

MINUTES
FOR THE MEETING OF THE
COMMISSION ON WATER RESOURCE MANAGEMENT

DATE: December 17, 2009
TIME: 9:30 a.m.
PLACE: Paia Community Center
Paia, Maui

Chairperson Laura H. Thielen called the meeting of the Commission on Water Resource Management to order at 9:34 a.m. from recess last night.

The following were in attendance and/or excused:

MEMBERS: Ms. Laura Thielen, Dr. Chiyo Fukino, Dr. Lawrence Miike, Mr. Neal Fujiwara, Mr. William Balfour, Jr.

STAFF: Deputy Ken Kawahara, Ed Sakoda, Dean Uyeno, Chui Cheng, Diane England

EXCUSED: Ms. Donna Kiyosaki, Mr. Sumner Erdman

COUNSEL: Colin Lau, Esq.

OTHERS: Jeff Eng (Maui Dept. of Water Supply); Lyn Scott; Beatrice Kekahuna; Lucienne de Naie (Sierra Club Maui); Ilima Kalama (Malama O Ka Aina); Amanda Martin (Na Moku); Victor Pellegrino (Taro Farmer)

Chair Thielen asked if anyone needed introductions or an overview of what is planned, and no one responded.

Chair Thielen addressed the commissioners, announced that the public testimony is closed, and that it was decided to take a rest last night and sleep on the information they heard from both the staff submittal as well as the public testimony. The choices in front of the Commission were accepting the staff submittal as is, accepting the staff submittal with some conditions, or changes, or modifications, rejecting the submittal or deferring the submittal. Chair Thielen felt the commissioners needed to have some discussion but one of the advantages of addressing the issue outside a contested case hearing as part of the Commission meeting is that it allows them to bring up people and talk through different options as questions, gather information and to talk among themselves before coming to a decision.

Chair Thielen said the issues are short term, middle term and long term issues. She explained that under the short term, a lot of people recognize that despite the Water Code and all the State laws,

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there is a diversion system that's been in place well over a hundred years and an island economy and people have grown up around it. What was heard in the prior day's testimony was concern for many people who are utilizing this water in other areas. A real fear is that a big change, an immediate change, is something that's going to impact people in a very hard way. And it seems that even the advocates who are arguing for the water to be returned to the streams, for the most part, are saying there needs to be some room in the short term to be able to recognize the needs of the local communities for the water in east Maui as well as the offstream uses in central and upper Maui.

Chair Thielen continued, that under the middle or mid term, people talked about reducing waste and that is certainly something that could be done that would take the limited amount of water that's available and make it more efficient; either for some to be returned to the streams and to those east Maui communities, or to make the uses offstream more efficient and to be able to maximize the water. Reducing the waste in the mid term is something that could be done and it will take a little bit of time, but what could this Commission do to make sure that those things are happening.

Under the long term, as many people said over and over the largest offstream use is HC&S and it's not certain whether sugar as its being done now is going to be viable over the long term. Chair Thielen stated that it may be that some modified type of sugar production is going to be viable and HC&S has gone into different types of production, it may be different types of agriculture, may be something different not yet known. But what happens to the water over that long term? While future Commissions cannot be bound, this current Commission can certainly talk about things and put into place as part of its decision to make sure that in the event of future changes there is information on the table and an opportunity to come back and revisit.

Chair Thielen decided to begin with what to do in the short and immediate term, and to see if some consensus or agreement among the Commission could be made before moving on to the mid term and long term.

Dr. Miike mentioned that yesterday they also talked about if they don't accept staff recommendations and take some other action, the Commission needs to give the staff more specific directions about what they can accomplish in a reasonable timeframe because the last thing he wants to happen is to use the old fall back about the need for more information and end up not making any decision. Dr. Miike said they make decisions on what information they can get and improve their decisions as they get more information. In retrospect, he said he was asking too much of the staff to not only provide the information but to then take the law and try to apply it so that it came out with very specific recommendations. What the Commission needs to do is to tell staff what additional information to gather. It's the other side, the uses that are not quite sufficient yet. The kind of comments, for example, that Alan Murakami had said are more legal issues more than anything else. Dr. Miike opined that the Commission should tell the staff what additional information is needed, along with some analysis of that information, and some of the options that the Commission can consider in order to provide a decision on the instream flow standards. Conceptually, Dr. Miike said it's pretty simple, instream restoration is a use. Some people testified earlier that they considered it a waste. It's no more a waste than saying a forest that is not cut down for lumber is a waste. And the law is pretty clear that instream restoration is a use. Based on the information provided yesterday, Dr. Miike believed that the Commission could give direction to the staff about

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which numbers they should be concentrating on and maybe even prioritizing about how it's done. The Commission is not compelled to restore all streams and under an interim standard versus a full standard, streams can be grouped. Thus, the Commission could decide which of these streams stand the best chance for improvement and not have to restore all streams.

Dr. Miike continued, that on the other side, Mr. Murakami was saying that if HC&S doesn't provide information on requirements that's the end of it. It's true if they were coming to the Commission for a permit, which could be denied because HC&S hasn't provided enough information. However, this is not the case in setting the interim IFS. The Commission can take whatever information can be garnered and make its own decisions on that. The reason for the discussion is that there is a parallel case in the Na Wai Eha situation and if one looks at that the way the Commission is approaching that situation it lays out a scheme about how such balancing can occur. There are offstream uses which are agricultural, Department of Water Supply, HC& S agriculture and taro loi; taro loi are offstream uses. In the past, when the Commission approved the eight (8) streams and changed the interim IFS to accommodate, in part, some taro loi, that was not an instream use. But, the interim IFS says that any water that is reserved for downstream, offstream uses are part of the interim IFS at a particular point on the stream. So what the Commission technically did was change the interim IFS so that part of the interim IFS was for downstream loi. It was not because taro loi were in the stream being used in the stream. On the other side, the law is quite clear that if this were a permit there is a very rigorous way of satisfying what the requirements are. In the interim IFS process, Dr. Miike believes that the Commission has more leeway to use the best information available. He said there were some confusing numbers thrown out yesterday by HC&S. Staff however had used a model to come up with a range of roughly 1,600 to 6,000 gallons per acre per day, and people were confused about those figures versus HC&S' figures. Dr. Miike stressed that staff's figures come from a model and that's just a starting point under ideal conditions. So there are judgments about what is actually applied in the field. On the upcountry agriculture, it's not enough to say they use 10 million gallons per day (mgd), but the Commission needs to know what kind of crops and how much water, so an estimate can be made of what is a reasonable use versus any old use; same for the Department of Water Supply and same for the taro loi. If the Commission does that and finds out, for example, that out of 177 mgd, requirements are only 150 mgd, then 27 million gallons could be put back into the streams because that's an excess. Dr. Miike believed that there would be no economic impact on offstream uses because by policy, the Commission should not ascribe economic impact to inefficient use of water. Now, if the Commission were to then put back 40 million gallons into the streams and begin to cut into reasonable uses, that's an area where the economic impact would need to be assessed. Dr. Miike suggested that staff should take the information that was talked about yesterday, come up with a list of streams and the amounts of water that might reasonably go in, ask again for use information in terms of the offstream uses, then see if estimates about water requirements come near that to the amounts of water that are being diverted. If it's exactly the same, so be it. If it's less than the amount diverted, then water can be put into the stream without harming anybody. If the Commission decided to put more than that into the streams then the impact on people who are receiving less water than they reasonably need would need to be determined. Sounds simple, Dr. Miike stated, but those are numbers that can be provided to the Commission, then the Commission, along with the Attorney General, can then apply the laws to that and decide what the answer should be.

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Chair Thielen stated that one commissioner's recommendation is more discussion on what specific data is available and then possibly come back. But again, the approach to the discussion was the concept of taking it on the short term, the mid term and the long term. If the Commission is agreeable to that, then the value of the deliberation will be that many of the parties that hold the information the Commission is seeking are present. Parties could be called up to begin some discussion and refine what information is available, clear up anything that is confusing and provide greater direction to the staff and others, and possibly reach some decisions today. Breaking the issue up into those terms makes sense because it's manageable pieces.

Commissioner Balfour agreed that Chair Thielen's approach makes sense and one of the things that kept coming up was the "average". However, the average is really not a number that can be used. Considering the East Maui Irrigation (EMI) System goes from a low of about 12 mgd to an excess of 450 mgd, using the average as a gage doesn't work. While people keep talking about HC&S, there are lot of other users, farmers on half an acre – 20 acres, ranchers, domestic water and a whole bunch of people at the other end that need to be considered. If the Commission considers putting water back into the streams, and EMI is already doing 12 mgd on a very poor day, then there's nothing left. The most important consideration should be domestic water supply. Every agricultural entity has an equal role in this whether big, small or indifferent. Commissioner Balfour stressed his concern about using averages, and asked that the Commission look more at the range than the averages.

Chair Thielen stated that Commissioner Balfour raises a good point, that averages are misleading, and that cumulative and winter and summer months should be kept in mind during the discussion.

Dr. Fukino wanted clarification on the short, mid and long terms, and asked if it refers to goals, actions, and things to see immediately. Chair Thielen explained that in looking at competing instream and offstream needs and competing desires, there are some things that can probably be addressed fairly quickly that will not be so wrenching and will be improvements. Some things can be relatively simple and accomplished in the short term. For instance, there is the importance of having a wet stream below a diversion so fish can move past it, along with the issue of entrainment and the animals being captured by the ditch system. If the Commission can direct staff to identify streams where those pathways can be improved to protect the biota, then that's a relatively simple objective in the short term. Chair Thielen also raised issues regarding summer and winter months, and if anything can be done in the short term to provide more water to the stream without creating a hardship. Mid term, she explained, is what is going to take a little bit more time to do but that this Commission needs to be the body to start directing entities to prepare for it. There are a lot of people using this water for offstream purposes including taro farmers, domestic and the like. It's very difficult to go after those individuals that may be in the hundreds, even thousands. HC&S tends to be an easier target because it's the one big user. But really, the avenue to go after all that waste is the County because they're the water system that's delivering it. And that's the system that has a significant amount of waste through the Upper Waikamoi Flume. So whether the water continues to be offstream or instream, that waste is something that could be recaptured. Given the drought, given the limited water supply and the competing demands and the needs to the streams themselves; what should be done? Long term? Chair Thielen noted a tremendous amount of community support for agriculture. She also identified Sandy Kunimoto, director of the Department

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of Agriculture, as the only one that mentioned that the State Constitution was encouraging the identification of important agricultural lands, especially since many lands have been turned into subdivisions. A&B is the first entity to step forward and voluntarily designate a significant amount of the central Maui plains as important agricultural lands. That's a significant thing, which is the support to keep it in agriculture. What happens if agriculture goes away? Chair Thielen believed that people supporting the use of water for long term agriculture would not be supporting the offstream use if it were going to other purposes. It's important for the public policy that the Commission is responsible for, that, if there's a decision to end agriculture for the long term in the central Maui plain, the decision on what to do with that water shouldn't be made by a private company. It should be made by public officials in a public process.

Evidently everything seems to be leaning towards restoration, Commissioner Fujiwara said, whether more water is added to the stream or not. Commissioner Fujiwara felt that what is needed is a dialog among the plantation farmers, DAR and everybody else. He also questioned the need for an action and if that action could come in terms of the things mentioned. Commissioner Fujiwara asked the staff how the process was different from the one last year on the eight streams or was the process same for the 19 streams. Deputy Ken Kawahara responded that he didn't think the process was different; however, the data that staff looked at was different. He gave as an example, the first eight (8) streams had 30 registered taro diversions versus one (1) active registered taro diversion on the present streams. Deputy Kawahara added, though that's not to say there couldn't be restoration of other taro loi in the future. Deputy Kawahara explained, that information was something staff was looking for in the October 15 public fact gathering meeting that was held in Paia. Staff tried to explain to the public that if there is information in the instream flow standard assessment reports that is not accurate or there's more information that can be provided, staff will factor that information in when preparing the recommendation. In general, from staff's perspective, there are various competing uses and it was important to address the needs of the people first. Deputy Kawahara noted that Commissioner Balfour talked about the needs for domestic use, taro cultivation, gathering in the streams, and native species. Staff believed that these aspects were considered. One example is the biota needs in the lower reaches based upon the information available in Table 6, the biological rating, the different blocks of species that were found within the stream (on page 15), the active taro diversions, and the noninstream uses of water that were taken off alongside the stream as well as to central Maui. Deputy Kawahara reiterated that he didn't believe that the process was different, but the data that was gathered was different for the previous eight streams.

Chair Thielen suggested setting aside mid term and long term issues. Looking at the short term, there was some discussion yesterday about the possible concentration of some streams, discussions about how much water HC&S need and she thought the Commission is going to want more information. The challenge is that the Commission doesn't have a way of mandating people provide the end use information because there aren't any permit conditions. Instead, she suggested that some of the users be called up to talk about the short term, their water needs for summer/winter, and explore what some options may be. The two big users are HC&S and the Maui County Department of Water Supply.

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Chair Thielen called forward the representatives from HC&S to answer questions about their water needs, discuss options, and summer and winter flows.

Dr. Miike commented that he did not agree with Commissioner Balfour about not being able to use averages and explained that the way it's monitored is a twelve month moving average. For example, if the 12 month moving average is 5,000 gallons within the limits of the source, the user can use any amount of water as long as the 12 month moving average is kept within the limit, so that in very rainy times they might use a little and very dry times they might use a lot. Dr. Miike affirmed that averages are usable. The limitation that users face is one that they've always faced with an added twist. They were always subject to how much water they could get out of the streams. The added twist is now users must leave a certain amount if the Commission changes the IFS then they are free to take anything over and above that as long as they stay within the moving average.

Chair Thielen stated that she thought Commissioners Balfour and Miike were being consistent. Dr. Miike is looking at the issue from a legal point where the 12 month average may vary over time. What Commissioner Balfour is saying is that when dealing with numbers, the Commission has to be mindful of the minimum flow that has to stay in the stream during dry months. The Commission recognizes that water levels are going to be different over time and over the course of a year.

Chris Benjamin, General Manager of HC&S, and Rick Volner, Sr. Vice President of HC&S in charge of all departmental operations as well as East Maui Irrigation came forward.

Mr. Benjamin thought that this is a very healthy discussion and stated that this really is at the core of the reason that it has been a challenge to provide the Commission with HC&S needs, and that is the issue of averages. Mr. Benjamin stated that averages are very difficult for HC&S to deal with and mentioned that Dr. Miike posed an earlier question, if HC&S could afford to give up 2%, 5%, 10%, and replied that if HC&S had 166 million gallons every day throughout the year then giving up the proposed 12 + 1 mgd would probably be reasonable. Mr. Benjamin pointed out that the problem is during the summer, when this becomes a significant percentage of the total flow. He asserted that the greatest growing opportunity and greatest water shortages are in the summer, and the greatest impact of over 13 million gallons is therefore in the summer. If HC&S had the ability to adjust the interim IFS as it went through the year and achieve an average through the course of the year then HC&S could absolutely afford to have a higher interim IFS in the winter. Mr. Benjamin stated that the reason that HC&S strongly supports staff's recommendation is the fact that this is going to hit the company in the summer, during the most water-short period but also during the best growing opportunity because of the sunshine and the warm, long days.

Rick Volner reiterated that, as a farmer, there's certain things that need to be looked at and obviously for HC&S, the key to their success are the yields. The more sugar HC&S produces, the more biomass is produced, the more sugar that's produced, the greater opportunity there is at success. Mr. Volner said that it's a very simple equation, sun plus water equal biomass. HC&S has a very complex system where evapotranspiration rates for all of the fields are measured on a daily basis and explained that this is done through 43 meteorological stations located throughout the plantation and on a daily basis, measure what the water needs of the crop are. If 100% of the

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evapotranspiration were applied every day of the year, in theory, the total production on those crop acres would be maximized. Obviously, the greatest opportunity for growth is during the summer months when there is the highest amount of sun energy available if there is adequate water to convert that to biomass, thus providing the greatest opportunity for high yield. Another key point is just as surface water flow changes on a daily basis or seasonal basis, evapotranspiration also changes. During the winter there are less hours of sunlight available and with cooler temperatures evapotranspiration is lower, therefore irrigation needs are lower. During the summer months, the opposite is true; with higher sunlight and higher temperatures, more water is needed to match that evapotranspiration. Mr. Volner thinks that averages can be very dangerous. If it were known that on every day of the year 166 million gallons of water would be available, it would be very simple to farm and manage, unfortunately that's not the reality. As was shown in the staff's submittal the period of ditch flow has a low of 21 mgd and of high of 317 mgd. At the very opposite end of the spectrum, the 317 mgd occurs in the winter months when demand of the crop is lowest. The 21 mgd occurs in the summer months when the crop needs the most amount of water. Any time less water is applied when there is evapotranspiration, this would limit the yields.

On the entire 30,000 acres that are irrigated from the east Maui system a simple average of evapotranspiration would be about 0.25 acre inches (equivalent to approximately 6,789 gallons per acre per day), which translates to about 204 mgd. If the plantation is receiving about 166 mgd, on average, from the east Maui system and the needs are 204 mgd on average, then there's already a deficit. Looking at one extreme during the summer months, normal acreage per day evapotranspiration is in the range of 0.35 (equivalent to approximately 9,500 gallons per acre per day), meaning that roughly 285 mgd would be needed to meet crop evapotranspiration and maximize yields.

Dr. Miike asked what the effect of rainfall is, since rainfall would need to be subtracted from evapotranspiration. Mr. Volner agreed, but rainfall is not something that can be counted on. Dr. Miike noted that based on the information presented for Na Wai Eha, HC&S basically used the same model that staff and Dr. Faris used to model real-world conditions. Dr. Miike stated that evapotranspiration does not equal what HC&S needs every day of the year, that when it rains, less water is used. Therefore, how would rainfall affect the numbers that were just provided? Mr. Volner noted that, as far as the average, the rainfall is already incorporated into the daily evapotranspiration rates, because if there's rainfall, then evapotranspiration for that day will be a lot lower. Dr. Miike said that's not the way he sees the model being used, where it is evapotranspiration rate minus the rainfall minus any ground water. In HC&S fields there is no ground water contribution because the roots don't reach down. Mr. Volner agreed and added that on any day that it's raining, generally there would be large cloud cover and the evapotranspiration calculated for that day is going to be a lot lower.

Chair Thielen stated that Commissioner Balfour had mentioned the low flow of the EMI system. She confirmed with staff that the amount ordered for restoration on the first eight streams was roughly 12 million gallons a day. Chair Thielen then inferred that the total system is taking from 29 streams and in the summer months is collecting 21 mgd, and that the water from the five streams that were restored will have diminished as well. So, the EMI system is only picking up a certain amount of that total. She asked if HC&S was aware of the volume of water being collected from

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the different streams, because one consideration for the Commission is to spread out restoration across a large number of streams or concentrate restoration in a few streams. Chair Thielen asked if information on the 19 streams being considered was available, what streams would be critical for operations during the summer, and what streams would be less critical from HC&S' perspective.

Mr. Volner said that HC&S, based on their gaging system, didn't have information on the amount of water diverted from each stream; however they did have regional data for the four licensed areas. Dr. Miike asked if it made any difference to HC&S, in terms of water needs, if the Commission were to concentrate restoration in a few select streams versus being spread across multiple streams. Mr. Volner said their understanding of the interim IFS was that when it was set in the stream it is the first priority, first water that's available. If the interim IFS were set correctly, and it could be achieved every day of the year, then it shouldn't matter which streams it's in. But, if it's an inflated number which is what's being found in some of the first eight streams, and that the water isn't there even when EMI is not diverting water, then it's actually been set too high. If the IFS is set too high on a stream that is very productive for HC&S, then yes it's going to hurt a lot more. Dr. Miike contended that if the IFS were set too high, water was released, and the IFS were not met, then it would mean that the IFS would be lower and it would then be to the advantage of HC&S. Mr. Benjamin agreed with Dr. Miike and noted that setting the IFS across fewer streams would probably be preferable to HC&S.

Chair Thielen wanted to revisit the 12 month moving average. Her understanding was that the instream flow standards was the amount of water that would stay in the stream and any time that the water was above that level could be diverted, so the 12 month moving average doesn't matter and asked if that was correct for the interim IFS. Dr. Miike said that for the interim IFS it doesn't matter, but he was referring to HC&S' use of water. Dean Uyeno said that normally, in the case for ground water especially, staff uses a 12-month moving average (MAV) to regulate well pumpages like Dr. Miike had mentioned, where pumpage rates in the summer months are higher, while winter pumpage rates are usually lower. While staff could consider using a 12-month MAV for offstream diversions, divertible capacity of the diversions are generally used instead. Chair Thielen asked if, in looking at the Water Code and the interim IFS, would the Commission be able to set divertible capacity standards based on dry seasons versus wet seasons? Mr. Uyeno agreed that was a possibility, but actual implementation would depend on the physical nature of the diversions' structures. Mr. Benjamin agreed and noted that EMI would need to consult with the staff on where that's feasible. Chair Thielen summarized that if the Commission were to go the route of using wet and dry season variations, then the existing infrastructure would need to be assessed if it can accommodate that or it would require work.

Chair Thielen reiterated that HC&S water needs, on average, were 204 mgd, and 285 mgd in the summer, but questioned the winter needs. Mr. Volner noted that evapotranspiration can drop as low as 0.15 acre inches, approximately 4,000 gallons per acre per day, or 122 mgd. Chair Thielen asked for a seasonal range. Mr. Volner responded that, generally, May through October is the dry period and November through April is the wet period.

Chair Thielen asked if HC&S has the total volume of water diverted by the EMI system in the summer and winter months. Mr. Volner said that he can get that information.

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Dr. Miike inquired how evapotranspiration matched up against the diverted amount of water diverted; considering system losses. Mr. Volner said loss is generally around 10 to 12 percent from diversion to actual application. However, there is also industrial use which accounts for about six (6) mgd. The 10 to 12 percent loss is equivalent to about 15 to 16 mgd on average. Dr. Miike also asked to clarify his understanding of the hydropower and that water is not being wasted. Mr. Volner confirmed that water used for hydropower is used for irrigation as soon as it's expelled from the hydro facility.

Dr. Fukino asked if the HC&S reservoirs were unlined and losing water, and if there were any plans to change those conditions to retain more water. Mr. Volner said that's something they would look at and do have two lined reservoirs on the plantation which were lined back in the 50's and 60's; and stated, again they do not feel it's a waste, but that it's contributing to ground water which is, in turn, pumped out of the ground in the summer months. Another important thing to remember is that when the ditch flows are low, water is not being stored but going directly to the crop, so during that time not much water is lost to reservoir seepage. In the winter months when ditch flows are higher more water is stored for when the ditch flows drops so more seepage occurs then. Chair Thielen asked if HC&S reservoirs go dry since water is used quickly. Mr. Volner stated that HC&S reservoirs are very small, on the order of 10 to 20 million gallons. Dr. Miike asked about the reservoir at the very end of the system. Mr. Volner noted Reservoir 45 is 15 to 20 million gallons, Reservoir 61 is very small, and Reservoir 90 is about 20 million gallons. Commission Balfour asked what the total storage capacity for all the reservoirs. Mr. Volner believed it is over 300 million gallons. Dr. Miike noted that it's a one day supply.

Commissioner Fujiwara asked if HC&S had ever considered putting some type of catchment system up in the forest reserve area that feeds the EMI system; perhaps clearing an acre, lining it, and catching water that can be added to the ditch. Mr. Volner said in the history of HC&S, the company has looked at a lot of ways to capture and use water, but he's not aware of anything out there. He noted that the plantation does capture water that falls on the plantation that's not used by the crops and any runoff is captured in other areas and directed to the ditches and ultimately used for irrigation. Commissioner Fujiwara noted that installation of a catchment system by NRCS for use by the Gorilla Foundation at Kapalua, and asked that HC&S look into such possibilities.

Dr. Miike noted that the argument regarding system losses being used to recharge the aquifer was made and lost in the Waiahole case by Waiahole Water Company; so, they were mandated to take reasonable steps to mitigate those losses. What the company has done is to reline the reservoir. It may be true that system losses help to recharge the aquifer, but as far as excusing system losses the law is clear that it's not. However, reservoir lining would be one of the intermediate steps that are needed, unless HC&S can show that the economic impact is too large. In any event, the approach has to be reasonable.

Chair Thielen asked for Maui County Department of Water Supply (Maui DWS) to come up, followed by the Division of Aquatic Resources, then the Petitioners (Native Hawaiian Legal Corporation, NHLC).

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Chair Thielen asked for the total land use, summer needs, winter needs, and the idea of multiple stream restoration versus fewer stream restorations. Director Jeff Eng said, in his experience, the Upcountry is by far the most complex to operate. The system is a mix of about 85% surface water and 15% ground water. An average day demand can vary from a low of 5.5 to 6 mgd in the winter, to 10 mgd in the summer. The challenge is in the summer when rainfall is low and the reservoirs are dry. The Upper Kula system has the Kahakapao Reservoirs and the two small Waikamoi reservoirs. The Lower Kula system Piiholo Reservoir holds 15 million gallons. Director Eng said at that point Maui DWS is relying on Wailoa Ditch and last summer that ditch went to a low of 12 mgd, the plantation was cut off, they ceased their planting operations and Maui DWS was just scrambling at that point. Generally, water is preferred at the higher levels, the Upper Kula system and the Piiholo system, because after treating the water it can be dropped down instead of having to pump the water up. During the summer when reservoirs are low, the system becomes very costly to operate, since water is taken from Wailoa Ditch, treated at the Kamole plant at 1100 feet elevation, then pumped up to the Upper Kula system at 4200 feet. This is monitored on a daily basis, so Maui DWS tries to operate at the lowest cost possible. Director Eng referred to the prior day's discussion of the Upper Kula system and the three sources that it relies on; Waikamoi Stream, Haipuaena Stream, and Puohokamoa Stream. He said the unique characteristic of that location is that it's generally a little bit above the rain forming clouds, so it looks like it's raining in east Maui but the Upper Kula system is not getting any water. Thus, the Lower Kula system is very critical for capturing rain-generated water.

Director Eng stated that Maui DWS has funding in the current CIP fiscal year to proceed with the design phase for replacement of the Waikamoi Flume and it is a very high priority. Funding for replacing the flume will be a challenge and Mayor Tavares will be going to Washington D.C. in January to seek federal assistance. It will probably be a cash-funded project at a minimum of 10 million dollars. Chair Thielen said she will put that in the mid-range box as far as the Maui system goes, then briefly recapped the Maui DWS Upcountry system.

Chair Thielen asked Director Eng to clarify the individual system needs for both summer and winter seasons. Director Eng responded that there is generally a 40% increase in overall demand in the summer across the board whether it's Upper Kula, Lower Kula, or Makawao. Chair Thielen asked if, from his experience, the system demand is 40% higher in the dry season. Director Eng replied yes. Chair Thielen questioned the prior day's testimony that one farmer testified that the Upcountry restrictions applied to agricultural water, while someone else testified that they don't. Director Eng confirmed that agriculture water users are exempted from any restrictions. Chair Thielen asked if it was an ordinance or just a judgment call made by Maui DWS in dealing with the water restrictions. Director Eng responded that Maui DWS does have the authority and, with the approval of the Mayor, to declare voluntary or mandatory restrictions. Chair Thielen questioned that in the future that's not a guarantee that that's always going to happen. Director Eng agreed that it's a judgment that will be made continually.

Commissioner Balfour asked to confirm that the Upcountry water demands range from a low of six (6) mgd in the winter to a high of 10 mgd in the summer, cumulative for all three systems. Director Eng confirmed that it was.

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Dr. Miike asked if there is any way of imposing or monitoring, voluntarily or otherwise, certain water limitations. As an example, if a farmer decided to dump a lot of water on the fields, is there any way Maui DWS can control that? Director Eng answered that the County has been very supportive of the efforts by agricultural customers and farmers, so the County hasn't really imposed restrictions or cutbacks. Most farmers are prudent enough to recognize when they're going through a drought period to pass on a planting stage or period. They apply common sense and are generally the best managers of water usage, so most conservation efforts are directed toward residential customers. Typical residential customers use an average of 300 to 400 gallons per day.

Dr. Fukino questioned Director Eng's mention of the Upcountry system comprised of 15% ground water and where it comes from. Director Eng said Maui DWS does have three (3) deep wells; one in Haiku, one in Kapakalua, and one in the Makawao area (Pookela well). Dr. Fukino then asked if Maui DWS ever changes the percentage of ground to surface water when experiencing trouble and how much can be pulled from the ground. Director Eng said the only backup they really have Upcountry is the Pookela well which has a maximum pumping capacity of 1.3 mgd. Generally, when there's sufficient storage in the Upper Kula and Lower Kula reservoirs and sufficient flow in the Wailoa ditch, then the Pookela well is not run, as the elevation of 1800 feet is very costly to operate. The Maui DWS management plan is always to operate at least cost, but operation during the summer does change the ground water-surface water mix. Looking at the three ground water sources, to date, the 12-month moving average has been about 1.4 mgd, but for many months Pookela well is not run. Only when there's a drought or a lack of rain in Upcountry, then the well is run as it's the only backup source of water.

Dr. Fukino asked what the cost is to pump the water. Director Eng said it varies, as right now oil prices are favorable so the costs have come down a bit. He used to monitor the cost per thousand feet of elevation, and that it's at least \$1.50 per thousand feet for electricity alone. Director Eng corrected himself and said per thousand gallons.

Commissioner Fukino then asked if alternative sources of energy have been considered to run the pumps. Director Eng said they are discussing options because they are Maui Electric's largest customer. At our Kamole facility, high-lift pumps are employed to pump water from the 1,100 feet elevation to the Pookela tank at 1,800 feet elevation. That electric meter for those pumps is Maui Electric's single largest account. So Maui DWS often looks at those costs and are conducting additional studies because it may be a location that wind power could be used at least part of the year. Currently their program is to replace most of the motors so for the past two years they've installed higher efficiency motors that have a payback period of two to three years. Director Eng agreed with Dr. Fukino that alternative energy is the right direction to go since they're basically pumping water uphill. Chair Thielen noted that this should go in the mid term box.

Commissioner Fujiwara asked if Maui DWS has looked at other wells in the area, since historically use has been surface water. Director Eng agreed that the direction for Upcountry was to not have 85% reliance on surface water; otherwise, any type of drought situation would be trouble.

Commissioner Fujiwara asked what any studies show for the area. Director Eng said that they currently have a contract out with a consultant to look at some ground water sources in the Makawao to the Kapakalua area. There may be some opportunities on siting the well, but many

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things need to be considered including the hydrology, geology, and the cost of tying into the existing water system.

Commissioner Fujiwara said Darrell Yagodich came up the prior day from DHHL and wanted a reserve of one million gallons out there and another testimony for more water than that. He asked if Maui DWS was aware of that and what they are doing about it. Director Eng has heard various numbers also and does understand the priority that Hawaiian Home Lands have. Maui DWS works closely with DHHL on a lot of their water needs Upcountry, projects in the Keokea area, central Maui and west Maui. In the case of west Maui, Maui DWS is working with DHHL in developing sources. Director Eng believes that as they proceed with future developments in Kula, Maui DWS will work with DHHL to develop more sources, primarily ground water in the far end of the system. Right now, most of the water is coming from the east Maui watershed and has to be transmitted to the very far end of Kula. For water quality purposes, Maui DWS would probably want to introduce water somewhere in intermediate areas of the Hawaiian Home Lands projects to keep the water age quality better and he said they will be working with them.

Dr. Miike asked to hear from HC&S about the capacity of their brackish water wells to supplement and to see how that capacity can mitigate during low surface water times.

Chair Thielen asked to hear from Dan Polhemus, Division of Aquatic Resources, regarding the impact to the stream if looking at a wet season versus a dry season variation, and whether it's any value to the biota. She noted that some issues covered during the prior day included the ability of fish to get upstream, the ability to avoid entrainment, and that's something everybody can work on a diversion basis. But as far as water volume, Chair Thielen asked if there's any value to the biota in the stream if there's more water in the winter and not so much water in the summer, or will it just not matter.

Dr. Dan Polhemus said there are two components for streamflow. There's the base flow which essentially means the ground water contribution that's always coming in, although USGS has shown that basic flow has gradually decreased over time. On top of that, there are effects from rainfall which augment base flow, comprising total flow in the stream. Clearly, during the summer there is lower total flow than in the winter, so yes, there's an annual variation in flow and yes, the animals that occupied the streams have evolved around that variation. It is less pronounced in certain systems because systems like Hanawi are highly spring fed, thus the base flow is very high. It probably has less of a total variation over the year than many of the other streams under discussion. While Hanawi is due to Big Spring, the others do have pronounced seasonal variations.

Chair Thielen asked if there would be enhanced ecological viability, or an improvement in the habitat units for native species, if there were releases during wet season more than dry season. Dr. Dan Polhemus said that animals can hold over in the sections that still flow or in pools during periods when there is not complete connectivity. In other words, 100% complete animal connectivity is not required to still have some biological viability. More water in the stream is better for animals, but if certain sections dry up for a period, it's not necessarily fatal to the biota as a whole. If streamflow could be fully restored the maximum benefit would be realized. But even if it could be mitigated for portions of the year, with streamflow more than what it is now (because

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now connectivity only occurs during high rainfall events) that would provide positive effects. Calculating habitat units is a combination of potentially suitable habitat versus the amount of time that habitat contains water. For example, if there were 100 habitat units, but those units contain water only 20% of the time; they might score as a 20. A habitat unit is only scored as viable in the model if it actually has water in it at any given time.

Dr. Miike asked if that would hold in conditions where most of the time all the water is being diverted. So, even if there's a flushing rain, flow would be decreased due to diversion and the result is a longer period of relatively low flow, which may go even lower in dry periods where it might not even flow. He asked if that would have a negative effect. Dr. Polhemus said it will influence how available habitat units are calculated at any given time. Dr. Miike asked if, overall, given the need of offstream uses in low flow periods and if the Commission tried to mitigate the effects of low flow periods for the offstream uses, would it then be a little worse for the instream uses. Is that a fair trade-off? Dr. Polhemus said that, in general, yes. For example, Honomanu is dry for a very long distance inland. There is a very brief period of connectivity during flow events. If this connectivity could be established for longer periods of time, then it would certainly improve recruitment into the upper catchment, resulting in better ecological function as a whole within the stream. Even though conductivity might not be reestablished 100% of the time every day of the year, there is still a benefit to increasing connectivity more frequently than is the case now.

Dr. Miike then asked if Dr. Polhemus is basically saying that any improvement over the current situation would increase recruitment; the extent of which you could only know once you do it. Dr. Polhemus agreed, and then added that the tools are available to be able to assess what is gained, rather than just guessing. The model can calculate it and provide quantitative outputs that can then be tested by ground-truthing. Commissioner Miike noted that there's an assumption that the increase in habitat is directly related to increased recruitment, which is not an unreasonable assumption. Dr. Polhemus clarified that it's a prediction that can be tested.

Commissioner Fujiwara asked staff where the stream assessments, specifically the portion on maintenance of fish and wildlife habitat, were taken from. Chui Ling Cheng said DAR published a Watershed Atlas which included the biological rating and an assessment summary for each stream based on stream surveys, some of which were done recently. Commissioner Fujiwara asked if they could get a feeling for the amount of habitat that was being talked about. Dr. Polhemus said its many linear kilometers of, currently non-functional, stream habitat that can be recovered. He noted, as was discussed the prior day, that DAR worked out the total predicted habitat loss in this system based upon an analysis of eight (8) species of microfauna and their habitat characteristics. Using GIS, they analyzed these species using a 10-meter grid and determined the aggregate kilometers of habitat in any given stream that the species occupy, don't occupy, or could potentially occupy. When DAR looked at this in total, across these eight species and for the streams under consideration, there is a total habitat loss of 67.3 kilometers of habitat. That doesn't mean 67 lineal kilometers of stream, but rather it's across all eight species. For example, there might be 20 kilometers of habitat loss for one species and 10 kilometers for another. In any case, the point of DAR's recommendation was simply that with a few strategic catchments the Commission could mitigate 68% of that habitat loss.

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Chair Thielen asked for clarification if what Dr. Polhemus was saying is that total habitat loss is for all eight (8) species and could be in the same area. Dr. Polhemus explained that, for instance, Stream A has habitat for mountain opae, which climbs really well, but is not losing as much habitat as would be the case for some of the fish.

Chair Thielen asked, as far the volume of water, if Dr. Polhemus was saying that some restoration is going to create some improvements even if it's a seasonal issue for the biota, and that DAR can go back and measure if there increased recruitment even there was not 100% conductivity 100% of the time. Dr. Polhemus agreed and added that it would vary on a species-by-species basis, because even if there was a certain amount of conductivity, shrimp might be able to use it but fish may not.

Commissioner Fujiwara said there was testimony the prior day on gathering rights regarding these streams and where wildlife was found. He asked if there was easy access for people to get to or would they usually wait for a big rainfall and catch it at the bottom. Dr. Polhemus said he was not personally familiar with local patterns of cultural resource utilization in east Maui. His assumption was that there is harvest in nearshore waters and perhaps, to some extent, in the shore where there is access by boat. There are few streams where you can access the mouth, such as Makapipi and Hanawi by trail. And there are other places to access such as at Hana Hwy, and other roads and trails.

Dr. Fukino asked Dr. Polhemus to describe what he meant by modification (in his December 15 report), where DAR recommends modification of the Koolau Ditch diversion structures, and if specifically meant gates that fish can climb up on the side or specific modification of the actual diversion structures. Dr. Polhemus said there are a wide variety of diversion structures on the EMI system, thus a simple solution would be difficult as each one presents a different challenge. However, there's one overall generalization to many of the structures and that is that they utilize a grate that extends across the width of the streambed. As the water comes down, the total flow goes into the grate and thus no water passes over the diversion, so that all the water is taken in and then moved off laterally. Those structures, in particular, are the types of structures that result in nearly 100% entrainment such that even if organisms managed to migrate upstream during high flow, over the diversion, as they are ready to migrate back down in a lower flow period, they get to the diversion and then are sucked in. So, even if the organisms get to the recruitment, the benefits would not be realized because they would be lost. What is needed is some way to partially bypass the grate so that a certain amount of water could flow over a portion of it to provide some sort of fish and animal passage corridor. The passage would not need to be that large so that even they could bypass a certain proportion of the diversion, and some proportion of species were able to make it back downstream, then its better than the situation today.

RECESSED: at 11:10 a.m.

BACK IN SESSION: at 11:19 a.m.

Chair Thielen said the longest discussion will be the short term and the mid term and long term discussions will be relatively smoother. Chair Thielen called up Alan Murakami, representative for the Petitioners.

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Chair Thielen said she thinks there's going to be different perspectives on the long term priorities and rights, so rather than having arguments on the legal issues, she would like to set those aside, understanding that no one is waiving their rights to bring up these legal arguments, later she asked the Commissioners and Petitioners to focus on the short term, seasonal approach for all the streams from their perspective.

Alan Murakami said he had some responses to particular questions that were raised. Chair Thielen noted that the Commission heard from the two main diverters, HC&S and the County of Maui, and their biggest concern was the dry season. From their perspective, there is probably room for something during the wet season, while DAR obviously believes that 100% return flow would be better, but some improvement is better than no improvements. She also stated that NHLC is representing some people in that area that also had some desires during dry seasons and wanted to hear from a different perspective.

Alan Murakami said he thought that they did not have access to a bunch of information which he believed was very relevant to the discussion. Mr. Murakami referred to DAR's perspective on legal issues, waste, and excessive use of water. Chair Thielen reiterated that Mr. Murakami certainly reserves all rights. Mr. Murakami said he was trying to get to the fact that he thinks it's very difficult for members of the public, from a purely non-legal standpoint, to deal with the questions of waste when the information seems to indicate a significant cushion of potential savings, some of which may just be issues of efficiency. The differences are so huge that it seems, as Dr. Miike suggested, that perhaps there's room for discussion of this efficiency problem. Chair Thielen said those issues would be debated in the mid term and long term but at hand was the immediate short term. Mr. Murakami said he was not so sure it's mid term because the uses are current and the degree of it is so high that those are suggestions for short term fixes but also some real questions on how to achieve that. There are some mid term and long term solutions such as lining and reducing evaporation, but there was a big question that was brought up by the staff last year. While NHLC calls for deferral because of lack of information, there needs to be some deadlines for action on some of these concerns so that certain things get done, or are triggered if that information is not available to the Commission in a reasonable time to favor the restoration of streams which is really the premier public interest at stake here. NHLC wants to move in that direction but clearly there's a bunch of things here that seem to be the real issue which overlies the whole approach that is being taken. If some resolution can be brought to the kinds of issues that were brought up in NHLC's complaint for waste, then perhaps the Commission could achieve the results it's seeking with the elimination of that waste. Mr. Murakami noted that there were some very specific things mentioned that needed to be addressed with respect to the management and short term about how a better balance might be achieved. For example, the question about the ground water versus surface water utilization by HC&S. Mr. Murakami raised the issue of a shift on the reliance on ground water sources, referring to Lucienne de Naie for more information, that at one time there was a 50-50 mix between ground and surface water five years ago to a heavier reliance, up to 80%, on surface water currently and there's no explanation for this. He questioned that during the summer months there is a drop in the total surface water flow, but why isn't there more ground water pumping to supplement the water needed to irrigate cane. Mr. Murakami also noted discrepancies in the HC&S

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flow values noted and questioned why during low flows can't ground water sources be utilized more heavily.

Chair Thielen stated that she understands the argument that Mr. Murakami is making and understands his frustration with the lack of data, but at this point she wanted to hear from them, noting that all the issues still remain on the table, and if the Commission were to defer as many people had suggested, perhaps including the petitioners, the Commission has spent about two years looking at these issues and still haven't been able to obtain all the information being asked for. Chair Thielen said that the Commission can either defer again and spend another two years, and maybe that information does or doesn't come to the table, or the Commission can take some actions, and as part of those actions, can warrant some requirements to get information to be able to make better decisions in the mid term and long term. She emphasized the need to get that information and what to do when the Commission comes back. Referring to the short term objectives, Chair Thielen noted that some discussion took place indicating that the Commission didn't have to wait for more information, but that there were some steps that could be taken right away to improve the situation that was not a wrenching upheaval for certain people or certain interests. She identified two that were mentioned to this point: 1) can some diversions be modified to allow recruitment of stream biota upstream and reduce entrainment downstream; and 2) can a seasonal approach be taken so that during the dry months the current diversion would continue but in the wet months more water could be returned to the streams.

Alan Murakami wanted to make clear that some of the things he said directly addressed short term solutions as well. He referred further discussion to Lucienne de Naie, but closed by saying that there's clearly some lack of information. He noted that the DAR proposal, for example, was a concept that didn't seem unreasonable, in terms of the ability to get the biggest bang for the buck to achieve immediate improvement, but was hesitant until he could see exactly how it works in each stream and how USGS could translate that into actual water on the ground. He said it was a little difficult to react to, but as a concept in terms of the spirit of what was being discussed, it doesn't sound like a bad short term solution to try and move forward. He said they clearly want to see water get into the stream as soon as possible in any form.

Lucienne de Naie said she is an on-stream resident and wanted to make clear that she thinks these ideas and the discussion are good, and is the direction that needs to be taken. She agreed with Mr. Murakami and that some key information to make decisions was missing, so at the very minimum that information needed to be identified, who could provide it, and when. She pointed out that though her stream which had partial restoration, Hanehoi Stream, the community has been taking some measurements in the drier season (i.e., July/August 2009), but that they're not getting the 0.57 mgd that's supposed to come below the diversion. She noted that during dry, low flow times, people need to realize that nobody gets the amount of water they're hoping that they might get. She believes that during those dry times, system losses take a heavier toll because if the system has to divert 10, 15, or 20 percent more to end up with some flow at the end (e.g., 12 mgd) and the flows have dropped 20%, then the impact is greater during those times. The other issue she noted is the idea of seasonal adjustments, and that there be some incentives for the large user (i.e., HC&S). Ms. de Naie said that she didn't consider Maui DWS a large user, since their entire needs are met with 7 mgd of water, and that there are two wells in central Maui that produce 7 mgd. Maui DWS are not

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the ones being impacted by this except that their system, the cheapest delivery system, is in such poor shape that it impedes the amount of water that they can reasonably receive from it. She emphasized that she would like the Commission to look at the needs of the stream biota in particular, noting that USGS already has some figures to indicate how much water might be needed to restore habitat. She believed the petitioners would agree that if all the numbers were known, a clear decision could be made on whether this is good for everybody or is it only going to put more burden on the system. She expressed support for the low tech solutions like Commissioner Fujiwara suggested, such as setting up some catchment areas, to start thinking simpler and cheaper, and to analyze rain records to see where rainfall is consistent in the summer. Referring to Mr. Baldwin and Mr. Alexander, Ms. de Naie stressed the need to think adaptive, to examine how to better utilize what happens in terms of weather patterns rather than place unrealistic demands on the natural resources, and the need to somehow store water for when there's no water. She agreed that the discussion was a good start and that more information was needed from HC&S on how they use water from their system (e.g., do they irrigate all 27,000 acres every day, or a certain number of acres every 2 days). Lastly, she noted a discrepancy between the 1990 Water Use and Development Plan, where HC&S wrote that 10,000 acres were solely dependent on surface water and could not utilize any pumped ground water, whereas in the current assessment that figure is now 13,000 acres. Ms. de Naie said that it would be good to find out where those acres are and if there are any other alternatives for them, because that's a large area dependant on surface water.

Chair Thielen recapped Ms. de Naie's comments that the mid term and long term solutions are to look at creative solutions and find alternatives, recognizing that nobody's going to have as much water in the summer months, but if there's more in the winter, then being able to do some restoration or improvement so long as the concept is one worth looking at.

Ms. de Naie said the Commission should find out exactly how many low flow days there have been over the last five years, is it 10, 100, 50, because that would be very useful information to make a decision with.

Chair Thielen agreed that more information in the area is better, but that there isn't as much data on hand as everybody would like. She reiterated that the Commission is looking to make decisions with best available data and identify data needs for the future. Commission staff also recommended adaptive management and so that as additional data is gathered the Commission would need to come back.

Ms. de Naie said her guess was that if the Commission asked for that data, it is readily available, because those stream records are kept in the EMI office. Mr. Murakami said that with the reliance on the data, there needs to be some mechanisms in place for achievement based on data needs because it's been a little frustrating, at least in the Honopou area, to implement the adaptive management strategies to meet the taro needs of his clients from last year's session. Something needs to be real concrete in terms of the adaptive management strategies, and not simply to say that it will be brought back next year.

Chair Thielen said it was also important for everybody to understand that to make the transition is not simple. Even in the other eight streams, some cases are going to be very stream specific, where

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some infrastructure in place may be relatively easy to make changes to, others are not. There are others where the gates are open all the way, but if there's no rain, there's no water. While the transition period might not be as fast as NHLC's clients would like, once the transitions are completed they'll be in place.

Ms. de Naie also brought up the structure about how the return is done. It's not done in the upper elevation, the first water, which goes to the Hamakua or the Wailoa Ditch. For example, their stream, Hanehoi has two branches so it's diverted at those two streams and the two branches are diverted at the Lowrie diversion as well. One branch has no return at all, so all that water goes to EMI. The other branch has a small return and it's her understanding that sometimes there's no water by the time it gets there, meaning that the springs haven't been replenished enough. She noted that their pipes leak a lot too. She suggested that they need what Honopou Stream has which is kind of like a little dip system where the water comes over the spillway, because pipes are a very ineffective way to return water to the stream. She recognizes that it's different on each stream, but it's important to understand that on some of the streams water is only being returned from one source, while many other sources are still diverted and still carrying that little flow of water some place else.

Chair Thielen agreed that it is different on each stream, also recognizing the hydrology and losing streams where water has been returned. And so that's another reason why some of the transitions have taken so long, because it's not something that can be applied across all streams which will likely hold true for these streams as well.

Dr. Miike said one question that they need for the short term is the water requirements of the taro loi clients. Both for what they are using now and some assessment, for the middle term, about what other taro loi might require too. He stated he understood the complication of it, but there's basically the consumptive use of the flow periods. Since the Commission has to account for those in any kind of balancing it really is necessary to have some estimate of that rather than a new use coming in saying they need a certain amount. That would be just like HC&S coming in and saying they need a certain amount for certain use, without the Commission being able to evaluate it. Alan Murakami said he understands what Dr. Miike is saying but what NHLC attempted to do, which he believed to be a little simpler, is to put in appropriate temperature gages in strategic spots in Honopou. That's still an issue that needs to be resolved and discussed with staff. But with respect to gathering, NHLC has on record many submitted declarations dealing with the desire to gather in various streams along the 19 streams at issue today. What he found a little distressing was that there was no investigation of those declarants and others who might be utilizing these resources or would want to, but rather for the diversions. To be fair, there has been some attempt, at least on NHLC's part, to try to get that information to the Commission. Mr. Murakami noted that what's been missing, and maybe due to a shortage of resources on staff's part, was their ability to translate that to actual concrete data.

Dr. Miike said he thought that was for the next step, but for the current time even though the temperature measurements were being taken, it's sort of an after-the-fact case. Like saying the amount of water needed won't be known until the temperatures are determined. There is information that estimates the kind of flow needed, such as Reppun's estimates about flow-through

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requirements. The Commission needs that sort of information so that it can do a balancing as part of the quantitative analysis. And then, suppose that amount released to the taro loi in the middle, if that's not enough the Commission can adjust it.

Chair Thielen restated what Mr. Murakami said for her understanding, that for the first eight (8) streams the interest was the stream biota, the gathering as well as the taro cultivation, whereas the primary interest for the 19 streams is the gathering. And the idea for some release, even if it's during the wet months that can possibly help in habitat and recruitment, would be something that NHLC would support, if that were the results of the Commission's decision.

Mr. Murakami agreed that they are in support of getting water back as soon as possible. Ms. de Naie wanted to also stress that for the hydrologic units of Honopou and Hanehoi, there is no public water supply so the streams are also water supply for domestic use.

Chair Thielen asked the Commissioners if they had any other questions on the 19 streams.

Ms. de Naie wanted to add another short term strategy. She spoke to Linda Howe about A&B Foundation making grants available for communities to work and improve the watersheds. Chair Thielen stated that she would encourage the Maui community to work on such solutions and that she shouldn't wait on the Commission to do that, since that's something the local community can do. Ms de Naie said that if it were one of the incentives given to A&B, because they are likely going to get a lot of what they want, she thought this was a good way for them to give back. A&B has this foundation, that foundation has the ability to make grants, and it doesn't cost HC&S anything.

An unidentified male protestor interrupted the meeting.

Chair Thielen said that the Commission heard from the different groups on the short term concepts and there are some things to tackle on the mid term and long term solutions, but since there aren't specific numbers at this point, she believed there is agreement with the concept that during the wet season, when there is more water above and beyond what is stated by the primary diverter is the minimum needs, that some restoration during those wet season months will not damage the offstream economic uses and would have a benefit to the instream biota and help with the local gathering that is done in that area. She pointed out that this was the time that she would like to hear from the Commissioners, if this sounded like the type of solution being sought and would the Commission want to discuss some specific direction and guidance to staff, timetable, and parties to come back with more specific numbers.

Dr. Miike said he didn't think it's an option but a requirement. If the Commission finds that so much water is the requirement for the offstream diverters, they cannot take more than that. They can do a variation of that, but any of the remaining water remains in the streams. So it's just a natural consequence of deciding reasonable offstream uses and taking into account the variations, but anything over and above that must stay in the streams. They don't do it as an interim IFS, but it's the excess water that remains in the stream and it's just the way that they report.

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Chair Thielen said she thinks there are some nuances that the Commission may want to be asking the discussion to consider. This includes direction for the offstream users that would be coming to the table with information about the seasonal variation of flows, the minimum needs for water, what may be returned to the streams from their perspective, where it would not damage their economic ability to operate, and also for Maui DWS for the farmers and the domestic supply needs. From there, the Commission can start to get better numbers on the wet season and the next thing might be to look at the specific streams and the hydrology. She said she thinks that USGS could assist Commission staff because there is still the question that if there were water available during the wet season, from the perspective of the offstream users without damaging their economic interests, where would the water be restored. The question remains whether water should be restored in multiple streams or in fewer streams that get the biggest bang for the buck, and in consideration of losing versus gaining streams. Information presented earlier pointed toward concentrating efforts in fewer streams, so Chair Thielen thought that needs to be looked at and brought back to the Commissioners as well. Dr. Miike said he thinks that should be broader, so that people should look at, from a scientific point of view, which are the best streams for restoration and prioritize some and determine the amount of water that would be reasonable to restore. Rather than saying which are the ones that won't hurt the offstream users. Once the Commission has that information, the next step would be to see which of those streams will not hurt the offstream users and which of those might have some water restored. This leaves the Commission some choices about what to decide rather than already making the decision that the offstream users won't be affected. What that really does, is to say that the Commission won't affect the offstream users but instead affect the instream uses and Dr. Miike didn't think that was a fair balance.

Commissioner Balfour said the nature of the beast is that when there is excess water, for the offstream users, it's immaterial to them where it's taken. Everything over a certain level is excess. The Commission has to look at a number of factors including instream uses, fish and fauna, gathering rights, taro growers, etc. In his experience, there are times when there's going to be more water than anybody can use. He said he don't think the offstream users really care when their water needs are satisfied.

Dr. Fukino said she agreed with Dr. Miike to the extent that the purpose of setting the interim IFS is really about the health of the streams. So it's important for the Commission to have the kind of information that has been discussed so that they can prioritize the streams to figure out where is the biggest bang for the buck past each return.

Commissioner Fujiwara asked that, if the Commission is ready to make an action today, would they need to come out with the recommendations for staff to look at. Chair Thielen said yes, that if the Commissioners agree to the concepts between them, then they should take a break to work with staff on the wording of the recommendation and then come back and start to work on the specifics of that recommendation.

Chair Thielen raised another short term guidance for staff which was to come back to the table with more information about the diversions that are currently in place and can they be structurally altered to increase the ability for recruitment upstream and minimize the entrainment going downstream. She believed this was part of DAR's recommendation for Hanawi Stream. Specifically talking

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about the wetted paths for the biota to get up and then some bypass so that when there are volumes of water coming down that it reduces entrainment. She said what is needed from DAR is some specific information about whether there are seasonal times or diurnal periods that are important for stream biota.

Chair Thielen said there was a statement made by one of the parties that Maui DWS waste is not as much of a concern because the total volume is about 10 million gallons, but at the same time it's important to address as well because its not fair to be concerned about 10 million gallons for one user and not another. She asked if there were any other conditions, data or information that the Commissioners wanted to have the parties take a look at on the mid- or long term and report back.

Commissioner Balfour stated that there are a couple of things that need to be taken care of. The waste on the Waikamoi flume is atrocious. That is a big problem, but unfortunately, as Mr. Eng said, it's a 10 million dollar job. Commissioner Balfour felt that it was so important, since it's their highest source of water. He then referred to the sinkhole on Waiokamilo Stream that with a simple little dam water could be put back into the stream. He believed that for a few thousand dollars it could be done in a couple of days. That's not a long term issue, but rather an immediate one. Obviously, discussion about lining reservoirs need to consider that this is big money and quite frankly there are two sides to the coin on that; does it make economic sense or not. There are things that could be done now and should be done now and Commissioner Balfour believes that if waste is a No. 2 priority, it verges on No. 1 as far as he's concerned, because there are things that can be done with tangible results.

Dr. Miike said for the mid term, he believed the Commission identified possible catchment areas and relining reservoirs. He believes that cost estimates, timetables, and identification of funding sources would be good information. Also, in terms of instream uses other than kalo loi, which streams are important. Hearing from some of the community representatives, saying they have not been consulted, maybe that can be mid term. Long term, the Commission needs to plan in the event offstream uses fundamentally change, such as HC&S not continuing sugar cane to the extent that they are now, and Maui Department of Maui Supply needing more and more water. Also, since part of the Maui DWS system is critically depending on the EMI system, what could be planned from that? In terms of the Commission being able to monitor and regulate these things, Dr. Miike believed that the Commission needed to think in terms of surface water management designation area for the east Maui streams just as was done for Na Wai Eha. In that case, if uses change drastically any permit that is issued is void and users need to come in again for justification for new uses. In that sense, the Commission continues to control a public resource. So, long term or even maybe short or mid term, the Commission should consider surface water designation as a means for better monitoring and regulation on these streams.

Dr. Fukino wanted clarification from A&B, since Alan Murakami stated that at some point in time water was 50-50 ground and surface, but that she doesn't remember hearing that. It seemed that most of the water for HC&S' crop was mostly surface.

Rick Volner said that as far as surface and ground water make up, he only had the last five years of data before him. But knowing the data that is available, there were very few exceptions where

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usage approached 50%. Actually last year was one of the highest percentages of ground water and surface water because it was such a dry year. In total, HC&S had 52 billion gallons of water available, with 23 billion of that being ground water, and that was just from the east Maui system. In general, HC&S is more heavily depended on the surface water by about four (4) times. Dr. Fukino asked if those were HC&S' well that they operated. Mr. Volner affirmed that the wells in question are HC&S brackish water wells. Dr. Fukino questioned if the one that the Commissioners saw was skimming off the top. Mr. Volner confirmed that water was skimmed off a very thin layer. Dr. Fukino asked if HC&S had any wells further inland where they're actually true, straight aquifer types of wells. Mr. Volner stated that a majority of their wells are basically tapping the basal lens whether they are inland or close to the shore.

Commissioner Fujiwara asked Dr. Miike if under the surface water designation for these 27 streams does the Commission have authority or does there need to be a petitioner. Dr. Miike said no, there are criteria, one of which there is substantial controversy.

RECESSED at 12:10 p.m.

BACK IN SESSION: at 12:37 p.m.

Chair Thielen said she does not have the precise language in front of her but she has the substance of a recommendation for a motion for consideration, a motion on short term, mid term and long term. Chair Thielen read a draft motion summary, then discussion followed:

Short Term: The Commission is giving guidance to staff to come back to this Commission in three months with specific information so that we may consider the possibility of stream restoration that may be season-dependent, and to direct staff to work with the various interests to identify minimum offstream needs during a wet season versus a dry season; the maximum restoration value per stream based on hydrology, habitat, and the ability to do the restoration based on the stream infrastructure; for all 19 streams, the diversions that are capable of being altered to increase upstream recruitment and reduce downstream entrainment.

Mid Term: Also within three months, the Commission is requiring: Maui DWS to come back to the Commission with a timetable, estimated costs, and possible funding source for repair of the Waikamoi flume; HC&S to come back to the Commission with alternative water recruitment ideas (e.g., catchment areas) and also data on their wells including the capacity, the costs of pumping, and the sustainable levels that can be pumped from those wells; and, NHLC to come back to the Commission with information about the specific interests within the community for new kalo loi including acreage, timetable, and costs.

Dr. Fukino asked for clarification from Chair Thielen when she said including new kalo interest, is it in addition to what they currently need.

Chair Thielen said that there is some specific information about the interests in the original eight (8) and for the existing streams. There was some testimony about possible interest for new loi in the 19 streams. The petitioners themselves provided information about gathering in the 19 streams, so

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what the Commission would be saying is if they have documentation of any other new kalo loi in the 19 they should come back to the table with that information in the three month period, same as Maui DWS and HC&S.

Commissioner Fujiwara asked for clarification about the information being requested on the kalo loi. Chair Thielen stated that if there were any documented interests within the community for new kalo loi on the 19 streams, identifying acreage, timetable, costs, and the specific area.

Chair Thielen noted that for the long term, there are some proposed conditions in the staff submittal calling for data to be provided about the end use of the water by any offstream users, and if there is a transition in any of the uses over the long term, that the Commission would come back and relook at that.

Long Term: In three months, Maui DWS will come back to the Commission with information on how they plan to begin the process of shifting the balance in the Upcountry area from 85% reliance on surface water to a more even balance, the timetable, and costs for implementing that process. In three month, HC&S will come back to the Commission with information on alternative, long term sources including locations, timetable, and costs.

On the long term summary, Chair Thielen explained that she is not expecting Maui DWS to come back to the Commission in three months and say here's the answer. Rather, Maui DWS should demonstrate how they plan to address this over the long term and identify the process they are going to follow (e.g., are they going to throw this question into their community plan, are they going to set-up a group to do it, etc.).

Dr. Fukino asked if this is information that the Commission would like to have in order to make some decisions on these recommendations or is the Commission going to adopt some of the recommendations. She noted that when talking about monitoring or modification in general terms, she didn't necessarily have issues with some of staff's recommendations. So is the action to adopt the short, mid, and long term needs and not necessarily to look at parts of the staff's recommendation.

Dr. Miike expressed that his understanding was to deny the recommendations by the staff and defer decision on amending the interim IFS until such time that the short term information is made available to the Commission and then staff can then provide options for consideration by the Commission on how they would implement the amended interim IFS. So, it's a denial and direction to bring further information to the Commission to make a subsequent decision.

Chair Thielen stated that some of the conditions in the staff recommendations are ones that the Commission would want to consider or continue. For instance, the conditions about the long term that are in there. She did not want to say this was a denial, but rather deferment and guidance to go back and do more work on the recommendation and bring it back in three months, at which time it may be amended. Chair Thielen believed that there are certainly some conditions in there that could be thrown on the table for consideration as an option today. Dr. Fukino requested to think about it.

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Dr. Miike said he meant that if they start picking and choosing among the overall recommendations, it would get confusing. He thinks most of the general recommendations are just directives to staff to continue the work and he didn't think a recommendation was needed on that. The important ones were that staff had proposed specific interim IFS as status quo, except for Makapipi where they would have a controlled release. The Commission should either deny or defer action on that. He stated that deferring would probably be the best way, so that when staff brings further information, the Commission can still act on this by amending it.

Chair Thielen noted that if the seasonal approach is taken, it may end up being in alignment with the recommendation then amending it with something alternate for the wet season is a possibility.

Dr. Miike made the motion that the Commission defers action on the staff recommendations with the directives to the staff to collect the information that Chair Thielen outlined for the short term, mid term and long term information.

MOTION:

Short Term:

The Commission is giving guidance to staff to come back to the Commission in three (3) months with specific information so that it may consider the possibility of stream restoration that may be season dependent, and to direct staff to work with the various interests to identify minimum offstream needs during a wet season versus the dry season, the benefits of seasonal stream restoration within the 19 streams based upon the stream hydrology and habitat, and the ability to accomplish seasonal restoration based on the stream infrastructure in the streams with diversions; and to identify which of the stream the diversions are that are capable of being altered to increase upstream recruitment and reduce downstream entrainment.

Mid Term:

Also within three (3) months, the Commission is requiring the Maui DWS to provide to the Commission a timetable, estimated costs, and possible funding sources for repair of the Upper Waikamoi flume; for HC&S to provide the Commission with alternative water recruitment ideas such as the catchment areas proposed during public testimony, and data on their wells including the capacity, the cost of pumping and the sustainable levels that can be pumped from those wells; and the Petitioners to provide documentation about specific interest within the community for new kalo loi including acreage, timetable and costs.

Long Term:

Maui DWS shall describe how they plan to begin the process of shifting the balance in the upcountry area from 85% reliance on surface water to a more even balance and the timetable and cost for implementing that process. The Commission doesn't expect an answer in three months, but rather wants to know how (i.e., the process) Maui County intends to address Upcountry water supply issues in the long term (e.g., community plans, work groups, etc.). Similarly, HC&S shall describe information on alternative longer term processes, including locations, timetable and costs.

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MOTION: Miike/Fujiwara

To defer action on submittal.

UNANIMOUSLY APPROVED.

Chair Thielen then gave direction to the parties and an explanation to the general public. To the parties: the Commission has deferred the motion and given three (3) months to come back to receive a staff recommendation at that time. Chair Thielen encourage all of the parties to be working closely with the staff to provide the specific information that is requested. She pointed out that the major diverter, HC&S, may want to take a look at the seasonal needs.

It was asked if these instructions will be made available. Chair Thielen said that the parties should be working directly with staff and that these are not considered official minutes, rather draft, until they come to the Commission and are approved.

Chair Thielen said for HC&S there needs to be a clearer breakout of the minimum needs, as the major diverter, for offstream use between the wet season and dry season and some timetable for that. For Maui DWS, the same. The Commission staff will be working with DAR and USGS on the hydrology and the habitat value, but will need to work with EMI on the infrastructure in the different streams, considering which ones can be readily restored based on wet season versus dry season, and also which ones can be altered to help with upstream recruitment and reduce downstream entrainment.

For Maui DWS in the mid term, the Commission would like to see, in three months, the estimated timetable, costs and potential funding sources for fixing the flume system. For HC&S in the mid term, in three months, some of this information will need to be provided to staff for the submittal as well. Some mid term improvements for gathering water into the EMI system were raised, with one example being catchment areas. So, if HC&S can come back to the table in three months with some options that may be low cost, low tech, relatively quick solutions, along with data on the wells, specifically the capacity, the costs, and the sustainable levels. For the sustainable levels, please work with Commission staff because they are familiar with the sustainable pumping. Based on her understanding, some of the recharge is currently coming from the EMI system, so with less water coming from the EMI system, means less pumping that can be done. And then, also for the Petitioners, if there is information available e within the community about interests among the 19 streams for new kalo loi, the location, the acreage and the estimated timetable and effort.

For the long term, Maui DWS, the Commission talked about the need to shift the balance in Upcountry from 85% reliance on streams to alternate systems, so the Commission asks that Maui DWS come back with some proposal on how to begin planning for that process formally. For HC&S, if there is information for alternative sources for water supplies, to detail the location, timetable and costs. That would also apply to improvements to the system which can result in more efficient use of water.

For the folks in the audience, the Commission has deferred, and technically what that means is that the recommendation by the Commission staff is still on the table. The Commission is asking all the parties to bring more information to the Commission so that it can come back in three months and

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take a look at what could be the same recommendation, or what could be an amended recommendation, in front of the Commission for consideration. Chair Thielen noted that because a decision in three months would be an action-making decision, the Commission will certainly try to hold the meeting on Maui, due to the tremendous community participation and interest in this. Timing wise, Dr. Fukino and Chair Thielen will be at the mercy of the Legislature and can't agree that it will be exactly in three months, but as far as the parties go, consider it three months because the staff is going to need time to work with the information that is provided and make their recommendations.

Dr. Fukino said she thinks to the extent that the community can work together and whatever can be discussed together would really help the Commission, so that if there are questions about pieces of information and people have already ironed it out before it gets to the Commission, then it won't be 'they say this' and 'they say that'. Then, the Commission is still left with a lot of questions. She also addressed the DLNR staff that, on behalf of the Commission, they really appreciate the work that has been done. This is an enormous task, that perhaps the Commission didn't provide the best guidance, but a lot of work was done in a short period of time and they appreciate the time and effort that staff put in. As it was said before, nothing was done for many years before Chair Thielen came here and she gave the task and assignment, so from Dr. Fukino's perspective, as a Commission member, she really does appreciate all the hard work that staff has done to provide this packet of information even if by many people's estimation it's not perfect, it is so much that the Commission can work with now.

Chair Thielen also wanted to thank the Commissioners, except for Dr. Fukino and her, all other Commissioners are volunteers and they have put in a tremendous amount of time, and she especially wanted to recognize the effort that they've gone through and the staff for arranging this, and the site visits, so that the Commission can understand this complex issue, it's really made the ability for this Commission to make a much better decision in this case. She also wanted to thank and recognize the Maui community for their civic engagement and participation. Again, as Dr. Fukino said, the community has an ability to shape this decision. From what was seen in room the prior day, people want a solution that works for as many people on Maui as possible. It seems that something can be done to also improve the habitat with some relatively modest changes that would not negatively impact people. What it will take now is for the people in east Maui working with the people of HC&S and EMI, and the people in Upcountry working with the Maui DWS, recognizing that there's less water in the summer than can meet all the needs, with maybe more in the winter that can be spread around for better impact. Chair Thielen encouraged the community to be working collaborative and together over the next three months as well. She said it would be a wonderful precedent for the entire world if everyone were able to come out in three months with a decision that everybody feels is a good one for this island, for the people, and the resources, in how to allocate scarce water because that would be very unique.

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H. NEXT COMMISSION MEETINGS (TENTATIVE)

TBD

I. MEETING ADJOURNED

Motion: Fujiwara/Fukino

Respectfully submitted,

KATHLEEN OSHIRO
Secretary

APPROVED AS SUBMITTED:

KEN C. KAWAHARA
Deputy Director