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

PETITION TO AMEND INTERIM INSTREAM FLOW STANDARDS
KAPAULU 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

<table>
<thead>
<tr>
<th>Firm/Name</th>
<th>Na Moku 'Aupuni o Ko'olau Hui c/o Native Hawaiian Legal Corporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Person</td>
<td>Alan Murakami, Attorney</td>
</tr>
<tr>
<td>Phone</td>
<td>521-2302</td>
</tr>
<tr>
<td>Address</td>
<td>1164 Bishop Street, Honolulu, Hawaii 96813</td>
</tr>
</tbody>
</table>

2. STREAMFLOW DATA

| USGS stream gaging station | 16511000 | Location/Reach | SEE ATTACHED |

(Attach a USGS map, scale 1"x1"=2000", and a property tax map showing diversion location referenced to established property boundaries.)

<table>
<thead>
<tr>
<th>TABLE 1. PERIOD OF RECORD AVERAGE MONTHLY STREAMFLOW WITHIN THE AFFECTED STREAM REACH, IN CFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
</tr>
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STREAMFLOW DATA TO FOLLOW.

<table>
<thead>
<tr>
<th>TABLE 2. PROPOSED AVERAGE MONTHLY STREAMFLOW DIVERSION FROM AFFECTED STREAM REACH, IN CFS</th>
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<tbody>
<tr>
<td>Jan</td>
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<td>-----</td>
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<td></td>
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UNDETERMINED; SUFFICIENT FOR TARO FARMING AND OR GATHERING.

<table>
<thead>
<tr>
<th>TABLE 3. AVERAGE MONTHLY STREAMFLOW IN AFFECTED STREAM REACH AFTER RESTORATION (10% release flow), IN CFS</th>
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</thead>
<tbody>
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</tr>
<tr>
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NATURAL STREAMFLOW EXCEPT FOR EXERCISE OF APPURTENANT WATER RIGHTS.

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

<table>
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<tr>
<th>TMK</th>
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<th>USE</th>
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<tbody>
<tr>
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</table>

RESEARCH IN PROGRESS.

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

<table>
<thead>
<tr>
<th>RESTORATION OF INSTREAM NATURAL HABITAT AND BIOTA, AND BENEFICIAL APPURTENANT AND GATHERING USES.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

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

May 24, 2001

Signature

Alan Murakami

Attorney for Na Moku 'Aupuni o Ko'olau Hui
Kapaula Stream

Kapaula Stream is headed at 2,400 ft altitude 1.7 mi inland from the coast (plate 1). This stream has a similar gradient (1,320 ft/mi) and stream-valley incision depth (260 ft) as Paakea and Waiaaka Streams to the west and lies entirely on lava flows of the Hana Volcanics (Stearns and Macdonald, 1942). Streamflow is diverted by the Koolau Ditch at about 1,300 ft altitude (table 4).

Two gaging stations were operated on Kapaula Stream, gaging station 5100 upstream of the Koolau Ditch and gaging station 5110 downstream at 540 ft altitude (plate 1). The estimated average annual base flow at the upstream gaging station is 2.34 Mgal/d and the lowest daily flow measured was 0.19 Mgal/d (table 2, fig. 15Q). At the downstream gaging station, the average annual base flow is estimated to be 1.68 Mgal/d and the lowest daily flow measured was 1.10 Mgal/d. All of this flow is gained in the 4,000 ft downstream of the Koolau Ditch. A regression plot of the estimated base flow, obtained the same way that was discussed earlier for Honopou Stream, also shows a linear relation (fig. 19). Because the regression line has a slope greater than 1.0 the stream has a net gain of water between each gaging station. The scatter of the data points around the regression line shows that the base-flow distribution along the stream is variable. Concurrent streamflow records on two different days show the expected pattern of gains between the two gaging stations but the actual values vary somewhat (table 18). A water budget was not calculated for this stream subbasin.
Streamflow

Estimates of streamflow and base flow are based on streamflow records of varying length and from different times. The error associated with comparing these records is not considered significant because the average annual values used in the comparisons are expected to be within about 10 percent of the true value in most cases. A statistical analysis of five streamflow records, each with more than 60 years of record, shows that the average annual discharge for any 10-year period within that record has a standard error of 12 percent when compared with the whole record (Fontaine, 1996). When the length of the subset is increased to a 50-year period, the standard error only improves to 5 percent. Thirty nine of the streamflow records for the study area are equal to or greater than 10 years long.

For this study, the length of the period of record at each gaging station was determined to be unimportant by comparing each record to three reference records from the study area. The three longest streamflow records, 5080 (73 years), 5180 (76 years), and 5870 (85 years) were chosen as reference records. For each other individual record, a time period equal to the length of that record was chosen. A subset of a reference record was then selected from this same time period and the average flow during that time period was compared with the total reference record to estimate the ratio of flow during the subset period to the reference period. This analysis was made for all three reference records and the result was averaged to obtain a period-of-record scale factor for each of the other records. The scale factor ranged from 0.88 to 1.13 (table 2). This variability is consistent with the statistical analysis reported by Fontaine (1996). This range of accuracy is considered sufficient for the type of comparisons made in this study, and therefore, no corrections were made to any of the records to account for differences in length or period of record.
Table 18. Streamflow in Kapaula Stream, northeast Maui, Hawaii
[ft, feet; Mgal/d, million gallons per day; all data from Paulsen (1950); gaging-station number is preceded by 5 and ends in 00]

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<thead>
<tr>
<th>Gaging-station number</th>
<th>Stream name</th>
<th>Altitude (ft)</th>
<th>Date</th>
<th>Streamflow (Mgal/d)</th>
<th>Cumulative streamflow without diversion (Mgal/d)</th>
<th>Comments</th>
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<td>Kapaula</td>
<td>540</td>
<td>9/11/46</td>
<td>1.20</td>
<td>2.17</td>
<td>Daily mean</td>
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<td></td>
<td></td>
<td></td>
<td>2/24/47</td>
<td>1.20</td>
<td>1.97</td>
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<td>5110</td>
<td>Kapaula</td>
<td>1,346</td>
<td>9/11/46</td>
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<td>0.97</td>
<td>Daily mean; upstream of Koolau Ditch diversion</td>
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<td>2/24/47</td>
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KAPAULA
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<th>Precip.</th>
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<td>0.9</td>
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<td>11.1</td>
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**NOTE:**
- The listed values represent a sample from the data set.
- The values are rounded to two decimal places.
- The table includes the elevation and precipitation values for each sample.
- The pattern observed in the data suggests a potential correlation between elevation and precipitation.

**Additional Information:**
- This data was collected during a specific season and may not be representative of all years.
- Further analysis is required to determine the long-term trends.
- The station ID is 1511200, which may be used for future reference.

**Data Source:**
- Credit: [Data Source URL]
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*FOR PROLL 5B TO 5E*

LOWEST MEAN VALUE AND RANKING FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS
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FOR PERIOD OF 70 TO 150

MAXIMUM MEAN VALUE AND RANKING FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS

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STATION ID - 15611000

DAILY VALUES STATISTICAL PROGRAM

STATION CODE - 000000

DISCHARGE CODE - 000000

STATION LOCATION WAS ACQUIRED FROM THE NAHMS, M.A.I.
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |

**NUMBER OF DAYS IN CLASS**

**DEPARTMENT TABLE OF DAILY VARIATIONS**

**STATION ID - 156515889**

**DEPARTMENT -**

**DIARY VALUES STATISTICAL PROGRAM**
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</tr>
</tbody>
</table>

**Daily Values Summary Report**

- **Station ID:** 15655000
- **Rainfall Code:** 000000
- **Rainfall Code Description:** Rainfall patterns and analysis

**Summary:**

- Total rainfall for the period: 321 mm
- Average daily rainfall: 10.0 mm
- Maximum daily rainfall: 987 mm

**Note:** All values are approximate and subject to rounding.
CORPORATE OF SWN

CORPORATE OF SWN

STANDARD DEVIATION OF LOGS = 0.16799 (VALENCE INDEX - SEE USES WSP 15424-V)

MEAN OF LOGS = 0.1970

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REMARKS ON DATA COLLECTION:

- THE USE OF VALUES IS RECOMMENDED FOR EACH NEAR-ZERO OR ZERO VALUE.
- ADDITIONAL CONSIDERATIONS FOR THIS AREA ARE:

- THE USE IS RESPONSIBLE FOR ADEQUATE AND ACCURATE
- DATA ARE NOT AUTOMATICALLY FILTERED TO A NEAR-ZERO DISTRIBUTION.
- STATISTICAL DATA VALUES ARE INFORMATION FROM ADAPTATION TABLE.

PARAMETER CODES

- 000000-RSTI
- 000000-RPM4
- 000001-RNAD
- 155115-RNAD
- 000001-RNAD
- 000001-RNAD

DESIRED CURVE STATISTICAL CHARACTERISTICS FOR
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**Lower Mean Values and Rankings for the Following Number of consecutive Days**

**Daily Values Statistical Program**

**Station:** 15510000

FOR PERIOD 00 TO 05P
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Highest mean value and ranking for the following month of consecutive days

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Station ID: 15610090

Drought - Daily Values Statistical Program
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**Note:** This table represents annual or semi-annual values.

---

**Water Year Range (Oct-Sep)**

Period included in high-water analysis:

Mean value and ranking for annual and/or semi-annual values:

---

**Statistical Code: 008014K**

**Streeter-Phelps Code: 008015D**

**Statutory Code: 008016S**

**Location Name:** Missouri River, Major, at St. Joseph, Missouri

**Station ID:** 165110000

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**Daily Values Statistical Program**
WATER YEAR (07-08)

PERIODS INCLUDED IN HIGH-VALUE ANALYSIS

MEAN VALUE AND RANKING FOR
ANNUAL AND/OR SEMI-ANNUAL VALUES

RANGE

WATER YEAR (07-08)

PERIODS INCLUDED IN LOW-VALUE ANALYSIS

MEAN VALUE AND RANKING FOR
ANNUAL AND/OR SEMI-ANNUAL VALUES

RANGE

STATISTICAL CODE
00001 MEAN
00002 CORR
00009 DISCHARGE
00004 QUICK MEAN, MAX, MIN
STATION ID: 16510000

NOTICE: DAILY VALUES STATISTICAL PROGRAM