

# EAST MAUI IRRIGATION COMPANY, LLC

P.O. BOX 791628, PAIA, MAUI, HAWAII 96779-1628 • (808) 579-9516

October 30, 2020

Ms. Suzanne D. Case  
Chairperson  
Board of Land and Natural Resources  
State of Hawaii  
P.O. Box 621  
Honolulu, HI 96809

RE: Revocable Permits S-7263, S-7264 and S-7265 to Alexander and Baldwin, Inc., and S-7266 to East Maui Irrigation Company, Limited.

Dear Chairperson Case:

This letter is in response to your letter of October 14, 2020, requesting additional information in regard to the Board of Land and Natural Resources' ("Board") consideration of the holdover/continuation of the above referenced revocable permits for water use for the calendar year 2021. The six questions are noted below, followed by our responses:

- 1. Provide the most current Mahi Pono farm plan—in full—along with the estimated amount of water needed for each phase of the plan. The plan should include a timeline of when an increase in water need is anticipated.**

Response: Please find attached as *EXHIBIT A* a copy of the proposed Maui Pono farm plan for the 30,000 acres of Central Maui agricultural lands which can be irrigated by the East Maui stream waters that are the subject of these revocable permits. As has been discussed with the Board in the past, Mahi Pono will be pursuing a mix of diversified agricultural crops on these acres, the majority of which is planned to be food-related. The attached plan represents full build-out of the 30,000 acres, which was expected to take ten years to achieve (from 2019 start of implementation). Also attached as *EXHIBIT B* is a phased water use plan that correlates to the farm plan provided.

# EAST MAUI IRRIGATION COMPANY, LLC

P.O. BOX 791628, PAIA, MAUI, HAWAII 96779-1628 • (808) 579-9516

Please note, however, that the attached farm plan and corresponding water use plan, like any responsible farming plan, are fluid plans that must be responsive to changing market demands, agronomic conditions, etc. to assure the long-term sustainability of the farm.

## **2. Explain how the amount of water attributed to system losses is calculated and/or measured and what is included in the term “system losses”**

Response: “System Losses” for the EMI Ditch System both east and west of Maliko Gulch have been evaluated by the Commission on Water Resource Management (“CWRM”) as recounted in CWRM’s June 20, 2018 Decision and Order (the “D&O”).

The EMI Ditch System east of Maliko Gulch is the integrated system of diversions, intakes, tunnels, ditches and reservoirs located on both State owned and private lands that run from Makapipi Stream at the eastern boundary of the License Areas to Maliko Gulch, which is located several miles west of Honopou Stream. Honopou Stream represents the western boundary of the License Areas.

USGS conducted a field study from March to October 2011 to identify ditch characteristics and quantify seepage losses and gains in the EMI Ditch System. The study was undertaken in cooperation with CWRM and its results were summarized in USGS Open-File Report 2012-1115, which was presented to CWRM at its meeting held on January 23, 2013. USGS concluded that there were both seepage gains and losses in the EMI Ditch System which largely cancelled each other out. As summarized in Finding of Fact (FOF) No. 723 of the D&O:

*“Thus, because both open ditches and tunnels in the EMI diversion system not only incur seepage losses but also gains from ground water, especially in the tunnels, it is not clear whether net seepage losses even occur in the EMI diversion system. At low flows, the USGS study results show that losses are greater than gains, but at higher flows, gains are greater than losses, supra, FOF 721”*

System losses in the HC&S irrigation system of ditches, reservoirs and related infrastructure west of Maliko Gulch were evaluated by CWRM based on the evidence submitted by HC&S in the contested case hearing that resulted in the D&O. HC&S submitted testimony and documentary evidence supporting its estimate that the average annual amount of “system losses” in the HC&S irrigation system was 41.67 mgd, or 22.7 percent of the total of the surface water delivered to HC&S at Maliko Gulch and ground water pumped from HC&S brackish water wells to irrigate the Central Maui fields then cultivated in sugar. This was illustrated in a table prepared by HC&S analyzing data from 2008 to 2013, which was submitted as Exhibit C-137, and

## EAST MAUI IRRIGATION COMPANY, LLC

P.O. BOX 791628, PAIA, MAUI, HAWAII 96779-1628 • (808) 579-9516

was discussed in FOF Nos. 724-727. This estimate included not only water assumed to be lost to seepage and evaporation, but also to “miscellaneous losses such as back-flushing of filters, drip tube ruptures or breaks, animal damage, pipeline breaks, misreported irrigation (if they are not applying the correct hours to the amount they ran), testing of systems prior to planting, or where water is taken out of the system but not accounted for in daily irrigation.” D&O FOF No. 733.

To cross check the reasonableness of this estimate, HC&S performed a separate estimate of seepage and evaporation by 1) calculating the range of expected seepage rate losses through the lined and unlined surfaces of HC&S’s on-farm (non-EMI) ditches and reservoirs utilizing factors published by the United States Department of Agriculture (“USDA”) in its National Engineering Handbook, and 2) calculating direct evaporation into the atmosphere from the surface area of the water typically present in the ditches and reservoirs. The result was presented in a table submitted as Exhibit C-139. The methodology used was discussed in detail in FOF Nos. 728 - 732 of the D&O. As found by CWRM, “the average of high and low estimated losses from seepage and evaporation is 27.55 percent, and HC&S’s losses of 22.7% fell below this average.” D&O FOF No. 731 and Exhibit C-139. CWRM concluded:

*Thus, HC&S’s system losses of 22.7 percent (41.67 mgd of 183.61 mgd of surface water delivered and ground water pumped) were reasonable losses under sugarcane cultivation. Because the same distribution system would be used for diversified agriculture, the same rate of 22.7 percent losses should be applicable.”*

In the quarterly reports filed with the BLNR up until Q2 2020, the 22.7% “System Losses” referred to above was presented in a separate column. This was not a directly measured amount but simply represented the average rate of HC&S system losses CWRM had validated as reasonable during sugar cultivation. The current rate of system losses is not precisely known, though it is thought that while the absolute amount of system losses is lower, the rate of system losses is higher since most of the seepage losses occur in the reservoirs of the former HC&S plantation, and those are still generally being filled for fire suppression purposes for the County, even though the total amount of water deliveries is currently only a fraction of what was being imported during sugar cultivation. The seepage losses thus represent significantly more than 22.7% of current EMI deliveries, which are far less than the deliveries during sugar cultivation. Recognizing that this may cause confusion, and to eliminate such confusion, starting with the Q3 2020 quarterly report, the 22.7% column was eliminated and all system losses of the on-farm (non-EMI) irrigation system were combined with all the water that is not otherwise separately measured and accounted for, i.e., for reservoirs, fire protection, dust control, and hydroelectric uses, along with system losses associated with those uses (“Other Uses”). The figure

# EAST MAUI IRRIGATION COMPANY, LLC

P.O. BOX 791628, PAIA, MAUI, HAWAII 96779-1628 • (808) 579-9516

apportioned to these Other Uses represents the net amount of water remaining after the Honopou East Maui water deliveries are allocated to the County of Maui DWS and Kula Ag Park, A&B's tenants and other historical water users, and Mahi Pono's agricultural operations. Again, total "system losses" west of Maliko Gulch are currently higher than the 22.7% rate determined to be reasonable under sugar cultivation, or under the anticipated full buildout of Mahi Pono's diversified agricultural farm plan. This is primarily due to the need to continue to maintain water levels in the reservoirs largely for the County of Maui's fire suppression needs. Seepage losses from the reservoirs are thus expected and continue to occur in the unlined reservoirs just as they did during sugar cultivation. This water is not being irretrievably "lost," however, or 'lost' at all, since it is being returned to the underlying aquifer, which is the source for the brackish water wells that supplement the current and future irrigation needs of the Mahi Pono farm plan as well as other users in Central Maui.

- 3. For uses identified in the quarterly reports as "historic/industrial uses", in addition to identifying the water user. Also identify the specific type of use of the water, (e.g. equipment cleaning, concrete mixing), and the amount of water used by each user.**

Response: Exhibit B to the 3Q 2020 permit compliance status report, which was recently submitted to the BLNR, includes greater detail about the specific type of use of the "historic/industrial uses" of East Maui stream water, as requested. Please note that these uses are not individually metered, thus we are unable to identify amounts of water used by each user.

- 4. Explain what is meant by the term "evaporation" in the quarterly reports and provide an estimate, if possible, of how much water is lost to evaporation.**

Response: "Evaporation" is the amount of water lost through evaporation from the surface of water in the ditches and reservoirs that are located on-farm, west of Maliko Gulch. As discussed in response #2 above, this amount was estimated during the course of the CWRM East Maui IIFS contested case hearing, using a pan evaporation rate of 0.40-acre inches a day, to be approximately 2.645 million gallons per day during sugar cultivation. The majority of this amount, 2.37 mgd, was estimated to be the amount of water lost by direct evaporation into the atmosphere from HC&S' on-farm reservoirs. As also noted in response #2 above, with respect to the quarterly reports, evaporation has been included in the definition of system losses and included in the last column with all the other water uses not otherwise separately measured and accounted for. Again, the reservoirs are currently being kept generally full at the request of the

# EAST MAUI IRRIGATION COMPANY, LLC

P.O. BOX 791628, PAIA, MAUI, HAWAII 96779-1628 • (808) 579-9516

Maui Fire Department to help with fire suppression needs. With more wetted perimeter, there will be greater evaporation.

- 5. Is groundwater being used to supplement surface water for crop irrigation or other uses/ If not, explain why not. If yes, explain under what circumstances is ground water being used.**

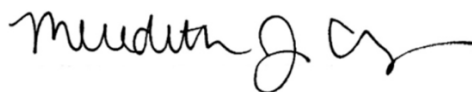
Response: Yes, Mahi Pono did use groundwater this year to supplement surface water for crop irrigation. In Q3 2020, Mahi Pono used approximately 12.7 million gallons of brackish groundwater. This was necessitated by Mahi Pono's growing farm operation as well as a lack of surface water availability from East Maui due to uncommonly dry weather conditions.

- 6. Confirmation that water used for hydroelectric purposes is non-consumptive and returned to the ditch and that the water is used for other uses stated in the quarterly report.**

Response: As recently stated in the Q3 2020 quarterly status report to the Board, it is confirmed that the water used by the Mahi Pono hydroelectric system is non-consumptive and is returned to the ditch and re-used consumptively by one of the other uses noted in the quarterly report.

Please do not hesitate to contact us should you have any questions on the information provided above and in *EXHIBIT A*.

Sincerely,



---

Meredith J. Ching, A&B



---

Mark Vaught, EMI

cc: Ian Hirokawa, DLNR Land Division (via email)

# EAST MAUI IRRIGATION COMPANY, LLC

P.O. BOX 791628, PAIA, MAUI, HAWAII 96779-1628 • (808) 579-9516

## EXHIBIT A

### Mahi Pono Farm Plan Crops & Acreages at Full Build-Out – Per Draft Environmental Impact Statement

	<u>Acres</u>
— Crops	
• Community Farm (vegetables, melons, etc.)	800
• Orchards (lemons, limes, mandarins, oranges, macadamia nuts, coffee, avocados, etc.)	12,850
• Tropical fruits (dragon fruit, guava, lilikoi, papaya, white pineapple, etc.)	600
• Row crops and annual crops (potatoes, etc.)	1,200
• <u>Energy crops</u>	<u>500</u>
• Total Crops	15,950
— Pasture	
• Irrigated	4,700
• <u>Unirrigated</u>	<u>9,100</u>
• Total Pasture	13,800
— <u>Green energy (solar farms)</u>	<u>250</u>
— Total Acreage	30,000

# EAST MAUI IRRIGATION COMPANY, LLC

P.O. BOX 791628, PAIA, MAUI, HAWAII 96779-1628 • (808) 579-9516

## EXHIBIT B

### Mahi Pono Farm Plan at Full Build-Out – Corresponding Surface Water Usage Projection (2019 – 2029)

<b>YEAR</b>	<b>County of Maui DWS</b>	<b>County of Maui Ag Park</b>	<b>Historic / Industrial Uses</b>	<b>Reservoir / Fire Protection / System Losses / Dust Control / Hydroelectric</b>	<b>Diversified Agriculture</b>	<b>TOTAL</b>
<b>2020</b>	4.0	3.1	1.1	12.0	4.3	<b>24.5</b>
<b>2021</b>	4.0	3.1	1.1	12.6	11.5	<b>32.3</b>
<b>2022</b>	4.0	3.1	1.1	13.2	30.9	<b>52.3</b>
<b>2023</b>	4.0	3.1	1.1	13.9	42.8	<b>64.9</b>
<b>2024</b>	4.0	3.1	1.1	14.6	50.2	<b>73.0</b>
<b>2025</b>	4.0	3.1	1.1	15.3	55.4	<b>78.9</b>
<b>2026</b>	4.0	3.1	1.1	16.1	57.4	<b>81.7</b>
<b>2027</b>	4.0	3.1	1.1	16.9	59.5	<b>84.6</b>
<b>2028</b>	4.0	3.1	1.1	17.7	61.9	<b>87.9</b>
<b>2029</b>	4.0	3.1	1.1	18.6	65.6	<b>92.5</b>