North Coast Regional Water Quality Control Board

August 29, 2025

Mr. John Smith
Director of Public Works
City of Fort Bragg
416 N. Franklin Street
Fort Bragg, CA 95437
jsmith@fortbragg.com

Dear Mr. Smith:

Subject: Water Code Section 13142.5(b) Determination Letter

File: City of Fort Bragg, Oneka Desalination Buoy Project,
WDID No. 1B25030RMEN, Place ID CW-900269

The City of Fort Bragg (City) submitted a request for a California Water Code (Water Code) section 13142.5(b) determination for the Oneka Desalination Buoy Pilot Project (Project) in a letter dated June 20, 2024. Based on the information provided within the City's Project Description dated October 8, 2024, and their application for enrollment under General Order No. R1-2020-0006, Low Threat Dischargers to Surface Waters in the North Coast Region, received on October 11, 2024, the Regional Water Board, in consultation with the State Water Board, has determined that the Project complies with Water Code section 13142.5(b).

In response to drought conditions and water reliability concerns experienced by the City in recent years, the City has sought new, reliable alternatives to supplement their potable water supply. Oneka Technologies (Oneka) wave-powered desalination buoy system, capable of converting seawater into freshwater through reverse osmosis using only the power of ocean waves, may be well suited to the coastal elements of the City. The Project deployment will determine the effectiveness of this technology along the coast of Northern California and refine operational parameters to inform a future utility-scale development. The Project comprises a single Oneka "Iceberg" class desalination buoy that can produce 13,200 gallons per day of fresh water for a period of twelve months. The Iceberg's general operation and environmental impacts will be monitored during this period to support future utility-scale permitting.

Water Code section 13142.5(b) requires that each new or expanded coastal powerplant or other industrial installation using seawater for cooling, heating, or industrial processing use the best available site, design, technology, and mitigation measures

feasible to minimize the intake and mortality of all forms of marine life. The Project is, however, exempt from the Implementation Provisions for Desalination Facilities contained within Chapter III.M.2, M.3, and M.4 of the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) because it has been identified as a portable desalination facility operated by a government agency that withdraws less than 0.10 million gallons per day of seawater.

This Water Code section 13142.5(b) determination is applicable only to the Project, which is a 12-month, temporary pilot study. The site, design, technology, and mitigation measures that the Regional Water Board has considered in this determination, as described further below, are derived from the information submitted by Oneka Technologies and the City. Any future pilot projects testing similar technologies or located at different sites will require separate permitting processes and evaluations. Further, any future utility-scale projects will require separate permitting processes.

The City must apply for a new Water Code section 13142.5(b) determination, in accordance with any applicable Ocean Plan or other legal requirements, if any potential future expansion of the installation occurs, including any of the following: 1) increases in the amount of seawater used either exclusively by the facility or used by the facility in conjunction with other facilities or uses, or 2) design or operational changes to the Project that could increase the intake and mortality of all forms of marine life beyond that which is approved under this Order.

Site:

“Site” is the general onshore and/or offshore location of a new or expanded facility. The City analyzed the general area of the Fort Bragg coastline to identify suitable locations to place the mooring system for the pilot desalination buoy. Since this type of technology has not been tested in California, the best available site feasible for this Project is one that can accommodate the following parameters: shoreside facilities to receive and test the permeate delivered from the buoy; access to supporting infrastructure for the disposal of the permeate; and a position in the Pacific Ocean that considers pumping efficiency, ambient wave energy, water depth for brine dispersion, and minimization of visual impacts.

The site proposed for the desalination buoy is northwest of the Fort Bragg Wastewater Treatment Facility, approximately 0.5 miles offshore. This location allows for efficient pumping of permeate from the desalination buoy to land without the need for supplemental pumps and minimizes visual impacts from the buoy. Additionally, the Fort Bragg Wastewater Treatment Facility has space to accept permeate for testing and disposal. Furthermore, the chosen location allows for the mooring system to be placed in an area dominated by soft-bottom habitat and allows the permeate pipeline to be placed along the previously disturbed habitat created by the wastewater treatment plant’s ocean outfall. The site is not located within a Marine Protected Area (MPA) or State Water Quality Protection Area (SWQPA).

The City concluded that the proposed location for the desalination buoy, adjacent to the Fort Bragg Wastewater Treatment Facility, was the best available site feasible because there were no other feasible locations that could accommodate the permeate piping without disrupting marine navigation near Noyo Harbor or encroaching on areas of hard bottom that support sensitive kelp beds. The Regional Water Board finds that the Project's location is consistent with section 13142.5(b).

Design:

"Design" is the layout, form, and function of a facility, including the configuration and type of infrastructure, including intake and outfall structures. The key design features of the Iceberg desalination buoy are the 60-micron mesh intake screen, low through-screen velocity intake, and low intake volume.

The desalination buoy's intake screen is made from a 60-micron stainless steel mesh to prevent the entrainment of larger marine organisms. This screen size is expected to minimize intake and mortality of all forms of marine life. The proposed screen size is anticipated to limit marine life entrainment to phytoplankton, nanoplankton, and microplankton and its efficacy will be further studied over the course of the Project as described in the Environmental Monitoring Plan.

The desalination buoy has also been designed for a maximum intake velocity of 0.22 feet per second (ft/sec), less than the 0.5 ft/sec required by the Ocean Plan. This low intake velocity protects marine life by significantly limiting the potential for impingement. Furthermore, since the intake structure also serves as the discharge for the brine, the backflushing during each pumping cycle is expected to release any marine life that is trapped against the screened (impinged). It is recommended that backflushing be verified under field conditions to confirm its effectiveness at removing impinged organisms.

The low seawater intake (up to 66,000 gal/day) and brine discharge volumes (up to 52,800 gal/day) used by the desalination buoy further protect marine life by allowing a passive diffusion of brine to mix with ambient seawater as it falls vertically from the near surface intake location. Salinity is estimated to increase from an ambient ocean salinity of 30.1 parts per thousand (ppt), to a maximum of 50.92 ppt in the discharge when the pump is operated at a 35% recovery rate. Design modeling indicates that the brine discharge is expected to be diluted to near-ambient salinity within 1-foot horizontally and 9-feet vertically of the discharge, well above the sea floor at the Project location. Salinity monitoring is proposed during the 12-month pilot period to provide detailed data on the characteristics and extent of the brine mixing zone.

Additional design criteria are being employed to reduce risks to marine life and the environment including minimizing the use of chemicals on the Iceberg desalination buoy, and reducing the number of mooring/anchoring lines to reduce the risk of entanglement. All mooring and anchoring lines shall be tensioned to prevent loops that

may ensnare marine life. The Regional Water Board finds that the Project's design is consistent with section 13142.5(b).

Technology:

"Technology" is the type of equipment, materials, and methods that are used to construct and operate the design components of the Project. The Iceberg desalination buoy makes use of ambient waves to generate energy used for the desalination process and to pump permeate to the shore-side receiving facility. This approach to desalination allows the production of fresh water without using the local power grid and reduces the normally heavy carbon footprint of traditional desalination technology. Ancillary systems on the desalination buoy can be powered by solar panels if necessary, although these systems are not required for the desalination process.

Other aspects of the Project's technology have been discussed in the design section above, and include the intake mesh size, low velocity intake velocity, passive discharge of the brine through the intake structure, and low volume discharge of brine. The Regional Water Board finds that the Project's technology is consistent with section 13142.5(b).

Mitigation:

"Mitigation" is the replacement of all forms of marine life or habitat that is lost due to the construction and operation of a desalination facility after minimizing intake and mortality of all forms of marine life through best available site, design, and technology (Ocean Plan, 2019). The Ocean Plan allows the payment of a mitigation value to an approved mitigation program in lieu of completing an independent mitigation project. The Regional Water Board has approved the use of a fee-based mitigation approach for this project because of the pilot nature of the Project, including its short operational timeframe, and the low intake and discharge volumes.

The City has estimated an approximate mitigation value of not less than $372; based on the State Water Board's interim mitigation calculations framework adopted by State Water Board Resolution No. 2024-0014. This mitigation approach is based on a default payment calculated per volume of water circulated over the course of 12 months, with an additional monitoring and maintenance payment. The final mitigation value will be determined upon completion of the Project and will be donated to a conservatory group conducting marine mitigation near the City of Fort Bragg. Final selection of the mitigation recipient and project shall be subject to Regional Water Board approval.

If you have any questions, please contact Matthew Herman of my staff, at matthew.herman@waterboards.ca.gov or (707) 576-2683.

Sincerely,

Charles E. Reed For

Digitally signed by CharlesReed
Date: 2025.08.29 09:14:34 -07'00'

r Boards

Valerie Quinto
Executive Officer

250825_MTH_FortBraggDesal_Determination_Ltr