how a requirement that people already on the public beaches be able to walk across the... property reduces any obstacles to viewing the beach created by the new house...."¹⁷ The Court decried "the lack of nexus between the condition and the original purpose of the building restriction...."¹⁸ Thus, any condition on land development, including impact fees and other exactions as well as zoning conditions, must meet this nexus requirement.

Development premiums and golf courses. It would be impossible under this rational nexus test for a county to attempt to charge a fee greater than, or out of proportion to, the cost of public facilities needed due to the golf course development (as the City and County of Honolulu has suggested by means of a fixed \$100 million fee per golf course). Such a "development premium" is neither an impact fee (or any other type of exaction) nor a tax. It is instead a charge on development purely for the privilege of building one and only one kind of land development: a golf course.

It is completely unrelated to either the cost of public facilities needed to support it, or a general revenue plan for which taxes can be legitimately levied. Furthermore, there is no authorization for it either by statute or by ordinance. Therefore, it has no basis in law. It is further flawed as a matter of policy. Why single out golf courses to pay for such as low-income housing by means of huge cash development premiums? Hopefully the rationale is not ability to extort.

The same rule applies to charges not related to any facility for which the golf course causes a need. For example, it would be difficult to charge a golf course for the cost of an entire new road

network or wastewater treatment plant, and for all but a fraction of any cost of low or moderate income housing.

Segregation of fees and use. As noted in the Florida case, the impact fee must be used to help pay only for the facility for which it is charged. Therefore, the government may not use a road impact fee to defray the cost of water and sewer facilities. For that, a water and sewer impact fee must be charged. Nor can the funds be used for a facility upon which the golf course has arguably no effect -- like the need for schools and parks, or housing -- however dire those needs might be.¹⁹

Impacts fees for environmental monitoring. Charging impact fees to monitor the post-construction environmental impact of a new development would require an extension of current case law defining the permissible scope of impact fees. A survey of court decisions on impact fees revealed no cases addressing the legality of an impact fee other than for capital improvement projects and their necessary incidents, capital acquisitions, and modest recoupment of capital costs of new facilities. There is no reference to recovering such costs in the literature describing impact fees, either. Conservatively, there is presently no basis for charging exactions such as impact fees for monitoring development projects. On the other hand, commentators have argued that such uses of impacts fees are permissible and consistent with the public policy in supporting impact fees.²⁰

Uniformity and equal protection. As the impact fee is development driven, it is essential that old and new residents be treated fairly. In general, this means that the fee may not recoup old losses or upgrade facilities at the expense of new development. Replacing old roadways or water treatment facilities or providing massive amounts of affordable housing by means of "impact" fees charged against new golf courses is, therefore, illegal. Nor can the golf course be made to pay all the costs of a new public facility because it has "triggered" the need for it by overburdening old facilities. Moreover, a golf course developer is entitled to offsets or credits against impact fees for those costs to which the development will contribute in the future by way of assessments and certain taxes.

The courts have dealt with the issues of proportionate share, equal protection, and credits. In calculating impact fees, courts have required consideration of a developer's contribution to the cost of existing capital improvements, future contributions to fund existing capital improvements through user fees, debt service payments or other payments toward the cost of existing capital improvements, and the extent to which new developments are required to construct and/or dedicate capital improvements as conditions of development or construction approval.²¹ Another court

said, more simply,²² that it was necessary to "...assure that a property owner involved in a new home development is not required to buy into the capital value of existing municipal services and then pay for the same capital value a second time by future indebtedness used to construct them originally...."²³

Thus, for example, if a golf course property had been previously subject to a special assessment for road improvements, the amount of that assessment should be credited against an impact fee levied for the same purpose. This prevents government from double dipping into the developer's pocket. In this context, past general and special taxes, future general and special taxes, and user fees need to be examined.²⁴

Plan implementation. Like the development agreement, the impact fee is considerably enhanced by tying it to comprehensive plans, like county general and development plans. A number of courts have based their support of impact fees on their consistency with such local plans. This consistency is a strong indicator that the local government has planned its need for future public facilities, and the impact fee is merely a tool to meet that need. It is a demonstration that the use of the police power is not arbitrary, capricious, or unreasonable, but in accordance with a well-considered comprehensive plan. The Supreme Court of Arkansas²⁵ declared a park dedication ordinance unlawful on the ground that the city did not have a sufficiently definite plan for parks and park facilities to justify the fee. See other court cases cited in the end note.²⁶

It would be prudent, if not legally necessary, for an impact fee ordinance to be well-coordinated with the county development plans. In the City and County of Honolulu, this would presumably be the appropriate development plan for the area, including that portion which deals with public facilities. Other counties have similar detailed comprehensive plans.²⁷

Timing and use of fees. Most impact fees are collected prior to the commencement of development. However, recent court cases from Florida and California demonstrate that such fees are, under appropriate circumstances, collectable after a project is completed. Particularly if the developer knows or should have known that such a fee was contemplated at the inception of the project. This is assuming that the fee can be justified for public facilities which are needed and planned-for and will benefit the development, and that the development generated a need for those facilities.

Moreover, the funds collected from the development must be segregated into separate accounts and used within a reasonable time period. Many ordinances from mainland jurisdictions

set a particular time period -- five years appears to be relatively common -- and provide for a refund, with interest, to the developer if the funds are not expended within that time. The risk of the fee being characterized as a tax is increased should these requirements be ignored, and since few local governments are authorized to levy development taxes, the impact fee will then be invalid.²⁸

In sum, the impact fee is a well-regarded and useful tool for a community. It allows development to pay its fair share of new public facilities. Golf courses can thus bear substantial portions of the costs of new facilities such as roads, water and sewer facilities and the like to the extent they generate a need for them. However, while Hawaii counties can almost certainly charge such fees under their existing statutory powers without a separate enabling statute, they must do so by means of ordinances tied to comprehensive development plans and demonstrated facility needs.

DEVELOPMENT AGREEMENT

The development agreement is a contract between government (usually a local government unit) and a private party, usually a land developer. It binds the developer to make certain dedications and contributions, in return for benefits like the "freezing" of certain existing land development regulations for a fixed period of time or vesting of rights to complete a portion of the project.

On one hand, the community benefits received from a developer in an agreement are generally in excess of these a local government could require under its authority for exactions or impact fees. On the other, any benefit given the developer, i.e., the freezing of land development regulations or the vesting of rights to develop a particular project is beyond what the developer would otherwise be entitled to have, and is based only on existing zoning or other land use regulations. A local government law cannot enter into development agreements without a state law.²⁹

Development agreements are completely voluntary, while impact fees are mandatory. Thus, if a development agreement is "required" before a permit can be granted it ceases to be voluntary and becomes an exercise of regulatory power similar to an impact fee or other exaction. Then it must pass the rational nexus test.

The development agreement is related to the impact fee. However, a development agreement can provide more public benefits in the form of the contribution and dedication than impact fees. While government can collect impact fees only for public facilities based on the need

generated by the development, a developer can agree to any level of contribution or dedication for public purposes for which the local government can bargain in a development agreement.

Authority and the need for a statute. Development agreements need statutes in order to be valid. Principally because in the execution of such an agreement, a local government is bargaining away the power of future County Councils by freezing land use regulations for a fixed period. To convince a court that such bargaining and freezing is in certain circumstances in the public interest, the public purpose of the law must be specifically stated in a state statute authorizing the bargain. Hawaii has such a statute which recites the wastefulness of changes in planning and land use regimes in mid-project and the need for the local government to obtain certain community benefits, such as affordable housing. These are not easily obtained, if at all, by other development exactions such as impact fees because of the nexus test.

The law also allows development agreements not only between a county and a developer, but also among the county, a developer, and the State of Hawaii.³⁰ This authority also permits a development agreement between a state agency and a developer well as the county. There are, of course, the procedural problems: what state agency becomes the designated agency and how the state becomes bound, or agrees.

Authority and the need for an ordinance. There is another problem with the current Hawaii law governing the development agreement. Based largely on the older (and heavily-used, with over 600 agreements in place in California under its law)³¹ California statute, the Hawaii statute includes a provision which arguably requires counties first to pass a general ordinance establishing procedures for negotiation of a development agreement before using the law:

§46-123 General Authorization. Any county by ordinance may authorize the executive branch of the county to enter into a development agreement with any person having a legal or equitable interest in real property, for the development of such property in accordance with this part;.... [The remainder of the section lists four sets of required provisions in the ordinance, including negotiation procedures, administration, review, and timetables] (Emphasis added.)

California modified its law years ago to provide that upon application by a developer for a development agreement a California local government MUST pass the requisite ordinance (but need not negotiate with the developer):

(a) Any city, county, or city and county, may enter into a development agreement with any person having a legal or equitable interest in real property for the development of such property as provided by this article. Every city, county or city

and county ~~shall, upon request of an applicant,~~ by resolution or ordinance, establish procedures and requirements for the consideration of development agreements upon application by, or on behalf of, the property owner or other person having a legal or equitable interest in the property.

(b) ~~A city, county or city and county may recover from the applicants the direct costs associated with adopting a resolution or ordinance to establish procedures and requirements for the consideration of development agreements.~~³² (Emphasis added.)

The Hawaii statute has not been so amended. Aside from incorporating the above from California, the Hawaii State Legislature could delete altogether that portion of the statute which appears to require the counties to set out procedures by ordinance. This would probably lead to procedures and processes for development agreements to be set out in county rules and regulations. However, as the statute now reads, the negotiating is still largely an executive function.

One could also argue that the legislature has declared development agreements to be in the public interest for the reasons set out in the law: lack of certainty in the land development process; time and money commitments of the landowner; and public benefits to be derived from development agreements such as affordable housing, design standards, and infrastructure improvements.³³ Thus a development agreement would be upheld whether or not it followed the detailed provisions of the development agreements statute.

The history of City and County of Honolulu bill No. 129, (now an ordinance as of November 13, 1991), relating to the development of golf courses reflects the problem with the voluntary nature of development agreements versus the involuntary nature of impact fees. The ordinance establishes review criteria for golf courses development on Oahu.

Previous versions of the bill used the development agreement statute (without first passing a separate bill authorizing them) by empowering a County agency, the Department of Land Utilization, to negotiate a golf course development agreement in accordance with the State statute and setting out the substantive provisions of the development agreement in the same bill. (According to participants in a recent development agreements workshop sponsored by the American Bar Association's Section on Urban, State, and Local Government Law and the Urban Land Institute in San Jose, California, this is a common practice in California.) The Honolulu ordinance provides that a golf course application (presumably for a development plan amendment) "...may also include a proposal for community benefits to be negotiated in return for the vesting of development rights.... It is contemplated that any benefits will be formalized in a development

agreement to be executed at the time of a decision to rezone a parcel or to issue a plan review use permit authorizing a golf course in accordance with its development plan designation...."³⁴

The ordinance does not require the negotiation and execution of a development agreement as a prerequisite to golf course development unless the proposal includes community benefits. Since it is difficult to contemplate a golf course proposal not including some community benefits, it is likely that Honolulu was, by this provision, seeking to require a development agreement as a condition of golf course approval. Thus, a golf course developer is not given an option to voluntarily enter into a development agreement. Once the voluntary nature is removed, it is no longer an agreement, but rather a regulation and the community benefits an exaction or impact fee. Therefore, the rational nexus text would almost certainly apply to all benefits under this City and County ordinance. This is a critical weakness of the ordinance.³⁵

A further problem is the singling-out of one type of development -- the golf course -- for development agreement/impact fee treatment. Other large-scale developments generate both demonstrable needs for public facilities and desires for community benefits. Shopping centers and hotel and resort facilities come readily to mind. It would be extremely difficult to find a logical or a legal basis for arbitrarily, capriciously, and unreasonably singling out only golf course development for such individual attention.

Cases and use. Nevertheless, the development agreement as authorized by the Hawaii enabling statute continues to be a potent tool for controlling large developments like golf courses and their usually associated residential and resort-commercial developments.

Eight states (including Hawaii) have now passed development agreement statutes. ³⁶ Moreover, in California, more than 600 such development agreements have been negotiated by local governments under the auspices of a statute similar to Hawaii's law.³⁷ Although no court has directly upheld the development agreement,³⁸ at least one California court has been willing to assume, without deciding, that properly authorized agreements are enforceable. In another California case,³⁹ the Court said: "Since no party has questioned the constitutionality of the statutory scheme authorizing development agreements, either on its face or as applied here, we do not comment on the question. Rather, we assume the statutory scheme is constitutional."

Stronger language comes from Arizona which provides for development agreements by statute. The Arizona Court of Appeals interpreted action taken by a developer under a statutory development agreement to be subject to certain public bidding requirements. However, the court

noted in its opinion that the purpose of the basic development agreement law was "...to permit the expeditious construction of needed or desired public improvements in order to facilitate a proposed private development...."40

An example of the potential use of the development agreement is the one reached between City and County of San Francisco and Catellus Corporation for the development of a mixed-use project. Over 500 pages in length, the statutory development agreement is designed to deal with the development of 313 acres into 4.8 million square feet of commercial space, 5,200 market rate homes, 3,250 affordable homes (priced between \$37,000 - \$147,000 for families with annual incomes ranging from \$15,400 and below to \$56,000) and 20,000 permanent jobs. The City vested in Catellus the rights in accordance with a plan, restrictions on transit impact fee rates, good faith assistance in seeking certain permits and grants for Catellus, preservation of certain rail transportation links, master tentative subdivision map approval, and the provision of funding for certain projects (such as \$150 million for 2,200 affordable housing units on land provided by Catellus and \$5.3 million for schools and police station contributions). In exchange benefits, the City and County of San Francisco obtained:

- \$4 million for 250 units of "very low income" off-site housing;
- 2000 housing units with 740 affordable units within 10 years;
- 865 affordable on-site housing units;
- 68 acres of park and open space;
- 26 acres of clean, improved affordable housing land to City;
- \$12.9 million and 3 acres for community/cultural facilities;
- \$85 million and land for infrastructure (streets, utilities,);
- \$24 million transit impact development fee;
- \$9.3 million school impact fee;
- \$6.1 million child care fee;
- \$5.3 million for public art;
- \$10 million for economic development fund; and
- \$2.25 million for public health.

Other obligations are linked to the rate of development and particular target dates and levels in the land development process (e.g., two acres of affordable housing land every four years for 16 years upon authorization to demolish an abandoned freeway structure). The development is expected to take 40 years. Catellus has so far expended \$12 million on the approval process, including the negotiation of the development agreement.

In sum, the development agreement represents a meaningful and useful tool, particularly when combined with an impact fee, to manage golf course development in Hawaii. As long as the developer is given credit for any voluntarily provided benefit against the required impact fee, local government could use both methods.

DEVELOPMENT (EXCISE) TAX

The development tax provides a third and quite different tool for paying for the consequences of new land development. The development tax is an exercise of the revenue-raising power of the state government. If exercised by local government, it must be authorized by a specific state statute.

As a tax, it is unrelated too and separate from both the regulatory power of government (on which impact fees and other exactions rest) and the voluntary and contractual relationship of development agreements. However, a tax must be exercised for a proper public purpose and without bias in its levy and application. Government does not need to establish any relationship between the collection and spending of tax funds, as required for impact fees. Indeed, a tax can be imposed on businesses and individuals who may never individually benefit from facilities and programs financed with tax money. In fact, there is no need to declare how the money will be spent at all.

Thus, a tax on the development of large parcels, or certain categories of development that would include golf courses, could be set at any level and used for whatever public purpose the government chooses. These could range from public facilities to public housing, so long as the tax is not deemed confiscatory (or regulatory in which event courts perceive they are development conditions and rational nexus tests apply). However, such a tax needs to be levied under the authority of a specific state statute, and it must furthermore be levied in a fair and equitable manner.

The State would have specifically empower the counties by a State law to allow them to levy a development tax.

There has been a fair amount of recent comment on the utility of the development excise tax as either an alternative to, or in addition to, the use of the development exaction or impact fee as a means for paying for growth.^{#1}

First, it is necessary to understand the two major types of taxes that government is authorized to levy by law. This is because courts have addressed various problems with, and limits

upon the use of various taxes, largely based upon such categorical classification. Taxes on land development are apparently characterized either as excise taxes or as property taxes. There are more limitations on the property tax than on the excise tax.

An *excise tax* is a tax imposed upon a particular use of property or the exercise of a single power over property, incidental to ownership. This is compared to a personal tax on a developer or an ad valorem tax on the property itself. The excise tax is a burden on use of the property rather than the property itself. Its purpose is to raise revenue (though incidental favoring of one business over another is apparently legal). Usually the excise tax raises a relatively small proportion of the revenue upon which the taxing agency relies, and to the extent it raises "too much" it may be characterized as "something else."

A *property tax*, on the other hand, is a charge on the ownership of property without regard to any particular use thereon, and must be uniformly applied to all property in the taxing jurisdiction in many states. Such taxes are based on the value of property and unpaid taxes result as a lien on the property. A characterization of a development tax as a property tax is often fatal for the obvious reasons that property taxes are already levied in most jurisdictions and an added property tax will be characterized as double taxation and therefore void.

Case law and use. Few courts have dealt with development excise taxes. The principal cases come from California. As the development excise tax is a relatively new and little-used device for raising revenue from the land development process, it is worthwhile to discuss these court decisions in detail.

In the principal case,⁴² land developers sought to invalidate a bedroom tax which was in essence an environmental excise tax. The contested tax ordinances levied from residential builders and developers taxes in the amount of \$500 per dwelling unit, up to a maximum of \$1000, upon the occupation and construction of new dwelling units, to provide revenues to meet "serious ecological and environmental problems created by the occupancy and construction of such facilities within the City."⁴³

The tax was calculated at the time of the issuance of the building permit or certificate of occupancy, and paid prior to occupancy itself. The major challenge to the ordinances was that it violated the equal protection clause, particularly as only residential development was subject to the tax. To this the court responded:

Yet the instant taxes do not lose their character as taxes and become an illicit regulation of residential development simply because the tax is higher or is measured differently than is the case with other businesses. It is within the discretion of the legislative body to exact different license taxes from different classes of businesses as long as the classification rests upon some rational basis.... The fact that revenue from the excise tax is earmarked for special environmental uses cannot change the character of the tax. While it is denominated a tax upon construction and occupancy, it is clear -- especially from its incorporation in the business license ordinance -- that the tax is imposed on the business of construction. We conclude that the City taxes challenged here constitute a valid business license tax upon the ongoing business of residential construction.⁴⁴

To the further claim that the tax unreasonably discriminated against developers of residences, as opposed to contractors, the court noted that there was a rational basis for the distinction:

[T]here are significant differences both in business function and in the scope of development which justify the developer-contractor classification. That is, a developer normally plans an entire subdivision and then mass produces the homes within a somewhat expansive tract.... On the other hand, the contractor usually custom designs homes pursuant to individual contracts with owners. Given such distinctions, the fact that the burden of the license tax may be borne unequally among different classifications is of no constitutional significance.⁴⁵

The bedroom tax court case is based in part on an earlier California appeals court decision that upheld a "license tax ordinance" that imposed a tax on a building construction business.⁴⁶ The taxes collected (before the issuance of a building permit) were deposited in a "capital outlay fund." The tax was held to be valid, in part, as being a purely a revenue-raising measure with no regulatory purpose.

These court decisions are in accord with general commentary on taxes facing an equal protection challenge. (The equal protection clause ensures like treatment of similarly situated persons.) The U.S. Supreme Court has upheld a tax differential of \$550 for large chain stores versus \$10 per store for small chains: "Taxation may be made the implement of the exercise of a state's police power; and the proper and reasonable discrimination between classes to promote fair competitive conditions and to equalize economic advantage is therefore lawful."⁴⁷

Corporate size was also the basis for a valid classification in another court case,⁴⁸ in which the tax per store depended upon the number of stores in the state, so that the multistore plaintiff paid \$5,443 per store, whereas a single store owner paid \$3.00. The Court held the competitive difference was sufficient to overcome an equal protection challenge. The Supreme Court has also permitted states to protect certain industries through taxation in the face of equal protection

challenges. In three additional cases, the U.S. Supreme Court has sustained a property tax on anthracite coal though no such tax was levied on bituminous coal,⁴⁹ a business license tax on laundries which exempted steam laundries,⁵⁰ and a tax on butter substitutes but not on butter, even though the effect was to destroy the margarine industry in that state.⁵¹

In sum, the Supreme Court has generally approved the use of taxation by state and local government to promote or retard selected social policies and business activities. These cases, however, do not distinguish between excise and other types of taxes and the limits, if any, upon the amount of excise tax that can be levied.

Other state courts have also had the opportunity to rule on various aspects of the development excise tax (other state courts' decisions are not binding on the Hawaii courts). The Arizona Supreme Court⁵² invalidated a parks and recreation facility tax of \$100.00 for each house and \$50.00 for each apartment based on the lack of enabling legislation for the tax. The same court did uphold an occupation license tax against a claim that it was too high, based on the ground that the city had authority to levy a tax and has unlimited discretion to set the rate.⁵³ This is not in accord with other authority which finds a tax is not a true excise tax if set too high. However, it supports a proposition that a golf course excise tax might be set at a fairly substantial level, if there is authority granted by the State to the Counties to levy the tax.

The Oregon Appeals Court upheld a "system development charge" to implement the construction, installation, and extension of street facilities and traffic control devices.⁵⁴ Like a development excise tax, the charge was collectible upon application for a building permit. Like an impact fee, the funds were to be expended in accordance with a capital improvements program. The court concluded:

On the face of it, imposing a tax burden on property as it is developed is not without reason because it may be assumed that increased automobile traffic will follow, thereby requiring increased capacity of the streets to handle it.... Imposition of a charge on new construction to pay for improvements to streets which may be reasonably be assumed will be burdened by increased traffic is not without a rationale basis.⁵⁵

The decision sounds more like a precursor to judicial approval of impact fees than a development excise tax. Nevertheless, the court did characterize the charge as a tax and not a development exaction.

The Colorado Supreme Court ⁵⁶ upheld a service expansion fee established to fund an expansion of city services. The fee based on square footage and type of construction was charged to persons who obtained building permits for new construction, additions to existing structures, or substantial alterations to existing structures. The court held it was a valid excise tax since it was computed without assessment and measured by the extent of a privilege exercised by the taxpayer, and was not based on the value of assets. If, however, the court said, it had been characterized as a property tax, the uniformity clause (requiring all similar types property to be taxed at the same rate) of the state constitution would have applied and it might have been invalid. (See Appendix H for a copy of the City of Cherry Hill Village ordinance.) The Colorado Supreme Court has also invalidated a municipal services expansion fee based upon building permit valuation on the ground that it is a property tax and the uniformity clause made it therefore illegal.⁵⁷

Building upon cases such as this, the City of Boulder charges an excise tax to both residential and commercial development. The tax is currently established at \$.322 per square foot for residential developments and \$.272 per square foot for nonresidential development. The tax is, however, only one element in a Community Housing Assistance Program designed to provide housing for Boulder's working poor. Since 1978, Boulder also utilizes a mandatory set-aside program, a Moderate Income Housing Program, which is a development exaction akin to an impact fee, and to which the rational nexus test applies.⁵⁸ See Appendix I for a copy of the City of Boulder ordinance.

In sum, the development excise tax is a potentially useful tool for funding various governmental activities and projects from moneys collected from the land development process, provided it is based on an appropriate statute. Despite early U.S. Supreme Court cases dealing with other kinds of excise and license taxes, when applied to land development, it is pretty much agreed among commentators that the use of the development excise tax for regulatory rather than revenue-raising purposes will likely result in its characterization as a regulatory measure and subject it to the rational nexus test -- which destroys its usefulness as an alternative to exactions like impact fees.

There must be a rational relationship between the tax and its differential classifications, if any, and indeed the tax itself must be rationally based. If the charge is too high, it may be judged confiscatory and void. If it looks too much like a property tax, then uniformity issues may also result in its invalidation. Lastly, care must be taken to avoid double taxation. On the other hand, the rational nexus test is almost certainly avoided by the use of the excise tax on development so that the funds need be neither related to nor spent upon particular facilities or programs, nor must

the taxed be specifically benefitted thereby, beyond their membership in the presumably benefitted community at large.⁵⁹

IMPLEMENTATION MEASURES

Impact fees, development agreements, and development excise taxes are only supplements to traditional government revenue sources. Government should not look to these methods as the primary source of funds for community needs.

Impact fees can only fund public facilities such as water systems, wastewater treatment systems, and roads the need for which is generated by land development. Development agreements can fund a greater, indeed infinite, range of community need. However, an agreement with the developer and the government must trade off some vested rights to complete a development project. The development excise tax requires neither the nexus to needed community facilities nor the consent of the land developer; however, it does require a new statutory scheme (especially if the counties are going to levy the tax). Furthermore, courts look with a jaundiced eye at local government attempts to use the excise tax as a principal revenue source for community facilities or benefits. But as a supplement this method can be important and effective means for defraying the burdens of development on the community.

Each method has its benefits and problems:

1. To use impact fees and development agreements, there is no need for new or additional legislation. The State already has a development agreement statute and counties have adequate authority to levy impact fees under various state statutory provisions. A development excise tax would require new legislation.
2. The impact fee is a direct and well-recognized regulatory tool to pay for public facilities made necessary by growth. While most courts are impressed if the community also contributes a portion of the costs thereof, it is theoretically possible for all public facilities the need for which is generated by new development to be funded entirely from such impact fees together with whatever new property taxes are collected from the new resident or tenant. There are limits to how much can be collected and spent for specific facilities under the guise of an "excise" tax.

3. Since the length of the land development approval process adds substantial costs and uncertainty to development in Hawaii (if the counties pass appropriate ordinances and use development agreements), developers should want to take advantage of the vesting of development rights and freezing of existing plans and regulations and enter into agreements. If this happens, many needed facilities and community benefits which would not pass the rational nexus test for impact fees might be gained from the developers.
4. Impact fees and development agreements allow the community and the developer to see and understand where the fees and contributions are going to be used. The impact fee is put into a particular fund to be spent within a few years. The development agreement usually requires the landowner to fund or construct specific facilities or to aid specific programs. Furthermore, in many, if not most cases, the facilities constructed with fees will directly benefit, and indeed be needed by, the developer paying the fees, building the facility, and making the contribution. There is no such assurance or "accountability" with respect to an excise tax unless the funds so collected are specifically earmarked.
5. There is considerable case law with respect to the impact fee, and widespread use of both it and the development agreement (particularly in California) upon which to rely for precedent and guidance. There is measurably less for the development excise tax, many of the limits of which are untested.
6. Unless the State flatly forbids the use of impact fees or informal -- ad hoc -- exactions, there is every likelihood that both will continue, even after the levying of a development excise tax. (It is unlikely that the amount of development excise tax on a golf course development, for example, would exceed what could be collected as an impact fee.) If the excise tax were modest, this would not necessarily be a bad thing. However, if it were the maximum which the case law suggests is allowable, the burden on the developer might grow to be excessive.
7. As indicated, the perceived advantage of the development excise tax may well be its major disadvantage in terms of securing its passage: unaccountability for the way the funds are spent. There is no guarantee that the developer who pays the tax, or the community which is accepting the burden of the development, will benefit particularly from the revenues collected.

IMPLEMENTATION/PROPOSED LEGISLATION

Since all three mitigation techniques discussed above present both problems and opportunities, the following three sections deal with the types of implementation measures necessary under each.

Impact fees. The principal need in Hawaii to implement impact fees is an ordinance passed by each of Hawaii's counties. There is probably no need for a State statute, with ample authority in existing laws pertaining to zoning, subdivision, and public facilities.

An "impact fee" ordinance should cover the following topics:

1. Definition of key terms, particularly the types of public facilities for which an impact fee will be charged.
2. Specific findings and purpose, tying the impact fee closely to rapid growth, shortage of funds, and need for public facilities, facility by facility.
3. Applicability of state and local plans, so that it is clear that the facilities and where they should go have been thought out.
4. Authority for the impact fee, as noted in the opening paragraph of this section.
5. Applicability of the fee to specific areas or facilities.
6. Method of fee calculation, by public facility, with details as to basis, formulae, assumptions, and so forth. This is the substantive guts of the ordinance.
7. Method for segregating the funds and providing refunds if not used within a fixed period of time.
8. Alternatives in lieu of fees, independent fee calculations, and credits against impact fees for other improvements, etc.

If there is a desire for a statute, despite the sufficiency of our statutory scheme,⁶⁰ then the following matters should be dealt with:

1. Basis in police power.
2. Appropriate standards/test.
3. Delegation of authority to local governments.
4. Provision for capital improvements.
5. Method of fee calculation as well as capital improvements program.

6. Administrative mechanisms (collection, segregation and refund of funds).
7. Relationship to other development exactions.

Development agreements. While Hawaii has a statute that serves well, it might be useful to consider amending the statute to more closely conform to the spirit of the California statute: to require the counties to adopt procedures for the negotiating and executing of a development agreement upon the request of a landowner to commence such negotiations. This does not bind the county to either negotiate or execute, but moves the process along. Alternatively, the requirements that the county adopt a specific procedural ordinance prior to negotiating agreements could be deleted entirely.

If ordinances are required, past efforts by the City and County of Honolulu could serve as guides. However, it is critical that the counties do not attempt to retain unilateral authority to change the agreement after it is negotiated and executed. If the county can unilaterally “unvest” or “unfreeze” development rights, development agreements would be useless. Also, it should be clear in any ordinance that the county does not agree to modify plans, zones and permit conditions according to some future scenario, nor to grant permits in futuro. The bargaining away of the police power permitted under our statute and under the theory of development agreements is the promise that existing land use regulations -- or some of them -- will not change during the course of the development process with respect to a given and carefully-described development. It is a misuse of the process and contrary to the statute to agree to make changes, or to make changes in land use controls in the development agreement itself. Whatever changes both sides agree upon, if any, must precede the development agreement execution.

Development excise tax. There is clearly a need for a statute in order to authorize counties to collect a development excise tax (indeed although there is no question of taxing authority, there will be a need for a statute if the state levies such a tax). One such statute, in bill form, has been introduced in at least one past (date) legislative session, as SB309 and HB639. While the bill is a well-intentioned effort to give counties the power to tax as an alternative to impact fees (as stated in its opening paragraphs), it has defects that will likely cause it to fail in its purpose because the “tax” still sounds too much like a regulatory fee.

First, naming the tax an “impact tax” is bound to cause a court or anyone else reviewing it to conclude that it is related to public facilities needs, which is the classic nexus requirement of the impact fee. This impression is bolstered mightily by the requirement of a “needs impact study” or NAS, which sounds very much like the components of a public facilities plan upon which many

impact fees are based. The same is true with respect to "offsets," "proportionate share" and "reasonable benefit." By tying the "tax" to specific public facility needs and the costs, the bill virtually guarantees a legal interpretation that it is an impact fee bill.

Essentially, a development excise tax bill should stay as far way from such linkages to public facility needs and studies as possible. A reasonable basis for beginning might well be the Environmental Excise Tax Ordinance of the City of Rancho Palos Verdes approved in the Westfield case, or the housing tax levied by the City of Boulder. While these set out in purpose clauses why the tax is needed, they carefully avoid linking the need to a particular charge, although some broad earmarking is provided for. Most of the provisions deal with how the fund is to be collected and who collects.

CONCLUSION

Impact fees, development agreements, and development excise taxes are only supplements to traditional government revenue sources. Government should not look to these methods as the primary source of funds for community needs.

Impact fees can only fund public facilities such as water systems, wastewater treatment systems, and roads the need for which is generated by land development. Development agreements can fund a greater, indeed infinite, range of community need. However, an agreement with the developer and the government must trade off some vested rights to complete a development project. The development excise tax requires neither the nexus to needed community facilities nor the consent of the land developer; however, it does require a new statutory scheme (especially if the counties are going to levy the tax). Furthermore, courts look with a jaundiced eye at local government attempts to use the excise tax as a principal revenue source for community facilities or benefits. But as a supplement this method can be important and effective means for defraying the burdens of development on the community.

ENDNOTES

1. §46-121, HRS.
2. David L. Callies, Impact Fees, Exactions and Paying for Growth in Hawaii, 11 U. Hawaii L. Rev. 295 (1989).
3. Davidson and Usagawa, Paying for Growth in Hawaii: An Analysis of Impact Fees and Housing Exactions Programs, Land Use Research Foundation of Hawaii, 1988; David L. Callies, Impact Fees, Exactions, and Paying for Growth in Hawaii, 11 U. Hawaii L. Rev. 295 (1989)) or by means of conditional zoning (see Land Use Ordinance, City and County of Honolulu, at 8.40.
4. Davidson and Usagawa, and Callies, both supra.
5. Don Clegg, Director, Department of Land Utilization, University of Hawaii, class in Land Use Management, October 1990.
6. James Nicolas, Report on Growth Management Studies, University of Florida, Gainesville, College of Law. 1991.
7. Chapter 205, HRS.
8. Chapter 226, HRS.
9. Bosselman and Callies, The Quiet Revolution in Land Use Controls, CEQ (1972).
10. §46-4(7), HRS.
11. §46-6, HRS.
12. §61-2 (3), (5), and (7), HRS.
13. See, e.g., Coulter v. City of Rawlins, 662 P.2d 888 (1983); J.W. Jones Co. v. City of San Diego, 157 Cal. App. 745 (1984); Call v. City of West Jordan, 606 P. 2d 217 (1979); Rupp v. Grantsville City, 610 P. 2d 338 (1980); and Banberry Development Corporation v. South Jordan City, 631 P.2d 899 (1981).
14. Nicholas, Proportionate Share Impact Fees, supra. Callies and Grant, Paying for Growth and Planning Gain, supra. Bosselman and Stroud, Mandatory Tithes: The Legality of Land Development Linkage, 9 Nova L. J. 381, at 397-99 (1985).
15. Heyman and Gilhool's classic 1964 article, Banberry Development Corp. v. South Jordan City, supra., and the Florida case of Contractors and Builders Association v. City of Dunedin, supra.
16. Nollan v. California Coastal Commission, 483 U.S. 825.
17. Id. at 838-39.
18. Id. at 837.
19. Nicholas, Nelson and Juergensmeyer, A Practitioner's Guide to Development Impact Fees, 1991.

20. James Nicholas, Professor, University of Florida, Gainesville, Office of State Planning Forum on Golf Course Development in Hawaii, September 17, 1991.
21. Banberry Development Corp. v. South Jordan City, 631 P.2d 899 (1981).
22. Lafferty v. Payson City, 642 P.2d 376 (1982).
23. Id. at 379.
24. See, for detailed analysis and examples of impact fee calculations which take such credits into consideration, Nicholas, Nelson and Juergensmeyer, A Practitioner's Guide to Development Impact Fees, 1991, at 91-118.
25. City of Fayetteville v. IBI, 659 SW 2d 505 (1983).
26. Coronado Development Co. v. City of McPherson, 368 P.2d 151 (1962) and Hillis Homes v. Public Utility District, 714 P.2d 1163 (1986).
27. David L. Callies, Regulating Paradise. Land Use Controls in Hawaii (1984) at ch. 3.
28. See, e.g., Amherst Builders Association v. City of Amherst, 401 NE 2d 1181 (1980); Lafferty v. Payson City, 642 P.2d 376 (1982); Broward County v. Janis Development, 311 So. 2d 371 (1975) and City of Fayetteville v. IBI Inc., 659 SW 2d 505 (1983), summarized, with other cases and materials, in Callies, Impact Fees, Exactions, and Paying for Growth in Hawaii, 11 U. Haw. L. Rev. 295 (1989).
29. Porter and Marsh, Development Agreements, Practice Policy and Prospects, ULI 1989.
30. §46-126(d), HRS.
31. Porter and Marsh, Development Agreements: Practice, Policy and Prospects, Chapter 2, 1989.
32. Deering section 65865, West's Supp. 1977 (Cal. Gov. Code Art. 2.5, Ch. 4, Title 7, as amended in 1984).
33. §46-121, HRS.
34. Attachment I-A DEVELOPMENT PLAN COMMON PROVISIONS, SECTION 32-1.15. GOLF COURSE DEVELOPMENT, (a) Additional Application Requirements.
35. See, for this view and the further view that all such negotiated benefits must pass such a test, Crew, Development Agreements After Nollan v. California Coastal Commission, 483 U.S. 825 (1987), 22 The Urban Lawyer 23 (1990).
36. See California, Nevada, Florida, Colorado, Arizona, Idaho, and New Jersey.
37. Callies and Grant, Paying for Growth and Planning Gain: An Anglo-American Comparison of Development Conditions, Impact Fees and Development Agreements, 23 The Urban Lawyer 221 (1991) at 239 et seq.
38. Callies and Grant, *supra*.

39. Midway Orchards v. County of Butte, 269 Cal. Rptr. 796, California Appeals Court at fn. 800 (1990).
40. Achen-Gardner v. Superior Court, 809 P. 2d 961 at 962 (1991).
41. See, e.g.; Strauss and Leitner, Financing Public Facilities With Development Excise Taxes: An Alternative to Exactions and Impact Fees, 11 Zoning and Planning Law Report 17 (1988); White, Using Fees and Taxes to Promote Affordable Housing, 43 Land Use Law and Zoning Digest #9 (September 1991) at page 3 et seq; Curtin, California Land Use and Planning Law at 65864 et seq. 1991. It is worth noting in passing that three authors are from the same law firm, which does a great deal of land use consulting on the public sector side all over the United States from offices in Missouri and California, while the fourth, Curtin, is an experienced practitioner from California with clients in both private and public sectors.
42. Westfield-Palos Verdes Company v. City of Rancho Palos Verdes, 141 Cal. Rptr. 36 (Cal. App. 1977).
43. Id. at 39.
44. Id. at 42-43.
45. Id. at 43.
46. Associated Homes Builders of the Greater East Bay, Inc., v. City of Newark, 95 Cal. Rept. 648 (1971).
47. Great Atlantic & Pacific Tea Co. v. Grosjean, 301 US 412, 426 (1937).
48. State Board of Tax Commissioners v. Jackson, 283 US 527 (1931).
49. Heisler v. Thomas Colliery Co., 260 U.S. 245 (1922).
50. Quong v. Kirkendall, 223 US 59 (1912).
51. A. Magmano Co. v. Hamilton, 292 US 40 (1934).
52. Home Builders Association of Central Arizona v. Riddel, 510 P.2nd 376 (1971).
53. Tanque Verde Enterprises v. Tucson, 691 P.2nd 302 (1984).
54. Oregon State Homebuilders v. City of Tigard, 604 P.2d 886 (1979).
55. Id. at 890-891.
56. Cherry Hills Farms, Inc. v City of Cherry Hills Village, 670 P. 2d 779 (1983).
57. Rancho Colorado, Inc., v. City of Bromfield, 586 P.2d 659 (1978).
58. See, for in depth discussion of both programs, White, Using Fees and Taxes to Promote Affordable Housing, supra, at pages 7-8. The author stresses that such taxes are "useful supplements to other affordability measures," and it would be " ...ineffective, risky and unfair" if such taxes and linkage fees were the sole source of revenue for affordable housing. id.; at p. 9.

59. Though at least two commentators think otherwise; Ethier and Weiss, Development Excise Taxes: An Exercise in Cleverness and Imagination, 42 Land Use Law and Zoning Digest no. 2 (1990) at p. 3 et seq.

60. About a quarter of the states appear to have adopted statutes, though only a handful of these are by any means comprehensive -- Nevada, Oregon, Texas and Vermont -- and California's statute acts as a limitation on the imposition of fees. See Morgan, Chapter 4, Recent Developments in the Law of Impact Fees with Special Attention to Legislation, in 1986 Proceedings of the Annual Institute on Planning, Zoning and Eminent Domain.

RECOMMENDATIONS FOR GOLF COURSE DEVELOPMENT CRITERIA

The former sections of the report inventoried and profiled the existing and proposed golf courses; reviewed the State's and counties' land use laws; examined the physical, social, and economic impacts of golf courses; and discussed the financial measures that can be implemented to pay for impacts from golf course development. This section recommends development criteria to address the impacts of golf course development, as follows:

- Overall recommendations;
- Proposed changes to Chapter 205, Land Use Law;
- Physical criteria to consider including:
 - sensitive areas,
 - timeframes and area governed by an EIS, and
 - ground water protection measures;
- Permit and approval conditions, as appropriate, including:
 - Erosion control plans and their compliance,
 - Permanent buffers for streams, wetlands, and coastal waters,
 - Vegetative filter strips,
 - Continued preservation of significant archeological sites; and
 - Community benefits;
- Information management; and
- Financial mitigation through development agreements.

OVERALL RECOMMENDATIONS

Before purchasing or developing a parcel of land for a potential golf course, the potential landowner or developer should expect to pass two "screens."

The first is essentially a "go/no go" decision based on the development's compatibility with three criteria:

- State Land Use District Classifications;
- County Planning, Zoning, and Ordinances; and
- Physical resources, such as aquifers, watersheds, wetlands, critical habitats, etc.

If the proposed golf course is an appropriate land use, in essence a "go" based on the above, the second screen would consist of any conditions that may be appropriate for the site, such as:

- Permanent buffers around streams, wetlands, and coastal waters;
- Inspection and monitoring of pesticide and fertilizer use;
- Preservation of archaeological and cultural sites;
- Community benefits such as jobs for local residents, public play times, etc.

LAND USE RECOMMENDATIONS

The report's land use recommendations for regulating golf course development are based in part on the proposed changes to Chapter 205, HRS, as outlined in Senate Bill 1342, 1991, Relating to Land Use (the State administration's so called LESA bill). The LESA bill proposes amendments including boundary changes so that land use districts include only lands which meet the district criteria, and creation of a new district -- the Open Space District -- to hold lands not currently classifiable in other districts. Once district boundaries are rationalized, golf courses should be appropriately restricted to the Urban District, and by special use permit only if consistent with the purpose of all other districts.

Although the Land Use Law's intent is to classify lands according to their resources, this has not been consistently applied nor does the current land use classification system adequately recognize the multiple values of the land. For example, some lands classified in the Agricultural District have conservation value, while other lands currently in the Conservation District have limited or no conservation resources and values. The land use recommendations take these facts into consideration.

Urban District. A golf course that serve as an accessory facility to major uses such as hotels, commercial complexes, and housing should be permissible only in the Urban District.

Agricultural District. The Hawaii State Constitution requires the State to conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency, and assure the availability of agriculturally suitable lands.¹ The primary purpose of the Agricultural District is to protect lands valued for cultivation. Less than 25% of the land currently included in the Agricultural District is under cultivation.²

While some people argue that golf courses are a form of agriculture--the cultivation of turf--in general, golf courses are considered recreation only.³ Based on the nature of the land use, golf courses are recognized as recreational land uses by Maui County's ordinances designating them in park districts, and by Oahu's ordinances that use golf courses as a preservation district. Protecting agricultural lands may be accomplished in two ways:

- *Alternative A: Golf course development should be allowed by special use permit in the new Open Space District, but not in Agricultural, Rural, or Conservation Districts.* S.B. 1342, Relating to Land Use, recognizes socioeconomic changes as a result of the decline in the sugar industry and the pineapple industry.⁴ This decline in large scale agriculture also will affect open space vistas. Faced with the growing demands of urbanization, buffers of green are still needed between communities, both to provide open space and to enhance the State's aesthetic qualities. The bill creates a new land use district -- an Open Space District. The Open Space District would include agriculture as a permissible use, as well as open area recreational uses and other low intensity uses, excluding golf courses except by special permit.
- *Alternative B. Golf course development should not be a permissible use in the Agricultural District, except in counties with populations below 200,000, by special permit in exceptional situations.* A golf course is not agriculture nor does it produce an agricultural product. Its inherent nature is a commercial activity, associated with or attracting higher density land uses of the Urban District. The distinction in county population size accounts for the City and County of Honolulu's position to disallow golf courses in the Agricultural District, while recognizing the other counties' position to permit golf courses in this district.

The Land Use Law should be amended to remove golf courses as a permissible use in the Agricultural District. Exceptions should be made, however, to allow golf courses with low intensity uses in the Agricultural District in the Neighbor Islands through the special use permit. Low intensity use golf courses are those with the golf course as the major attraction, and with only ancillary uses associated with it, such as a small restaurant, golf pro shop, cart barns, and a club house.

For example, where low density use is appropriate, stand alone type golf courses may be determined to be an appropriate use. Such locations may be isolated areas, away from urban areas. Urban zoning of the area, however, could bring with it intensive,

undesirable, and incompatible urban uses, such as houses, hotels, industries, etc. Under these circumstances, the preferred alternative to urban zoning is to allow a low density golf course through a special use permit.

Conservation District. Golf courses should not be allowed in the Conservation District. The Hawaii State Constitution requires the State to conserve and protect Hawaii's natural beauty and natural resources and also to support water resource planning by providing protection of watersheds and ground water resources. A golf course is not generally consistent with these requirements and is thus an inappropriate use in the Conservation District. This position conforms with the State Constitution and the purpose of the Conservation District as stated in the Land Use Law. It is also consistent with the movement over time to more restrictive and protective policies governing permitted uses in this district.

Hiking, fishing, swimming, viewing, and camping are uses which illustrate the types of recreation envisioned in the Conservation District. These activities are harmonious with the goals and resources, including preservation of native plants, forests, and water resources. A golf course, with its large-scale grubbing and mass grading, increases in traffic congestion, water use, application of chemicals, etc., on approximately 120 to 150 acres will usually have significant impacts within the Conservation District.

Ideally, if the land in question does not possess conservation values, it should be reclassified to a more appropriate district. This would be in keeping with the movement to more restrictive and protective policies governing permitted uses in this district. An alternative would be the placement of a golf course, on a case-by-case basis, within a special subzone in the Conservation District where the parcel of land has certain conservation values, for example, open space, view plains, etc. This would be accomplished through both Chapter 91 rule-making procedures, and a conservation district use application (CDUA) which will require extensive public review akin to reclassification, but through the Board of Land and Natural Resources rather than the Land Use Commission.

Rural District Lands. The Rural District should be governed the same as agricultural districts for golf course development.

PHYSICAL RESOURCES RECOMMENDATIONS

Information on the State Land Use Districts and County planning, zoning, and ordinances is readily available to anyone interested in possible development of a particular site. Determining whether a site contains critical physical and cultural resources is somewhat more difficult. While much of the pertinent information is available, it is not "packaged" and may be overlooked. Several of the recommendations in this section concern the further development of technology, plans, and policies that may eventually be a significant part of the "go/no go" decision process for golf course development. In the interim:

*Do not allow golf course construction in sensitive sites.*⁶ Golf courses proposed for sensitive sites should not be allowed. Sensitive sites include those with slopes steeper than 20 percent,⁷ highly erodible soils, watersheds, intact native forests, areas with concentrations of rare and endangered species, and overlying irreplaceable potable aquifers.⁸ County plans should be premised to reflect these sensitive sites.

To address long-range concerns and cumulative impacts of golf course development:

Require each EIS statement to consider the cumulative impacts of all portions of a golf course development in a regional area for a period of at least five years before the proposed project and projections for five years after its construction. The cumulative impact of a project is generally not addressed in environmental impact statements. Communities also want to feel a sense of predictability in their future, and apprehension about possible urbanization due to golf course development is a reflection of a lack of confidence that current regulations and processes will protect them from urban encroachment. An example of the need for a comprehensive regional review of a development is the Akahi Joint Venture Country Club, a two-proposal development in South Kona. One proposal is the development of a 27-hole golf course as a permitted use in the Agricultural District pursuant to §205-2(d). The second proposal is a 54-unit lodge on a parcel 15 acres or less; land use review of the second proposal is either as a special use permit pursuant to §205-6 or as a reclassification of the Agricultural District to Urban District pursuant to §205-3.1(c). (This latter act is a statutory delegation by the State to the counties to reclassify small parcels of 15 acres or less.) Both of these proposals should be reviewed together for their environmental impacts; under the present law, this is not required. To ensure adequate consideration of all environmental impacts, the developer should prepare one EIS to address all aspects of the development which may have significant cumulative impacts on the region.

Amend the law to ensure that all golf course proposals trigger the environmental assessment requirements. Currently, due to variances in the review processes among State and County agencies, golf courses are not always required to prepare an environmental assessment in accordance with Chapter 343, HRS. Nonetheless, development projects of this magnitude and potential for environmental impacts should be required to submit an environmental assessment in accordance with §343-5, HRS.

Finalize and implement the State Ground Water Protection Plan. The plan addresses many of the concerns regarding the degradation of ground water from all chemical uses. Its implementation would assist all users to protect Hawaii's ground water resources. Legislation may be required. In addition, a number of other ground water recommendations should be considered in concert with the Ground Water Protection Plan:

- *Coordinate scientific data on ground water in the review and approval of golf courses.* The Water Resource Research Center is identifying and classifying aquifers, and this data provides guidance to determine the potential impacts of a golf course by location based on such factors as the hydrology, geology, and the status of the ground water. As developed, the data needs to be disseminated to both State and County decision makers.
- *Uniformly ensure protection of ground water.* The water code adequately governs "threatened" water resources in designated areas. Counties have jurisdiction in non-designated areas, but not all have policies governing the use of their water resources. Decision making on proposed uses in non-designated areas needs to be based on standards developed from empirical data, needs to ensure protection of the sustainable yields, and needs to conform with County development plans.
- *Establish a policy to regulate the quality of ground, surface and coastal waters from all impacts, including irrigation, that apply to all permits and approvals for the development of golf courses; and to monitor the waters and their biota.* Currently, the Department of Health (DOH) regulates drinking water at its source and impacts from injection wells through its enabling legislation. However, it merely guides the monitoring and regulation of golf course impacts from irrigation, without specific policies or laws. DOH does attempt to regulate water use over drinking water sources through its Twelve Conditions.⁹ DOH's guidelines have been found acceptable by most counties, the State, environmentalists, and developers. Nonetheless, they need

the force of law to be effective. To properly monitor, DOH needs to test the waters and their biota, plants and animals, as the indicators of biological impacts.¹⁰⁹

- *Develop a data base for all pesticides used; develop policy and laws to manage and regulate fertilizers; and provide additional research on the effects of all uses of pesticides and fertilizers.* The Department of Agriculture is not empowered to collect information to develop a data base on pesticides and fertilizers. The information should be collected from all sources including industry, agriculture, urban, as well as golf courses. Numerous studies on golf courses cited in the Environmental Considerations section have been tracking elements from fertilizers, because of their potential adverse impacts. More information is needed regarding the impacts of chemicals on the habitat, wildlife, and waters. Policy makers need this data to make informed decisions.
- *Establish a policy that protects sustainable yields and quality of water in all locations, as is done for "designated areas" in the water code.* Allocation of water resources should conform with the community plans developed in each county. Policies need to be incorporated into a ground water protection plan that protects sustainable yields and quality of water before "designation," as established in the present law. This would include the encouragement of the use of non-potable water, where appropriate.
- *Allow the development of golf courses in areas in need of flood retention and storm water run-off protection.* In recognizing the positive contribution of large grassed areas to serve as drainways and filters for storm water run-off and water retention, golf course development should be allowed in areas they can serve these functions. The Ewa plain is such an area. However, current floodplains with significant wildlife habitat should be preserved.

CONDITIONS, AS APPROPRIATE

Conditions that may be appropriate for approval of a golf course will vary widely with the specific sites. The following are examples of conditions that may be required:

Erosion control plans. Currently some counties require erosion control plans for golf course construction, that include mitigation measures for sediment control and storm water runoff during construction. This provision needs to be provided uniformly to ensure the protection of streams and coastal waters and their aquatic resources from golf course construction impacts.

More extensive inspection, monitoring, and enforcement for all construction especially on large tracts of land. Reviewing agencies need to increase the frequency of on-site inspections during construction, particularly at sites which have the greatest potential for soil loss problems including steep slopes of less than 20 per cent. Current resources are very limited.¹¹

Permanent buffers between golf courses and streams, wetlands, and coastal waters. Specific impacts of golf courses on sensitive resources will vary based on the topography of an area, soil types, and geology. Minimal mitigation measures in the form of buffers can assist in protecting the habitat including streamside areas, rare and endangered species, coral reefs, and other aquatic resources.

- 300 feet for wetlands which serve primarily as wildlife habitat protection.¹²
- 100 foot corridor for significant streams.¹³
- 150 feet for shorelines, except in the Urban Land Use District.¹⁴

All land uses that have some impacts on the resources specific to that resource should have the same buffer requirements.

Vegetative filter strips for all uses. Biofiltration, or filter strips, protects aquatic resources from nonpoint source pollution. Biofiltration can significantly reduce and filter sediment and sediment-bound pollutants and nutrients and provide storm water management to protect sensitive areas. These measures include vegetative filter strips, grassed swales or vegetated channels, and created wetlands.¹⁵

Continued preservation of significant archaeological sites. Preservation and adequate protection of sites -- as well as the use of signage, brochures, and visitor display -- will further preserve the physical artifacts as well as the culture. Buffers to sites may be recommended where appropriate. Although the DLNR State Historic Preservation Division has primary responsibility for review of reports, the community has valuable insights and concerns about antiquities. The community often needs more time to present its views in the permit review process for a development; thus, more public input should be allowed in the preliminary permit review process.

Monitoring air quality for airborne chemicals or sewage effluent. Public concern about potential problems from contamination by airborne chemicals sprayed on golf courses (and agriculture), or sewage effluent where spray irrigation is used, warrants routine monitoring of residential areas adjacent to and especially downwind of a golf course site.

Tangible benefits to the community. In communities where a golf course will have a prominent role, or is part of an overall effort to develop the area, community benefits need to be considered. Where appropriate these benefits could be designated impact fees or credited in lieu of an impact fee or tax, or as part of a development agreement, on a cost equivalent basis, in accordance with legal measures governing impact fees, development agreements, or development taxes. Models of impact fees to implement these types of benefits are found in California's farmland mitigation fees. These have been proposed to allow urbanizing development to pay an impact fee into a public fund that would be used to acquire land, open space, or conservation easements, that is, the purchase of the development rights, as appropriate.¹⁶

Examples of community benefits include:

- Promotion of recreational facilities and uses. The recreational value of golf courses is sometime lost in a host of other community issues and priorities, such as concern over foreign investment and protection of the character of rural communities. Recreation is a vital part of a community, however, and providing days and times open for public play on courses may mitigate some community concerns.
- A portion of greens fees could be used to enhance the non-golf recreational resources in the area.
- If the golf course will require in-migration to fill on-site jobs, there should be proportional participation in affordable housing efforts, as well as resident-related services such as education and day care. This community benefit meets the "nexus" test needed for impact fees discussed in this report.
- If the golf course will cause the disruption of food gathering or recreational activities, appropriate off-site non-golf activities or resources of at least equal value should be provided.
- Setting up a trust fund is one way to provide benefits, while remaining flexible enough to address changing community priorities. This benefit could be provided through impact fees based on the models from California's farmland mitigation fees.¹⁷

INFORMATION MANAGEMENT RECOMMENDATIONS

One additional area of concern is the lack of information, or the difficulty in finding information on golf courses and golf course development in Hawaii. In compiling the inventory on proposed golf courses, available information was inconsistent in content and substance. This presents problems for communities in reviewing studies on environmental impacts, and it is difficult for the lay person to understand cumulative effects without standard information requirements.

Conduct an updated inventory on existing and proposed golf courses, and develop a data base on golf courses to include demographic and economic information for the golf courses and their surrounding communities. More data is needed on: 1) price trends in golf fees, 2) local resident and visitor golf participation rates, 3) impacts on property values and property taxes on lands adjacent to golf courses, 4) spending patterns of visiting golfers versus non-golfers, 5) number of rounds played by residents and visitors, and 6) percentage resident and visitor play at resort, municipal, and daily fee/public play courses.

Such information would probably require frequent and timely surveys of golf courses, local resident, and visitors. Agencies such as the Hawaii Visitors Bureau; the Department of Business, Economic Development, and Tourism; or private organizations like the Professional Golf Association would be appropriate entities to conduct such surveys. Furthermore, such data would help determine a systematic way to identify the "affected community," which is particularly important with regards to possible community benefits.

Develop maps in the State Geographic Information System (GIS) to identify sensitive areas. It would be useful to prepare Geographic Information System (GIS) databases using the existing information about ground water and aquifers. By overlaying such information with rainfall, slope, soil type, sensitive resources, existing and proposed courses, and land use districts, useful maps could be derived for golf course siting. This would help planners to review proposals. Preparation of such maps would be a benefit yielded by the basic set of information in the State GIS. This would be a useful product for planners during review of proposals, for it would provide them with instant access to a technical and quantifiable basis for a "go or no go" recommendation. If initial screening proved favorable, then planners could embark on more detailed analyses. The technology is readily available to combine land use and environmental considerations in one mapping system.

FINANCING MEASURES RECOMMENDATIONS

As communities and governments grapple with golf course development, one popular response has been to charge the developer for the privilege of building a golf course. There are three basic ways to accomplish this end: impact fees, development agreements, and development taxes.

*This report recommends the use of development agreements as a financing tool to mitigate the impacts from golf courses.*¹⁸ A development agreement is a contract between government and the developer which establishes a voluntary exchange. The developer typically agrees to pay money, build community facilities, or provide other community benefits; and the government typically agrees to freeze some or all of the existing zoning and other land use designations at the development site for a set period of time. This technique is voluntary and mutual, with no need to meet a nexus test. Within limits, fees and mitigation measures that exceed the actual impact of the specific development are allowed.

The rationale for endorsing the use of the development agreement as the financing tool over the other two choices is basically two fold:

First, as to impact fees, there is concern and uncertainty as to whether a consensus can be reached regarding impact fee amounts and their application. The mechanisms to implement impact fees include calculation of the development's fair share of proposed public facilities, separate funds to hold the accounts, and the requirement that the funds be spent within a reasonable period of time.

Second, as to a development excise tax, besides requiring legislation, the implementation of a development excise tax creates potential equal protection problems. How do you fairly tax different types of golf courses to reflect their actual financial impacts? For example, a stand alone, membership only course may provide fewer public benefits as a whole than a public/daily fee course. However, to tax it at higher rate than a public/daily fee course to compensate for its lower level of "openness" to the public may leave the government vulnerable in court for not having a rational basis to charge the membership only course more than the public/daily fee course.

The use of a development agreement is the easiest and most legally defensible. The law already exists for its implementation. However, as noted in the Financial Measures section of this report, there is a need to clarify the law to remove any argument that a general ordinance is required

by a county prior to their entering into development agreements. This too is simple; by merely deleting the words "by ordinance" from §46-123, HRS, all doubt is removed that a general ordinance is required for a county to enter into a development agreement. Furthermore, as a contract between the government and the developer, the development agreement is a voluntary agreement.

CONCLUSIONS

The Office of State Planning's objective in this report has been to develop a process that compares resources to uses, and provides predictability to development. A developer, real estate agent, community organizer, investor, environmentalist, etc., should be able to use this report to determine where a golf course development is or is not feasible based on its physical impacts. It is the opinion of the Office of State Planning that if these types of measures of predictability had been available prior to the golf course development "boom," many of the problems facing the state and counties today would not exist.

ENDNOTES

1. **Hawaii State Constitution, Article XI, Section 3.**
2. **Dan Davidson, Executive Director, Land Use Research Foundation, letter to Office of State of State Planning, December 6, 1991.**
3. **Public commentary was received by OSP in response to the Draft Golf Course Report, November 1991, that reflected both positions.**
4. **Senate Bill No. 1342, 1991.**
5. **Hawaii State Constitution, Article XI, Section 1, and Article XI, Section 7.**
6. **The sensitive sites are identified from numerous resources:**

WETLANDS

1. **Wetlands and Wetland Vegetation of Hawaii: Margaret Elliot and Erin Hall, 1977.**
2. **State Conservation Lands Functional Plan: Department of Land and Natural Resources, 1991.**
3. **State Recreational Functional Plan and Technical Reference Document: Department of Land and Natural Resources, 1991.**
4. **Hawaiian Waterbirds Recovery Plan: United States Fish and Wildlife Service and Department of Land and Natural Resources, 1985.**
5. **Hawaiian Wetlands National Wildlife Refuge Complex Master Plan (Draft): United States Fish and Wildlife Service, 1985.**
6. **Regional Wetlands Concept Plan; Emergency Wetlands Resource Act; United States Fish and Wildlife Service, Region I, 1990.**
7. **Ecologically Sensitive Wetlands on Oahu: Groundwater Protection Strategy for Hawaii. Technical Report No. 184, Draft: Environmental Center, Water Resources Research Center, University of Hawaii, 1989.**
8. **Discussion with resource personnel at the Department of Land and Natural Resources Division of Forestry and Wildlife and the United States Fish and Wildlife Service.**

STREAMS

Special Streams were identified using the Hawaii Stream Assessment Draft Report by the Department of Land and Natural Resources and input from stream experts. Special Streams were identified as having outstanding aquatic or riparian resources or a high quality estuary.

WATERSHEDS

The following areas were selected as high priority areas for review for watershed values by the Department of Land and Natural Resources, Office of State Planning, and the University of

Hawaii Water Resources Research Center. Selection was based on areas which are currently subject to increasing development pressures.

1. Watershed Protection Study for the Five Year Boundary Review; Conservation Zone Adjustments Leeward Koolau Range, Oahu (Draft): Water Resources Research Center, University of Hawaii , 1991.
 2. Watershed Protection Study for the Five Year Boundary Review; Conservation Zone Adjustments Kona, Hawaii (Draft): Water Resources Research Center, University of Hawaii, 1991.
 3. Watershed Protection Study for the Five Year Boundary Review; Conservation Zone Adjustments North Kohala, Hawaii (Draft Pending): Water Resources Research Center, University of Hawaii, 1991.
 4. Watershed Protection Study for the Five Year Boundary Review; Conservation Zone Adjustments East Maui (Draft Pending): Water Resources Research Center, University of Hawaii, 1991.
7. Kenneth Kitabayashi, Section Chief, Department of Public Works, Kauai County, telephone interview, December 30, 1991, stated that a slope greater than 20 percent requires extra control measures.
- Richard H. Cameron, Vice President/Property Management, Maui Land & Pineapple Company, Inc., recognized that portions of both the Village and Plantation golf courses have slopes approximately 20 percent and no adverse environmental impacts were caused by construction or ongoing operations, letter to Harold Masumoto, Office of State Planning, December 9, 1991.
- Carl Honig, M.D., a citizen of Kaneohe who opposed the Bay View Golf Course on other grounds, finds that no more than a 20 percent slope satisfactory, personal interview, December 25, 1991.
- Donna Wong, Executive Director, Life of the Land, Memorandum to Office of State Planning, December 2, 1991.
8. See Appendix __, analysis by John Mink for the Office of State Planning.
 9. Department of Health, "Twelve (12) Conditions Applicable to All New Golf Course Development," revised January 1992, (formerly 8 conditions, revised April 1991).
 10. Cynthia Hunter, Ph.D., Assistant Researcher, Hawaii Institute of Marine Biology, telephone conference, January 3, 1992.
 11. For example, Hawaii County has nine inspectors, three in Kona, six in Hilo; and Maui County has three. Inspectors are assigned to projects and use a spot-check approach which varies depending on work loads. Assuming the necessary grading permits are in place, inspectors can issue a stop-work order if problems develop, and if the contractor is unresponsive to the inspector's concerns. The City and County of Honolulu has recently imposed stronger sanctions with the ability to levy civil fines.
 12. John I. Ford, Land Protection Coordinator, U.S. Fish and Wildlife Service, letter to the Office of State Planning, January 3, 1992; recommended buffer for wetlands.

13. U.S. Environmental Protection Agency, Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, based on best management practices, May 1991; and the Office of State Planning's proposed recommendations in the five-year boundary review, based further on technical advice of aquatic biologists.

14. Office of State Planning, Recommendations for Improving the Hawaii Coastal Zone Management Program, January 1991. Justified to protect against further shoreline encroachment for protection against current erosion, and to provide open space and views, protection of historic trails and sites, and the long-term possibility of sea level rise. More empirical data is needed to ensure the buffer distance is adequate to protect from chemical impacts of golf courses.

15. Environmental Protection Agency, supra., pp. 7-15.

16. Anne E. Mudge, "Protecting Farmland through Impact Fees in California," Land Use Law & Zoning Digest, January 1992, citing the City of Davis with a mitigation fee program to purchase buffer zones between new urban development and agricultural land, Solano County and the City of Fairfield have an farmland/open-space acquisition program, and the County of Alameda imposes fees from \$2,500 to \$35,000 per residential unit to be used to purchase development rights on nearby fertile land under development pressure.

17. Id.

18. This is the position of the Office of State Planning, and does not necessarily reflect the opinion or position of the consultant, Professor David Callies.

TABLE OF APPENDICES

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Appendix A

STAND. COM. REP. NO. U6977

Honolulu, Hawaii

APR 29, 1991

RE: S.C.R. No. 192

S.D. 1

Honorable Daniel J. Kihano
Speaker, House of Representatives
Sixteenth State Legislature
Regular Session of 1991
State of Hawaii

Sir:

Your Committees on Water, Land Use and Hawaiian Affairs and Planning and Economic Development, to which was referred S.C.R. No. 192, S.D. 1, entitled:

"SENATE CONCURRENT RESOLUTION REQUESTING THE OFFICE OF STATE PLANNING TO CONDUCT A COMPREHENSIVE STUDY OF THE CUMULATIVE IMPACT OF GOLF COURSE DEVELOPMENT IN HAWAII (AMENDED TITLE),"

beg leave to report as follows:

The purpose of this concurrent resolution is to request the Office of State Planning (OSP) to conduct a comprehensive study on the cumulative impact of golf course development in the State. The study shall include the effects on the State's natural resources and the environment, social and economic impact on affected communities. In addition, the study shall propose policies for the formulation of consistent compensatory fees to be imposed on golf course developers by the State and local governments to mitigate any negative impacts attributable to golf course development. The OSP is requested to report its findings and recommendations to the Legislature no later than twenty days prior to the convening of the 1992 Session.

Your Committees received supporting testimony from the Office of State Planning and the Founder's Group Kōkua Council for Senior Citizens.

One goal of the study is to determine the environmental carrying capacity of various areas with respect to golf courses. There are many adverse environmental effects resulting from golf courses. Pesticide runoff contaminates streams, aquifers, and

the ocean. The vast quantities of water consumed for irrigation deplete water resources already being stretched to the limit by the State's exploding population. In cases where golf courses are carved out of undeveloped areas, they ruin Hawaii's natural beauty. The bulldozing of the forest between the Pali and Mt. Olomana for a golf course has detracted from one of the most spectacular views on Oahu, enjoyed by both residents and tourists.

Many local people like to golf but have difficulty obtaining tee times on the few overloaded municipal courses. The majority of golf courses are far too expensive for most Hawaii residents. Some courses do not even sell memberships locally.

Since Hawaii's people must bear the environmental and recreational impacts of these courses, it is important to determine exactly how much money they really put into the State's economy. Questions the study should address are whether impact fees can make up for these consequences and, if they can, how high the fees should be.

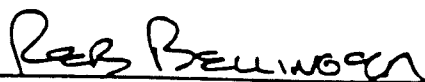
With the mind-boggling prospect of forty potential new golf courses on Oahu alone, this study is essential.

Your Committees on Water, Land Use and Hawaiian Affairs and Planning and Economic Development concur with the intent and purpose of S.C.R. No. 192, S.D. 1 and recommend its adoption.

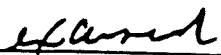
Respectfully submitted,

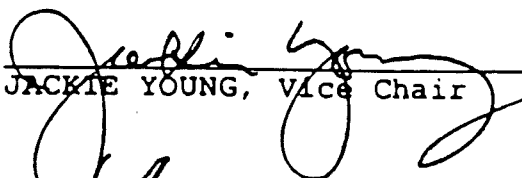
COMMITTEE ON PLANNING
AND ECONOMIC DEVELOPMENT

COMMITTEE ON WATER, LAND
USE AND HAWAIIAN AFFAIRS


REB BELLINGER, Chair

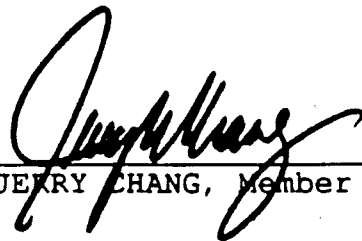

DAVID M. HAGINO, Chair

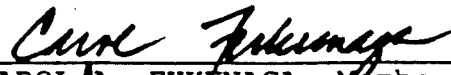

EZRA R. KANOHO, Vice Chair

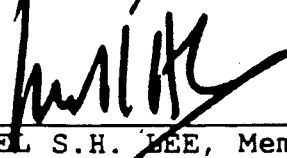

JACKIE YOUNG, Vice Chair

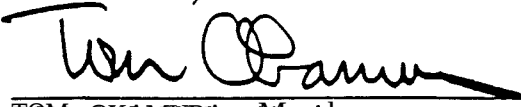

ROMY M. CACHOLA, Member

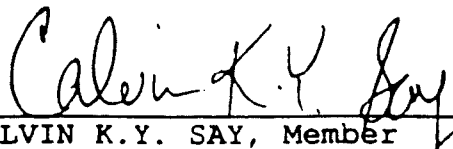

EMILIO S. ALCON, Member


JERRY CHANG, Member


CAROL A. FUKUNAGA, Member

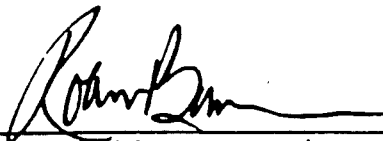

SAMUEL S.H. LEE, Member


TOM OKAMURA, Member


CALVIN K.Y. SAY, Member


HARVEY S. SCHARF, Member


BARBARA MARUMOTO, Member


ROBERT BUNDA, Member


KENNETH T. HIRAKI, Member


DAVID Y. IGE, Member


DAVID MORIKAWA, Member


ALEXANDER C. SANTIAGO, Member


DAVID STEGMAIER, Member


DWIGHT L. YOSHIMURA, Member


MIKE O'KIFFE, Member


CYNTHIA THIELEN, Member

SENATE CONCURRENT RESOLUTION

REQUESTING THE OFFICE OF STATE PLANNING TO CONDUCT A
COMPREHENSIVE STUDY OF THE CUMULATIVE IMPACT OF GOLF COURSE
DEVELOPMENT IN HAWAII.

WHEREAS, due to the increased popularity of the sport of golf, there are about seventy existing golf courses and approximately eighty new golf courses now underway or proposed in the State of Hawaii; and

WHEREAS, proposed golf course projects in Hawaii have generated much public controversy related to use of the State's land, water, and other natural resources; and

WHEREAS, while golf courses provide open space and recreational opportunities for Hawaii's residents and visitors, they have significant environmental, social, and economic impacts, and utilize scarce resources that may be more appropriately used to benefit entire communities rather than a privileged few; and

WHEREAS, golf courses require large tracts of undeveloped lands at or near locations which have scenic, agricultural, and historic significance, and could be used for a wide variety of other uses, including housing; and

WHEREAS, the governmental bodies of the State and Counties are considering several proposals for new golf courses and driving ranges; and

WHEREAS, the approval process of each individual golf course and driving range should be considered in relation to the cumulative impact on Hawaii's land, water, and people; and

WHEREAS, to provide value and well-being to the public and to mitigate the burden golf courses place on the communities, State and County governments are in the process of formulating procedures requiring golf course exactions to compensate for the social, economic, environmental, and infrastructure impacts; and

WHEREAS, our present knowledge of the cumulative impact of golf courses and driving ranges is limited and inadequate; now, therefore,

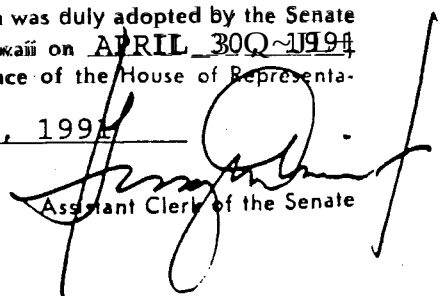
BE IT RESOLVED by the Senate of the Sixteenth Legislature, Regular Session of 1991, the House of Representatives concurring, that the Office of State Planning is requested to conduct a comprehensive study on the cumulative impact of golf course development in the State of Hawaii which shall include but not be limited to the effect of golf course development on the State's natural resources and the environment, social and economic impact on affected communities, and proposed policies for the formulation of consistent compensatory fees to be imposed on golf course developers by the State and local governments to mitigate any negative impacts attributable to golf course development; and

BE IT FURTHER RESOLVED that the Office is requested to solicit and carefully consider appropriate input from golf course architects, engineers, and developers, county governments, and members of affected communities; and

BE IT FURTHER RESOLVED that the Office is requested to submit to the Legislature a report on its findings and recommendations no later than twenty days prior to the convening of the Regular Session of 1992; and

BE IT FURTHER RESOLVED that certified copies of this Concurrent Resolution be transmitted to the Office of State Planning, the Governor of the State of Hawaii, and the Mayors and Chairpersons of the Councils of the respective Counties in the State.

I hereby certify that the foregoing is a true and correct copy of Senate Concurrent Resolution No. 192 SD1, which was duly adopted by the Senate of the State of Hawaii on APRIL 30, 1991 with the concurrence of the House of Representatives.
Dated: MAY 14, 1991


Assistant Clerk of the Senate

APPENDIX B

GOLF COURSE REPORT PROCESS

In response to Senate Concurrent Resolution No. 192, 1991, the Office of State Planning (OSP) initiated a study of golf course development in Hawaii, including a report of the results to the 1992 Legislative Session. The report was developed with an extensive amount of public participation at all phases.

OSP used a five-step process: scoping workshops, a forum on golf course development in Hawaii, consultant drafts of the report, statewide input and presentation of the draft report, and completion of the final study.

The first step involved seven workshops to scope the issues, with public and government "brainstorming" the concerns revolving around golf course development. The workshops were conducted from June through August 1991, with over fifty people participating. The participants included developers; environmentalists; State, County, and Federal government administrative and elected officials; golf professionals; as well as golf course superintendents.

During the next two months, a steering committee representing a wide range of constituencies, and selected by their colleagues from each workshop, met weekly with OSP staff to plan the forum: developing its agenda, selecting and contacting the speakers, and keeping their constituencies apprised of the process.

A Forum on Golf Course Development in Hawaii, held in September, was the second step in the process; nearly four hundred people attended. The purpose of the two-day forum was both to educate and to gather information. The assembled experts were asked to share their knowledge through four panels:

- environmental and land use concerns of golf courses;
- social and economic issues;
- regulatory methods involving fees and taxes used in golf course development, and how other jurisdictions handle golf course development; and
- a round table discussion of seven panelists selected from the three previous panels, discussing potential concerns with golf course locations and methods to facilitate communications between the public and government agencies.

Based on the scoping workshops and the golf course forum, consultants conducted research on areas related to the environmental, social, and economic impacts of golf course development and a golf course inventory, and wrote respective chapters of the draft report. The Office of State Planning made only minor revisions to their findings and recommendations. This was the third step of the process.

The fourth step was public review and comment on the draft study as prepared by the consultants for OSP. The draft study incorporated ideas from the forum, together with research, to address the impacts of golf courses; and recommended broad policies to address the impacts and a proposed method to impose development exactions. OSP held statewide public meetings in November and early December, 1991, for review and comment on the draft study. Based on the public comments provided at the statewide meetings, responses from State and County agencies, conferences with private citizens from all the constituencies, as well as over seventy written comments received in response to the consultant's draft report, OSP prepared the final report.

This report, its executive summary and appendices is the fifth and final step. The final report is a culmination of all the comments received from the scoping workshops, the forum, statewide public meetings, research, and numerous written comments and conferences from the general public.

APPENDIX C

TABLES

- Table 1. Profile of Existing Golf Courses by Type**
- Table 2. Overview of Proposed Golf Courses by Status**
- Table 3. Regulations & Authorities Specific to Golf Courses**
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Proposed Golf Courses

<u>Course</u>	<u>Holes</u>	<u>MGD</u>	<u>Sector</u>	<u>System</u>	<u>Type</u>	<u>Status</u>
Ko Ollina 2	18	1.0	Pearl Harbor	Ewa	116/121	13321/13213
Ko Ollina 3	18	1.0	Pearl Harbor	Ewa	116/121	13321/13213
Luahuallei	18	1.0	Waianae	Luahuallei	112	23321
Heleakala	18	1.0	Waianae	Luahuallei		
Maiili Kai	18	1.0	Waianae	Luahuallei	116/122	23421/23423
Waianae Kai	27	1.5	Waianae	Waianae	116/122	13311/23223
Makaha V. CC	9	0.3	Waianae	Makaha	116/122	13321/11113
Ohiukoololo	18	0.6	Waianae	Keaau	112	21211
Mokuleia	36	0.8	North	Mokuleia	116/121	13221/11113
Waialua	18	0.4	North	Waialua	111	11111
Haleiwa	9	0.2	North	Kawaailoa	116/121	12211/12312
Lihii Lami	36	0.8	North	Kawaailoa	111	11111
Turtle Bay	18	0.6	Windward	Koolauloa	116/121	12211/12213
Kahuku	18	0.6	Windward	Koolauloa	116/121	12211/12213
Punamano	54	1.8	Windward	Koolauloa	116/121	12211/12213
Malaekahana	18	0.6	Windward	Koolauloa	116/121	12211/12213
Malaekahana	18	0.6	Windward	Koolauloa	116/121	12211/12213
Waikane 1	27	0.6	Windward	Koolaupoko	212	11111
Waikane 2	18	0.2	Windward	Koolaupoko	212	11111
Waaihee Valley	18	0.4	Windward	Koolaupoko	212	11111
Heeia Kea	18	0.4	Windward	Koolaupoko	212	11111
Minami	18	0.2	Windward	Koolaupoko	212	11111
Kaunua Drive	18	0.4	Windward	Koolaupoko	212	11111
Bay View	18	0.4	Windward	Koolaupoko	116/122	12211/11122
Royal Haw. 1	18	0.4	Windward	Koolaupoko	212	11111
Royal Haw. 2	18	0.4	Windward	Koolaupoko	212	11111

Table 1: Profile of Existing Golf Courses by Type

Hawai'i County

	Type	Location	Holes	Surrounding Uses	Fees	Opened
Discovery Harbour	Daily fee/public play	Na'alehu	18	Rural residential	\$25	1972
Hamakua Country Club	Daily fee/public play	Honoka'a	9	Residential	\$10 All day	1927
Naniloa Country Club	Daily fee/public play	Hilo	9	Mixed uses	\$25-35	1970
Volcano Golf & Country Club	Daily fee/public play	Volcano	18	Residential; open space	\$23-38	1922
Waikoloa Village Golf Course	Daily fee/public play	Waikoloa	18	Residential; open space	\$35-62	1972
Hilo Municipal Golf Course	Municipal	Hilo	18	Mixed uses	\$8; \$3 senior play	1950
Kona Country Club	Resort	Keauhou	27	Condominiums	\$45-85	1967
Kona Country Club	Resort	Keauhou	9	Condominiums	Not available (just completed)	1991
Mauna Kea Beach Hotel Golf Course	Resort	South Kohala	18	Open space	\$75-125	1964
Mauna Lani Resort	Resort	South Kohala	18	Open space	\$65-130	1981
Sea Mountain Golf Course	Resort	Punaluu'u	18	Resort; open space	\$25-50; \$33 senior play	1974
Waikoloa Beach Golf Course	Resort	Waikoloa	18	Hotels; condos	\$70-90	1981
Waikoloa Kings Golf Course	Resort	Waikoloa	18	Hotels; condos	\$80-90	1981

Source: Earthplan

Kaua'i County

	Type	Location	Holes	Surrounding Uses	Greens Fees	Opened
Kiahuna Golf Club	Daily fee/public play	Koloa	18	Residential; commercial	\$38-75	1984
Kukui O Lono Golf Course	Daily fee/public play	Kalaheo	9	Open space; park	\$5	1928
Wailua Municipal Golf Course	Municipal	Kapa'a	18	Open space	\$4.50-11	1920
Poipu Bay Resort	Resort	Poipu	18	Resort; residential	\$22-35	1991
Princeville Golf Course	Resort	Princeville	27	Resort; residential	\$45-85	1971
Princeville Prince	Resort	Princeville	18	Resort; residential	\$45-85	1990
Westin Kauai Kiele	Resort	Lihu'e	18	Lihu'e Airport	Hotel \$105; Outsiders \$135	1988
Westin Kauai Lagoon	Resort	Lihu'e	18	Lihu'e Airport	\$45-95	1989

Source: Earthplan

Table 2: Overview of Proposed Golf Courses by Status

City and County of Honolulu

Golf Course	Type	Location	Acres	Holes	Nearest Land Use	Status
Makakilo	Daily fee/public play	Makakilo	232	18	Residential	Under Construction
Minami	Daily fee/public play	Kane'ohe	240	18	Vacant	Under Construction
Myers/Seibu	Daily fee/public play	'Ewa	270	27	Residential	Under Construction
Puuloa	n.a.	'Ewa Beach	133	18	Vacant	Under Construction
Royal Hawaiian Country Club	Daily fee/public play	Maunawili	255	36	SF Residential	Under Construction
Turtle Bay	Resort	Kahuku	194	18	Pasture	Under Construction
Royal Kunia #1 (Phase I)	Daily fee/public play	Kunia	172	18	Sugarcane	Rec'd Major State & County Approvals
Royal Kunia #2 (Phase I)	Daily fee/public play	Kunia	163	18	Sugarcane	Rec'd Major State & County Approvals
Waikele	Daily fee/public play	Koolauloa	142	18	Sugarcane	Rec'd Major State & County Approvals
Kapolei	Public (State)	'Ewa	200	18	Sugarcane	Rec'd Major State; Exempt re: Act 15
Ewa Gentry	Daily fee/public play	'Ewa	170	18	Residential	Needs County Approval
Ewa Marina	Daily fee/public play	'Ewa Beach	272	27	Sugarcane	Needs County Approval
He'eia Kea	n.a.	He'eia	200	18	Vacant	Needs County Approval
Ko'Olina #2	Daily fee/public play	'Ewa	160	18	SF Residential	Needs County Approval
Lualualei	Daily fee/public play	Lualualei	259	18	Truck farming	Needs County Approval
Makaha Valley Country Club	Daily fee/public play	Makaha	85	9	Farming	Needs County Approval
Mokuleia	Membership	Mokuleia	250	18	Agriculture, ranching	Needs County Approval
Royal Kunia Phase 2	Daily fee/public play	Kunia	194	18	Sugarcane	Needs County Approval
Waianae Kai	Daily fee/public play	Wai'anae	250	27	Vacant	Needs County Approval
Waiawa	Daily fee/public play	Waiawa	400	36	Fallow	Needs County Approval
Waikane #1	n.a.	Waikane	505	27	Truck Farming	Needs County Approval
Waimalu	Daily fee/public play	Pearl City	115	18	Residential, open spac	Needs State Approval
Mokuleia	Daily fee/public play	Mokuleia	219	18	Agriculture, ranching	Needs State/County approvals
Lihī Lani	Daily fee/public play	Pupukea	212	18	Pasture	App. Denied/Withdrawn
Bay View Expansion	Daily fee/public play	Kan'eohe	140	18	Residential	App. Denied/Withdrawn
Kipapa Ridge Estates	Municipal	Cent. O'ahu	45	9	Pineapple	App. Denied/Withdrawn

City and County of Honolulu

Golf Course	Type	Location	Acres	Holes	Nearest Land Use	Status
Ko'Olina #3	Daily fee/public play	'Ewa	160	18	Urban	App. Denied/withdrawn
Kunia	Daily fee/public play	Kunia	203	18	Sugarcane	App. Denied/Withdrawn
Malaekahana (Asahi Jyukun)	Daily fee/public play	Kahuku	228	18	Pasture	App. Denied/Withdrawn
Malaekahana (Campbell Estate)	Daily fee/public play	Kahuku	200	18	Pasture	App. Denied/Withdrawn
Punamano	Daily fee/public play	Kahuku	605	54	Fallow	App. Denied/Withdrawn
Waialua	n.a.	Waialua	214	18	Sugarcane	App. Denied/Withdrawn
Haleiwa	n.a.	Haleiwa	90	9	Vacant	No Official Submittal
Heleakala	n.a.	Lualualei	n.a.	n.a.	Landfill; open space	No official submittal
Kahuku	Municipal	Kahuku	150	18	Existing course	No Official Submittal
Kailua Drive-in	n.a.	Kailua	258	18	Drive-in	No Official Submittal
Maili Kai	n.a.	Maili	160	18	Vacant	No Official Submittal
Ohikilolo	n.a.	Makaha	190	18	Ranching	No Official Submittal
Waihee Valley	n.a.	Waihee	150	18	Vacant	No Official Submittal
Waikane #2	n.a.	Waikane	300	27	Vacant	No Official Submittal

Source: Earthplan

Table 2 : Overview of Proposed Golf Courses by Status

Maui County

Maui Island

Golf Course	Type	Location	Acres	Holes	Nearest Land Use	Status
Lahaina HFDC	Public	Lahaina	150	18	Sugarcane	Received major State/County approvals
Maui Lani	Daily fee/public play	Kahului	172	18	Pasture	Received major State/County approvals
Keola Hana Maui	Resort	Hana	243	18	Fallow	Needs County approvals
Waihe'e	Daily fee/public play	Waihe'e	313	18	Golf course, res., open	Needs county approvals
Wailea 670	Resort	Wailea	360	18	Pasture	Needs County approvals
Haleakala Ranch	n.a.	Kihei/Kula	n.a.	36	Fallow	No official submittal
Kaanapali	n.a.	Kaanapali	160	18	Sugarcane	No official submittal
Kaono Ulu Ranch	n.a.	Kihei/Kula	n.a.	18	Pasture	No official submittal
Lahaina, Launiupoko	n.a.	Lahaina	300	18	Pasture	No official submittal
Maalaea, Kealia	n.a.	Maalaea	n.a.	36	Sugarcane	No official submittal
Ulupalakua Ranch	n.a.	Kihei/Kula	n.a.	18	Pasture	No official submittal
Wailea Gold	Resort	Wailea	n.a.	18	Fallow	No official submittal

Moloka'i

Golf Course	Type	Location	Acres	Holes	Nearest Land Use	Status
Molokai Highlands	Membership	Kualapu'u	n.a	18	Residential	Needs County approvals
Kaluakoi, Kukui	Resort	West Moloka'i	360.7	27	Residential	Needs County approvals
Kaluakoi, Kukui	Resort	West Moloka'i	547.6	27	Resort	Needs County approvals
Laau Point/Haleolono	Resort; employee	S.W. Moloka'i	n.a	27	Pasture	No official submittal
Maunaloa, Molokai Ranch	n.a	Maunaloa	n.a	9	Pasture	No official submittal
Maunaloa, Molokai Ranch	n.a	Maunaloa	n.a	18	Pasture	No official submittal

Lana'i

Golf Course	Type	Location	Acres	Holes	Nearest Land Use	Status
Manele	Resort	Lana'i City	200	18	Fallow	Needs County approval

Source: Earthplan

Table 2: Overview of Proposed Golf Courses by Status
Hawai'i County

Golf Course	Type	Location	Acres	Holes	Surrounding Uses	Status
Huehue Ranch Golf Course	Daily fee/public play	North Kona	No listing of acreages available	18	Pasture	Under construction
Ka'upulehu Resort #1	Resort	North Kona		n.a.	Vacant; resort	Under construction
Kona Country Club	Resort	North Kona		9	Vacant	Under construction
Mauna Lani (second course)	Resort	South Kohala		18	Vacant	Under construction
Otaka Country Club	Resort	Hamakua		18	Vacant	Under construction
South Kohala Resort	Resort	South Kohala		18	Vacant	Under construction
Waikoloa Highlands Golf Course	Resort	South Kohala		18	Vacant	Under construction
Kaloko Golf Course	n.a.	North Kona		18	Vacant	Received major State/County approvals
Ka'upulehu Resort #2	Resort	North Kona		36	Vacant	Received major State/County approvals
Kohala Ranch	Daily fee/public play	North Kohala		18	Vacant	Received major State/County approvals
Kohanaiki Resort	Resort	North Kona		18	Vacant	Received major State/County approvals
Komohana	Daily fee/public play	Hilo		18	Vacant	Received major State/County approvals
Regent Beach Golf Course #1	Resort	Kuhio		18	Vacant	Received major State/County approvals
Regent Beach Golf Course #2	Resort	Kuhio		18	Vacant	Received major State/County approvals
O'oma II	Resort	North Kona		18	Vacant	In State Land Use process
Waikoloa Heights	Daily fee/public play	South Kohala		18	Vacant	Needs County approvals
Hawaiian Riviera Resort (3)	Resort	Ka'u		54	Vacant	Needs County approvals
Kona Municipal Golf Course (Kealakehe)	Municipal	North Kona		18	Vacant	Needs County approvals
Oneloa Golf Course at Pohoiki (2)	Resort	Puna		36	Vacant	Needs County approvals
Puako (6)	Daily fee/public play	North Kona		108	Vacant	Needs County approvals
Royal Vista Golf & Country Club	Daily fee/public play	Pu'uana'hulu		27	Pasture	Needs County approvals
Signal Puako (Ouli)	Daily fee/public play	South Kohala		18	Pasture	Needs County approvals
Waikoloa Beach Resort II	Resort	South Kohala		18	Vacant	Needs County approvals
Waikoloa Beach Resort III	Resort	South Kohala		18	Vacant	Needs County approvals
Chalon International	n.a.	Mahukona		18	n.a.	No official submittal
Kealakekua Bay	Daily fee/public play	South Kona		18	Vacant	No official submittal
Manini'owali	Daily fee/public play	North Kona		18	Vacant	No official submittal

(*) It is assumed that the membership courses will be required to provide public play.

Source: Earthplan

Table 2 : Overview of Proposed Golf Courses by Status
Kaua'i County

Golf Course	Type	Location	Acres	Holes	Nearest Land Use	Status
Hemmeter/Ninini Point	Daily fee/public play	Ninini Point	140	18	Airport	Pending construction
Kilauea	Daily fee/public play	Kilauea	200	18	Agriculture	In State Land Use process (in litigation)
Poipulani	Daily fee/public play	Poipu	150	18	Fallow	In State Land Use process
Wailua	Municipal	Wailua	150	18	Fallow	Needs County Approval
A&B	Daily fee/public play	S.W. Kaua'i	233	18	Fallow; agriculture	Needs County approval
Grove Farm	Daily fee/public play	Lihue	171	18	Agriculture	Needs County approval
Kihouna	Daily fee/public play	Kihouna Point	80	9	Fallow	Needs County Approval
Kikiaola	Daily fee/public play	West Maui	154	18	Fallow	Needs County approvals

Source: Earthplan

Table 3

Regulations & Authorities Specific to Golf Courses¹					
Land Use District	State of Hawaii	Kauai	C&C Honolulu	Maui	Hawaii
<u>State Land Use District Classification²</u>	DOH, applies to all sites in any land use district. DWRM, non-degradation of aquifer policy applies if site is in a designated water management area.				
Conservation General or Resource Subzones	DLNR, DOA -- no special rules for golf courses, but precedents for special requests.				
Agricultural		Zoning: None	Zoning: P-2	Zoning: Park Dist.	Zoning: Open
Class A & B Land	Counties must approve first, followed by Land Use Commission approval.	Planning Commission approval required: Special permit.	Planning Commission approval required: Special permit.	Planning Commission approval required: Special permit.	Planning Commission approval required: Special permit.
Class C, D & E Land	No LUC approval required. County approval required.	Use Permit: Planning Commission. The County has attached extensive requirements to golf course approvals.	Golf Course applications would be part of the annual Development Plan review process (Ord. 91-82). There are strict environmental requirements (Ord. 90-15).	Use Permit: Planning Commission. Precedent for administrative requirements [Ord. 2031 (PK-4); Ord. 2066 (Water)].	Use Permit: Planning Commission. No golf course specific requirements, but there is precedent of requesting special provisions (Ord. 90-105).
Urban		Normal County review and planning process.	Normal County review and planning process.	Normal County review and planning process.	Normal County review and planning process.

¹If there is no entry, then the same regulations regarding any land use apply to a golf course. An entry denotes that there are special regulations for golf courses as well. Other regulations may apply as well.

²The Rural State Land Use District is excluded from this table because of the small land area of this classification state-wide.

Table 4
AQUIFER CLASSIFICATION EXPLANATION

AQUIFER TYPE:		Hydrology†
1	Basal	Fresh water in contact with seawater
2	High Level	Fresh water not in contact with seawater
1	Unconfined	Where water table is upper surface of saturated aquifer
2	Confined	Aquifer bounded by impermeable or poorly permeable formations, and top of saturated aquifer is below groundwater surface
3	Confined or Unconfined	Where actual condition is uncertain

AQUIFER TYPE:		Geology‡
1	Flank	Horizontally extensive lavas
2	Dike	Aquifers in dike compartments
3	Flank/Dike	Indistinguishable
4	Perched	Aquifer on an impermeable layer
5	Dike/Perched	Indistinguishable
6	Sedimentary	Nonvolcanic lithology

†First two digits from hydrologic descriptors (ps. 1, 2).
‡Last digit from geologic descriptor.

STATUS CODE (GROUNDWATER)

Development Stage

- 1 Currently used
- 2 Potential use
- 3 No potential use

Utility

- 1 Drinking
- 2 Ecologically important
- 3 Neither

Salinity (mg/l Cl⁻)

- 1 Fresh (<250)
- 2 Low (250-1000)
- 3 Moderate (1000-5000)
- 4 High (5000-15,000)
- 5 Seawater (> 15,000)

Uniqueness

- 1 Irreplaceable
- 2 Replaceable

Vulnerability to Contamination

- 1 High
- 2 Moderate
- 3 Low
- 4 None

Table 5
Aquifer Codes and Water Usage of Golf Courses by Island

OAHU

Existing Golf Courses

<u>Course</u>	<u>Holes</u>	<u>MGD</u>	<u>Sector</u>	<u>System</u>	<u>Type</u>	<u>Status</u>
Hawaian Kai	36	1.2	Honolulu	Waialae	116/121	23421/21113
Waialae	18	0.6	Honolulu	Waialae	116/121	23421/21113
Ala Wai	18	0.6	Honolulu	Paloalo	116/121	23321/11113
Oahu CC	36	0.4	Honolulu	Kalihi	111	11111
W. Nagonski	9	0.2	Honolulu	Mbanaalua	116/121	23321/11113
Honolulu CC	18	0.6	Honolulu	Mbanaalua	116/121	23321/11113
Mbanaalua	9	0.2	Honolulu	Mbanaalua	116/121	23321/11113
Navy Marine	18	1.0	Honolulu	Mbanaalua	116/121	23321/11113
Hickam	27	1.5	Honolulu	Mbanaalua	116/121	23321/11113
Pearl CC	18	0.6	Pearl Harbor	Waianalu	111	11111
Ford Island	9	0.5	Pearl Harbor	Waianalu	116/121	12211/12312
Ted M. Keenan	18	0.6	Pearl Harbor	Waipahu	116/121	12211/12212
Mililani	18	0.4	Pearl Harbor	Waipahu	111	11111
Hawaian CC	18	0.6	Pearl Harbor	Waipahu	111	11111
West Loch	18	1.0	Pearl Harbor	Waipahu	116/121	12211/12212
Barbers Point	18	1.0	Pearl Harbor	Ewa	116/121	13321/13213
Ko Olina	18	1.0	Pearl Harbor	Ewa	116/121	13321/13213
Makaha Valley	18	0.6	Waianae	Makaha	116/122	13321/11113
Sheraton Makaha	18	0.6	Waianae	Makaha	116/122	13321/11113
Kalakaua	18	0.4	Central	Waiaawa	212	11111
Leilehua	18	0.4	Central	Waiaawa	212	11111
Turtle Bay	18	0.6	Windward	Koolauloa	116/121	12211/12213
Kahuku	9	0.3	Windward	Koolauloa	116/121	12211/12213
Bayview	18	0.4	Windward	Koolaupoko	116/122	12211/11122
Kaneohe Klipper	18	0.6	Windward	Waiananalo	116/122	12211/11113
Paoli	18	0.4	Windward	Koolaupoko	212	11111
Mid Pacific	18	0.4	Windward	Waiananalo	116/122	12211/11113
Olomana	18	0.4	Windward	Waiananalo	202	11111

Proposed Golf Courses

<u>Course</u>	<u>Holes</u>	<u>MGD</u>	<u>Sector</u>	<u>System</u>	<u>Type</u>	<u>Status</u>
Waiaawa	36	0.8	Pearl Harbor	Waiaawa	111	11111
Waikale	18	0.6	Pearl Harbor	Waipahu	111	11111
Kipapa Ridge	9	0.2	Pearl Harbor	Waiaawa	111	11111
Waianalu	18	0.6	Pearl Harbor	Waianalu	111	11111
Royal Kunia 1	18	0.6	Pearl Harbor	Waipahu	111	11111
Royal Kunia 2	18	0.6	Pearl Harbor	Waipahu	111	11111
Royal Kunia	18	0.6	Pearl Harbor	Waipahu	111	11111
Kunia	18	0.6	Pearl Harbor	Waipahu	111	11111
Hawaian Prince	27	1.5	Pearl Harbor	Ewa	116/121	13321/13213
Punaloa	18	1.0	Pearl Harbor	Waipahu	116/121	12211/12212
Ewa Marina	27	1.5	Pearl Harbor	Waipahu	116/121	12211/12212
Ewa Gantry	18	1.0	Pearl Harbor	Waipahu	116/121	12211/12212
Kapolei	18	1.0	Pearl Harbor	Ewa	116/121	13221/13213
Makahaalo	18	1.0	Pearl Harbor	Ewa	111	11111

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OAHU

Proposed Golf Courses

<u>Course</u>	<u>Holes</u>	<u>MGD</u>	<u>Sector</u>	<u>System</u>	<u>Type</u>	<u>Status</u>
Ko Ollina 2	18	1.0	Pearl Harbor	Ewa	116/121	13321/13213
Ko Ollina 3	18	1.0	Pearl Harbor	Ewa	116/121	13321/13213
Lualualei	18	1.0	Waianae	Lualualei	112	23321
Haleakala	18	1.0	Waianae	Lualualei		
Maiili Kai	18	1.0	Waianae	Lualualei	116/122	23421/23423
Waianae Kai	27	1.5	Waianae	Waianae	116/122	13311/23223
Makaha V. CC	9	0.3	Waianae	Makaha	116/122	13321/11113
Ohiokoolo	18	0.6	Waianae	Keaau	112	21211
Mokuleia	36	0.8	North	Mokuleia	116/121	13221/11113
Waialua	18	0.4	North	Waialua	111	11111
Haleiwa	9	0.2	North	Kawailoa	116/121	12211/12312
Lihi Lami	36	0.8	North	Kawailoa	111	11111
Turtle Bay	18	0.6	Windward	Koolauloa	116/121	12211/12213
Kahuku	18	0.6	Windward	Koolauloa	116/121	12211/12213
Punamano	54	1.8	Windward	Koolauloa	116/121	12211/12213
Malaekahana	18	0.6	Windward	Koolauloa	116/121	12211/12213
Malaekahana	18	0.6	Windward	Koolauloa	116/121	12211/12213
Waikane 1	27	0.6	Windward	Koolaupoko	212	11111
Waikane 2	18	0.2	Windward	Koolaupoko	212	11111
Waiehe Valley	18	0.4	Windward	Koolaupoko	212	11111
Heeia Kea	18	0.4	Windward	Koolaupoko	212	11111
Minami	18	0.2	Windward	Koolaupoko	212	11111
Kailua Drive	18	0.4	Windward	Koolaupoko	212	11111
Bay View	18	0.4	Windward	Koolaupoko	116/122	12211/11122
Royal Haw. 1	18	0.4	Windward	Koolaupoko	212	11111
Royal Haw. 2	18	0.4	Windward	Koolaupoko	212	11111

MAUI

Existing Golf Courses

Course	Holes	MGD	Sector	System	Type	Status
Maui CC	9	0.3	Central	Paia	116/111	33321/33321
Pukaalani	18	0.6	Central	Makawao	214/111	11121/21112
Makana	18	1.0	Central	Kaanapali	214/111	21121/11212
Waialea	36	2.0	Central	Kaanapali	214/111	21121/11212
Silversword	18	0.6	Central	Kaanapali	214/111	21121/11212
Kaanapali S.	18	1.0	Lahaina	Homokowai	116/111	33421/33322
Kaanapali N.	18	1.0	Lahaina	Homokowai	111	11111
Kapalua Bay	18	0.6	Lahaina	Honolulu	111	11111
Kapalua Village	18	0.6	Lahaina	Honolulu	111	11111
Kapalua Plant.	18	0.6	Lahaina	Honolulu	111	11111
Waiehu	18	0.4	Waialuku	Iao	116/121	22211/21113
Waikapu	18	0.6	Waialuku	Waikapu	116/121	23222/23223
Waikapu Slwd.	18	0.6	Waialuku	Waikapu	116/121	23222/23223
Maui Lani	18	1.0	Central	Kaunolu	116/111	12211/12212
Kihei	18	1.0				
Haleakala R	36	2.0				
Waialea	18	1.0	Central	Kaanapali	214/111	21121/11212
Waialea 670	36	2.0	Central	Kaanapali	214/111	21121/11212
HFDC	18	1.0	Lahaina	Homokowai	111	11111
Kaanapali	18	1.0	Lahaina	Homokowai	111	11111

Proposed Golf Courses

Course	Holes	MGD	Sector	System	Type	Status
Maui Lani	18	1.0	Central	Kaunolu	116/111	12211/12212
Kihei	18	1.0				
Haleakala R	36	2.0				
Waialea	18	1.0	Central	Kaanapali	214/111	21121/11212
Waialea 670	36	2.0	Central	Kaanapali	214/111	21121/11212
HFDC	18	1.0	Lahaina	Homokowai	111	11111
Kaanapali	18	1.0	Lahaina	Homokowai	111	11111
Keala Hana	18	0.6				
Waiehe	18	0.6	Waialuku	Waiehe	116/111	21111/11111
Waikapu	36	1.2	Waialuku	Waikapu	116/121	23222/23223
Launiupoko	18	1.0	Lahaina	Launiupoko		
Maalaea	36	2.0				
Ulu Palakua	18	0.6				

KAUAI

Existing Golf Courses

<u>Course</u>	<u>Holes</u>	<u>MGD</u>	<u>Sector</u>	<u>System</u>
Kauai Kiele	18	0.6	Lihue	Hanamaulu
Kauai Lagoons	18	0.6	Lihue	Hanamaulu
Poipu Bay	18	0.6	Lihue	Koloa
Kiahuna	18	0.6	Lihue	Koloa
Kukunuiolono	9	0.2	Lihue	Koloa
Princeville	27	0.8	Hanalei	Kaalihiwai
Prince	18	0.4	Hanalei	Kaalihiwai
Wailua	18	0.6	Lihue	Hanamaulu

Proposed Golf Courses

<u>Course</u>	<u>Holes</u>	<u>MGD</u>	<u>Sector</u>	<u>System</u>
Hennetier	18	0.6	Lihue	Hanamaulu
Grove farm	18	0.4	Lihue	Hanamaulu
Kilohana	9	0.3	Lihue	Hanamaulu
A&B	18	0.4	Lihue	Koloa
Poipulani	18	0.4	Lihue	Koloa
Kiikuaola	18	0.4	Waimea	Kekaha
Kilauea	18	0.4	Lihue	Kilauea
Wailua	9	0.3	Lihue	Hanamaulu

HAWAII

Existing Golf Courses

Course	Holes	MGD	Sector	System
Hilo Muni.	18	0.2	Northeast Mauna Loa	Hilo
Naniiloa	9	0.1	Northeast Mauna Loa	Hilo
Volcano	18		Kilauea	Pahoa
Sea Mt.	18	0.6	Southeast Mauna Loa	Maalehu
Discovery H.	18	0.6	Kilauea	Keaiwa
Kona CC	36	1.2	Hualalai	Keauhou
Waikoloa Beach	18	0.6	Hualalai	Kiholo
Waikoloa Vill.	18	1.0	Hualalai	Kiholo
Waikoloa	18	0.6	Northwest Mauna Loa	Anaehoomalu
Mauna Lani	18	1.0	Northwest Mauna Loa	Anaehoomalu
Mauna Kea	18	1.0	West Mauna Kea	Waimea
Hanalei CC	9	0.2	East Mauna Kea	Honokaa

Proposed Golf Courses

Course	Holes	MGD	Sector	System
Riviera	54	1.8	Southeast Mauna Loa	Kailae
Kona	9	0.3	Hualalai	Keauhou
Kamalekua	18	0.6	Southwest Mauna Loa	Kamalekua
Kohalaiki	18	1.0	Hualalai	
Kaloko	18	1.0		
Kaupulehu	36	2.0	Hualalai	Keauhou
Oono	18	1.0	Hualalai	Keauhou
Konohana	18	0.4		
Royal Wista	27	1.5	Hualalai	Kiholo
Waikoloa 2	18	1.0	Hualalai	Kiholo
Mauna Lani 2	18	1.0	Northwest Mauna Loa	Anaehoomalu
Waikoloa Beach	18	1.0	Hualalai	Kiholo
Ouli	36	2.0	West Mauna Kea	Waimea
Kohala Ranch	18	0.6	Kohala	Mauihona
S. Kohala	18	1.0	Northwest Mauna Loa	Anaehoomalu
Hanalei	18	0.4	East Mauna Kea	Honokaa
Huehue	18	1.0	Hualalai	Kiholo
Regent Beach 1	18	0.6		
Regent Beach 2	18	0.6		
Waikoloa Hills	18	0.6		
Kona Muni.	18	0.6		
Oneloa	36	0.8		
Puako	108	3.6		
Chalco	18	1		
N. Kona	18	1.0		

MOLOKAI

Existing Golf Courses

<u>Course</u>	<u>Holes</u>	<u>MGD</u>	<u>Quality</u>	<u>Sector</u>
Kaluakoi	18	1.0	P	West
Ironwood Hills	9	0.3	P	Central

Proposed Golf Courses

<u>Course</u>	<u>Holes</u>	<u>MGD</u>	<u>Sector</u>	<u>System</u>
Molokai H.L.	18	0.4	Central	Kualapuu
Kaluakoi	27	1.5		
Kaluakoi	27	1.5		
Laa Pointt	27	1.5		
Maunaloa	9	0.5		
Maunaloa	18	1.0		

LANAI

Existing Golf Courses

<u>Course</u>	<u>Holes</u>	<u>MGD</u>	<u>Sector</u>	<u>System</u>
Cavendish	9	0.2		
Kaale	18	0.4		

Proposed Golf Courses

<u>Course</u>	<u>Holes</u>	<u>MGD</u>	<u>Sector</u>	<u>System</u>
Manele	18	1.0		

Table 6

Key:

Historical Community Issues Regarding Golf Courses

Frequently raised

Sometimes raised

Appears to not be an issue

	Rural	Suburban Urban Fringe	Planned for Major Growth	Urban
Will eventually cause urbanization, starting with luxury housing and visitor condos				
Will change local culture and lifestyle				
Competition with farmers for land and water				
Will change the character of the area by urbanizing open space				
Negatively impact archaeological resources				
Local people will feel or be excluded				
Will increase and diversify job supply				
Foreign ownership and membership means loss of local control				
Question need and feasibility of currently numerous proposals				
Environmental impacts				

Table 7

Potential Social Impacts With No Non-Golf Benefits: Rural Communities

(assumes no impact fee or requirement for additional non-golf community benefits)

Municipal	Membership with Public Play	Resort	Membership Only
• Provides recreational alternative for local residents • Affordable for residents and visitors • Increased employment good, if moderate or high unemployment rate • If low unemployment rate, increased employment and possible in-migration • Environmental concerns, especially in light of the present natural setting • Environmental impacts may affect food gathering activities * Change in visual character to urban open space * Possible displacement of use which may have community value	• Provides recreational alternative for local residents • May be affordable to local residents • Increased employment good, if moderate or high unemployment rate • If low unemployment rate, increased employment means possible in-migration • Environmental concerns, especially in light of the present natural setting • Environmental impacts may affect food gathering activities • Possible indicator of future urbanization since historical association with other urban uses, such as housing • Possible displacement of use which may have community value • Change in visual character to urban open space	• Provides recreational alternative for local residents * Relatively expensive recreation * Increased employment good, if moderate or high unemployment rate • If low unemployment rate, increased employment and possible in-migration * Environmental concerns, especially in light of the present natural setting * Environmental impacts may affect food gathering activities * Amenity to an urban use which may stimulate future urbanization * Possible displacement of use which may have community value • Change in visual character to urban open space (manicured greens) • If local residents feel excluded from resort, likely to exacerbate "have/have not" problems	• Recreational value only if one joins the club * Increased employment good, if moderate or high unemployment rate * If low unemployment rate, increased employment and possible in-migration * Environmental concerns, especially in light of the present natural setting * Environmental impacts may affect food gathering activities * Possible indicator of future urbanization since historical association with other urban uses, such as housing • Possible displacement of use which may have community value • Change in visual character to urban open space (manicured greens) • Exclusionary aspect likely to exacerbate "have/have-not" problems

Table 8

Potential Social Impacts With No Non-Golf Benefits: Suburban Communities

(assumes no impact fee or requirement for additional non-golf community benefits)

Municipal	Membership with Public Play	Resort	Membership Only
• Provides recreational alternative for local residents • Affordable to residents and visitors • Increased employment likely to not affect growth, since area is accessible and workers can commute to golf course • Environmental concerns mostly dealing with the cumulative impacts of this and other development • Preservation of open space for existing and future community • Compatible with surrounding residential use	• Provides recreational alternative for local residents • May be affordable to local residents • Increased employment likely to not affect growth, since area is accessible and workers can commute to golf course • Environmental concerns mostly dealing with the cumulative impacts of this and other development • Preservation of open space for existing and future community • Possible association with urban expansion • Compatible with surrounding residential use	• Provides recreational alternative for local residents • Relatively expensive recreation • Increased employment likely to not affect growth, since area is accessible and workers can commute to golf course • Environmental concerns mostly dealing with the cumulative impacts of this and other development • Preservation of open space for existing and future community • Amenity to an urban use which may stimulate or induce future urbanization • Contribute to social diversity initiated by other visitor facilities • If local residents feel excluded from resort, likely to exacerbate "have/have not" problems	• Recreational value only if one joins the club • Increased employment likely to not affect growth, since area is accessible and workers can commute to golf course • Environmental concerns mostly dealing with the cumulative impacts of this and other development • Possible association with urban expansion • Preservation of open space for existing and future community • Exclusionary aspect likely to exacerbate "have/have not" problems

Table 9

Potential Social Impacts With No Non-Golf Benefits: Communities Planned for Future Growth
(assumes no impact fee or requirement for additional non-golf community benefits)

Municipal	Membership with Public Play	Resort	Membership Only
• Provides recreational alternative for local residents • Economically accessible recreation • Increased employment likely to not affect growth, since housing supply is expected to significantly increase • Environmental concerns, mostly dealing with the cumulative impacts of this and other development • Preservation of open space for existing and future community	• Provides recreational alternative for local residents • May be affordable to local residents • Increased employment likely to not affect growth, since housing supply is expected to significantly increase • Environmental concerns, mostly dealing with the cumulative impacts of this and other development • Preservation of open space for existing and future community • Very likely that course is part of a growth-stimulant project consistent with public policy • Will contribute to social diversification by bringing in golfers	• Provides recreational alternative for local residents • Relatively expensive recreation • Increased employment likely to not affect growth, since housing supply is expected to significantly increase • Environmental concerns, mostly dealing with the cumulative impacts of this and other development • Preservation of open space for existing and future community • Amenity to an urban use which may stimulate or induce future urbanization which is likely to be consistent with public policy • Will contribute to social diversification by supporting the resort • If local residents feel excluded from resort, likely to exacerbate "have/have not" problems	* Recreational value only if one joins the club • Increased employment likely to not affect growth, since housing supply is expected to significantly increase • Environmental concerns, mostly dealing with the cumulative impacts of this and other development • Preservation of open space for existing and future community • Exclusionary aspect likely to exacerbate "have/have not" problems

Table 10

Potential Social Impacts With No Non-Golf Benefits: Urban Communities

(assumes no impact fee or requirement for additional non-golf community benefits)

Municipal	Membership with Public Play	Resort	Membership Only
• Provides recreational alternative for local residents • Economically accessible recreation • Increased employment likely to not affect population growth, since housing supply is already present • Environmental concerns, mostly dealing with the cumulative impacts of this and other development • Open space value is highly positive • May cause displacement because of limited land supply	• Provides recreational alternative for local residents • May be affordable to local residents • Increased employment likely to not affect population growth, since housing supply is already present • Environmental concerns, mostly dealing with the cumulative impacts of this and other development • Open space value is highly positive • May cause displacement because of limited land supply	• Provides recreational alternative for local residents • Relatively expensive recreation • Increased employment likely to not affect population growth, since housing supply is already present • Environmental concerns, mostly dealing with the cumulative impacts of this and other development • Open space value is highly positive • Amenity to an urban use which is likely already part of the urban fabric • If local residents feel excluded from resort, likely to exacerbate "have/have not" problems • May cause displacement because of limited land supply	• Recreational value only if one joins the club • Increased employment likely to not affect population growth, since housing supply is already present • Environmental concerns, mostly dealing with the cumulative impacts of this and other development • Open space value is highly positive • Exclusionary aspect likely to exacerbate "have/have not" problems • May cause displacement because of limited land supply

Appendix D



STATE OF HAWAII DEPARTMENT OF HEALTH

January, 1992 (Version 4)

TWELVE (12) CONDITIONS APPLICABLE TO ALL NEW GOLF COURSE DEVELOPMENT

The following conditions are recommended for all new golf course development in Hawaii to assure that environmental quality is preserved and enhanced as it relates to human health and the protection of sensitive ecosystems. Additional conditions may be imposed based on site-specific considerations.

1. Baseline groundwater/vadose zone and/or, if appropriate, coastal water quality shall be established. Once the sampling plan has been determined and approved by the State Department of Health, the owner/developer shall establish the baseline groundwater/vadose zone water quality, and, if appropriate, nearshore water quality, and report the findings to the State Department of Health. Analyses shall be done by a laboratory approved by the Department of Health.
2. The owner/developer and all subsequent owners shall establish a groundwater monitoring plan and system which shall be presented to the State Department of Health for its approval. The groundwater monitoring plan and system shall minimally describe the following components:
 - a. A monitoring system tailored to fit site conditions and circumstances. The system shall include, and not be limited to, the use of monitoring wells, lysimeters, and vadose zone monitoring technologies. If monitoring wells are used, the monitoring wells shall generally extend 10 to 15 feet below the water table.
 - b. A routine groundwater monitoring schedule of at least once every six (6) months, or more frequently, if required by the State Department of Health in the event that the monitoring data indicates a need for more frequent monitoring.
 - c. A list of compounds which shall be tested for as agreed to by the State Department of Health. This list shall include, but not be limited to the following: total dissolved solids; chlorides; PH; nitrogen; phosphorus; and other compounds associated with fertilizers, biocides, or effluent irrigation.

3. If the data from the monitoring system indicate increased levels of a contaminate that poses, or may pose, a threat to public health and the environment, the State Department of Health shall require the owner to take immediate action to stop the source of contamination. Subsequently, the owner shall mitigate any adverse effects caused by the contamination.
4. Owner/developer shall provide sewage disposal for the clubhouse and other facilities by connecting to the public sewer system or by means of a treatment individual wastewater system approved by the Department of Health in conformance with Administrative Rules, Title 11, Chapter 62, Wastewater Treatment Systems. The use of wastewater for irrigation will be generally encouraged, with appropriate controls (see Condition 5).
5. If a wastewater treatment works with effluent reuse becomes the choice of wastewater disposal, then the owner/developer, and all subsequent owners, shall develop and adhere to a Wastewater Reuse Plan which shall incorporate the provisions of the Department of Health's Guidelines for the Use of Reclaimed Water which includes:
 - a. An Irrigation Plan encompassing buffer distances, pipe and appurtenance placement, and labeling.
 - b. An Engineering Report encompassing treatment options and treatment levels.
 - c. Hydro-geologic and hydrologic surveys to determine application rates, sizing and storage needs.
 - d. A monitoring plan.
 - e. A management plan.
 - f. Public and employee education plans.
6. Underground storage tanks (USTs) used to store petroleum products for fueling golf carts, maintenance vehicles, and emergency power generators that pose potential risk to groundwater shall be discouraged. Use of electric golf carts and above-ground storage tanks for emergency power generators shall be encouraged.

Should the owner/developer/operator plan to install USTs that contain or other regulated substances, the owner/developer/operator must comply with the federal UST technical and financial responsibility requirements set forth in Title 40 of the Code of Federal Regulations Part 280. These federal rules require, among other things, owners and operators of USTs to meet specific requirements in release detection and response, and subsequent corrective action. Also, the owner/developer/operator must comply with all State UST rules and regulations pursuant to the Hawaii Revised Statutes, Chapter 342-L, Underground Storage Tanks.

7. Buildings designed to house the fertilizer and biocides shall be bermed to a height sufficient to contain a catastrophic leak of all fluid containers. It is also recommended that the floor of this room be made **waterproof** so that all leaks can be contained within the structure for cleanup.
8. A golf course maintenance plan and program will be established based on "Best Management Practices (BMP)" in regards to utilization of fertilizers and biocides as well as the irrigation schedule. BMP's will be reviewed by the State Department of Health prior to implementation.
9. Every effort shall be made to minimize the amount of noise from golf course maintenance activities. Essential maintenance activities (e.g., mowing of greens and fairways) shall be conducted at times that do not disturb nearby residents.
10. Solid waste shall be managed in a manner that does not create a nuisance. Whenever possible, composting of green wastes for subsequent use as a soil conditioner or mulching material is encouraged. The composting and reuse should be confined to the golf course property to eliminate the necessity for offsite transport of the raw or processed material.
In addition, during construction, the developer should utilize locally-produced compost and soil amendments whenever available.
11. Fugitive dust shall be controlled during construction in accordance with Hawaii Administrative Rules, Title 11, Chapter 60, Air Pollution Control. Pesticides and other agricultural chemicals should be applied in a manner that precludes the offsite drift of spray material. The State Department of Agriculture should be consulted in this regard.
12. To avoid soil runoff during construction, the developer should consult with the U.S. Department of Agriculture, Soil Conservation Service to assure that best management practices are utilized. If the total project area is five (5) acres or more and the development activities include clearing, grading, and excavation, a National Pollutant Discharge Elimination System (NPDES) stormwater permit application shall be submitted to the Department of Health in accordance with the Federal Clean Water Act requirements.

If there are any questions regarding the twelve (12) conditions mentioned here, please contact the Environmental Planning Office at 586-4337. We appreciate your cooperation in preserving and protecting environmental quality in Hawaii.

APPENDIX E

WATER RESOURCES

Conversion of land to golf course and activities performed to maintain them may substantially affect the condition of water resources to which the courses are tributary. Surface runoff rinses fertilizers and biocides, depositing them in streams, and subsurface percolation of rainfall and surplus irrigation carries them to ground water. The quantity of contaminants transported either to streams or ground water depends on the management of the maintenance operations as well as on natural variables such as rainfall, topography, and geology. Always, however, some of the applied chemicals escape into the hydrological environment where they may become detectable pollutants.

In addition to generating potentially deleterious effects on the quality of surface water and ground water, maintenance operations compete for water supply in locations where only exploitable potable water exists. A typical 18-hole golf course in a dry but not arid climate in Hawaii requires an average of 0.5 to 1.0 mgd for irrigation, which is comparable to the demand for 3,000 to 6,000 people. Many golf courses, however, are irrigated with non-potable water having greater than 250 mg/l chloride. For best maintenance of grasses, the irrigation supply should not have more than 750 mg/l chloride, but many courses have to use water having salinities as high as 1500 mg/l. When brackish water irrigates courses that overlie fresh water aquifers, the ambient ground water suffers quality deterioration.

Clearly golf course location and maintenance practices have the potential to affect the quality and quantity of both surface water and ground water resources. In some instances the effects are undetectable and inconsequential, in others significant risks may arise. Keeping a golf course green and attractive resembles an agricultural enterprise. In both, surplus irrigation is practiced and an array of fertilizers and biocides are applied. The irrigation requirements compete for water in areas where the supply is marginal, and inevitably a fraction of the chemicals are entrained in surface runoff and subsurface percolation.

GEOLOGICAL CONTROLS ON WATER RESOURCES

The primal rock formations constituting the Hawaiian Islands are mid-ocean basalts which were laid down as innumerable thin lava layers that emanated from rift zones anchored to calderas. Toward the end of the primary phase of volcanism, in large regions andesitic rocks formed a

mantle over the volcanic shield. Long after the primary volcanos had become dormant, secondary eruptions flowed onto the eroded terrain. Sedimentary deposits, comprised of erosional debris and biogenic growth (e.g., coral reefs), accumulated along the margins of the islands and extended inland in valleys. Changes in sea level over geologic time controlled the placement of the sediments.

The volcanic rocks belong to three broad categories: 1) primal basalt, 2) andesitic rocks (hawaiite, mugearite) and 3) post erosional volcanics. The disposition of water on and within these rocks differs greatly, and the differences need to be considered when evaluating the effects of golf courses on water resources. The basalts constitute the principal aquifers throughout the islands. Virtually all truly important ground water development exploits aquifers in basalt. Andesitic rocks cover basalts in many areas and are particularly widespread on the Island of Maui. Andesite aquifers are poor in comparison to those in basalt and generally are small, frequently consisting of permeable lenses and layers of rubble resting on massive, low permeability lavas. The area of post erosional volcanics is substantial on Kauai, less on Maui and Oahu, virtually absent on Molokai, of very small but uncertain extent on Hawaii, and missing on Lanai. Aquifers in these rocks are small and not regionally extensive, and their development is limited.

The structural and geomorphic domains in which volcanic rocks occur are classified in three general types: 1) caldera, the central focus of the original main volcano, 2) rift zones, which are structural lineations radiating from calderas and from which the bulk of the lavas was extruded, and 3) flanks, the enormous piles of lava forming the shields of the volcanoes. Caldera rocks are poorly permeable and restricted in area; rift zones contain the dikes which impound water in small aquifers at high levels; and flanks are the main mass of lavas in which the most extensive and voluminous aquifers occur. Caldera rocks are rarely exploited as aquifers; dike aquifers in rift zones are a valuable source of water, and flanks embrace aquifers which yield most of the ground water developed.

Sedimentary deposits are limited to coastal margins and valleys of the islands. Where they occur along coasts they consist of terrestrial and marine accumulations, and because of the complexity of deposition often behave as low permeability caprock. Appreciable portions of Oahu, Maui, Molokai, and Kauai are rimmed with sediment wedges, but in Hawaii and Lanai only thin, discontinuous deposits interfere with direct contact between volcanic rock and the sea. The aquifers in sedimentary rocks are not used for water supply. Only the uppermost aquifer in the sequence normally has utility, but only for irrigation. Deeper aquifers are too saline.

In the valleys at elevations above about 40 feet sediments consist of partly indurated to loose alluvium and piles of slope wash (talus). These sediments do not serve as exploitable aquifers, but they are important as catchment and temporary storage for recharge.

With reference to the simplified hydrogeological classification described above, it is clear that the geological domain in which a golf course is located is the most fundamental environmental variable relating to the effects of golf course maintenance on water supply. Typical ground water occurrences in important geological categories are summarized as follows.

Category	Comments
Flank basalt	Principal aquifers
Flank andesitic rocks	Form a mantle on underlying basalt. Not important as major aquifers. Often contain perched water.
Rift zone basalt	Important high level aquifers. Source of perennial stream flow.
Caldera rocks	Small, poor aquifers. Contribute to base flow of streams.
Post erosional volcanics	Small to moderate size aquifers.
Sediments	Brackish to saline water aquifers. Use restricted to irrigation.

Manifestly a golf course located directly above a flank basalt aquifer should be of greater concern than one placed on caldera rock or on sediments. Not all locations are equal.

SURFACE WATER

Stream water may be affected by golf course operations either from direct overland runoff or seepage of ground water that passed beneath the course. Overland flow entrains material, including fertilizers and biocides, and transports it to streams. This type of runoff is usually restricted to periods of heavy rainfall and is controlled by the nature of the ground surface. Ground water seepage, on the other hand, is continuous, and in areas where it takes place it accounts for the base flow of perennial streams.

Ground water seepage to streams is rare where flank basalts comprise the geological milieu. Streams are not perennial except where rainfall is very high. Infiltrate moves vertically to combine with ground water in the saturated zone. Where flank rocks are andesitic, small perched aquifers contribute spring flow to spring channels. A chief contributor to perennial streams on all islands is ground water seepage from rift zone basalt (dike aquifers). The post erosional volcanics on Kauai sustain the low flows of many streams in the eastern portion of the island. Alluvial sediments in valleys slowly release water but not in sufficient volume over long periods to insure perennial flow except in very high rainfall areas.

GROUND WATER

The occurrence of ground water has already been discussed to some extent in the description of hydrogeological environments. As noted in that discussion, the most voluminous aquifers are found in flank basalts, but rift zone dike aquifers, though much smaller, yield valuable supplies. Aquifers in other environments typically are less significant as opportunities for large scale water development.

In the simplest classification of ground water in Hawaii, aquifers are either basal or high level. Basal aquifers contain fresh to brackish water in the form of a lens resting on sea water; in high level aquifers ground water is not hydraulically continuous with sea water. Most basal aquifers occur in flank volcanics while much high level ground water is impounded in dike compartments. However, basal water also exists in rift zones at low elevations, and high level ground water is found in perched aquifers in flank volcanics.

In basal aquifers ground water travels at a rate of 3 to 10 ft/day, but in high level aquifers movement is by leakage and depends on the volume of water accumulated. The volume of water in basal lenses depends on head (elevation of the water table above sea level); the higher the head, the greater the volume of fresh-brackish water below sea level. Volumes in high level aquifers are very much smaller. A contaminant added to a basal aquifer may escape detection because of the possibility of high dilution, whereas in a high level aquifer contaminants are likely to retain their identities because of lower volume and flow rate.

Ground water is the accumulation of infiltration in a zone of saturation in the rock mass. Pristine ground water originates as percolation from rainfall and undisturbed stream flow. In an area of development - agricultural, urban, golf course - the infiltrate will carry anthropomorphically derived constituents. The impact of these constituents on the quality of the pristine ground water

depends on their concentration in the infiltrate, the path followed, changes in concentration and composition during passage, and the volume of ambient ground water with which the residuals mix. In most cases, infiltrate must percolate through a soil layer one to two feet thick; subsoil several feet thick; a deep section of saprolite, which is weathered rock in its original position, as much as 100 feet or more thick; then unaltered fresh rock until it finally settles on and mixes with ground water in the saturated aquifer. The soil is a strongly reactive medium that often alters the nature of the contaminant. The subsoil and saprolite are efficient filters and absorbers. Once in the fresh rock the percolate is assumed to retain its residual identity. In the saturated aquifer mixing and dilution take place. As the mixture travels with the ambient flow, the concentration of contaminants is further reduced by dispersion.

MODELS OF CONTAMINATION

Contamination is modeled by analytical techniques (classical mathematics) and numerical methods (essentially computer mathematics). Both approaches are constrained by assumptions and simplifications. Aquifer characteristics in each approach are obtained from pump tests and the estimates normally are reasonable. Where dispersion is included in a model, on the other hand, the fundamental constants of dispersivity are assumed because tests have not been devised to give accurate values. Simplifications consist of assigning aquifer boundaries and compositional features. Mathematical boundaries are also assigned.

Analytical models are restricted to providing global equations for describing ground water behavior, usually in one or two dimensions. Numerical models can incorporate local details and thus can provide a more accurate picture of behavior if the original assumptions and simplifications are valid. Three dimensional numerical models are possible but not often employed because of their complexity and the amount of computer time required.

To gain insight about ground water contamination and to provide reasonable estimates of changes in concentration as a result of mixing, a relatively simple advection mixing model can be employed. Advection means transport of the contaminant with the ambient ground water without taking into account dispersion. In the model the contaminant mixes with a volume of ambient ground water and travels down the flow path. The steady state distribution of the contaminant along a line down gradient of the point of contamination is determined. Neglecting dispersion does not significantly affect the concentration gradient because the longitudinal dispersivity constant in basaltic rock is likely to be 100 to 200 times greater than the transverse dispersivities. The contaminant plume will not spread widely as it moves down the ground water flow path.

The model allows for percolation from a golf course containing whatever contaminants are assumed. The percolate mixes with the ground water beneath the golf course, then continues flowing down gradient beyond the boundary of the course. In the reach between the golf course and the discharge line, such as the coast, infiltration from rainfall is added, diluting the ground water mixture. The percolation carrying fertilizers and biocides is assumed to be continuous, and the depth of mixing in the ambient ground water is taken as a single value, although the model can be expanded to handle variable depths of mixing.

An accompanying graph illustrates what happens to contaminant concentrations down gradient of the golf course for a range of average rainfall recharge rates. The depth of mixing is 10 feet and the ambient ground water velocity is 10 ft/day, which is typical of basal aquifers in basalt. Along the vertical axis the ratio of the concentration to the original concentration in the first cell is given. Along the horizontal axis is distance down gradient of the edge of the golf course.

For example, when the average annual recharge rate is 10 inches, which would happen where average annual rainfall is 40 to 50 inches; at a distance 5000 feet from the golf course the contaminant concentration would be about 32 percent of its original strength in the first cell. A concentration of 10 mg/l nitrogen (N), for instance, would decay to about 3 mg/l a mile or so down gradient of the golf course. For higher rainfall recharge, the residual constituent concentration would be considerably less, virtually vanishing when recharge is greater than 40 inches per year. The graph displays the significance of dilution.

The graph also points out the obvious fact that down gradient concentration depends on rainfall infiltration; the lower the recharge, the greater the retention of the original concentration.

GEOLOGICAL CONTROLS ON WATER RESOURCES AQUIFER CLASSIFICATION AND GOLF COURSE LOCATION

The Aquifer Classification which is being created on an island by island basis for the State Department of Health, is a practical reference frame for making an initial assessment of the potential effects golf courses may have on water resources. Classification has been completed for Oahu, Maui and Kauai, and a general outline has been drafted for the other islands. The project will be completed in 1992.

A full explanation of the Aquifer Classification scheme is given in: John F. Mink and L. Stephen Lau, 1990, Aquifer Identification and Classification for Maui; Groundwater Protection Strategy for Hawaii; University of Hawaii Water Resources Research Center Technical Report,

185. In brief, the classification scheme is based on a hierarchy of descriptors beginning with general location by Island and Sector, to which belongs a set of Aquifer Systems, within which are a variety of Aquifer Types. Sectors primarily reflect broad hydrogeological features and secondarily geography. Aquifer Systems are more specifically defined by hydrogeological continuity, in particular hydraulic connections among units. Aquifer Types are differentiated by distinctive features of hydrology and geology.

The classification category of the most direct interest to water use and potential contamination is the Aquifer Type. A compact description of the hydrology and geology of each Aquifer Type as a number code accompanies the locational information. The code is described below.

Hydrology - Aquifer Types are described as either basal or high level. The choices are:

<u>No.</u>	<u>Type</u>	<u>Description</u>
1	Basal	Fresh water in contact with sea water.
2	High Level	Fresh water not in contact with sea water.
1	Unconfined	Where the water table is the upper surface of the saturated aquifer.
2	Confined	Aquifer is bounded by impermeable or poorly permeable formations; top of the saturated aquifer is below the ground water potential surface.
3	Confined or Unconfined	Actual condition uncertain.

Using the above coding, ground water can be 11 (basal, unconfined) or 12 (basal, confined), or 21 (high level, unconfined) or 22 (high level, confined). Where confining conditions are unclear, the second number is taken as 3.

Geology. Aquifers are categorized as occurring in flank lavas of the volcanic domes, in rift zones characterized by dikes, as perched aquifers, or within the sedimentary sequence. The geologic codes are as follows:

<u>No.</u>	<u>Type</u>	<u>Description</u>
1	Flank	Horizontally extensive lavas.
2	Dike	Aquifers in dike compartments.
3	Flank/Dike	Indistinguishable
4	Perched	Aquifer on an impermeable layer.

5	Dike/Perched	Indistinguishable
6	Sedimentary	Non-volcanic lithology.

One of the above numbers attached to the two hydrology numbers completes the Aquifer Type.

Accompanying the Aquifer Code is the Status Code. This code describes the development stage, utility, salinity, uniqueness, and vulnerability to contamination of the Aquifer Types. The Status Code is conveniently attached to the Aquifer Code, and the combination is an efficient representation of location, hydrology, geology, utility, quality and contamination potential of ground water resources.

The five-digit Status Code consists of single number from each of five separate descriptive categories. They are:

Development Stage

- 1 Currently used
- 2 Potential use
- 3 No potential use

Utility

- 1 Drinking
- 2 Ecologically important
- 3 Neither

Salinity (mg/l Cl)

- 1 Fresh (<250)
- 2 Low (250-1000)
- 3 Moderate (1000-5000)
- 4 High (5000-15,000)
- 5 Sea Water (>15,000)

Uniqueness

- 1 Irreplaceable
- 2 Replaceable

Vulnerability to Contamination

- 1 High
- 2 Moderate
- 3 Low
- 4 None

Only one number from each category above is allowable in the Status Code. For instance, a currently developed ground water source (1), used for drinking (1), having a salinity of less than 250 mg/l Cl (1), being irreplaceable (1), and highly vulnerable to contamination (1) would have the Status Code 11111.

The scheme described above allows anyone to see at once the relationship between golf course location and ground water resources. It allows for an early assessment concerning, 1) competition for potable water, and 2) susceptibility of the ambient ground water to contamination.

Table 5 lists by island, all existing golf courses and the known proposed ones. The courses are listed in clockwise order starting at the main population center of each island. The courses are located by Aquifer Sector and System, and for those islands where classification has been completed (Oahu, Maui and Kauai) the Aquifer Type code and Status Code are listed. Also listed is an estimate of the irrigation requirement for each course.

The estimated average irrigation demand assumes an irrigated area of 100 to 120 acres for every 18 holes and is scaled by broad climate zones. These zones along with estimated demand are:

<u>Climate</u>	<u>Av. Rain (in/yr)</u>	<u>Av. Irrig. (mgd)</u>	<u>Av. Irrig. (in/wk)</u>
Arid	<20	1.0	2.6
Dry	20-40	0.6	1.5
<u>Climate</u>	<u>Av. Rain (in/yr)</u>	<u>Av. Irrig. (mgd)</u>	<u>Av. Irrig. (in/wk)</u>
Moist	40-60	0.4	1.0
Humid	>60	0.2	0.5

The demands listed in the table are estimates and linked to rainfall only. Other important variables are not considered, e.g., soil type, geology, topography. The estimates are not taken from actual operating data. Nevertheless, they reasonably suggest the magnitude of golf course irrigation demand.

The estimated demands are noted as whether the water is potable or non-potable. The categorization is not founded on information supplied by the golf courses but on either anecdotal or personal observations. A summary of the estimates are included in Table I-A at the end of the document.

Table 1A

Estimates of Average Demand Per 18 Holes
(mgd)

<u>Type</u>	<u>Kauai</u>	<u>Oahu</u>	<u>Maui</u>	<u>Molokai</u>	<u>Lanai</u>	<u>Hawaii</u>
Existing						
Potable	5.0	14	5.4	1.3	0.6	5.2
Non-potable	0	3.2	4.6	0	0	4.0
Total	5.0	17	10	1.3	0.6	9.2
Proposed						
Potable	3.5	16	3.0	0.4	0	8.0
Non-potable	0	13	12	6.0	1.0	16
Total	3.5	29	15	6.4	1.0	24
Total Potable	8.5	30	8.4	1.7	0.6	13
Total Non-pot.	0	16	17	6.0	1.0	20
Grand Total	8.5	46	25	7.7	1.6	33

APPENDIX F

UNDERSTANDING THE AQUIFER CLASSIFICATION CODES

For those islands where Aquifer Classification has been completed (Oahu and Maui), the Type code is a summary of the hydrological and geological environment in which the ground water occurs, and the Status code summarizes basic information relevant to ground water as a source of water supply. Although the complete codes have been prepared only for Oahu and Maui to date, the Kauai codes are in draft form and the codes for the other islands will be completed in 1992.

Familiarity with the codes comes about easily as they are put to use. the following examples will help familiarize the user with the codes.

I. Example: Oahu, Waialae Golf Course

Type 116/121

Explanation: The golf course is on an aquifer type (116) which overlies another aquifer type (121).

The upper aquifer is basal (1), unconfirmed (1), and composed of sediments (6).

The lower aquifer is also basal (1), unconfirmed (1), and composed of flank lavas (1).

This means that if the lower aquifer is the one in which useable ground water occurs, it is protected from direct contamination by the upper aquifer.

Status: 23432/21113

Explanation: The upper aquifer is not currently used but has potential use (2); but its water is not suitable for drinking nor is it ecologically important (3); salinity is high (4); it is replaceable, that is, it is not a vital resource (2); and because it is near the surface it is highly vulnerable to contamination (1).

The lower aquifer (21113) also is not currently used but has potential use (2); it may be developed to supply drinking water (1); it carries water with less than 250 mg/l chloride, the upper recommended limit for drinking water (1); is irreplaceable in the sense that any drinking water source in Oahu is irreplaceable (1); and because it is covered by a sedimentary aquifer has low vulnerability to contamination (3).

2. Example: Oahu, Mililani Golf Course.

Type: 111

Explanation: In this case the golf course overlies a single main aquifer. The ground water is basal (1), unconfined (1), and the aquifer consists of flank lavas (1).

Status: 11111

Explanation: Ground water is currently pumped from the aquifer (1); it is used for drinking (1); it is fresh (1); the resource is irreplaceable (1); and it is highly vulnerable to contamination (1).

REFERENCES

Mink, J.F., and Lau, L.S., 1009 Aquifer Identification and Classification for Oahu: Groundwater Protection Strategy for Hawaii, University of Hawaii, Water Resources Research Center, Technical Report 179.

Mink, J.F., and Lau, L.S., 1009 Aquifer Identification and Classification for Maui: Groundwater Protection Strategy for Hawaii, University of Hawaii, Water Resources Research Center, Technical Report 185.

Ordway, N., Gilbert, S.W., and Grady, M., 1990, Analyzing the Market and Environmental Impacts of the Golf Course Industry in Hawaii, University of Hawaii, College of Business Administration.

Professional Golfers Association, 1991, PGA Aloha Section.

APPENDIX G

COMPARISON OF THE USE OF PESTICIDES: GOLF COURSE, SUGAR CANE, PINEAPPLES, AND URBAN APPLICATIONS

Pesticides Branch, January 9, 1992

The 1991 Legislature required the Office of State Planning to prepare a report concerning the impact of golf courses on the State of Hawaii. The Pesticides Program was asked to prepare information comparing and contrasting the use of pesticides by different users, including golf courses. Four (4) sites were selected for presentation; golf courses, sugarcane, pineapples, and urban application.

Since pesticide usage is not reported or recorded for many sites, estimates were obtained from studies, unpublished data, or experts on the horticultural practices employed in the State of Hawaii. Golf course pesticide use estimates are based upon data collected by the University of Hawaii, College of Tropical Agriculture and Human Resources, Cooperative Extension Services. Hawaiian Sugar Planters' Association unpublished data was used to estimate sugarcane pesticide use. Pineapple data is an estimate supplied by a representative of the Pineapple Growers' Association. The urban use estimate is a best guess based on reasonable pest control in residences.

This summary presents pesticides data only, and does not attempt to address other contaminants (i.e. fertilizers, wastes from maintaining equipment, etc.) or factors that may exacerbate or mitigate the impact of pesticides on the environment (i.e. urban environments resulting in runoff to surface water, and agricultural field crops encouraging water retention and recharge of groundwater).

The selection of pest management practices depend upon many factors. Among the most important factors are:

1. The crop or site;
2. The damage, including reduction in yield, increased cost of harvesting, customer tolerance for pests or pest damage on a crop or site, caused by the pest. (It is worth noting that pest populations are influenced by weather, elevation, and other environmental factors, therefore, more herbicides and fungicides may be applied in wetter areas, drier areas may be subject to more insect pressure);
3. The stage of crop development when control can be achieved;

4. The stage of pest development when control can be achieved;
5. Time required to implement the pest management practices;
6. The cost to implement the pest management practice;
7. The likelihood that the pest control practice will succeed in reducing damage; and
8. The knowledge of the individual responsible for making pest management decisions.

These factors, and the knowledge of the persons making pest control decisions is responsible for a wide range of values on pesticides applied to the various sites below.

Site or Crop	Area 000A	Usage lb/A/yr	% of Total by Class of Pesticide				
			H	I	F	N	Other
Sugarcane	162	7.7	97	n	n	0	2
Pineapple	31	70-83	6	2	1	89	1
Golf courses	5	13.8	76	4	20	0	n
Residence		20.2	8	92			

n = negligible

no estimate was made for the area occupied by homes.

Classes of pesticides

H = Herbicides

I = Insecticides

F = Fungicides

N = Nematocides

Others - plant growth regulators, ripeners.

SITE DESCRIPTIONS

Sugarcane: Sugarcane is a two year crop in Hawaii. Almost all the herbicides are applied as preplant, pre-emergence, or before the cane becomes too dense to enter. Fungicides are applied to the seed peices. Insecticides are applied for mosquito abatement. Ripeners are applied to dessicate the sugarcane prior to harvest. Rodenticides are applied for rat control within the sugarcane (zinc phosphide only) and surrounding vegetation. Chlorine, which was not included in this estimate, may be used for bacteria and algae growth in irrigation systems.

Pineapple: Pineapple is a four to five year crop in Hawaii. With the phase out of canning, and the need for large fruit for the fresh fruit market, the crop cycle may be shortened. Nematocides constitute the greatest volume of pesticides used. Nematocide use ranges from 250 to 450 pounds per acre, depending upon the chemical selected, soil type, pest pressure, and other factors.

Golf courses: Golf courses may apply pesticides throughout the year. However, pest pressure may increase during wetter periods, resulting in the application of more fungicides and herbicides.

Residence: It is assumed that the average lot size in Hawaii is 8,000 square feet, therefore, 5.4 residences are calculated for each acre of land. The primary pest of houses is termites. Termiticide application begins with treating the wood, and the ground on which a house is built. Gas treatments for drywood termites are estimated to occur every 7 years. An average of approximately 10 pounds of gas is used per treatment. For ground termites, retreatment occurs about every three years. Approximately 6 pounds of insecticide are applied to the perimeter of a residence when treatments are made. Landscape pesticide use around residences is estimated to be approximately one-eighth of golf course use (assuming half the lot is occupied by a structure and asphalt or concrete and that only one in four residences use pesticides for ornamentals and turf). It should be noted that his estimate does not include the use of household insecticides, disinfectants, or wood preservatives.

Appendix H

A BILL

FOR

AN ORDINANCE PROVIDING FOR THE CREATION AND COLLECTION OF A SERVICE EXPANSION FEE AS A CONDITION OF ISSUING BUILD- ING PERMITS

WHEREAS, the City of Cherry Hills Village, Colorado is experiencing a period of

slowdown in the rate of growth and development and expects this situation to continue, and

WHEREAS, in order to provide for expansion of all services of the City, it is, in the judgment of the City Council, necessary and appropriate to provide additional sources of revenue for the funding of expanding services, and

WHEREAS, the period of one to two years elapses between the time that a building permit is issued and the City begins to receive property tax revenues,

NOW, THEREFORE, THE COUNCIL OF THE CITY OF CHERRY HILLS VILLAGE, COLORADO, ORDAINS:

Section 1. Definitions.

(a) Contractor. Any person, firm, partnership, joint venture, architect, or corporation, required to obtain a building permit pursuant to the Ordinances of the City of Cherry Hills Village, Colorado.

(b) Floor Area. The area of each floor and basement included within the summing of exterior walls of a building or portion thereof, measured from the inside of all exterior walls, including parking garages.

(c) Building Inspector. The official charged with the administration and enforcement of the Uniform Building Code as adopted by the City of Cherry Hills Village, Colorado, or his regularly authorized deputy.

(d) Building. Any enclosed structure without reference to use or occupancy for which a building permit is required by the Ordinances of the City of Cherry Hills Village, Colorado.

Section 2. Payment of Services Expansion Fee.

(a) Any owner, architect, contractor or other person applying for a building permit in accordance with the applicable Ordinances of the City of Cherry Hills Village, Colorado shall, as a condition to obtaining such building permit, pay to the City of Cherry Hills Village, Colorado a services expansion fee.

1) For any building constructed in R-1, R-2, R-3, R-4, R-5, F-1, RA-1, C-1 and

C-2 zoning districts as established and defined in the Zoning Ordinance for the City of Cherry Hills Village, Colorado, a services expansion fee of forty cents (40c) per square foot of total floor area, as herein defined, as the same may be determined from the plans and specifications submitted to the building official as part of the application for a building permit.

2) For any enclosed parking garage and recreational structure such as tennis courts and swimming pools constructed in R-1, R-2, R-3, R-4, R-5, F-1, RA-1, C-1 and C-2 zoning districts as the same are created, established and defined in the Zoning Ordinance for the City of Cherry Hills Village, Colorado a services expansion fee of fifteen cents (15c) per square foot of total area, as the same may be determined from the plans and specifications submitted to the building official as part of the application for a building permit.

(b) The service expansion fee shall apply to all new construction, all additions to existing structures and the substantial alterations or reconstruction of existing structures, except for churches, schools, governmental, municipal or quasimunicipal structures.

(c) Services expansion fee shall be due and payable at the time the building permit is issued. Under no circumstances shall the building official issue a certificate of occupancy until and unless the services expansion fee, as calculated in this section, has been paid in full.

Section 3. Effective Date.

The Service Expansion Fee provided for herein shall be due and payable with respect to all building permit applications filed with the City from and after the 1st day of November, 1979.

Section 4. Severability.

If any part, section, subsection, ... sentence of (sic) phrase of this Ordinance is for any reason held to be invalid, such decision shall not effect (sic) the validity of the remaining portions of this Ordinance; and the City Council for the City of Cherry Hills Village, Colorado hereby declares it would have

passed this Ordinance and each part, section, subsection, sentence, clause or phrases thereof, irrespective of the fact that any one or more parts, sections, subsections, sentences, clauses or phrases be declared invalid.

Adopted as Ordinance No. 7, Series of 1979, by the City Council of the City of Cherry Hills Village, Colorado and signed and approved by its Mayor and presiding officer this 2nd day of October, 1979.



TITLE 3 REVENUE AND TAXATION

Chapter 8 Development Excise Tax¹

Section:

- 3-8-1 Legislative Intent
- 3-8-2 Development Excise Tax Imposed on Commercial and Residential Development and Annexation of Developed Land
- 3-8-3 Waiver of Tax Imposed on Annexation of Developed Land
- 3-8-4 Development Excise Tax on Redevelopment
- 3-8-5 Development Excise Tax to be Revised
- 3-8-6 Development Excise Tax Revenues to be Earmarked
- 3-8-7 Development Excise Tax Credit
- 3-8-8 Collection of Unpaid Taxes

3-8-1 Legislative Intent.

The purpose of this chapter is to impose a development excise tax on persons engaged in commercial and residential development in the city to fund the costs of future capital improvements. The tax imposed by this chapter is based upon the replacement costs of the capital improvements currently existing in the city and is intended to provide that new capital improvement needs are met as commercial and residential development occurs. The development excise tax applies regardless of the value of the property developed. The development excise tax shall be imposed in addition to the park land acquisition and development fee imposed by Section 8-3-18, B.R.C. 1981, and the water and sanitary sewer plant investment fees imposed by Sections 11-1-52 and 11-2-31, B.R.C. 1981.

3-8-2 Development Excise Tax Imposed on Commercial and Residential Development and Annexation of Developed Land.

- (a) No person engaged in commercial or residential development in the city shall fail to pay the development excise tax in the amounts specified below prior to the scheduling of final building inspection. No person whose property is annexed into the city shall fail to pay the development excise tax in the amounts specified below no

later than ten days after the effective date of an annexation ordinance annexing such property.

- (1) For commercial development: seventy-nine cents for each square foot of floor area.

- (2) For residential development:

(A) One thousand eighteen dollars and eighty cents for each single-unit dwelling.

(B) Six hundred seventy-nine dollars and twenty cents for each dwelling unit in a multi-unit dwelling and each mobile home.

- (b) For purposes of this chapter:

(1) "Accessory use" means a portion of developed property that is incidental to but a necessary part of the principal development, which is operated for the benefit and convenience of the occupants, employees, and customers of or visitors to the principal development and which is served by any utility from the principal development.

(2) "Commercial development" means the principal use of developed property as other than a single-unit or multi-unit dwelling and includes, without limitation, motels, hotels, resorts and bed and breakfasts.

(3) "Development" and "developed property" means the construction or existence of any structure attached to real property.

(4) "Floor area" means the total square footage of all levels included within the outside walls of a building or portion thereof, but excluding courts and uninhabitable areas below the first floor level.

(5) "Mobile home" means a transportable single-family dwelling unit, suitable for year-round occupancy that contains the same water supply, waste disposal, and electrical conveniences as immobile housing; that has no foundation other than wheels or removable jacks for

¹Adopted by Ordinance No. 5044 (1987).

- b) conveyance on highways; and that may be transported to a site as one or more modules, but the term does not include "travel trailers," "campers," "camper buses," or "motor homes," or modular homes designed to be placed on a foundation.

(6) "Multi-unit dwelling" means a building used by two or more of the following groups of persons living independently of each other in separate dwelling units but not including motels, hotels, and resorts:

(A) The members of family related to the head of the household by marriage, adoption, or blood, up to the second degree of consanguinity, plus one or two roomers, provided that the quarters the roomers use do not exceed one-third of the total floor area of the dwelling unit and are not a separate dwelling unit;

(B) Up to three individuals in RR, ER, and LR zones;

(C) Up to eight persons sixty years of age or older in RR, ER, and LR zones;

(D) Up to four individuals in MR, HR, TB, CB, and RB zones; or

(E) Two individuals and any of their children by blood, marriage, or adoption.

(7) "Single-unit dwelling" means a detached principal building other than a mobile home, designed for or used as a dwelling exclusively by one group of the following persons as an independent living unit:

(A) The members of family related to the head of the household by marriage, adoption, or blood, up to the second degree of consanguinity, plus one or two roomers, provided that the quarters the roomers use do not exceed one-third of the total floor area of the dwelling unit and are not a separate dwelling unit;

(B) Up to three individuals in RR, ER, and LR zones;

(C) Up to eight persons sixty years of age or older in RR, ER, and LR zones;

(D) Up to four individuals in MR, HR, TB, CB, and RB zones; or

(E) Two individuals and any of their children by blood, marriage, or adoption.

- (c) No person applying for a building permit for commercial development shall fail to provide the city with a floor area measurement of the proposed building signed and certified by a professional engineer or architect licensed by the state of Colorado at the time of such application. Where both commercial and residential development exist within a particular developed property, the floor area measurement shall specify the amount of floor area dedicated to commercial development, and the tax imposed by this chapter shall be apportioned according to such measurement. The rate of tax for each accessory use shall be the same as that for the principal development to which the accessory use is related.

3-8-3 Waiver of Tax Imposed on Annexation of Developed Land.

In the case of annexation of property upon which residential development existed prior to June 1, 1987, the city council, upon a recommendation of the planning board, may waive all or part of the tax imposed by this chapter if the council finds that such a waiver is in the public interest. In making this determination, the council shall consider:

- (a) Whether any capital improvement funds will be transferred by Boulder County to the city at the time of annexation;
- (b) Whether the annexation will create a substantial increase in the need for capital improvements in the city;
- (c) The date on which residential development was completed on the property as a means of determining the extent to which the city's sales and use tax may have been paid by the owners or users of the property; and
- (d) Whether substantial capital improvements that serve the public-at-large and not only the annexed property will be dedicated to the city as a condition of annexation.

3-8-4 Development Excise Tax on Redevelopment.

Whenever existing developed property in the city is redeveloped, no person shall fail to pay the development excise tax imposed by Section 3-8-2, B.R.C. 1981, for the net increase in floor area or number of dwelling units prior to obtaining a building permit.

3-8-5 Development Excise Tax to be Revised.

In 1988, and every year thereafter, the development excise tax imposed by this chapter shall be recomputed by raising or lowering it in an amount equal to the percentage of change for the preceding year in the consumer price index (all items) of the U.S. Department of Labor, Bureau of Labor and Statistics for the statistical area which includes the city. In 1990, and every three years thereafter, the development excise tax imposed by this chapter shall be recomputed to reflect changes in population and service levels.

3-8-6 Development Excise Tax Revenues to be Earmarked.

The development excise tax imposed by this chapter shall be deposited in a capital improvements fund which shall be used exclusively for the purpose of capital improvements and collection and administration of the tax.

3-8-7 Development Excise Tax Credit.

The city council may grant a development excise tax credit to a taxpayer on any or all of the tax imposed by this chapter if the city council, after receiving a recommendation from the planning board, finds that the taxpayer has agreed to make and dedicate to the city any police, fire, library, human services, municipal offices, or streets capital improvements beyond those required by any provision of this code that would benefit the public-at-large to the same degree as collection of the tax, and that granting the credit will not result in a substantial increase in the city's costs of providing capital improvements in the future. The amount of the credit shall be equal to the cost of such improvements to the taxpayer, as determined by the city manager, and in no event shall the credit be greater than the amount of development excise tax that would be due on the property. No certificate of occupancy, temporary or otherwise, shall be issued for the property until such improvements have been completed to the satisfaction of the city

manager and dedicated to the city, or a financial guarantee in a form allowed under Section 9-5-10, B.R.C. 1981, and in an amount sufficient to secure the full costs, as determined by the city manager, of constructing or installing the improvements, has been provided by the developer.

3-8-8 Collection of Unpaid Taxes.

Unpaid development excise taxes constitute a lien on the property. In addition to other collection remedies, the city manager may certify due and unpaid development excise taxes to the Boulder County Treasurer for collection in the same manner as general property taxes are collected as provided in Section 2-2-12, B.R.C. 1981.