

MINUTES
FOR THE MEETING OF THE
COMMISSION ON WATER RESOURCE MANAGEMENT

DATE: January 16, 2018
TIME: 10:00 am
PLACE: DLNR Board Room
Kalanimoku Bldg.

Chairperson Suzanne D. Case called the meeting of the Commission on Water Resource Management to order at 10:06 a.m.

The following were in attendance and/or excused:

MEMBERS: Ms. Suzanne Case, Mr. Neil Hannahs, Mr. Paul Meyer,
Mr. Kamana Beamer, Mr. Michael Buck

STAFF: Jeff Pearson, Roy Hardy, Charley Ice, Dean Uyeno, Rebecca
Alakai, Queenie Komori, Bob Chenet, Patrick Casey, Neal Fujii,
Malie Beach-Smith, Ayrton Strauch

EXCUSED: William Balfour and DOH Designee Keith Kawaoka

COUNSEL: David Day

OTHERS: Mark Manfredi, Erwin Kawano, E. Halealoha Ayau, Alice Jordan,
Robert Flint, Jonathan Scheuer

All written testimonies submitted at the meeting are filed in the Commission office and are available for review by interested parties.

A. APPROVAL OF MINUTES

December 19, 2017

Commissioner Meyer made a correction to the December 19, 2017 minutes. On page 2 it should read: "Commissioner Meyer asked if this is a software package that ~~can be~~ is custom made?"

Commissioner Hannahs commented on the enforcement discussion. He stated that it was very honest and is hoping that the staff would have a "go forward plan" as we bring these kinds of items and to have some specific concrete steps that we are going to address. He stated that the discussions were good. He asked what are we going to do and what is the next step.

Approved by the Commission on
Water Resource Management at
the meeting held on March 20, 2018.

Commissioner Buck asked if we could have an agenda item on that each month until the Commissioners feel comfortable that we have a plan? He asked if this would be a discussion topic at the next meeting.

Deputy Director Pearson answered that he will discuss with Chair first.

Chair Case agreed to have discussions and the best way to follow up with the Commissioners. We will talk about it.

MOTION: (BUCK/HANNAHS)

To approve the minutes as amended.

UNANIMOUSLY APPROVED AS AMENDED.

ABSTENTION BY COMMISSIONER BEAMER.

B. ACTION ITEMS

- 1. Application For After-The-Fact Well Construction / Pump Installation Permits, Flint Dug Well (Well No.5331-002), Well Construction: 72-inch Casing Diameter, 14-ft Deep Well Pump Installation:10 gpm for Individual Domestic Household and Irrigation Use, TMK (2) 3-3-018:005, Mokuhau, 'Iao, Maui**

PRESENTATION OF SUBMITTAL: Charley Ice

Commissioner Buck asked if the wastewater system is a leach field.

Mr. Ice answered yes but it has no significant impact on the well.

Commissioner Beamer stated that the applicant initially submitted a water use permit for 3,000 gpd and changed that to 600 gpd. He asked if water being obtained from somewhere else.

Mr. Ice said that his understanding is that because of the pump size, the amount they can pump out would not be sufficient for 3,000 gpd. The applicant stated that since its only 600 gpd it falls within the County's typical use which does not require a ground water use permit.

Commissioner Beamer wants to make sure that if we approve this today that 600 gpd is the amount that they will be pumping. He asked what is meant that no permanent monitor tube is required.

Mr. Ice said that it is sometimes called a chase tube. It is a separate pipe that goes down inside the well bore to do monitoring. In this case, it's a large round bore, like a cesspool ring. This will be easy in case they needed to do any monitoring. In lots of cases, in small wells, the typical private well have a narrow gage and don't always have a chase tube. It's an artifact of an older time when it was required that every well have one.

Commissioner Beamer stated that we are not monitoring this well, but they are reporting the pumpage which is something old that is in our permitting structure.

Mr. Ice answered that it is always recommended that people test their water on a regular basis because it is in their interest to do so. They will be reporting the amounts of use and at some point, may be asked for something that is required and in the Code. But currently, there isn't any crucial point to that.

Commissioner Hannahs commented the good faith effort with the landowner is very much appreciated. Although it took over 2 years and asked if this was a burden to the applicant; did it create a hardship for them? Is there a way to expedite these requests?

Mr. Ice answered that there were issues that needed completion as far as potential stream impacts were concerned. It was not possible to get someone in the field right away. That took quite some time. Once the information came back from the ground water, a review from the stream branch was needed. All of factors took time. Because the Flints may not be on site, they needed to commute to the site. They were also contacted by email and phone. There was also that huge flood in Iao that caused a lot of delays. In addition, the Flints requested an emergency use of their pump for cleaning.

Alice Jordan commented that despite all circumstances, Mr. Ice did a great job on being proactive in putting this all together.

Mr. Jonathan Scheuer didn't have a testimony, but noticed that in the submittal, there is a 10-gallon per minute pump that has been installed and the submittal analyzes it based on the 10-gallon permit pump. The proposed action says to approve the after-the-fact permit that is included in the standard conditions. The standard conditions specify that a 5-gallon permit pump is required. He noted an inconsistency.

Mr. Ice made note that Exhibit 8, No. 2 in the Standard Pump Installation Permit Conditions, should be corrected to 10 gpm not 5 gpm.

Commissioner Buck moved to approve Item B-1 with the amendment on Exhibit 8 No. 2 for installation of a 10 gpm capacity or less, pump in the well.

MOTION: (BUCK/MEYER)

To approve the submittal as amended.

UNANIMOUSLY APPROVED AS AMENDED.

C. PRESENTATIONS AND UPDATES

1. Department of the Navy (NAVFAC) Update on Red Hill Administrative Order of Consent (AOC) Activities.

Mr. Mark Manfredi, Navy Region Hawaii updated the Commission on the progress of Red Hill as far as the Administrative Order of Consent. The presentation is attached. It is also available at <http://files.hawaii.gov/dlnr/cwrm/submittal/2018/sb20180116C1.pdf>

Questions and answers between Mr. Manfredi and the Commissioners are as follows:

Commissioner Buck asked about the status of the four, new monitoring well.

Mr. Manfredi said that he hoped that the process was going faster. They ran into issues of obtaining permits, real estate agreements and approvals to install wells in certain locations. Last year the Navy installed 2 or 3 wells.

Commissioner Hannahs asked Mr. Manfredi if the Navy has an analysis of upgrades alternatives in 2018.

Mr. Manfredi stated that the Navy had a contract to have an engineering study on the various alternatives. That study was completed and submitted to the regulators on December 8, 2017.

Commissioner Meyer recollected on the rules from the Safe Drinking Water Act regarding underground storage tanks (UST) requires every UST be remediated in over 3 periods beginning in the 90s, 1992, 1993. He did not believe that there were any exceptions; it was national. Underground storage tanks were required to be double walled or put above ground, no exceptions.

Mr. Manfredi stated that there are exceptions. In 40 CFR Part 280, talks about field constructed underground storage tanks from the U.S. regulatory standpoint. It lists the factors that is necessary to maintain those tanks. He recalls that tanks of 50,000 gallons that were constructed after 2013, are required to be double walled. Older fuel constructed tanks as far as the current regulation is concerned, was not a requirement, if there were other things that were put in place.

Commissioner Hannahs asked if this is the basis of that exception.

Mr. Manfredi answered that primarily any other rule that comes in place, the regulatory bodies look at industry and what it would take to get them where they need to be to comply with regulations. For double walling oil tankers, a 25-year time frame is the order for the industry to catch up with the regulations.

Commissioner Hannahs asked in this case if we are in a sensitive location and was that considered?

Mr. Manfredi answered that he would think it was considered as far as federal regulations are concerned and imagine it was considered from an entire U.S. perspective, but not sure if they looked at individual installations.

Commissioner Meyer asked if he was aware of any other tanks, underground storage tanks in Hawaii that were not remediated or double walled or above ground?

Mr. Manfredi was not sure if there are; he did not know.

Chair Case asked Mr. Manfredi to reiterate the error that happened in tank 5 and how this fixes it.

Mr. Manfredi – on tank 5. When the contractors are going in and doing well repairs, putting patches on the tanks, as a matter of procedure, they will drill a test hole about 1/8 to 1/4-inch hole through the steel and inspect for or detect if there are any fumes or gases between the steel and concrete. At least 17 of these locations, the contractor failed to adequately or sufficiently patch those holes back up. That was a failure on the part of the contractor on following his procedures. There was a failure in his oversight as well as the government oversight. After the tank was put back into service and after American Petroleum Institution certified that this tank was good to go, filling the tank began on December 2013. Immediately as the tank was filling up the operators received alarms that gave them an indication that they had an unscheduled fuel release. In other words, the fuel level was dropping. They ignored those alarms. They thought that it was probably a system malfunction because it was not put in place and have not been used for several years. The tank had been down for maintenance for several years. They received several alarms. In January 2014, they acknowledged they had a release and that's when all fuel in the tank was pumped out. It was cleaned out; when they went back in, the holes were found.

Chair Case asked if the holes were patched incorrectly or not patched.

Mr. Manfredi answered that they were patched incorrectly, the test holes.

Commissioner Buck asked if it was true that 27,000-gallon leak measures 3 inches on the tank?

Mr. Manfredi answered that he thought it was 6 inches. The tanks are 250 feet tall and 100 feet in diameter.

Commissioner Beamer said that according to an earlier report, there were leaks as far back in the 50s. He asked if this was correct and were there a series of leaks that have happened prior to this one?

Mr. Manfredi answered yes but couldn't give the timeframe. Prior to 1988 industry was not required to report any leaks and there are no detailed records of previous releases before 1988. The Navy acknowledges that there must have been some. What brought this on was when the Navy started the ground water monitoring, they drilled borings below each tank. From the borings that was withdrawn from several tanks, they found traces of fuel. That is what brought on the ground water modelling effort for Red Hill. It was from those borings that the Navy acknowledged that there were prior releases. The records were very spotty to calculate exactly how much fuel was released prior to 1988.

Mr. Manfredi stated that there are 6 major alternatives the Navy will be considering by the end of this year. They are:

1. Use improved maintenance procedures; 3 double wall variance and 3 single wall variance
2. Same as No. 1 but completely coat the tank with epoxy coating.
3. Take out old steel and replace with new carbon steel liner
4. and 5 Composite design; install a new steel liner with 3-inch gap between the existing tank and the new tank. That interior space will be filled with grout.
6. Building a tank within the tank; whole new tank within the existing tank with a 5-foot space between the old and new.

Commissioner Buck asked about the risk factor in looking at the criteria using for the six tanks. He understood the cost benefit and strategic importance about the facility, but questioned asked how risk to the drinking water be factored in.

Mr. Manfredi referred to Section 8 of the AOC; the quantitative risk and vulnerability assessment has been contracted out. A contractor is conducting that study. He will be gathering and reviewing data and submit a dissertation on how he will use that data to do a quantitative analysis. That report is not due till November 2018. Although it is later, it may be a possible to evaluate and get a sense of the risk to the aquifer and surrounding environment, do the work that is being done in Sections 6 and 7 of the AOC which is all the environmental studies. The additional monitoring wells, the seismic work that has been completed recently, the synoptic water level survey is on-going. They will have an idea as well as the studies on what is going on in the aquifer with regards to this previous releases and what is happening with regards to continuation remediation, biodegradation of that fuel. That too is a work in progress. The Navy has made some significant headway over the past several months which will give them information as to what is the actual risk.

Commissioner Hannahs commented that the 18 attributes that is used to grade each alternative does not include environmental reports.

Mr. Manfredi answered that this is an engineering report that deals with the constructability with regards to the 6 tanks. A decision can't be made; it's a culmination of all this work.

Commissioner Buck asked if there are cost for each one of these.

Mr. Manfredi answered that has been redacted information because they are official government estimates. Due to procurement sensitivity rules, that information cannot be released.

Commissioner Buck asked if that State Department of Health has AOC access.

Mr. Manfredi answered yes, regulators have that. Anyone in an official capacity that can sign a non-disclosure agreement has access to it.

Commissioner Buck commented that the Navy has been involved from the beginning and meeting with the communities but cannot get a risk assessment report till November and hope to decide by December and cannot tell people how much it would cost. The hydrological science on the westward movement is still debatable.

Mr. Manfredi answered that the responsibility on the Navy, especially at public meetings is to make that information digestible and understandable.

Commissioner Beamer asked that in addition to looking at the engineering specifications and the cost, would there be a possibility of relocation.

Mr. Manfredi said yes. That is an item that the AOC that we agree that we would do this outside of the AOC. They have done an ultimate site study and that should be available to the public in February. They are looking at alternate sites. He couldn't share that information, but as far as relocating the facility, there are 3 guidelines that must be followed:

1. Needs to provide the same capacity and capabilities that existing facility does.
2. It must store the same amount of fuel. It must provide fuel at the same rate within the same guidelines; within the same capacity; must replicate that technology.
3. Not moving Pearl Harbor, Hickam, fuel must be provided for those facilities.

Facility will still be on Oahu and looked at several different sites. That report will be available soon.

Commissioner Meyer asked about alternatives 4 and 5 and will that preclude real time monitoring of leaks between the space and still back to ground water and level detection changes.

Mr. Manfredi answered that they would still do real time monitoring; they will be able to monitor that space.

Commissioner Meyer asked how it can be done inside the grout.

Mr. Manfredi answered that in this case, a geosynthetic material, mesh or screen, would be placed between the steel and concrete. If there was a leak between the primary barrier it would get into the mesh, find its way to a piping network which would lead to a leak detection system. The fuel would get into that system before it got outside into the environment.

Chair Case asked if they are finding any particular problems other than the one that caused the big leak?

Mr. Manfredi answered no. When tanks are scanned, they are looking for not just holes, they are looking for where in the back side of the plate where it may have corroded or otherwise have damages. About 75% of the things they find are hammer marks or dent in the steel. In some locations, there is corrosion in the back of the plate. They analyze the corrosion and mark it and put a plate on it to bring the thickness back to ¼ inch of steel.

Once they weld the plates, every well is inspected to make sure the well is proper and the plates are vacuum sealed.

Mr. Manfredi continued to section 6 and 7 of his presentation.

Commissioner Buck asked if the Honolulu Board of Water Supply put in some additional monitoring wells.

Mr. Manfredi answered yes, within 100 yards from our monitoring well no. 9.

Commissioner Beamer asked in addition to the modeling, elementary school, residences nearby, and the aquifer itself, if there is any catastrophic failure of one of these tanks, is there a mitigation plan. Is the Navy responsible at some level for helping us identify what is needed to do?

Mr. Manfredi answered that regardless of any catastrophic or minimal failure, the Navy is responsible for remediating anything.

Commissioner Beamer asked if there is a plan in place, if that is a remote possibility of this happening, probable likely. Is that being developed?

Mr. Manfredi answered that is similar work that the Navy is doing under sections 6 and 7, some remediation strategy that can be employed.

Commissioner Beamer asked if there are any other examples that the Navy is doing this in other areas.

Mr. Manfredi said not necessarily related to Red Hill. He said currently for this island, the Navy has things that happened in the 20s and 30s that the Navy and Army are involved in remediation efforts. It is an ongoing effort.

Mr. Manfredi continued to section 8, the decision process and where we are today. He gave a timeline on when decision for the TUA by July or August of this year.

Commissioner Buck asked if it will be before the risk study is available.

Mr. Manfredi answered that they will have a quantitative risk and vulnerability assessment completed first and do a qualitative analysis, mostly looking at the environmental work to help inform that decision.

Commissioner Beamer asked if the Navy is funding the risk assessment that is so important and thorough and why decide about the future of these tanks without the assessment in hand.

Mr. Manfredi said that wasn't a deliberate plan. The Navy didn't decide to make the decision before we have this quantitative risk and vulnerability assessment complete. When the AOC was drafted, there were some things that happened sooner than others along the timeline to obtaining contracts awarded and certain studies done. We have not missed any

of the deadlines, but this study, the quantitative analysis took longer than the TUA report. It took a year. The quantitative analysis and risk vulnerability assessment studies took 18 months.

Chair Case asked would the decision on alternatives change?

Mr. Manfredi said in the AOC the Navy is required to relook at the TUA decision every 5 years. If something were to come back from this quantitative risk assess, the Navy would have to reevaluate the decision. If this quantitative assessment comes in and reports if what you decide does not make sense, the Navy would have to reevaluate this decision. For contracting purposes, whatever the Navy decides, they have 22 years to get it done. The AOC is written to have a 22-year time frame and not to just make a decision. The Navy has 22 years to implement the decision to all the active tanks. Any tanks that aren't upgraded at the end of the 22 years must come out of service. The Navy is under pressure to get that decision implemented and get the contracting and funding requirements in place.

Commissioner Buck asked that when the decision is made and the risk assessment gives more data, do you have to back track and start the contracting again.

Mr. Manfredi answered that part is we want the contract to do an independent study and don't want it to be influenced by anything during the process.

In summary, Mr. Manfredi stated that the water has been and continues to be safe to drink and it is our intent to keep it that way. The last round of tank tightness testing was wrapped up in December 2017 and all tanks remain free of leaks. Because this is a major undertaking in the construction perspective, 22 years is a very tight window.

Commissioner Beamer asked prior to the recognition of this spill, how long was the Navy utilizing it. It seems to have a life cycle.

Mr. Manfredi answered that it wasn't designed to have a life cycle. It was designed to last indefinitely. The design and effort that went in to the construction is phenomenal. If you read through the construction records, this wasn't something that was thrown together because the country was soon to be at war. There were a lot of deliberate, including the aquifer was taken into consideration. The strength and material used was designed to last indefinitely.

Commissioner Buck thanked Mr. Manfredi for his presentation and intentions to prevent the spills. He encouraged Commissioners to take the tours.

Commissioner Buck directed a question to Mr. Erwin Kawano of the Honolulu Board of Water Supply (HBWS). In the letter to the stakeholders the Navy says the current signs indicate that there is a barrier for any sort of ground water moving towards the west side. He asked Mr. Kawano if he agreed with that analysis.

Mr. Kawano said that comment came from monitor well no. 11 that indicated some saprolite that was present in the bore. HBWS hasn't had an opportunity to look at the core samples

and from their perspective indicates a single sample is still insufficient amount of information. HBWS would like to see more data and that is part of what Mr. Manfredi talked about is correct in terms of discussion, but there is a tremendous amount of debate as to the interpretation of the information that has been available so far. HBWS would like to see the well head data, pumping data to analyze ourselves. The more well data would be better. Monitor well no. 11 shows some saprolite at least an additional monitor well along that area would help to validate that information, but if the board were to make the conclusion based on a single data point, their answer would be no; not now. HBWS would like to have more data.

Commissioner Buck asked Mr. Kawano if he was happy to have a long-term plan for the monitoring wells that the Navy is proposing.

Mr. Kawano said that he certainly is very encouraged as to what the Navy is doing. The HBWS supports what they are doing. Most of the monitor well installation was done within the property boundaries. They have decided to go beyond that, across the valley and BWS supports that. That is where much of the data needs to be collected. This area is not well studied and not well characterized in terms of subsurface geology. HBWS certainly commends the Navy in their work.

Commissioner Hannahs asked Mr. Kawano if he had a sense of what the commission should be doing based on Mr. Kawano's knowledge on the data and the situation.

Mr. Kawano answered that he believes the HBWS have very similar fiduciary duties in terms of protection of the resource. He would opt to select a more conservative approach in the assets of information because of the need to protect the ground water for the future. As Mr. Manfredi indicated, Mr. Kawano stated that there is some evidence of ground water contamination or presence of petroleum products underneath the tanks. None is seen in any of the HBWS wells and HBWS would like to keep it that way. From that standpoint, some of the issues the Navy is currently facing with respect to the timeline with the AOC. Mr. Kawano said that they certainly understand their concern. HBWS have asked the regulatory agencies to consider providing the Navy an extension so they can get additional data they need so they can make some very well-informed decisions. Specifically, with respect to the tank upgrade. Much of the question that the Commissioners presented so far are the same kinds of concerns of the HBWS and have expressed those concerns in meetings. HBWS sees the Navy putting forth a very in-depth and honest effort and commend them for that. However, HBWS wants to see more data and be able to examine the data that they are collecting so at least the HBWS and Navy can all be on the same page.

Commissioner Meyer asked if any modeling had been done on the 20,000-gallon spill in the plume that might result from that at this point.

Mr. Kawano answered no because they don't have sufficient data to do that. Any kind of effort at this point would be too preliminary.

Commissioner Hannahs asked if there are ways that we should be working together to better protect the public interest.

Mr. Kawano said that the Commission does send representatives to their meetings. They are encouraged to see that. He said we can continue to communicate with the Navy, look for some continued updates, try to see if we can all be able to collectively look at all the data so that we can understand it in the same way. He also said that we can collectively pull our efforts.

Chair Case asked if there is data being collected that you don't have access to.

Mr. Kawano said yes, that's correct. Primarily, much of the data that the Navy is collecting, are collection from many data points. They see that any data points having some national security interest in terms of where the tanks are located, what is the condition. They understand as Mr. Manfredi indicated, this information, the cost of the tanks upgrades made available by signing a non-disclosure agreement. The Board has chosen not to sign the non-disclosure agreement because they want to maintain transparency with their board members and the public. If that means that the data will not be available, so be it. The AOC does provide stakeholders on subject matters to receive redacted information. HBWS are perfectly willing to work with that redacted information. They have gone through this process and have analyzed it in terms of the decision to sign the non-disclosure agreement within the department and have communicated with HBWS. Mr. Kawano does not want to put himself in a position where if asked a question, he would have to answer and say that he couldn't tell you because he signed a non-disclosure agreement. He does not want to do that to their Board nor to the public they serve. For that reason, the HBWS decided not to sign the non-disclosure agreement.

Commissioner Beamer that was something we, the commission, discussed and debated as well and several us expressed reservations.

Mr. Kawano said the HBWS is a public agency. They serve the people and have to be able to communicate with the residents and their board who they serve. They work very hard to try to keep transparency with their rate payers and don't want to do anything to compromise that.

2. "Ground Water Management Area Designation Petition Decision: Keauhou Aquifer System Area – Next Steps"
 - Presented to Hawaii Water Works Association (HWWA)/Hawaii Rural Water Association (HRWA) Joint Conference in Kona on November 2, 2017

Presentation: Roy Hardy, presentation attached. It is also available at <http://files.hawaii.gov/dlnr/cwrn/submittal/2018/sb20180116C2.pdf>

Commissioner Beamer asked when was the hydrologic units established and how were the boundaries drawn.

Mr. Hardy answered that when the Commission was first established in 1987 they had to come up with the Hawaii Water Plan (HWP) and the Water Resources Protection Plan

(WRPP). The version of the WRPP was done in 1990 in conjunction with the University of Hawaii. Mink and Yuen were the consultants. Mr. John Mink had the knowledge and experience in hydrology and geology. The Big Island is based primarily on the geological settings rift zones from the volcanoes.

Commissioner Buck asked what exactly is the process that we encourage to get more information.

Mr. Hardy said that when people come in for a well permit, we would encourage them like we did Kohanaiki, to put in a deep monitor well although staff doesn't think the Commission has the authority to compel or force that upon an applicant.

Commissioner Beamer asked a question about measuring the salinity.

Mr. Hardy said that the conductivity is the measure of salinity. In the first deep monitor well, the conductivity is about 1400 which is very fresh. Seawater is up at 45,000. After we sealed it at 150 feet below sea level, the temperature changed. There wasn't as much mixing going on after that in the original deep monitor well, so we were successful in stopping the leakage of freshwater from the deep confined aquifer.

After Mr. Hardy's presentation, Commissioner Hannahs remarked that there is a lot here, lots of activity. What does this mean? He asked Mr. Hardy if he still stood by the recommendations or feel like it is solid today.

Mr. Hardy answered that he thinks it is headed in the right direction. We would rather spend our time doing these things instead of fighting a permit designation process. It's good that we have been working with Ike Wai and the National Park Service (NPS).

Deputy Director Pearson added that the Commission staff is continuing discussions with National Park Service (NPS). We notified NPS about Mr. Hardy's presentation, and they attended the conference in Kona.

Commissioner Buck asked if the draft Hawaii Water Use and Development Plan was approved. According to his understanding the County Council did not approve. He asked if the Commission had a role.

Mr. Hardy answered that after the County approves it, it comes back to the Commission for final approval.

Commissioner Beamer asked about the failures of the wells. He asked about the feasibility of the Plan. Are you confident that it's just engineering mishaps?

Mr. Hardy said that we are not there to operate their wells. Some of the stories we've heard is when HDWS got a new pump for a well it wasn't new but a refurbished pump. That's all part of an engineering problem rather than an aquifer problem.

Commissioner Buck asked about wells on private lands that the county doesn't have jurisdiction over. He asked if they still need a well application from us.

Mr. Hardy answered yes and that if a private well went in above the Park, and in conjunction with the County, HDWS would have leverage because the private well would want to tap into the HDWS system. Before the County accepts it, the Commission will encourage the private well applicant to put in a deep monitor well. The County would hopefully advise the same before allowing them to tie into the HDWS system. Therefore, we have some leverage on the private owners.

Commissioner Buck asked if the Commission would be made aware if encouragement is not working for wells on private land above Keauhou.

Mr. Hardy answered that we may bring the well to the Commission for decision if necessary. We were planning to do that with Kohanaiki, but at the 11th hour Kohanaiki decided to put in the deep monitor wells. That worked in that situation.

Chair Case moved to public testimony. She made note that written testimonies were submitted.

Mr. Jonathan Scheuer, consultant for National Park Service (NPS) stated that he had phone conversations with Roy Hardy on the current issues at Keauhou and phone conversations with Lenore Ohye on the Water Resource Protection Plan (WRPP) update. He said that he is trying to put language in the WRPP to talk about the limitations of the sustainable yield approach. He is hoping that it will be accepted at the annual conservation conference as the call for proposals. He proposes doing a panel on ground water dependent ecosystems and some of the parameters around that. He is reaching out to various researchers and trying to get some people together to discuss this matter. He hopes that power point can be put online and highlight some things that were not mentioned in the presentation: At the request of NPS, they requested Deputy Director Pearson to memorialize the 8 conditions in a letter of June 7. NPS never received response on how certain of the 8 conditions would be implemented. He pointed out that while the update to the WUDP gave the Commission confidence in moving forward and denying the petition it is important to note that the WUDP has to get initial approval from the Commission, the HDWS, as well as the Hawaii County Council. That process was suspended on Hawaii Island. A number of community members sent public testimony in response about their concerns they had whether the Aha Moku was a fully representative process and if their concerns be included into the process. The response has been at this point for the HDWS to withdraw the request of approval of the WUDP. Currently, the assumption was that the WUDP would be in place to provide these protections. The process of approving the WUDP has been suspended. Mr. Scheuer was not sure where that is. It will be good when Delwyn Oki of USGS brings his model forward even with its limitations because some of his indications which he presented in an earlier presentation, if you look at the isotope modeling or trying to track where water is coming from. There is some indication in his modeling that you can't get the water levels at Kaloko Park without up migration of water from that deep aquifer. There is a theory that this is purely offshore. The scientific evidence that is available indicates it is not necessarily the case.

Chair Case asked Mr. Scheuer if he is aware that there is research already showing the deep-water connection.

Mr. Scheuer said yes, preliminary findings could not conclude or written up yet by Delwyn Oki indicating there will be no model results unless some of that deep waters floats up through that confined area to the basal.

Commissioner Buck asked what is the best way the Commission can keep up with the resource management activities at the NPS. He is aware that water is critical. But is not the only issue that is impacting the public trust resources; the removal of the invasive species and some anchialine ponds. There were some concerns that there could be more aggressive management activities that could help the public trust resources.

Mr. Scheuer stated that he was certain the NPS would be happy to update the Commission any time.

Commissioner Beamer asked if he had any thoughts about the sustainable yield within the isotope study.

Mr. Scheuer, quoting the Commission's previous work on sustainable yield (SY) in the first WRPP in 1990, SY should be a range not a number. Presentations given, example given; Iao Aquifer SY is 18 and we are at 16 so we are good. SY is not a meaningful management tool as a set number; it is a range. SY assumes you can evenly spread pumping from the aquifer and hydrology and geology is uniform throughout the aquifer. Know clearly for Hawaii that is not the case. Because of landowner issues and steepness and proximity of infrastructure you can't spread pumping evenly throughout the aquifer. You can try to optimize it but you can't get a mathematically perfect spread. So what you can actually develop of SY is not necessarily equal to the SY itself. One good thing that has come out of this is acknowledgement that SY does not take into account explicitly the effect of ground water flow to the coast or other ground water areas dependent ecosystems. That, Mr. Scheuer believes will be the language in the next Water Use and Development Plan but in an area that is very large. Generalized coastal area it makes a difference how much SY is pumping but again you can pump a very concentrated area and you are going to have localized effects. Our ecosystems are not protected by SY because SY doesn't specify where pumping can come from necessarily. The problems continue to exist.

Commissioner Beamer asked about instances where we have wells and the salinity is increasing. SY doesn't necessarily consider it is a localized interest in that well and we don't normally shut down; let them pump till it is inoperable. He asked if there is a management tool that can utilize with that, the well salinity. Does it say anything about the health of the aquifer or individual wells.

Mr. Hardy answered that there are probably 2 parts to the answer. The first part is when they drill the well. Does the pump test have salinity problems? The second part is long-term. If the well starts salting up overtime the pumpage needs to be cut back regardless of the capacity. If it is not in a management area the Commission does not have that ability to

order cutbacks. That's one of the criteria for designation. If only one individual well is involved, they can probably fix the problem on their own. They need some quality of water for their operations. Another situation is the location of that well and upconing. If there is upconing, and there are wells below where the well is affecting the neighbors, they can have some data on how they are impacting other neighbors, designated or not designated. Kohanaiki next to the NPS can monitor evidence for upconing.

Commissioner Hannahs asked Mr. Scheuer where SY is a range not a number, what would that range look like here.

Mr. Hardy stated that this designation was discussed at the way we are computing SY. There is a SY range and all the recharge studies were looked at, applied to RAM and resulted in a SY range. From that range, we select the minimum, one number, but it is looking at the range. The minimum side of the range is used. The question might be, what do you consider in computing that range. That might be where Mr. Scheuer is getting towards. Ground water dependent ecosystems may shift your minimum. Minimum might shift if you start looking at other considerations.

After no further testimonies, Chair Case asked for a motion to adjourn.

**MOTION: (HANNAHS/BEAMER)
UNANIMOUSLY APPROVED TO ADJOURN.**

The January 16, 2018 Commission meeting was adjourned at 1:04 pm.

H. NEXT COMMISSION MEETINGS (TENTATIVE)

- February 20, 2018 (Tuesday)
- March 20, 2018 (Tuesday)

Respectfully submitted,



FAITH CHING
Secretary

Attachments

APPROVED AS SUBMITTED:



JEFFREY T. PEARSON, P.E.
Deputy Director

Red Hill Bulk Fuel Storage Facility

Commission on Water Resource Management

16 January 2018





Red Hill Timeline Strategic, Enduring Requirement



Field Work Started
19 August, 1940



Clean Water Act Passed
Regulation/Reporting Begins

Navy Investigating and
Environmental Monitoring



Tank 5 Released
27,000 gal (JP8)

Tank Upgrade Alternative
(TUA) Selected; **HASC Brief**

*Tank Upgrade Alternative
Implemented



1940 1943

1978

1988

1994

1995

1998

2008

2014

2015

2018

2020

2025

2037

Final Tank (20) Operational
20 July 1943



Tank Modernization
(1978-1984)



Designated Historic Civil
Engineering Landmark



American Petroleum
Institute (API) Standard
653 Tank Clean, Inspect,
and Repair Implemented

Ground Water Protection
Plan Complete

Administrative Order on
Consent (AOC) Signed



*All Tanks
Upgraded/Upgrades
Begun and Compliant

*Best Available Practicable
Technology (BAPT) Reviewed

*Dates Tentative



Agenda

Section 1: Project Management and Public Outreach

Section 2: Tank Inspection, Repair, and Maintenance (TIRM)

Section 3: Tank Upgrade Alternatives (TUA)

Section 4: Release Detection/Tank Tightness Testing

Section 5: Corrosion and Metal Fatigue Practices

**Sections 6/7: Investigation and Remediation of Releases/Groundwater
Protection and Evaluation**

Section 8: Quantitative Risk/Vulnerability Assessment (QRVA)

TUA Decision Process



AOC/SOW Section 1: Project Management & Public Outreach

Since Last Year:

- Full Time Program Director Hired
- Two Public Meetings
- Eight status update/working group meetings with EPA/DOH and Subject Matter Experts
- Released Four Stakeholder Letters, two videos and seven press releases
- Attend recurring Neighborhood Board meetings – brief as requested
- QRVA Progress Review

Current/Upcoming:

- Ground Water Modeling Working Group and Environmental update
- Stakeholder Letter # 10
- TUA Report Public Outreach
- TUA Decision Meetings





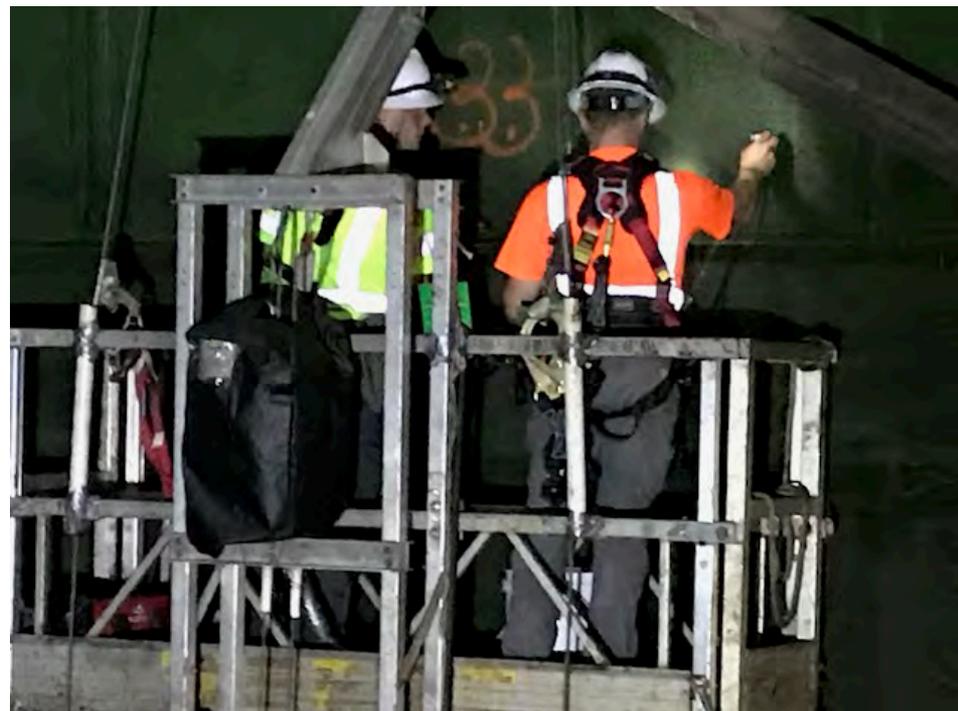
AOC/SOW Section 2: Tank Inspection, Repair, and Maintenance

Since Last Year:

- Submitted and received approval for two key deliverables; TIRM Report and TIRM Decision Document. TIRM improvements include:
 - Quality Control/Quality Assurance
 - Tank Tightness Testing now annual
 - Return to service procedures
 - Tank inspection and repair specifications
 - Construction Management
 - Tank cleaning specifications
- Clean Inspect and Repair contracts awarded for tanks 4, 13, 14, 17 and 18.
 - Inspections in progress tanks 13, 14, 17
- Re-inspection of tank 5 in progress

Current/Upcoming:

- Improved Procedures added to future contracts
- Return to Service of tank 5 - Fall 2018
- Complete work on tank 14 or 17, start work on 18
- Complete work on tank 13, start work on 4
- Upon selection, incorporate TUA into TIRM schedule





AOC/SOW Section 3: Tank Upgrade Alternatives

Since Last Year:

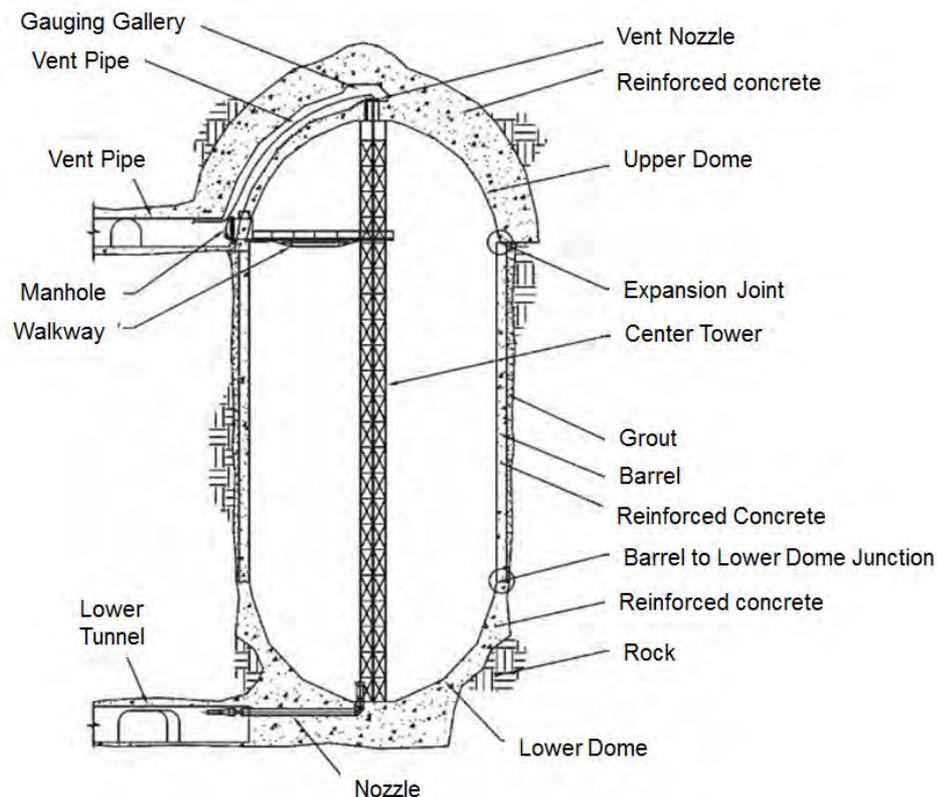
- Statement of Work for TUA Report approved
- Contract awarded
- Screened 33 initial TUA candidates to six viable
- TUA Decision Process Document submitted
- TUA Report Submitted December 8, 2017

Current/Upcoming:

- Public Outreach/Comment
- Decision Meeting with EPA/DOH
- Navy submit Proposed TUA Decision
- Public Outreach/Comment
- EPA/DOH Review
- Navy/EPA/DOH Brief HASC

TUA Report

- Is **NOT** a TUA Decision Or Recommendation
- It **IS** a programmatic level Engineering Evaluation of six tank upgrade alternatives
- It **RATES** each alternative, three single wall and three double wall, across 18 Attributes





AOC/SOW Section 4: Release Detection/Tank Tightness Testing

Since Last Year:

- Release Detection Statement of Work was approved and contract awarded to evaluate potential Release Detection systems at Red Hill.
- All tanks passed annual Tank Tightness Testing in February 2017 and again in December 2018

Current/Upcoming:

- New Leak Detection Evaluation in progress
- Preliminary Leak Detection results available to support TUA decision
- Leak Detection final report due in July 2018





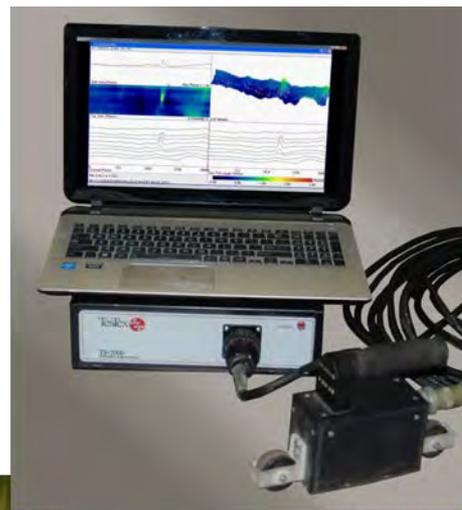
AOC/SOW Section 5: Corrosion and Metal Fatigue Practices

Since Last Year:

- Destructive Testing Statement of Work Approved
- Commenced scanning tanks 14 and 17
- Submitted Non-Destructive Evaluation (NDE) Plan for regulatory review

Current/Upcoming:

- Review Preliminary NDE reports for ongoing tank inspections with EPA/DOH
- Destructive Testing Coupon Selection with EPA/DOH
- Remove Coupons and test
- Submit Final Report July 2019





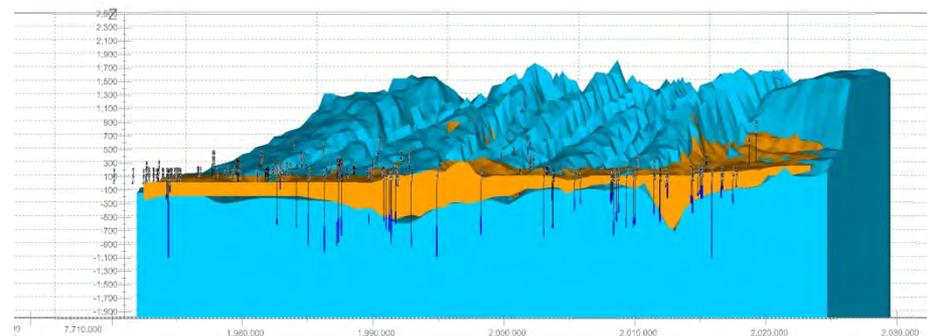
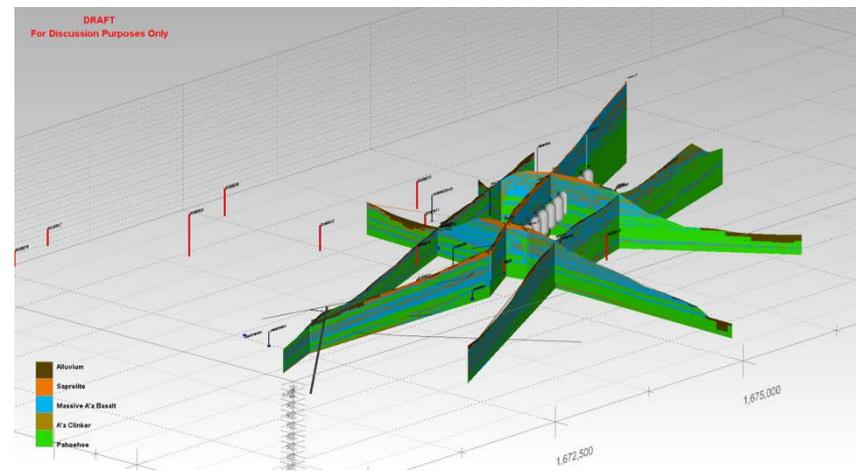
AOC/SOW Sections 6/7: Investigation and Remediation of Releases/Groundwater Protection and Evaluation

Since Last Year:

- Work Plan Approved
- Ground Water Modeling Working Group established
- Added Hydrogeologist Specialists to EV team
- Accelerated EV efforts: Additional wells, biodegradation, seismic and geo-physic logging
- Submitted nine Derivative Deliverable Reports
- Installed three new Monitoring Wells
- Synoptic groundwater level monitoring/study
- Split groundwater sampling with EPA/DOH
- Sentinel Well Network Development Plan
- Risk-Based Decision Criteria Development Plan

Current/Upcoming:

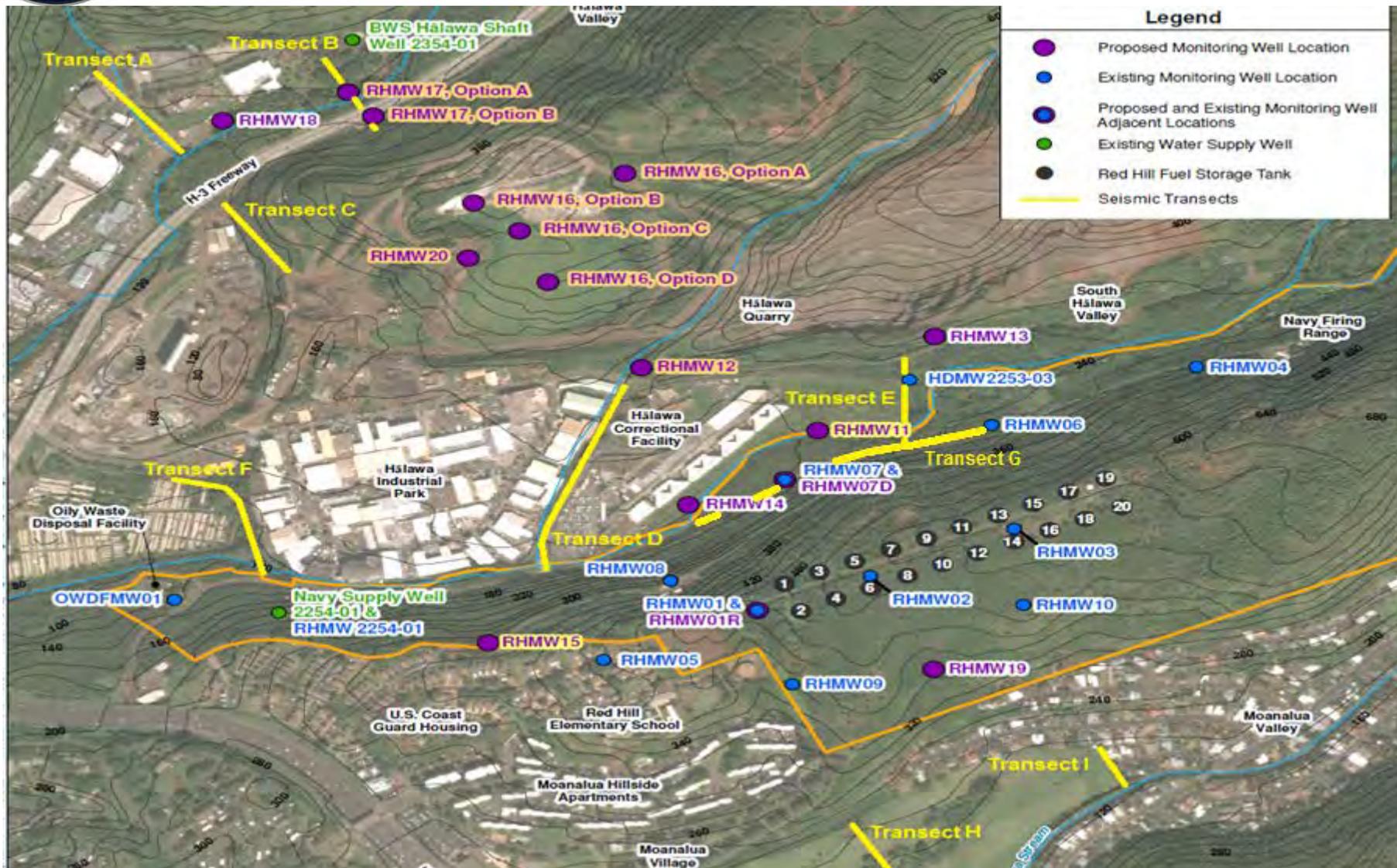
- Interim Modeling Reports to inform TUA decision
 - Four Monitoring Wells
 - Seismic Survey
 - Biodegradation
 - Capture Zone Analysis
- Ground Water Flow Model Report
- Contaminate Fate and Transport Report
- Ground Water Monitoring Well Network Report



Cap Rock / Basalt Cross-Section
Groundwater Model Monitoring Well Network



Sections 6/7 Monitoring Wells and Seismic Transects





AOC/SOW Section 8: Quantitative Risk/Vulnerability Assessment

Since Last Year:

- Statement of Work approved
- Phase 1 QRVA contract awarded.
Focuses on internal events, i.e. equipment failure, human error, etc.
- Technical Review/Status Update

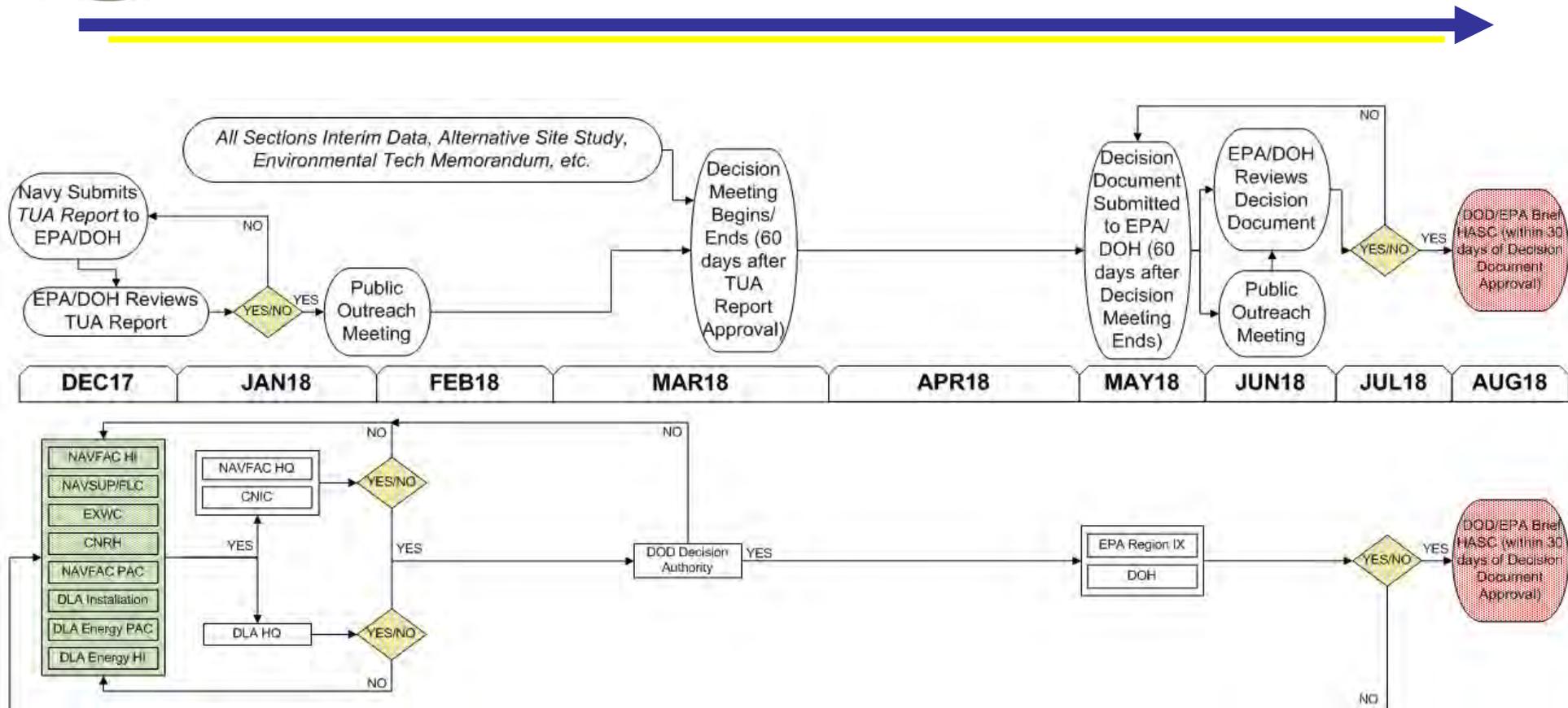
Current/Upcoming:

- Interim Qualitative Assessment of Empirical Data
- Phase 1 QRVA Complete
- Phases 2-4
 - Phase 2: Internal and External Fire and Flood
 - Phase 3: Seismic
 - Phase 4: Additional external events, e.g. storms, chemical spills, airplane crashes, etc





TUA Decision Process



*HASC – House Arms Services Committee



Summary

- Water is safe to drink
 - Routine water sampling/testing
- Tanks are not leaking
 - Annual Tank Tightness Testing
- The AOC is working
 - Holds the Navy/DLA accountable
 - Navy has met/meeting all AOC deadlines
- Clean Inspect Repair Tanks 13, 14 and 17 In Progress
- Tank 5 warranty repair work complete
 - 2nd full inspection with improved QA in progress
 - Planned Return to Service - Fall 2018
- TUA Decision expected August 2018



Ground Water Management Area Designation Petition Decision: Keauhou Aquifer System Area – Next Steps

(As Presented in Kona 11-2-17 to HWWA/HRWA Conference)





State of Hawaii, Department of Land and Natural Resources
Commission on Water Resource Management

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PETITION FOR GROUND WATER MANAGEMENT AREA DESIGNATION, KEAUHOU
AQUIFER SYSTEM AREA, NORTH KONA, HAWAII
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-  [State Water Code & Rules](#)
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WEBSITE UPDATES

As of October 13, 2017

- Permit Review: SCAP.4693.3, Application for a Stream Channel Alteration Permit (SCAP.4693.3), Manoa Stream Improvements at Woodlawn Drive Bridge, Manoa, TMK: various
- May Commission Meeting Minutes
- October Commission Meeting CANCELLED
- Public Notice: Application for Water Use Permit, Koolauloa Ground Water Management Area, Oahu
- Notice of Public Hearing: Public Hearings on proposed amendments to Title 13, Section 13-167-10(b), Section 13-168-3(a), Section 13-169-3(a), Section 13-168-12(a)



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DEPUTY DIRECTOR

The duties of the Deputy Director for Water Resource Management are to administer and implement, under the direction of the Commission, the State Water Code and all rules, and other directives promulgated by the Commission. The Deputy Director must have experience in the area of water resources and is appointed by the Chairperson, subject to the approval of a majority of the Commission.

JEFFREY T. PEARSON, P.E., DEPUTY DIRECTOR



The Hawaii Commission on Water Resource Management (CWRM) today confirmed the appointment of Jeffrey T. Pearson as deputy to the chairperson and chief executive officer of the Commission.

Pearson, a professional engineer (PE), was most recently the manager of capital improvement projects for Maui County's Department of Water Supply. Prior to this he was the water manager for Maui Land and Pineapple Company and served as deputy director for Maui County's Department of Water Supply. He's also worked in the private engineering sector.

CWRM and DLNR Chair Suzanne Case said, "Jeff has the skills and experience that will be needed to administer and continue the implementation of Hawaii's water code. He will work closely with the commission, CWRM staff and all stakeholders to address the critical water issues facing all of Hawaii."

Pearson holds a Bachelor of Science in Civil Engineering from the University of Minnesota and earned his PE credentials in Hawaii. He's been a resident of Maui for the past 30 years and is an active member of a number of community, non-profit and sports organizations. He begins work with the CWRM on August 25, 2015.

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Symbols:

➤ indicates an external website link

📺 indicates a video link

[Download Adobe Reader here.](#)

Commission on Water Resource Management



- Seven Members of the Commission

- Chairperson of BLNR (Chair of Water Commission)

- Suzanne D. Case



- Director, State DOH (ex-officio voting member)

- Virginia Pressler, M.D.



- Five members are appointed by the Governor and confirmed by the State Senate



William D. Balfour, Jr.



Kamana Beamer



Michael G. Buck



Neal Hannahs



Paul Meyer

Ke Kahuwai Pono

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



Commission on Water Resource Management



Ke Kahuwai Pono

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

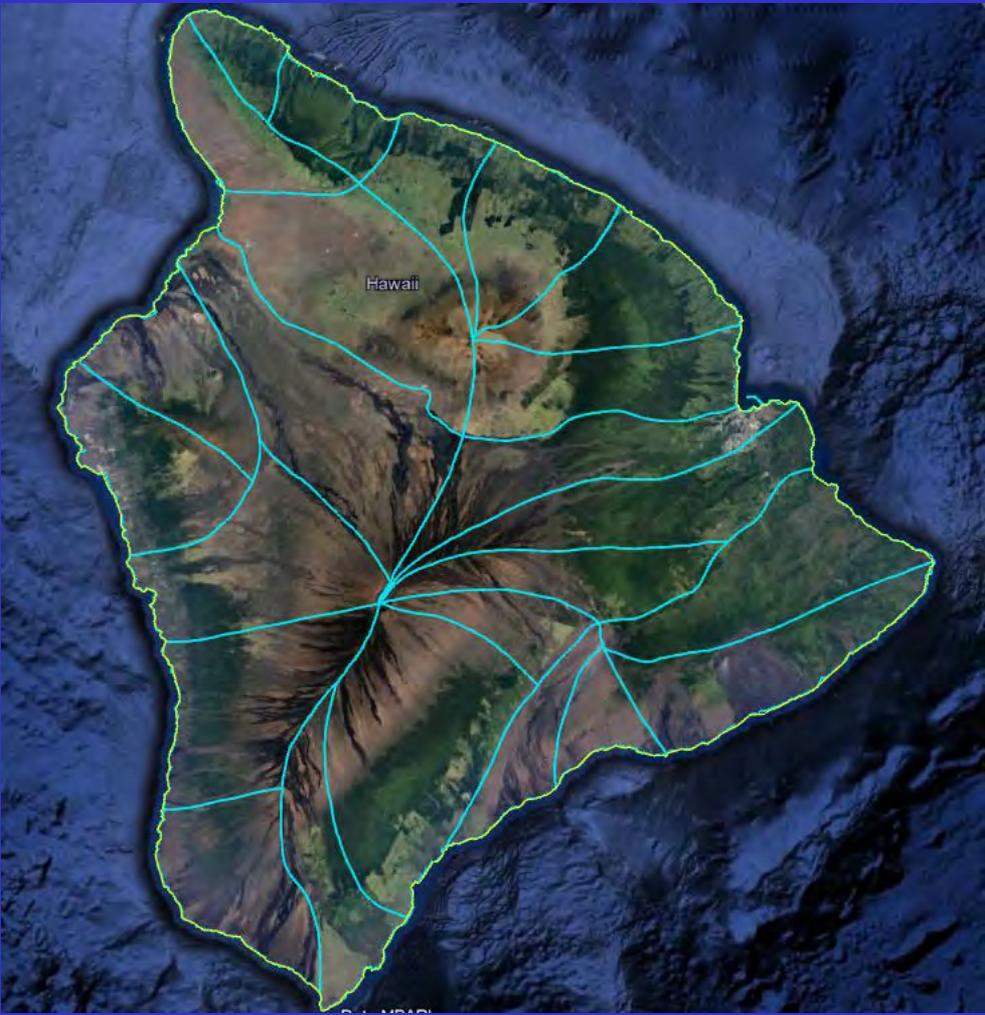
Outline –

- Short Background
- Commission Decision
- Follow-up Actions Status & Next Steps

Outline –

- **Short Background**
- Commission Decision
- Follow-up Actions Status & Next Steps





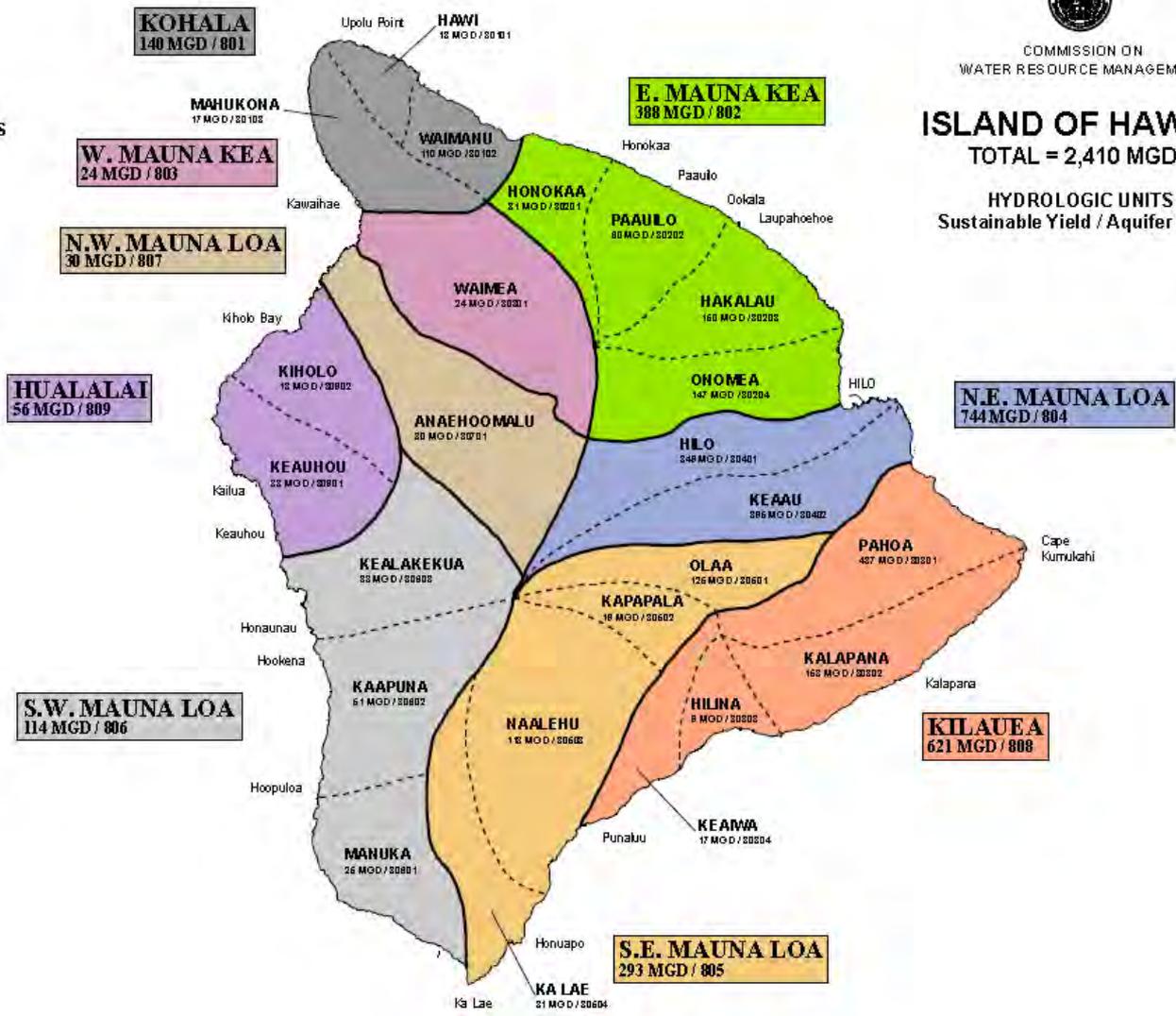


COMMISSION ON WATER RESOURCE MANAGEMENT

ISLAND OF HAWAII

TOTAL = 2,410 MGD

HYDROLOGIC UNITS
Sustainable Yield / Aquifer Code





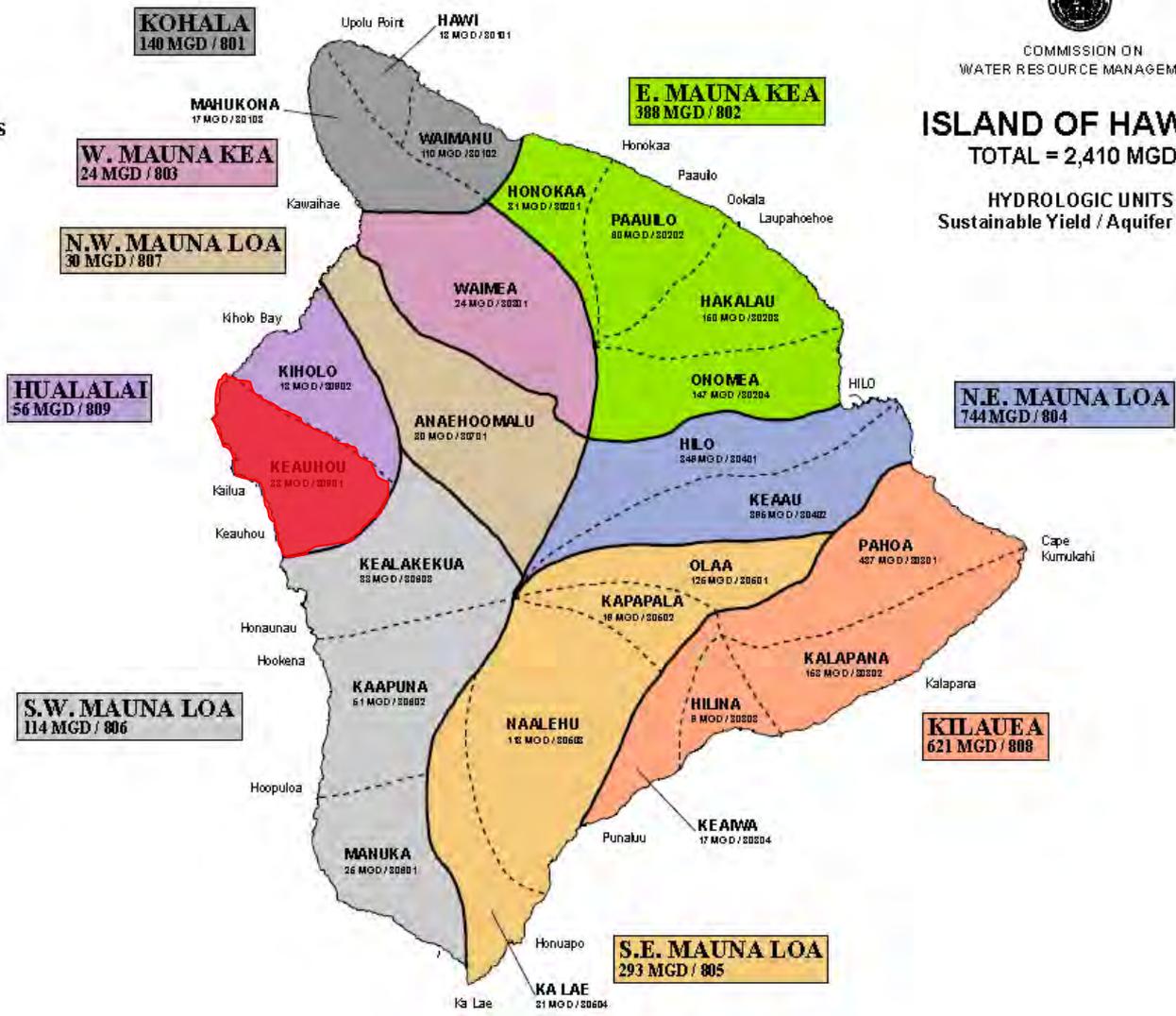
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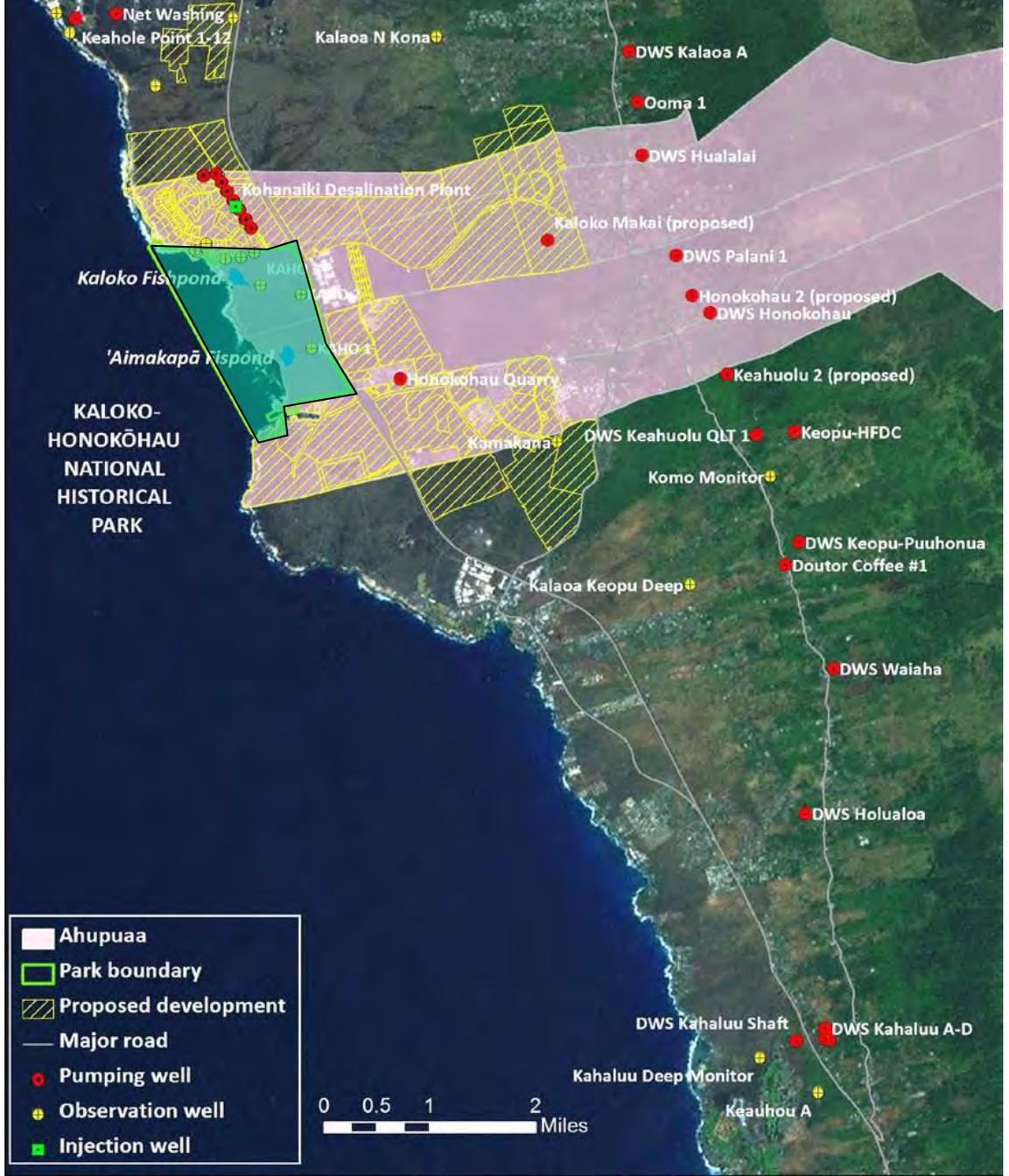
HYDROLOGIC UNITS
Sustainable Yield / Aquifer Code

N
1" = 15 MILES



September 13, 2013
NPS Petition:

To designate
Keauhou Aquifer
System Area as a
Ground Water
Management Area



**Designated Ground Water Management Areas
require additional regulation:**

Commission approved Ground Water Use Permits.

Differences in Permit Requirements:



Non-Designated vs. Designated

Non-designated Areas Statewide (administrative approval)	Designated Areas
Well Construction/Pump Installation Permits required (HWCPIS)	Well Construction/Pump Installation Permits required (HWCPIS)
Water Use Reporting	Water Use Reporting
	Ground Water Use Permits required (public hearing approval)

(Modified from NPS & J. Scheuer2014)



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PETITION FOR GROUND WATER MANAGEMENT AREA DESIGNATION, KEAUHOU AQUIFER SYSTEM AREA, NORTH KONA, HAWAII



View of Kaloko-Honokōhau National Historical Park.



This map depicts the wells surrounding the Kaloko-Honokōhau National Historical Park in the Keauhou Aquifer System Area ([Click here to view the well maps](#)).

GROUND WATER INDEX

- Ground Water
- Ground Water Activities
 - Petition for Ground Water Management Area Designation, Keauhou Aquifer System Area, North Kona, Hawaii
- Hydrologic Units
- Well Information Request
- Well Construction & Pump Installation Standards
- Water Management Areas
- Water Use Reporting
- Reported Ground Water Pumpage

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Outline –

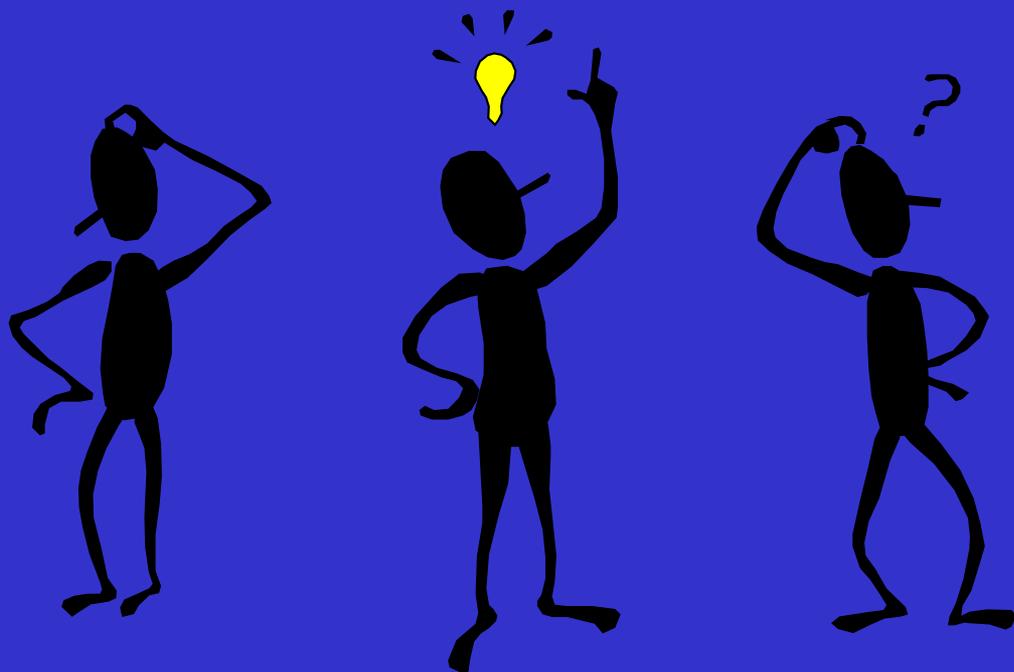
- **Short Background**
- Commission Decision
- Follow-up Actions Status & Next Steps

Outline –

- Short Background
- **Commission Decision**
- Follow-up Actions Status & Next Steps

On February 14, 2017, the Commission denied the NPS petition requesting that the Keauhou Aquifer System Area (KASA) be designated as a Ground Water Management Area.

QUESTIONS?



Recommendation

That the Commission deny the petition to designate the Keauhou Aquifer System Area (KASA) as a groundwater management area and directs staff to further investigate the science of coastal leakage impacts for consideration in setting or adjusting sustainable yields in the upcoming Water Resource Protection Plan (WRPP) 2017 update. The Commission will continue to closely monitor the Keauhou Aquifer System Area (KASA) to protect and ensure the health of the aquifer and all public trust uses therein in accordance with the eight (8) actions described in the conclusion section of this submittal.

Recommendation

That the Commission deny the petition to designate the Keauhou Aquifer System Area (KASA) as a groundwater management area and directs staff to further investigate the science of coastal leakage impacts for consideration in setting or adjusting sustainable yields in the upcoming Water Resource Protection Plan (WRPP) 2018 update. The Commission will continue to closely monitor the Keauhou Aquifer System Area (KASA) to protect and ensure the health of the aquifer and all public trust uses therein in accordance with the eight (8) actions described in the conclusion section of this submittal.

Conclusions

- Alternative actions to designation:

& DHHL

1. Aha Moku review of well construction & pump installation permits and, if necessary, set conditions to address traditional & customary practices (T&C).
2. New private wells in ahupua'a of Kaloko, Honokohau 1-3, or Kealakehe to be encouraged to put in a deep monitor well, if none already exist.
3. Finish remediation of Keopu DMW and construction of new Keopu DMW 2.
4. Convert Kaloko Irrigation Well 1 (Well No. 4160-001) to a DMW.
5. Enforcement of monthly water reports from all production and monitor wells.
6. If APU reaches 80% (30.4 mgd), staff will commence public information meetings.
7. If plans of the Keauhou WUDP are not followed and 12-MAV pumpage reaches 17.1 mgd, staff will commence public information meetings.
8. When USGS 3-D Model is finished, the Commission will be briefed in a regular meeting.

Outline –

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Aha Moku System Act 288

**Signed into law by
Governor Abercrombie
July 9, 2012**

**Establishes Aha Moku
Advisory Committee
within the DLNR and
formally recognizes the
Aha Moku System**

Why an Aha Moku System?



*Makalani Estates
Keauhou Mauka*



Kohanaiki

- Last 25 years, the general public concerns on ecosystem degradation included NH fears of resource depletion
- 1st time since overthrow, kupuna and native Hawaiian resource experts from traditional moku on the eight main Hawaiian Islands gathered to address natural & cultural resource protection

Purpose of Act 288

To formally recognize the Aha Moku System and to establish the Aha Moku Advisory Committee within the DLNR

To serve in an advisory capacity to the chairperson of the BLNR

May advise on issues related to land and natural resources management through the Aha Moku System

To integrate the Native Hawaiian cultural and traditional values into the fabric of state policy



*Anaeho'omalu
Ku'u Ali'i Royal Pond
Kaha Papa Pond*

The Aha Moku System to provide advice on



Keahuolu Ahupua'a, Kona



Puuhonua O Honaunau

1. Integrating NH resource management practices with western practices in each moku
2. Id comprehensive set of NH practices for natural resource management
3. Fostering understanding & practical use of NH resource expertise
4. 4. Sustaining the State's marine, land, cultural, agricultural &

5. Providing community education

6. Fostering cultural awareness on the benefits of the Aha Moku System



Kealakekua Mauka

Kaloko Honokohau National Park



*Aimakapa Fishpond
Kaloko-Honokohau NHP*



Kohanaiki, Kona

Ka Pa'akai O Ka Aina (2000) ***(The Salt of the Land)***

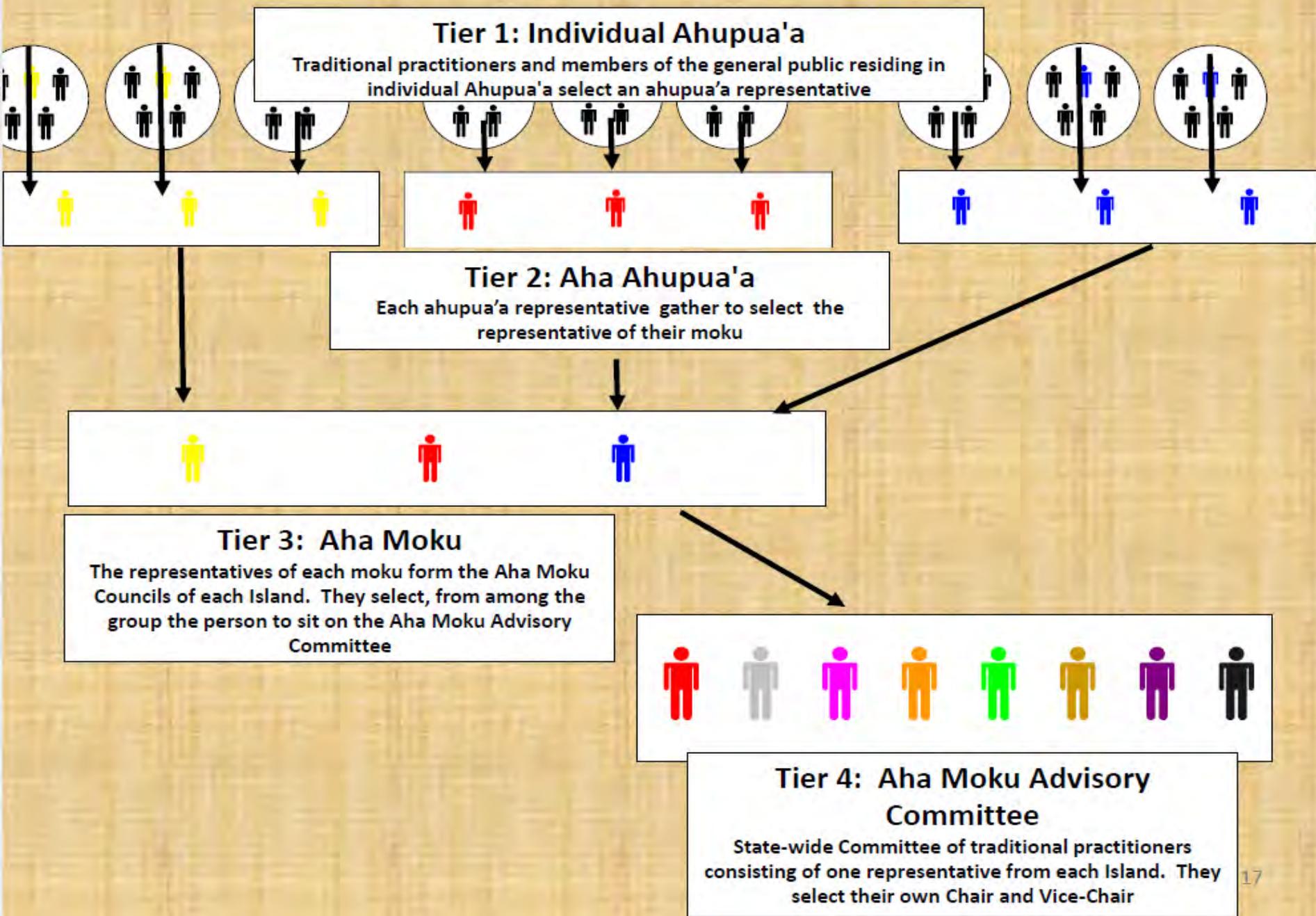
Findings of Fact and Conclusions of Law

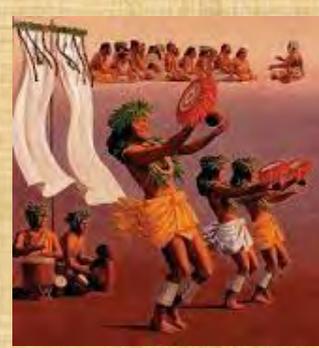
- ❖ Identification and scope of “valued cultural, historical, or natural resources” in petition or impacted area, including the extent to which traditional and customary native Hawaiian rights are exercised in the petition area;
- ❖ The extent to which those resources, including traditional and customary native Hawaiian rights, will be affected or impaired by the proposed actions;
- ❖ The feasible action, if any, to be taken to reasonably protect native Hawaiian rights if they are found to exist.

Ahupua'a / Moku Structure



Public Trust, BLNR, Legislature



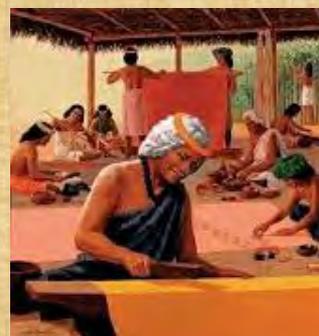


Ahupua'a Communities

Site- specific communities within an ahupua'a identify or respond to natural resource concerns that impact the community

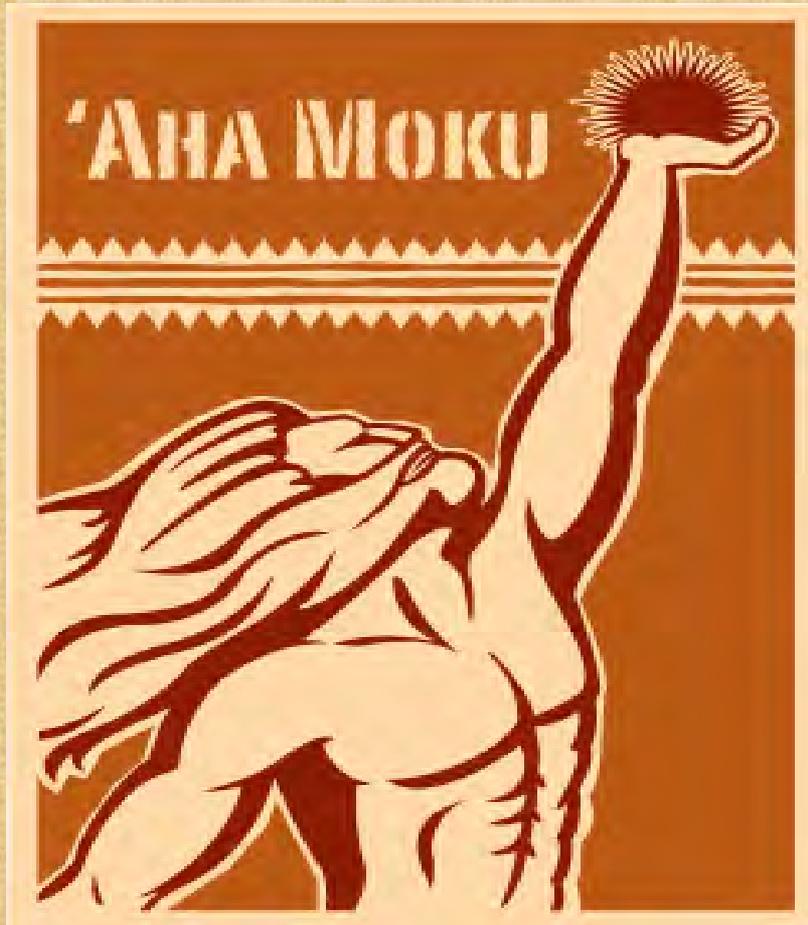
Families and kupuna who have generational knowledge of traditional and customary practices of the ahupua'a are consulted

Focus on the foundation – sustainability of ecosystem



Mahalo Nui Loa!

For Further Information,
please contact:



Moku O Keawe (Island of Hawaii)

Kawehi Nguyen, Kona Moku

Phone: 808-937-1714

Piilani Kaawaloa, Po'o, AMAC

Phone: 808-896-4172

Email: punatita7@yahoo.com

Aha Moku Advisory Committee

Leimana DaMate

Malama Po'e Kupuna Hou

Phone: 808- 640-1214

Leimana.K.DaMate@hawaii.gov

Department of Land and Natural Resources

1151 Punchbowl Street, Ste. 130

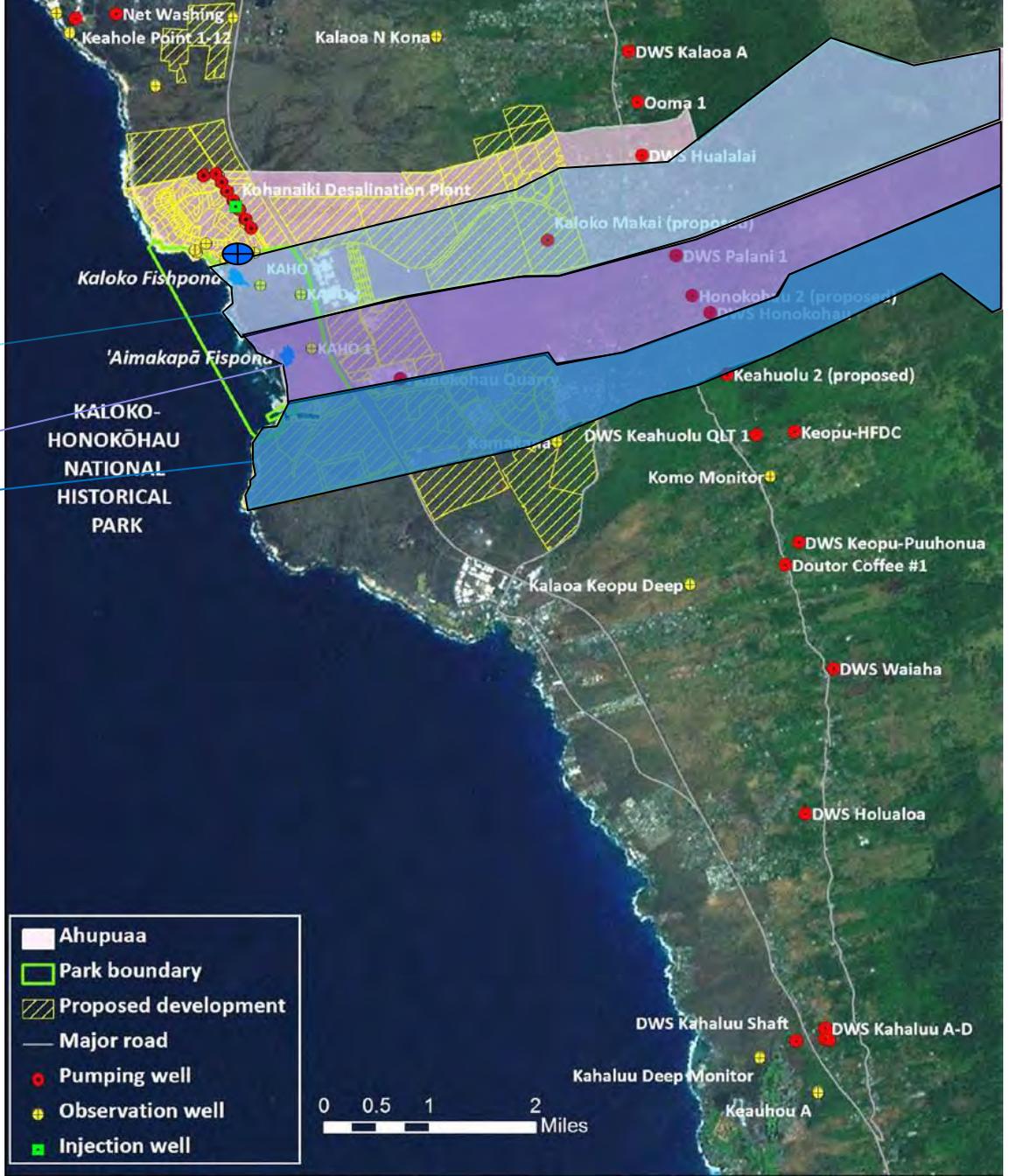
Honolulu, HI 96813

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Ahupua'a

- Kaloko
- Honokohau 1-3
- Kealakehe



Conclusions

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Remediation of Keopu DMW

Problem – leaking from deep freshwater aquifer

Objectives – stop leaking

isolate deep freshwater aquifer and/or

isolate upper basal and saltwater

long-term DMW data collection

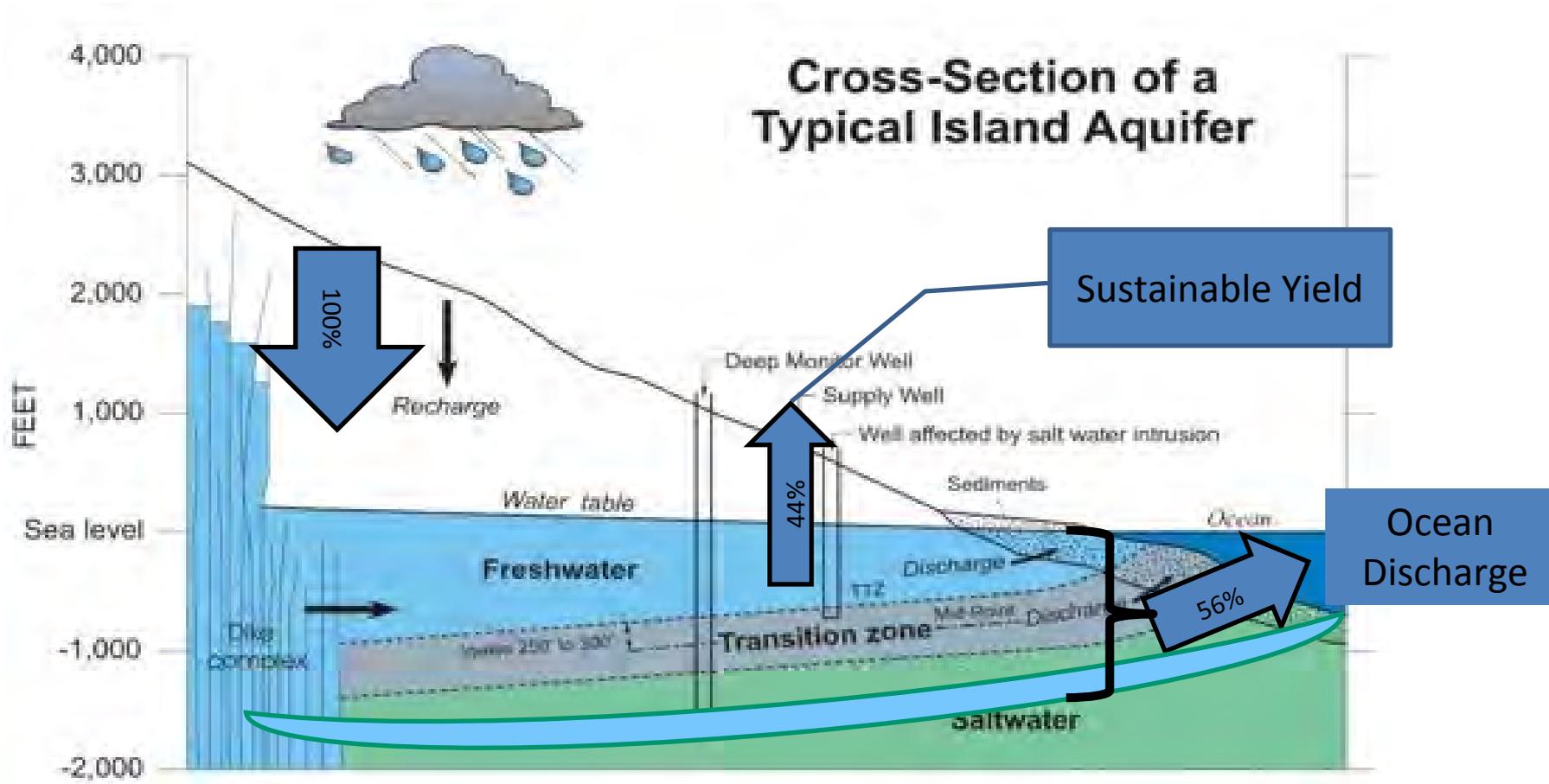
Construction of New Keopu DMW 2

Objectives – isolate deep freshwater aquifer

long-term DMW data collection

Ground Water

Resource Assessment – Keauhou Aquifer System Area Sustainable Yield



Kaloko-Honokōhau National Park



Existing Deep Monitor Wells (DMW)

Keopu Basal DMW 3858-01



Keopu Deep Monitor 3858-02

Keolani Sbd





CWRM 1-16-18 Meeting

Keopu 1 video before

Go to 29:00 at 940'

35:13 plunge

37:14 at 959'

41:47 at 982'







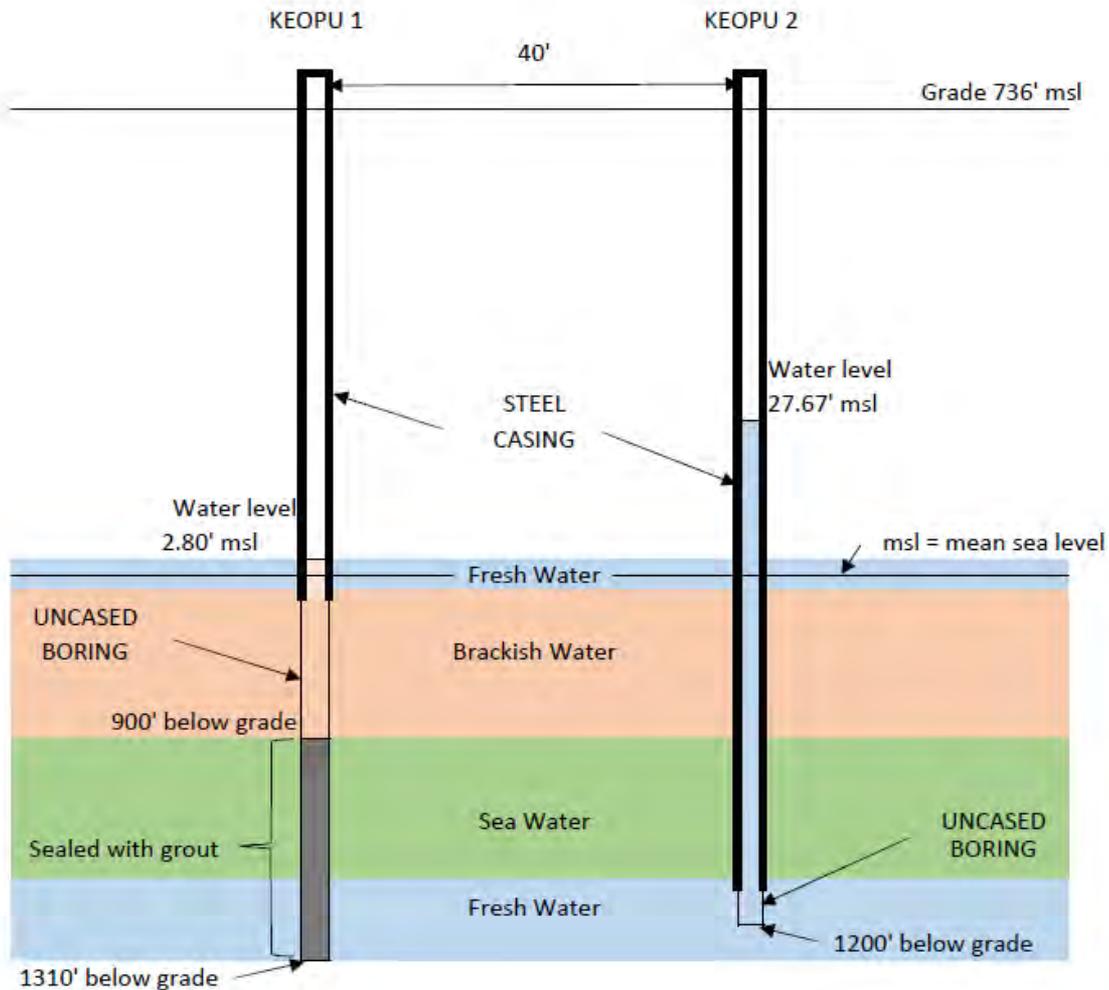


Keopu 1 after
Go to 14:40 at 891'

Keopu 2
Go to 12:20 at 1160'

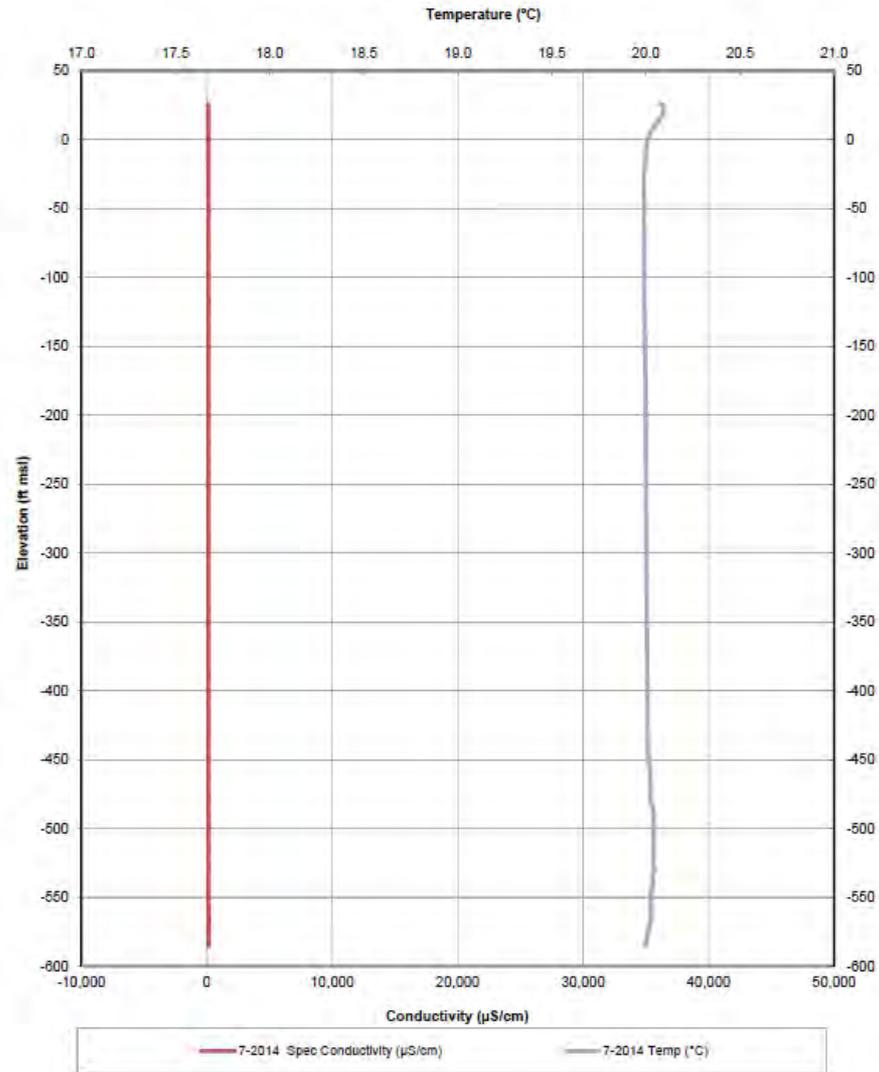
KEOPU 1 (8-3858-001) and KEOPU 2 (8-3858-002) DEEP MONITORING WELLS

Installation Diagram



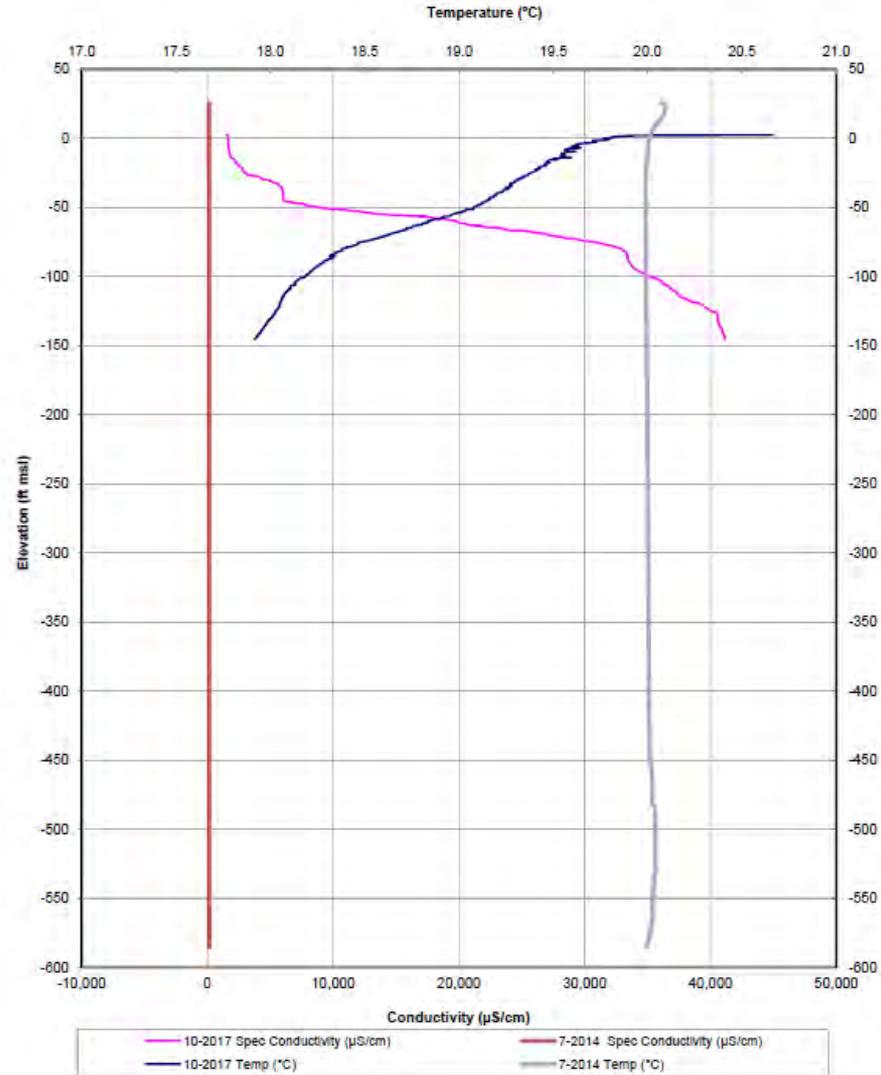
Keopu 1 (8-3858-001)

Comparison of Specific Conductivity and Temperature
July 29, 2014 (Before Sealing)



Keopu 1 (8-3858-001)

Comparison of Specific Conductivity and Temperature
July 29, 2014 (Before Sealing) and October 24 2017 (After Sealing)

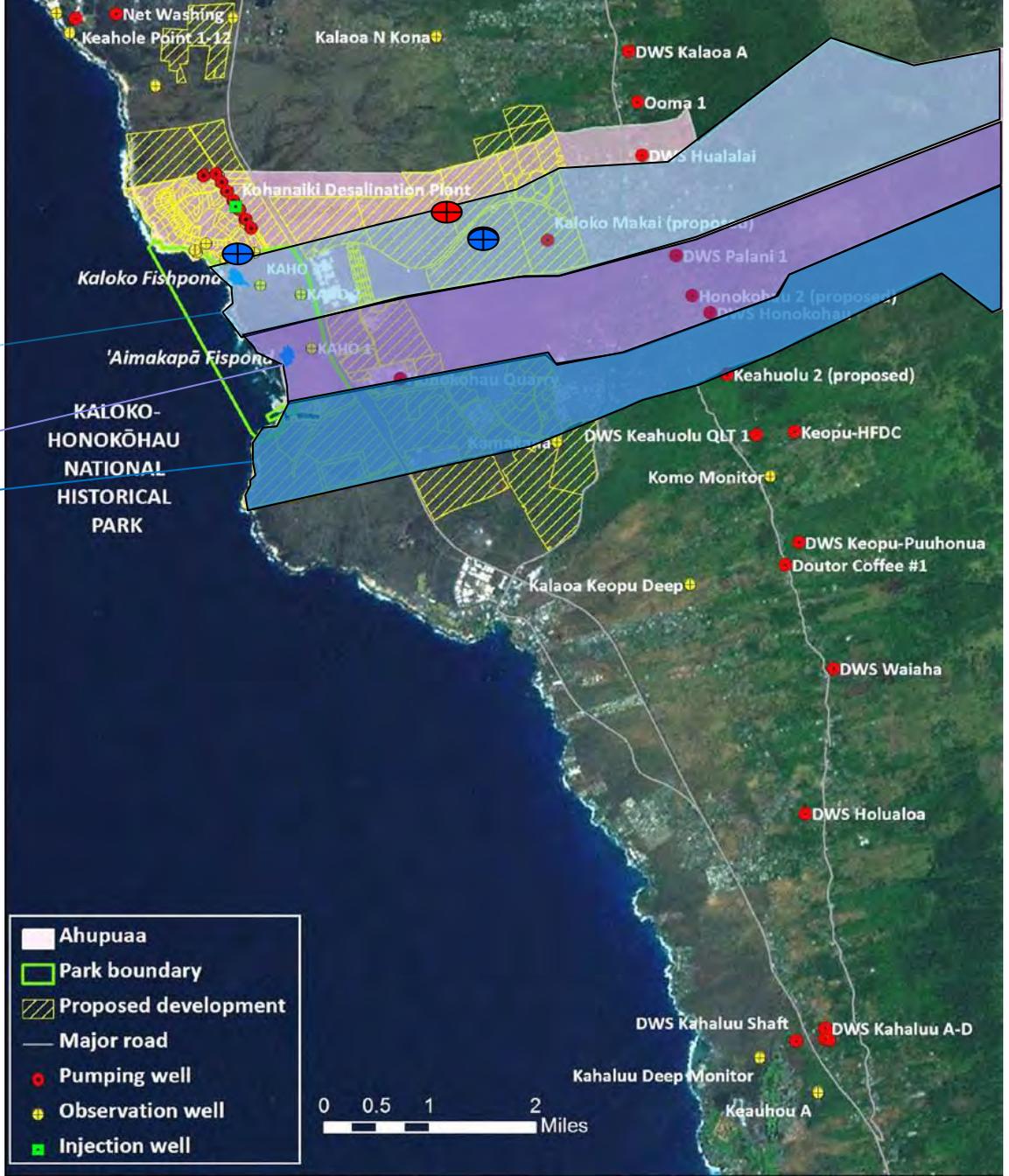


Conclusions

- Alternative actions to designation:
 1. Aha Moku review of well construction & pump installation permits and, if necessary, set conditions to address traditional & customary practices (T&C).
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Ahupua'a

- Kaloko
- Honokohau 1-3
- Kealakehe



Conversion of Kaloko Irrigation Well 1 to a Deep Monitor Well (DMW)

- New Landowner
 - Kaloko Residential Park LLC
(Former owner SCD-TSA Kaloko Makai LLC)
 - Right of Entry
 - Topo survey
 - MOA/MOU/Easement
 - Design/Construction Contract (June 2018)
- Alternative sites:
 - Pahoehoe (Palani Ranch)
 - Keauhou A (Kamehameha Schools)

Conclusions

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Enforcement of monthly water reports

- Penalty Policy Update
- Enforcement Policy Update

Enforcement of monthly water reports

- Penalty Policy Update
 - Rule Change
 - Consistency with Statute
 - \$1,000 per violation goes to \$5,000
 - Statewide Public Hearings
 - November 8 (Kona) / November 9 (Hilo)
 - Penalty calculation

Approved by
Commission on
October 1, 2014

Staff working on

- Rule change
- Translating to simpler written policy

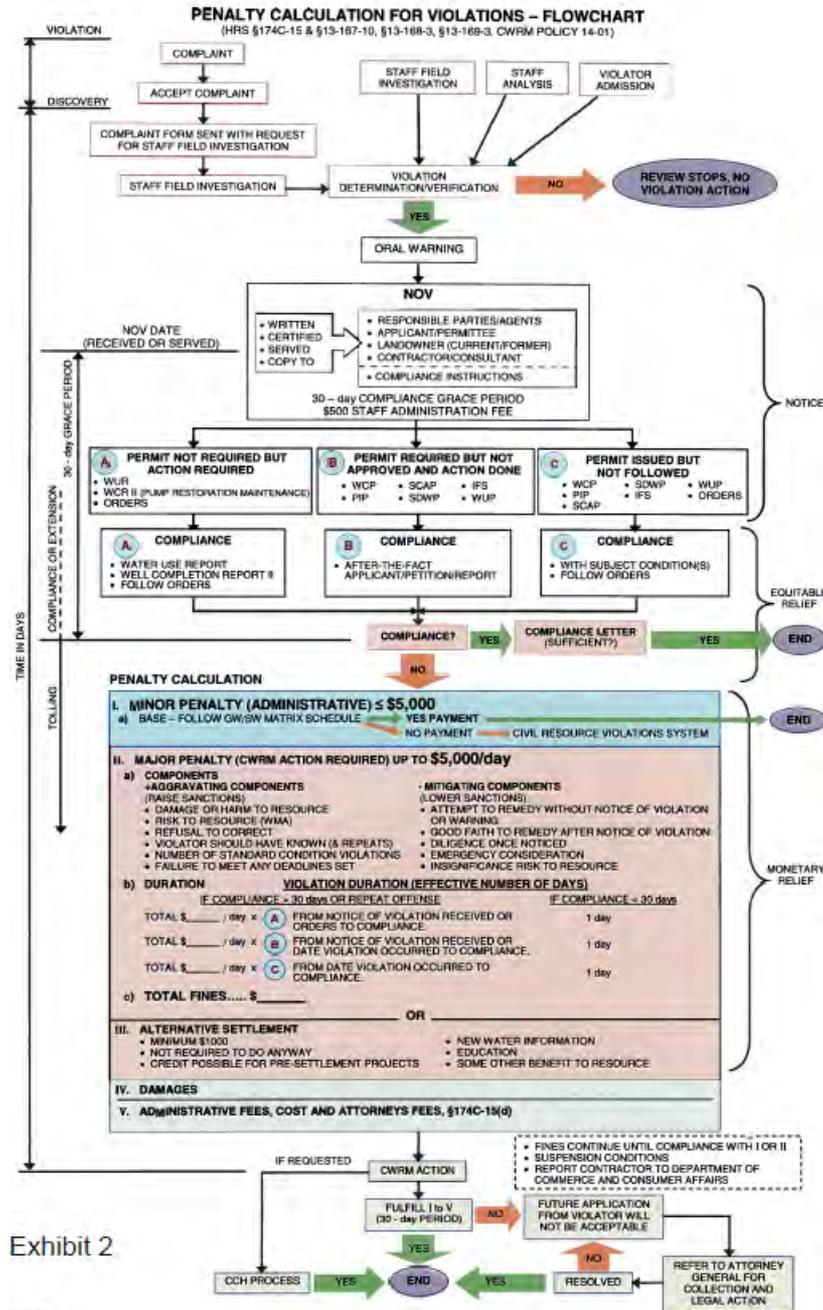


Exhibit 2

Enforcement of monthly water reports

- Enforcement Policy Update
 - DLNR Civil Resource Violation (CRV)
 - Schedule of standard simple fines
 - Needs Commission approval prior to using CRV
 - Outreach to train well owners how to report online

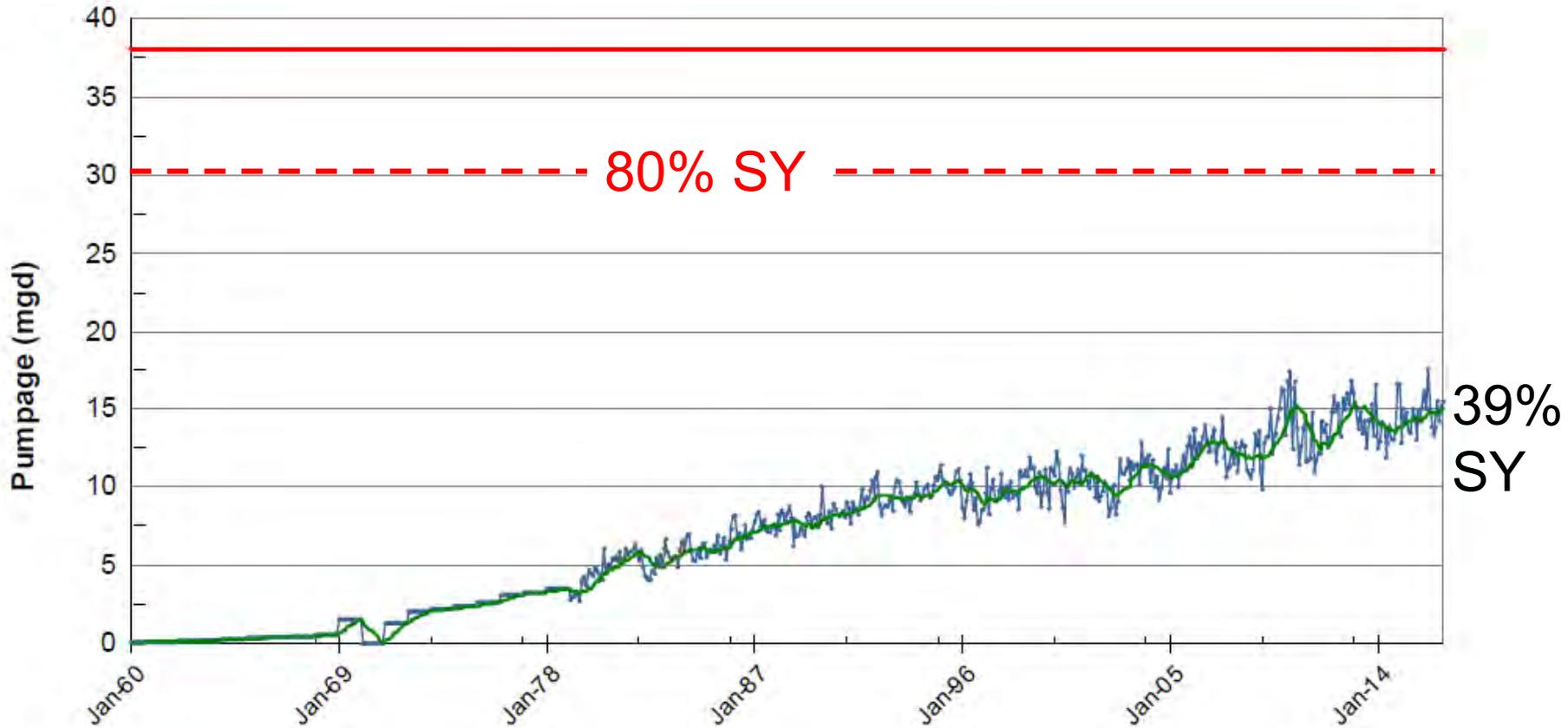
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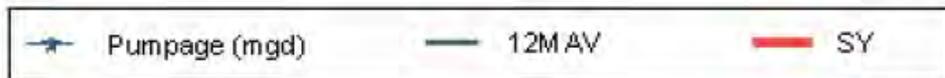
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Monthly Pumpage Chart 12 Month Moving Average



39%
SY

127 total wells
47 production wells



Keauhou Aquifer System Area Projected Demands



Phase 1
KWUDP

APU = 28

— Sustainable Yield

⊙ Authorized
Planned Use

— Projected Use -
Growth Rate A

— Projected Use -
Growth Rate B

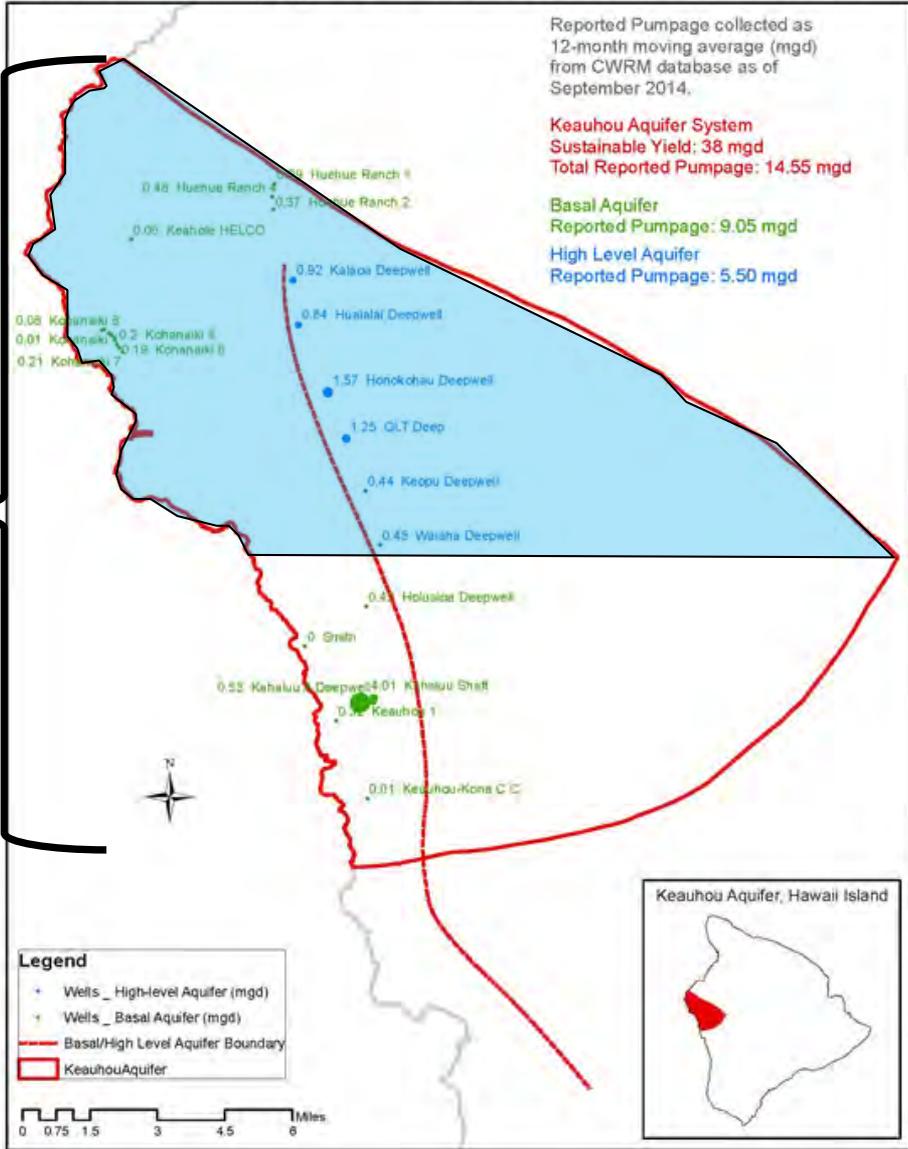
— Projected Use -
Growth Rate C

$$\frac{APU}{SY} = \frac{28}{38} = 74\%$$

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Reported Pumpage from Keauhou Aquifer System Area



15 mgd KASA

9 mgd Basal

6 mgd High Level

17.1 mgd =
45% of the SY
of 38 mgd

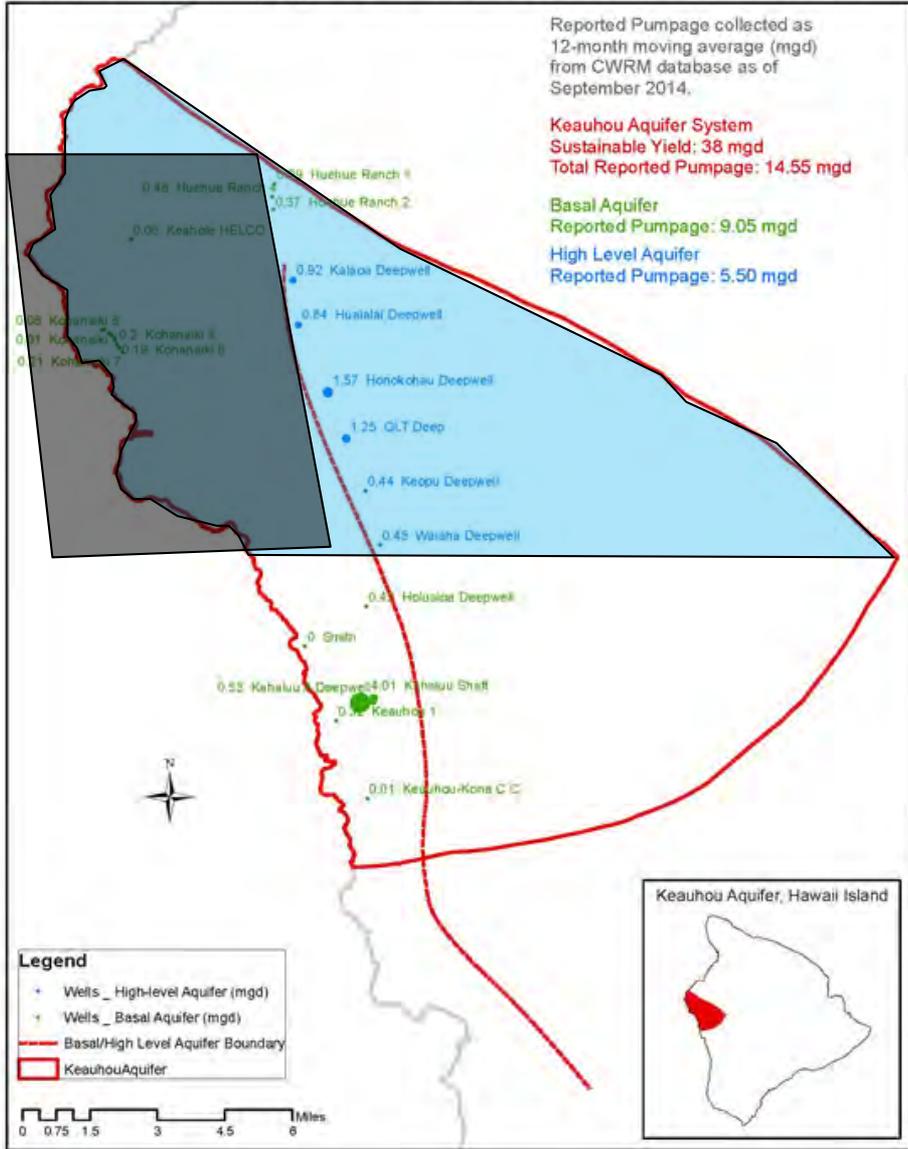
90 %
CWRM
Consideration
criteria

FOF Figure 3. Map showing Keauhou Aquifer System Area with high-level pumping wells and

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Reported Pumpage from Keauhou Aquifer System Area



15 mgd KASA

9 mgd Basal

6 mgd High Level

17.1 mgd =
45% of the SY
of 38 mgd

3D Model will assess changes in SGD due to pumping, but will not accurately assess high-level wells.

FOF Figure 3. Map showing Keauhou Aquifer System Area with high-level pumping wells and

The 8 alternative actions help towards addressing the main recommendation:

That the Commission deny the petition to designate the Keauhou Aquifer System Area (KASA) as a groundwater management area and directs staff to further investigate the science of coastal leakage impacts for consideration in setting or adjusting sustainable yields in the upcoming Water Resource Protection Plan (WRPP) 2018 update.

The Commission will continue to closely monitor the Keauhou Aquifer System Area (KASA) to protect and ensure the health of the aquifer and all public trust uses therein in accordance with the eight (8) actions described in the conclusion section of this submittal.

The 8 alternative actions help towards addressing the main recommendation:

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In Hawai‘i, on one end of the spectrum are parties arguing that groundwater wells will diminish SGD and thus seriously degrade or destroy marine ecosystems. On the other end, landowners and developers insist that the effects are small and/or insignificant relative to other activities such as overfishing and pollution in general. In the midst of these battles, new and emerging SGD data and analyses are being wielded as weapons. In most cases the science is in its infancy or there is no definitive analysis available. This may be leading to, in our opinion, very dangerous legal and policy precedent.

Source:

Optimal management of a Hawaiian Coastal aquifer with nearshore marine ecological interactions

2010 - Thomas Kaeo Duarte,¹Sittidaj Pongkijvorasin,²James Roumasset,³Daniel Amato,⁴ and Kimberly Burnett⁵

Published 2 months after CWRM decision:

National Ground Water Associations (NGWA):

The image shows a screenshot of a journal article page. At the top, the journal title "groundwater" is displayed in a stylized font, followed by the NGWA logo (The Groundwater Association) and a link to "Explore this journal >". Below the journal information, there are icons for "Open Access" and "Creative Commons". The article title is "A Global Synthesis of Managing Groundwater Dependent Ecosystems Under Sustainable Groundwater Policy", written by Melissa M. Rohde, Ray Froend, and Jeanette Howard. The article was first published on 17 April 2017. The DOI is 10.1111/gwat.12511. The article has been cited by 0 articles according to CrossRef. The article is available as a PDF, and there is an info icon. A sidebar on the left contains icons for PDF, Info, References, and Figures. On the right, there is a thumbnail for the journal issue, "Volume 55, Issue 3, May/June 2017, Pages 293-301".

groundwater NGWA The Groundwater Association
Explore this journal >

Open Access Creative Commons

Issue Paper/
A Global Synthesis of Managing Groundwater Dependent Ecosystems Under Sustainable Groundwater Policy
by Melissa M. Rohde, Ray Froend, Jeanette Howard

First published: 17 April 2017 Full publication history

DOI: 10.1111/gwat.12511 View/save citation

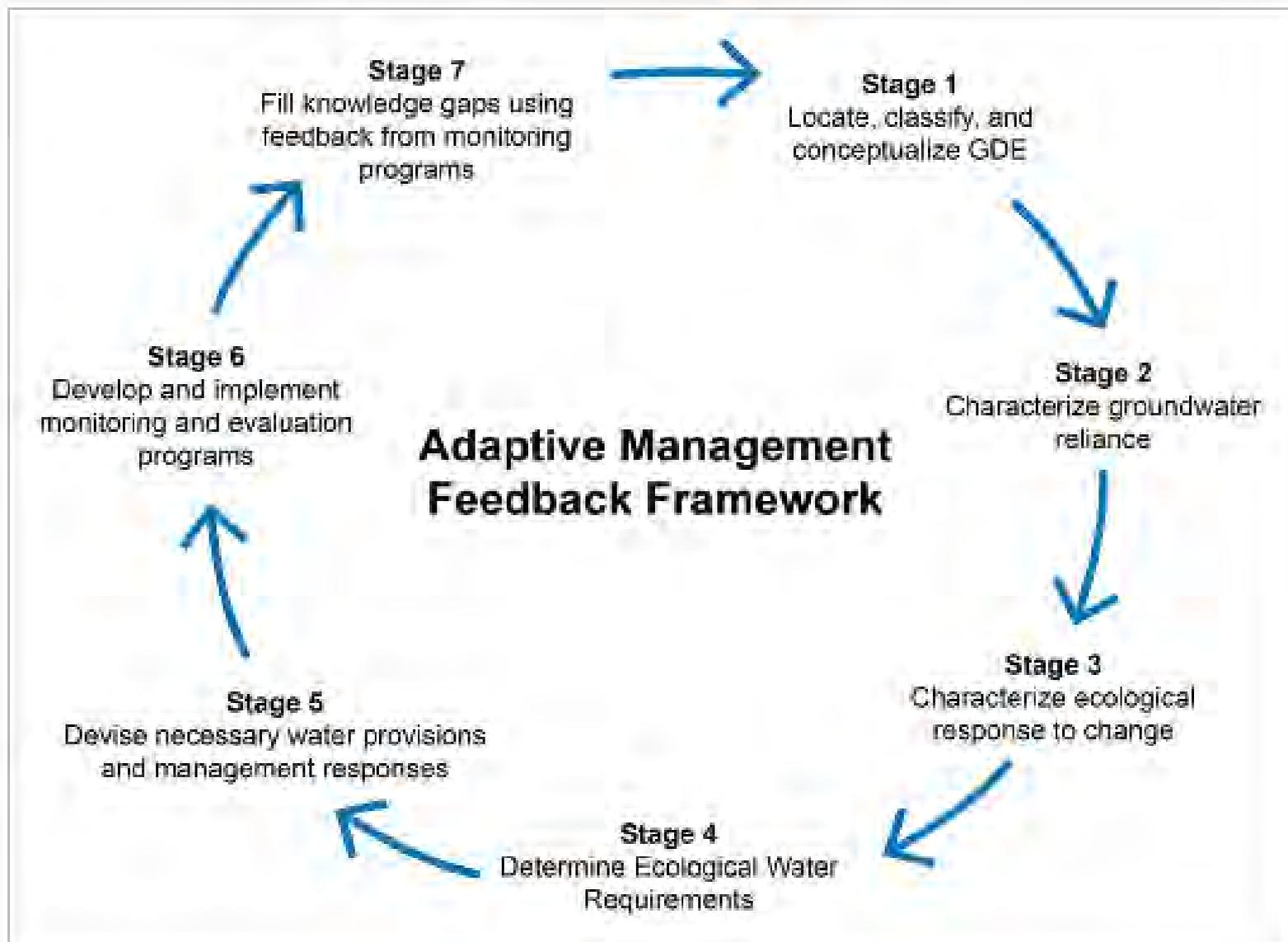
Cited by (CrossRef): 0 articles Check for updates Citation tools

Am Scopus 1

Funding Information

Article Impact Statement : Global synthesis of opportunities and challenges for managing groundwater dependent ecosystems under sustainable water management policies.

View issue TOC
Volume 55, Issue 3
May/June 2017
Pages 293-301



Incorporated GDE into Draft 2018 Water Resource Protection Plan (WRPP):

- **3.2.1 - Ground Water Dependent Ecosystems and Sustainable Yield**
- **Public Hearings to be held early 2018**

Indicators of Ecosystem Health

- **Kaloko Fishpond – Striped Mullet**



Juveniles and fingerlings prefer estuary-like conditions, traditional fishponds may need further protection (Nishimoto et al. 2007)

- **Anchialine Pools – Orange-Black Hawaiian Damselfly**



Eggs and larva sensitive to increased temperature & salinity, no larva survive > 15 ppt in lab (Tango 2010)

- **Aimakapa Fishpond – Waterbird habitat**



Saltwater intrusion may affect food availability for Hawaiian waterbirds (U.S. Fish & Wildlife Service 2011)

- **Intertidal Zone – Limu manauea**



Productivity is salinity dependent, excessive withdrawals may limit distribution (Amato 2009; Duarte et al. 2010)

Comprehensive Literature Review to characterize & determine monitoring needs for:

- **Key indicator Species**
- **Related monitoring relationships**
 - **Submarine Groundwater Discharge**
 - **Salinity**
 - **Nutrients**
 - **Pollution**
 - **Competing species**
 - **Disease**
 - **Temperature**

Adaptive Management Framework

Adaptive management is a “learning by doing” management strategy that utilizes ongoing monitoring and research to inform management decisions.

Adaptive Management Framework (AMF)

- National Park Service (NPS)
Symposium
- Division of Aquatic Resources DLNR -
RFP to do local synthesis and/or AMF
- University of Hawaii (UH) -
2017 GES Senior Thesis Project
(local synthesis)
- University of Hawaii (UH) -
'Ike Wai - \$20M NSF Grant
(local synthesis)

https://dlnr.hawaii.gov/cwrm/

QUESTIONS? / THOUGHTS?



PETITION FOR GROUND WATER MANAGEMENT AREA DESIGNATION OAHU
 AQUIFER SYSTEM AREA NORTH HAWAII
[Read More](#)

- Commission Meetings
- State Water Code & Rules
- Applications & Forms
- Hawaii Water Plan
- Contact Us

WEBSITE UPDATES

As of October 13, 2017

- Permit Review: (SCAP.4693.3) Application for a State Stream Channel Alteration Permit (SCAP.4693.3), Manoa Stream Improvements at Woodlawn Drive (Bridge, Manoa, TMK/Various) - JS
- May Commission Meeting Minutes
- October Commission Meeting CANCELLED
- Public Notice: Application for Water Use Permit, Koolauloa Ground Water Management Area, Oahu
- Notice of Public Hearing: Public Hearings on proposed amendments to Title 13, Section 13-167-10(b), Section 13-168-3(a), Section 13-169-3(a), Section 13-168-12(a)