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ABSTRACT (PURPOSE, METHOD, RESULTS, CONCLUSIONS)

A community interaction project was included as a component of the overall Kailua Bay water quality and water circulation studies. The intended purpose of the community interaction activities was to keep concerned residents of Kailua informed about the activities and progress of the scientific studies that the Water Resources Research Center was conducting. A further goal of the project was to involve the Kailua residents as sources of input in the planning stages of the study and to give interested persons an opportunity to participate actively in the scientific studies. The project fell short of achieving these goals in several areas. No mechanism was ever successfully implemented to solicit constructive input from the community and no community resident ever became actively involved in the research. Involving the community in scientific research projects introduces organizational difficulties into the process of study design which has traditionally been conducted between contractor and contractee. Some suggestions for how community involvement might be accomplished in future projects are included. Difficulties in communicating research findings arose from the fact that some members of the community would not believe the results of the studies that were conducted, preferring instead to believe the many rumors and anecdotes that circulated concerning water quality in Kailua Bay. The logic behind this preference seems to be related to a generalized mistrust of government and science. The reasons for this phenomenon extend into the fields of psychology and risk perception.

KAILUA BAY STUDIES: COMMUNITY INTERACTION (KB-1)

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Project Report PR-94-04

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PREPARED FOR

Department of Wastewater Management

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for

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BACKGROUND

Extensive in-migration to windward Oahu in recent years has led to population pressure, rapid land development, and a general deterioration of the natural environment. As a result, awareness among Kailua residents over environmental issues is high. One environmental issue of particular concern to residents is the quality of the water in Kailua Bay, a length of shoreline which incorporates some of the best beaches and marine recreation opportunities on the island of Oahu. For several years residents of Kailua have vocally expressed concern over a perceived deterioration of the water quality in Kailua Bay. Kailua residents' high level of awareness of water quality issues may stem in part from the unfortunate situation which developed in nearby Kaneohe Bay some years ago when sewage effluent was discharged into that extremely enclosed, circumscribed body of water resulting in considerable ecosystem damage. Although the physical circumstances of Kailua Bay are entirely different, residents are concerned about the possible effects of improperly discharged sewage.

Anecdotal evidence provided by beach users suggests that algal blooms in Kailua Bay may be increasing in frequency and severity, and that there is an increased incidence of a variety of illnesses associated with swimming in the ocean near Kailua. Repeated sewage spills from a City and County of Honolulu pump station into Ka'elepulu Stream in a residential area of Kailua and occasional bypasses of partially treated effluent through the outfall have contributed to the concerns that residents have about the adequacy of sewage disposal practices in the Kailua area. A perceived lack of responsiveness on the part of government to these problems and to repeated expressions of public concern has led to feelings of frustration on the part of many Kailua residents. This has moved them to establish community action groups, such as Save Our Bays and Beaches, to try and get the issue of possible deterioration of water quality in Kailua Bay addressed.

Concern over water quality in Kailua Bay has been further heightened by extensive, sometimes inaccurate media coverage of the issue. The issue of water quality and sewage disposal is an emotionally charged one in Hawaii, and the local media have occasionally been somewhat less than objective in their coverage of Kailua Bay. Anecdotal reports and "evidence" provided by non-scientific agencies using inappropriate methods have sometimes been given equal or greater coverage than the findings of the bona fide researchers (Appendix A). The lay person seeing these reports could have difficulty separating fact from fiction.

The need to address the community's concerns and to provide a channel through which the findings of the researchers could be communicated fairly was recognized by the Water Resources Research Center, the City and County of Honolulu Department of Wastewater Management, and the State Department of Health. Accordingly a "Community Interaction"

component was incorporated into the overall study that the Water Resources Research Center proposed to perform for the City and County of Honolulu.

THE COMMUNITY INTERACTION COMPONENT

The initial study proposal (Appendix B) outlines the motives for including a community interaction component in the Kailua Bay Studies, as well as the goals and objectives of the component. These are briefly outlined below.

GOALS:

- 1) To involve the residents as a source of constructive input in the early planning stages of the study.
- 2) To keep residents apprised of progress during the project's 3 year span, and to let them know the possible results and conclusions that could be expected from the projects.
- 3) To give the residents an opportunity to become active participants in the study.

In order to achieve these goals the following strategies were decided upon:

- 1) Identify community groups to target for participation in the project.
- 2) Inform the community of the basic goals and objectives of the Kailua Bay studies before actual study plans and time schedules were finalized.
- 3) Solicit input from the community during the critical study design phases.
- 4) Solicit reports of pollution sightings from people who use the bay for quick follow-up and documentation of sources of pollution.
- 5) Obtain feedback from the community on the results and conclusions of the study before the final report was prepared.

RESULTS OF THE COMMUNITY INTERACTION EFFORT

Unfortunately the community interaction program initially got off on a bad footing possibly due in part to an underestimation of the pent-up frustration in the community toward the City and County. This frustration may have been transferred, by association, to the Water

Resources Research Center personnel. WRRC's initial contact with the community was set up as an open community meeting held on May 1, 1990 at which time the study agenda and methodologies were presented to the audience. Some members of the audience had specific ideas and technical questions regarding what problems they wanted to see addressed, and about the methods to be used in the studies. Unfortunately the researchers were not present at this meeting so response to these questions had to be deferred to a later date. This delay may have had the result of increasing community frustration. This first meeting and several subsequent public meetings were characterized by an atmosphere of confrontation rather than cooperation, and tended to degenerate into fora for Kailua residents to express their anger against the City. Some attendees at these meetings clearly had little interest in hearing what the researchers had been doing; instead, they were there to publicly voice their opinions on many related topics. Nevertheless, this first community meeting helped to identify a number of community concerns to the WRRC researchers, including the problem of periodic algal blooms. Appendix B contains some comments and questions that arose at the first community meeting.

WRRC researchers made public presentations of the progress of their studies at additional public meetings organized by the WRRC on August 13, 1990, and April 14, 1992, and at several public meetings that were organized by other groups, including the Kailua Town Public Forum held by the Honolulu City Council on August 9, 1990; the Kailua Neighborhood Board meeting of January 8, 1991; and the Kailua community meeting organized by Representative Cynthia Thielen on October 29, 1991. A number of information posters illustrating the various subprojects were put on display in the Kailua public library for two months in April of 1992. Appendix C contains a listing of various events related to the Kailua Bay community interaction component and the dates on which they occurred.

The first of the goals stated in the community interaction study proposal submitted to the Department of Wastewater Management (Appendix D), i.e., "The residents must be involved in the early planning of the study," was never fully realized. The community was not involved in the preliminary stages of planning. Members of the community were informed as to what the objectives and experimental design would be; however, they were not consulted on the design and planning of the studies, and input from the community at large was not obtained. This may have led to feelings among some Kailua residents that they had been bypassed and their concerns discounted (Appendix E, article on community leaders wanting more involvement).

Much of the dissatisfaction that the public expressed with the WRRC's Kailua Bay studies probably arose from the fact that the residents felt they were not given an adequate opportunity to provide input into the study design. The initial decision regarding what studies should be done was made by the City and DOH. The consent decree between DOH and the City and County, which mandated the studies, broadly specified what kinds of studies were to

be done (Appendix F). The actual design of the studies was carried out by the researchers in consultation with the City and County Department of Wastewater Management. Certain people from the community did make contact, writing and phoning the WRRC researchers on an individual basis, to share their ideas about what they felt were important considerations for the studies; however, by the time they made this contact the studies were already underway. The establishment of a more structured mechanism for people to communicate their ideas and opinions to the WRRC researchers at the earliest stages, and to incorporate this input in the study designs might have been useful in reducing the dissatisfaction that many in Kailua felt with the studies. This is likely to be a lengthy, consensus-building type of activity that can be expected to considerably lengthen the planning stages of any future project which endeavors to incorporate community opinion.

It was realized early on that there was a need for an effective mechanism for facilitating community input, and for transmitting information to the residents, and that without such a mechanism the community interaction component would be relatively unsuccessful. The public meetings tended to degenerate into sessions where a few people with theatrical or political leanings monopolized the agenda, preventing effective sharing of ideas or information. People with limited scientific background asked lengthy questions which required equally lengthy, rudimentary explanations, thus using up limited meeting time in an unproductive way.

Public meetings proved not to be an effective way of sharing technical information. This was recognized by Kailua community leaders and by Dr. Leroy Heitz at the first meeting. Accordingly, contact was made with the Kailua Neighborhood Board Environmental Committee (KNBEC), specifically with Kailua residents Dr. Robert Bourke, a marine biologist, and City Council member Steven Holmes, to get the committee to serve in the capacity of liaison between the Kailua community-at-large and the WRRC. However, by the time this arrangement was made, the time for input into the planning of the studies was passed. The KNBEC never had an opportunity to meet with the researchers or with the community, and contact was largely limited to discussions among the KNBEC members and between Dr. Bourke and Dr. Roger Fujioka. Unfortunately the negative atmosphere that emerged at the first public meeting seems to have set the tone for the community's future interaction with the WRRC researchers. In retrospect it might have been more effective to have the community choose a small technical committee, preferably comprised of people with scientific training, at the outset of the study. This committee could have solicited input from the community; organized, focused and interpreted their concerns and views; and reported this information to the WRRC researchers without the emotionalism, rambling anecdotes, and grandstanding that characterized the public meetings. The goal of "identifying community groups to target for

participation in the project” that was stated in the community interaction proposal was a good one that unfortunately was not implemented at the beginning of the project.

Part of the intent of the community interaction component was to inform the community of the researchers’ activities. It seems that there may have been several options for achieving this information dissemination which were not utilized, such as arranging with the Windward Sun Press (who took an active interest in the issue and, in fact, served to keep the community informed about the projects to a considerable degree) (Appendix E) to have a regular update column in every edition of the weekly paper, or sending a regular newsletter to interested residents (who could have been identified by a meeting with the community appointed committee). These options would have permitted people to stay informed about the progress of the studies in an efficient, convenient manner.

Due to the need for flexibility in the timing of experiments in order to allow for varying environmental conditions, progress on the studies was irregular. The studies, therefore, did not adhere to any particular timetable. In the case of certain of the studies there arose difficulties which resulted in extreme delays in the generation of any data at all. This made it difficult to keep the community informed on the progress of the studies. Long periods of time elapsed between releases of project information. Furthermore researchers were naturally reticent to release any of their data until they had time to analyze it. There is the risk that data taken out of context will be misinterpreted. These factors made for an extremely awkward situation when trying to report to the Kailua community on the work in progress. The public may have equated this lack of information with an unwillingness on the part of the researchers to release data that might implicate the City’s wastewater disposal system in polluting the bay.

It became apparent that it is important to keep the public informed in situations such as this, not only of research results, but also of difficulties encountered and reasons for delay. This will help to allay misgivings that the public may have about the integrity of the research being conducted. When researchers fail to respond to direct questions concerning the very information that they are supposed to be looking at may damage their credibility. Seriously involving the community in research projects opens researchers’ activities up to increased scrutiny. Furthermore, researchers who traditionally have not had to consult with others on how they conduct their research may have to exercise a greater degree of compromise and cooperation if the community is to be included in future projects.

It should be recognized that the priorities of the public may not be in accord with what the researchers want to examine, or what the City wants to determine. When public concerns are given greater weight in developing plans of study it is possible that some resources will be expended in examining issues that researchers may view as being of limited relevance. This is not the traditional way of deciding on research priorities, and researchers naturally resent what

they might see as a waste of limited resources. If communication is good between the researchers and the concerned public, then compromises that meet the needs of both groups can be achieved; no unnecessary studies need be pursued, and the concerns of the community can hopefully be answered.

The public generally doesn't imagine the expense, difficulty, manpower, and time involved in mounting even a small research project, and are likely to have unrealistic expectations as to what can be accomplished with the limited resources available. The limitations of the Kailua Bay studies should have been made abundantly clear to the community right at the outset, at the same time as they were being asked for their constructive input on the study design. This fits in with the second goal listed in the outline of the proposed community interaction study, i.e., to "keep the Kailua Bay community informed as to the progress of the studies and possible results and conclusions that can be expected from the projects." Educating the community early on as to what can realistically be achieved in the scope of a study may have reduced criticism that not enough was done at a later date. Many Kailua residents may not have realized that the scope of the Kailua Bay studies was largely dictated by the consent decree that the City and County of Honolulu and DOH drew up in May 1990 and that the researchers' range of possible studies was limited by the terms of this decree.

Although the third goal stated in the initial study proposal was "to give the residents an opportunity to become active participants in the study" very few community members ever did become actively engaged in the Kailua Bay studies. There may have been some reticence of the part of the researchers to enlist the help of people with no formal training, and this goal was never really pursued. The question of liability also made using community members in data collection for the study problematic. Although members of the community may state that they would like to participate in a study, they may lose enthusiasm once they realize the drudgery involved in sampling on a regular basis in all kinds of weather. Unreliable sample collection is worse than no sample collection to a researcher. If some way could be found to overcome these obstacles the direct involvement of community members might prove an excellent way to keep a community abreast of progress in future studies, one which would give residents the feeling that the projects are in fact their own.

CONCLUSION

In order for there to be successful and productive interaction with the community it is important that the public be given sufficient background information to decide what factors warrant study, that they be informed of what is and what is not realistically achievable with the

available resources, and that they be given an opportunity to have their concerns heard and considered right from the very start of project planning. Information about the project's progress, including bad or no news, should be disseminated on a regular basis. Formalized mechanisms for the exchange of information, opinions, and ideas should be established at the outset. People and or groups that can serve as liaisons between the researchers and the community should be identified early on so that they might serve as such a mechanism. Other methods such as newsletters and newspaper columns could be used to further contribute to information dissemination. The researchers themselves need to commit to keeping the community abreast of what they are doing, and make the time to do so. The community needs to recognize the limitations inherent in any scientific study.

APPENDIXES

- A. Examples of Media Reports of Anecdotal and Unsubstantiated Reports on Water Quality in Kailua Bay
- B. Comments from Public Made at First Kailua Bay Study Community Meeting May 1, 1990
- C. Community Interaction Study Highlights
- D. Community Interaction Study Initial Proposal
- E. Windward Sun Press Articles About the Project
- F. Consent Decree

Appendix A
Examples of Media Reports of Anecdotal and
Unsubstantiated Reports on Water Quality in Kailua Bay

Kailua Bay study disputes findings

By Thomas Kaser
Advertiser Staff Writer

Kailua Bay is occasionally very polluted with bacteria — and not from runoff coming from streams that empty into it — according to a seven-month study of the bay's water by an organization dedicated to the protection of ocean and coastal resources.

The Hawaii chapter of the Surfrider Foundation, made up mainly of surfers and boardsailors, has been making regular readings of water in the bay since December — initially almost daily, then from one to three times a week since January.

The group's findings support the contention of the Sierra Club Legal Defense Fund that pollution in the bay is considerable and may be caused by the Mokapu Outfall, which empties treated sewage from the Kailua sewage treatment plant into the bay about a mile offshore and 110 feet below the water's surface.

Such findings conflict with research done by two University of Hawaii scientists — who are supported by the city — showing that unusual quantities of bacteria show up in Kailua Bay only after heavy rains, and even then not from the outfall but from the nearby Kaelepulu Stream and Kawai-nui Channel, which the re-

searchers say carry bacteria from land-based sources.

The Surfrider Foundation challenges the researchers' findings with these points:

■ Kaelepulu Stream does not empty into the ocean because it is blocked by sand berm at Kailua Beach Park most of the time. The berm has been bulldozed away only three times since the Surfrider Foundation began taking water samples in the bay early last December, and yet pollution in the bay has continued to be high most of the time.

■ Rainfall, which the UH researchers say picks up land-based bacteria and carries it to the bay via the streams, has been light since December.

"Only a few times since (then) has the National Weather Service's Maunawili (rain-gauge) Station topped the one-inch mark in any 24-hour period," says the foundation's report.

Adds Steven Squire, who was in charge of collecting data for the foundation: "No one can exclusively blame runoff for the bay's pollution, because there hasn't been much rainfall."

■ The amount of total coliform bacteria in Kailua Bay regularly surpasses the "safe-for-humans" ceiling of 200 counts per 100 milliliters of sampled water, set by the state between 1959 but discontinued

in 1989 when the state switched to testing another type of bacteria.

The foundation said it found that water at the Lanikai boat ramp — next to Kailua Beach Park — tested unsafe 69 percent of the time for total coliform.

■ On days when waters both in Kaelepulu Stream and near the Lanikai boat ramp were tested, half of that time the Lanikai boat ramp tested higher in coliform than Kaelepulu Stream did — refuting the runoff theory of the UH researchers.

■ The UH researchers had said the outfall and the ocean itself can't bring much bacteria into Kailua Bay because currents run predominantly north, and not into the bay. The Surfrider Foundation notes that previous UH studies have shown surface currents come directly on-shore from the outer reefs, including the Mokapu Outfall area.

Says Squire: "We don't think Kailua Bay's pollution is caused exclusively by the streams that feed into the bay. Very clearly, bacteria seems to be coming from other sources, and we think the bay needs to be studied more."

"Before anything can be done, the city and its supporters on this issue need to recognize that there is a pollution problem in the bay."

A-6 Wednesday, May 6, 1992

Star-Bulletin

Sewer fight triggers another suit against city

By Peter Wagner
Star-Bulletin

Name-calling, political posturing and other unpleasant exchanges between the city and its sewage critics has resulted in yet another major lawsuit against the Fasi administration, with each side blaming the other in separate news conferences yesterday.

The Sierra Club, Hawaii's Thousand Friends, Save Our Bays and Beaches (SOBB) and the Surfrider Foundation, yesterday filed suit in federal court alleging more than 8,000 violations of the Clean Water Act at the Kaneohe and Kailua sewage treatment plants since mid-1989.

City officials denounced the suit, the third in recent years over sewage treatment problems, as an election year ploy to oust Mayor Frank Fasi.

"The fact is, improvements were done and the plant is operating within permit specifications, so what's the purpose of the lawsuit?" said city Managing Director Jeremy Harris.

But the groups say Oahu is facing a sewage crisis that the Fasi administration refuses to acknowledge. A suit brought by the SCLDF over the city's Sand Island plant ended in a costly settlement last year, and another against its Honolulu plant is to go to trial in federal court in July.

"We want an end to this running to the courts all the time to get the city to do the things it should be doing and doing diligently," said Fred Madlener of Hawaii's Thousand Friends.

The suit was threatened in January, with a standard 60-day period under the federal pollution laws to work out differences in the hope of avoiding costly litigation. SCLDF attorney Skip Spaulding said negotiations with the city broke down after a single meeting because of derisive public statements by Fasi, in which opponents were labeled "kooks" and "ignorant housewives."

"It was clear that the mutual respect necessary in settlement

meetings wasn't present," Spaulding said at a news conference.

He said the suit will seek to extend the mile-long Mokapu outfall, continue water-quality studies of pollution in Kailua Bay; a re-assessment of the plant's capacity, long-term plans to fix the city's failing sewer collection and treatment systems, and other remedies.

Harris, responding with his own news conference, called the suit "ludicrous" and said allegations of poor maintenance, bypasses, and other pollution violations are "totally false."

Recent modifications at the Kai-

lua plant improved efficiency of existing secondary treatment and ongoing construction will increase capacity to minimize future sewage bypasses, he said. And pollution in Kailua Bay shouldn't be blamed on the plant's mile-long outfall, which empties off the Mokapu outfall into more than 100 feet of water, he added.

"The outfall simply, scientifically is not polluting Kailua Bay," Harris said.

He called the suit "politically motivated," with potential mayoral candidate Michael Wilson and SOBB founder Clara Olds among the suit's plaintiffs.

"To waste the city's precious tax dollars repeatedly trying to explain there is not a problem relat-

ing to the outfall is a waste of resources," Harris said.

The city believes near-shore pollution in Kailua Bay is coming from two canals, fed by fertilizers, animal waste and other urban runoff.

The Surfrider Foundation says it has been conducting its own water quality tests in Kailua Bay in recent months, with weekly readings showing higher bacterial counts than those done by city consultants. The group also believes the problem can be traced to the outfall, with effluent rising to the surface and being blown toward shore by prevailing winds.

"We continue to have algal blooms in our bay," said Olds. "Our concerns have not been resolved."

Pollution in Kailua Bay is debated

Defense fund, researchers disagree on cause and degree

By Thomas Kaser
Advertiser Staff Writer

Two University of Hawaii researchers and the Sierra Club Legal Defense Fund sharply disagree on how much pollution is in Kailua Bay and what's causing it.

The defense fund says pollution in the bay is considerable and is caused primarily by the city's Mokapu Outfall, which empties treated sewage from the Kailua sewage treatment plant into the bay about a mile offshore and 110 feet below the water's surface.

The researchers say bacteria shows up in unusual quantities only after heavy rains — and even then, not from the outfall but from two nearby streams that bring the bacteria from land-based sources.

The city, which paid for one study and chose the researcher who did it, says the researchers are right and the defense fund is wrong.

The defense fund says the researchers are playing political footsie with the city.

On Jan. 7 the defense fund, representing four organizations — Save Our Bays and Beaches, the national Sierra Club, Hawaii's Thousand Friends, and the Surfrider Foundation — filed a 60-day notice of intent to sue the city over what it now says are more than 8,000 violations of the federal Clean Water Act by the Kailua sewage treatment plant. As yet, no suit has been filed.

"We tried to talk settlement with the city, but those talks fell apart," says Skip Spaulding, managing attorney of the defense fund, which is unrelated to the Sierra Club. "We will be filing the suit soon."

The defense fund says the city is under-treating sewage at the plant by using "secondary" treatment equipment that has deteriorated.

One of the UH researchers, Richard Grigg, says the equipment operates fine except when heavy rains or repairs

Sewage spills into stream

About 1,500 gallons of raw sewage overflowed into Halawa Stream by the Opukea Street area yesterday morning, city officials said.

James Honke, assistant chief of the city Division of Wastewater Management, said a blocked sewer line caused the sewage to overflow from a manhole and into a storm drain that leads into the stream. The overflow was stopped at 10:30 a.m., he said.

Portions of the stream that

were affected extend from Salt Lake Boulevard to the stream mouth in Pearl Harbor, near the the Arizona Memorial ferry, Honke said.

Signs have been posted warning people of the spill.

Honke said Halawa Stream flows so slowly that it was unlikely the spill had reached Pearl Harbor by late yesterday afternoon. Park officials at the Arizona Memorial said they were unaware of the spill and that business was normal.

require bypassing raw sewage around that equipment.

The defense fund also says there are too many spills and bypasses at both plants, causing huge quantities of effluent to flow into Kailua Bay.

Grigg and researcher Roger Fujioka have a different view.

They say their studies show that bacteria is usually not found at high levels in the bay — and that when it is found there it comes not from the outfall but from Kawaiul Marsh Canal, which empties into the ocean near Alakahi Park, and Kaelepulu Stream, which empties into the ocean at Kailua Beach Park, after heavy rains.

Fujioka, public health professor and director of the UH Water Resources Research Center, acknowledges the city chose him for the study and financed it.

And he says it's true that water close to shore in Kailua Bay sometimes is slightly green and contains bacteria. But he says the bacteria comes not from the outfall but from four main land sources:

- Storm drains and smaller streams that catch feces from cattle and domestic animals, plus other filth, and send it to the ocean via the two main

streams;

- Bird and duck droppings;

- Occasional raw-sewage bypasses at nearby sewage pumping stations;

- Bacteria that occurs naturally in the soil.

Grigg, an oceanography professor, did a separate study focusing on what happens to treated sewage after it leaves various Oahu outfalls.

He says he found the outgoing sewage has no negative effect on either coral reefs or reef fishes and the "die-off" of bacteria in the treated sewage is accomplished within 10 minutes in saltwater.

He said that was true both at the Waianae outfall, where sewage has been treated at a "primary" level, meaning 30 percent of its solids are removed, and in Kailua Bay, where it has been treated at a "secondary" level, meaning 85 percent of its solids are removed.

"So what's the point of converting a sewage-treatment plant — at a cost of about \$100 million — from primary to secondary if no significant benefit is to be gained?"

Grigg, who said his study was financed by the state, also found that the sewage plume coming out of the Mokapu Out-

fall goes straight out to 90 percent of the time.

"The environment who've been seeing greater in Kailua Bay have mate concern, but it sh directed at improving water quality in the two that flow into the bay seems to be where the is, not at the outfall," said.

Spaulding says it is i to say sewage from t kapu Outfall flows str to sea 95 percent of the

"Other oceanographic have shown that sew charged from that out to the surface of the about 75 percent of t and about 90 percent time it washes direct Kailua Beach because on the surface of the governed by winds, most of the time blo shore."

Spaulding also says t conflict of interest in and Grigg's work.

"These two men ma living doing studies city, and it's not su their results came out did. Grigg has often wo and been paid by the sewage-related cor work."

Fujioka and Grigg his allegations.

Grigg said none of search has been fina the city and he is not p the city.

"I have no political a work for a university; ry is paid for; I'm not for political office; I'm to produce credible, ho formation.

"But I question the of the Sierra Club Lense Fund because it ing large settlements cost of Hawaii taxpay defense fund does have ical agenda. It says it profit, but its operati are being paid for by tlement of lawsuits th against the city."

Thielen: Press lawmakers on sewage

□ Windward residents hold a town meeting to address the problem

By David Oshiro
Star-Bulletin

Windward Oahu residents were told last night to put pressure on state legislators if they want to keep sewage from fouling beaches.

That advice came from state Rep. Cynthia Thielen, who called a town meeting at Kailua Intermediate School to discuss frequent sewage spills in the Windward area.

Thielen, upset over sewage that flowed into Kailua Bay after recent heavy rains, said city and state officials need adequate funding to prevent those spills.

"Sewer lines may be out of sight and underground and not really a sexy issue, but they are a critical issue to the well-being of our community and to the state at large," Thielen said.

She told the crowd of about 100 people to talk to Sen. Mamoru Yamasaki, chairman of the Senate Ways and Means Committee, and Rep. Joseph Souki, chairman of the House Finance Committee — two legislators who have a big say over how the state's money is spent.

Michael Street, city deputy director of public works, said major modifications to the city's sewage treatment plant in Kailua will be completed in December 1993.

In the meantime, work is being done to improve treatment facilities in Kaneohe and Ahuimanu, and sewer lines in Kaneohe and Enchanted Lake, Street said.

In addition, the city is checking its sewage collection system to evaluate water infiltration into the system caused by heavy rainfall. Street said work will begin soon on problem areas.

Dr. Philip Hellreich, a dermatologist, says he's disturbed by what he's seen among his patients in recent years.

"I have not conducted any scientifically controlled studies, but it's been my impression in recent years that I detect a great increase in the incidence of skin infections in individuals involved in water sports — swimming, surfing, windsurfing, paddling — in Kailua," Hellreich said.

Bruce Anderson, state deputy director of health for the environment, said bacteria from animal wastes may be carried by a stream emptying into Kailua Bay. This contributes to pollution in the area but is not necessarily a health threat, he said.

Marlin Atkinson, a research scientist at the Hawaii Institute of Marine Biology, said practically no traces of sewage can be detected near the Mokapu outfall, which discharges nearly a mile offshore in water about 100 feet deep.

But Pohai Ryan, a Coconut Grove resident, said something in the water sickened children when her family got together at Kailua Beach during the July Fourth holiday. Eight children under the age of 7 became ill after playing in the water, she said.

"Most of us here are pretty proud to live in Kailua. It's a really beautiful place to live," Ryan said.

She said she used to get "really insulted when people used to say the word Kailua, in Hawaiian, means 'toilet water.'"

Though "toilet water" is an incorrect translation of the community's name, it is probably an apt term, Ryan said.

Appendix B
Comments from Public Made at First Kailua Bay Study
Community Meeting May 1, 1990

COMMENTS FROM PUBLIC
FIRST KAILUA BAY STUDY
COMMUNITY MEETING
MAY 1, 1990

1. Giardia is an important water quality issue in the freshwater streams of the area. Why aren't you looking at this problem in your study?
2. The entire bay is used for recreational uses where water contact is possible. You should not just concentrate on the near shore environment. (Holmes)
3. In your final assessment you should take into account any changes that occur in volumes of sewage discharge released both during the life of your project and in the future. (Heime, Holmes ??)
4. It appears that twice monthly sampling in the bay and freshwater streams may not be adequate. Could you take samples more often? (Holme's Wife)
5. Why isn't Roger Fujioka at the Meeting? (O'Malley)
6. The indicator organisms you are proposing to use are proposing are unsatisfactory for evaluating the quality of the Bay. *Clostridium Perfringens* may be ubiquitous in our environment. I have talked with researchers at U.S. EPA in Cincinnati and other places who have better methods of for evaluating the sewage pollution potential in the Bay. (Holmes)
7. There are simple and inexpensive ways to evaluate for disease causing viruses directly. Dr Heitz's statement that these would be extremely difficult to do is wrong. (Holmes)
8. I have worked with Dr. Fujioka's researchers on other water quality projects and think he is genuinely concerned about the bay and trying to do a good job. (Stone)
9. When study is about to begin you should use media (Television, Radio and Paper) to again announce the Citizens Pollution warning system. (Heime)

(All comments are paraphrased from notes of the meeting taken by
I. Heitz)

10. There is a floating yellow scum that appears on the water. It moves around the Bay depending on wave conditions wind etc. It seems to cause slow healing of cuts etc when people come into contact with it. You should evaluate if this is dangerous and from where is it coming. (Stone)
11. Steve Holmes should be incorporated into the project (possibly as a paid participant) at a minimum as the active community liaison. He has much expertise in these matters and we would feel much more comfortable with the study if he were an active participant. (Heime, seconded by O'malley, and Beiber, Felix, as member of the Council Wastewater Committee, said he would foreword an official letter asking for this)
12. I would like a study progress report forwarded to the the Council Wastewater Committee at least every two months. (Felix)
13. I have many questions on the the make up and volume of sewage outflows and the operation of the sewage treatment plant. I also would like to know more about the yellow scum that forms on the water. (Jackson)
14. What is a technology transfer specialist and what are your qualifications. (Thielen)
15. Will you be looking at sea life such as fish or other marine organisms that might be concentrating disease causing organisms, heavy metals etc? Many people are eating fish etc that they are catching from the bay. (Same guy as commented on Giardia)

Appendix C
Community Interaction Study Highlights

KAILUA BAY COMMUNITY INTERACTION PROJECT HIGHLIGHTS

DATE	OCCURENCE
	Outline of Kailua Bay Community Interaction Component
90/02/15	Windward Sun Press (reporter Mark Doyle) ran an article about the Kailua Bay Project, "Wastewater pollution study in Kailua Bay starts in July"
90/03/06	Consent Agreement between DOH & City specifying studies to be done by the City. Study KB-1 is the Community interaction component.
90/04/25	Windward Sun Press announces first informational meeting to be held 5/1/90
90/05/01	First informational meeting Kailua Community Council meeting. Leroy Heitz presented information, was not well received. Comments from community.
90/05/02	City Council member John Henry Felix sent a letter to Dr. Heitz asking to have Steven Holmes put on Kailua Community Technical Advisory Committee for the Kailua Bay studies.
90/05/14	Kailua resident Ron Jackson sent Dr. Heitz a letter regarding getting better information on the sampling program of the project.
90/05/17	Leroy Heitz wrote memo to Roger Fujioka to tell him that Kailua community people had suggested to him that a Community Technical Advisory Committee be formed to provide a vehicle for transmitting technical information to the public.
90/05/17	Windward Sun Press ran an unfavorable article about the first Kailua Bay Project Community Information Meeting held by L. Heitz on 90/05/01.
90/06/06	Honolulu Advertiser article: "Official sees Kailua sewage plant violation (about Bruce Anderson)
90/06/08	Star Bulletin article about Kaneohe MCAS closing its beaches because of a sewage smell and elevated counts of non-indicator bacteria.
90/06/09	Another Star Bulletin article about Kaneohe MCAS closing its beaches because of a sewage smell and elevated counts of non-indicator bacteria.
90/06/12	Dr. Fujioka, Robert Bourke, and Steven Holmes met over lunch to discuss the first informational meeting.
90/06/14	Yet another Star Bulletin article about Kaneohe MCAS closing its beaches because of a sewage smell and elevated counts of non-indicator bacteria.
90/07/23	WRRC investigators held meeting at Holmes Hall with City and County of Honolulu Wastewater Division people. In attendance were: Dr. Fujioka, Dr. Krock, David Nagamine, Tina DeJesus, Ken Tenno, Alvin Muranaka.
90/07/25	Kailua lifeguard Tom Stone took Dr. Fujioka, Bruce Roll, Tina DeJesus, and Faith Caplan up Kaelepulu Stream in a boat to Enchanted Lakes. They took salinity measurements and samples for bacteriological and nutrient analysis enroute.

DATE	OCCURENCE
90/07/30	Roger Fujioka sends Bob Bourke letter re: May 1st Kailua Community info. meeting. Stating problem was no scientists were there to answer the peoples technical questions.
90/08/00	Kailua Bay Study fact sheet sent out by Leroy Heitz announcing the date of the 2nd informational meeting
90/08/09	Kailua Town Public Forum: "Environmental Quality in Kailua". Sewage outflow into Kailua Bay, one of five different environmental issues discussed at the meeting. Presentation given by: B. Anderson, S. Callejo, L. Heitz, Dr. John Hall (City & County physician).
90/08/13	Second informational meeting with Kailua Community. Drs. Heitz, Fujioka, Krock, Sam Callejo, Bruce Anderson, Steven Holmes, and Bob Bourke spoke.
90/11/24	Star Bulletin article: Hawaii's 1,000 friends, Life of the Land, and 10 Windward residents start lawsuit against City to renovate Enchanted Lakes pump station.
90/11/25	Star Bulletin/Honolulu Advertiser article "City Sued over Kailua Sewage Spills"
91/04/03	Bob Bourke sent a letter to Kailua neighborhood board environmental committee informing them that Dr. Krock's instrument strings in preparation for deployment, Bruce Roll and Faith Caplan starting water quality studies.
91/08/01	Kailua Neighborhood Board meeting at Kailua Recreation Center. Drs. Fujioka and Krock spoke.
91/08/14	Windward Sun Press article about soil and animals as source of indicator bacteria. Dr. Fujioka says that the EPA standards are not good for Hawaii.
91/10/04	Presentation of Kailua Bay Study to DOH, City & County , and Army Corps of Engineers personnel at Holmes Hall. Drs. Fujioka and Krock, Bruce Roll, Lina Ahuna.
91/10/29	Kailua community meeting hosted by Representative Cynthia Thielen. Speakers: B. Anderson, Michael Street, Dr. Marlin Atkinson, Dr. Philip Hellreich (Kailua dermatologist).
91/10/30	Star Bulletin article by David Oshiro regarding Kailua community meeting of previous night "Thielen: Press lawmakers on sewage"
91/11/22	Informational meeting with Kailua community leaders at Kailua STP. Sam Callejo, Bruce Anderson, Doak Cox, R. Fujioka, H Krock.
92/01/08	Article in Star-Bulletin by Peter Wagner "Official blames Kailua Bay pollution on 'urban runoff'"
92/01/20	Roy Abe (a local engineer) article published in Star Bulletin explaining why secondary treatment is unnecessary.
92/02/06	Bruce Anderson, Bob Bourke, James Honke participated in seminar presentation of Kailua Bay study to Hawaii Water Pollution Control conference.

DATE	OCCURENCE
92/02/06	Star Bulletin article by Peter Wagner "Kailua Pollution: don't blame the sewer"
92/02/06	HWPCA Conference presentation by Drs. Fujioka, Krock, B. Anderson, Bruce Roll and Bob Bourke on "Assessing the impact of sewage discharge into Kailua Bay via the Mokapu outfall on shoreline recreational waters at Kailua beaches"
92/03/01	Article in Star Bulletin "The stink over sewage"
92/04/09	Windward Sun Press article "Olds: More study needed" "Water: Research data indicate runoff polluting bay" Kailua resident ans SOBB head Clara Olds calls for study to explain algae blooms in Bay.
92/04/14	Community informational meeting Kailua Rec. Center 7:00 - 9:30. B. Bourke, R. Fujioka, B. Roll, L. Ahuna, H. Krock, R. Grigg, S. Henderson, spoke.
92/04/16	Posters illustrating Kailua Bay Studies put on display at Kailua Library till 5/92
92/05/03	Article in Star-Bulletin "Pollution in Kailua Bay is debated". Tom Kaser reports Skip Spaulding's slanderous allegations concerning the integrity of the scientists working on the project.
92/05/06	Star Bulletin Article "Sewer fight triggers another suit against City"
92/05/15	Dr. Fujioka writes letter to editor of Honolulu Advertiser in response to misinformed article by Tom Kaser in the 5/3/92 Star-Bulletin wherein Kaser reports Skip Spaulding's irresponsible allegations concerning the integrity of the scientists working on the project.
92/06/18	Honolulu Advertiser article by Tom Kaser regarding Surfrider Foundation disputing WRRC bacteriological findings.
92/07/05	Hawaii ASCE and HWPCA publish statement of position on wastewater treatment and disposal issues in Sunday Star-Bulletin, basically supporting the City's position.
92/08/01	Star Bulletin article "Official blames Kailua Bay pollution on urban runoff (about Sam Callejo).
92/11/17	Kailua Neighborhood Board meeting at Territorial Savings in Kailua. Dr. Krock, Bruce Roll, and Karl Bromwell informally discussed Kailua Bay projects with members of the Kailua Community.
93/02/04	Kailua Studies Posters put on display at HWPCA annual conference

Appendix D
Community Interaction Study Initial Proposal

OUTLINE OF PROPOSED STUDY

PROJECT TITLE: KAILUA BAY STUDY
COMMUNITY INTERACTION COMPONENT (KB-1)

PRINCIPAL INVESTIGATOR: Leroy F. Heitz, Ph D.
Water Resources Research Center
University of Hawaii

FUNDING AGENCY: Division of Wastewater Management
City and County of Honolulu

PROJECT PERIOD: July 1, 1990 - June 30, 1993

TOTAL COST: \$10,000

MOTIVATION FOR STUDY: The residents of Kailua are very vocal in their concern for the quality of the water in Kailua Bay. Some residents have seen pollutants on the beaches and others have reportedly become ill as a result of using the Bay's waters for recreational purposes. The question as to whether or not the reported pollutants and illnesses are a result of the Mokapu sewage outfall has not been satisfactorily resolved to the residents of Kailua. The three other proposed Kailua Bay studies are designed to answer this question. The following are essential if the results of these three studies are to be accepted by the Kailua community:

- The residents must be involved in the early planning of the study.
- They must be kept appraised of the progress of the study during the three year study period.
- They must feel that they have been given the opportunity to become active participants in the studies.

PROJECT OVERALL GOALS: The overall goals of the community interaction component of the Kailua Bay study are to:

- Involve the Kailua Bay community as a source of constructive input at the beginning and during the course of the studies.
- Keep the Kailua Bay community informed as to the progress of the studies and possible results and conclusions that can be expected from the projects.

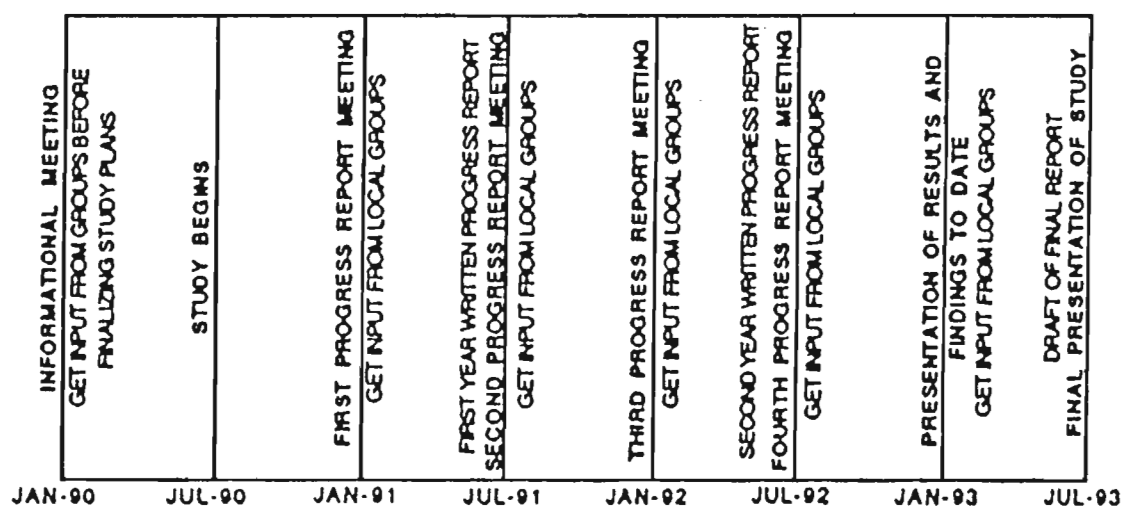
OBJECTIVES

In order to accomplish the goals outlined above, the following objectives will be fulfilled:

- Identify the target community group(s) upon which the community interaction program will be directed.
- Inform the community of the basic goals and objectives of the Kailua Bay studies before actual study plans and time schedules are finalized.
- Solicit input from the community during the critical study design phases.
- Enlist individuals in the community who spend time on the Bay to report sightings of possible pollutants to the research staff so that quick follow up and documentation of sources of pollution can be accomplished.
- Keep the community informed on the progress of the study and receive community input during the three year course of the study.
- Obtain feedback from the community on the results and conclusions of the study before the final report is prepared.

METHODOLOGY: The goals and objectives of this component of the Kailua Bay study will be accomplished mainly through a series of reports and public meeting that will be held during the life of the project. Figure 1 below shows the schedule for the release of progress reports and public meetings.

Figure 1
KAILUA BAY STUDY
COMMUNITY INTERACTION PLAN



The meetings will be targeted for a small number of key community groups that are interested in the Bay's water quality. Kailua Neighborhood Board No. 31 and the Kailua Community Council are possible target groups.

The first interaction meeting will be held early in the project planning phase in order to familiarize the community with the project and to solicit input at a time when outside suggestions can be easily incorporated into study plans.

Progress report meetings will be scheduled every six months. These meetings will be designed to brief the community on the progress of the studies and to also allow for an interchange of ideas between the community and the researchers. Annual written progress reports will be supplied to the community groups in time for review before the annual progress report meetings.

The community will be urged to report all pollution sightings to the researchers. The principal investigator for this community interaction component will serve as the liaison between those in the community reporting the sightings and the researchers who will be making the field observations and documentation of the pollutants.

CONTRIBUTION: Community cooperation is the key to the overall success of the Kailua Bay studies. Through a series of meetings and community interactions this component of the studies will provide for the cooperation that will help to establish the communities overall confidence in the study no matter what the outcome of the scientific investigations.

Appendix E
Windward Sun Press Articles About the Project

Wastewater pollution study in Kailua Bay starts in July

By MARK DOYLE
News Editor

KAILUA — The problems of wastewater pollution in Kailua Bay and its adjacent streams will be the focus of a new three-year study soon to be conducted by the University of Hawaii's Water Resources Research Center (WRRRC).

According to Dr. Leroy Heitz, the project's "technology transfer specialist," the study is scheduled to begin this July and end in June 1993. He said the proposed study is awaiting final approval from the city's Division of Wastewater Management, which will fund the project.

"The purpose of the studies will be to find out just what is happening in the bay," Heitz said. "We want to find out exactly what kind of effects pollution is having on the bay, the beaches, the streams — the whole area."

Heitz said the other purpose of the project is to open an effective line of communication with the public in order to better address concerns about sewage pollution and to keep people more informed about what the city and state governments are doing about pollution events.

"We'll be starting the public information part in the next month or so," he said. "I'm hoping we can do it by visitation and presentation to the community through the neighborhood board and the community council. It'll probably take a couple of meetings at each one."

Heitz said the project's public information program (called the community interaction study) will not only be to inform the community of the findings of the studies, but also to involve people



Leroy Heitz



Roger Fujioka

in the project itself.

In a speech delivered last week to the Hawaii Water Pollution Control Federation, assistant WRRRC director Dr. Roger Fujioka stressed the importance of keeping in close touch with the public on this project.

"Dr. Heitz will be interacting with the Kailua community organizations even before we begin this project to inform them of our studies, to get their input and to have them participate in the project as advisors, as well as sentinels and samplers of pollution events," Fujioka said.

"The problem we expect to pursue is to obtain enough information to determine whether the sewage discharged into Kailua Bay via the Mokapu outfall is responsible for the contamination observed in the shoreline beaches and recreational waters," he added.

Fujioka said the sewage and

waters near the outfall will be monitored and that scientists will be determining the entire circulation pattern for Kailua Bay in order to predict future movements of the sewage and other pollution sources that enter the bay.

He said they will also be monitoring the quality of Kaelepulu Stream and the Kawaiui Channel, both upstream and downstream.

"The impacts of these streams on the quality of the recreational beaches will be documented as will the circulation pattern of these stream waters entering Kailua Bay," he said.

Heitz said Dr. Hans Krock will conduct the circulation pattern studies by gathering existing information on water depth, wind patterns, discharges from other water sources, currents and wave conditions. He will then develop a descriptive model from which to conduct planned analyses.

BRIEFLY

Water quality

KAILUA — Representatives from the Water Resources Research Center at the University of Hawaii will speak at the Kailua Community Council meeting at 7:30 p.m. Tuesday at the Chamber of Commerce meeting room behind Safeway on Hamakua Drive.

Dr. Leroy Heitz and Dr. Roger Fujioka will provide information on a comprehensive three-year study of the water quality and circulation in Kailua Bay, which is scheduled to begin in July.

According to Heitz, the study will be a cooperative partnership between the county, the state, the university and the citizens of Kailua in order to find out what is really going on with regard to water quality in the bay.

One of the primary objectives, he said, is to determine the effect sewage effluent from the Mokapu Outfall is having on the bay, as well as the effect of accidental discharges into Kaelepulu Stream.

"We'll be introducing ourselves and giving an overview of the study," Heitz said. "But we'll also be looking for input from the community at the meeting."

Heitz said he will be conducting a series of informational meetings in Kailua in order to clear up some of the disagreements about water quality and open lines of communication between all the parties involved.

Water quality study gets off to rocky start

By MARK DOYLE
News Editor

KAILUA — The University of Hawaii's strategy to directly involve the residents of Kailua in its upcoming water-quality study in Kailua Bay may have backfired for the time being.

According to Steve Holmes, chairman of the Kailua Neighborhood Board's water quality committee, the university's first communitywide informational meeting held two weeks ago came off as condescending and unimpressive, doing more to alienate the community than to integrate it into the three-year study.

"I think they don't want us to be involved with the technical aspects," Holmes said Friday. "Roger Fujioka (the scientist who will head the study) didn't even attend the meeting because I understand he doesn't think we can understand the technical data."

Another member of the neighborhood board, chairman Bonnie Heim, agreed with Holmes that the informational meeting, sponsored by the Kailua Community Council, did little to impress those residents in attendance.

"I felt they were long on flash and short on substance," Heim said of the slide-show presentation given by Dr. Leroy Heitz from the University's Water Resource Research Center (WRRRC). "It was the dullast thing I've ever sat through in my life — slide after slide after slide. There were only about eight people there (16 according to Heitz). And when Steve (Holmes) had a couple of opportunities to raise questions, he was just sort of brushed aside."

The study, scheduled to begin in July and end in 1993, is being conducted by WRRRC to make a detailed assessment of the quality of Kailua Bay's waters, according to Heitz's presentation. In addition to testing for bacteria and studying water currents in the bay, the research also will look to identify sources of potential pollution in Kaelepulu Stream and Kawainui Stream.

The study is being funded by

See WATER on A-8

Community leaders want more involvement in water quality study

WATER from A-1

\$230,000 generated from fines levied on the city by the state Health Department for recent problems with sewage spills in Kailua area waters.

"The city has got a great deal," Holmes said. "In essence, they're paying the university in lieu of fines to test what federal permits already require them to do anyway."

"The state Department of Health also makes out, because they too are required to monitor water quality, and this way it's already being funded for them."

Holmes said he has some legitimate questions regarding bacteria testing procedures and the university's plans to test only twice a month for pollutants in the bay. But his questions went unanswered at the community council meeting because of Fujioka's absence.

Fujioka, a microbiologist/virologist in the University of Hawaii School of Health, is a noted authority on dangerous microorganisms in both fresh water and sea water.

"One of my concerns was that the microorganisms they're going to test for may be inappropriate," Holmes said.

Heitz, the project's "technical transfer specialist," said Fujioka

did not attend the meeting because the two of them had decided beforehand to keep the presentation from getting too technical and "turning everybody off."

The present plans are to hold two meetings a year in the community to report on the study's progress, with the next meeting slated for January 1991.

But both Holmes and Heim indicated that holding two meetings a year is not nearly enough to truly involve Kailua residents.

"If they don't want to talk to the community about the technical aspects of the study, then at least allow us to put together a community technical task force and open a dialogue with us," Holmes suggested.

"We're not going to rest with just lip service," Heim said. "We won't tolerate not being informed properly on the procedures and results of this study. And we'll know if we're not."

Heitz said he thought Holmes' idea of forming a community task force to communicate on a regular basis with Fujioka is a good idea.

And Fujioka, who is presently attending a conference in California, called the Sun Press Monday night and agreed, saying he is planning to meet...

Holmes and other community leaders as soon as he returns to Oahu.

"I am very confident I can answer all of their questions and concerns," Fujioka said. "This is my area of expertise."

Water study:

Soil, animals major source of pollution

By ELOISE AGUIAR
News Editor

KAILUA — Preliminary water quality studies being conducted by the university at Kailua Bay and Kaelepulu Pond and its tributaries indicate that soil is a major contributor to pollution in the water.

3 The study, led by Roger Fujioka of the University of Hawaii Water Research Resource Center, is being conducted to analyze for pollution from sewage.

In his report to the Kailua Neighborhood Board last week, Fujioka said that the bacteria count is high when sewage is being released into the water. It also is high at times when there is no sewage spill, however, and his study shows that soil and animals are contributing to the pollution.

"When there is no sewage source, the numbers should drop," he said. "But that is not so."

Fujioka said that he uses the Environmental Protection Agency (EPA) standards when studying sewage pollution in Hawaii's water, but those standards don't seem to be good indicators of pollution in our tropical climate.

He said that the bacteria *E. coli*, fecal coliform and enterococci are used for testing. These can come from Hawaii's soil, animals and people. On the Mainland, those bacteria are not in the soil, he said, probably because they are killed off during the winter months.

"The standard is misleading because we pick it up in the soil," he said. "We need to change the standard in Hawaii."

Fujioka said that he would use the bacteria *C. perfringens* as an indicator because it is found in humans and sewage, but it can't grow in the environment. He is now working with the EPA to change the standard for Hawaii, but he said

See STUDY ON A-8

STUDY from A-1
it is a long, slow process.

The EPA has been hearing his complaint for five years and only recently asked him to conduct a study to see if the bacteria in the soil is different from that found in sewage.

Fujioka said the only way to do this is through genetic comparison. If he can find a difference, then he would be able to convince the EPA, he said.

"I want to change the standard for Hawaii, but we must find that the bacteria here is different from the Mainland," he said.

The state is convinced that Fujioka is correct, but he said he was told that the state cannot change its standard and he must convince the EPA first.

The water quality study, which is half finished, took samples from the sewage outfall off Kaneohe Marine base and surrounding areas, Kawainui Channel and Kaelepulu Pond and its tributaries.

Bruce Roll and Hans Krock are conducting parts of the study.

Fujioka: EPA standards not good for Hawaii water

Roll told the neighborhood board that he is collecting samples from 13 sites beginning at the mouth of Kaelepulu Stream and including a golf course site, one at Keolu Bridge, St. John Vianney school, next to the sewage pumping station and at one end of Enchanted Lake.

He tested for *E. coli*, enterococci and fecal coliform. Calculations were done over a 30-day period, and his evaluation is based on federal EPA standards.

The highest numbers occur when it rains, he said. Numbers that normally are around 45 for enterococci, where the standard is 33, shot up to 46,000 after a heavy rain, Roll said.

"We're seeing a dramatic change under rain conditions," he said.

Roll said that preliminary figures show that the pumping station has the highest *E. coli* count when it's not raining. The tributary by St. John Vianney has a mid-level count, and the lowest reading is farthest north on the same tributary.

However, most of the areas met federal standards, he said.

With enterococci, all the areas sampled — including the ocean — exceeded federal standard,

Roll said. Fecal coliform, he said, was high at St. John Vianney and the pumping station. All other areas were below standard.

Animals also impact on the number of bacteria in the water, Roll said. He tested where ducks gather and said he found significant impact.

Krock's involvement in the study was more oriented to the ocean. He tested for the effect of ocean currents, wind and water depth on water quality. Tests were made to see how long matter stays in the near shore area, on the surface layer and in the current along the shore.

"Preliminary findings indicate that residence in the longshore area is a half a day," he said. "The residence time in the surface area is about two days. And the residence time in the near-shore area is one day."

The study is expected to be completed in about six months. Fujioka promised to return to give a completed wrap-up of the study at that time.

Sun Press

Environmentalist wants sewage seepage investigated

Olds: More study needed

WEEK OF APRIL 9-15, 1992

Water: Research data indicate runoff polluting bay

By ELOISE AGUIAR
News Editor

KAILUA — A recently updated University of Hawaii water quality study indicates that pollution in Kailua Bay comes from the streams that feed into the bay, but some environmentalists believe the study is flawed.

Roger Fujioka, principal investigator for the UH study, said last week that there is no apparent connection between sewage from the Mokapu outfall and pollution in the bay. Fujioka and his graduate assistants will present an intermediate report on the water quality study at a town meeting scheduled for 7 p.m. Tuesday at the Kailua Recreation Center, 21 S. Kainalu Dr.

"The evidence we have (shows) that deterioration of any water quality along the beach is primarily affected by the streams that flow into the bay," Fujioka said.

"We don't have evidence that it's sewage from the outfall that is moving toward the shore. But we do have evidence that what is coming out of the streams is impacting the shoreline water."

However, environmental group leader Clara Olds said the study did not go far enough and did not collect enough data to be helpful in determining what is causing the pollution.

Olds, who is president of Save Our Bays and Benches, said it is still possible for sewage to be seeping into the streams from broken pipes. The study did not address this possibility, she said.

Olds said that she is reluctant to make further comment because she has not seen the data. She did note, however, that Kailua Bay had a severe algae bloom a couple of weeks ago.

"It was horrible," she said. "The waves were breaking mustard."

Olds said that the university study needs to be expanded and the state must find out why Kailua gets these blooms. She noted that Kaanapali on Maui has experienced even more severe algae blooms recently, which makes her believe prompt action is required in Kailua.

The recent conclusions in the university study are consistent with preliminary results released last July. Fujioka told the Kailua Neighbor-

See STUDY on A-8.

STUDY from A-1

borhood Board last year that high bacteria counts appeared in the water samples during heavy rains and sewage spills.

Fujioka said that the data suggests that non-point source water contamination is a problem that must be addressed. But he said there are no guidelines to address the situation.

"There are regulations to address sewage," he said. "Yet there are no regulations to do anything about what's coming down the stream."

The study began in July 1990 and will continue until June 1993. Water samples were taken at 13 sites along Kaelepulu Stream and pond, at the Mokapu outfall and at Kawainui Channel. The water was tested for the indicator bacteria *E. coli*, enterococci and fecal coliform. Another part of the study involved the effect of ocean cur-

rent, wind and water depth on water quality.

Results of the ongoing study are on display at the Kailua library.

Fujioka said that calculations are made according to the U.S. Environmental Protection Agency (EPA) standard. The bacteria tested for is part of that standard.

But he prefers to use the bacteria *Clostridium perfringens* as an indicator of sewage in water. *Perfringens* is an anaerobic bacteria found in sewage, Fujioka said.

It is also in the soil and streams, he said, but in low concentrations. The problem with the bacteria used by EPA is that it grows in the environment and skews the numbers, misleading people into thinking there is sewage in streams and ponds when there is not, Fujioka said.

"The EPA standards make the assumption that you do not find

E. coli and enterococci in the absence of fecal or sewage sources," he said. "If we find it in other than (fecal or sewage sources), then the basic assumption doesn't hold."

Fujioka said his theory that *E. coli* and enterococci multiply in the soil was met with reservations by the federal Environmental Protection Agency, which believes the high counts are due to fecal droppings. But high numbers are found everywhere, he said, and that would mean that fecal droppings are everywhere.

An indication of seven is the acceptable standard of bacteria in the water, Fujioka said, and when the indicator is 10, people react with astonishment.

"I would like to see how many people would be concerned that I pick up 500 in their back yard," he said. "Would they tell their children don't sit there?"

Appendix F
Consent Decree

EXHIBIT 1

IN THE DEPARTMENT OF HEALTH

STATE OF HAWAII

DEPARTMENT OF HEALTH,
STATE OF HAWAII,

Complainant,

VS.

CITY & COUNTY OF HONOLULU
KANE OHE AND KAILUA WASTEWATER
TREATMENT PLANTS,

Respondent.

DOCKET NO. 89-PIE-EOW-2
DOCKET NO. 89-PIE-EOW-2

CONSENT AGREEMENT

CONSENT AGREEMENT

This CONSENT AGREEMENT is entered into effective
MAR - 6 1990 by and between the Director of Health,
Department of Health, State of Hawaii, hereinafter referred
as "DOH" and the City & County of Honolulu, hereinafter
referred to as "Respondent";

WHEREAS, the DOH issued two Notices and Finding of Violation dated June 23, 1989, and August 14, 1989, against Respondent";

WHEREAS, the parties desire to mutually settle the Notices and Finding of Violation without the need for a hearing;

NOW, THEREFORE, the DOH and the Respondent mutual agree as follows:

1. "TOTAL COSTS - \$160,000
OVERALL STUDY PERIOD - July 1990 to June 1991

a. Community Interaction (\$10,000)

A spokesman will keep neighborhood boards, community organizations, environmental groups, and other interested parties informed of the status of the studies.

b. Clostridium Perfringens (\$35,000)

Using clostridium perfringens as a sewage indicator, monitoring of the Mokapu Outfall receiving waters and Kailua Bay Shoreline areas will be conducted.

c. Kailua Bay Circulation Study (\$75,000)

Ocean current and land discharge information will be collected and used to characterize Kailua Bay circulation.

d. Assessment Report (\$40,000)

The above studies will be conducted as outlined in attachment A entitled Kailua Bay Study. Data from above studies will be compiled and assessed. Conclusions and recommendations regarding impacts from sewage will be made.

2. Respondent shall make improvements to the Kaneohe Wastewater Treatment Plant as outlined in the Compliance schedule for Kaneohe Improvements dated February 13, 1990 as attached hereto as Exhibit "B".
3. Respondent shall make improvements to the Kailua Wastewater Treatment Plant as outlined in the Compliance Schedule for Kailua Improvements dated February 13, 1990 and in the Kailua WWTP Expansion Schedule dated February 15, 1990 attached hereto as Exhibits "C" and "D".
4. The sum of ONE HUNDRED NINETY THOUSAND DOLLARS (\$190,000.00) shall be suspended provided Respondent complies with the studies in paragraph 1 above.
5. The Respondent may appeal to the DOH for relief or partial relief from this Consent Agreement in the case of noncompliance with the deadlines

herein due to circumstances beyond the reasonable control of the Respondent. Any such appeal shall be in writing and made at least ten (10) days in advance of the deadline the Respondent will not be able to meet or no later than five (5) days after the occurrence of the circumstances beyond the reasonable control of the Respondent. The burden shall be on the Respondent to show such circumstances, and the grant of such relief shall be solely within the discretion of the Director of Health.

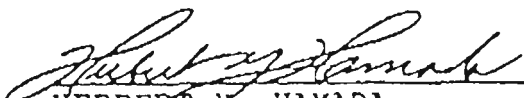
IN WITNESS WHEREOF, the parties hereto have executed this document effective as of the date above written.


STATE OF HAWAII

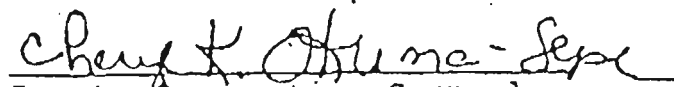
By 

APPROVED AS TO FORM:

CITY & COUNTY OF HONOLULU


HERBERT Y. HAMADA
Deputy Attorney General

By 
SAM CALLEJO
Director and Chief Engineer
Department of Public Works


Deputy Corporation Counsel
CITY & COUNTY OF HONOLULU

6594R