



NATURAL ENERGY LABORATORY OF HAWAII AUTHORITY

An Authority of the State of Hawaii attached to the Department of Business, Economic Development & Tourism



**BOARD OF DIRECTORS
MEETING MINUTES
Tuesday, October 19, 2021
10:00 a.m.**

An Interactive Conference Technology Meeting was held at

**NELHA OceanView Conference Room
Hale Iako Building
73-970 Makako Bay Drive
Kailua-Kona, HI 96740**

and via Zoom Video Conferencing Software.

Members/Designees in Attendance

William Mielcke (Gov. Appointee/Chair)
Cyd Miyashiro (Gov. Appointee/Vice Chair)
Linda Rosehill (Gov. Appointee)
Robert Masuda (DLNR)
Chung Chang (DBEDT)
Dick Jones (Tenant Representative)
Alan Hilton (RAC Chair)
Dr. Vassilis Syrmos (University of Hawaii)
Dr. Phil Bossert (RAC Secretary)
Neil Sims (Tenant Representative)

Guests/Staff Present

Greg Barbour (Executive Director)
Laurence Sombardier (Dep. Director)
Keith Olson (NELHA)
Dr. Alex Leonard (NELHA)
Jerrae Miranda (NELHA)
Jennifer Rasmussen (NELHA)
Georgette Espinueva (NELHA)
Bryan Yee (Deputy AG)
Robert Bergstrom (NOW Co)
Michael Porter (NOW Co)
Leonard Tanaka (T&T Electric)
Robert Command (County of Hawaii)
Jerry Chang (Hawaii Island Resident)
Aldric Ulep, (House Finance)

Board Members Not Attending and Excused

Douglass Adams (County of Hawaii).
Dr. Phil Bossert (RAC Secretary)

- **Item 1. Call to Order.**

The meeting was called to order by Chair Mielcke at 10:04 a.m. Upon calling the meeting to order, Chair Mielcke introduced and welcomed Director Jones as a new tenant representative to the Board. Chair Mielcke requested a roll call of Board members, NELHA staff, and guests in attendance.

Chair Mielcke announced that, we would like to take Item 7 next and recognize a 10-year Service Award for the NELHA Business Manager Ms. Jerrae Miranda and then return to Item 2.

- **Item 7. Announcements.**

Executive Director Barbour read the service award for Ms. Miranda's completion of 10 years of employment at NELHA. ED Barbour and Chair Mielcke thanked Ms. Miranda for her excellent service and dedication over the past 10 years.

Ms. Miranda, Ms. Rasmussen and Ms. Espinueva left the meeting.

- **Item 2. Approval July 20, 2021 NELHA Board of Directors' Meeting Minutes.**

Chair Mielcke entertained a motion to approve the July 20, 2021 minutes. The motion was made by Director Masuda and seconded by Director Sims. No discussion ensued or corrections were noted. The Board voted by roll call. The motion carried unanimously 9-0.

- **Item 3. Financial Report: Approval and Decision Making.**

ED Barbour presented and overview and summary the Financial Report in the board packet (Attachment A). Chair Mielcke called for a motion to accept the report. Director Rosehill made the motion which was seconded by Director Hilton. The Board voted by roll call. The motion carried unanimously 9-0. There being no further discussion or questions concerning the Financial Report, Chair Mielcke thanked NELHA and its staff for its report.

- **Item 4. Change the Membership of Special Investigative Committee for the purpose of preparing and delivering to the Board the annual performance evaluation for the period July 1, 2020 through June 30, 2021 of the NELHA Executive Director.**

Chair Mielcke explained that Dr. Gerry Cysewski served on the Board as a Tenant Representative. Dr. Cysewski decided not to run again for election as a Tenant Representative last month. Director Jones and Director Sims were elected as Tenant Representatives to the Board effective October 1, 2021. This is Director Jones first term on the Board. Chair Mielcke recommended that given his past experience on the Board, Director Sims be appointed to replace Dr. Cysewski. Director Masuda made a motion, seconded by Director Rosehill to approve the

recommendation of Chair Mielcke to have Director Sims replace Dr. Gerry Cysewski on the Special Investigative Committee. The Board voted by roll call. The motion carried unanimously 9-0.

- **Item 5a. New Business – Request for Approval in Concept for NOWCo for an offshore desalination demonstration project.**

Deputy Director Sombardier stated that NOWCo is requesting an approval in concept to demonstrate proprietary subsea desalination technology by building and operating a demonstration desalination system off of HOST Park's coastline at 1,500-foot (460 meters) depth for two years.

NOWCo deployed a small-scale prototype of their desalination system at the Deep Ocean Simulation Lab at Port Hueneme Naval Base in California in February 2021. Based on the successful test results from that deployment which validated their concept, they approached NELHA for assistance in demonstrating the next stage in the real world. NOWCo feels that NELHA is the best location for their pilot project to demonstrate continuous operation, validate theoretical calculations, and further optimize their technology. HOST Park and the adjoining research corridor is particularly attractive for this project, because of proximity to near shore deep waters, onshore facilities to support the project, offshore research corridor, potential sale of desalinated water for aquaculture purposes and existing unused pipeline infrastructure including a shore crossing which could be utilized for this effort.

NOWCo has made significant progress since they first presented their project to NELHA earlier this year. NOWCo has alleviated some of NELHA staff's initial concerns regarding the company's expertise in marine construction by hiring Makai Ocean Engineering (MOE) to conduct an analysis on how best to anchor the pilot system. MOE also performed preliminary analysis of the intake flow into the system using Solidworks Flow Simulation software and the brine discharge out of the system using the CORMIX software, to understand environmental impacts of the NOWCo system on surroundings.

NOWCo aims to take advantage of high deep sea ocean pressure to reduce energy use by up to 40% compared to traditional onshore reverse osmosis. The pilot system will be a 1/10th scale of the commercial pods and is expected to produce approximately 50,000 to 80,000 gallons (200 to 300 cubic meters) of fresh water per day. NOWCo believes their system has very low ecological impact as it will have a very low onshore footprint, the return brine strength will be very low because the system operates at very low recovery rates (approximately 10%), organisms entrained in the system will undergo small pressure changes and will not be harmed, and carbon emissions could be null if renewable energy is utilized.

As a next step in developing their commercial strategies, NOWCo needs to validate their proprietary technology in a continuous mode and in a real ocean situation. A successful demonstration at HOST Park would bring their technology to readiness level 7 and provide data to estimate costs of building, owning and operating NOWCo systems. This project is pre-commercial and with little or no commercial activity expected. However, after some optimization, NOWCo believes the price of freshwater produced offshore and delivered onshore might be competitive even at the smaller scale in Hawaii and depending on results, there may be an opportunity to commercializing the project beyond the 2-year demonstration by providing fresh water to HOST park clients.

This could be an exciting project for NELHA. It is extremely innovative and uses NELHA's unique assets and resources. There are however a few concerns regarding funding, project end of life, NOWCo budget and timeline, permitting, environmental assessment, technical challenges work at 1,500-foot depth, and disposal of seawater produced. An approval in concept from NELHA would be helpful in allowing NOWCo to address these challenges and would greatly assist in helping them raise capital in their next funding round.

Director Chang joined the meeting at 10:35 a.m.

Robert Bergstrom, NOWCo CEO summarized their technology and noted that this is the second desalination company that he has started. His first company is now owned by Morgan Stanley and is in eight countries. Their technology uses the hydrostatic head at 1,500-foot depth and as such is much more passive than onshore reverse osmosis, pressurizes 50 percent less seawater, lower capital costs, lower moving parts, more energy efficient, and low brine content effluent.

Director Hilton summarized the comments from the Research Advisory Committee (RAC). All RAC members found the proposal to be well written, detailed, and informative and all support the proposal and are enthusiastic. They found that the proposal is well aligned with the NELHA mission and appropriate use categories, along with an opportunity to promote advancement of what may be a key enabling technology to eventually address the need for freshwater resource alternatives, as our global society continues to face increasing issues with overstressed conventional resources and freshwater scarcity around the world. Director Hilton summarized the RAC positive comments as well as several areas that need further analysis and are in line with those presented by DD Sombardier earlier.

Jerry Chang asked about what happens with the brine. Mr. Bergstrom stated that they do not produce brine like an onshore system does and experiences salinity of the brine at 50% increase. In our case, they use much lower pressure and pass through much more water and the salinity of the effluent increases by only about

5 percent. We have designed a natural diffusion system that discharges into the ocean current and brings the discharge to an ambient salinity and is no longer an issue.

Director Sims asked about the cost of the water at scale and could this be a long-term solution that NELHA faces with freshwater. Mr. Bergstrom stated that they are still in the demonstration mode and not economic but at larger scale it becomes very economic and will provide a strong cost advantage. ED Barbour stated that we are very interested, but it is still in the demonstration phase and excited to see how they progress. Using this water for aquaculture is easier as there are lower health requirements.

Director Rosehill made a motion, seconded by Director Hilton to approve the staff recommendation for “approval in concept” for the NOWCo proposal to demonstrate their technology in the NELHA ocean research corridor to allow the company to seek additional funding for the project and request a full business plan be submitted for final approval once an environmental assessment has been completed for the project and permitting issues have been resolved. The Board voted by roll call. The motion carried 8-0 with Director Masuda excused.

- **Item 5b. New Business – NELHA Capital Improvement Requests (CIP) for Fiscal Year 2023.**

ED Barbour explained four CIP requests that were submitted to the administration for their consideration. The four requests are being presented to the Board for their information and include 1) \$1.5M to update our onshore EIS and this is our highest priority; 2) \$1.5M for an offshore EIS to expand our research corridor; 3) \$500,000 for an offshore survey to identify potential deep-sea freshwater seeps; and 4) \$13M to complete expansion of the new Ocean Economy Innovation Village that was started with FEMA and insurance company funds.

Regarding the offshore freshwater survey Director Sims asked if it is necessary to place sensors on the ocean floor or a towed array might be more economical. ED Barbour indicated that the researchers have developed more sensitive sensors and they believe these are a better alternative. We will discuss this issue further with the researchers and determine which alternative is the most appropriate.

- **Item 6. Executive Director’s Informational Status Report on ongoing projects including: New leases; seawater system maintenance; new potable water supply update; aquaculture accelerator and investment fund initiative and grant application to extend accelerator for four additional years; renewable distributed energy resources initiative including grant applications and solicitations for microgrids, energy storage, and solar desalination; analysis HOST Park energy system; and, the grant application to the US government for**

damage to buildings and associated items in Kapoho, Hawaii.

ED Barbour presented an overview and summary of NELHA's major goals and key projects timeline as contained in the Board Packet (Attachment B) as part of the Executive Director's Information Status Report.

Chair Mielcke asked if there were any questions or comments. Hearing no further questions or comments, the report was accepted unanimously as presented.

- **Item 8. Adjournment.**

Chair Mielcke adjourned the meeting at 11:23 a.m.

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