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COMMISSION ON WATER RESOURCE MANAGEMENT

OF THE STATE OF HAWAII

In the Matter of: IAO GROUND WATER MANAGEMENT AREA HIGH-LEVEL SOURCE WATER USE WUPAS AND PETITION TO AMEND INTERIM INSTREAM FLOW STANDARDS OF WAIHEE, WAIEHU, IAO, & WAIKAPU STREAMS CONTESTED CASE HEARING	Case No. CCH-MA-06-01 HAWAIIAN COMMERCIAL AND SUGAR COMPANY'S REBUTTAL BRIEF; DECLARATION OF RICK W. VOLNER, JR.; DECLARATION OF GARRET S. HEW; DECLARATION OF CHRISTOPHER J.BENJAMIN; EXHIBITS E-R32, E-R33, E-R34 AND E-R35; CERTIFICATE OF SERVICE Hearing: Date: March 10-28, 2014 Hearing Officer: Dr. Lawrence Miike

HAWAIIAN COMMERCIAL AND SUGAR COMPANY'S REBUTTAL BRIEF

I. INTRODUCTION

HC&S respectfully submits this rebuttal brief to respond to the arguments in the responsive briefs filed by Hui/MT and OHA. In summary, Petitioners' arguments should be rejected for the following reasons:

- **System Losses:** The IIFS should not be increased by the amount of seepage loss from Waiale Reservoir because CWRM has already taken such seepage into account in

amending the IIFS, and HC&S has responded to CWRM's mandate that it explore solutions for mitigating such losses. Petitioners' position that HC&S should be held to the percentage level of system losses that WWC has allegedly been able to achieve is overly simplistic because it overlooks important differences between the infrastructure that makes up the HC&S system versus the WWC system. Moreover, HC&S's analysis of the seepage rate factors for various materials in irrigation conveyance systems contained in the National Engineering Handbook cited by WWC supports the system loss estimates of HC&S.

- **Fields 921 & 922**: OHA effectively concedes that Fields 921 and 922 are being reasonably cultivated. OHA then misleadingly selects just portions of HC&S's water application data to wrongly suggest that all of HC&S's seed cane fields require a lower water duty than the 5,958 gad contained in the 2010 D&O.
- **Well No. 7**: The tripping of the sump shutoff feature for the Well No. 7 pumps is not an equipment malfunction. It is plausibly explained by the lowering of the water level in Well No. 7, which is corroborated by the lowering of the water levels in other wells in Central Maui and is unsurprising given HC&S's increased usage of Well No. 7 and the diminished recharge of its water source due to the 2010 D&O IIFS amendments.
- **HC&S's Incremental Impacts Analysis Model**: The model that HC&S created to help CWRM understand the incremental impacts of various IIFS amounts on HC&S is valid for the purpose offered, notwithstanding Petitioners' criticisms.
- **Importance of Maintaining the Viability of HC&S**: A&B is committed to keeping its Maui agricultural lands in cultivation, but under HC&S's current business model, the availability of water is critical for HC&S to remain viable.

- **Petitioners' Failure to Quantify Their Water Needs**: Petitioners have not complied with the Hearings Officer's request that they quantify their water needs on a stream-by-stream basis and have failed to acknowledge the positive effects of the stream flows that have already been restored.

II. DISCUSSION

A. No Further Reductions in HC&S's Allowance For System Losses Are Appropriate.

OHA overreaches in arguing that 8 mgd, representing the upper end of the estimate of seepage loss from Waiale Reservoir, should be "summarily added to the IIFS." OHA Responsive Brief at 13. OHA demands that this amount be excluded from the calculation of HC&S's reasonable uses because HC&S has not taken steps to mitigate such loss. What OHA fails to mention is that CWRM has already taken into account the seepage loss due to Waiale Reservoir in setting the amended IIFS. Adding another 8 mgd to the IIFS as OHA suggests would count the same seepage loss against HC&S twice.

The 2010 D&O estimated that it is practical to prevent 6-8 mgd of losses through seepage of Waiale Reservoir. *See* 2010 D&O, COL 229. Hence, CWRM did not include any portion of the estimated seepage loss from Waiale Reservoir in estimating HC&S's reasonable uses. CWRM estimated HC&S's total reasonable uses to be 29.81 mgd, which includes 2 mgd representing half of 3-4 mgd estimated system losses *other than those attributable* to Waiale Reservoir. In calculating the 2 mgd allocation for system losses, CWRM expressly excluded the 6-8 mgd of seepage loss from Waiale Reservoir. *See id.*, COL 231. Thus, OHA's demand that another 8 mgd be added to the IIFS is unreasonable.

OHA also too hastily assumes that HC&S is content to allow the seepage from Waiale Reservoir to go unabated indefinitely. In fact, HC&S has responded to the mandate in the 2010

D&O regarding seepage loss from Waiale Reservoir. As HC&S previously reported to CWRM, HC&S has essentially three options: (i) line the existing reservoir with concrete or HDPE; (ii) line a smaller configuration and limit its use accordingly; or (iii) bypass the reservoir. *See* Declaration of Rick W. Volner, Jr. dated February 18, 2014 ("***Volner 2/18/14 Decl.***") at ¶ 37.

If there will be a further reduction in deliveries to Waiale Reservoir due to a further amendment of the IIFS, HC&S will most likely choose the bypass option. This will reduce HC&S' flexibility to store water when stream flows are high, but even if lined in its current configuration, the reservoir capacity is limited to two to three days of average daily irrigation demand. *See id.* at ¶ 38. Until the final IIFS is determined and average surface water deliveries identified, it is difficult for HC&S to perform an appropriate cost benefit analysis of the seepage mitigation options for Waiale Reservoir. Any further reduction in surface water flows will negatively impact any cost benefit analysis HC&S performs and will probably lead to HC&S severely limiting impounded water at Waiale Reservoir, or bypassing the reservoir completely. *See id.* ¶ 39. Once HC&S makes a final decision to elect one of the three options, and the chosen solution is implemented, the 6-8 mgd in seepage that was deducted from the estimate of HC&S's reasonable use should be substantially reduced. Regardless of which option HC&S ultimately settles upon for Waiale Reservoir, however, there is no justification for Petitioners' request to double the reduction already made to the amount of HC&S's reasonable use allotment for purpose of determining the IIFS.

Petitioners have also argued that HC&S should be held to a system loss of 5% based on testimony submitted by Wailuku Water Company LLC ("***WWC***") to the effect that WWC has reduced its estimated system losses to approximately 5%. This oversimplistic position overlooks important differences between the infrastructure that makes up the HC&S system versus the

WWC system. The WWC reservoirs, for example, are more in the nature of settling ponds, which overflow back into the ditch system, than true reservoirs, such as HC&S reservoirs 91 and 92, which are regulated with inlet control gates and outlet valves and are managed for the regular storage and release of irrigation water. Unlike HC&S, who is using its system for irrigation, WWC does not need all of its reservoirs and has closed several, contributing to a reduction in system losses. Further, WWC has closed off several ditches that it no longer uses and has completely stopped diverting water from North Waiehu Stream. HC&S, on the other hand, has not removed any portions of its system from its operations. *See* Declaration of Garret Hew dated February 18,2014 (***"Hew 2/18/14 Decl."***) at ¶ 4.

HC&S does not know exactly how WWC arrived at its estimate of its current system losses. HC&S has consulted the National Engineering Handbook referred to in WWC's testimony, however, to obtain seepage rate factors that could be used to estimate rates of seepage from the various sections of the HC&S system. *See id.* at ¶ 5. Exhibit E-R33 is Figure 2-50 from the National Engineering Handbook, which graphs the relationship of different conveyance system materials to expected seepage loss rates. Exhibit E-R34 is a map depicting the sections of the HC&S West Maui irrigation system for which HC&S has estimated seepage loss rates utilizing Exhibit E-R33. *See id.*

In order to estimate expected seepage loss for the HC&S system, excluding Waiale Reservoir, HC&S prepared a table which summarizes, for each section of the system, its length, average surface area under water and the type of material that holds or conveys the water. To calculate an expected range of seepage, HC&S selected what it believes would be a relatively low seepage factor along with what it believes would be relatively a high seepage factor from Exhibit E-R33. Exhibit E-R35 is a copy of the resulting table. This exercise produced an

expected range of seepage from a low of 2.05 mgd to a high of 4.10 mgd. This corresponds to a percentage rate of loss of from 8.7% to 17.3%. *See id.* at ¶ 6.

Exhibit E-R35 also contains a table that HC&S prepared to estimate the average daily amount of evaporation that can be expected from the surface of the water contained in the HC&S system, excluding Waiale Reservoir. This was calculated by multiplying the average daily evaporation rate of 0.40 acre-inches by the average daily surface area of the water in the system, which yielded an average daily evaporation loss of 95,889.51 gallons, or 0.096 mgd. The total expected seepage losses from seepage and evaporation combined range from 2.15 mgd to 4.20 mgd. This corresponds to a percentage rate of loss of from 9% to 17.7%. *See id.* at ¶ 7.

This range of expected seepage and evaporation losses compares well with the 3-4 mgd estimate that HC&S provided at the initial hearing, and demonstrates that the 2 mgd allowable system loss established in the 2010 D&O is actually a little too low. There are additional system losses, besides seepage and evaporation, than are reasonably to be expected but are difficult to measure and to estimate. These include water lost during the backflushing of sand filters, during the startup and shutdown of irrigation rounds (when water pressure is established and the drip tubes are purged), and during the repair and water testing of the irrigation system prior to planting of the crop. *See id.* at ¶ 8.

Accordingly, as set forth in the testimony of Garret Hew and supported by the exercise set forth in Exhibit E-R35, HC&S respectfully submits that a reasonable allowance for system losses for HC&S' West Maui system, excluding Waiale Reservoir, would be 4 mgd. *See id.* at ¶ 9.

B. A Reduction in the Water Duty For Fields 921 and 922, and the Balance of HC&S's Seed Cane Farm, is Not Justified Based on OHA's Analysis, Which Arbitrarily Cherry-Picks Irrigation Data For HC&S's Seed Cane Fields.

OHA initially argued that it would be wasteful for HC&S to irrigate Fields 921 and 922,

because of their sandy soils, with surface water from the Nā Wai 'Ehā Streams. In response, HC&S demonstrated that the soils profiles of these fields includes a layer of loam beneath a superficial layer of sand, and that these fields do not consume, on average, any more water than the balance of HC&S's seed cane farm, of which these fields are a part. *See* Volner 2/18/14 Decl. at ¶ 21. To make the latter point, HC&S submitted a table (Exhibit E-R29) containing a four-year snapshot of data from HC&S's irrigation records summarizing the total water recorded as applied to these fields in isolation and as compared with the balance of the acreage in this area dedicated to seed cane. Exhibit E-R29 clearly shows that these fields are not consuming an excessive amount of water despite Petitioners' claims that the fields consist of sandy soil. *See id.* at ¶ 22.

In the face of such information, OHA retreats from its position that Fields 921 and 922 should be excluded from the calculation of HC&S's acreage. Instead, OHA now argues for a reduction in the water duty for not only those fields, but the entirety of HC&S's seed cane farm. OHA attempts to shore up support for its position by focusing on just two of the four years of data, 2011 and 2012, the years of lowest water usage, in which the average annual rate of water applied to the 1445 acre seed farm averaged 4,555 gallons per acre per day ("***gad***"). According to OHA, since this amount is less than the average annual irrigation requirement of 5,958 gad for the Waihe'e-Hopoi fields established in the 2010 D&O, the D&O should be modified to reduce the amount of water allocated in the D&O for HC&S's reasonable beneficial use on the acreage devoted to seed cane to instead reflect an annual irrigation requirement of 4,555 gad. *See id.* at ¶ 23.

OHA's argument is not well-founded for several reasons. First, Exhibit E-R29 is a limited data set and was not compiled in an exercise to determine an average annual irrigation

requirement. The 5,958 gad average annual irrigation requirement of the D&O was arrived at, initially, by using an annual average developed by OHA's agronomist expert, Dr. Fares, using a model into which he had loaded 54 years of rainfall and pan evaporation data. OHA's argument, in contrast, does not take any rainfall or pan evaporation data at all into consideration, relying instead on just two of four available years of water usage contained in E-R29. *See id.* at ¶ 24.

Second, if OHA had instead used the data for 2009 and 2010, the other two years in Exhibit E-R29, this would have generated an average usage for those two years of 5,959 gad which, coincidentally, is almost exactly the amount determined for the Waihe'e-Hopoi fields in the 2010 D&O. Unfortunately, HC&S was plagued with numerous mechanical breakdowns in its equipment used to reestablish seed fields in 2011 and 2012. This resulted in longer than normal periods between cutting and reestablishment and also necessitated the cutting of non-seed fields outside of the Waihe'e-Hopoi area. Consequently, the data for 2009 and 2010 are actually more representative of the water usage for these fields than the data for 2011 and 2012. *See id.* at ¶ 25.

Third, while OHA has posited that Exhibit E-R29 demonstrates that the average annual irrigation requirement for seed cane should necessarily be less than that for crop cane, this is not necessarily true. The object of irrigating both seed cane and crop cane is to apply the optimum amount of moisture to maximize the rate of growth of the plant, i.e., the generation of biomass. Since they are both the same species of plant, the primary driver of their water needs is their common rate of evapotranspiration. While, as further explained below, differing crop cycles and harvesting methods create some variability in water application rates, seed cane and crop cane nonetheless have a roughly equivalent average annual irrigation requirement. *See id.* at ¶ 26.

Seed cane cycles vary from year to year depending on cutting sequence, yields and planting requirements, which makes it difficult to rely on just one or two years of irrigation data to establish an annual average. Seed cane also requires extra precautions to ensure disease and pests are not present. Irrigation applications are a major deterrent to the onset of both. For example, the Lesser Corn Stalk Borer will attack young ratoon cane plants in a dry environment. Frequent watering above evapotranspiration rates is required to keep soil surface moisture high, inhibiting the habitat the vector prefers. In addition, the hardening period, or the period of time before the seed cane is harvested or cut, is significantly shorter than the drying period that crop cane fields are subjected to before harvesting. A typical hardening period may be two weeks for a seed field as compared to a six to eight week drying period for crop cane. *See id.* at ¶ 27.

In any event, it would take a much more comprehensive analysis to determine whether, on average, the annual irrigation requirement is significantly less for seed cane than crop cane and would have to take into account a number of other factors including the time of year the field was started, the length of the cut cycle, disease and pest control and planting requirements. *See id.* at ¶ 28. It is thus misleading for OHA to contend that HC&S's seed cane fields should be assigned a lower water duty than other fields based solely on data regarding water application rates for 2011 and 2012.

C. The Reduced Sustainable Capacity of Well No. 7 Is Plausible Due to the Lowering of Water Levels Over Time.

Petitioners suggest that it is suspect that the sump level shutoff feature for Well No. 7 trips now when all pumps are run in parallel given that Well No. 7 was historically pumped at a sustained rate of over 30 mgd. Petitioners erroneously assume that the tripping of this shutoff device is a purely mechanical problem for which a solution can be engineered. Petitioners

overlook the function of the shutoff mechanism as a safety measure to protect against damage to the pumps, which doubles as a warning against over-pumping the aquifer.

If the water level in Well No. 7 were the same currently as it was during the periods in which HC&S pumped a sustained rate of over 30 mgd, the most recent instances being periods in October of 1996 and July of 2000, HC&S believes that Well No. 7 would be able to produce at a rate closer to what is reflected in historical pumping records. It is apparent, however, based on rate of drawdown of the sump level, and the tripping of the shutoff mechanism, that the water level is lower than it used to be. The fact that well water levels change over time is not controversial. There is extensive discussion of the relationship between well water levels and rainfall and other sources of recharge in several USGS studies, including Hui/MT's Exhibits A-R1 and A-R2. *See* Volner 2/18/14 Decl. at ¶ 32. Another table prepared by the USGS that is available on its website, Exhibit E-R32, shows decreases that have taken place in the water level of various wells in the Central Maui area, in feet above mean sea level, between May 17, 2005 and August 29, 2012. For a number of these wells, the water level was significantly lower in 2012 than in 2005. *See id.* at ¶ 33.

The staff gauge currently installed in Well No. 7 is not tied to mean sea level and therefore HC&S is not presently able to convert the sump level readings in Well No. 7 into the number of feet above mean sea level. Based on the USGS table set forth in Exhibit E-R32, however, it is nonetheless quite plausible that the water level in Well No. 7 has declined between 2005 and 2012 as has been the case with other wells in the Central Maui area. *See id.*

In addition to the fact that 2007 and 2008 were severe drought years, there has been a reduction since 2010 of approximately 10 mgd coming in to the Waiale Reservoir for application to the Waihe'e-Hopoi fields. Between this lesser amount of imported surface water applied to

the fields and the correspondingly reduced amount of seepage from Waiale Reservoir, there has been an average reduction of approximately 10 mgd in the recharge of the groundwater source for Well No. 7. In addition, HC&S has recently been running Well No. 7 much more than it was run in 2005 and earlier years. As discussed at length in Exhibits A-R1 and A-R2, reducing the inputs into a groundwater source results in a lower water level and a reduction in the capacity of wells drawing from that source. Between the decreased recharge of the groundwater source and HC&S' increased usage of Well No. 7 in recent years, some reduction in the water level of Well No. 7 would be expected. *See id.* at ¶ 34.

D. Petitioners' Criticism of HC&S's Incremental Impacts Model Is Flawed and Does Not Diminish the Model's Ability to Help CWRM Understand the Financial Impact on HC&S of Upward Amendment of the Nā Wai 'Ehā IIFS.

1. The Model serves its intended purpose.

Hui/MT and OHA argue that the economic model introduced by HC&S in its opening submissions (the "***Model***") has not been validated and is inaccurate. Petitioners' criticism fails to take into account the purpose and inherent limitations of the Model. *See* Volner 2/18/14 Decl. at ¶ 3. The main purpose of the Model is to provide CWRM with an understanding of the approximate relationship among various variables that have an impact on HC&S's business operations, including the amount of water available to HC&S for irrigation of the West Maui Fields. The Model attempts to establish the existence of a correlation between differing IIFS levels, the availability of irrigation water and the resulting financial impact on HC&S. *See id.* at ¶ 4.

Petitioners have not discredited the ability of the Model to serve its main purpose. The Model was not designed, and cannot be expected, to replicate actual conditions with absolute accuracy. For instance, the Model does not take into account certain events that affect the

availability of irrigation of water such as the shutdown of ditches and intakes for maintenance or safety reasons during storm conditions.

2. The power component of the cost to operate Well No. 7 is accurately represented in the Model.

Hui/MT contends that HC&S has overstated its cost of power to run Well No. 7 by measuring this cost with displaced revenues from Maui Electric Company ("***MECO***"). Hui/MT first complains that, because those revenues are determined under HC&S's existing agreement with MECO that is scheduled to expire at the end of 2014, there is no assurance that those revenues would continue to be displaced after the end of 2014. *See id.* at ¶ 16. Hui/MT then contends that, even prior to the end of 2014, it is improper for HC&S to calculate the operating cost on the assumption that each hour of pumping would necessarily displace MECO revenues, rather than being "prorated among the rest of its energy demands, and not just Well 7." *See* Hui/MT's Responsive Brief at 8.

HC&S has calculated the power component of its cost to operate Well No. 7 using $0.196 per kilowat hour ("***kw-hr***"). This represents the average revenue that HC&S receives under its Power Purchase Agreement ("***PPA***") with MECO. The rationale supporting HC&S use of this figure is that, to the extent Well No. 7 is used to mitigate the loss of irrigation water that would have been available but for the amended IIFS for the Nā Wai 'Ehā Streams, this incrementally reduces the amount of revenue received from MECO. This is an accurate assumption because any excess power capacity that HC&S has over its own power needs is currently sold to MECO. *See* Volner 2/18/14 Decl. at ¶ 17. It is true that the current PPA is set to expire at the end of 2014. The terms and conditions under which it may be extended beyond that date are under negotiation and hence unknown. At the present time, therefore, the current average MECO

revenue of $$0.196 per kw-hr is the best available measure of the power component of HC&S' cost of operating Well No. 7. *See id.* at ¶ 18.

In the event that the PPA is not extended, or is extended under different price terms per kw-hr sold to MECO, this does not mean that there will be no cost of power component to the incremental financial impacts on HC&S of running Well No. 7 to replace surface water lost to the amended IIFS. HC&S' own power needs already consume all the power generated from the burning of bagasse and the hydroelectric power generated by HC&S' turbines on the eastern portion of its internal ditch system and require the use of supplemental fossil fuels. Running Well 7 would therefore cause HC&S to incur additional fuel costs above and beyond what are already required to meet all of its internal demands. *See id.* at ¶ 19. Because of the uncertain future of the PPA, it is true that the appropriate formula for measuring the power component of HC&S's incremental cost of running Well No. 7 could change after the end of 2014. Whether it goes up or down, however, will depend upon future fuel prices. *See id.* at ¶ 20.

3. Even if Well No. 7 is a reasonably practicable alternative, that does not require CWRM to exclude costs related to Well No. 7 in its analysis of the financial impact to HC&S.

Petitioners contend that the costs of utilizing Well No. 7 should be excluded from the Model because such costs are already considered in the analysis of whether Well No. 7 is a reasonably practicable alternative source. Simply because it is reasonably practicable for HC&S to utilize an alternative source does not mean that HC&S incurs no cost to utilize that source. Petitioners' argument is akin to saying that so long as a business expense is at a level that enables the business to generate a profit, the cost should be ignored in calculating the financial impact of government regulation on the business. That makes no logical sense.

One of the outputs of the Model is an estimate of the total financial impact of setting the IIFS at particular levels. Since pumping of Well No. 7 will be necessary under certain IIFS

scenarios, there is no reason why the costs of such pumping should be excluded from the estimate of total financial impact.

4. The Model withstands Petitioners' attempts to discredit it with arbitrary comparisons and flawed interpretations.

Using the Model, OHA generated two scenarios in an attempt to show that the Model is flawed. In the first scenario ("***OHA Scenario 1***") OHA assumed IIFS of zero for all Nā Wai 'Ehā Streams and inputted HC&S's actual daily water usage for the years 2004 through 2006, as recounted in Conclusion Of Law ("***COL***") No. 66 of the 2010 D&O, plus 10.5 mgd representing average system losses. The output of the Model for OHA Scenario 1 is shown in OHA Exhibit C-R18. *See* Volner 2/18/14 Decl. at ¶ 5.

OHA Scenario 1 is not a useful means of testing the Model. The Model was designed to project annual average shortfalls between water deliveries and the average annual irrigation requirements and system loss amounts already determined by CWRM in the 2010 D&O. OHA's Scenario 1 changes the inputs to defeat that purpose by instead trying to use the Model as if the average annual usage and estimated system losses of HC&S for the years 2004 through 2006 can be substituted for the annual average irrigation requirements and system loss allowance set forth in the D&O. Among other things, the 10.5 mgd system loss included in these actual usage amounts was not a measured number, but only an estimate. Further, average annual usage does not necessarily correspond closely with daily irrigation requirements. *See id.* at ¶ 6.

Unlike OHA Scenario 1, the second scenario that OHA generated ("***OHA Scenario 2***") is a much more useful exercise in testing the accuracy of the Model. OHA Scenario 2 again assumes IIFS of zero for all Nā Wai 'Ehā Streams but for HC&S's daily water requirements and system losses, OHA inputted the amounts that CWRM concluded were reasonable as stated in

COL No. 231. The output of the Model for OHA Scenario 2 is shown in OHA Exhibit C-R19. *See id.* at ¶ 7.

OHA Scenario 2 demonstrates that on most days, HC&S would be able to meet daily water requirements with relatively minimal utilization of Well No. 7. The scenario output shows that there would be no days out of the year when the ʻĪao-Waikapū Fields would receive less than the daily requirement, and there would be only 2 days out of the year when the Waiheʻe-Hopoi Fields would receive less than the daily requirement if surface water flows are supplemented with pumped water from Well No. 7. Even then, Well No. 7 would only need to be pumped an average of 1.75 mgd to meet daily requirements. *See* Exhibit C-R19. This corroborates the positive relationship between increasing the IIFS for Nā Wai ʻEhā Streams and the additional amount of pumping of Well No. 7 that HC&S would need to meet daily requirements. *See id.* at ¶ 8. This also validates the Model because it shows that if the IIFS is set to zero, the Model predicts that very little pumping would be necessary, which is consistent with HC&S's minimal usage of Well No. 7 from 2004-2006, the "years of actual usage" that OHA utilized in OHA Scenario 1.

In addition to testing the Model with scenarios, OHA tries to manipulate the result reported in the histogram included with each Model output in an effort to discredit the Model. It must be remembered, however, that only a few years of data are reflected in the histograms. It would take a much larger data set to draw any conclusions regarding how well the Model is predicting the daily frequency of specific flow ranges. In a small data set, there can be expected to be wide variations in the number of days of specific flow ranges. This reflects the inherent difficulty of trying to develop annual averages of flow conditions that, on any given day or for any given year, cannot be predicted. *See id.* at ¶ 13.

OHA points to comparisons of actual deliveries versus forecasted deliveries in an attempt to show that the Model is flawed. OHA selects two flow levels for this exercise. OHA notes that the Model predicts that 20 mgd or less is delivered to Waiale Reservoir 36% of the time, whereas the actual data show the occurrence of that flow level 8% of the time. The Model also predicts that 25 mgd or less is delivered to Waiale Reservoir 48% of the time, whereas the actual data show the occurrence of that flow level 27% of the time. *See id.* at ¶ 14.

These comparisons are arbitrary. OHA selected these flow levels for comparison only because they produce the largest amount of discrepancy. Had OHA moved one point to the right on the histogram and compared the actual versus predicted percentage of time that flow levels are 35 mgd or less, the contrast would be far less dramatic—i.e., the Model predicts that such flow levels occur 55% of the time versus deliveries at such flow levels actually occurring 47% of the time, a difference of only 8%. *See id.*; Exhibit C-R18.

OHA further maintains that in the five years preceding the implementation of the amended IIFS, the daily volume delivered to Waiale Reservoir exceeded 30 mgd 72% of the time. This is a misreading of the histogram shown on Exhibit C-R18. Each set of bars on the histogram represents a five percent range and overlaps with the set preceding it and the set following it, e.g., the first set is 0-5 mgd, the second set is 5-10 mgd, the third set is 10-15 mgd, etc. OHA's calculation of the 72% occurrence rate is erroneous because it includes the set representing the 30-35 mgd range. Had OHA calculated correctly, it would have concluded that daily deliveries to Waiale Reservoir exceeded 30 mgd 52% of the time, not 72% of the time. *See* Volner 2/18/14 Decl. at ¶ 15.

5. Petitioners' concerns about the Model's ability to forecast the financial impact of upward amendments of the IIFS can be mitigated by making slight adjustments to the Model.

Using OHA Scenario 2, Petitioners argue that the Model does not accurately predict the financial impact of setting the IIFS at a particular level because even when the IIFS are set to zero and the inputs for daily water requirements and losses are the same as those HC&S uses for its scenarios, the Model projects a total financial impact to HC&S of $227,744. *See* Volner 2/18/14 Decl. at ¶ 9. Such criticisms do not demonstrate that the Model is incapable of serving its main purpose—to give CWRM a rough understanding of how various IIFS amounts relate to HC&S's irrigation requirements, the use of Well No. 7, and the financial impacts to HC&S of shortfalls in the amount of water available as measured against average annual requirements. And to the extent Petitioners criticize the Model for not accurately forecasting the direct financial impact of setting the IIFS at particular levels because it predicts a negative financial impact even under the so-called "baseline" conditions of OHA Scenario 2, that concern can be mitigated by making slight adjustments to the Model. *See id.* at ¶ 10.

Assuming for the sake of argument that OHA Scenario 2 represents "baseline" conditions, 1.75 mgd of pumping would need to occur to meet daily irrigation requirements for the Waihe'e-Hopoi Fields. Therefore, the annual operational costs of running Well No. 7 to produce 1.75 mgd (*i.e.*, $118,994) could be deducted from the total financial impact. *See id.* at ¶ 11.

The amortized cost of the upgrades to Well No. 7 should not be deducted, however, because the IIFS set by the 2010 D&O made the improvements a necessity in order for HC&S to remain a viable operation. These improvements would not have been necessary in order to support the 1.75 mgd "baseline" level of required pumping, but were necessary in order for HC&S to cope with the reduced surface water deliveries resulting from the 2010 D&O. To be

accurate, therefore, any attempt at quantification of the financial impact to HC&S of IIFS increases needs to take into account the amortized cost of the expenditures HC&S has made in direct response to the previous actions of CWRM in these proceedings. *See id.*

The OHA Scenario 2 "baseline" outputs also include a total revenue shortfall due to less than daily water requirements that cannot be replaced by Well No. 7 of $1,048 for the Waihe'e-Hopoi Fields and 'Īao-Waikapu Fields combined. To meet OHA's concern that the baseline should show no financial impact to HC&S where the IIFS amounts are set to zero, this amount could also be deducted from the total financial impact outputs of the Model for other IIFS settings. In sum, deducting $120,042 ($118,994 + $1,048) from the total financial impact generated by the Model would cause the OHA Scenario 2 "baseline" financial impact amount to be zero, except for the amortized cost of the Well No. 7 improvements which, for the reasons previously stated, should not be removed from the Model outputs under other IIFS scenarios. *See id.* at ¶ 12.

E. A&B Is Committed to Keeping Its Maui Agricultural Lands in Cultivation, But Pending the Discovery of a Viable Alternative Business Model, HC&S's Operations Require Adequate Water to Remain Sustainable.

Petitioners' speculation that the ability of HC&S to remain a viable operation over the long term is irrelevant is not grounded in business reality. A&B's longstanding intent with respect to its Maui agricultural lands has been to keep them in active cultivation. A&B believes that the benefits of active farming on its Maui lands accrue to the community in many ways, not the least of which is the economic contribution to the Island of Maui, including the provision of meaningful jobs. *See* Declaration of Christopher J. Benjamin (***"Benjamin Decl."***) at ¶ 2.

A&B is open to growing alternative crops or converting sugar into energy products but over the long term, farming must be at least modestly profitable in order to satisfy shareholders and maintain their support for the continued investment in the farming operation. While A&B

has, over short periods of time, been willing to absorb financial losses at HC&S, it has done so only when it has believed that improved financial performance could be reasonably expected. *See id.* at ¶ 3. For example, A&B chose to continue HC&S's operations after losing nearly $30 million in 2009 because it foresaw significant improvements in farming productivity and believed that an enhanced operating model could be developed. Such improvements, combined with rising sugar prices, helped drive a material improvement in financial results. However, the benefits of those improvements and sugar prices cannot be relied upon to support HC&S's financial results in the long term. *See id.* at ¶ 4.

Despite many years of research into alternative crops and renewable energy technologies, no new business model has yet emerged. A&B continues to search for a new business model, and is actively evaluating several potential solutions, but, at present, cannot confidently expect that a new and viable model will be found in the very near term. As such, the future outlook for HC&S must continue to be based, at least for the foreseeable future, on the traditional sugar model. *See id.* at ¶ 5.

For the sugar business to remain sustainable at sugar pricing levels that are anticipated to remain in the low-to-mid 20-cent range – not highly profitable, but simply sustainable – production levels must exceed 200,000 tons (average yields of 12.5 TSA) on a consistent basis. Water losses to date from previous IIFS decisions already make such yields very difficult to achieve. Further water losses are likely to tip the scale further against the sustainability of this business. *See id.* at ¶ 6.

Ultimately, the decision regarding the fate of the HC&S plantation will depend on A&B's forecast of future profitability. After sugar pricing, the single most important criterion in the forecasting process will be production outlook, and the single most significant driver of

production is water availability. Therefore, further water losses could very well seal the fate of the plantation. *See id.* at ¶ 7.

F. Petitioners Fail to Provide the Stream-by-Stream Quantification of Their Water Needs That the Hearings Officer Requested.

Petitioners have unfailingly been quick to criticize HC&S but slow to support their own positions with specific information that enables CWRM to undertake the balancing of competing interests in Nā Wai 'Ehā water as mandated in the Water Code. Thus, it comes as no surprise that OHA's responsive brief claims that Petitioners "have always advocated balance and sharing" while "only WWC and HC&S . . . have been taking absolutist positions[.]" OHA Responsive Brief at p. 11. Ironically, however, Petitioners have consistently demanded "full" restoration of mauka-to-makai flow in all Nā Wai 'Ehā Streams. That is more akin to an "absolutist position" than one promoting "balance and sharing."

Not only is Petitioners' demand extreme and unyielding, but it has consistently been unsupported by any stream-by-stream particularized descriptions of what they believe the flow levels should be. Throughout the evidentiary phase of the prior proceedings, Petitioners refused to disclose the specific IIFS they were requesting, opting instead to advocate for a series "controlled releases" of an extended duration. Following the remand, the Hearings Officer specifically requested that Petitioners quantify their water needs on a stream-by-stream basis. Petitioners have not honored that request. HC&S, on the other hand, has done its best to comply with the Hearings Officer's request for an incremental impacts analysis.

Petitioners have also failed to acknowledge and discuss the positive effects on stream flows and habitat resulting from the partial restorations of flow that have already occurred. Since 2010, the implementation of the amended IIFS have restored a substantial amount of flow into Waihe'e River and North and South Waiehu Streams. It would be plausible to anticipate that

such restoration efforts have positively impacted stream ecology and native habitat. For example, Hui/MT witness Piko A'o has observed the recent return of native species like the endangered ae'o (Hawaiian stilt), 'auku'u (black-growned night heron), and koloa (Hawaiian duck). *See* Piko A'o Decl. at ¶ 13. While such observations suggest that an adequate flow may have already been returned to Waihe'e River both to protect habitat and the exercise of Petitioners' traditional and customary practices, Petitioners neglect this point in favor of maintaining their consistent hue and cry in favor of "full" restoration.

III. CONCLUSION

HC&S reserves its right to provide additional information and arguments concerning the above at the hearing.

DATED: Honolulu, Hawai'i, February 18, 2014.

CADES SCHUTTE LLP

DAVID SCHULMEISTER
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Attorneys for HAWAIIAN COMMERCIAL AND SUGAR COMPANY

COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII

'Iao Groundwater Management Area High-Level Source Water Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waihe'e, Waiehu, 'Iao & Waikapu Streams Contested Case Hearing	Case No. CCH-MA06-01 DECLARATION OF RICK W. VOLNER, JR.

DECLARATION OF RICK W. VOLNER, JR.

I, RICK W. VOLNER, JR., hereby declare:

1. I am General Manager of Hawaiian Commercial & Sugar ("***HC&S***"), and submit this rebuttal testimony on behalf of HC&S.

2. I have reviewed the responsive briefs and exhibits filed herein by Hui O Nā Wai 'Ehā and Maui Tomorrow ("***Hui/MT***") and the Office of Hawaiian Affairs ("***OHA***") on January 28, 2014.

HC&S Incremental IIFS Impacts Analysis

3. Hui/MT and OHA argue that the economic model introduced by HC&S in its opening submissions (the "***Model***") has not been validated and is inaccurate. Petitioners' criticism fails to take into account the purpose and inherent limitations of the Model.

4. The main purpose of the Model is to provide CWRM with an understanding of the approximate relationship among various variables that have an impact on HC&S's business operations, including the amount of water available to HC&S for irrigation of the West Maui Fields. The Model attempts to illustrate the existence of a correlation between differing IIFS levels, the availability of irrigation water and the resulting financial impact on HC&S. The Model was not designed, and cannot be expected, to replicate actual conditions with absolute accuracy.

For instance, the Model does not take into account certain events that affect the availability of irrigation water such as the shutdown of ditches and intakes for maintenance or safety reasons during storm conditions.

5. Using the Model, OHA generated two scenarios in an attempt to show that the Model is flawed. In the first scenario, which I will refer to as "***OHA Scenario 1***," OHA assumed IIFS of zero for all Nā Wai 'Ehā Streams and inputted HC&S's actual daily water usage for the years 2004 through 2006, as recounted in Conclusion Of Law ("***COL***") No. 66 of CWRM's Findings of Fact, Conclusions of Law, and Decision and Order issued on June 10, 2010 (the "***2010 D&O***") plus 10.5 mgd representing average system losses. The output of the Model for OHA Scenario 1 is shown in OHA Exhibit C-R18.

6. OHA's Scenario 1 is not a useful means of testing the Model. First, the Model was designed to project annual average shortfalls between water deliveries and the average annual irrigation requirements and system loss amounts already determined by CWRM in the 2010 D&O. OHA's Scenario 1 changes the inputs to defeat that purpose by instead trying to use the Model as if the average annual usage and estimated system losses of HC&S for the years 2004 through 2006 can be substituted for the annual average irrigation requirements and system loss allowance set forth in the D&O. Among other things, the 10.5 mgd system loss included in these actual usage amounts was not a measured number, but only an estimate. Further, average annual usage does not necessarily correspond closely with daily irrigation requirements.

7. The second scenario that OHA tested using the Model, which I will refer to as "***OHA Scenario 2***," is a much more useful exercise. OHA Scenario 2 again assumes IIFS of zero for all Nā Wai 'Ehā Streams but for HC&S's daily water requirements and seepage losses, OHA

inputted the amounts that CWRM concluded were reasonable as stated in COL No. 231. The output of the Model for OHA Scenario 2 is shown in OHA Exhibit C-R19.

8. OHA Scenario 2 demonstrates that on most days, HC&S would be able to meet daily water requirements with relatively minimal utilization of Well No. 7. The scenario output shows that there would be no days out of the year when the ʻĪao-Waikapu Fields would receive less than the daily requirement, and there would be only 2 days out of the year when the Waiheʻe-Hopoi Fields would receive less than the daily requirement if surface water flows are supplemented with pumped water from Well No. 7. Even then, Well No. 7 would only need to be pumped an average of 1.75 mgd to meet daily requirements. *See* Exhibit C-R19. This corroborates the positive relationship between increasing the IIFS for Nā Wai ʻEhā Streams and the additional amount of pumping of Well No. 7 that HC&S would need to meet daily requirements.

9. Using OHA Scenario 2, Petitioners argue that the Model does not accurately predict the financial impact of setting the IIFS at a particular level because even when the IIFS are set to zero and the inputs for daily water requirements and losses are the same as those HC&S uses for its scenarios, the Model projects a total financial impact to HC&S of $227,744.

10. Petitioners have not shown that the Model is incapable of serving its main purpose—to give CWRM a rough understanding of how various IIFS amounts relate to HC&S's irrigation requirements, the use of Well No. 7, and the financial impacts to HC&S of shortfalls in the amount of water available as measured against average annual requirements. To the extent Petitioners criticize the Model for not accurately forecasting the direct financial impact of setting the IIFS at particular levels because it predicts a negative financial impact even under the so-called

"baseline" conditions of OHA Scenario 2, that concern can be mitigated by making slight adjustments to the Model.

11. Assuming for the sake of argument that OHA Scenario 2 represents "baseline" conditions, 1.75 mgd of pumping would need to occur to meet daily irrigation requirements for the Waihe'e-Hopoi Fields. Therefore, the annual operational costs of running Well No. 7 to produce 1.75 mgd (*i.e.*, $118,994) could be deducted from the total financial impact. The amortized cost of the upgrades to Well No. 7 should not be deducted, however, because the IIFS set by the 2010 D&O made the improvements a necessity in order for HC&S to remain a viable operation. These improvements would not have been necessary in order to support the 1.75 mgd "baseline" level of required pumping, but were necessary in order for HC&S to cope with the reduced surface water deliveries resulting from the 2010 D&O. To be accurate, therefore, any attempt at quantification of the financial impact to HC&S of IIFS increases needs to take into account the amortized cost of the expenditures HC&S has made in direct response to the previous actions of CWRM in these proceedings.

12. The OHA Scenario 2 "baseline" outputs also include a total revenue shortfall due to less than daily water requirements that cannot be replaced by Well No. 7 of $1,048 for the Waihe'e-Hopoi Fields and 'Īao-Waikapū Fields combined. To meet OHA's concern that the baseline should show no financial impact to HC&S where the IIFS amounts are set to zero, this amount could also be deducted from the total financial impact outputs of the Model for other IIFS settings. In sum, deducting $120,042 ($118,994 + $1,048) from the total financial impact generated by the Model would cause the OHA Scenario 2 "baseline" financial impact amount to be zero, except for the amortized cost of the Well No. 7 improvements which, for the reasons previously stated, should not be removed from the Model outputs under other IIFS scenarios.

13. OHA also uses the histogram included with each Model output to make several arguments to the effect that the Model is unreliable. Before considering OHA's specific arguments regarding these histograms, it must be remembered that there are only a few years of data reflected in the histograms. It would take a much larger data set to draw any conclusions regarding how well the Model is predicting the daily frequency of specific flow ranges. In a small data set, there can be expected to be wide variations in the number of days of specific flow ranges. This reflects the inherent difficulty of trying to develop annual averages of flow conditions that, on any given day or for any given year, cannot be predicted.

14. OHA argues that under OHA Scenario 1, the histogram in the Model reflects a prediction that 20 mgd or less will be delivered to Waiale Reservoir 36% of the time, whereas actual data show that deliveries of 20 mgd or less occurred 8% of the time. Similarly, the Model predicts that deliveries of 25 mgd or less will occur 48% of the time, whereas actual data show that deliveries of 25 mgd or less occurred 27% of the time. These comparisons are arbitrary; OHA selected these flow levels for comparison only because they produce the largest amount of discrepancy. Had OHA moved one point to the right on the histogram and compared the actual versus predicted percentage of time that flow levels are 35 mgd or less, the contrast would be far less dramatic—i.e., the Model predicts that such flow levels occur 55% of the time versus deliveries at such flow levels actually occurring 47% of the time, a difference of only 8%. *See* Exhibit C-R18.

15. OHA further maintains that in the five years preceding the implementation of the amended IIFS, the daily volume delivered to Waiale Reservoir exceeded 30 mgd 72% of the time. This is a misreading of the histogram shown on Exhibit C-R18. Each set of bars on the histogram represents a five percent range and overlaps with the set preceding it and the set following it, e.g.,

the first set is 0-5 mgd, the second set is 5-10 mgd, the third set is 10-15 mgd, etc. OHA's calculation of the 72% occurrence rate is erroneous because it includes the set representing the 30-35 mgd range. Had OHA calculated correctly, it would have concluded that daily deliveries to Waiale Reservoir exceeded 30 mgd 52% of the time, not 72% of the time.

Power Component of Well No. 7 Operating Cost

16. Hui/MT contends that HC&S has overstated its cost of power to run Well No. 7 by measuring this cost with displaced revenues from Maui Electric Company ("***MECO***"). Hui/MT first complains that, because those revenues are determined under HC&S's existing agreement with MECO that is scheduled to expire at the end of 2014, there is no assurance that those revenues would continue to be displaced after the end of 2014. HUI then contends that, even prior to the end of 2014, it is improper for HC&S to calculate the operating cost on the assumption that each hour of pumping would necessarily displace MECO revenues, rather than being "prorated among the rest of its energy demands, and not just Well 7." Hui/MT's Responsive Brief at 8.

17. HC&S has calculated the power component of its cost to operate Well No. 7 using $0.196 per kilowat hour ("***kw-hr***"). This represents the average revenue that HC&S receives under its Power Purchase Agreement ("***PPA***") with MECO. The rationale supporting HC&S's use of this figure is that, to the extent Well No. 7 is used to mitigate the loss of irrigation water that would have been available but for the amended IIFS for the Nā Wai 'Ehā Streams, this incrementally reduces the amount of revenue received from MECO. This is an accurate assumption because any excess power capacity that HC&S has over its own power needs is currently sold to MECO.

18. It is true that the current PPA is set to expire at the end of 2014. The terms and conditions under which it may be extended beyond that date are under negotiation and hence

unkown. At the present time, therefore, the current average MECO revenue of $0.196 per kw-hr is the best available measure of the power component of HC&S's cost of operating Well No. 7.

19. In the event that the PPA is not extended, or is extended under different price terms per kw-hr sold to MECO, this does not mean that there will be no cost of power component to the incremental financial impacts on HC&S of running Well No. 7 to replace surface water lost to the amended IIFS. HC&S's own power needs already consume all the power generated from the burning of bagasse and the hydroelectric power generated by HC&S's turbines on the eastern portion of its internal ditch system and therefore require the use of supplemental fossil fuels. Running Well 7 would cause HC&S to incur additional fuel costs above and beyond those already required to meet all of its internal demands.

20. Because of the unknown future of the PPA after the end of 2014, it is true that the appropriate formula for measuring the power component of HC&S's incremental cost of running Well No. 7 could change. Whether it goes up or down, however, will depend upon future fuel prices.

Average Annual Irrigation Requirement for Seed Cane

21. Initially, OHA argued that it would be wasteful for HC&S to irrigate Fields 921 and 922, because of their sandy soils, with surface water from the Nā Wai 'Ehā Streams. In response, HC&S demonstrated that the soils profiles of these fields includes a layer of loam beneath a superficial layer of sand, and that these fields do not consume, on average, any more water than the balance of HC&S's seed cane farm, of which these fields are a part.

22. To make the latter point, HC&S submitted a table, Exhibit E-R29, containing a four-year snapshot of data from HC&S's irrigation records summarizing the total water recorded as applied to these fields in isolation and as compared with the balance of the acreage in this area

dedicated to seed cane. Exhibit E-R29 clearly shows that these fields are not consuming an excessive amount of water.

23. OHA has responded by focusing on just two of the four years of data, 2011 and 2012, in which the average annual rate of water applied to the 1445 acre seed farm averaged 4,555 gad. According to OHA, since this amount is less than the average annual irrigation requirement of 5,958 gad for the Waihee-Hopoi fields established in the 2010 D&O, the D&O should be modified to reduce the amount of water allocated in the D&O for HC&S's reasonable beneficial use on the acreage devoted to seed cane to instead reflect an annual irrigation requirement of 4,555 gad rather than the 5,958 gad of the D&O.

24. OHA's argument is not well-founded. Exhibit E-R29 is a limited data set and was not compiled in an exercise to determine an average annual irrigation requirement. The 5958 gad average annual irrigation requirement of the D&O was arrived at, initially, by using an annual average developed by OHA's agronomist expert, Dr. Fares, using a model into which he had loaded 54 years of rainfall and pan evaporation data. OHA's argument, in contrast, does not take any rainfall or pan evaporation data into consideration at all, relying instead on just two of four available years of water usage contained in E-R29.

25. If OHA had instead used the data for 2009 and 2010, the other two years in Exhibit E-R29, this would have generated an average usage for those two years of 5,959 gad which, coincidentally, is almost exactly the amount determined for the Waihee-Hopoi fields in the 2010 D&O. Unfortunately, HC&S was plagued with numerous mechanical breakdowns in its equipment used to reestablish seed fields in 2011 and 2012. This resulted in longer than normal periods between cutting and reestablishment and also necessitated the cutting of non-seed fields

outside of the Waihee-Hopoi area. Consequently, the data for 2009 and 2010 are actually more representative of the water usage for these fields than the data for 2011 and 2012.

26. While OHA has posited that Exhibit E-R29 demonstrates that the average annual irrigation requirement for seed cane should necessarily be less than that for crop cane, this is not necessarily true. The object of irrigating both seed cane and crop cane is to apply the optimum amount of moisture to maximize the rate of growth of the plant, i.e., the generation of biomass. Since they are both the same species of plant, the primary driver of their water needs is their common rate of evapotranspiration. While, as further explained below, differing crop cycles and harvesting methods are used, which create some variability in water application rates, they nonetheless have roughly equivalent average annual irrigation requirements.

27. Seed cane cycles vary from year to year depending on cutting sequence, yields and planting requirements, which makes it difficult to rely on just one or two years of irrigation data to establish an annual average. Seed cane also requires extra precautions to ensure disease and pests are not present. Irrigation applications are a major deterrent to the onset of both. For example, the Lesser Corn Stalk Borer will attack young ratoon cane plants in a dry environment. Frequent watering above evapotranspiration rates is required to keep soil surface moisture high, inhibiting the habitat the vector prefers. In addition, the hardening period, or the period of time before the seed cane is harvested or cut, is significantly shorter than the drying period that crop cane fields are subjected to before harvesting. A typical hardening period may be two weeks for a seed field as compared to a six to eight week drying period for crop cane.

28. In any event, it would take a much more comprehensive analysis to determine whether, on average, the annual irrigation requirement is significantly less for seed cane than crop

cane and would have to take into account a number of other factors including the time of year the field was started, the length of the cut cycle, disease and pest control and planting requirements.

Well No. 7 Sump Level

29. As explained in the written testimony of Garret Hew, HC&S upgraded the equipment and other infrastructure of Well No. 7 in an effort to increase its use as a source of replacement irrigation water. The improvements were designed to enable HC&S to transport to its Waihee Hopoi fields up to the theoretical maximum capacity of the two pumps, 7A and 7B, that are located at the base of the well. HC&S hoped that this would enable Well No. 7 to be used, on an as needed basis, to pump up to 32 mgd when irrigation needs required.

30. After the improvements were completed, HC&S sought to run both pumps in parallel with the two booster pumps on the surface, 7C and 7D, in October of 2012, at their combined maximum capacity of 32 mgd. After approximately two days of sustained pumping, the sump level shutoff feature tripped, shutting down the pumps. This feature automatically shuts down the pumps when the sump water level drops to the point where air can enter the pumps which causes cavitation that will damage the pumps.

31. Petitioners complain that HC&S has not adequately explained why the sump level shutoff feature trips now, but apparently did not in the past when historical pumping records reflect sustained pumpage of more than 30 mgd from Well No. 7. The most recent such instances cited by Petitioners are periods in October of 1996 and July of 2000.

32. If the water level in Well No. 7 were the same currently as it was during these past periods, HC&S believes that Well No. 7 would be able to produce at a rate closer to what is reflected in historical pumping records. It is apparent, however, based on rate of drawdown of the sump level, and the tripping of the automatic pump shutoff feature, that the water level is lower

than it used to be. The fact that well water levels change over time is not controversial. There is extensive discussion of the relationship between well water levels and rainfall and other sources of recharge in several USGS studies, including the Hui/MT's Exhibits A-R1 and A-R2.

33. Exhibit E-R32 is a copy of a table that can be downloaded from the following USGS websites: http://hi.water.usgs.gov/studies/synoptic/central_maui/table_1.pdf and http://hi.water.usgs.gov/studies/synoptic/central_maui/. This table shows differences in water level, in feet above mean sea level, between May 17, 2005 and August 29, 2012 for various wells in the Central Maui area. For a number of the wells, the water level was significantly lower in 2012 than in 2005. The staff gauge currently installed in Well No. 7 is not tied to mean sea level and therefore HC&S is not presently able to convert the sump level readings in Well No. 7 into the number of feet above mean sea level. Based on this table, however, it is nonetheless quite plausible that the water level in Well No. 7 has declined between 2005 and 2012 as has been the case with other wells in the Central Maui area.

34. In addition to the fact that 2007 and 2008 were severe drought years, there has been a reduction since 2010 of approximately 10 mgd coming in to the Waiale Reservoir for application to the Waihe'e-Hopoi fields. Between the lesser amount of imported surface water applied to these fields and the correspondingly reduced amount of seepage from Waiale Reservoir, there has been an average reduction of approximately 10 mgd in the recharge of the groundwater source for Well No. 7. In addition, HC&S has recently been running Well No. 7 much more than it was run in 2005 and earlier years. As discussed at length in Exhibits A-R1 and A-R2, reducing the inputs into a groundwater source results in a lower water level and a reduction in the capacity of wells drawing from that source. Between the decreased recharge of the groundwater source and

HC&S's increased usage of Well No. 7 in recent years, some reduction in the water level of Well No. 7 would be expected.

HC&S System Losses

35. Regarding HC&S's system losses, the 2010 D&O deemed HC&S's estimated seepage losses of 6-8 mgd from the Waiale Reservoir as unacceptable. It therefore deducted this amount, along with half of HC&S's estimated 2-4 mgd of other system losses, from its calculation of HC&S's reasonable use. Accordingly, the only HC&S system losses taken into account by CWRM in establishing HC&S's reasonable use amount in relation to the IIFS was 2 mgd for system losses other than seepage from Waiale Reservoir.

36. OHA and the HUI complain that, because HC&S has not demonstrated that it has either lined or otherwise completely eliminated seepage from Waiale Reservoir, that another 8 mgd should be deducted from the calculation of HC&S's reasonable use amount and added to the IIFS. This does not make any sense because the current calculation already limits HC&S to a maximum system loss of 2 mgd. The most that it would mathematically be possible to reduce HC&S's allowance for system losses, therefore, is 2 mgd.

37. HC&S's efforts to mitigate and estimate its system losses other than seepage from Waiale Reservoir is addressed in the written testimony of Garret Hew being submitted contemporaneously herewith. Regarding HC&S's plans for mitigating seepage from Waiale Reservoir, as previously reported by HC&S to CWRM, HC&S has essentially three options:

i. line the existing reservoir with concrete or HDPE;

ii. line a smaller configuration and limit its use accordingly; or

iii. bypass the reservoir.

38. If there will be a further reduction in deliveries to Waiale Reservoir due to a further amendment of the IIFS, HC&S will most likely choose the bypass option. This will reduce HC&S's flexibility to store water when stream flows are high, but even if lined in its current configuration, the reservoir capacity is limited to two to three days of average daily irrigation demand.

39. Until the final IIFS is determined and average surface water deliveries identified, it is difficult for HC&S to perform an appropriate cost benefit analysis of the seepage mitigation options for Waiale Reservoir. Any further reduction in surface water flows will negatively impact any cost benefit analysis HC&S performs and will probably lead to HC&S severely limiting impounded water at Waiale Reservoir, or bypassing the reservoir completely.

I, RICK W. VOLNER, JR., declare, verify, certify, and state under penalty of perjury that the foregoing is true and correct.

DATED: Maui, Hawaii, February 18, 2014.

RICK W. VOLNER, JR.

ImanageDB:2680329.2

COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII

Iao Groundwater Management Area High-Level Source Water Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waihee, Waiehu, Iao & Waikapu Streams Contested Case Hearing	Case No. CCH-MA06-01 DECLARATION OF GARRET HEW

DECLARATION OF GARRET HEW

I, GARRET HEW, hereby declare:

1. I am the President of East Maui Irrigation Co., Ltd. ("***EMI***"), a subsidiary of Alexander & Baldwin, Inc. ("***A&B***"). I am also the Water Resources Manager for Hawaiian Commercial and Sugar Company ("***HC&S***"), which is the division of A&B that operates A&B's sugar cultivation operations on Maui.

2. I have reviewed the responsive briefs and exhibits filed herein by Hui O Nā Wai 'Ehā and Maui Tomorrow ("***Hui/MT***") and the Office of Hawaiian Affairs ("***OHA***") on January 28, 2014.

3. Hui/MT and OHA have argued that HC&S should be held to a system loss of 5% based on testimony submitted by Wailuku Water Company LLC ("***WWC***") to the effect that WWC has reduced its estimated system losses to approximately 5%. I have reviewed the WWC testimony and have consulted the National Engineering Handbook published by the Soil Conservation Service of the United States Department of Agriculture cited in the WWC testimony.

4. There are important differences between the infrastructure that makes up the HC&S system versus the WWC system. The WWC reservoirs, for example, are more in the

nature of settling ponds, which overflow back into the ditch system, than true reservoirs, such as HC&S reservoirs 91 and 92, which are regulated with inlet control gates and outlet valves and are managed for the regular storage and release of irrigation water. Unlike HC&S, who is using its system for irrigation, WWC does not need all of its reservoirs and has closed several, contributing to a reduction in system losses. Further, WWC has closed off several ditches that it no longer uses and has completely stopped diverting water from North Waiehu Stream. HC&S, on the other hand, has not removed any portions of its system from its operations.

5. So far as seepage and evaporation losses are concerned, I do not know exactly how WWC arrived at its estimates. I did consult the National Engineering Handbook, however, to obtain seepage rate factors that I could use to estimate rates of seepage from the various sections of the HC&S system. Exhibit E-R33 is Figure 2-50 from the National Engineering Handbook, which graphs the relationship of different conveyance system materials to expected seepage loss rates. Exhibit E-R34 is a map depicting the sections of the HC&S West Maui irrigation system that I estimated seepage loss rates for utilizing Exhibit E-R33.

6. In order to estimate expected seepage loss for the HC&S system, excluding Waiale Reservoir, I prepared a table which summarizes, for each section of the system, its length, average surface area under water and the type of material that holds or conveys the water. To establish a range, I then selected what I thought would be a relatively low seepage factor along with what I thought would be relatively a high seepage factor from Exhibit E-R33, based on my knowledge of the system. I then calculated an expected range of seepage. Exhibit E-R35 is a copy of the resulting table. This exercise produced an expected range of seepage from a low of 2.05 mgd to a high of 4.10 mgd. This corresponds to a percentage rate of loss of from 8.7% to 17.3%.

7. Exhibit E-R35 also contains a table that I prepared to estimate the average daily amount of evaporation that can be expected from the surface of the water contained in the HC&S system, excluding Waiale Reservoir. This was calculated by multiplying the average daily evaporation rate of 0.40 acre-inches by the average daily surface area of the water in the system, which yielded an average daily evaporation loss of 95,889.51 gallons, or 0.096 mgd. The total expected seepage losses from seepage and evaporation range from 2.15 mgd to 4.20 mgd. This corresponds to a percentage rate of loss of from 9% to 17.7%.

8. This range of expected seepage and evaporation losses compares well with the 3-4 mgd estimate that HC&S provided at the initial hearing, and demonstrates that the 2 mgd allowable system loss established in the 2010 D&O is actually a little too low. There are additional system losses, besides seepage and evaporation, than are reasonably to be expected but are difficult to measure or estimate. These include water lost during the backflushing of sand filters, during the startup and shutdown of irrigation rounds (when water pressure is established and the drip tubes are purged), and during the repair and water testing of the irrigation system prior to planting of the crop.

9. In my opinion, a reasonable allowance for system losses for HC&S's West Maui system, excluding Waiale Reservoir, would be 4 mgd.

I, GARRET HEW, declare, verify, certify, and state under penalty of perjury that the foregoing is true and correct.

DATED: Maui, Hawaii, February 18, 2014.

GARRET HEW

ImanageDB:2683754.1

COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII

'Iao Groundwater Management Area High-Level Source Water Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waihe'e, Waiehu, 'Iao & Waikapu Streams Contested Case Hearing	Case No. CCH-MA06-01 DECLARATION OF CHRISTOPHER J. BENJAMIN

DECLARATION OF CHRISTOPHER J. BENJAMIN

I, CHRISTOPHER J. BENJAMIN, hereby declare:

1. I am President and Chief Operating Officer of Alexander & Baldwin, Inc. ("***A&B***") and President of A&B Properties, Inc. Previously, I served as Senior Vice President, Chief Financial Officer and Treasurer of A&B from February 2004 to August 2011, and as Plantation General Manager for Hawaiian Commercial & Sugar Company ("***HC&S***") from March 2009 to March 2011. I began working for A&B in August 2001 as the Director of Corporate Development.

2. A&B's longstanding intent with respect to its Maui agricultural lands has been to keep them in active cultivation through whatever means are most viable. A&B believes that the benefits of active farming on its Maui lands accrue to the community in many ways, not the least of which is the economic contribution to the Island of Maui, including the provision of meaningful jobs.

3. A&B has consistently expressed that it is not wed to sugar as an end product, and is open to growing alternative crops or converting sugar into energy products. Over the long term, however, farming must be at least modestly profitable in order to satisfy shareholders and

maintain their support for the continued investment in the farming operation. While A&B has, over short periods of time, been willing to absorb financial losses, it has done so only when it has believed that improved financial performance could be reasonably expected.

4. In 2009, for example, when A&B's agribusiness operation (comprised almost entirely of HC&S) lost nearly $30 million, A&B chose to continue operations because it foresaw significant improvements in farming productivity and believed that an enhanced operating model could be developed. Operational improvements did, in fact, drive a material improvement in financial results. Rising sugar prices further enhanced performance and A&B was optimistic that higher earnings could provide a bridge to a new business model. However, the benefits of the operational movements have for the most part been realized, and sugar prices have retreated from their record-setting highs of three years ago and returned to levels approximating that in place before the dramatic rise began in 2009.

5. Unfortunately, despite many years of research into alternative crops and renewable energy technologies, no new business model has emerged. A&B continues to search for a new business model, but at present, A&B cannot confidently structure the operations of HC&S around the expectation that a new and viable model will be found in the very near term. As such, the future outlook for HC&S must continue to be based, at least for the foreseeable future, on the traditional sugar model.

6. For the sugar business to remain sustainable at sugar pricing levels that are anticipated to remain in the low-to-mid 20-cent range – not highly profitable, but simply sustainable – production levels must exceed 200,000 tons (average yields of 12.5 TSA) on a consistent basis. Water losses to date from previous IIFS decisions already make such yields

very difficult to achieve. Further water losses are likely to tip the scale further against the business.

7. Ultimately, the decision regarding the fate of the HC&S plantation will depend on A&B's forecast of future profitability. After sugar pricing, the single most important criterion in the forecasting process will be production outlook, and the single most significant driver of production is water availability. Therefore, further water losses could very well seal the fate of the plantation.

I, CHRISTOPHER J. BENJAMIN, declare, verify, certify, and state under penalty of perjury that the foregoing is true and correct.

DATED: Honolulu, Hawaii, February18, 2014.

CHRISTOPHER J. BENJAMIN

Table 1. Synoptic groundwater-level measurements in the Central Maui area, Maui, Hawaii, 2005-2012.

[Water levels are rounded to the nearest tenth of a foot; --, no available water-level measurement; USGS, U.S. Geological Survey]

USGS site number	Site name	Water level, in feet above mean sea level	
		May 17, 2005	August 29, 2012
204722156274501	6-4727-01 Kihei Shaft (S14), Maui, HI	3.4	--
204806156293401	6-4829-02 Maalaea Power Plant, Maui, HI	4.4	--
204818156310301	6-4831-01 Maalaea (W272), Maui, HI	3.9	--
204827156242201	6-4824-01 Kihei Exploratory Well, Maui, HI	3.7	--
204845156255001	6-4825-01 Kihei Shaft, Pump 3 (S15), Maui, HI	2.3	--
204909156281401	6-4928-02 Puunene Airport Shaft (S34), Maui, HI	3.8	--
205102156282501	6-5128-02 Waikapu Shaft (S16), Maui, HI	3.4	--
205110156293801	6-5129-02 Waikapu Baseyard, Maui, HI	3.8	--
205140156304501	6-5130-01 Waikapu 1, Maui, HI	12.8	10.9
205140156305301	6-5131-01 Waikapu Tank Site, Maui, HI	--	12.0
205154156303801	6-5130-02 Waikapu 2, Maui, HI	11.6	10.4
205200156304401	6-5230-02 Iao Deep, Maui, HI	--	11.5
205201156261001	6-5226-02 Puunene, Pump 6 (S18), Maui, HI	3.5	--
205207156285001	6-5228-07 Reynolds 2 (W13), Maui, HI	3.4	--
205217156271901	6-5227-0S Puunene, Pump 19 (S35), Maui, HI	1.0	--
205234156293401	6-5229-03 Maui Lani 2, Maui, HI	2.8	--
205243156243201	6-5224-02 Puunene Shaft (S22), Maui, HI	3.7	--
205254156265801	6-5226-01 Kaluahonu (S19), Maui, HI	3.3	--
205259156304501	6-5230-03 Iao Tank Site, Maui, HI	--	8.5
205305156304401	6-5330-05 Shaft 33, well 1, Maui, HI	10.2*	--
205312156321402	6-5332-04 Kepaniwai Observation Well, Maui, HI	637**	639**
205320156284001	6-5328-01 Cannery Shaft (513), Maui, HI	2.1	--
205323156291001	6-5329-19 Maui Central Park 1, Maui, HI	3.5	--
205327156213201	6-5321-01 Kaheka, Pump 18 (S27), Maui, HI	2.5	--
205327156270301	6-5327-07 Central PP, Maui, HI	2.7	--
205329156305502	6-5330-09 Mokuhau Pump 2, Maui, HI	9.7	7.5
205337156290101	6-5329-21 Maui Central Park 3, Maui, HI	2.9	--
205405156305401	6-5430-05 Waiehu Deep Monitor Well, Maui, HI	11.5	8.0
205414156220901	6-5422-02 Paia, Pump 17 (528), Maui, HI	3.4	--
205416156244301	6-5424-01 Specklesville Shaft, Maui, HI	2.6	--
205432156304401	6-5430-02 Waiehu Heights 2, Maui, HI	10.7	--
205433156184101	6-5418-01 EMWDP Monitor Well, Maui, HI	4.8	--
205437156310501	6-5431-01 TH-B Waiehu, Maui, HI	10.2	6.5
205449156231001	6-5423-02 Low Paia, Pump 16 (S30), Maui, HI	0.8	--
205617156311101	6-5631-01 TH-A1 Waihee, Maui, HI	11.2	--
205645156311101	6-5631-09 Waihee Deep, Maui, HI	--	4.3
205650156311601	6-5731-04 Kanoa 2, Maui, HI	4.2	4.4
205651156313001	6-5631-03 North Waihee 2, Maui, HI	6.7	5.1
205651156313201	6-5631-02 North Waihee 1, Maui, HI	5.0	5.2
205656156311601	6-5731-02 Kanoa 1, Maui, HI	4.3	4.2
205705156312401	6-5731-05 Kanoa TH, Maui, HI	5.7	3.8

*Daily mean groundwater level.

**Water level estimated based on land-surface altitude of 713 feet. Water level rounded to nearest foot.

Exhibit E-R32

Figure 2–50 Method to estimate seepage losses from irrigation delivery systems (adapted from USDA 1985)

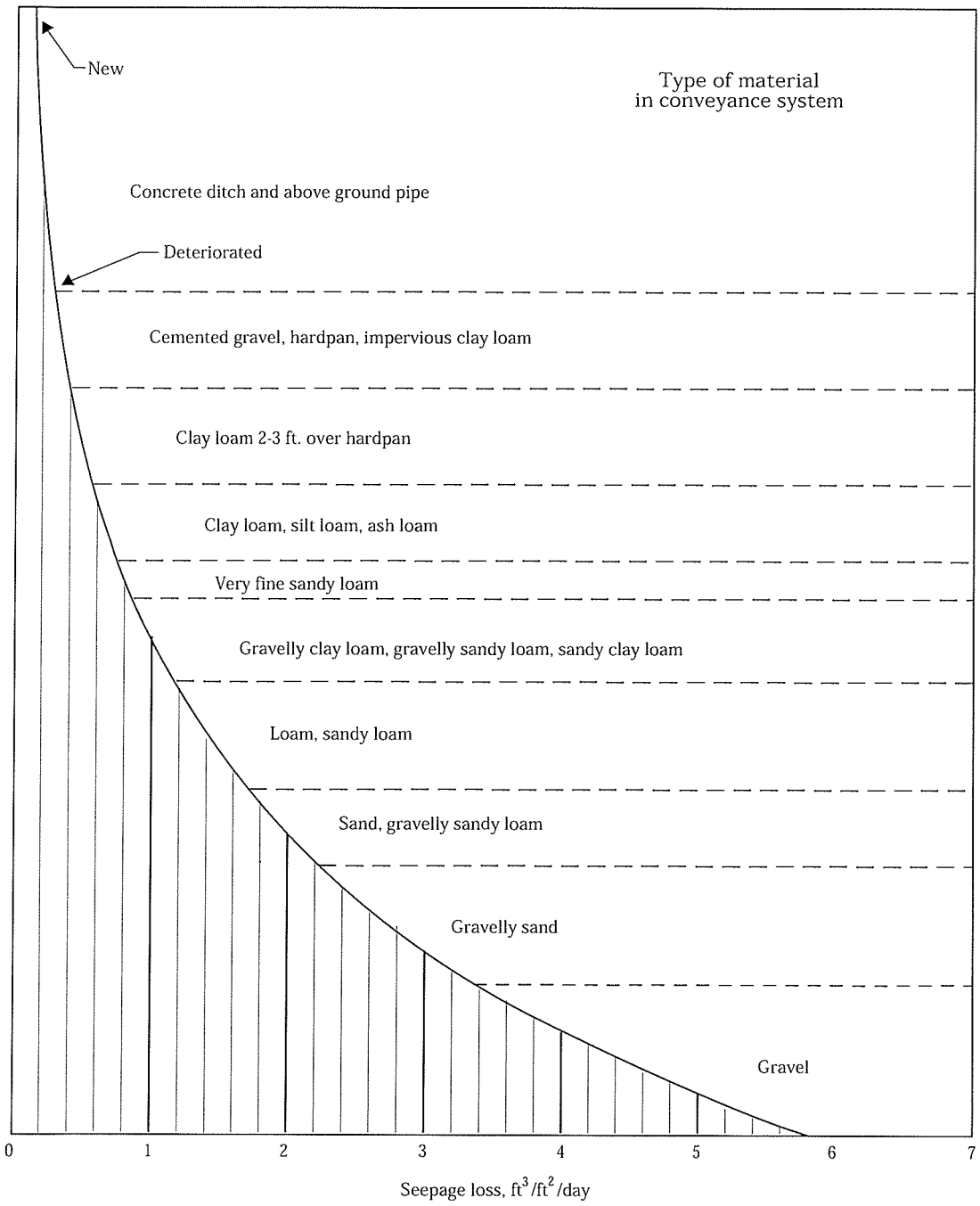
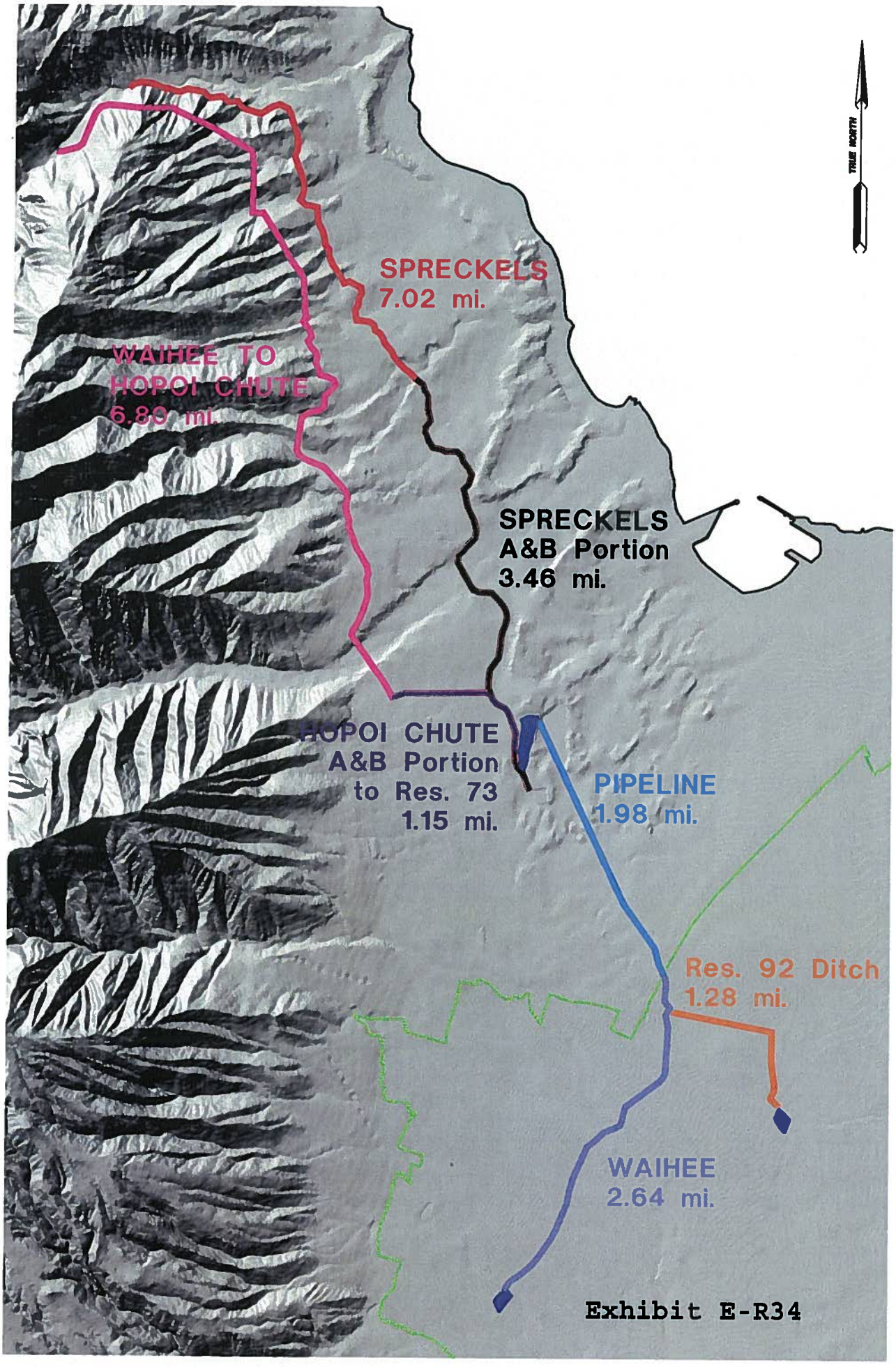


 Exhibit E-R33


TRUE NORTH
SPRECKELS
7.02 mi.
WAIHEE TO
HOPOI CHUTE
6.80 mi.
SPRECKELS
A&B Portion
3.46 mi.
HOPOI CHUTE
A&B Portion
to Res. 73
1.15 mi.
PIPELINE
1.98 mi.
Res. 92 Ditch
1.28 mi.
WAIHEE
2.64 mi.
Exhibit E-R34

HC&S Seepage Loss- West Maui System

Ditch	Location	Miles	Feet	Sq ft water area loss/foot	Type of ditch/reservoir	Low Seepage loss factor cubic feet/sq	High Seepage loss factor cubic feet/sq	Gal/sq ft loss (low factor)	Gal/sq ft loss (high factor)	Low Seepage loss/day	High Seepage loss/day
Spreckels Ditch	South Waiehu (Hano's) to Res 73	3.46	18,269	10	unlined	0.45	0.90	3.366	6.732	614,927.81	1,229,855.62
Waihee Ditch	Hopoi Chute to Res 73	1.15	6,072	N/A	corrugated pipe	N/A	N/A	N/A	N/A	N/A	N/A
Waihee Ditch	Res 73 to HC&S Waihee ditch	1.98	10,454	N/A	HDPE/steel pipe	N/A	N/A	N/A	N/A	N/A	N/A
Waihee Ditch	HC&S Waihee ditch to Res 91	2.64	13,939	10	lined concrete ditch	0.25	0.50	1.87	3.74	260,663.04	521,326.08
Waihee Ditch	HC&S Waihee ditch to Res 92	1.28	6,758	4.5	lined cutstone/concrete	0.2	0.40	1.496	2.992	45,497.55	90,995.10
	Reservoir 91 - diameter = 380'			236,552	unlined	0.45	0.90	3.366	6.732	796,233.70	1,592,467.39
	Reservoir 92 - diameter = 245'			98,855	unlined	0.45	0.90	3.366	6.732	332,746.10	665,492.20
										2,050,068.19	4,100,136.38

Location	Lineal feet	Width of water-feet	Total area in square feet	Acres	Evaporation rate of 0.40 acre-inch/day	Acre inch to gallons/day
South Waiehu (Hano's) to Res 73	18,269	6	109,613	2.52	1.01	27,332.03
HC&S Waihee ditch to Res 91	13,939	7	97,574	2.24	0.90	24,330.24
HC&S Waihee ditch to Res 92	6,758	2.5	16,896	0.39	0.16	4,213.03
Reservoir 91 - diameter = 380'			113,354	2.60	1.04	28,264.90
Reservoir 92 - diameter = 245'			47,120	1.08	0.43	11,749.31
						95,889.51

West Maui Average Annual Delivery -MGD	
2011	22.11
2012	26.05
2013	22.90
Total	71.07
Average/day	23.69

Low seepage loss factor -MGD		Seepage and evap
Seepage loss/day	2.05	2.15
Percentage lost	8.7	9.06

High seepage loss factor - MGD		Seepage and evap
Seepage loss/day	4.10	4.20
Percentage lost	17.3	17.71

Note: Reservoirs 91 and 92 is total sq ft water area loss

Exhibit E-R35

COMMISSION ON WATER RESOURCE MANAGEMENT

OF THE STATE OF HAWAII

IAO GROUND WATER MANAGEMENT AREA HIGH-LEVEL SOURCE WATER USE WUPAS AND PETITION TO AMEND INTERIM INSTREAM FLOW STANDARDS OF WAIHEE, WAIEHU, IAO, & WAIKAPU STREAMS CONTESTED CASE HEARING & COMPLAINT C04-31 REGARDING WASTE OF SURFACE WATER, WAILUKU MAUI CONTESTED CASE HEARING	Case No. CCH-MA-06-01 CERTIFICATE OF SERVICE

CERTIFICATE OF SERVICE

The undersigned hereby certifies that, on this date, a true and correct copy of the foregoing document was duly served on the following parties by U.S. Mail:

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