Board of Land and Natural Resources Meeting
Kalanikukou Building, Oahu
December 12, 2008

Staff Presentation on the
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
Petition to Amend IIFS

**HONOPOU**
- Honopou Stream

**HANEHOI**
- Hanehoi and Puolua Streams

**PIINAAU**
- Piinaau Stream
- Palauhulu Stream

**WAIOKAMILO**
- Waiokamilo Stream
- Kualani Stream

**WAILUANUI**
- East and West Wailuanui Streams
- Waikani Waterfall [Stream]
Presentation Overview

• Background
  ▪ Timeline
  ▪ Interim IFS process
  ▪ Adaptive Management
  ▪ Hydrology

• Issues and Analysis
  ▪ General Considerations
  ▪ Hydrologic Unit-Specific Considerations
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Timeline

- **October 8, 1988**
  - Initial “status quo” interim IFS for East Maui streams
- **May 24, 2001**
  - NHLC filed 27 Petitions to Amend the Interim IFS
- **July 23, 2001**
  - Focus on 5 hydrologic units, 8 petitions
- **March 20, 2002**
  - Commission approved Water Resource Investigations for Northeast Maui Streams
Timeline

• June 15, 2005

• January 2006
  ▪ USGS Report: Effects of Surface-Water Diversions on Habitat Availability for Native Macrofauna, Northeast Maui, Hawaii

• December 13, 2006
  ▪ Approval of Interim IFS process

• April 10, 2008
  ▪ Public fact gathering meeting

• September 2 & 3, 2008
  ▪ Commission site visits
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Balancing the Needs

**Fish/Wildlife Habitat**
- Stream Channelizations
- Native Vertebrates
- Invertebrates
- Invasive Species
- Recruitment
- Abundance
- Diversity
- Distribution
- Other

**Recreation**
- Swimming
- Nature Study
- Fishing
- Boating
- Parks
- Other

**Ecosystem Maintenance**
- Estuaries
- Wetlands
- Nearshore Waters
- Natural Area Reserves
- National Parks
- Other Protected Areas
- Other

**Aesthetics**
- Scenic Views
- Waterfalls
- Tourism
- Other

**Navigation**
- Boating
- Other

**Hydrology**
- Median Flow
- Base Flow
- Pre-Diversion Flow Estimate
- Groundwater Interaction
- Surface-Water Use
- Ground-Water Use
- Other

**Hydropower**
- Present Use
- Potential Use
- Other

**Water Quality**
- Water Quality Standards
- 303(d) Impaired Waters
- Total Maximum Daily Loads
- Land Use
- Other

**Conveyance of Water**
- Multiple Diversions on a Single Stream
- Other

**Hawaiian Rights**
- Traditional and Customary Rights
- Taro Cultivation
- Appurtenant Rights
- Cultural Values
- Other

**Noninstream Uses**
- Diversions
- Domestic/Municipal Use
- Agriculture
- Industrial
- Present vs. Potential Use
- Economic Impacts
“The Commission shall weigh the importance of the present or potential instream values with the importance of present or potential uses of water for noninstream purposes, including the economic impact of restricting such uses.”
Interim IFS Process

1. CWRM Receives or Initiates a Petition to Amend the Existing IIFS (Status Quo)
2. CWRM Staff Conducts an Inventory of Best Available Information
3. Seek Agency Review and Comments
4. Staff Issues a Public Notice and Conducts a Public Fact Gathering Meeting
5. Staff Compiles and Incorporates New Information
6. Staff Prepares a Recommendation for IIFS Amendment for Action at a CWRM Meeting
7. CWRM Action
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Adaptive Management

1. Establish Objectives
2. Implement Management
3. Monitor Effectiveness
4. Evaluate Results
5. Revise Management
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  ▪ **Hydrology**

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Hydrology

A

Rain

Overland flow

Infiltration

Stream

Subsurface storm flow

B

Water table

Base flow

C

Rain

Flow to bank storage (high stage)

D

Bank storage returns to stream (low stage)

Source: USGS
Hydrology

Source: USGS

TFQ_{50} = 10 cfs
BFQ_{50} = 6 cfs
TFQ_{95} = 1.2 cfs
BFQ_{95} = 0.9 cfs
Habitat Availability

Source: USGS
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General Considerations

- **Sustainability**
  - Agriculture
- **Public health**
  - Health risks of stagnant water
  - Nutrition
- **Decreased streamflow**
  - Reduction in ground water storage and recharge
  - Decreased annual rainfall
  - Increased water demand
  - Climate change
  - Landcover change

East Wailuanui Stream, Maui
General Considerations

• **Ongoing water issue**
  ▪ Dates back to the 1881 petition

• **Status quo interim IFS**
  ▪ Initial establishment
  ▪ Differing opinions
  ▪ Lack of data

• **Cultural landscape study**
  ▪ Support return of water and taro farming

• **EMI cultural study**
  ▪ Relationship between EMI and community
General Considerations

• HC&S water needs
  ▪ Accuracy of information
  ▪ Other sources of water

• Agricultural subsidies
  ▪ Economics of HC&S / EMI operations

• Upcountry Maui
  ▪ Residents rely on EMI water

• Energy
  ▪ Sales to MECO
  ▪ Renewable energy - hydroelectric and biomass

Wailoa Ditch siphon at Maliko Gulch. It transports water to west and central Maui.
General Considerations

• Water management practices
  - Release of water downstream
  - Impact to downstream resources

• Water use by HC&S
  - NHLC calculation
    - Winter: 134 mgd over 7,560 ac = 17,724 gad
    - Summer: 268 mgd over 7,560 ac = 35,449 gad
  - HC&S calculation
    - Winter: 17,724 gad applied 2 out of 7 days = 5,064 gad
    - Summer: 35,449 gad applied 2 out of 7 days = 10,128 gad

MGD = million gallons per day; ac = acres; gad = gallons per acre per day
General Considerations

• Alternative water sources (HC&S)
  ▪ Brackish water from wells

• Viability of HC&S
  ▪ Land size and location
  ▪ Revenue from energy sales
  ▪ Other sources of water
  ▪ Product diversity line

HC&S Co., sugar mill, Maui
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Discussion Outline

Hydrologic Unit-Specific Considerations

- Assessment Summary
- Additional Considerations
- Rationale
- Diagrams
- Adaptive Management Strategy
Discussion Outline

• Assessment Summary
• Additional Considerations
• Proposed Interim IFS
• Rationale
• Adaptive Management Strategy
Assessment Summary

- **Hydrology**
  - Gaining stream
  - Ground water gain above ditch:
    - E. Wailuanui: 1.7 MGD
    - W. Wailuanui: 2.2 MGD
  - Ground water gain below ditch is 0.79 MGD
  - Data from regression equations (USGS)
  - Decreasing long-term trend in streamflow

MGD = million gallons per day
Assessment Summary

• **Fish and Wildlife**
  - Rich diversity
  - Lacks common introduced species
  - Larval recruitment
  - Lack of streamflow continuity
  - Deep pools and dewatered sections

• **Recreational**
  - HSA – “Outstanding”
  - Swimming, hunting, fishing, scenic views

Native Hawaiian snail: Hihiwai (Neritina granosa)
Assessment Summary

• **Ecosystem Maintenance**
  - 80% is part of Haleakala National Park, Koolau Forest Reserve, and Waikamoi Preserve

• **Aesthetic**
  - Wailua State Valley Wayside
  - Wailua Valley lookout

• **Water Quality**
  - Class 1b – “protective” conservation subzone
Assessment Summary

• **Irrigation and Domestic**
  - Total of 3 non-EMI diversions
  - 2 registered for cultivation of other crops and livestock
  - Keanae Well No. 1 - drinking water for Keanae and Wailuanui communities

• **Traditional and Customary**
  - 2 registered for taro cultivation
  - One of Wailuanui loi complexes relies on Wailuanui Stream
Assessment Summary

• Noninstream
  ▪ EMI diversions - 4 major, 3 minor
  ▪ EMI supplies water to:
    ◦ HC&S
    ◦ Makawao DWS system
    ◦ MLP
  ▪ Effects of decreasing water diverted
    ◦ Irrigation in west and central Maui
    ◦ Long-term trends in ground water levels
Additional Considerations

• Public testimony
  ▪ Lack of water
  ▪ Family had to move

• HC&S
  ▪ Pipe intake for taro damaged by landslide
  ▪ Questions the need to amend interim IFS
Rationale

• Why restore flow?
  ▪ Increase flow continuity for stream biota
  ▪ Support robust native species-dominated community
  ▪ Protection and maintenance of reserves and preserves
  ▪ Taro farmers and domestic users in Wailua Valley
  ▪ Future demand
Rationale

• Why not full restoration?
  ▪ Upcountry Maui - domestic use, agriculture
  ▪ Central Maui - agriculture
  ▪ Power to MECO
  ▪ Sustainability - diversified agriculture

Maui Electric Company (MECO)
Rationale

- **Interim IFS**
  - Estimate: Based on median natural base flow (BFQ\textsubscript{50})
  - Purpose: Water for taro farmers and stream biota
Diagram not to scale
Proposed Interim IFS

Diagram not to scale
Adaptive Management

• Hydrologic Unit-Specific
  ▪ Maintenance of auwai, transmission lines, and intakes
  ▪ Flushing flows for auwai and taro loi
  ▪ Monitor streamflow downstream of Waikani Falls

• General Strategies
  ▪ Implementation
  ▪ Monitoring
  ▪ Evaluation
• General Strategies
  ▪ Implementation
    ◦ Comply with State Water Code for unregistered diversions
    ◦ Collaborate with agency staff and registered diversion owners to determine appropriate actions
    ◦ Coordinate with EMI and DAR to assess existing conditions and status of EMI diversions
RECOMMENDATIONS

• General Strategies
  ▪ Monitoring
    ◦ Monitor streamflow by taking periodic measurements
    ◦ Conduct periodic biological surveys
    ◦ Affected parties monitor and document the negative impacts of diversions or adopted interim IFS
    ◦ Conduct investigations with granted access to stream channels and private property
RECOMMENDATIONS

- **General Strategies**
  - Evaluation
    - Report to Commission within one year from date of adoption
    - Assess implementation of adaptive management strategies
    - Prepare long-term management framework
Approved with the following amendments

- Moving forward on the staff’s recommendation is the first step in an integrated approach to all 27 (twenty-seven) streams that are subjects of these petitions.
- Staff shall provide progress reports to the Commission at regularly scheduled meetings during the course of the year.
- In cases of return of water to losing streams, staff and all parties shall monitor and report whether there are increases in either downstream flow or groundwater in the vicinity.
Questions?

Ke Kahuwai Pono
“The trustee who oversees the rightful sharing of water.”