



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
P.O. BOX 621  
HONOLULU, HAWAII 96809

STAFF SUBMITTAL  
for the meeting of the  
COMMISSION ON WATER RESOURCE MANAGEMENT

September 24, 2008  
Haiku, Maui

Petition to Amend the Interim Instream Flow Standards  
for the Surface Water Hydrologic Units of  
Honopou (6034), Hanehoi (6037), Piinaau (6053),  
Waiokamilo (6055), and Wailuanui (6056), Maui

PETITIONER:

Na Moku Aupuni O Koolau Hui, Beatrice Kekahuna, and Marjorie Wallett  
c/o Native Hawaiian Legal Corp.  
1164 Bishop Street  
Honolulu, HI 96813

LOCATION MAP: See Exhibit 1

SUMMARY OF REQUEST:

Staff is requesting that the Commission consider the recommendations for eight (8) Petitions to Amend the Interim Instream Flow Standards for streams contained within the following five (5) surface water hydrologic units in the region of east Maui (See Exhibit 2).

HONOPOU (6034)

- Honopou Stream

HANEHOI (6037)

- Hanehoi and Puolua (Huelo) Streams

PIINAUU (6053)

- Piinauu Stream
- Palauhulu Stream

WAIOKAMILO (6055)

- Waiokamilo Stream
- Kualani Stream

WAILUANUI (6056)

- East and West Wailuanui Streams
- Waikani Waterfall [Stream]<sup>1</sup>

BACKGROUND:

On May 24, 2001, Native Hawaiian Legal Corporation (NHLC), on behalf of Na Moku Aupuni O Koolau Hui (Na Moku), Beatrice Kepani Kekahuna, Marjorie Walleth, and Elizabeth Lehua Lapenia<sup>2</sup>, filed 27 Petitions to Amend the Interim Instream Flow Standards (Interim IFS) for 27 East Maui streams.

On July 23, 2001, NHLC met with Commission staff to discuss the handling of the 27 petitions. Agreement was reached that efforts would focus on Honopou, Hanehoi, Waiokamilo, Kualani, Piinaau, Palauhulu, and Wailuanui Streams. Subsequent efforts by the Commission to adopt surface water hydrologic units for the purpose of improving surface water resource management resulted in the grouping of streams into the five subject hydrologic units. The State Water Code (Code), Chapter 174C, Hawaii Revised Statutes (HRS), provides that the Commission may adopt interim IFS on a stream-by-stream basis or a general IFS applicable to all streams within a specified area.

The current interim instream flow standard (interim IFS) for the streams being considered were established by way of Hawaii Administrative Rules (HAR) §13-169-44, which, in pertinent part, reads as follows:

Interim instream flow standard for East Maui. The Interim Instream Flow Standard for all streams on East Maui, as adopted by the commission on water resource management on June 15, 1988, shall be that amount of water flowing in each stream on the effective date of this standard, and as that flow may naturally vary throughout the year and from year to year without further amounts of water being diverted offstream through new or expanded diversions, and under the stream conditions existing on the effective date of the standard.

The current interim IFS became effective on October 8, 1988. Thus, the status quo interim IFS, in effect, grandfathered all existing diversions that were registered with the Commission in subsequent years. Following the initial registration of stream diversions works, any new or modified stream diversion works structure requires a permit for construction.

---

<sup>1</sup> The Petition to Amend the Interim Instream Flow Standard for Waikani Waterfall [Stream] shall be consolidated with and addressed as part of the Petition to Amend the Interim Instream Flow Standard for East and West Wailuanui Streams.

<sup>2</sup> The Commission was notified by letter on May 10, 2007, that NHLC “no longer represent Ms. Lapenia and are, therefore, no longer authorized to advance the claim with respect to the parcel identified as TMK: 2-9-008:31 or LCAw-S-1 Claimant: Naoo on her behalf.”

Under the Code, the Commission has the responsibility of establishing IFS on a stream-by-stream basis whenever necessary to protect the public interest in the waters of the State. In the Waiahole Ditch Contested Case Decision and Order (Waiahole), the Hawaii Supreme Court emphasized that “instream flow standards serve as the primary mechanism by which the Commission is to discharge its duty to protect and promote the entire range of public trust purposes dependent upon instream flows.”

The Code defines an instream flow standard as a “quantity or flow of water or depth of water which is required to be present at a specific location in a stream system at certain specified times of the year to protect fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses. In considering a petition to amend an interim instream flow standards, the Code directs the Commission to “weigh the importance of the present or potential instream values with the importance of the present or potential uses of water for noninstream purposes, including the economic impact of restricting such uses.”

“Instream use” means beneficial uses of stream water for significant purposes which are located in the stream and which are achieved by leaving the water in the stream. Instream uses include, but are not limited to:

- 1) Maintenance of fish and wildlife habitats;
- 2) Outdoor recreational activities;
- 3) Maintenance of ecosystems such as estuaries, wetlands, and stream vegetation;
- 4) Aesthetic values such as waterfalls and scenic waterways;
- 5) Navigation;
- 6) Instream hydropower generation;
- 7) Maintenance of water quality;
- 8) The conveyance of irrigation and domestic water supplies to downstream points of diversion; and
- 9) The protection of traditional and customary Hawaiian rights.

“Noninstream use” means the use of stream water that is diverted or removed from its stream channel and includes the use of stream water outside of the channel for domestic, agricultural, and industrial purposes.

Over the past several years, starting with the establishment of the Stream Protection and Management Branch in July 2002, the Commission has been developing a framework for setting measurable instream flow standards statewide. The process applied to the five hydrologic units under consideration, if deemed appropriate and acceptable by the Commission, shall serve as a model framework for not only the remaining 19 petitions for east Maui streams, but for streams statewide.

On December 13, 2006, the Commission authorized staff to initiate and conduct public fact gathering to solicit more information than what the Code requires for the setting of an interim IFS. Under this adopted process, staff conducts a preliminary inventory of best available information upon receipt of a petition to amend an existing interim IFS. Staff then seeks agency review and comments on the compiled information (compiled in an Instream Flow Standard Assessment Report) in conjunction with issuing a public notice for a public fact gathering

meeting. Shortly thereafter (generally within 30 days), staff conducts a public fact gathering meeting in, or near, the hydrologic unit of interest.

The final products of the public review process and the supporting documentation for the proposed interim IFS contained herein are the Instream Flow Standard Assessment Reports for each of the five surface water hydrologic units under consideration. These five reports are all provided as exhibits:

- Exhibit 3: *Instream Flow Standard Assessment Report, Island of Maui, Hydrologic Unit 6034, Honopou, September 2008, PR-2008-01*
- Exhibit 4: *Instream Flow Standard Assessment Report, Island of Maui, Hydrologic Unit 6037, Hanehoi, September 2008, PR-2008-02*
- Exhibit 5: *Instream Flow Standard Assessment Report, Island of Maui, Hydrologic Unit 6053, Piinaau, September 2008, PR-2008-03*
- Exhibit 6: *Instream Flow Standard Assessment Report, Island of Maui, Hydrologic Unit 6055, Waiokamilo, September 2008, PR-2008-04*
- Exhibit 7: *Instream Flow Standard Assessment Report, Island of Maui, Hydrologic Unit 6056, Wailuanui, September 2008, PR-2008-05*

In addition, Exhibit 8 is the *Compilation of Public Review Comments (CPRC), Hydrologic Units of Honopou (6034), Hanehoi (6037), Piinaau (6053), Waiokamilo (6055), Wailuanui (6056), Island of Maui, September 2008, PR-2008-07* (CPRC). The CPRC serves as a supporting document containing the oral and written comments that were submitted as part of the initial public review process. Exhibit 9 is a consultant paper by Leroy O. Laney, submitted by Hawaiian Commercial & Sugar Company (HC&S) on September 12, 2008, entitled *The Importance of the Hawaiian Commercial & Sugar Company to the Hawaii Economy and Conditions for Its Survival: A consultant paper by Leroy O. Laney, Ph.D.* Due to the timing of its submission, staff did not have the opportunity to incorporate this information into its Instream Flow Standards Assessment Reports (IFSARs). Based upon a preliminary review, staff agrees that HC&S plays an important role in Maui's economy as reflected in the IFSARs; however, the paper fails to provide any data with regards to water usage by HC&S or any data that demonstrates the impacts of specific reductions in water availability.

The application of this process in compiling the best available information, conducting a public fact gathering meeting, and developing a recommendation based on the balanced needs of all instream and noninstream uses is a considerable departure from prior water resource management schemes in Hawaii. In Waiahole, the Commission recognized the purpose of maintaining status quo conditions as they would prevent future harm to streams, while providing for more scientifically-based instream flow standards to be developed and an overall stream protection program to be established. The interim IFS values presented herein represent a significant shift in thinking from the status quo interim IFS flows which did not appear to consider any ecological, social, or economic values, to a system which seeks to assess and balance all competing needs of instream and noninstream uses.

In response to this new paradigm of stream protection and management, staff has embraced the basic tenets of adaptive management, which are to: 1) Establish management objectives; 2) Implement management decisions; 3) Monitor effectiveness of decisions; 4) Evaluate results of

management; and 5) Revise management decisions as necessary<sup>3</sup>. Should initial management decisions need further amendment, the decisions can then be revised and the process repeated over. This is learning process that can be repeated over and over, until a sound management decision is reached. Due to the complex and dynamic nature of Hawaii's stream systems, adaptive management affords staff the ability to proceed in making reasonable management decisions and ensuring that impacts are minimized in the face of uncertainty, thus allowing staff to proceed responsibly while advancing the clear intentions of the State Water Code.

### ISSUES/ANALYSIS:

Outlined below are the analyses for each respective surface water hydrologic unit being considered under this submittal for amendment of the existing interim instream flow standards (interim IFS). The surface water hydrologic units addressed include Honopou (6034), Hanehoi (6037), Piinaau (6053), Waiokamilo (6055), and Wailuanui (6056), Island of Maui. This section of the submittal begins with GENERAL CONSIDERATIONS, which outlines issues that broadly apply to all five hydrologic units. The remainder of the ISSUES/ANALYSIS section is hydrologic unit-specific and is organized as follows:

A. Interim IFS Assessment Summary

This is a summary of key points from the respective Instream Flow Standard Assessment Reports (IFSAR), and is by no means intended to substitute the information compiled in each report. See Exhibits 3 to 7 for each of the respective hydrologic unit reports.

B. Additional Considerations

This subsection consists of claims and anecdotal events or observations. Most, if not all of these claims are according to testimony submitted through the public review process. Oral and written testimony is provided for reference in the Compilation of Public Review Comments. See Exhibit 8.

C. Proposed Interim IFS and Rationale

This subsection describes the recommended interim IFS and its location on the stream, as well as the process that was undertaken to determine the recommendation.

D. Simplified Diagrams

The first diagram provides a simplified representation of the stream in discussion. Hydrologic data are placed on the diagram to facilitate the determination of the interim IFS. This diagram is not intended to substitute the vast amount of information compiled in each report. The second diagram provides a general graphical representation of current and proposed interim IFS values on the stream.

E. Proposed Adaptive Management Strategy

This subsection outlines the recommended management strategies that can be applied towards regulation and management of the proposed interim IFS.

In developing the interim IFS recommendations, staff has attempted to remain consistent in weighing all of the instream and noninstream uses of each stream based upon the best available information presented in the IFSARs, along with the oral and written comments received through

---

<sup>3</sup> Adapted from The Instream Flow Council, 2004, p.126.

the public review process. Needless to say, this process has proved challenging due to the unique nature of each stream, whether in attempting to compare stream characteristics across multiple hydrologic units or within a single one.

The fundamental first step in developing an IFS is assessing hydrology. Streams are largely characterized by the different geologic components that affect flow characteristics, particularly the ground water contribution to streamflow. The amount of water flowing in a given stream is also affected by regional climate variations (e.g. rainfall, fog drip, solar radiation). The quantity and quality of data available for each stream that is reflective of these geologic and hydrologic characteristics varies considerably from stream to stream. For streams with available measured data, the process for developing an interim IFS may be greatly different from that for streams with limited hydrologic data.

The next step is to weigh often-competing instream and noninstream uses of water against the amount of water available to accommodate the needs of these uses. Again, the quantity and quality of information varies from stream to stream. This step is further complicated by the tremendous variability of instream and noninstream uses across and within surface water hydrologic units. For example, one stream may support extensive taro cultivation while another may primarily support domestic uses. The potential of the stream and hydrologic unit to support additional water use in the future has also been considered. Whatever the differences may be, the process must be based upon best available information when weighing the present or potential, instream and noninstream uses.

While staff has strived for general consistency and transparency in determining the interim IFS recommendation for each stream, the differences discussed must also be considered. Therefore, the proposed interim IFS values cannot be compared to one another. Rather, the proposed interim IFS values for each hydrologic unit should be perceived as specific only to that unit and its unique set of geologic, hydrologic, instream use, and noninstream use characteristics.

## GENERAL CONSIDERATIONS

The issues outlined below consist of general considerations that were identified by staff and other interested persons through the oral and written comments submitted as part of the public review process. Many of the comments below were general in nature and were not included as part of the IFSARs; however, staff included them here for further consideration.

- *Sustainability.* The Hawaii Farm Bureau contends that large-scale agriculture is constitutionally protected and important to the sustainability of the islands, particularly in times of disaster when imports could be severed.
- *Public health.* Public testimony indicates that the decrease in the ability to gather impacts nutrition. Stagnant water in the streams results in increased mosquitoes, which may lead to increased risk in dengue fever or other mosquito-borne illnesses. Stagnant water may also increase the risk of skin disease from the water.

- *Decreased streamflow.* Streamflow trends have decreased Statewide<sup>4</sup>. Many people testified that the water in the east Maui streams has diminished in the last 20-30 years, but there may be multiple variables, including but not limited to:
  - a) Possible reduction in ground water storage and recharge<sup>5</sup>.
  - b) Decreased annual rainfall<sup>6</sup>.
  - c) Increased demand for water. Though this was not thoroughly evaluated, population increases and commercial operations (i.e., transient accommodations) in rural areas may impact surface water resources.
  - d) Possible regional climate changes.
  - e) Global climate change.
  - f) Landcover has changed. Changes in vegetation over time may considerably impact water uptake and storage thus affecting availability of surface water resources. In 1905, the native forest in the Koolau and Hamakualoa Districts had heavy stands of Koa (*acacia koa*); lower down the predominant tree was Ohia Lehua (*Metrosideros polymorpha*), in mixture with “other and less important trees of the Hawaiian forest<sup>7</sup>.” In 1924, the Territorial Superintendent of Forestry wrote about the character of the native forest and its suitability “to prevent erosion and convert surface runoff into underground drainage, the desired outcome in water conservation<sup>8</sup>.”
  - g) Waterways are not kept clear of growth as they were in the past<sup>9</sup>.
- *Ongoing water issue.* There is a lot of passion among east Maui residents over the issue. Oral comments discuss generations of discontent, including a petition in 1881 to the Commissioners of Crown Lands asking not to dispose of pono wai (water rights) in Honomanu, Keanae, and Wailua to Claus Spreckels and a petition in 1902 against auction of land, and diversions of water to other districts.
- *Status quo interim IFS.* Since the initial establishment of interim IFS as “status quo” on June 15, 1988, east Maui residents have been asking for restoration of streamflow. In 1987, the Keanae-Wailuanui Community Association pointed out that east Maui presents a unique situation due to the extensive ditch and tunnel system. Staff reviewed the files pertaining to the initial establishment of interim IFS in east Maui and found that there were many differing opinions: Some examples include: A DLNR forester stated that 95 percent of the streams were already diverted; some people argued for release of water, while others, particularly Upcountry and agriculture interests, supported status quo. The interim IFS had to be set by July 1, 1988 due to statutory deadline in the Water Code; however it was envisioned that the interim IFS were temporary and that “permanent” IFS would be set at a future time. In all the informational meetings, a lack of data was noted. Staff, at the time, anticipated that studies underway or to be undertaken in the “next year or two” would provide more data.

---

<sup>4</sup> USGS study, Oki, 2004

<sup>5</sup> USGS study, Oki, 2004

<sup>6</sup> USGS study, Oki, 2004

<sup>7</sup> Kumu Pono Associates, 2001a, p.427-428

<sup>8</sup> Kumu Pono Associates, 2001a, p.441

<sup>9</sup> Kumu Pono Associates, 2001b, p.II:9

- *Cultural Landscape Study.* Testimony indicates that the recommendation of the County of Maui Planning Department's 1995 cultural landscape study is to support return of water and taro farming.
- *EMI Cultural Study.* East Maui Irrigation Company (EMI) commissioned a study by Kumu Pono Associates in 2001 entitled, *Wai o ke ola: He wahi mo 'olelo no Maui Hikina, Oral history interviews with families of Hāmākua Poko, Hāmākua Loa and Ko'olau, East Maui*, in conjunction with their water license application to the Board (for a long-term lease). Some interviewees felt that the relationship between the community and EMI was generally good.<sup>10</sup>
- *HC&S water needs.* Public testimony raises the question of how are water "needs" of HC&S and Maui Land and Pineapple Company (MLP) determined and challenges the accuracy of their information. NHLC contends that the burden is on HC&S to justify their water needs, and others contend that Alexander & Baldwin, Inc. (A&B) and EMI are "banking" the waters for future development in central Maui. NHLC also questions the agreement between MLP and EMI for water purchase, as to EMI's ability to sell water over 100 million gallons per day (mgd), EMI's water needs in excess of 100 mgd, and the possibility that EMI has other sources of water.
- *Agricultural subsidies.* NHLC contends that federal and state agricultural subsidies should be considered when assessing the economics of HC&S/EMI operations.
- *Upcountry Maui.* Upcountry Maui residents rely on water diverted from east Maui streams for domestic water supply, and often have to reduce consumption when water supply is limited. Upcountry Maui farmers and ranchers also rely on east Maui surface water resources.
- *Energy.* Maui Electric Company (MECO) purchases power from HC&S. HC&S generates renewable energy via hydroelectric and biomass, and (according to public testimony) have been generating electricity before MECO was ever in place. HC&S is furthering research into renewable energy with the help of the State via tax incentives accumulated in the millions of dollars. Through this joint venture, HC&S and the State of Hawaii can realize Hawaii's Clean Energy Initiative of 70 percent clean energy including energy efficiency and renewable energy by 2030.
- *Water management practices.* The cultural study commissioned by EMI identified issues regarding EMI's practice of releasing water downstream during periods of heavy rainfall. Area residents raised concerns that this practice negatively impacted taro loi, and may cause increased siltation resulting in damage to the reef and nearshore fisheries<sup>11</sup>.
- *Water use by HC&S.* NHLC contends that HC&S is using, on average, over 17,724 gallons per acre per day (gad) in the wet winter months, and over 35,449 gad in the dry summer months. NHLC states that the average water use of a typical truck crop is 2,000 gad. (For the number used in their calculation, NHLC references testimony from the east Maui contested case hearing regarding water licenses for the numbers used in their calculation.) NHLC calculated the amount of water used in irrigation based on the acreage watered for a single given day and did not account for irrigation rounds.

---

<sup>10</sup> Kumu Pono Associates, 2001b, p.II:9

<sup>11</sup> Kumu Pono Associates, 2001b, p.II:400



- 134 mgd applied over 7,560 acres = 17,724 gad for winter months
- 268 mgd applied over 7,560 acres = 35,449 gad for summer months

HC&S agrees with the “simple arithmetic” approach taken by NHLC, but argues that the assumptions made by NHLC do not take into account irrigation rounds, whereby the 7,560 acres identified only receives water every two out of seven days on a rotational basis.

- 17,724 gad applied for 2 out of 7 days = 5,064 gad for winter months
- 35,449 gad applied for 2 out of 7 days = 10,128 gad for summer months

While this is not as high as NHLC calculates, staff finds this water use to be high: The newly-developed Irrigation Water Requirement Estimation Decision Support System (IWREDSS) model, staff calculate average irrigation need for sugarcane to range from 1,400 to 6,000 gallons per acre per day.

- *Alternative water sources.* NHLC has raised concerns over HC&S’ access to alternative source of water, such as pumped ground water. HC&S states that if there is only a little decrease in surface water availability, they would have to rely on brackish water to irrigate their fields or install costly pumps to water the fields located far from the wells.
- *Viability of HC&S.* HC&S contends that it has been able to maintain operation as a result of: 1) Large acreage; 2) Lands located in flat/gently sloping areas; 3) Revenue from energy sales to MECO; 4) Additional acreage from Wailuku Sugar Company; 5) Additional water from West Maui Irrigation System limiting HC&S’ reliance on brackish water from wells; and 6) Product line diversity.

## **HONOPOU (6034)**

### A. Interim IFS Assessment Summary

#### Hydrology

- Honopou Stream is mostly a gaining stream. The average annual ground water gain measured immediately downstream of Haiku Ditch is 2.3 million gallons per day (mgd) or 3.56 cubic feet per second (cfs), with 50 percent originating upstream of Wailoa Ditch.
- The Haiku, Lowrie, New Hamakua, and Wailoa Ditch are four active diversion systems that are currently capturing base flow from Honopou Stream.
- USGS flow statistics are illustrated in Section D, Simplified Diagrams. These statistics show that diversions at the ditches contribute to the 50 percent reduction in total flow observed between gaging stations 16587000 and 16595000.
- Three 4-inch bypass pipes are installed at Haiku Ditch on Honopou Stream to allow water to bypass the diversion structure and flow back into the stream.
- Long-term streamflow data indicate that monthly total and base flows on the stream have generally decreased from 1913 to 2002. This is consistent with decreasing rainfall trends statewide. Changing streamflow characteristics could pose a negative effect on the availability of drinking water for human consumption and habitat for native stream fauna.

#### Maintenance of Fish and Wildlife Habitat

- Low numbers of native aquatic and insect species were observed in the stream. Large sections of the stream are currently unsuitable habitat for native animals. *Lentipes concolor* (oopu alamo‘o) was observed only in the upper reaches. Larval recruitment of native fish was observed near the stream mouth.
- The bypass pipes at Haiku Ditch and pipes in diversion structures block upstream migration of native amphidromous species.
- By dewatering different sections of the stream, diversions create disconnected deep pools in the stream to which adult animals inhabiting them are restricted.
- Partial restoration of streamflow and increased continuity in flow could lead to the development of a richer and more native-dominated community in the stream. However, care must be taken to not introduce invasive species through the release of water from irrigation ditches.

#### Outdoor Recreational Activities

- The Hawaii Stream Assessment (HSA) identified swimming as a recreational opportunity.
- Public comments indicated reduction in streamflow over the last 20 to 30 years has dramatically reduced recreational opportunities in east Maui streams, including Honopou Stream.
- Approximately 24 percent of the Honopou hydrologic unit is public hunting area.

#### Maintenance of Ecosystems

- More than half of the hydrologic unit is made up of alien forests, with some native Koa-Ohia forests that spread throughout the upper slopes as part of the Koolau Forest Reserve.
- Almost 40 percent of the Honopou hydrologic unit is within the East Maui Watershed Partnership management area.

- The estimated Net Present Value of the amenities offered by the Koolau Forest Reserve is 7 to 14 billion dollars. Approximately 25 percent of the Honopou hydrologic unit is lies in the Koolaus.
- The East Maui watershed is the single largest source of surface water in the state, and it is home to the largest concentration of endangered native forest birds.

#### Aesthetic Values

- Opportunities for scenic enjoyment are available where Honopou Stream crosses Hana Highway.

#### Maintenance of Water Quality

- Samples collected in Honopou Stream indicated no exceedence of Water Quality Standards.
- Puniawa Stream and roughly the lower half of Honopou Stream are mostly Class 2 inland waters, protected for recreational and agricultural uses, and aquatic life.
- Upper reaches of Honopou Stream are Class 1 inland waters, protected to “remain in their natural state as nearly as possible with an absolute minimum of pollution from any human-caused source.”

#### Conveyance of Irrigation and Domestic Water Supplies

- Seven out of 22 diversions were registered under the East Maui Irrigation Co. (EMI). Of the 15 non-EMI diversions, 12 were declared for domestic purposes. All 15 diversions utilize water for irrigation of crops and livestock, including taro cultivation.

#### Protection of Traditional and Customary Hawaiian Rights

- Two landowners claim appurtenant rights in Honopou for wetland taro cultivation.
- Of the 15 non-EMI diversions, 6 declared water use for taro cultivation with an estimated cultivable area of 35 acres.
- Twenty-five testimonies were submitted by the Native Hawaiian Legal Corporation addressing insufficient water flow that is affecting taro cultivation and traditional gathering practices in the east Maui streams.
- A large proportion (about 70 percent) of the water diverted by EMI originates on State lands under revocable permits, including water from Honopou Stream. Appurtenant rights of taro growers are public trust purposes recognized by the Code and respected as the highest form of protection. Traditional and customary native Hawaiian rights are constitutionally protected.

#### Noninstream Uses

- Seven out of the 22 registered major diversions are registered by EMI. There are also two EMI minor diversions.
- The EMI system primarily captures surface water from multiple watersheds in east Maui with a combined area of approximately 56,000 acres. The system delivers an average of 37 percent (165 mgd) of its delivery capacity. Approximately 70 percent of the water delivered via the system emanates from State lands, for which A&B and EMI currently hold revocable permits for the four license areas.
- The HC&S plantation consists of 43,300 acres of land. Sugar is cultivated on 37,000 acres while the rest, which are unsuitable for cultivation, are leased to third parties. The

majority of the sugarcane fields are irrigated with water delivered by EMI and supplemental ground water pumped by HC&S. The amount of water HC&S claims to need from EMI ranges from 134 to 268 mgd the winter and summer months, respectively.

- Testimony indicates that HC&S helps supplement the local economy, which is very critical during this time of recession. It provides over 800 jobs and supports large and small businesses alike. HC&S is an economic pillar in the community. A&B and its companies help Maui's communities through its Foundation, through which numerous organizations receive much-needed funding and in-kind services.
- HC&S receives revenue from 1) sale of sugar and molasses, 2) sale of electricity to Maui Electric Company (MECO), 3) delivery of water to the County of Maui Department of Water Supply's (DWS) Upcountry system, and 4) delivery of water to Maui Land and Pineapple Company, Inc (MLP) for its east Maui pineapple fields.
- Among the three Upcountry DWS water systems (i.e., Makawao, Upper Kula, and Lower Kula), only the Makawao water system is served by EMI through the Wailoa Ditch. This system receives 8.2 mgd from EMI, a portion of which goes to the Kula Agricultural Park. With rising populations, the water demand in Upcountry Maui is expected to increase.
- MLP cultivates 6,000 acres of pineapple, of which over 2,800 acres are situated in east Maui and relies on EMI for water. The amount of water MLP claims to need from EMI is 4.5 mgd.
- Since over half of the irrigation water for west and central Maui comes from east Maui, decreasing the amount of water diverted at the ditches located in the east affects the amount of water available for the irrigation of crops in the west and central parts of Maui.
- Compared to periods of lower than average rainfall, prolonged loss of irrigation water caused by a decrease in the amount of water diverted by irrigation ditches has greater effects on the long-term trends of ground water levels.

## B. Additional Considerations

- NHLC's Motion to Enforce (related to the BLNR Contested Case Hearing) indicates that Beatrice Kekahuna takes issue with the finding that she has adequate water; particularly her desire to open more loi in the future, thus triggering her appurtenant rights to more water.
- Oral testimony by Marjorie Wallett's daughter, Lyn Scott, indicates that Honopou Stream is diverted four times and that there is not enough water below the ditches. Their auwai is located nearly two miles below the last EMI diversion. The water is 76°F going into the auwai and 82°F going out, resulting in pythium rot of their taro crop.
- According to NHLC, the BLNR Interim Order (related to the BLNR Contested Case Hearing) was based on flow measurements of Ms. Kekahuna's auwai which were made by EMI, and therefore NHLC contests the accuracy and refers to the measurements as "biased."
- HC&S states that they assisted Ms. Kekahuna in her taro irrigation needs. BLNR ruled (in the Contested Case Hearing Interim Order) that there is enough water for Ms. Kekahuna's auwai. HC&S does not believe there is a reason for amending interim IFS for Honopou Stream for Ms. Kekahuna's taro needs.

- According to statements made at the Commission's September 2008 site visit to the Kekahuna/Wallett properties, Honopou area residents do not receive water from a county water system.

### C. Proposed Interim IFS and Rationale

#### Interim IFS A

Proposed Location: Lower reach of Honopou Stream near the inactive USGS stream gaging station 16595000 at 383 feet elevation, downstream of Haiku Ditch.

Proposed Interim IFS: 2.00 cubic feet per second, 1.29 million gallons per day

#### Interim IFS B

Proposed Location: Lower reach of Honopou Stream near 40 feet elevation. Upstream of the confluence of Puniawa Stream and Honopou Stream, and downstream of the lowest registered diversion on Honopou Stream.

Proposed Interim IFS: 0.72 cubic feet per second, 0.47 million gallons per day

#### Rationale

Under the current flow conditions, Honopou Stream has limited recreational and aesthetic opportunities. Regarding stream biota, the stream has poor aquatic and insect diversity. The presence of dewatered sections in the stream, possibly caused by diversions, affects habitat availability for native species. The use of pipes in diversion structures, especially those observed at the Haiku Ditch that bypass water across the ditch, block upstream migration of native amphidromous species. The stream currently supports taro cultivation with two appurtenant rights claimants, as well as the cultivation of other crops and livestock. The stream also supports twelve registered domestic users, for whom access to county water service is not available. Honopou Stream is an important source of irrigation water for East Maui Irrigation Company (EMI), which operates a total of seven major diversions and two minor diversions on the stream.

Staff believes that some of the currently diverted flow should be restored to the stream in order to balance the instream and noninstream uses of stream water. Flow restoration would increase the continuity of flow in the stream, which would enhance habitat availability and native species diversity. Restoration of flow in the stream would also benefit the large number of surface water users downstream from the irrigation ditches. Furthermore, Honopou could potentially support more taro cultivation, as well as gathering and other traditional practices, which increase surface water demand. Other benefits of stream restoration may also include improvement of the currently limited recreational opportunities offered by the stream, as well as furthering the protection and maintenance of the Koolau Forest Reserve.

In an effort to balance the multiple demands on the stream, staff does not propose return of all the stream water. While it is important to have water downstream of the irrigation ditch diversions for the reasons listed above, it is likewise important to continue allowing the irrigation diversions. The water that flows into the ditch system supports Upcountry Maui's domestic and agricultural uses, large-scale agriculture in central Maui, and provides power to Maui Electric Company. The large-scale agriculture is important to Maui's economy, and diversified agriculture is particularly important to the overall self-sustainability of the island.

In determining the interim IFS, the ground water contribution to Honopou Stream under undiverted condition is used as the starting point for the following reasons:

- Ground water contribution to total flow is generally considered as part of base flow, or the total flow that is present in the stream 70 to 90 percent of the time ( $Q_{70}$  -  $Q_{90}$ );
- Ground water contribution estimates instead of total flow estimates are used because major diversion structures are generally assumed to capture a majority of the base flow, which is assumed to be mostly ground water flow; and
- Median base flow, which is mostly ground water flow, is used as a standard of comparison to determine the relative native species habitat availability in a USGS study.

Due to the variable and abstract nature of base flow, it is best to associate this term as 70 to 90 percent of the total flow in the stream, or flow that is present in the stream 70 to 90 percent of the time. However, for ease of reference, this flow will be referred as "base flow" in the text.

The first proposed interim IFS A is set downstream of Haiku Ditch to ensure that an adequate amount of water reaches the downstream users. According to measured streamflow data, Honopou is mostly a gaining stream. The average annual ground water contribution to Honopou Stream upstream of Wailoa Ditch is 1.78 cfs. Between Wailoa Ditch and Haiku Ditch, the stream gains another 1.78 cfs from ground water. If diversion of water from Wailoa Ditch is allowed and diversions at Lowrie and Haiku Ditch are minimal, the flow below Haiku Ditch should be larger than 1.78 cfs, which is the amount of ground water contribution to streamflow. Considering that Honopou Stream continues to gain an unknown amount of ground water flow below Haiku Ditch, the flow near the inactive USGS gaging station 16595000 is approximately 2.0 cfs.

The second interim IFS B is proposed to regulate the flow in stream reaches downstream of domestic and taro diversions located in the lower part of the hydrologic unit. A second interim IFS downstream of all surface water users prevents the drying of the stream from the domestic and taro diversions. This interim IFS would increase the continuity of flow to enhance biological integrity in the stream. According to long-term data (94 complete years) at USGS gaging station 16587000 upstream of Wailoa Ditch, a flow of 0.72 cfs is present in the stream 90 percent of the time. This value is commonly referred as 90 percent of total flow in the stream ( $Q_{90}$ ) or flow that is present in the stream 90 percent of the time. Since the gaging station is located above all diversions, this flow may also represent the median base flow in the stream, although the median base flow could also be as high as  $Q_{70}$  or 70 percent of total flow. Considering that Honopou Stream is gaining ground water flow from the headwaters to the coast, the minimum amount of water that should flow through the stream near the outlet should be at least, if not greater, than 0.72 cfs. Since the diverted  $Q_{90}$  flow at

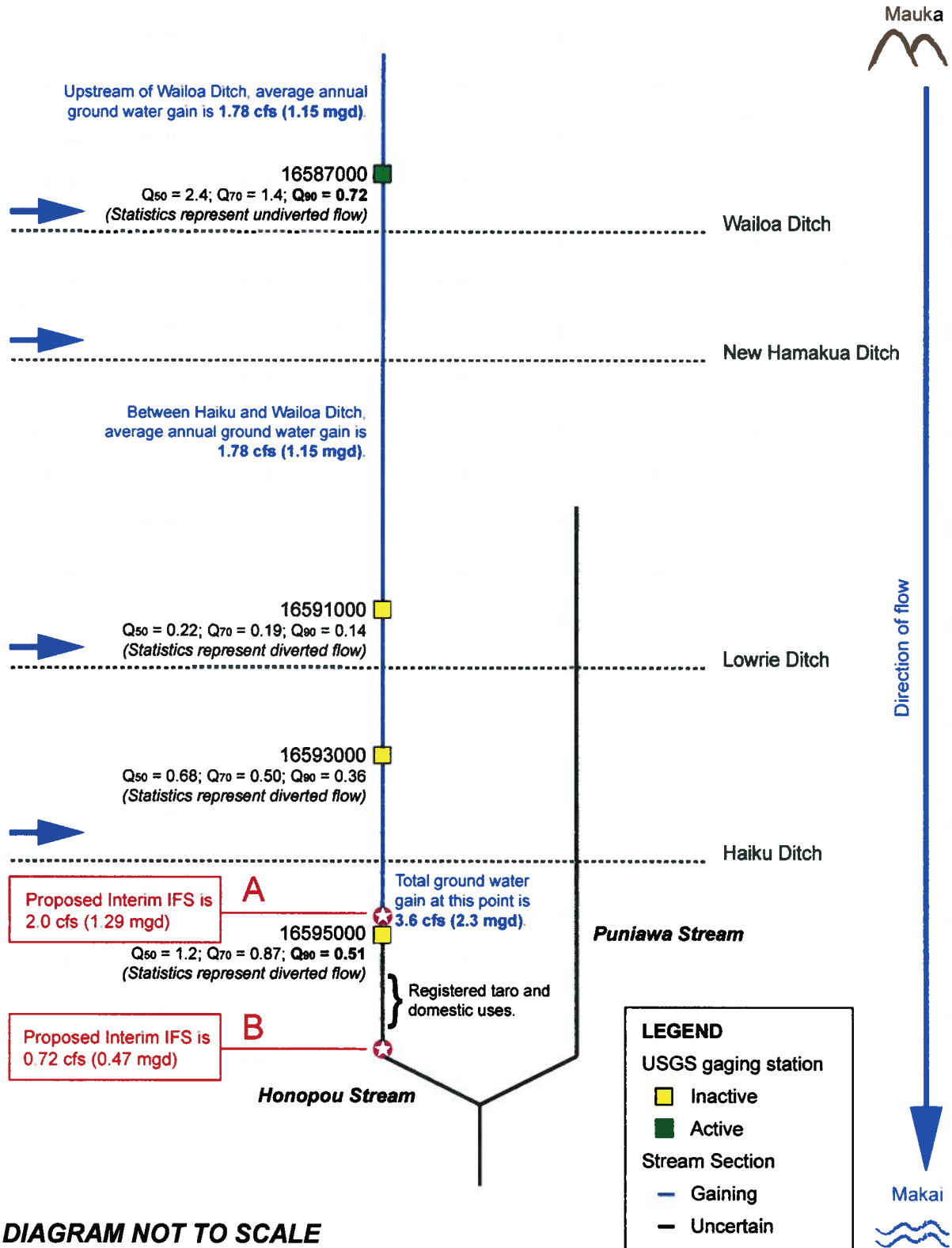
gaging station 16595000 below Haiku Ditch is 0.51 cfs, the interim IFS should be set at a higher flow in order for stream restoration to occur.

Please note that the proposed interim IFS and the  $Q_{70}$  and  $Q_{90}$  listed above are averages. Staff proposes an adaptive management strategy that includes periodic review of the proposed interim IFS in providing for both instream and noninstream uses. Specific actions are proposed for consideration under Section E, Proposed Adaptive Management Strategy.

D. Simplified Diagrams.

**HONOPOU Hydrologic Unit: Stream System Schematic Diagram**

[All flows are in cubic feet per second (cfs) unless other wise noted; mgd = million gallons per day.]

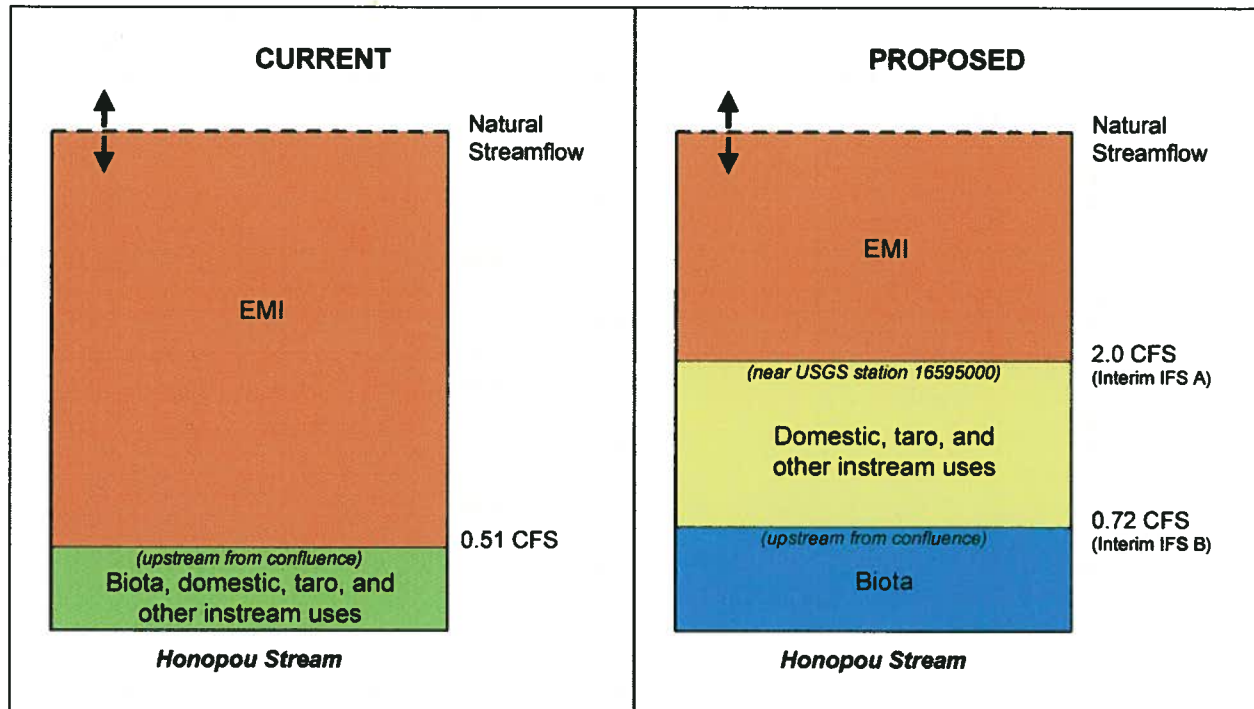


**DIAGRAM NOT TO SCALE**



**HONOPOU Hydrologic Unit: Current and Proposed Interim IFS Diagram**

The diagram below is intended to provide a general graphical representation of current and proposed interim IFS values for Honopou Stream. Corresponding flows (in cubic feet per second) are identified to the right of each illustration.



**DIAGRAM NOT TO SCALE**

### E. Proposed Adaptive Management Strategy

Interim IFS A is proposed to ensure that an adequate amount of water reaches the downstream diversions, which are primarily for domestic use and taro cultivation. Interim IFS B is proposed to protect the biological integrity in the lower reaches of the stream, downstream from all diversions. The effects of flow restoration on stream biota and habitat availability are unknown. Therefore, staff proposes adopting an adaptive management program that may include the following:

Staff proposes the following hydrologic unit-specific adaptive management strategies:

- EMI, in coordination with staff, shall consider alteration of the diversion at Haiku Ditch to allow for the upstream migration of native aquatic species across the diversions. Currently, the EMI diversion at Haiku Ditch takes all the base flow except that which flows through three 4-inch (outside diameter) pipes.

Staff proposes the following general adaptive management strategies:

#### IMPLEMENTATION

- Staff shall seek to enforce the provisions of the State Water Code should any unauthorized, non-registered or non-permitted diversions be discovered in the course of its fieldwork. Staff recommends that all owners of unauthorized diversion works structures contact staff to file the necessary applications to seek compliance with all permitting requirements set forth by the Code.
- Staff shall coordinate with EMI to identify and determine appropriate actions with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall coordinate with other registered stream diversion works owners with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall assess the existing condition and status of all EMI diversions, in coordination with EMI and Division of Aquatic Resources (DAR) staff, to determine if any modifications are necessary to improve habitat conditions for stream biota.

#### MONITORING

- Staff shall monitor streamflow by taking periodic flow measurements, subject to available funding, at the proposed interim IFS locations, as weather permits. These will be point-in-time measurements; however, the installation of stream gaging stations remains an option for long-term management.
- Periodic biological surveys shall be conducted, subject to available funding, to monitor the response of stream biota to post-interim IFS implementation.
- Any party claiming to be negatively impacted as a result of the adopted interim IFS shall monitor and document, in cooperation with staff, the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.
- Likewise, any party claiming that negative impacts are a direct result of actions (i.e., diverting too much water, violating the interim IFS) caused by another party, shall monitor and document the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.

- All claimants shall cooperate with staff in conducting appropriate investigations and studies, particularly with regard to granting access to stream channels and private property related to such investigations, subject to the provisions of the State Water Code, Chapter 174C, HRS.

#### EVALUATION

- Within one year from the date of adoption of an interim IFS, staff shall report to the Commission on the progress of implementing the interim IFS and the application of the adaptive management strategies outlined above, and the impacts of the interim IFS upon instream and noninstream uses. Should an interim IFS need to be revised prior to one year from the date of adoption, staff may opt to propose another amended IFS to the Commission.
- Staff shall assess the implementation of these strategies on an as-needed basis, as may be necessary upon consultation with the affected parties.
- Staff shall begin preparation of a long-term management framework for the implementation of measurable IFS statewide. Since this is the first time this interim IFS process is being applied to a standing petition, broader adaptive management strategies must be identified and assessed in consideration of the Commission's Stream Protection and Management Program as a whole (i.e., competing priorities, staffing, budget, etc.).

## **HANEHOI (6037)**

### A. Interim IFS Assessment Summary

#### Hydrology

- There currently is very little flow in Hanehoi Stream. There are no data on whether Hanehoi and Huelo (Puolua) Streams are losing or gaining flow from ground water.
- Residents reported the streams traditionally (pre-1960s) had continuous flow except in times of drought. Archaeological evidence of extensive taro loi along the lower reaches of the streams suggests that water was once readily available.
- The Haiku, Lowrie, New Hamakua, and Wailoa Ditches are four active diversion systems that are currently capturing base flow from the streams.
- Measured streamflow data are limited for Hanehoi and Huelo (Puolua) Streams. Flow statistics were estimated with regression equations, and they are illustrated in Section D, Simplified Diagrams. Since Hanehoi is outside of the study area in which the regression equations were developed, the estimated flow statistics may not be representative of the flow conditions in Hanehoi and Huelo (Puolua) Streams.
- Streamflow data from long-term gaging stations around the islands indicate that monthly mean total and base flows have generally decreased from the 1940s to 2002. This is consistent with decreasing rainfall trends statewide. Changing streamflow characteristics could pose a negative effect on the availability of drinking water for human consumption and habitat for native stream fauna.

#### Maintenance of Fish and Wildlife Habitat

- Hanehoi Stream has degraded native aquatic and insect biota in the middle and lower reaches. Large sections of the stream are currently unsuitable habitat for native animals. Only the native mountain opae were observed and are present in the upper reaches. Native dragonflies and damselflies were observed in the upper reaches as well.
- Use of pipes in diversion structures blocks upstream migration of native amphidromous species.
- By dewatering different sections of the stream, diversions create disconnected deep pools in the stream to which adult animals inhabiting them are restricted.
- Restoration of streamflow and increased continuity in flow could lead to the development of a richer and more native-dominated community in the stream. However, care must be taken to not introduce invasive species through the release of water from irrigation ditches.
- The terminal waterfall at the mouth of the stream would likely restrict upstream migration.

#### Outdoor Recreational Activities

- The HSA classified the recreational resources of Hanehoi Stream as “limited”, with no identified recreational resources.
- Approximately 30 percent of the Hanehoi hydrologic unit is public hunting area.
- Public comments indicate that a reduction in streamflow over the last 20 to 30 years has dramatically reduced recreational opportunities in east Maui streams, including Hanehoi Stream.

- Residents reported recently established agricultural educational centers that have access to the stream through traditional trails. Environmental groups have utilized the centers and the trails to offer educational hikes and other activities.

#### Maintenance of Ecosystems

- Almost 70 percent of the Hanehoi hydrologic unit is within the East Maui Watershed Partnership management area.
- The upper slopes of the Hanehoi hydrologic unit are reserves and wetlands, dominated by native plants.
- The estimated Net Present Value of the amenities offered by the Koolau Forest Reserve is 7 to 14 billion dollars. Approximately 30 percent of the Honopou hydrologic unit lies in the Koolau Forest Reserve.
- The east Maui watershed is the single largest source of surface water in the state, and it is home to the largest concentration of endangered native forest birds.

#### Aesthetic Values

- Opportunities for scenic enjoyment are available where Hanehoi Stream crosses Hana Highway.

#### Maintenance of Water Quality

- Hanehoi and Huelo (Puolua) Stream are mostly Class 2 inland waters, protected for recreational and agricultural uses, and aquatic life.

#### Conveyance of Irrigation and Domestic Water Supplies

- Seven out of 12 diversions were registered under EMI. Of the five non-EMI diversions, one was declared for domestic purposes. Four diversions utilized water for irrigation of crops and livestock, including taro cultivation. The diversion for domestic purposes serves approximately 30 families, or approximately 100 people in the Huelo community.

#### Protection of Traditional and Customary Hawaiian Rights

- Of the five non-EMI diversions, two declared water use for taro cultivation with an estimated cultivable area of 2.3 acres.
- Twenty-five testimonies were submitted by the NHLC addressing insufficient water flow that is affecting taro cultivation and traditional gathering practices in the east Maui streams.
- Residents reported archaeological evidence of extensive taro loi along the lower reaches of the streams. They also reported cultural remains of auwai and ancient terraces in Hanehoi.
- A large proportion (about 70 percent) of the water diverted by EMI originates on State lands under revocable permits. Appurtenant rights of taro growers are public trust purposes recognized by the Code and respected as the highest form of protection. Traditional and customary native Hawaiian rights are constitutionally protected.

#### Noninstream Uses

- There are 12 registered major diversions on Honopou Stream, seven of which are registered by EMI. There are also seven EMI minor diversions.

- The EMI system primarily captures surface water from multiple watersheds in east Maui with a combined area of approximately 56,000 acres. The system delivers an average of 37 percent (165 million gallons per day) of its delivery capacity. Approximately 70 percent of the water delivered via the system emanates from State lands, for which A&B and EMI currently hold revocable permits for the four license areas.
- The HC&S plantation consists of 43,300 acres of land. Sugar is cultivated on 37,000 acres while the rest, which are unsuitable for cultivation, are leased to third parties. The majority of the sugarcane fields are irrigated with water delivered by EMI and supplemental ground water pumped by HC&S. The amount of water HC&S claims to need from EMI ranges from 134 to 268 million gallons per day (mgd) in the winter and summer months, respectively.
- Testimony indicates that HC&S helps supplement the local economy, which is very critical during this time of recession. It provides over 800 jobs and supports large and small businesses alike. HC&S is an economic pillar in the community. A&B and its companies help Maui's communities through its Foundation, through which numerous organizations receive much-needed funding and in-kind services.
- HC&S receives revenue from 1) sale of sugar and molasses, 2) sale of electricity to Maui Electric Company (MECO), 3) delivery of water to the County of Maui Department of Water Supply's (DWS) Upcountry system, and 4) delivery of water to Maui Land and Pineapple Company, Inc (MLP) for its east Maui pineapple fields.
- Among the three Upcountry DWS water systems (i.e., Makawao, Upper Kula, and Lower Kula), only the Makawao water system is served by EMI through the Wailoa Ditch. This system receives 8.2 mgd from EMI, a portion of which goes to the Kula Agricultural Park. With rising populations, the water demand in Upcountry Maui is expected to increase.
- MLP cultivates 6,000 acres of pineapple, of which over 2,800 acres are situated in east Maui and rely on EMI for water. The amount of water MLP claims to need from EMI is 4.5 mgd.
- Since over half of the irrigation water for west and central Maui comes from east Maui, decreasing the amount of water diverted at the ditches located in the east affects the amount of water available for the irrigation of crops in the west and central parts of Maui.
- Compared to periods of lower than average rainfall, prolonged loss of irrigation water caused by a decrease in the amount of water diverted by irrigation ditches has greater effects on the long-term trends of ground water levels.

#### B. Additional Considerations

- Maui Tomorrow states that the unmet demand for additional streamflow is poorly represented in the draft IFSAR. Hanehoi Stream is a primary source of domestic water for nearly 100 Huelo area residents. There is rarely water available in residents' sections of the stream under present conditions so they are not using the stream water for their crops.
- HC&S states that Ernest Schupp complained there was not enough cool water for his auwai just below Haiku Ditch. A site visit conducted by HC&S indicated that the auwai was not in use. BLNR ruled that there was enough water for Mr. Schupp's taro needs. HC&S argues that there is no need to amend the interim IFS for Hanehoi Stream to accommodate taro cultivation in Hanehoi.

## C. Proposed Interim IFS and Rationale

Interim IFS A

Proposed Location: Lower reach of Huelo (Puolua) Stream near 420 feet elevation, downstream of Haiku Ditch. This is the location of the ungaged site, station HuelL.

Proposed Interim IFS: 0.89 cubic feet per second, 0.57 million gallons per day

Interim IFS B

Proposed Location: Lower reach of Hanehoi Stream near 420 feet elevation, downstream of Haiku Ditch.

Proposed Interim IFS: 0.63 cubic feet per second, 0.41 million gallons per day

Interim IFS C

Proposed Location: Lower reach of Hanehoi Stream, upstream of Lowrie Ditch and the diversion of water for domestic use in the Huelo community.

Proposed Interim IFS: 1.15 cubic feet per second, 0.74 million gallons per day

Rationale

Under the current flow conditions, Hanehoi and Huelo (Puolua) Streams have limited recreational and aesthetic opportunities. The presence of agricultural educational centers within the hydrologic unit signifies that the streams have the potential for providing high quality educational and recreational experiences. Regarding stream biota, the streams have poor aquatic and insect diversity in the middle and lower reaches. This may be a result of the terminal waterfall, restricting upstream migration of certain native amphidromous species. The presence of dewatered sections in the stream, possibly caused by diversions, may affect habitat availability for native species. The streams currently support taro cultivation and the cultivation of other crops and livestock. The streams, particularly Hanehoi Stream, also support a large number of domestic users (approximately 30 families, totaling approximately 100 people) in the Huelo community, situated at the lower part of the hydrologic unit. Hanehoi and Huelo (Puolua) Streams are also important sources of irrigation water for EMI, with a total of twelve major diversions and seven minor diversions on the streams.

Staff believes that flow may need to be partially restored to the stream in order to balance the instream and noninstream uses of stream water. Flow restoration would increase the continuity of flow in the stream, which would enhance habitat availability and native species diversity. However, the presence of a terminal waterfall may continue to block the upstream migration of certain amphidromous species. Restoration of flow in the stream would also benefit the large number of surface water users downstream from the irrigation ditches.

Benefits of streamflow restoration may include improvement of the currently limited recreational opportunities offered by the stream, as well as further the protection and maintenance of the Koolau Forest Reserve.

Only estimated flow statistics are available to determine the interim IFS because no actual flow measurements were collected in these streams. The estimated low base flow value (BFQ<sub>95</sub>) of Hanehoi Stream is used as the starting point for the following reasons:

- The low base flow value (BFQ<sub>95</sub>) is generally similar to the low total flow value (TFQ<sub>95</sub>) at each ungaged site, representing the flow in the stream 95 percent of the time (Q<sub>95</sub>);
- Since the regression equations tend to overestimate flow values, the low base flow value instead of the median base flow (BFQ<sub>50</sub>) is used to represent the natural base flow in the stream to ensure a more conservative approach in determining the interim IFS;
- In a USGS study, natural base flow is used as a standard to determine the relative native species habitat availability, which will be important for future comparisons; and
- Base flow instead of total flow estimates are used because major diversion structures are generally assumed to capture a majority of the base flow.

Due to the variable and abstract nature of base flow, it is best to associate this term with 70 to 90 percent of the total flow in the stream, or flow that is present in the stream 70 to 90 percent of the time. However, for ease of reference, this flow will be referred as “base flow” in the text.

The proposed interim IFS A and B are set on Huelo (Puolua) Stream and Hanehoi Stream, respectively, upstream of their confluence, to ensure that an adequate amount of surface water reaches users downstream from Haiku Ditch. According to the estimated flow statistics, the base flow that is present in the stream 95 percent of the time (BFQ<sub>95</sub>) at ungaged site HaneL is 3.04 cubic feet per second (cfs), which is similar to the total flow that is present in the stream 95 percent of the time (3.07 cfs). In this case, BFQ<sub>95</sub> represents a conservative estimate of natural base flow for reasons stated in the previous paragraph. Based on the USGS study on habitat availability, when 50 percent of natural base flow is present in the stream, potentially 80 to 90 percent of the natural habitat for selected native species is available. Fifty percent of the natural base flow in Hanehoi Stream (3.04 cfs) is 1.52 cfs. This flow is assumed to maintain biological integrity of the stream. Although the research conducted by the USGS on habitat availability does not include Hanehoi as part of the study area, results of this study are the best information available to determine the needs of native species in the stream.

Since there is currently insufficient information for the Commission to determine whether Hanehoi Stream is gaining or losing ground water flow, the only reasonable assumption to make is that the tributaries of Huelo (Puolua) and Hanehoi Streams contribute to the 1.52 cubic feet of flow per second at ungaged site HaneL. The proposed interim IFS for Huelo (Puolua) Stream is set at the low base flow value (BFQ<sub>95</sub>) of 0.89 cubic feet per second, and one for Hanehoi Stream is set at the 0.63 cfs (1.52 cfs minus 0.89 cfs equals 0.63 cfs). These sites are below the irrigation ditches. Another interim IFS is proposed further upstream on Hanehoi Stream to allow withdrawal of stream water by domestic users in the Huelo community (discussed below). The downstream proposed interim IFS for Hanehoi Stream is set at a lower value than the low base flow value of 1.15 cubic feet per second because the stream is an important source of irrigation water for EMI. Compared to two major diversions



on Huelo (Puolua) Stream, EMI is diverting water from Hanehoi Stream at four ditches (Wailoa, New Hamakua, Lowrie, and Haiku Ditch). The interim IFS for Huelo (Puolua) Stream is set at a higher flow to allow water to be available for the downstream surface water users, both in Huelo (Puolua) Stream and below its confluence with Hanehoi Stream.

An interim IFS C is proposed to provide adequate surface water for domestic use of the Huelo community. The site of the proposed interim IFS is just above the pool in which there is an intake (pipe) for domestic users in the Huelo community; this intake is just upstream of Lowrie Ditch. The proposed interim IFS value is the low base flow (BFQ<sub>95</sub>) of 1.15 cfs estimated at an ungaged site, designated station HaneM. This value is used because the ungaged site location is relatively close to that of the proposed interim IFS location upstream of Lowrie Ditch. Assuming this flow represents the above-mentioned conservative estimate of the natural base flow in the stream, then this flow would allow for the improvement of stream biota, as well as provide enough flow for the large number of domestic users of the Huelo community.

In an effort to balance the multiple demands on the stream, staff does not propose return of all the stream water. While it is important to have water downstream of the irrigation ditch diversions for the reasons listed above, it is likewise important to continue allowing the irrigation diversions. The water that flows into the ditch system supports Upcountry Maui's domestic and agricultural uses, large-scale agriculture in central Maui, and provides power to Maui Electric Company. The large-scale agriculture is important to Maui's economy, and diversified agriculture is particularly important to the overall self-sustainability of the island. In practical terms, the result of the proposed interim IFS C is that the upstream diversions at Wailoa Ditch and New Hamakua Ditch could not divert the low flows, but they could divert flows greater than the proposed interim IFS. Considering the importance of Hanehoi Stream to EMI, staff has mitigated this by proposing a lower interim IFS downstream from Haiku Ditch that allows for substantial diversion at Lowrie Ditch and Haiku Ditch.

An interim IFS is not proposed at the stream mouth because of the small number of registered surface water users below the confluence of the streams, and because the stream has a terminal waterfall.

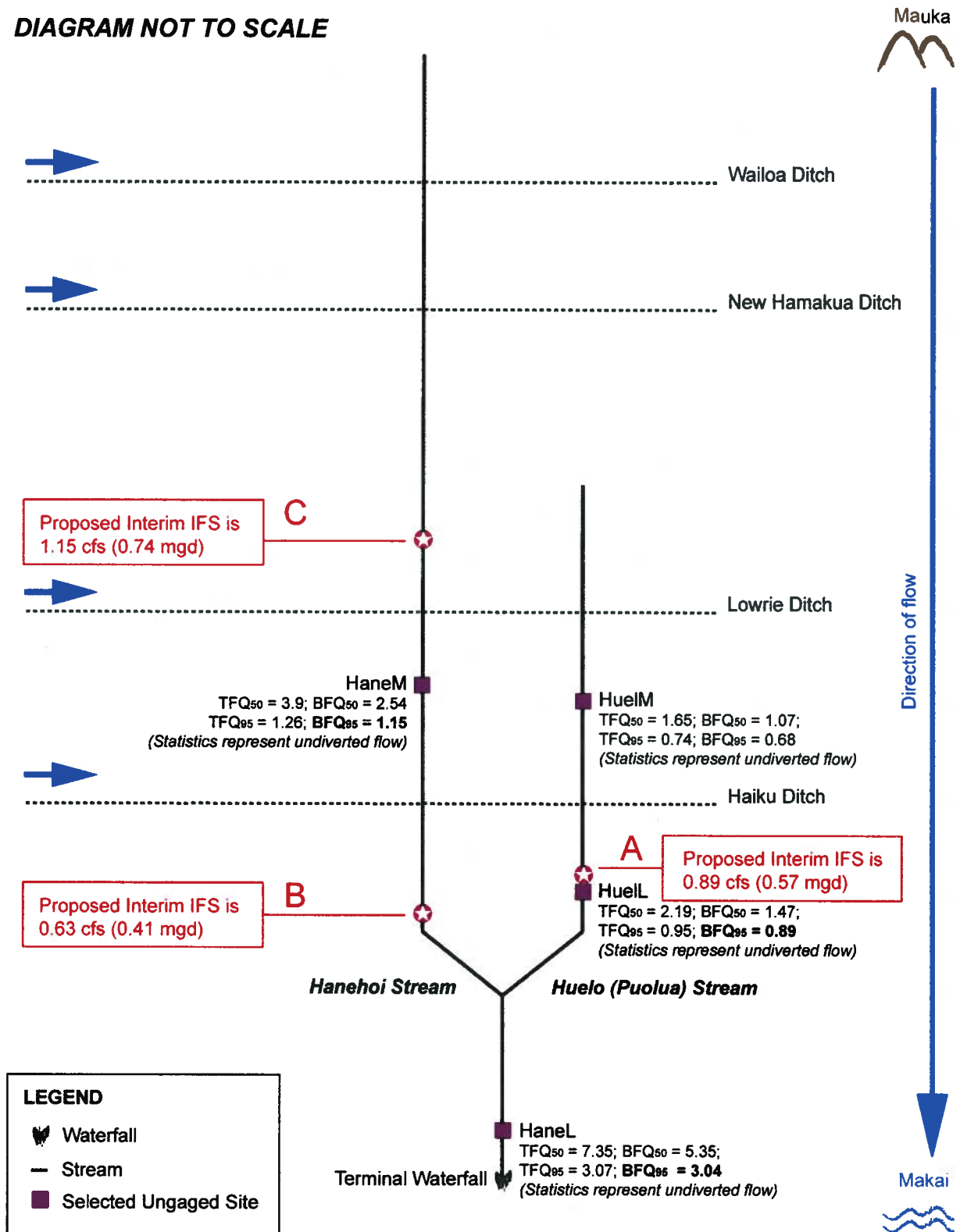
Please note that the proposed interim IFS and the BFQ<sub>95</sub> are averages. Additionally, they are based on regression equations and not directly measured flows, so in addition to natural fluctuations in flow, there is some uncertainty in the data. Therefore, staff proposes an adaptive management strategy that includes periodic review of the proposed interim IFS in providing for both instream and noninstream uses. Specific actions are proposed for consideration under Section E, Proposed Adaptive Management Strategy.

D. Simplified Diagrams.

**HANEHOI Hydrologic Unit: Stream System Schematic Diagram**

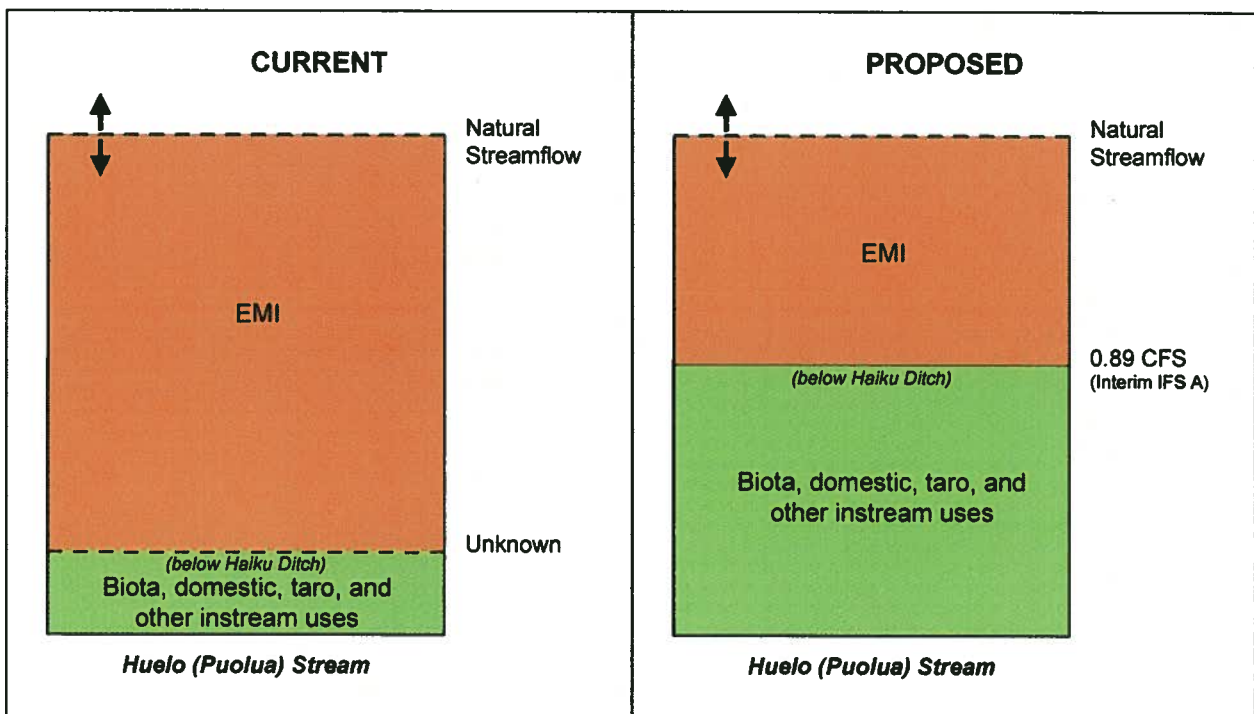
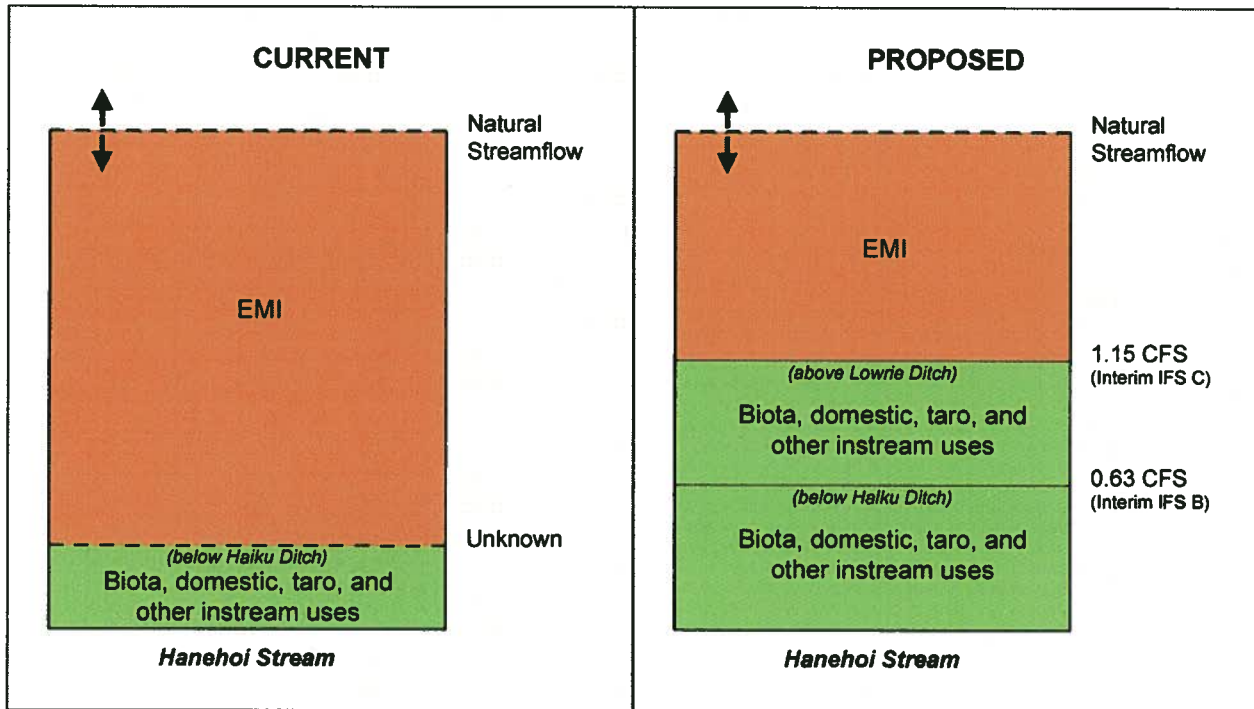
[All flows are in cubic feet per second (cfs) unless other wise noted; mgd = million gallons per day.]

**DIAGRAM NOT TO SCALE**



**HANEHOI Hydrologic Unit: Current and Proposed Interim IFS Diagram**

The diagrams below are intended to provide a general graphical representation of current and proposed interim IFS values for Hanehoi (top) and Huelo (bottom) Streams. Corresponding flows (in cubic feet per second) are identified to the right of each illustration.



**DIAGRAMS NOT TO SCALE**

### E. Proposed Adaptive Management Strategy

Staff proposes one interim IFS for Huelo (Puolua) Stream and two interim IFS for Hanehoi Stream, above its confluence with Huelo (Puolua) Stream. The interim IFS are proposed to allow a majority of the low flow in the stream to pass through the upper diversions and reach the domestic users in the downstream areas. Staff has not proposed an interim IFS below the lowest diversion on Hanehoi Stream.

Staff proposes the following hydrologic unit-specific adaptive management strategies:

- EMI, in coordination with staff, shall consider alteration of the diversions at Haiku Ditch and Lowrie Ditch to allow for the upstream migration of native aquatic species across the diversions.
- Staff may periodically monitor streamflow below the lowest non-EMI diversion to determine whether an interim IFS should be established to protect biological integrity.

Staff proposes the following general adaptive management strategies:

#### IMPLEMENTATION

- Staff shall seek to enforce the provisions of the State Water Code should any unauthorized, non-registered or non-permitted diversions be discovered in the course of its fieldwork. Staff recommends that all owners of unauthorized diversion works structures contact staff to file the necessary applications to seek compliance with all permitting requirements set forth by the Code.
- Staff shall coordinate with EMI to identify and determine appropriate actions with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall coordinate with other registered stream diversion works owners with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall assess the existing condition and status of all EMI diversions, in coordination with EMI and Division of Aquatic Resources (DAR) staff, to determine if any modifications are necessary to improve habitat conditions for stream biota.

#### MONITORING

- Staff shall monitor streamflow by taking periodic flow measurements, subject to available funding, at the proposed interim IFS locations, as weather permits. These will be point-in-time measurements; however, the installation of stream gaging stations remains an option for long-term management.
- Periodic biological surveys shall be conducted, subject to available funding, to monitor the response of stream biota to post-interim IFS implementation.
- Any party claiming to be negatively impacted as a result of the adopted interim IFS shall monitor and document, in cooperation with staff, the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.
- Likewise, any party claiming that negative impacts are a direct result of actions (i.e., diverting too much water, violating the interim IFS) caused by another party, shall monitor and document the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.

- All claimants shall cooperate with staff in conducting appropriate investigations and studies, particularly with regard to granting access to stream channels and private property related to such investigations, subject to the provisions of the State Water Code, Chapter 174C, HRS.

EVALUATION

- Within one year from the date of adoption of an interim IFS, staff shall report to the Commission on the progress of implementing the interim IFS and the application of the adaptive management strategies outlined above, and the impacts of the interim IFS upon instream and noninstream uses. Should an interim IFS need to be revised prior to one year from the date of adoption, staff may opt to propose another amended IFS to the Commission.
- Staff shall assess the implementation of these strategies on an as-needed basis, as may be necessary upon consultation with the affected parties.
- Staff shall begin preparation of a long-term management framework for the implementation of measurable IFS statewide. Since this is the first time this interim IFS process is being applied to a standing petition, broader adaptive management strategies must be identified and assessed in consideration of the Commission's Stream Protection and Management Program as a whole (i.e., competing priorities, staffing, budget, etc.).

## **PIINAAU (6053)**

### A. Interim IFS Assessment Summary

#### Hydrology

- Piinaau Stream is dry immediately downstream of Koolau Ditch, possibly from infiltration losses and diversion at the ditch. Actual measurements for this stream are unavailable due to the complex geomorphology of the area (causing inaccessibility), and a major landslide in 2001.
- Palauhulu Stream gains flow (averaging 2.7 million gallons per day) from Plunkett Spring below the ditch. Diversion at the ditch could decrease natural (undiverted) base flow by 36 percent, and natural (undiverted) total flow by 44 percent. The lower reach is dry from infiltration losses above Store Spring, below which the stream gains an unknown amount of flow from the spring.
- Streamflow statistics were estimated with regression equations and low-flow measurements. The statistics are illustrated in Section D, Simplified Diagrams.
- Streamflow data from long-term gaging stations around the islands indicate that monthly mean total and base flows have generally decreased from 1940s to 2002. This is consistent with decreasing rainfall trends statewide. Changing streamflow characteristics could result in a negative effect on the availability of drinking water for human consumption and habitat for native stream fauna.

#### Maintenance of Fish and Wildlife Habitat

- Piinaau Stream has a rich native species diversity in which all of the expected native stream animals were observed. Larval recruitment of native fish was observed near the stream mouth.
- Piinaau and Palauhulu Streams feeds Waialohe Pond, which provides habitat for estuarine animals.
- Factors restricting upstream migration of native amphidromous species include: 1) dry sections in the middle and lower reaches; and 2) use of pipes in diversion structures.
- By dewatering different sections of the stream, diversions create disconnected deep pools to which adult animals inhabiting them are restricted.
- Partial restoration of streamflow and increased continuity in flow would likely increase habitat availability for native animals. However, care must be taken to not introduce invasive species through the release of water from irrigation ditches.
- Study shows that when 44 percent of natural base flow is present in the stream, potentially 71-81 percent of the natural habitat for selected native species (i.e., oopu, hihiwai, opae) is available.
- Native forest bird habitat spans nearly 6 square miles across the intermediate slopes of the Piinaau hydrologic unit, in the Waikamoi Preserve.

#### Outdoor Recreational Activities

- The HSA classified the recreational resources of Piinaau Stream as “outstanding”. Recreational opportunities include hiking, fishing, hunting, swimming, nature study, and scenic views. Most of the recreational activities are known to occur at or near the coast.
- Keanae Arboretum Walk (part of Na Ala Hele Trails) features native Hawaiian plants.
- Approximately 40 percent of the Piinaau hydrologic unit is public hunting area.

### Maintenance of Ecosystems

- Haleakala National Park, Koolau Forest Reserve, and Waikamoi Preserve are management areas with natural resources of particular value. Combined, they make up over 85 percent of the Piinaau hydrologic unit.
- Upper slopes of Piinaau have a high concentration of threatened and endangered plant species.
- The estimated Net Present Value of the amenities offered by the Koolau Forest Reserve is 7 to 14 billion dollars. Approximately 40 percent of the Piinaau hydrologic unit lies in the Koolaus.
- The east Maui watershed is the single largest source of surface water in the state, and it is home to the largest concentration of endangered native forest birds.

### Aesthetic Values

- Waiokuna and Keaku Falls are located in the more accessible lower reaches of Palauhulu Stream.
- Lookout points along the main road offer scenic views of Keanae Peninsula.
- Keanae Arboretum features native Hawaiian plants.

### Maintenance of Water Quality

- Piinaau and Palauhulu Streams are mostly Class 1b inland waters as the surrounding area is “protective” conservation sub-zone. Class 1 inland waters are protected to “remain in their natural state as nearly as possible with an absolute minimum of pollution from any human-caused source.” These waters are protected for a number of purposes including domestic water supply and protection of native breeding stock.

### Conveyance of Irrigation and Domestic Water Supplies

- Six out of 14 diversions were registered under EMI. Of the eight non-EMI diversions, four were declared for domestic purposes. Eight diversions utilized water for irrigation of crops and livestock, including taro cultivation.
- The Keanae Well No. 1 (5801-01) was drilled in 1984 to replace an existing surface water source that did not meet Safe Drinking Water Standards, and is the primary source of drinking water for the Keanae Water System which serves the Keanae and Wailuanui communities.

### Protection of Traditional and Customary Hawaiian Rights

- Twenty-five testimonies were submitted by NHLC addressing insufficient water flow that is affecting taro cultivation and traditional gathering practices in the east Maui streams. Ten directly address Piinaau and/or Palauhulu Streams.
- Of the eight non-EMI diversions, five declared water use for taro cultivation with an estimated cultivable area of 106 acres. Six registrants claimed water use for livestock, aquaculture, and/or cultivation of fruits, vegetables, and plants.
- The Piinaau hydrologic unit has two loi complexes. The Keanae complex, with roughly 107 loi, is fed by Palauhulu Stream. The number of loi in this complex has decreased by more than half since 1903. The loi complex at Keanae Arboretum, with 14 loi, is fed by Piinaau Stream.

- Fishponds represent native Hawaiian skill and knowledge in aquaculture. Waialohe fishpond is located at the mouth of Piinaau Stream.
- A large proportion (about 70 percent) of the water diverted by EMI originates on State lands under water licenses revocable permits. Appurtenant rights of taro growers are public trust purposes recognized by the Code and respected as the highest form of protection. Traditional and customary native Hawaiian rights are constitutionally protected.

#### Noninstream Uses

- There are 14 registered major diversions, six of which are registered by EMI. Of these EMI diversions, one is on Piinaau Stream and five on Palauhulu Stream. There are also six EMI minor diversions; one on Piinaau Stream and five on Palauhulu Stream.
- The EMI system primarily captures surface water from multiple watersheds in east Maui with a combined area of approximately 56,000 acres. The system delivers 37 percent (165 million gallons per day) of its delivery capacity. Approximately 70 percent of the water delivered via the system emanates from State lands, for which Alexander and Baldwin and EMI currently hold revocable permits for the four license areas.
- The HC&S plantation consists of 43,300 acres of land. Sugar is cultivated on 37,000 acres while the rest, which are unsuitable for cultivation, are leased to third parties. The majority of the sugarcane fields are irrigated with water delivered by EMI and supplemental ground water pumped by HC&S. The amount of water HC&S claims to need from EMI ranges from 134 to 268 million gallons per day (mgd) in the winter and summer months, respectively.
- Testimony indicates that HC&S helps supplement the local economy, which is very critical during this time of recession. It provides over 800 jobs and supports large and small businesses alike. HC&S is an economic pillar in the community. A&B and its companies help Maui's communities through its Foundation, through which numerous organizations receive much-needed funding and in-kind services.
- HC&S receives revenue from: 1) sale of sugar and molasses; 2) sale of electricity to Maui Electric Company (MECO); 3) delivery of water to the County of Maui Department of Water Supply's (DWS) Upcountry system; and 4) delivery of water to Maui Land and Pineapple Company, Inc (MLP) for its east Maui pineapple fields.
- Among the three Upcountry DWS water systems (i.e., Makawao, Upper Kula, and Lower Kula), only the Makawao water system is served by EMI through the Wailoa Ditch. This system receives 8.2 mgd from EMI, a portion of which goes to the Kula Agricultural Park. With rising populations, the water demand in Upcountry Maui is expected to increase.
- MLP cultivates 6,000 acres of pineapple, of which over 2,800 acres are situated in east Maui and rely on EMI for water. The amount of water MLP claims to need from EMI is 4.5 mgd.
- Since over half of the irrigation water for west and central Maui comes from east Maui, decreasing the amount of water diverted at the ditches located in the east affects the amount of water available for the irrigation of crops in the west and central parts of Maui.
- Compared to periods of lower than average rainfall, prolonged loss of irrigation water caused by a decrease in the amount of water diverted by irrigation ditches has greater effects on the long-term trends of ground water levels.



## B. Additional Considerations

- Public testimony indicates an inadequacy of water in Keanae area for taro cultivation.
- HC&S states that it would not make sense to amend the interim IFS because there is no flow contribution from the upper reaches to the middle and lower reaches due to extensive infiltration into the streambed. HC&S claims that the lower sections of the stream are spring-fed.

## C. Proposed Interim IFS and Rationale

### Interim IFS A

Proposed Location: Lower reach of Piinaau Stream near 40 feet elevation, upstream from the confluence of Piinaau and Palauhulu Streams. This is the location of the USGS ungaged site, station PiL.

Proposed Interim IFS: Status quo

### Rationale for Interim IFS A

The proposed interim IFS for Piinaau Stream is status quo. This means the flow in the stream is to remain in the current condition, without increases in the amount of water diverted from the stream for noninstream uses. The flow in the stream may change due to climate variability, including the effects of drought or periods of higher than normal rainfall.

The complex geology and hydrology of Piinaau Stream makes the determination of an interim IFS particularly challenging. Much of Piinaau Stream, especially in higher elevations, is inaccessible due to the complex geomorphology of Keanae Valley, as well as the occurrence of a large landslide in 2001 that covered the stream from 1,000 feet to 600 feet elevation, a large section below Koolau Ditch. The landslide complicates the flow characteristics in the stream; therefore, streamflow data collected by USGS in 2003 is questionable in regards to its representation of normal flow in the stream. Whether the stream is gaining or losing ground water flow cannot be determined because of inaccessibility of the stream and the lack of reliable streamflow data. A flow value cannot be determined with such large uncertainty in the hydrologic data.

With the current flow, Piinaau Stream exhibits a rich native species diversity, most of which was observed in Waialohe Pond. The benefits of flow increase to native species population and diversity are uncertain due to the presence of a waterfall above Waialohe Pond, which restricts upstream migration of certain native amphidromous species. Furthermore, the stream also offers a variety of recreational and aesthetic opportunities with the current flow. There are only two registered diversions currently diverting water on Piinaau, and neither has indicated a lack of water availability. Considering the current streamflow conditions and the uncertainty of the limited hydrologic data available for Piinaau Stream, the Commission proposes that the interim IFS be set at status quo.

Interim IFS B

Proposed Location: Lower reach of Palauhulu Stream near 80 feet elevation, upstream from the confluence of Piinaau and Palauhulu Streams. This is the location of the USGS ungaged site, station PhL.

Proposed Interim IFS: 5.50 cubic feet per second, 3.56 million gallons per day

Rationale for Interim IFS B

Under the current flow conditions, Palauhulu Stream offers a variety of recreational and aesthetic opportunities, including Waiokuna and Keaku Falls, which are located in the more accessible lower reaches of the stream. Regarding stream biota, the stream has rich native species diversity, which is mostly observed in Waialohe Pond. However, the presence of dewatered sections in the middle and lower reaches of the stream, possibly caused by upstream diversions, may affect habitat availability for native species. The stream currently supports taro cultivation in the Keanae peninsula (via the Keanae Flume), as well as cultivation of other crops and livestock. The stream also supports a number of domestic uses. Palauhulu Stream is an important source of irrigation water for EMI, with a total of five major diversions and five minor diversions on the stream and its tributaries.

Staff believes that partial flow should be restored to the stream in order to balance the instream and noninstream uses of stream water. Flow restoration would increase the continuity of flow in the stream, which would enhance habitat availability and native species diversity. Restoration of flow in the stream would also benefit the surface water users downstream from Koolau Ditch. Furthermore, Keanae peninsula has the potential for more taro cultivation, as well as traditional and gathering practices, both of which increase surface water demand.

In an effort to balance the multiple demands on the stream, Staff does not propose return of all the stream water. While it is important to have water downstream of the irrigation ditch diversions for the reasons listed above, it is likewise important to continue allowing the EMI diversions. The water that flows into the ditch system supports Upcountry Maui's domestic and agricultural uses, large-scale agriculture in central Maui, and provides power to Maui Electric Company. The large-scale agriculture is important to Maui's economy, and diversified agriculture is particularly important to the overall self-sustainability of the island.

In determining the interim IFS, the median base flow value (BFQ<sub>50</sub>) of Palauhulu Stream is used as the starting point for the following reasons:

- Base flow is generally considered as the total flow that is present in the stream 70 to 90 percent of the time (Q<sub>70</sub> - Q<sub>90</sub>);
- Base flow instead of total flow estimates are used because major diversion structures are generally assumed to capture a majority of the base flow; and
- Median base flow is used as a standard to determine the relative native species habitat availability in a USGS study, which will be important for future comparisons.

Due to the variable and abstract nature of base flow, it is best to associate this term with 70 to 90 percent of the total flow in the stream, or flow that is present in the stream 70 to 90

percent of the time. However, for ease of reference, this flow will be referred as “base flow” in the text.

The proposed interim IFS is set upstream from the confluence of the Piinaau Stream and Palauhulu Stream to ensure that the proposed flow reaches the downstream users in Keanae peninsula. However, a second interim IFS is not proposed near the stream mouth because under the current conditions, the amount of water flowing from Piinaau Stream and Palauhulu Stream into the estuary, Waialohe Pond, is deemed adequate.

According to existing streamflow data and estimated flow statistics, the median base flow at station PhL is 4.8 cfs under diverted conditions, and 11 cfs under undiverted conditions. According to the USGS study on habitat availability, under diverted conditions, when 44 percent of natural base flow is restored to the stream, the potential for 71 to 81 percent of the natural habitat for selected native species is available. If flow is restored to 50 percent of natural base flow, potentially 80 to 90 percent of native habitat is available in Palauhulu Stream upstream of the confluence. Fifty percent of the natural median base flow (11 cfs) is 5.5 cfs. At this increased flow, more surface water would be available to the downstream users without sacrificing habitat availability.

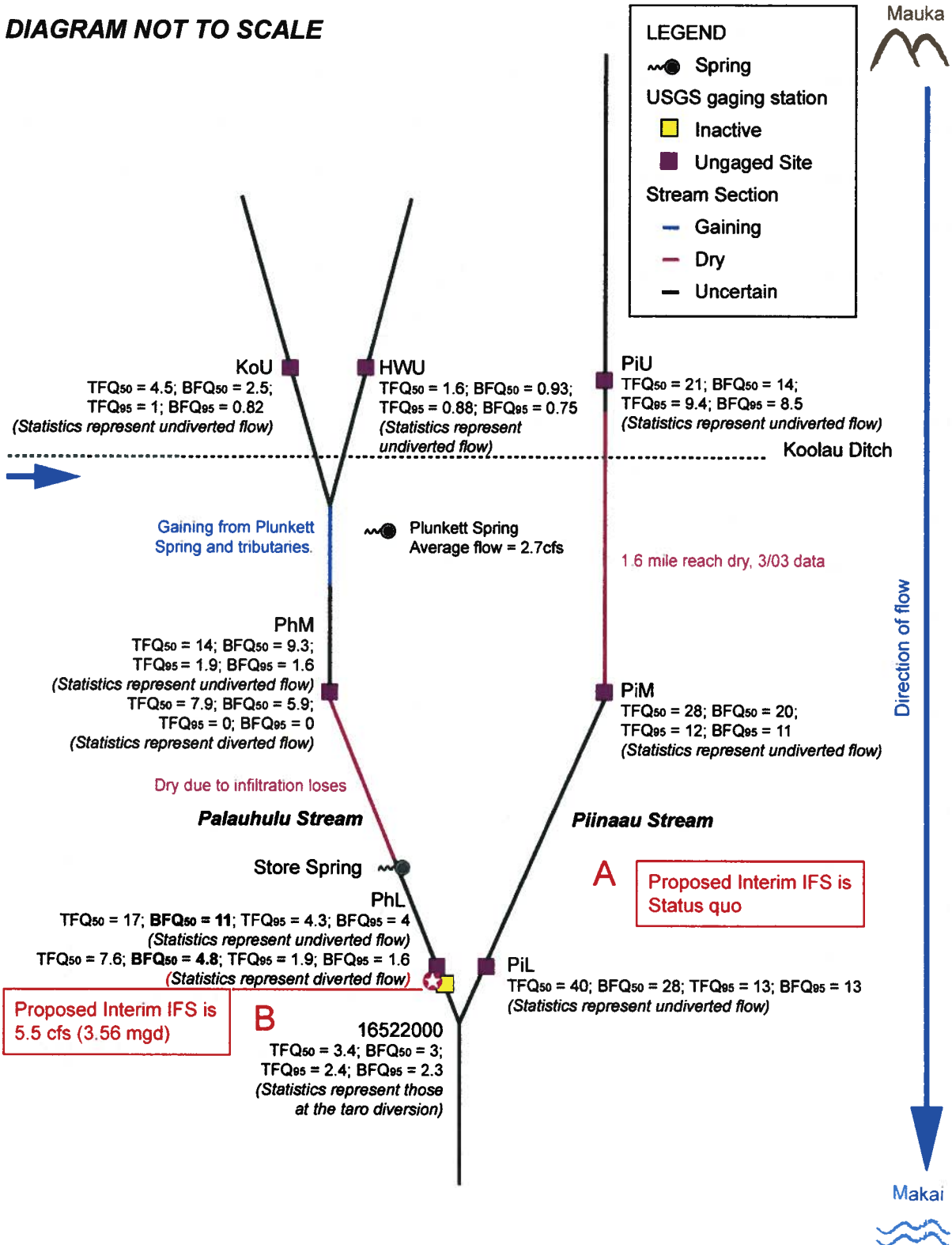
Please note that the proposed interim IFS and the  $Q_{70}$  and  $Q_{90}$  listed above are averages. Staff proposes an adaptive management strategy that includes periodic review of the proposed interim IFS in providing for both instream and noninstream uses. Specific actions are proposed for consideration under Section E, Proposed Adaptive Management Strategy.

D. Simplified Diagrams.

**PIINAAU Hydrologic Unit: Stream System Schematic Diagram**

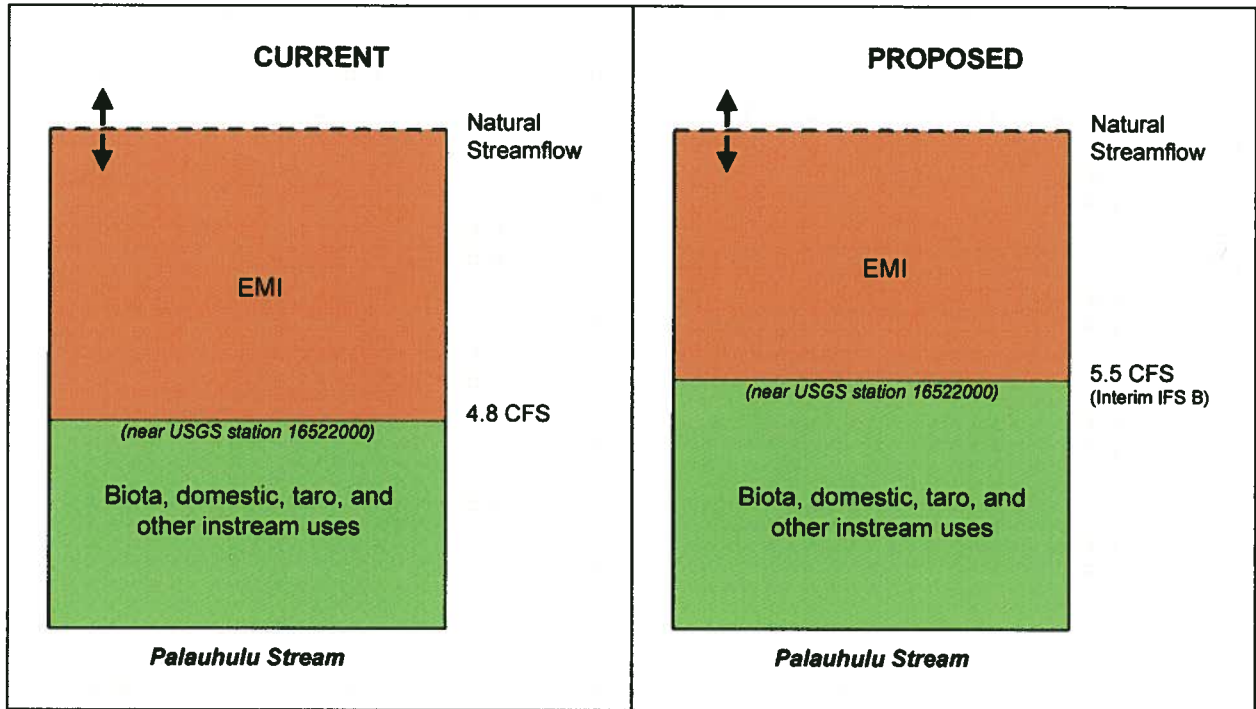
[All flows are in cubic feet per second (cfs) unless other wise noted; mgd = million gallons per day.]

**DIAGRAM NOT TO SCALE**



**PIINAAU Hydrologic Unit: Current and Proposed Interim IFS Diagram**

The diagram below is intended to provide a general graphical representation of the current and proposed interim IFS values for Palauhulu Stream. Corresponding flows (in cubic feet per second) are identified to the right of each illustration.



**DIAGRAM NOT TO SCALE**

## E. Proposed Adaptive Management Strategy

Staff proposes that the interim IFS for Piinaau Stream above its confluence with Palauhulu Stream remains status quo. This means that current diversions may remain, but alterations to and construction of new stream diversion works must be permitted by the Commission. Staff does not propose any adaptive management strategies for this stream reach.

An interim IFS is proposed on Palauhulu Stream just upstream of its confluence with Piinaau Stream. Based on existing streamflow data, a dry reach exists between Koolau Ditch and Store Spring. Thus, the attainability of the proposed interim IFS is uncertain. If the proposed interim IFS cannot be attained by allowing water to flow undiverted past Koolau Ditch, EMI will not be required to release ditch water from other streams in order to meet the proposed interim IFS.

Staff proposes the following hydrologic unit-specific adaptive management strategies:

- None at this time.

Staff proposes the following general adaptive management strategies:

### IMPLEMENTATION

- Staff shall seek to enforce the provisions of the State Water Code should any unauthorized, non-registered or non-permitted diversions be discovered in the course of its fieldwork. Staff recommends that all owners of unauthorized diversion works structures contact staff to file the necessary applications to seek compliance with all permitting requirements set forth by the Code.
- Staff shall coordinate with EMI to identify and determine appropriate actions with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall coordinate with other registered stream diversion works owners with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall assess the existing condition and status of all EMI diversions, in coordination with EMI and Division of Aquatic Resources (DAR) staff, to determine if any modifications are necessary to improve habitat conditions for stream biota.

### MONITORING

- Staff shall monitor streamflow by taking periodic flow measurements, subject to available funding, at the proposed interim IFS locations, as weather permits. These will be point-in-time measurements; however, the installation of stream gaging stations remains an option for long-term management.
- Periodic biological surveys shall be conducted, subject to available funding, to monitor the response of stream biota to post-interim IFS implementation.
- Any party claiming to be negatively impacted as a result of the adopted interim IFS shall monitor and document, in cooperation with staff, the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.
- Likewise, any party claiming that negative impacts are a direct result of actions (i.e., diverting too much water, violating the interim IFS) caused by another party, shall

monitor and document the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.

- All claimants shall cooperate with staff in conducting appropriate investigations and studies, particularly with regard to granting access to stream channels and private property related to such investigations, subject to the provisions of the State Water Code, Chapter 174C, HRS.

#### EVALUATION

- Within one year from the date of adoption of an interim IFS, staff shall report to the Commission on the progress of implementing the interim IFS and the application of the adaptive management strategies outlined above, and the impacts of the interim IFS upon instream and noninstream uses. Should an interim IFS need to be revised prior to one year from the date of adoption, staff may opt to propose another amended IFS to the Commission.
- Staff shall assess the implementation of these strategies on an as-needed basis, as may be necessary upon consultation with the affected parties.
- Staff shall begin preparation of a long-term management framework for the implementation of measurable IFS statewide. Since this is the first time this interim IFS process is being applied to a standing petition, broader adaptive management strategies must be identified and assessed in consideration of the Commission's Stream Protection and Management Program as a whole (i.e., competing priorities, staffing, budget, etc.).

## **WAIOKAMILO (6055)**

### A. Interim IFS Assessment Summary

#### Hydrology

- Waiokamilo Stream is generally a losing stream. The USGS Study indicated that the stream was dry immediately downstream of Koolau Ditch. The stream then gains about 3.8 million gallons per day (mgd) from Akeke (Banana) Spring. Thereafter, the stream loses flow to ground water, minor diversions, and a known losing reach near Dams 2 and 3.
- Diversions along the middle reach could decrease natural (undiverted) base flow by 39 percent. Diversions along the lower reach could decrease natural (undiverted) base flow by 70 percent.
- Streamflow statistics at USGS ungaged sites were estimated with regression equations and low-flow measurements. These statistics are illustrated in Section D, Simplified Diagrams.
- In July 2007, as a result of the BLNR's interim order to release flow back into Waiokamilo Stream, a USGS stream gaging station 16521300 was installed near Dam 3.
- Streamflow data from long-term gaging stations around the islands indicate that monthly mean total and base flows have generally decreased from 1940s to 2002. This is consistent with decreasing rainfall trends statewide. Changing streamflow characteristics could pose a negative effect on the availability of drinking water for human consumption and habitat for native stream fauna.

#### Maintenance of Fish and Wildlife Habitat

- Some native animals were observed in the middle reaches of the stream. Larval recruitment was not observed at the stream mouth. Many sites with adequate water depth were uninhabited.
- Factors restricting upstream migration of native amphidromous species include: 1) terminal waterfall (Waiokilo Falls) at the stream mouth; 2) dry sections in the lower reaches; and 3) use of pipes in diversion structures.
- By dewatering different sections of the stream, diversions create disconnected deep pools to which adult animals inhabiting them are restricted.
- Partial restoration of streamflow and increased continuity in flow would likely increase habitat availability for native animals. However, care must be taken to not introduce invasive species through the release of water from irrigation ditches.
- A USGS study estimated that when only 30 percent of natural base flow is present in the stream, potentially 59-73 percent of the natural habitat for selected native species (i.e., alamoo, nopili, nakea, hihiwai, and opae) is available.

#### Outdoor Recreational Activities

- The HSA classified the recreational resources of Waiokamilo Stream as "outstanding". Recreational opportunities include fishing, hunting, swimming, and scenic views. Most of the recreational activities are known to occur at or near the coast.
- Approximately three-fourths of the Waiokamilo hydrologic unit is public hunting area.



### Maintenance of Ecosystems

- Upper slopes of the Waiokamilo hydrologic unit have a high concentration of threatened and endangered plant species, with few alien species.
- Nearly half of the hydrologic unit, mostly in the upper slopes, consists of wetlands.
- The estimated Net Present Value of the amenities offered by the Koolau Forest Reserve is 7 to 14 billion dollars. Approximately three-fourths of the Waiokamilo hydrologic unit lies in the Koolau Forest Reserve.
- The East Maui watershed is the single largest source of surface water in the state, and it is home to the largest concentration of endangered native forest birds.

### Aesthetic Values

- Waiokilo Falls is a terminal waterfall at the mouth of Waiokamilo Stream.
- Wailua Valley State Wayside Lookout offers scenic views of the entire Waiokamilo basin.

### Maintenance of Water Quality

- Waiokamilo and Kualani Streams are mostly Class 1b inland waters as the surrounding area is “protective” conservation subzone. Class 1 inland waters are protected to “remain in their natural state as nearly as possible with an absolute minimum of pollution from any human-caused source.” These waters are protected for a number of purposes including domestic water supply and protection of native breeding stock.

### Conveyance of Irrigation and Domestic Water Supplies

- Four out of 19 diversions were registered under EMI. Of the 15 non-EMI diversion, 11 were declared for domestic purposes. Four diversions utilized water for irrigation of crops and livestock, including taro cultivation.
- The Keanae Well No. 1 (5801-01) was drilled in 1984 to replace an existing surface water source that did not meet Safe Drinking Water Standards, and is the primary source of drinking water for the Keanae Water System which serves the Keanae and Wailuanui communities.

### Protection of Traditional and Customary Hawaiian Rights

- Twenty-five testimonies were submitted by NHLC addressing insufficient water flow that is affecting taro cultivation and traditional gathering practices in the east Maui streams. Eleven directly address Waiokamilo Stream.
- Of the 15 non-EMI diversions, 11 declared water use for taro cultivation with an estimated cultivable area of 515 acres. Six of these registrants claimed water use for livestock, aquaculture, and/or cultivation of fruits, vegetables, and plants.
- Three taro loi complexes, two of which are part of the larger Wailuanui loi complex, rely on Waiokamilo and Kualani Streams for irrigation water.
- Fishponds represent native Hawaiian skill and knowledge in aquaculture. Puu Polu fishpond is located in the northern end of the coastal section of the Waiokamilo hydrologic unit.
- Wailua Valley taro farmer Steven Hookano provided photos of taro root rot occurring to his harvest in September 2006 to illustrate the effects of an insufficient supply of water on taro growth.

- Wailua Valley taro farmer Kimo Day provided photos that illustrate his attempt to start a taro loi in April 2007 that failed due to a lack of water in Waiokamilo Stream.
- A large proportion (about 70 percent) of the water diverted by EMI originates on State lands under revocable permits. Appurtenant rights of taro growers are public trust purposes recognized by the Code and respected as the highest form of protection. Traditional and customary native Hawaiian rights are constitutionally protected.

#### Noninstream Uses

- There are 19 registered major diversions on Waiokamilo Stream, four of which are registered by EMI. There are also 24 EMI minor diversions.
- The EMI system primarily captures surface water from multiple watersheds in east Maui with a combined area of approximately 56,000 acres. The system delivers an average of 37 percent (165 mgd) of its delivery capacity. Approximately 70 percent of the water delivered via the system emanates from State lands, for which Alexander and Baldwin and EMI currently hold revocable permits for the four license areas.
- The HC&S plantation consists of 43,300 acres of land. Sugar is cultivated on 37,000 acres while the rest, which are unsuitable for cultivation, are leased to third parties. The majority of the sugarcane fields are irrigated with water delivered by EMI and supplemental ground water pumped by HC&S. The amount of water HC&S claims to need from EMI ranges from 134 to 268 mgd in the winter and summer months, respectively.
- Testimony indicates that HC&S helps supplement the local economy, which is very critical during this time of recession. It provides over 800 jobs and supports large and small businesses alike. HC&S is an economic pillar in the community. A&B and its companies help Maui's communities through its Foundation, through which numerous organizations receive much-needed funding and in-kind services.
- HC&S receives revenue from: 1) sale of sugar and molasses; 2) sale of electricity to Maui Electric Company (MECO); 3) delivery of water to the County of Maui Department of Water Supply's (DWS) Upcountry system; and 4) delivery of water to Maui Land and Pineapple Company, Inc (MLP) for its east Maui pineapple fields.
- Among the three Upcountry DWS water systems (i.e., Makawao, Upper Kula, and Lower Kula), only the Makawao water system is served by EMI through the Wailoa Ditch. This system receives 8.2 mgd from EMI, a portion of which goes to the Kula Agricultural Park. With rising populations, the water demand in Upcountry Maui is expected to increase.
- MLP cultivates 6,000 acres of pineapple, of which over 2,800 acres are situated in east Maui and rely on EMI for water. The amount of water MLP claims to need from EMI is 4.5 mgd.
- Since over half of the irrigation water for west and central Maui comes from east Maui, decreasing the amount of water diverted at the ditches located in the east affects the amount of water available for the irrigation of crops in the west and central parts of Maui.
- Compared to periods of lower than average rainfall, prolonged loss of irrigation water caused by a decrease in the amount of water diverted by irrigation ditches has greater effects on the long-term trends of ground water levels.

## B. Additional Considerations

- NHLC's Motion to Enforce (related to the BLNR contested case hearing) indicates that a monitor is needed to ensure compliance with the Interim Order, because they state "it is unclear whether all possible releases have occurred to allow for the release of 6 mgd."
- Public testimony indicates that mosquitoes are prevalent due to low flow in Waiokamilo Stream. A family dog contracted skin disease from the water. The community can't let children swim in the river because it's black and dirty. Traditional gathering cannot be practiced because it's hard to find anything now. The opae are in the EMI ditches and get washed down to the reservoir.
- Public comments indicate that EMI has diversions with PVC pipes in the mountains that are not old diversions, since they claim that PVC is from the 1970s and 1980s.
- Public comment indicates that in only 4 of the past 24 years, Waiokamilo Stream has run continuously from the springs below the EMI ditch to the ocean; the last year was 1994. There is often no continuous water flow for endemic stream species. The water that flows at times is often too warm, causing problems for taro.
- HC&S claims that:
  - 1) Contrary to taro farmers' claims, EMI stopped diversion as a result of the 2007 ruling by BLNR. With that, USGS still finds no enhancement of streamflows during dry periods. EMI argues the combination of a losing reach (which they term a "sinkhole") in the Waiokamilo streambed, and that the Koolau Ditch was built to prevent water from filtering into the ground are reasons for the loss of streamflow.
  - 2) There has been no increase of HC&S diversion at Koolau Ditch since 1985, except seepage collection by PVC pipes.
  - 3) In 1985, EMI assisted Wailuanui Taro Growers organization in irrigation needs.
  - 4) A&B, EMI, and Na Moku entered into an "Interim Agreement" to manage complaints from Wailuanui Taro Growers. After repairs, a gaging station was installed on Waiokamilo Stream which measured 3.57-3.85 mgd.
  - 5) There is no need to amend interim IFS in Waiokamilo Stream. The heavy reliance on mathematical equations induces large margins of errors since they do not consider the physical conditions of the stream. Koolau Ditch is well above the spring; thus, decreasing stream diversions would not help the farmers.
- According to statements made at the Commission's September 2008 site visit to the EMI offices, EMI claimed that they are not, in fact, diverting from Kualani Stream, but rather a higher elevation tributary to Waiokamilo Stream.

## C. Proposed Interim IFS and Rationale

### Interim IFS A

Proposed Location: Lower reach of Waiokamilo Stream at the location of the USGS gaging station 16521300 near Dam 3. This location is downstream of Koolau Ditch, but upstream of the confluence of Waiokamilo and Kualani (Hamau) Streams.

Proposed Interim IFS: 4.90 cubic feet per second, 3.17 million gallons per day

Rationale for Interim IFS A

Under the current flow conditions, Waiokamilo Stream offers limited recreational and aesthetic opportunities. Some native species were observed in the middle reaches of the stream, while many sites with adequate water depth were uninhabited, probably due to the terminal waterfall, Waiokilo Falls, restricting upstream migration of certain native amphidromous species. The presence of dewatered sections in the lower reaches of the stream, possibly caused by upstream diversions, may affect habitat availability for native species. However, the observation of native species in the middle reaches may be through other water pathways (i.e., taro loi and auwai).

The stream currently supports a large portion of the taro cultivation occurring in Wailua Valley, as well as the cultivation of other crops and raising of livestock. Gathering and other traditional practices are also components of the hydrologic unit. Water is apparently still diverted for domestic uses; however, the area is served by a county water system. EMI has a total of four major diversions and 24 minor diversions on the stream and its tributaries. However, following the BLNR's interim order to release 6 million gallons of water per day into the stream, EMI has stopped diverting water from Waiokamilo Stream and its tributaries since July of 2007.

Staff believes that restoration of flow in the stream would greatly benefit the surface water users downstream from Koolau Ditch, particularly domestic users and taro farmers in Wailua Valley. Currently, the taro farmers rely heavily on water diverted from Waiokamilo and Kualani Streams into the Lakini system, which then feeds two of the larger loi complexes in Wailua Valley. With relatively large sections of Waiokamilo Stream losing flow underground, the amount of water reaching downstream areas is limited.

The proposed interim IFS is set at its proposed location on Waiokamilo Stream because of the measured streamflow data available at USGS gaging station 16521300, which was installed as a result of the BLNR's interim decision to release water back into the stream. The median total flow ( $Q_{50}$ ) at the gaging station is used as the interim IFS because that is the total flow in the stream without diversions at Koolau Ditch. The gaging station has been collecting streamflow data since September 1, 2007; however, only the first 8 months (September 1, 2007 to April 30, 2008) of data were used to estimate the median total flow since the rest of the data (from May 1, 2008 to present) are still in provisional status, meaning the data are subject to further scrutiny before finalization to represent the actual flow in the stream. Staff estimated the median total flow to be 4.9 cubic feet per second. Because this flow is calculated from a short-term data set, it may not be representative of the actual flow in the stream at all times. If this flow cannot be maintained even when no diversion occurs at Koolau Ditch, the proposed interim IFS may need to be readjusted based upon additional streamflow data collected from gaging station 16521300.

Staff has identified a need to provide increased amounts of water downstream of Dam 2 for existing domestic uses. However, because of the uncertainty of water availability due to losing reaches on Waiokamilo Stream, gaining reaches on Kualani Stream, spring flow upstream of Hana Highway, and existing diversions, proposing an interim IFS at this time is very difficult. Staff proposes to coordinate with Na Moku and area residents to investigate

and monitor streamflow conditions on Waiokamilo Stream downstream of Dam 2. Should the domestic use needs of area residents not be met, the subsequent establishment of a measurable interim IFS may be necessary.

Staff proposes an adaptive management strategy that includes periodic review of the proposed interim IFS in providing for both instream and noninstream uses. Specific actions are proposed for consideration under Section E, Proposed Adaptive Management Strategy.

### Interim IFS B

Proposed Location: Lower reach of Kualani (Hamau) Stream, upstream from its confluence with Waiokamilo Stream and downstream from Dam 1.

Proposed Interim IFS: Status quo

### Rationale for Interim IFS B

The proposed interim IFS for Kualani (Hamau) Stream is status quo. This means the flow in the stream is to remain in the current condition, without increases in the amount of water diverted from the stream for noninstream uses. The flow in the stream may change due to climate variability, including the effects of drought or periods of higher than normal rainfall.

At the present time, there are very limited hydrologic and biological data available for Kualani Stream. The only flow measurement available is that downstream from the confluence of Waiokamilo and Kualani Stream near 250 feet elevation, the stream is reported (in a 1999 USGS study) to gain 1.28 cfs (0.83 mgd) from Kualani Stream. This is a point-in-time measurement made on May 11, 1999 and does not reflect the average gain in streamflow. With the lack of reliable hydrologic data, a flow value cannot be determined as an interim IFS proposal for Kualani Stream. The geographical location of Kualani Stream is also questionable. Location of Kualani Stream depicted on the maps in the IFSAR is based on a map that EMI had provided. However, during the September 3, 2008 Commission meeting, Garret Hew, manager of EMI, indicated that the location of Kualani Stream on the EMI map is inaccurate and that his staff is in the process of revising the map. Regarding stream biota, no aquatic or insect surveys were conducted to determine the biological integrity of the stream under the current flow conditions. Therefore, an interim IFS cannot be proposed without balancing the importance of stream biota with other instream and noninstream uses.

Based on the information collected in public comments, the surface water diversion registration database, and site visits, the only use for Kualani Stream is that it serves as a conduit for the Lakini auwai system. As illustrated in Section D, Simplified Diagrams, water from Waiokamilo Stream is diverted into the Lakini system, and then joins with Kualani Stream before reaching Dam 1, after which it is diverted for taro cultivation in the Lakini taro patches and in Wailua Valley further downstream. During the site visits, staff did not visit Dam 1 because it is located in the lower reaches of Kualani Stream, and access, which is through private property, was denied. Thus, further assessment of the flow conditions in the stream could not be conducted.

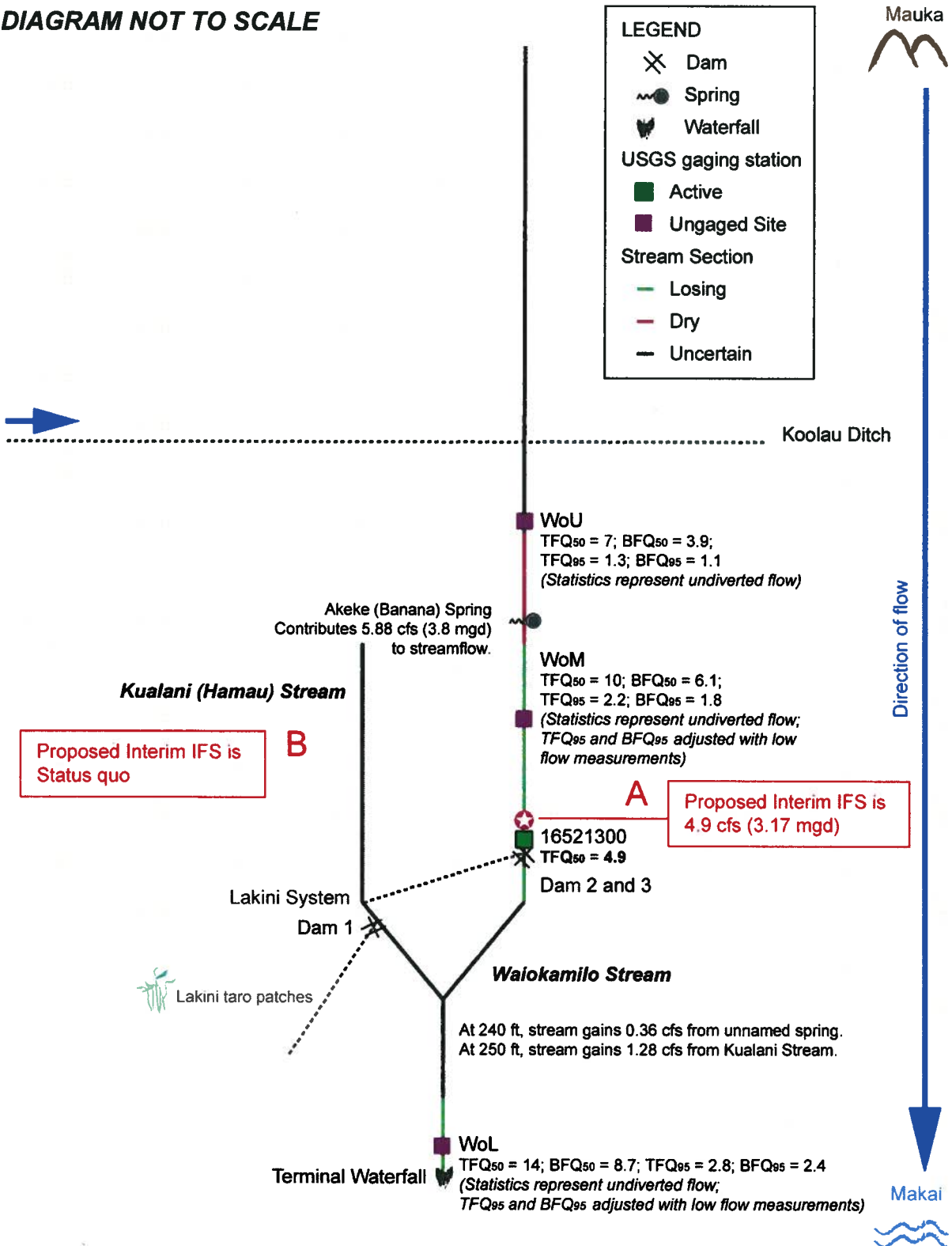
Staff has identified a need to provide increased amounts of water downstream of Dam 2 for existing domestic uses. However, because of the uncertainty of water availability due to losing reaches on Waiokamilo Stream, gaining reaches on Kualani Stream, spring flow upstream of Hana Highway, and existing diversions, proposing an interim IFS at this time is very difficult. Staff proposes to coordinate with Na Moku and area residents to investigate and monitor streamflow conditions on Kualani. Should the domestic use needs of area residents not be met, the subsequent establishment of a measurable interim IFS may be necessary.

D. Simplified Diagrams.

**WAIOKAMILO Hydrologic Unit: Stream System Schematic Diagram**

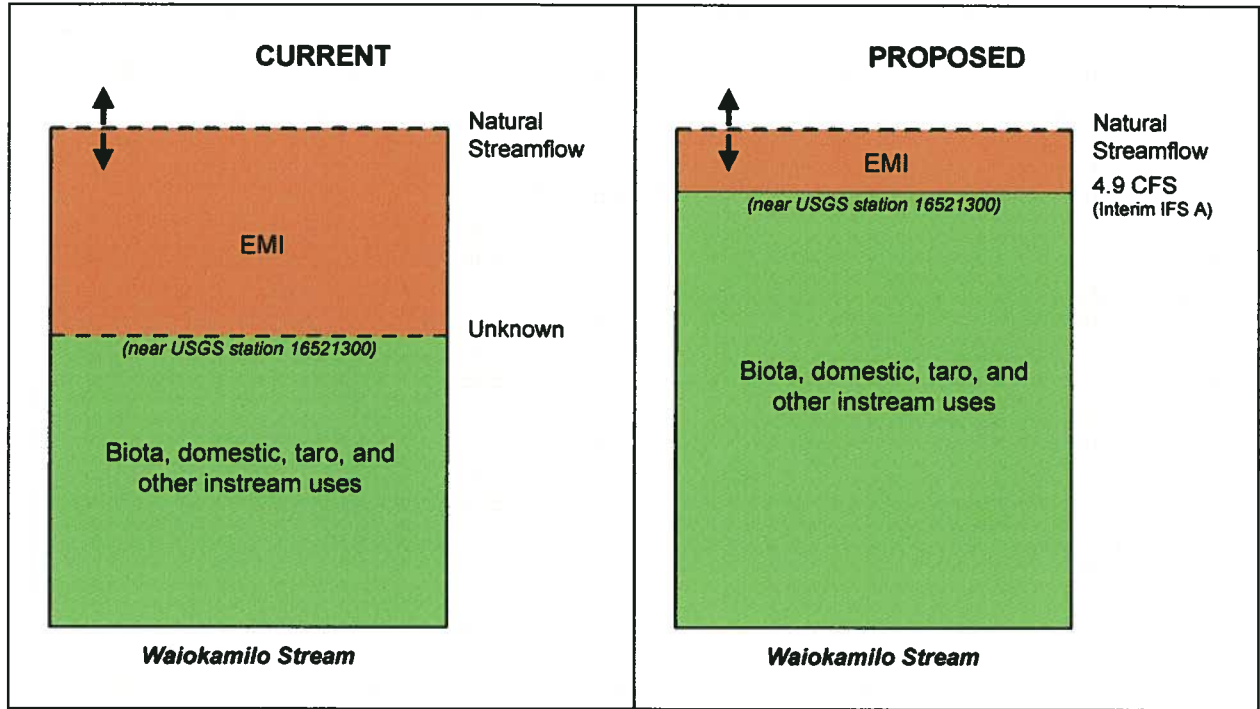
[All flows are in cubic feet per second (cfs) unless other wise noted; mgd = million gallons per day.]

**DIAGRAM NOT TO SCALE**



### WAIOKAMILO Hydrologic Unit: Current and Proposed Interim IFS Diagram

The diagram below is intended to provide a general graphical representation of the current and proposed interim IFS values for Waiokamilo Stream. Corresponding flows (in cubic feet per second) are identified to the right of each illustration.



**DIAGRAM NOT TO SCALE**



## E. Proposed Adaptive Management Strategy

Based on existing streamflow data, losing reaches exist between Koolau Ditch and the dams. Thus, the attainability of the proposed interim IFS is uncertain. If the proposed interim IFS cannot be attained by allowing water to flow undiverted past Koolau Ditch, EMI will not be required to release ditch water from other streams in order to meet the proposed interim IFS.

The proposed interim IFS is based on short-term data, but the intention of the staff is that no low flow is diverted upstream of the taro diversion at Dam 2.

Staff proposes the following hydrologic unit-specific adaptive management strategies:

- Taro farmers, in coordination with staff, shall consider reestablishing a control mechanism in the auwai just downstream of Dam 2 or at the auwai intake to limit the amount of water entering the auwai in times of high flow and to allow some water to flow past Dam 2 for downstream domestic users.
- Taro farmers, in coordination with staff, should repair and maintain coffer dams upstream of Dam 3 to redirect flow away from portions of the stream channel that appear to be losing flow underground.
- Taro farmers should examine ways to improve maintenance of auwai, transmission lines, and intakes.
- Taro farmers should consider flushing flows for auwai and taro loi. Flushing flows are a natural process of stream dynamics. In the case of taro cultivation, flushing flows may play a role in the long term maintenance of taro loi and auwai.
- Staff shall monitor streamflow by analyzing data collected at the USGS stream gaging station 16521300. Since the gaging station was installed in response to the BLNR's interim order in July 2007, it is questionable whether the station will be continued if an interim IFS is adopted. However, staff will collaborate with USGS and BLNR to devise ways to maintain the gaging station for the purpose of monitoring the proposed interim IFS.
- If funding is inadequate to maintain USGS gaging station 16521300, staff will monitor streamflow by taking periodic flow measurements, as funding is available, at the proposed interim IFS locations, as weather permits. These will be point-in-time measurements; however, the installation of stream gaging stations remains an option for long-term management.
- Staff shall assess, subject to available funding, the extent and conditions of Kualani Stream.
- Staff shall assess, subject to available funding and in coordination with EMI, the current condition and status of EMI diversions on Waiokamilo Stream.
- Staff, in consultation with area residents, taro farmers, and Na Moku, shall assess the amount of water necessary to flow past Dam 2 in Waiokamilo Stream for the purposes of domestic use and maintenance of fish and wildlife habitat.

Staff proposes the following general adaptive management strategies:

### IMPLEMENTATION

- Staff shall seek to enforce the provisions of the State Water Code should any unauthorized, non-registered or non-permitted diversions be discovered in the course of

its fieldwork. Staff recommends that all owners of unauthorized diversion works structures contact staff to file the necessary applications to seek compliance with all permitting requirements set forth by the Code.

- Staff shall coordinate with EMI to identify and determine appropriate actions with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall coordinate with other registered stream diversion works owners with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall assess the existing condition and status of all EMI diversions, in coordination with EMI and Division of Aquatic Resources (DAR) staff, to determine if any modifications are necessary to improve habitat conditions for stream biota.

#### MONITORING

- Staff shall monitor streamflow by taking periodic flow measurements, subject to available funding, at the proposed interim IFS locations, as weather permits. These will be point-in-time measurements; however, the installation of stream gaging stations remains an option for long-term management.
- Periodic biological surveys shall be conducted, subject to available funding, to monitor the response of stream biota to post-interim IFS implementation.
- Any party claiming to be negatively impacted as a result of the adopted interim IFS shall monitor and document, in cooperation with staff, the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.
- Likewise, any party claiming that negative impacts are a direct result of actions (i.e., diverting too much water, violating the interim IFS) caused by another party, shall monitor and document the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.
- All claimants shall cooperate with staff in conducting appropriate investigations and studies, particularly with regard to granting access to stream channels and private property related to such investigations, subject to the provisions of the State Water Code, Chapter 174C, HRS.

#### EVALUATION

- Within one year from the date of adoption of an interim IFS, staff shall report to the Commission on the progress of implementing the interim IFS and the application of the adaptive management strategies outlined above, and the impacts of the interim IFS upon instream and noninstream uses. Should an interim IFS need to be revised prior to one year from the date of adoption, staff may opt to propose another amended IFS to the Commission.
- Staff shall assess the implementation of these strategies on an as-needed basis, as may be necessary upon consultation with the affected parties.
- Staff shall begin preparation of a long-term management framework for the implementation of measurable IFS statewide. Since this is the first time this interim IFS process is being applied to a standing petition, broader adaptive management strategies must be identified and assessed in consideration of the Commission's Stream Protection and Management Program as a whole (i.e., competing priorities, staffing, budget, etc.).

## **WAILUANUI (6056)**

### A. Interim IFS Assessment Summary

#### Hydrology

- Wailuanui Stream is gaining flow from the lower reaches of its tributaries down to the coast. Average annual ground water gains estimated upstream of Koolau Ditch for East and West Wailuanui Streams are 1.7 and 2.2 million gallons per day (mgd), respectively. Between the ditch and the lowest stream gage, Wailuanui Stream gains an average of 0.8 million gallons of ground water per day.
- Koolau Ditch is the only diversion system capturing base flow from Wailuanui Stream. Based on estimated flow statistics, diversion at the ditch could reduce natural total flow by 84 percent. A number of other diversions between the lowest stream gage and the coast could reduce natural total flow by 85 percent.
- Streamflow statistics at USGS ungaged sites were estimated with regression equations and low-flow measurements. These statistics are illustrated in Section D, Simplified Diagrams.
- Streamflow data from long-term gaging stations around the islands indicate that both the monthly mean total and base flows have generally decreased from 1940s to 2002. This is consistent with decreasing rainfall trends statewide. Changing streamflow characteristics could pose a negative effect on the availability of drinking water for human consumption and habitat for native stream fauna.

#### Maintenance of Fish and Wildlife Habitat

- Wailuanui Stream has a rich native species diversity in which many of the expected native stream animals were observed. Larval recruitment of native fish was observed near the stream mouth. The stream lacks the commonly introduced species, making the native biota relatively intact.
- Use of pipes in diversion structures blocks upstream migration of native amphidromous species.
- By dewatering different sections of the stream, diversions create disconnected deep pools mostly in the upper reaches, to which adult animals inhabiting them are restricted.
- Partial restoration of streamflow and increased continuity in flow would likely increase habitat availability for native animals. However, care must be taken to not introduce invasive species through the release of water from irrigation ditches.
- A USGS study estimated that if 90 percent of natural base flow is present in Wailuanui Stream, 95-97 percent of the expected natural habitat for selected native species (i.e., alamoo, nopili, nakea, hihiwai, and opae) is available.
- Native forest bird habitat spans 1.3 square miles across the intermediate slopes of the Wailuanui hydrologic unit, in which Waikamoi Preserve is situated.

#### Outdoor Recreational Activities

- The HSA classified the recreational resources of Wailuanui Stream as “outstanding”. Recreational opportunities include fishing, hunting, swimming, and scenic views. Most of the recreational activities are known to occur at or near Wailuanui Bay.
- Approximately one-third of the Wailuanui hydrologic unit is public hunting area.

### Maintenance of Ecosystems

- Haleakala National Park, Koolau Forest Reserve, and Waikamoi Preserve are management areas with natural resources of particular value. Combined, they make up over 80 percent of the Wailuanui hydrologic unit.
- Upper slopes of the Wailuanui hydrologic unit have a high concentration of threatened and endangered plant species.
- The estimated Net Present Value of the amenities offered by the Koolau Forest Reserve is 7 to 14 billion dollars. Approximately 35 percent of the Wailuanui hydrologic unit lies in the Koolau Forest Reserve.
- The East Maui watershed is the single largest source of surface water in the state, and it is home to the largest concentration of endangered native forest birds.

### Aesthetic Values

- A number of waterfalls, including the more accessible Waikani Falls, are along the stream.
- The lookout point located along the main road provides a picturesque view of Wailuanui Valley.
- Wailua Valley State Wayside offers scenic views for visitors and residents.

### Maintenance of Water Quality

- East and West Wailuanui Streams are mostly Class 1b inland waters as the surrounding area is “protective” conservation subzone. Class 1 inland waters are protected to “remain in their natural state as nearly as possible with an absolute minimum of pollution from any human-caused source.” These waters are used for a number of purposes including domestic water supply and protection of native breeding stock.

### Conveyance of Irrigation and Domestic Water Supplies

- Four out of 7 diversions were registered under EMI. Of the three non-EMI diversions, none was declared for domestic purposes. Two diversions are utilized for irrigation of various crops and livestock.
- The Keanae Well No. 1 (5801-01) was drilled in 1984 to replace an existing surface water source that did not meet Safe Drinking Water Standards, and is the primary source of drinking water for the Keanae Water System which serves the Keanae and Wailuanui communities.

### Protection of Traditional and Customary Hawaii Rights

- Twenty-five testimonies were submitted by NHLC addressing insufficient water flow that is affecting taro cultivation and traditional gathering practices in the east Maui streams. Nine directly address Wailuanui Stream.
- Of the three non-EMI diversions, two declared water use for taro cultivation with an estimated cultivable area of 350 acres.
- The Wailuanui loi complex relies on three different sources of water, two of which are associated with Waiokamilo Stream and the other with Wailuanui Stream.
- Wailua Valley taro farmer Steven Hookano provided photos of taro root rot occurring to his harvest in September 2006 to illustrate the effects of an insufficient supply of water on taro growth.

- Wailua Valley taro farmer Kimo Day provided photos that illustrate his attempt to start a taro loi in April 2007 that failed due to a lack of water in the stream.
- A large proportion (about 70 percent) of the water diverted by EMI originates on State lands under revocable permits. Appurtenant rights of taro growers are public trust purposes recognized by the Code and respected as the highest form of protection. Traditional and customary native Hawaiian rights are constitutionally protected.

#### Noninstream Uses

- There are four major diversions registered by EMI. There are also three active EMI minor diversions.
- The EMI system primarily captures surface water from multiple watersheds in east Maui with a combined area of approximately 56,000 acres. The system delivers an average of 37 percent (165 mgd) of its delivery capacity. Approximately 70 percent of the water delivered via the system emanates from State lands, for which Alexander and Baldwin and EMI currently hold revocable permits for the four license areas.
- The HC&S plantation consists of 43,300 acres of land. Sugar is cultivated on 37,000 acres while the rest, which are unsuitable for cultivation, are leased to third parties. The majority of the sugarcane fields are irrigated with water delivered by EMI and supplemental ground water pumped by HC&S. The amount of water HC&S claims to need from EMI ranges from 134 to 268 mgd in the winter and summer months, respectively.
- Testimony indicates that HC&S helps supplement the local economy, which is very critical during this time of recession. It provides over 800 jobs and supports large and small businesses alike. HC&S is an economic pillar in the community. A&B and its companies help Maui's communities through its Foundation, through which numerous organizations receive much-needed funding and in-kind services.
- HC&S receives revenue from 1) sale of sugar and molasses, 2) sale of electricity to Maui Electric Company (MECO), 3) delivery of water to the County of Maui Department of Water Supply's (DWS) Upcountry system, and 4) delivery of water to Maui Land and Pineapple Company, Inc (MLP) for its east Maui pineapple fields.
- Among the three Upcountry DWS water systems (i.e., Makawao, Upper Kula, and Lower Kula), only the Makawao water system is served by EMI through the Wailoa Ditch. This system receives 8.2 mgd from EMI, a portion of which goes to the Kula Agricultural Park. With rising populations, the water demand in Upcountry Maui is expected to increase.
- MLP cultivates 6,000 acres of pineapple, of which over 2,800 acres are situated in east Maui and rely on EMI for water. The amount of water MLP claims to need from EMI is 4.5 mgd.
- Since over half of the irrigation water for west and central Maui comes from east Maui, decreasing the amount of water diverted at the ditches located in the east affects the amount of water available for the irrigation of crops in the west and central parts of Maui.
- Compared to periods of lower than average rainfall, prolonged loss of irrigation water caused by a decrease in the amount of water diverted by irrigation ditches has greater effects on the long-term trends of ground water levels.

**B. Additional Considerations**

- Public testimony indicated that a family had to move because of lack of water in Wailuanui Stream, since they could not farm in their kupuna's loi and had to move to take care of the family where there was enough water to farm.
- HC&S states that it would not make sense to amend interim IFS for taro cultivation until the pipe intake, which was damaged by a landslide, is replaced. This pipe intake diverts water from Waikani pond to the Wailua taro patches.

**C. Proposed Interim IFS and Rationale**Interim IFS

Proposed Location: Lower reach of Wailuanui Stream near the inactive USGS gaging station 16521000 at 620 feet elevation. This location is downstream of Koolau Ditch, below the confluence of the tributaries, East and West Wailuanui Streams.

Proposed Interim IFS: 3.05 cubic feet per second, 1.97 million gallons per day

Rationale

Under the current flow conditions, Wailuanui Stream offers a variety of recreational and aesthetic opportunities, including Waikani Falls, which is located in the more accessible lower reaches of the stream. Regarding stream biota, the stream has rich native species diversity and lacks many of the commonly introduced species. However, the presence of dewatered sections in the middle and lower reaches of the stream, possibly caused by upstream diversions, may affect habitat availability for native species. The stream currently supports approximately a quarter of the taro cultivation occurring in Wailua Valley, as well as the cultivation of other crops and livestock. Wailuanui Stream is an important source of irrigation water for EMI, with a total of four major diversions and three minor diversions on the stream and its tributaries.

Staff believes that flow should be partially restored to the stream in order to balance the instream and noninstream uses of stream water. Flow restoration would increase the continuity of flow in the stream, which would further enhance habitat availability and help build a robust native species dominated community. Restoration of flow in the stream would also benefit the surface water users downstream from Koolau Ditch, particularly the taro farmers in Wailua Valley. Furthermore, gathering and other traditional practices occurring in downstream reaches increase instream flow demands.

In an effort to balance the instream and non instream uses, staff does not propose return of all the stream water. While it is important to have water downstream of the irrigation ditch diversions for the reasons listed above, it is likewise important to continue allowing the irrigation diversions. The water that flows into the ditch system supports Upcountry Maui's domestic and agricultural uses, large-scale agriculture in central Maui, and provides power to Maui Electric Company. The large-scale agriculture is important to Maui's economy, and diversified agriculture is particularly important to the overall self-sustainability of the island.

In determining the interim IFS, the median base flow value ( $BF_{Q_{50}}$ ) of Wailuanui Stream is used as the starting point for the following reasons:

- Base flow is generally considered as the total flow that is present in the stream 70 to 90 percent of the time ( $Q_{70} - Q_{90}$ );
- Base flow instead of total flow estimates are used because major diversion structures are generally assumed to capture a majority of the base flow; and
- Median base flow is used as a standard to determine the relative native species habitat availability in a USGS study, which will be important for future comparisons.

Due to the variable and abstract nature of base flow, it is best to associate this term as 70 to 90 percent of the total flow in the stream, or flow that is present in the stream 70 to 90 percent of the time. However, for ease of reference, this flow will be referred as “base flow” in the text.

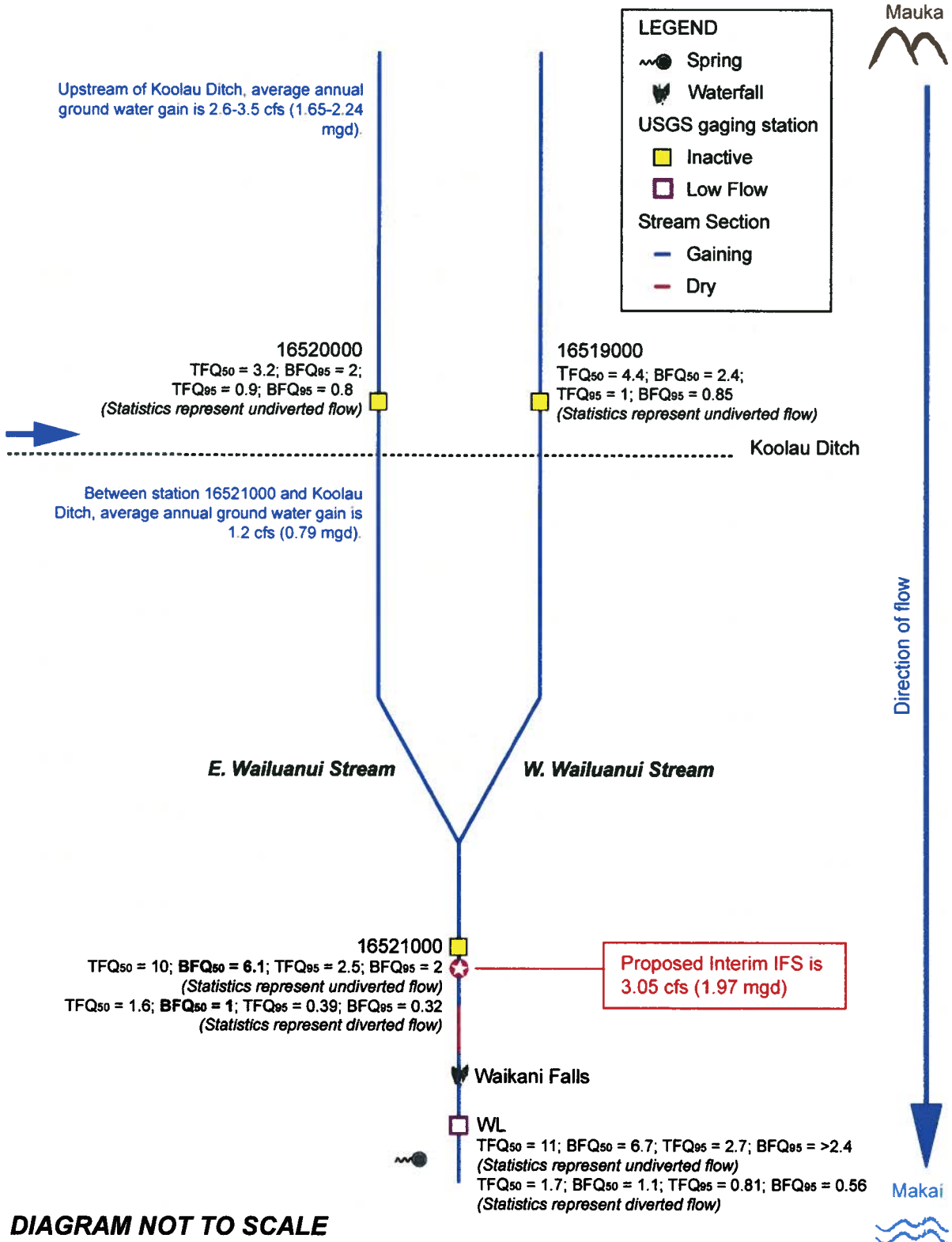
The proposed interim IFS is set at its proposed location on Wailuanui Stream because of the measured data available at USGS gaging station 16521000, as well as the presence of the majority of the downstream users below this location. According to streamflow data and estimated flow statistics, the median base flow at station 16521000 is 1 cubic foot per second under diverted conditions, and 6.1 cubic feet per second under undiverted conditions. Based on the USGS study on habitat availability, when 16 percent of natural base flow is present in the stream, only 40 to 50 percent of the natural habitat for selected native species is available. If flow is restored to 50 percent of natural base flow, potentially 80 to 90 percent of native habitat is available in Wailuanui Stream. Fifty percent of the natural median base flow (6.1 cubic feet per second) is 3.05 cubic feet per second. At this increased flow, more surface water would be available to the downstream users in Wailua Valley while increasing habitat availability.

Please note that the proposed interim IFS and the  $Q_{70}$  and  $Q_{90}$  listed above are averages. Staff proposes an adaptive management strategy that includes periodic review of the proposed interim IFS in providing for both instream and noninstream uses. Specific actions are proposed for consideration under Section E, Proposed Adaptive Management Strategy.

D. Simplified Diagrams.

**WAILUANUI Hydrologic Unit: Stream System Schematic Diagram**

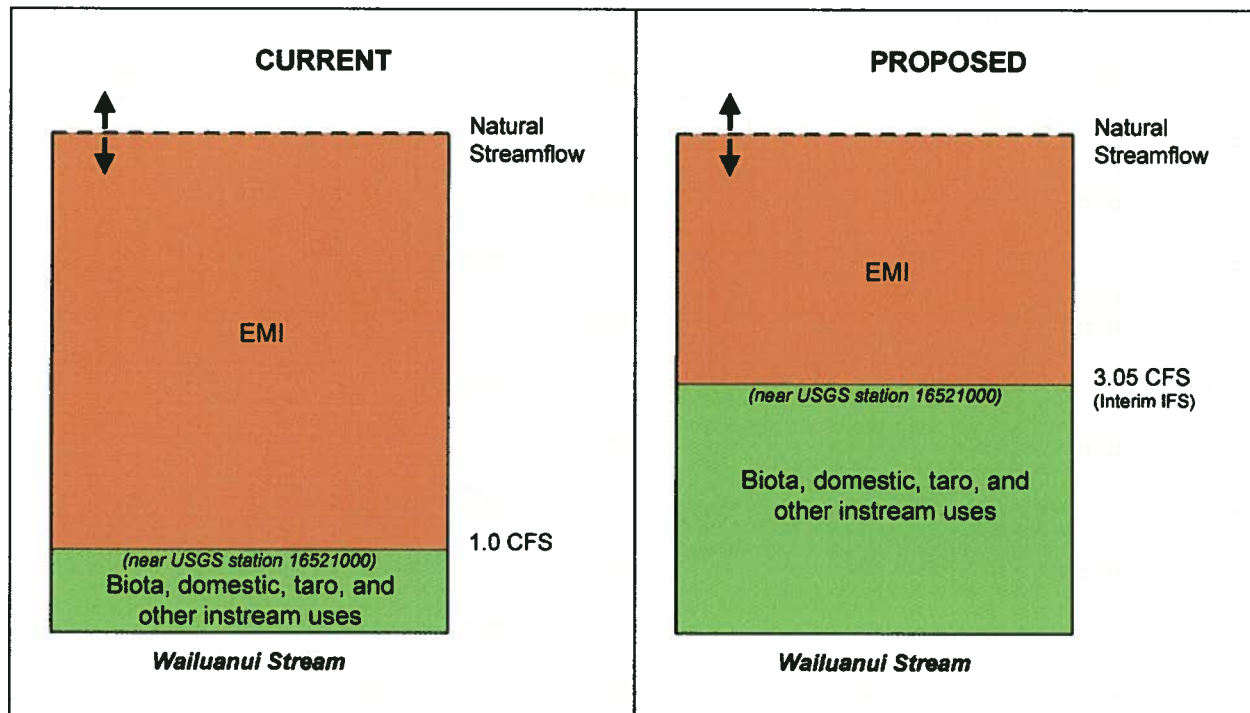
[All flows are in cubic feet per second (cfs) unless other wise noted; mgd = million gallons per day.]





### WAILUANUI Hydrologic Unit: Current and Proposed Interim IFS Diagram

The diagram below is intended to provide a general graphical representation of the current and proposed interim IFS values for Wailuanui Stream. Corresponding flows (in cubic feet per second) are identified to the right of each illustration.



**DIAGRAM NOT TO SCALE**

## E. Proposed Adaptive Management Strategy

A single interim IFS is proposed below the confluence of East and West Wailuanui Streams to allow an adequate amount of water to flow past the upper diversions for both instream and noninstream uses. Since only about a quarter of the taro loi in the valley receive water from Wailuanui Stream, with the rest coming from Waiokamilo Stream, staff proposes that more water should be made available from Waiokamilo Stream than Wailuanui Stream for use by the taro farmers.

Staff proposes the following hydrologic unit-specific adaptive management strategies:

- Taro farmers should examine ways to improve maintenance of auwai, transmission lines, and intakes.
- Taro farmers should consider flushing flows for auwai and taro loi. Flushing flows are a natural process of stream dynamics. In the case of taro cultivation, flushing flows may play a role in the long term maintenance of taro loi and auwai.
- Staff shall assess and monitor the conditions of Wailuanui Stream downstream of Waikani Falls. In consultation with Na Moku and Wailua residents, staff shall determine whether an interim IFS downstream of Waikani Falls will be necessary in light of present and future water demands for taro cultivation.

Staff proposes the following general adaptive management strategies:

### IMPLEMENTATION

- Staff shall seek to enforce the provisions of the State Water Code should any unauthorized, non-registered or non-permitted diversions be discovered in the course of its fieldwork. Staff recommends that all owners of unauthorized diversion works structures contact staff to file the necessary applications to seek compliance with all permitting requirements set forth by the Code.
- Staff shall coordinate with EMI to identify and determine appropriate actions with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall coordinate with other registered stream diversion works owners with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall assess the existing condition and status of all EMI diversions, in coordination with EMI and Division of Aquatic Resources (DAR) staff, to determine if any modifications are necessary to improve habitat conditions for stream biota.

### MONITORING

- Staff shall monitor streamflow by taking periodic flow measurements, subject to available funding, at the proposed interim IFS locations, as weather permits. These will be point-in-time measurements; however, the installation of stream gaging stations remains an option for long-term management.
- Periodic biological surveys shall be conducted, subject to available funding, to monitor the response of stream biota to post-interim IFS implementation.
- Any party claiming to be negatively impacted as a result of the adopted interim IFS shall monitor and document, in cooperation with staff, the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.

- Likewise, any party claiming that negative impacts are a direct result of actions (i.e., diverting too much water, violating the interim IFS) caused by another party, shall monitor and document the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.
- All claimants shall cooperate with staff in conducting appropriate investigations and studies, particularly with regard to granting access to stream channels and private property related to such investigations, subject to the provisions of the State Water Code, Chapter 174C, HRS.

#### EVALUATION

- Within one year from the date of adoption of an interim IFS, staff shall report to the Commission on the progress of implementing the interim IFS and the application of the adaptive management strategies outlined above, and the impacts of the interim IFS upon instream and noninstream uses. Should an interim IFS need to be revised prior to one year from the date of adoption, staff may opt to propose another amended IFS to the Commission.
- Staff shall assess the implementation of these strategies on an as-needed basis, as may be necessary upon consultation with the affected parties.
- Staff shall begin preparation of a long-term management framework for the implementation of measurable IFS statewide. Since this is the first time this interim IFS process is being applied to a standing petition, broader adaptive management strategies must be identified and assessed in consideration of the Commission's Stream Protection and Management Program as a whole (i.e., competing priorities, staffing, budget, etc.).

**RECOMMENDATION:****HONOPOU (6034) RECOMMENDATIONS:**

In the matter of the Petition to Amend the Interim Instream Flow Standard for Honopou Stream, staff recommends that two measurable interim IFS be established for Honopou Stream:

- **Proposed Interim IFS A:** An interim IFS of 2.00 cubic feet per second (1.29 million gallons per day) is recommended at the lower reach of Honopou Stream near the inactive USGS stream gaging station 16595000 at 383 feet elevation, downstream of Haiku Ditch.
- **Proposed Interim IFS B:** An interim IFS of 0.72 cubic feet per second (0.47 million gallons per day) is recommended at the lower reach of Honopou Stream near 40 feet elevation. This location is upstream of the confluence of Puniawa Stream and Honopou Stream, and downstream of the lowest registered diversion on Honopou Stream.

In addition to the General Recommendations listed below, staff recommends approval of the following adaptive management strategies for the hydrologic unit of Honopou:

- EMI, in coordination with staff, shall consider alteration of the diversion at Haiku Ditch to allow for the upstream migration of native aquatic species across the diversions. Currently, the EMI diversion at Haiku Ditch takes all the base flow except that which flows through three 4-inch (outside diameter) pipes.

**HANEHOI (6037) RECOMMENDATIONS:**

In the matter of the Petition to Amend the Interim Instream Flow Standard for Hanehoi and Puolua Streams, staff recommends that three measurable interim IFS be established for Hanehoi and Huelo (Puolua) Streams:

- **Proposed Interim IFS A:** An interim IFS of 0.89 cubic feet per second (0.57 million gallons per day) is recommended at the lower reach of Huelo (Puolua) Stream near 420 feet elevation, downstream of Haiku Ditch. This is the location of the ungaged site, station HuelL.
- **Proposed Interim IFS B:** An interim IFS of 0.63 cubic feet per second (0.41 million gallons per day) is recommended at the lower reach of Hanehoi Stream near 420 feet elevation, downstream of Haiku Ditch.
- **Proposed Interim IFS C:** An interim IFS of 1.15 cubic feet per second (0.74 million gallons per day) is recommended at the lower reach of Hanehoi Stream, upstream of Lowrie Ditch and the diversion of water for domestic use in the Huelo community.

In addition to the General Recommendations listed below, staff recommends approval of the following adaptive management strategies for the hydrologic unit of Hanehoi:

- EMI, in coordination with staff, shall consider alteration of the diversions at Haiku Ditch and Lowrie Ditch to allow for the upstream migration of native aquatic species across the diversions.
- Staff may periodically monitor streamflow below the lowest non-EMI diversion to determine whether an interim IFS should be established to protect biological integrity.

**PIINAAU (6053) RECOMMENDATIONS:**

In the matter of the Petition to Amend the Interim Instream Flow Standard for Piinaau Stream, staff recommends that the interim IFS remain at status quo with no modifications to existing diversions on Piinaau Stream:

- Proposed Interim IFS A: The recommended interim IFS for Piinaau Stream is status quo.

In the matter of the Petition to Amend the Interim Instream Flow Standard for Palauhulu Stream, staff recommends that one measurable interim IFS be established for Palauhulu Stream:

- Proposed Interim IFS B: An interim IFS of 5.50 cubic feet per second (3.56 million gallons per day) is recommended at the lower reach of Palauhulu Stream near 80 feet elevation, upstream from the confluence of Piinaau and Palauhulu Streams. This is the location of the USGS ungaged site, station PhL.

In addition to the General Recommendations listed below, staff recommends approval of the following adaptive management strategies for the hydrologic unit of Piinaau:

- None at this time.

**WAIOKAMILO (6055) RECOMMENDATIONS:**

In the matter of the Petition to Amend the Interim Instream Flow Standard for Waiokamilo Stream, staff recommends that one measurable interim IFS be established for Waiokamilo Stream:

- Proposed Interim IFS A: An interim IFS of 4.9 cubic feet per second (3.17 million gallons per day) at the lower reach of Waiokamilo Stream at the location of the USGS gaging station 16521300 near Dam 3. This location is downstream of Koolau Ditch, but upstream of the confluence of Waiokamilo and Kualani (Hamau) Streams.

In the matter of the Petition to Amend the Interim Instream Flow Standard for Kualani (Hamau) Stream, staff recommends that the interim IFS for Kualani Stream remain at status quo with no modifications to existing diversions on Kualani Stream:

- Proposed Interim IFS B: The recommended interim IFS for Kualani Stream is status quo.

In addition to the General Recommendations listed below, staff recommends approval of the following adaptive management strategies for the hydrologic unit of Waiokamilo:

- Taro farmers, in coordination with staff, shall consider reestablishing a control mechanism in the auwai just downstream of Dam 2 or at the auwai intake to limit the amount of water entering the auwai in times of high flow and to allow some water to flow past Dam 2 for downstream domestic users.
- Taro farmers, in coordination with staff, should repair and maintain coffer dams upstream of Dam 3 to redirect flow away from portions of the stream channel that appear to be losing flow underground.
- Taro farmers should examine ways to improve maintenance of auwai, transmission lines, and intakes.

- Taro farmers should consider flushing flows for auwai and taro loi. Flushing flows are a natural process of stream dynamics. In the case of taro cultivation, flushing flows may play a role in the long term maintenance of taro loi and auwai<sup>12</sup>.
- Staff shall monitor streamflow by analyzing data collected at the USGS stream gaging station 16521300. Since the gaging station was installed in response to the BLNR's interim order in July 2007, it is questionable whether the station will be continued if an interim IFS is adopted. However, staff will collaborate with USGS and BLNR to devise ways to maintain the gaging station for the purpose of monitoring the proposed interim IFS.
- If funding is inadequate to maintain USGS gaging station 16521300, staff will monitor streamflow by taking periodic flow measurements, as funding is available, at the proposed interim IFS locations, as weather permits. These will be point-in-time measurements; however, the installation of stream gaging stations remains an option for long-term management.
- Staff shall assess, subject to available funding, the extent and conditions of Kualani Stream.
- Staff shall assess, subject to available funding and in coordination with EMI, the current condition and status of EMI diversions on Waiokamilo Stream.
- Staff, in consultation with area residents, taro farmers, and Na Moku, shall assess the amount of water necessary to flow past Dam 2 in Waiokamilo Stream for the purposes of domestic use and maintenance of fish and wildlife habitat.

#### **WAILUANUI (6056) RECOMMENDATIONS:**

In the matter of the Petition to Amend the Interim Instream Flow Standard for East and West Wailuanui Streams, staff recommends that one measurable interim IFS be established for Wailuanui Stream:

- Proposed Interim IFS: An interim IFS of 3.05 cubic feet per second (1.97 million gallons per day) at the lower reach of Wailuanui Stream near the inactive USGS gaging station 16521000 at 620 feet elevation. This location is downstream of Koolau Ditch, below the confluence of the tributaries, East and West Wailuanui Streams.

In addition to the General Recommendations listed below, staff recommends approval of the following adaptive management strategies for the hydrologic unit of Wailuanui:

- Taro farmers should examine ways to improve maintenance of auwai, transmission lines, and intakes.
- Taro farmers should consider flushing flows for auwai and taro loi. Flushing flows are a natural process of stream dynamics. In the case of taro cultivation, flushing flows may play a role in the long term maintenance of taro loi and auwai<sup>13</sup>.
- Staff shall assess and monitor the conditions of Wailuanui Stream downstream of Waikani Falls. In consultation with Na Moku and Wailua residents, staff shall determine whether an interim IFS downstream of Waikani Falls will be necessary in light of present and future water demands for taro cultivation.

---

<sup>12</sup> Kumu Pono Associates, 2001a, p.79.

<sup>13</sup> Kumu Pono Associates, 2001a, p.79.

**GENERAL RECOMMENDATIONS:**

Staff recommends approval of the following adaptive management strategies for all five of the hydrologic units being considered, Honopou (6034), Hanehoi (6037), Piinaau (6053), Waiokamilo (6055), and Wailuanui (6056).

**IMPLEMENTATION**

- Staff shall seek to enforce the provisions of the State Water Code should any unauthorized, non-registered or non-permitted diversions be discovered in the course of its fieldwork. Staff recommends that all owners of unauthorized diversion works structures contact staff to file the necessary applications to seek compliance with all permitting requirements set forth by the Code.
- Staff shall coordinate with EMI to identify and determine appropriate actions with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall coordinate with other registered stream diversion works owners with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall assess the existing condition and status of all EMI diversions, in coordination with EMI and Division of Aquatic Resources (DAR) staff, to determine if any modifications are necessary to improve habitat conditions for stream biota.

**MONITORING**

- Staff shall monitor streamflow by taking periodic flow measurements, subject to available funding, at the proposed interim IFS locations, as weather permits. These will be point-in-time measurements; however, the installation of stream gaging stations remains an option for long-term management.
- Periodic biological surveys shall be conducted, subject to available funding, to monitor the response of stream biota to post-interim IFS implementation.
- Any party claiming to be negatively impacted as a result of the adopted interim IFS shall monitor and document, in cooperation with staff, the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.
- Likewise, any party claiming that negative impacts are a direct result of actions (i.e., diverting too much water, violating the interim IFS) caused by another party, shall monitor and document the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.
- All claimants shall cooperate with staff in conducting appropriate investigations and studies, particularly with regard to granting access to stream channels and private property related to such investigations, subject to the provisions of the State Water Code, Chapter 174C, HRS.

**EVALUATION**

- Within one year from the date of adoption of an interim IFS, staff shall report to the Commission on the progress of implementing the interim IFS and the application of the adaptive management strategies outlined above, and the impacts of the interim IFS upon instream and noninstream uses. Should an interim IFS need to be revised prior to one year from the date of adoption, staff may opt to propose another amended IFS to the Commission.

- Staff shall assess the implementation of these strategies on an as-needed basis, as may be necessary upon consultation with the affected parties.
- Staff shall begin preparation of a long-term management framework for the implementation of measurable IFS statewide. Since this is the first time this interim IFS process is being applied to a standing petition, broader adaptive management strategies must be identified and assessed in consideration of the Commission's Stream Protection and Management Program as a whole (i.e., competing priorities, staffing, budget, etc.).

Respectfully submitted,

  
KEN C. KAWAHARA, P.E.  
Deputy Director

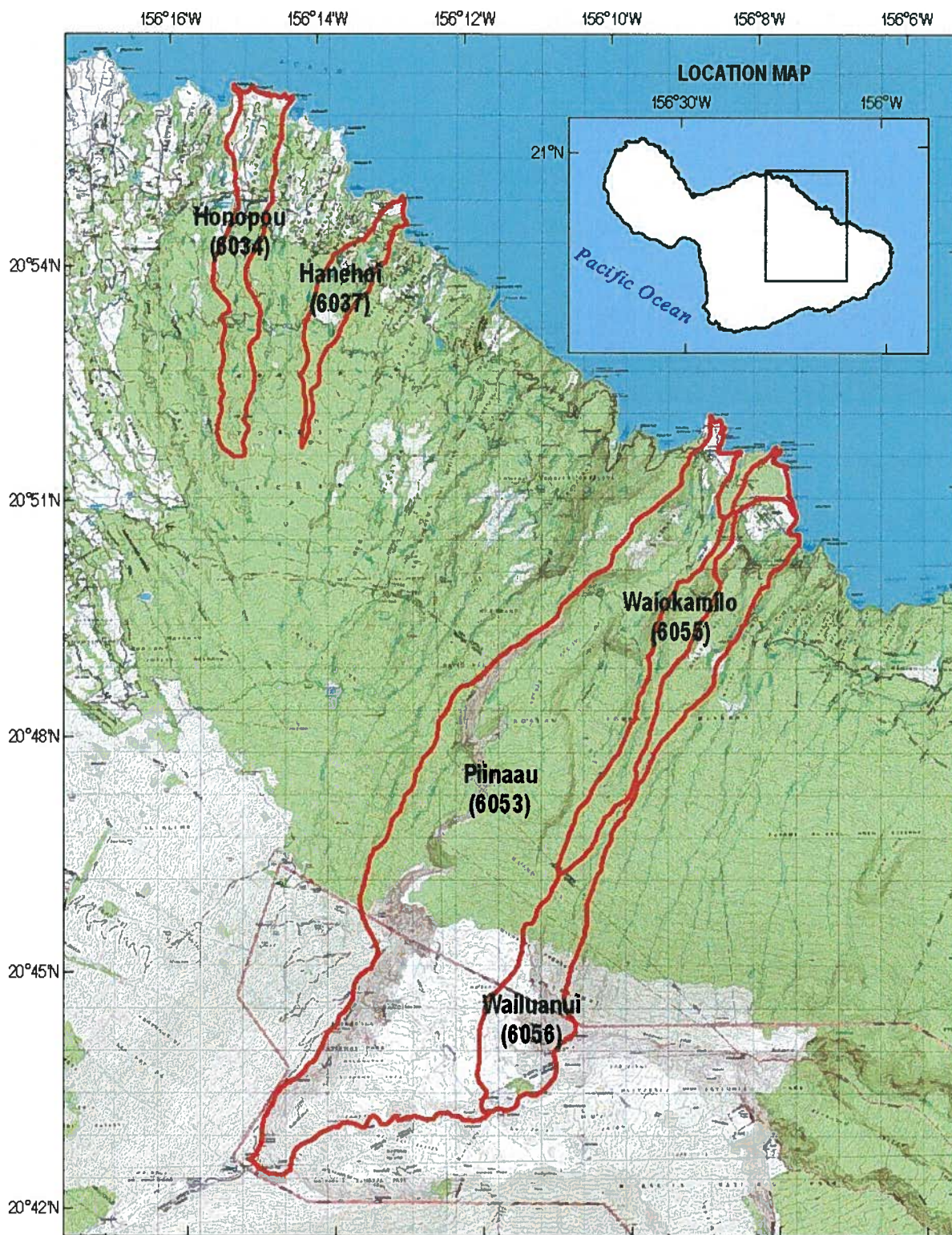
- Exhibit 1 Location Map of Honopou, Hanehoi, Piinaau, Waiokamilo, and Wailuanui Surface Water Hydrologic Units
- Exhibit 2 Petition to Amend Interim Instream Flow Standards for Honopou Stream, Hanehoi and Puolua Streams, Piinaau Stream, Palauhulu Stream, Waiokamilo Stream, Kualani Stream, East and West Wailuanui Streams, and Waikani Waterfall [Stream]
- Exhibit 3 Instream Flow Standard Assessment Report for Honopou Unit 6034, PR-2008-01
- Exhibit 4 Instream Flow Standard Assessment Report for Hanehoi Unit 6037, PR-2008-02
- Exhibit 5 Instream Flow Standard Assessment Report for Piinaau Unit 6053, PR-2008-03
- Exhibit 6 Instream Flow Standard Assessment Report for Waiokamilo Unit 6055, PR-2008-04
- Exhibit 7 Instream Flow Standard Assessment Report for Wailuanui Unit 6056, PR-2008-05
- Exhibit 8 Compilation of Public Review Comments, PR-2008-07
- Exhibit 9 The Importance of the Hawaiian Commercial & Sugar Company to the Hawaii Economy and Conditions for Its Survival: A consultant paper by Leroy O. Laney, Ph.D.

APPROVED FOR SUBMITTAL:

  
LAURA H. THIELEN  
Chairperson



# LOCATION MAP



Prepared by the Department of Land and Natural Resources,  
Commission on Water Resource Management.  
Transverse Mercator projection, zone 4, North American Datum 1983

**State of Hawaii  
COMMISSION ON WATER RESOURCE MANAGEMENT  
Department of Land and Natural Resources**

MAY 24 10:00 AM '01  
**PETITION TO AMEND INTERIM INSTREAM FLOW STANDARDS**

HONOPOIU STREAM, EAST MAUI

Instructions: Please print in ink or type and send completed petition with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96808. Petition must be accompanied by a non-refundable filing fee of \$25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225.

**1. PETITIONER**

Firm/Name Beatrice Kepani Kekahuna & Marjorie Waiet c/o Native Hawaiian Legal Corp.  
 Contact Person Alan Murakami, Attorney Ph: 521-2302  
 Address 1164 Bishop Street, Honolulu, HI 96813

**2. STREAMFLOW DATA**

16587000, 16588000, 16590000,

USGS stream gaging station 16591000, 16593000, 16595000 Period of Record DATA TO FOLLOW.

Location/Reach SEE ATTACHED.

(Attach a USGS map, scale 1"=2000', and a property tax map showing diversion location referenced to established property boundaries.)

**TABLE 1. PERIOD OF RECORD AVERAGE MONTHLY STREAMFLOW WITHIN THE AFFECTED STREAM REACH, IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

STREAMFLOW DATA TO FOLLOW.

Annual Median flow in cfs =

**TABLE 2. PROPOSED AVERAGE MONTHLY STREAMFLOW DIVERSION FROM AFFECTED STREAM REACH, IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

UNDETERMINED; SUFFICIENT FOR TARO FARMING AND/OR GATHERING.

Annual Median flow in cfs =

**TABLE 3. AVERAGE MONTHLY STREAMFLOW IN AFFECTED STREAM REACH AFTER DIVERSION (min release flow), IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

NATURAL STREAMFLOW EXCEPT FOR EXERCISE OF APPURTENANT WATER RIGHTS.

Annual Median flow in cfs =

**3. EXISTING INSTREAM AND OFFSTREAM WATER USES FOR ENTIRE STREAM REACH**

TMK	OWNER	USE
-----	-------	-----

RESEARCH IN PROGRESS.

(If more space is necessary, attach an extended list following above format)

**4. ANTICIPATED IMPACTS ON STREAM AND BASIS FOR SUCH IMPACTS:**

RESTORATION OF INSTREAM NATURAL HABITAT AND BIOTA, AND BENEFICIAL APPURTENANT AND GATHERING USES.

(Attach supporting documentation, plans, letters, etc.)

NATIVE HAWAIIAN LEGAL CORPORATION

May 24, 2001

Date

Signature

Alan Murakami  
 Attorney for Beatrice Kepani Kekahuna and  
 Marjorie Waiet

Petitioner

For Official Use

Date Received

Date Accepted

**State of Hawaii  
COMMISSION ON WATER RESOURCE MANAGEMENT  
Department of Land and Natural Resources**

JUN 24 9:00

**PETITION TO AMEND INTERIM INSTREAM FLOW STANDARDS  
HANEHOI & PUOLUA STREAMS, EAST MAUI**

Instructions: Please print in ink or type and send completed petition with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96808. Petition must be accompanied by a non-refundable filing fee of \$25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0223.

**1. PETITIONER**

Firm/Name Elizabeth Lehua Lapenia c/o Native Hawaiian Legal Corporation  
 Contact Person Alan Murakami, Attorney Ph. 521-2302  
 Address 1164 Bishop Street, Honolulu, HI 96813

**2. STREAMFLOW DATA**

USGS stream gaging station UNGAGED. Period of Record UNAVAILABLE.  
 Location/Reach SEE ATTACHED.  
 (Attach a USGS map, scale 1"=2000', and a property tax map showing diversion location referenced to established property boundaries.)

**TABLE 1. PERIOD OF RECORD AVERAGE MONTHLY STREAMFLOW WITHIN THE AFFECTED STREAM REACH, IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

DATA UNAVAILABLE.

Annual Median flow in cfs =

**TABLE 2. PROPOSED AVERAGE MONTHLY STREAMFLOW DIVERSION FROM AFFECTED STREAM REACH, IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

UNDETERMINED, SUFFICIENT FOR TARO FARMING AND/OR GATHERING.

Annual Median flow in cfs =

**TABLE 3. AVERAGE MONTHLY STREAMFLOW IN AFFECTED STREAM REACH AFTER DIVERSION (min release flow), IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

NATURAL STREAMFLOW EXCEPT FOR EXERCISE OF APPURTENANT WATER RIGHTS.

Annual Median flow in cfs =

**3. EXISTING INSTREAM AND OFFSTREAM WATER USES FOR ENTIRE STREAM REACH**

TMK	OWNER	USE
		<u>RESEARCH IN PROGRESS.</u>

(If more space is necessary, attach an extended list following above format)

**4. ANTICIPATED IMPACTS ON STREAM AND BASIS FOR SUCH IMPACTS:**

RESTORATION OF INSTREAM NATURAL HABITAT AND BIOTA, AND BENEFICIAL APPURTENANT AND GATHERING USES.

(Attach supporting documentation, plans, letters, etc.)

May 24, 2001  
Date

Signature

NATIVE HAWAIIAN LEGAL CORPORATION

Alan Murakami Personer  
 Attorney for Elizabeth Lehua Lapenia

For Official Use  
 Date Received \_\_\_\_\_  
 Date Accepted \_\_\_\_\_

**State of Hawaii  
COMMISSION ON WATER RESOURCE MANAGEMENT  
Department of Land and Natural Resources**

MAY 23 12 01 PM '01  
MAY 23 10 01 AM '01  
**PETITION TO AMEND INTERIM INSTREAM FLOW STANDARDS**

P'IANA'AU STREAM, EAST MAUI

Instructions: Please print in ink or type and send completed petition with attachments to the Commission on Water Resource Management, P.O. Box 821, Honolulu, Hawaii 96808. Petition must be accompanied by a non-refundable filing fee of \$25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 567-0223.

**1. PETITIONER**

Firm/Name Na Moku 'Aupuni o Ko'olau Hui c/o Native Hawaiian Legal Corporation  
 Contact Person Alan Murakami, Attorney Ph: 521-2302  
 Address 1164 Bishop Street, Honolulu, Hawaii'i 96813

**2. STREAMFLOW DATA**

USGS stream gaging station 16522000 Period of Record Data to follow.  
 Location/Reach SEE ATTACHED Gage Inactive  
 (Attach a USGS map, scale 1"=2000', and a property tax map showing diversion location referenced to established property boundaries.)

**TABLE 1. PERIOD OF RECORD AVERAGE MONTHLY STREAMFLOW WITHIN THE AFFECTED STREAM REACH, IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

STREAMFLOW DATA TABLES TO FOLLOW.

Annual Median flow in cfs =

**TABLE 2. PROPOSED AVERAGE MONTHLY STREAMFLOW DIVERSION FROM AFFECTED STREAM REACH, IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

NONE. UNDETERMINED; SUFFICIENT FOR TARO FARMING AND/OR GATHERING.

Annual Median flow in cfs =

**TABLE 3. AVERAGE MONTHLY STREAMFLOW IN AFFECTED STREAM REACH AFTER RESTORATION (min release flow), IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

NATURAL STREAMFLOW EXCEPT FOR EXERCISE OF APPURTENANT WATER RIGHTS.

Annual Median flow in cfs =

**3. EXISTING INSTREAM AND OFFSTREAM WATER USES FOR ENTIRE STREAM REACH**

TMK	OWNER	USE
-----	-------	-----

RESEARCH IN PROGRESS.

(If more space is necessary, attach an extended list following above format)

**4. ANTICIPATED IMPACTS ON STREAM AND BASIS FOR SUCH IMPACTS:**

RESTORATION OF INSTREAM NATURAL HABITAT AND BIOTA, AND BENEFICIAL APPURTENANT AND GATHERING USES.

(Attach supporting documentation, plans, letters, etc.)

NATIVE HAWAIIAN LEGAL CORPORATION

May 24, 2001

Signature

Alan Murakami Petitioner  
 Attorney for Na Moku 'Aupuni o Ko'olau Hui

For Official Use

Date Received  
 By

**State of Hawaii  
COMMISSION ON WATER RESOURCE MANAGEMENT  
Department of Land and Natural Resources**

**PETITION TO AMEND INTERIM INSTREAM FLOW STANDARDS**

PALAUHULU STREAM, EAST MAUI

Instructions: Please print in ink or type and send completed petition with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96808. Petition must be accompanied by a non-refundable filing fee of \$25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225.

**1. PETITIONER**

Firm/Name Na Moku 'Aupuni o Ko'olau Hui c/o Native Hawaiian Legal Corporation  
 Contact Person Alan Murakami, Attorney Ph: 521-2302  
 Address 1164 Bishop Street, Honolulu, Hawai'i 96813

**2. STREAMFLOW DATA**

USGS stream gaging station 16522000 Period of Record Data to follow.  
 Location/Reach SEE ATTACHED Gage Inactive  
 (Attach a USGS map, scale 1"=2000', and a property tax map showing diversion location referenced to established property boundaries.)

**TABLE 1. PERIOD OF RECORD AVERAGE MONTHLY STREAMFLOW WITHIN THE AFFECTED STREAM REACH, IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

STREAMFLOW DATA TABLES TO FOLLOW.

Annual Median flow in cfs =

**TABLE 2. PROPOSED AVERAGE MONTHLY STREAMFLOW DIVERSION FROM AFFECTED STREAM REACH, IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

NONE. UNDETERMINED; SUFFICIENT FOR TARO FARMING AND/OR GATHERING.

Annual Median flow in cfs =

**TABLE 3. AVERAGE MONTHLY STREAMFLOW IN AFFECTED STREAM REACH AFTER RESTORATION (min release flow), IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

NATURAL STREAMFLOW EXCEPT FOR EXERCISE OF APPURTENANT WATER RIGHTS.

Annual Median flow in cfs =

**3. EXISTING INSTREAM AND OFFSTREAM WATER USES FOR ENTIRE STREAM REACH**

TMK	OWNER	USE
-----	-------	-----

RESEARCH IN PROGRESS.

(If more space is necessary, attach an extended list following above format)

**4. ANTICIPATED IMPACTS ON STREAM AND BASIS FOR SUCH IMPACTS:**

RESTORATION OF INSTREAM NATURAL HABITAT AND BIOTA, AND BENEFICIAL APPURTENANT AND GATHERING USES.

(Attach supporting documentation, plans, letters, etc.)

NATIVE HAWAIIAN LEGAL CORPORATION

May 24, 2001

Signature

Alan Murakami Petitioner  
 Attorney for Na Moku 'Aupuni o Ko'olau Hui

For Official Use

Date Received

**State of Hawaii  
COMMISSION ON WATER RESOURCE MANAGEMENT  
Department of Land and Natural Resources**

**PETITION TO AMEND INTERIM INSTREAM FLOW STANDARDS**

WAIKAMILO STREAM, EAST MAUI

Instructions: Please print in ink or type and send completed petition with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Petition must be accompanied by a non-refundable filing fee of \$25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0223.

**1. PETITIONER**

Firm/Name Na Moku 'Aupuni o Ko'olau Hui c/o Native Hawaiian Legal Corporation  
 Contact Person Alan Murakami, Attorney Ph: 521-2302  
 Address 1164 Bishop Street, Honolulu, Hawai'i 96813

**2. STREAMFLOW DATA**

USGS stream gaging station UNGAGED. Period of Record NONE.  
 Location/Reach SEE ATTACHED  
 (Attach a USGS map, scale 1"=2000', and a property tax map showing diversion location referenced to established property boundaries.)

**TABLE 1. PERIOD OF RECORD AVERAGE MONTHLY STREAMFLOW WITHIN THE AFFECTED STREAM REACH, IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

CURRENT DATA UNAVAILABLE.

Annual Median flow in cfs =

**TABLE 2. PROPOSED AVERAGE MONTHLY STREAMFLOW DIVERSION FROM AFFECTED STREAM REACH, IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

NONE. UNDETERMINED; SUFFICIENT FOR TARO FARMING AND/OR GATHERING.

Annual Median flow in cfs =

**TABLE 3. AVERAGE MONTHLY STREAMFLOW IN AFFECTED STREAM REACH AFTER RESTORATION (min release flow), IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

NATURAL STREAMFLOW EXCEPT FOR EXERCISE OF APPURTENANT WATER RIGHTS.

Annual Median flow in cfs =

**3. EXISTING INSTREAM AND OFFSTREAM WATER USES FOR ENTIRE STREAM REACH**

TMK	OWNER	USE
-----	-------	-----

RESEARCH IN PROGRESS.

(If more space is necessary, attach an extended list following above format)

**4. ANTICIPATED IMPACTS ON STREAM AND BASIS FOR SUCH IMPACTS:**

RESTORATION OF INSTREAM NATURAL HABITAT AND BIOTA, AND BENEFICIAL APPURTENANT AND GATHERING USES.

(Attach supporting documentation, plans, letters, etc.)

May 24, 2001

Date

Signature

NATIVE HAWAIIAN LEGAL CORPORATION

Alan Murakami Petitioner  
 Attorney for Na Moku 'Aupuni o Ko'olau Hui

For Official Use

Date Received  
 Date Accepted

**State of Hawaii  
COMMISSION ON WATER RESOURCE MANAGEMENT  
Department of Land and Natural Resources**

01/24/2001 03:00

**PETITION TO AMEND INTERIM INSTREAM FLOW STANDARDS**

KUALANI STREAM, EAST MAUI

Instructions: Please print in ink or type and send completed petition with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96808. Petition must be accompanied by a non-refundable filing fee of \$25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0223.

**1. PETITIONER**

Firm/Name Na Moku 'Aupuni o Ko'olau Hui c/o Native Hawaiian Legal Corporation  
 Contact Person Alan Murakami, Attorney Ph: 521-2302  
 Address 1164 Bishop Street, Honolulu, Hawai'i 96813

**2. STREAMFLOW DATA**

USGS stream gaging station UNGAGED. Period of Record NONE.  
 Location/Reach SEE ATTACHED  
(Attach a USGS map, scale 1"=2000', and a property tax map showing diversion location referenced to established property boundaries.)

**TABLE 1. PERIOD OF RECORD AVERAGE MONTHLY STREAMFLOW WITHIN THE AFFECTED STREAM REACH, IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

DATA UNAVAILABLE.

Annual Median flow in cfs =

**TABLE 2. PROPOSED AVERAGE MONTHLY STREAMFLOW DIVERSION FROM AFFECTED STREAM REACH, IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

AND/  
UNDETERMINED; SUFFICIENT FOR TARO FARMING OR GATHERING.

Annual Median flow in cfs =

**TABLE 3. AVERAGE MONTHLY STREAMFLOW IN AFFECTED STREAM REACH AFTER RESTORATION (min release flow), IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

NATURAL STREAMFLOW EXCEPT FOR EXERCISE OF APPURTENANT WATER RIGHTS.

Annual Median flow in cfs =

**3. EXISTING INSTREAM AND OFFSTREAM WATER USES FOR ENTIRE STREAM REACH**

TMK	OWNER	USE
		<u>RESEARCH IN PROGRESS.</u>

(If more space is necessary, attach an extended list following above format)

**4. ANTICIPATED IMPACTS ON STREAM AND BASIS FOR SUCH IMPACTS:**

RESTORATION OF INSTREAM NATURAL HABITAT AND BIOTA, AND BENEFICIAL APPURTENANT AND GATHERING USES.

(Attach supporting documentation, plans, letters, etc.)

NATIVE HAWAIIAN LEGAL CORPORATION

May 24, 2001

Date

Signature

Alan Murakami Petitioner  
 Attorney for Na Moku 'Aupuni o Ko'olau Hui

For Official Use  
 Date Received  
 By

**State of Hawaii  
COMMISSION ON WATER RESOURCE MANAGEMENT  
Department of Land and Natural Resources**

**PETITION TO AMEND INTERIM INSTREAM FLOW STANDARDS**

EAST AND WEST WAILUANUI STREAMS, EAST MAUI

Instructions: Please print in ink or type and send completed petition with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96808. Petition must be accompanied by a non-refundable filing fee of \$25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 567-0225.

**1. PETITIONER**

Firm/Name Na Moku 'Aupuni o Ko'olau Hui c/o Native Hawaiian Legal Corporation  
 Contact Person Alan Murakami, Attorney Ph. 521-2302  
 Address 1164 Bishop Street, Honolulu, Hawai'i 96813

**2. STREAMFLOW DATA**

16519000 (W), 16520000 (E),

Data to follow.

USGS stream gaging station 16521000 Period of Record Gages Inactive

Location/Reach SEE ATTACHED

(Attach a USGS map, scale 1"=2000', and a property tax map showing diversion location referenced to established property boundaries.)

**TABLE 1. PERIOD OF RECORD AVERAGE MONTHLY STREAMFLOW WITHIN THE AFFECTED STREAM REACH, IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

STREAMFLOW DATA TABLES TO FOLLOW.

Annual Median flow in cfs =

**TABLE 2. PROPOSED AVERAGE MONTHLY STREAMFLOW DIVERSION FROM AFFECTED STREAM REACH, IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

NONE. UNDETERMINED; SUFFICIENT FOR TARO FARMING AND/OR GATHERING.

Annual Median flow in cfs =

**TABLE 3. AVERAGE MONTHLY STREAMFLOW IN AFFECTED STREAM REACH AFTER RESTORATION (min release flow), IN CFS**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

NATURAL STREAMFLOW EXCEPT FOR EXERCISE OF APPURTENANT WATER RIGHTS.

Annual Median flow in cfs =

**3. EXISTING INSTREAM AND OFFSTREAM WATER USES FOR ENTIRE STREAM REACH**

TMK	OWNER	USE
-----	-------	-----

RESEARCH IN PROGRESS.

(If more space is necessary, attach an extended list following above format)

**4. ANTICIPATED IMPACTS ON STREAM AND BASIS FOR SUCH IMPACTS:**

RESTORATION OF INSTREAM NATURAL HABITAT AND BIOTA, AND BENEFICIAL APPURTENANT AND GATHERING USES.

(Attach supporting documentation, plans, letters, etc.)

NATIVE HAWAIIAN LEGAL CORPORATION

May 24, 2001

Date

Signature

Alan Murakami  
 Attorney for Na Moku 'Aupuni o Ko'olau Hui

Petitioner

For Official Use

Date Received

By



**State of Hawaii  
COMMISSION ON WATER RESOURCE-MANAGEMENT  
Department of Land and Natural Resources**

01/24 P3:10

PETITION TO AMEND INTERIM INSTREAM FLOW STANDARDS

WAIKANI <sup>WATERFALL</sup> (STREAM) EAST MAUI

Instructions: Please print in ink or type and send completed petition with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96808. Petition must be accompanied by a non-refundable filing fee of \$25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 567-0225.

**1. PETITIONER**

Firm/Name Na Moku 'Aupuni o Ko'olau Hui c/o Native Hawaiian Legal Corporation  
 Contact Person Alan Murakami, Attorney Ph. 521-2302  
 Address 1164 Bishop Street, Honolulu, Hawai'i 96813

**2. STREAMFLOW DATA**

USGS stream gaging station UNGAGED. Period of Record NONE.  
 Location/Reach SEE ATTACHED  
 (Attach a USGS map, scale 1"=2000', and a property tax map showing diversion location referenced to established property boundaries.)

TABLE 1. PERIOD OF RECORD AVERAGE MONTHLY STREAMFLOW WITHIN THE AFFECTED STREAM REACH, IN CFS

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

DATA UNAVAILABLE.

Annual Median flow in cfs =

TABLE 2. PROPOSED AVERAGE MONTHLY STREAMFLOW DIVERSION FROM AFFECTED STREAM REACH, IN CFS

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

Annual Median flow in cfs =

TABLE 3. AVERAGE MONTHLY STREAMFLOW IN AFFECTED STREAM REACH AFTER RESTORATION (min release flow), IN CFS

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

NATURAL STREAMFLOW EXCEPT FOR EXERCISE OF APPURTENANT WATER RIGHTS.

Annual Median flow in cfs =

**3. EXISTING INSTREAM AND OFFSTREAM WATER USES FOR ENTIRE STREAM REACH**

TMK	OWNER	USE
		RESEARCH IN PROGRESS.

(If more space is necessary, attach an extended list following above format)

**4. ANTICIPATED IMPACTS ON STREAM AND BASIS FOR SUCH IMPACTS:**

RESTORATION OF INSTREAM NATURAL HABITAT AND BIOTA, AND BENEFICIAL APPURTENANT AND GATHERING USES.

(Attach supporting documentation, plans, letters, etc.)

NATIVE HAWAIIAN LEGAL CORPORATION

May 24, 2001

Date

Signature

Alan Murakami Petitioner  
 Attorney for Na Moku 'Aupuni o Ko'olau Hui

For Official Use

Date Received

By