# 2. Project Description

## 2.1 Introduction

This project description provides information and supporting figures for the Samoa Peninsula Land-based Aquaculture Project, hereafter referred to as the Project, proposed by Nordic Aquafarms California, LLC. (NAFC). The Project is proposed to be located on the Samoa Peninsula in the unincorporated community of Samoa in Humboldt County, California.

### 2.1.1 Project Definition

The Project includes four main elements – the primary terrestrial development, the discharge of treated effluent through the existing ocean outfall, the upgrade of two existing water intakes in Humboldt Bay and associated terrestrial water pipelines, and the compensatory off-site permitting-agency required restoration associated with the water intakes. This Project Description covers each of the four Project elements in detail as follows:

- The Terrestrial Development is described in Section 2.2;
- The Ocean Discharge is described in Section 2.3; and
- The Humboldt Bay Water Intakes are described in Section 2.4.
- Off-site Compensatory Restoration in Section 2.4.7

This organizational approach to the four Project elements is applied throughout this Environmental Impact Report (EIR). Throughout the EIR, these four Project elements are discussed separately to distinctly and fully analyze potential impacts related to each component of the full Project. Additionally, the Humboldt Bay Water Intakes element of the Project would be undertaken by the Humboldt Bay, Harbor, Recreation, and Conservation District (Harbor District), whereas the Terrestrial Development would be undertaken in full by NAFC. The treated effluent would be discharged through the existing Redwood Marine Terminal II (RMT II) Ocean Outfall which is owned by the Harbor District. NAFC would lease capacity in the RMT II Ocean Outfall and complete permitting of the Project's discharge. The Harbor District would remain responsible for ongoing maintenance and monitoring of the ocean outfall infrastructure.

As part of the Terrestrial Development, the Project proposes to redevelop the site of the decommissioned Freshwater Tissue Samoa Pulp Mill facility (pulp mill) in order to construct a land-based finfish recirculating aquaculture system (RAS) facility (aquaculture facility). The Project includes the construction of five buildings totaling approximately 766,530 square feet, and installation of a 4.8 megawatt photovoltaic solar panel array covering approximately 657,000 square feet of the facility roofs. The Project also includes modernizing two existing saltwater intakes and distribution infrastructure located in Humboldt Bay on property owned by the Humboldt Bay Development Association, Inc. (HBDA) and managed by the Harbor District At full operational capacity, the Project would discharge a maximum of 12.5 million gallons per day (MGD) via the existing RMT II ocean outfall pipe, which extends 1.55 miles offshore to a diffuser array. The construction and operation of the aquaculture facility, and the off-site compensatory restoration for the terrestrial development is to be undertaken and permitted by NAFC, working in collaboration with the Humboldt County Planning Department, the Humboldt Bay Harbor, Recreation and Conservation District (Harbor District), and applicable regulatory agencies. Modernization of the existing Humboldt Bay water intakes, associated piping installation, and associated compensatory offsite mitigation will be undertaken and permitted by the Harbor District and is analyzed in this EIR.

## 2.1.2 Project Site Definition

The Samoa Peninsula is bounded on the west by the Pacific Ocean and the east by Humboldt Bay. The Project Site is located adjacent to the eastern shore of the Samoa Peninsula, east of New Navy Base Road, and due west, across Humboldt Bay, from the City of Eureka. The Project Site is accessed from Vance Avenue via New Navy Base Road and LP Drive. The Project Site and surrounding vicinity are shown on Figure 2-1. The Area of Potential Effect (APE) applied to terrestrial developments is shown on Figure 2-2. Jurisdictional boundaries are shown on Figure 2-3.

The Project Site consists of portions of one parcel of which approximately 36 acres would be used for the land-based finfish aquaculture facility and associated infrastructure. The cumulative area, designated by the following Assessor Parcel Numbers (APN) 401-112-013, 401-112-021, 401-112-011, and 401-031-040, where Project construction activities are planned to occur shall herein be defined as the Project Site. The Project conceptual layout is shown on Figure 2-4 and the Humboldt Bay intakes and associated piping are shown on Figure 2-5.

## 2.1.3 Project Objectives

The general objective of the proposed Project is to provide sustainably raised seafood to consumers on the West Coast using environmentally and socially responsible business practices. Specific Project objectives include the following:

1. To establish a world-class land-based finfish RAS aquaculture facility on the Samoa Peninsula
2. To provide a fresh local food source, produced in the region where it is consumed, to mitigate the damaging environmental impacts associated with long-distance air shipment of seafood
3. To produce nutritious seafood for the West Coast market free of antibiotics and avoidance of GMOs
4. To construct and operate a fresh water-efficient aquaculture facility with a minimal environmental impact
5. To provide approximately 150 fulltime jobs, including engineers, biologists, administration staff, maintenance staff, fish processing, and other operations staff
6. To remediate existing environmental contamination at the Project Site associated with a former industrial site (brownfield) encountered during demolition and re-development of the site
7. Redevelop an existing underutilized industrial site absent residential neighbors to minimize environmental impacts as much as possible, remediating existing environmental contamination that may be present to meet the standards of food production and safety.
8. To support local industry and innovation by selling nutrient-rich aquaculture coproducts to local businesses for beneficial uses.

### Project Benefits

Direct and indirect benefits of the Project are anticipated to include the following:

1. The project would generate approximately 150 fulltime jobs
2. Tax revenue for Humboldt County
3. Redevelopment and infrastructure improvements which have the potential to catalyze future coastal-dependent development on the Samoa Peninsula
4. Remediation of existing brownfield site with removal of above ground hazardous materials and decaying structures, improvements to soil quality, stormwater management, and landscaping.
5. Many indirect jobs as a result of the Project in construction and vendor partners
6. Workforce development initiatives related to a growing seafood industry
7. A diversification of the local seafood industry, integrating more resilience, more jobs, and more opportunities for local businesses
8. An opportunity to expand the seafood/food brand of Humboldt County

9. Coproducts that can leverage other local business models
10. Collaboration and research opportunities with local academic institutions and other interested entities

## 2.1.4 Project Background

The following sections provides an overview of the historical industrial uses of the Project Site.

### Project Site History

Large-scale construction on the Project Site began in 1963 when Georgia Pacific LLC (GP) developed the site as a bleached Kraft pulp mill. The pulp mill began operation in 1965 and was operated by GP until 1972. To support the pulp mill operations, an ocean outfall pipe was installed to discharge mill water effluent offshore. A 60-KV electrical switchyard was also constructed adjacent to the ocean outfall intake to provide electricity to power pulp mill operations.

The pulp mill was sold by GP to Louisiana-Pacific Corporation (LP) in 1972. LP continued operation of the pulp mill into the 1990s. In 1994, the facility was converted from a standard Kraft pulp mill process to a chlorine-free pulp-making process. From the late 1990s through 2008 the pulp mill changed ownership multiple times before being sold to Evergreen Pulp Inc. (EPI) in 2005. After air quality concerns culminated in a lawsuit against EPI in 2006, the pulp mill was ultimately shut down by EPI in 2008. The pulp mill was acquired from EPI by Freshwater Tissue Company (FTC) in 2009. The mill was permanently closed by FTC in 2010 and FTC subsequently undertook decommissioning activities and selective demolition of the facility infrastructure until 2013.

In association with the decommissioning of the pulp mill, various asbestos material assessments were conducted by GHD (formerly Winzler & Kelly) under contract with FTC between 2010 and 2012. The asbestos assessments identified asbestos containing materials associated with many of the pulp mill structures. Asbestos material removal (abatement) at select structures was conducted by FTC subcontractors between 2011 and 2013. Between 2011 and 2013 many pulp mill structures were demolished, including the pulp mill Recovery Boiler, Bleach Plant, re-causticizing area, and liquor storage tanks. Additional asbestos assessment of the former pulp mill site has been completed by NAFC, and additional asbestos abatement would be necessary.

In August 2013, ownership of the former pulp mill site was transferred from FTC to the Humboldt Bay Development Association Inc and leased to the Harbor District. In November 2013 the USEPA began a series of studies to assess the existing risks presented by stored chemicals onsite and the degree of contamination of the soils and groundwater from historic pulp mill operations. Based on the USEPA assessments, an emergency remediation effort was commenced in 2014 by the USEPA and the United States Coast Guard at the former pulp mill. The $15 million site remediation involved the removal of spent pulping liquors and other hazardous chemicals that had been stored onsite (Times Standard 2018). Bulk waste liquors from the pulp mill were transported to Washington for reuse by other Kraft pulp mill operations.

The former pulp mill infrastructure has been partially demolished however many structures remain in situ, including the 12-story Reboiler Building, the machine building, the approximately 270-foot smokestack, and other smaller structures. Additionally, several remnant debris stockpiles resulting from the FTC infrastructure demolition operations remain at the former pulp mill site. Demolition debris piles were assessed by the Harbor District and found to not contain hazardous material contamination, including asbestos, heavy metals, or petroleum hydrocarbons. Since 2013, extensive debris removal has been undertaken by Harbor District and much of the demolition waste has been transported offsite to appropriate disposal facilities. Existing demolition debris stockpiles currently at the Project Site are scheduled to be removed by the Harbor District prior to the commencement of the proposed Project.

The proposed location of the Humboldt Bay water intakes at RMT II dock and Red Tank dock are on Harbor District-managed land, have had various uses in the past, and are currently not in operation. The associated saltwater and industrial fire water piping are located on District-owned property, which has had various industrial uses, and is currently generally vacant, previously developed area.

## Site Selection

The 2018 site selection process assessed the West Coast from the Monterey area to the Canadian border through systematic data gathering related to a set of location criteria. The high-level selection criteria are summarized below in Image 2-1.

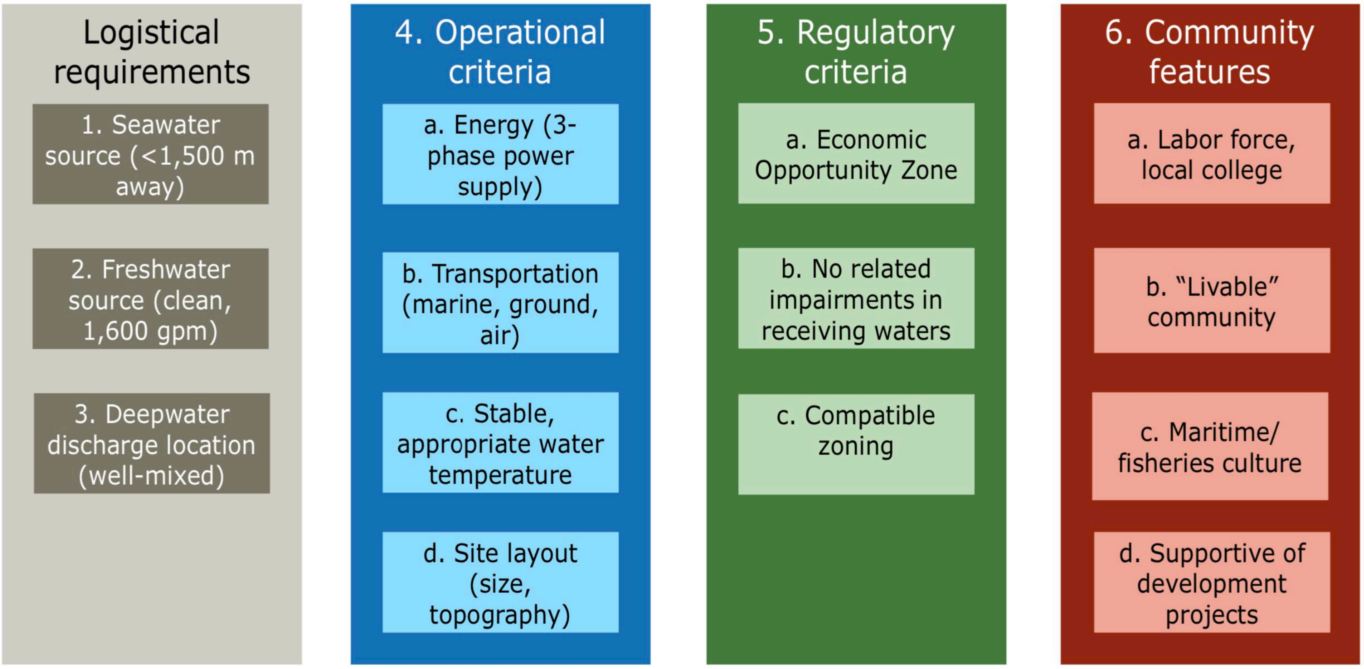



***Image 2-1 Site Selection Criteria***

A number of locations along the coastline were narrowed down to three candidate locations. Further detailed assessments concluded that the Samoa Peninsula site provided the best conditions for development of the Project. Key strengths of the chosen Samoa Peninsula site include:

1. Existing outfall pipe and other necessary infrastructure already in place
2. Industrial freshwater supply line in place, formerly supplying 30 million gallons per day (MGD) to the pulp mill
3. Two existing sea chest intake structures on Harbor District docks providing access to cold and clean saltwater
4. 20 MW electrical substation on the site
5. A flat site with good constructability
6. Road access that formerly served 500+ wood chip trucks per day to supply the former pulp mills
7. Forward-looking political climate to support economic growth in the region
8. A vibrant community for aquaculture facility staff to live

The final decision to move forward was based on negotiations with the Harbor District and a resulting lease-option agreement for the preferred Project Site property (aquaculture facility).

The Project has a wealth of economic and social benefits for the community. The environmental profile of the Project greatly reduces potential impacts compared to other methods of aquaculture production. The Project's goal is to displace imports of fresh fish currently shipped from overseas by air freight and will not compete with the regional fisheries.

## 2.1.5 Project Setting

The proposed site for the RAS aquaculture facility (APN 401-112-021) is owned by the HBDA, leased by the Harbor District, and shown in Figure 2-3. The HBDA is a non-profit that was formed by the Harbor District to receive New Market Tax Credit Financing. Harbor District staff provides administrative support to the HBDA. The parcel comprising the Project Site would be leased by NAFC under lease agreements with the Harbor District.

The NAFC lease area is irregular in shape, does not have frontage on New Navy Base Road, and is bisected by Vance Avenue. Centered along Vance Ave there is a 50-foot-wide non-exclusive easement for ingress, egress and public utility purposes and a 5-foot wide easement for utility purposes lying adjacent to and parallel with the non-exclusive easement (Figure 2-6 and Figure 2-7). The combined sixty-foot easement extends approximately 15 feet beyond the edge of the paved surface on both sides of Vance. All facility buildings would be located to the east of the Vance Avenue easement. The building closest to Vance Avenue would be the processing / administrative building located approximately 23 feet east of the edge of the road and 8-feet east of the edge of the easements.

The Humboldt Bay intakes are located on APNs 401-112-014 and 401-031-040, which are owned by the Harbor District.

### Project Regulatory Setting

The Project Site is located in the California Coastal Zone (CZ). Permitting jurisdiction for most land based activities is with County of Humboldt. The Humboldt County jurisdiction aligns with the eastern Project Site parcel boundaries that border Humboldt Bay. See Figure 2-3 for a depiction of the Project Site parcel boundaries and jurisdictional limits of the Coastal Commission and the County of Humboldt. All activities within the bay and Pacific Ocean and in the tidelands around the bay are under the permitting jurisdiction of the Coastal Commission.

The California Coastal Commission (CCC) issued a jurisdictional boundary determination for the pulp mill parcel (APN 401-112-021) on July 10, 2015, confirming that these parcels are within Humboldt County jurisdiction and within the CCC geographic appeal jurisdiction. The Project Site is also subject to the Humboldt Bay Area Plan (HBAP), a component of the Humboldt County Local Coastal Program

The Project Site for the terrestrial development (APN 401-112-021) is designated for Industrial by the Humboldt Bay Area Plan. The area east of Vance Avenue is designated Coastal Dependent Industrial (MC), and the area west of Vance Avenue Industrial General (MG). Aquaculture and other industrial activities are allowable uses under both the MC and MG land use designations applicable to the Project Site.

The Humboldt County zoning designation for the parcel comprising the Project Site (APN 401-112-021) is Industrial/Coastal Dependent (MC) and includes an Archaeological Resource Area Outside Shelter Cove combining zone overlay (A). The combining zone (A) designates the Project Site as an area potentially containing archaeological resources and provides for “reasonable mitigation measures where development would have an adverse impact upon archaeological and paleontological resources” (HCC 313-16.1). The Project Site location and legal designations are summarized below in Table 2-1.

The water intake structures in Humboldt Bay and associated piping include APNs 401-112-011, 401-012-024, and 401-031-040, operated by the Harbor District via HBDA (except APN 401-031-040 that is owned by the Harbor District) are on parcels within the Humboldt County’s jurisdiction and within the State’s primary permitting jurisdiction. Thus, the Harbor District’s Coastal Development Permit application is consolidated to the CCC for the intakes and associated piping.

*Table 2-1 Project Location Summary*

| APN | Parcel Size /Utilized Portion (Acres) | Owner | Current Use | Proposed Project Use | NAFC Use Means | Zoning | Current General Plan Designation |
|---|---|---|---|---|---|---|---|
| 401-112-021 | 76.7/36 | HBDA | Former Pulp Mill (Partially Demolished) and Existing Structures in Current Use | Aquaculture Facility (Pulp Mill Site Only) | Lease | MC/A | MC, MG |
| 401-112-011 | 16.39 / N/A | HBDA | Redwood Marine Terminal II dock | Sea water intake | Use Easement | MC/A | MC |
| 401-012-024 | 36.25 / N/A | HBDA | Vacant industrial parcel | Water pipeline trenching | Use Easement | MC/A | MC |
| 401-031-040 | 67.27 / N/A | Harbor District | Redwood Marine Terminal I | Water pipeline trenching and Sea water intake | Use Easement | MC/A | MC |

Notes: APN = Assessor's Parcel Number
HBDA = Humboldt Bay Development Association, Inc.
MC = Industrial, Coastal Dependent (MC) General Plan Designation
MC/A = Industrial/Coastal Dependent with Archaeological Overlay Zoning Designation
NAFC = Nordic Aquafarms California, LLC.

The shoreline of Humboldt Bay, beyond the Project Site eastern parcel boundaries, is under the jurisdiction of the Harbor District and subject to the water use designations and policies outlined in the Humboldt Bay Management Plan (Harbor District 2007). As defined by Section 2.2 of the Humboldt Bay Management Plan, the bay waters east of the Project Site (outside of the Project Site boundary) are classified under the Harbor use designation. The Harbor use designation classifies "harbor-related waters adjacent to upland areas (under the land use jurisdiction of the County of Humboldt and the City of Eureka) that are reserved or designated for coastal-dependent or water-dependent uses" (Harbor District 2007).

**Required Permits and Approvals**

Environmental permits, agency approvals, and associated documentation would be and/or have been filed with the appropriate regulatory agencies in association with the Project. Table 2-2 summarizes the anticipated permits, consultations, and approvals from federal, state, and local agencies and the applicant.

*Table 2-2 Anticipated Regulatory Permits and Approvals*

| Project Component(s) | Agency | Permit or Approval | Regulated Activity / Applicant |
|---|---|---|---|
| Terrestrial Development<br>Ocean Discharge<br>Water Intakes | Humboldt County | California Environmental Quality Act (CEQA) Environmental Impact Report (EIR) | State environmental protection requirement / Nordic & Humboldt Bay Harbor, Recreation, and Conservation District |
| Terrestrial Development | Humboldt County | Coastal Development Permit (CDP) | Development within County jurisdiction of the project site / Nordic |
| Terrestrial Development | Humboldt County | Demolition Permit, Building Permit | Demolition, Construction, installation, or alteration of structures / Nordic |
| Terrestrial Development<br>Water Intake Trenching | Humboldt County | Grading Permit | > 50 cubic yards per parcel, among other thresholds / Nordic & Humboldt Bay Harbor, Recreation, and Conservation District |
| Terrestrial Development | Humboldt County | Loading Space Exception Petition | Facilities with less than one loading space for each 20,000 $ft^2$ of floor area / Nordic |
| Ocean Discharge | California Coastal Commission | Coastal Development Permit | Compliance of discharged effluent with the Coastal Act / Nordic |
| Terrestrial Development | Humboldt County | Encroachment Permit | Signage and improvements to New Navy Base Road / Nordic |
| Terrestrial Development<br>Water Intake Trenching | North Coast Regional Water Quality Control Board (NCRWQCB) | National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit Stormwater Pollution Prevention Program (SWPPP) | Construction >1 acre of ground disturbance / Nordic & Humboldt Bay Harbor, Recreation, and Conservation District |
| Ocean Discharge<br>Water Intake | NCRWQCB | National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit, including compliance with Water Code Section 13142.5(b) for water intake from Humboldt Bay | Water quality of effluent discharged to the Pacific Ocean and intake of water from Humboldt Bay / Nordic |
| Terrestrial Development | NCRWQCB | Interim Measures Work Plan and Soil/Groundwater Management | Handling, testing, disposal and/or reuse of site materials. Including soil and groundwater / Nordic |
| Terrestrial Development | North Coast Unified Air Quality Management District (NCUAQMD) | National Emissions Standard for Hazardous Air Pollutants (NESHAP) notification | Facility demolition and/or asbestos abatement; backup generator emissions / Nordic |
| Terrestrial Development | North Coast Unified Air Quality Management District (NCUAQMD) | Stationary Source Air Quality Permit | Operation of stationary internal combustion engine / Nordic |
| Terrestrial Development | California Department of Fish and Wildlife | Aquaculture Registration | Aquaculture / Nordic |

| Project Component(s) | Agency | Permit or Approval | Regulated Activity / Applicant |
|---|---|---|---|
| Terrestrial Development | California Department of Fish and Wildlife | Egg Importation | Importation of eggs into California from other states or countries / Nordic |
| Water Intake | California Department of Fish and Wildlife | Incidental Take Permit for CESA Compliance[1] | Coverage for state-listed species / Humboldt Bay Harbor, Recreation, and Conservation District |
| Water Intake | US Army Corps of Engineers/Regional Water Quality Control Board | Rivers and Harbors Act Section 10 / 401 Certification | Placement of structures in a navigable waterway / Humboldt Bay Harbor, Recreation, and Conservation District |
| Water Intake | National Marine Fisheries Service and/or U.S. Fish and Wildlife Service | If required, ESA Section 7 Consultation | Coverage for federally listed (formal consultation is not expected) / Humboldt Bay Harbor, Recreation, and Conservation District |
| Water Intake | California Coastal Commission | Coastal Development Permit | Compliance of water intakes and associated piping with the Coastal Act / Humboldt Bay Harbor, Recreation, and Conservation District |
| Water Intake | Humboldt Bay Harbor, Recreation, and Conservation District | Harbor District Permit | Construction, maintenance, and operation of intakes / Humboldt Bay Harbor, Recreation, and Conservation District |

[1]Notes:

EIR = Environmental Impact Report
> = Symbol signifying “greater than”
CESA = California Endangered Species Act
ESA = Endangered Species Act

## Project Site Vicinity

A wood biomass electrical generation facility (biomass facility), most recently operated by DG Fairhaven Power Company (Fairhaven Power), is located approximately 0.21 miles southwest of the Project Site. When operational, the 17.25 MW of electrical power generated by the Fairhaven Power facility is supplied to Pacific Gas and Electric Company (PG&E), the local electrical utility (RCEA 2016). Biomass inputs to the Fairhaven Power facility come in the form of wood waste from local sawmills and timber harvest companies. Wood waste inputs consist of woodchips, wood shavings, bark, and sawdust. Wood waste stockpiles are located immediately north of the biomass facility.

A one million-gallon (1-MG) water storage tank, owned and operated by the Humboldt Bay Municipal Water District (HBMWD), is located southwest of the Project Site, approximately 600 feet west of the Project Site between Vance Avenue and New Navy Base Road. The 1-MG water tank contains industrial freshwater from the Mad River, supplied to the tank by HBMWD water lines which are approximately 42 inches in diameter. The 1-MG water tank provides industrial process water to local industrial end-users, including the former pulp mill, Fairhaven Power biomass facility and the Harbor District RMT II. The 1-MG water tank also provides water for local fire suppression use. The 1-MG water tank is accessed via a paved private road, connecting New Navy Base Road to Vance Avenue.

The former Louisiana Pacific Corporation Samoa Solid Waste Disposal Site (SWDS) is located to the west of Vance Ave on the same parcel but outside the NAFC lease area. The SWDS is comprised of four known closed and capped Waste Management Units (WMUs) and an additional area within the SWDS facility boundaries which may contain other closed WMUs. The Harbor District is the current operator of the closed SWDS. The SWDS was owned and operated by LP during all waste disposal and closure activities. The SWDS is an unlined Class III landfill, as defined in

California Code of Regulations, title 27. The wastes contained in the landfill are approximately 98 percent wood ash with less than one percent each of slaker grits (unreacted lime nodules from the pulping process), pulp rejects, wood chips, and construction debris. All wastes came from LP activities. The SWDS had been operating since 1970 and ceased accepting waste in May 1997.

A woodchip distribution facility and associated dock, owned and operated by California Redwood Company (CRC), are located south of the Project Site. The CRC wood chip stockpiles, chip conveyor and associated chip transport barge-loading dock are accessed via Bay Street and located approximately 0.15 miles south of the Project Site. A PG&E electrical switchyard, accessed via Vance Avenue, is located adjacent (northwest) to the CRC woodchip facility, between the CRC stockpiles and the Fairhaven Power biomass facility.

The Green Diamond Resource Company operates a log deck on APN 401-031-061. RMT I is an underutilized and largely vacant parcel, zoned Coastal Dependent Industrial. RMT I is bordered on the west by APN 401-031-055, privately owned by Samoa Pacific Group LLC (Danco) and also zoned Coastal Dependent Industrial.

Samoa Dunes State Recreation Area is located approximately 2.3 miles south of the Project Site at the southerly end of the North Spit. The Samoa Dunes State Recreation Area is administered by the United States Department of the Interior, Bureau of Land Management (BLM) and provides limited public facilities supporting coastal recreation, including off-highway vehicle (OHV) usage. The Project is bordered to the east by Humboldt Bay, and the two saltwater intakes are located in the waters of Humboldt Bay.

The current uses of adjacent parcels around the Project Site are summarized in Table 2-3.

*Table 2-3 Project Vicinity Summary*

| Direction | APN | Current Use | Zoning | Current HBAP Designation |
|---|---|---|---|---|
| North | 401-031-061 and 401-112-013 | GDRC Log Deck, Paved Staging Areas | MC/A | MC |
| North | 401-031-040 | HBDA District, Redwood Marine Terminal I | MC/A | MC |
| North | 401-031-055 | Samoa Pacific Group LLC | MC/A | MC |
| North and East | 401-112-024 | HBDA Vacant Industrial Property | MC/A | MC |
| East | 401-112-011 | HBDA, Redwood Marine Terminal II and Dock,<br>Humboldt Bay (Open Water) | MC/A | MC |
| South | 401-122-004 | Unpaved Vacant Staging Area, CRC Woodchip Facility and Dock | MC/A | MC |
| West | N/A | New Navy Base Road (Humboldt County), Samoa Dunes State Recreation Area (BLM) | NR/W/B | NR |

Notes: APN = Assessor’s Parcel Number
CRC = California Redwood Company
GDRC = Green Diamond Resource Company
Harbor District = Humboldt Bay Harbor, Recreation and Conservation District
MC = Industrial, Coastal Dependent (MC) General Plan Designation
MC/A = Industrial/Coastal Dependent with Archaeological Overlay Zoning Designation
NR = Natural Resources Zoning Designation
W = Coastal Wetlands Overlay Zoning Designation
B = Beach and Dune Areas Zoning Designation

## 2.1.6 Overall Project Timeline

Special studies and initial permit submission were submitted to the agencies in September and October 2020 (See Table 2-2 for a summary of required permits and approvals). The finalization of this document will complete permit submittals. The permitting phase for the terrestrial development and ocean discharge is expected to generally be complete in 2022. The Harbor District is concurrently pursuing permits required for the two Humboldt Bay water intakes, as summarized above in Table 2-2. The water intakes require a Coastal Development Permit from the California Coastal Commission, a Clean Water Act Section 401 Water Quality Certification from the North Coast Regional Water Quality Control Board (NCRWQCB), and a Clean Water Act Section 10 permit from the U.S. Army Corps of Engineers (USACE). A California Endangered Species Act (CESA) Incidental Take Permit (ITP) administered by the California department of Fish and Wildlife (CDFW) and/or formal or informal consultation with the National Marine Fisheries Service (NMFS)/National Oceanic and Atmospheric Association (NOAA) Fisheries and/or the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the federal Endangered Species Act (ESA) would also occur for the potential take of Longfin Smelt (*Spirinchus thaleichthys)* as a result of water intakes operations. Project civil engineering and design are currently underway and anticipated to be completed in due course after permits are obtained. Project construction for the terrestrial development would follow once the required agency approvals and permits are secured by NAFC. It is expected that demolition and construction would commence following final permit approvals, in 2022 or 2023. The Harbor District would commence construction required for the Humboldt Bay water intakes in 2022. Ocean discharge would not commence until after the completion of Phase 1 construction, between 2024 and 2026.

# 2.2 Terrestrial Development

## 2.2.1 Existing Conditions

The terrestrial portion of the Project Site is situated in a developed industrial area of the Samoa Peninsula where timber processing and pulp mill and timber-related industrial operations have historically occurred for more than 50 years. The Project Site generally consists of remnant pulp mill infrastructure and concrete foundations associated with previously demolished pulp mill structures (APN 401-112-021). The eastern portion of the pulp mill parcel (APN 401-112-021) supports ongoing coastal-dependent industry within RMT II, further described below, that would not be disturbed by the Project.

The terrestrial portion of the Project Site maintains a generally consistent elevation across the site, ranging from roughly 15 to 20 feet above mean sea level (MSL), then slightly increasing in elevation along the western portion of the site, ranging from approximately 20 to 25 feet above MSL. The topography of the western Project Site boundary, located west of Vance Avenue, gradually transitions into dune swales and the former Samoa Landfill (now capped) west of Vance Avenue. Vance Avenue is separated from New Navy Base Road by 300 to 700 feet of sand dunes sporadically intersected by unpaved access roads.

The pulp mill parcel (APN 401-112-021) includes existing infrastructure some of which would remain to support ongoing commercial operations RMT II while the majority would be demolished for the proposed Project. Additionally, specific existing pulp mill structures are proposed to be overhauled and utilized by the Project. Image 2-2 provides an overview of existing structures and their placement on the pulp mill.


*Image 2-2 Project Existing Site Conditions for the Terrestrial Development and Location of the Water Intake (Sea Chest) on the RMT II Dock*

The following pulp mill industrial components are planned for reuse in association with the Project (general location onsite noted in parentheses):

1. 60-kilovolt (KV), 20 Megawatt (MW) electrical switchyard and transformer (northwest portion of pulp mill site)
   a. The 60-KV switchyard is in a fenced area at the northwest corner of the former pulp mill site and connected to transmission lines that feed various structures within the Project Site. Modernization and upgrade of the substation will take place, if necessary, when NAFC is taking over the existing meter. The total capacity of the switchyard will be expanded to accommodate NAFC's peak capacity in future operations. The switchyard and transformer are currently owned by the Harbor District and will be transferred to NAFC ownership.
2. Ocean outfall piping (northwest portion of pulp mill site)
   a. The outfall pipe collection point is located within a below-grade concrete vault, west of the pump house at the northwest corner of the pulp mill facility. The outfall was formerly used to discharge an average of 22.5 million gallons per day of treated industrial wastewater from the Evergreen Pulp Mill into the Pacific Ocean. The pulp mill facility is no longer in operation and the outfall is being used to discharge less than 200,000 gallons per day of industrial process water from DG Fairhaven Power Plant and wastewater from the Samoa wastewater treatment facility. The 36-inch internal diameter outfall pipe extends underground in a westerly direction from the intake for 1.55 miles (8,200 feet). The outfall pipe ends with an 852-foot, 36 Inch, multiport diffuser. The diffuser consists of 144 individual ports, paired along its length, discharging at a 45-degree vertical orientation, aligned perpendicular to the shoreline. The diffuser orifices have a spacing of 12 feet on center with openings 2.4 inches in diameter. Eight pairs of diffusers are currently open and flowing, however there are an additional 69 diffuser pairs offshore of the eight open diffusers that are currently sealed with toggle bolt blind assemblies. The plates bolted onto the ports were cleared using water jetting and inspected by MM Diving in October 2019 (MM Diving 2019). The diffuser assembly rests on the seafloor approximately

82 feet below the surface. A study completed in 2016, commissioned by Harbor District, concluded that hydraulic assessment indicates the outfall can discharge up to 40 MGD based on 144 2.4-inch diffuser ports. See Section 2.3 – Ocean Discharge for additional information about the effluent discharge component of the Project.

3. Humboldt Bay water intakes (east and northeast of the pulp mill site)
   a. Water intakes would supply saltwater through piping affixed to the existing docks located one-half mile apart, Redwood Marine Terminal II (RMT II) and Red Tank Dock (Figure 2-5). Upgrades to the intake structures would include modernizing the screening system, upgrading water pipe runs on docks, improving the sea chest intake infrastructure, and installation of piping along the shoreline as part of the multi-year Harbor District aquaculture business park plan.

The following pulp mill structures are within the Project redevelopment area and are planned for demolition (general location on pulp mill site noted in parentheses):

1. Reboiler (boiler) buildings (northwest)
2. Five tile lined tanks (north-center)
3. Concrete smokestack (northwest-center)
4. Miscellaneous concrete foundations, pedestals, and concrete structures (throughout site)
5. Leach field (south-center) to be used temporarily and subsequently decommissioned
6. A clarifier system with two tank pools and multi-stage sand filter rack (southwest)
7. Machine building, attached warehouse, and office (northeast)
8. Elevated water tank (northeast)
9. Demolition debris piles (throughout site) to be removed by Harbor District

There are currently seven tenants leasing areas within the proposed Site under an Interim Non-Coastal Dependent Industrial lease with the Harbor District. Occupants would be relocated with the assistance of Harbor District and NAFC in compliance with the California Relocation Assistance and Real Property Acquisition Guidelines. Current tenants are permitted to remain on the property until demolition activities commence.

Remnant timber and wood product processing infrastructure, including a woodchip conveyor and silo, are located on two parcels (APNs 401-112-030 and 401-112-029) to the north. The existing wood product processing infrastructure is not planned to be impacted by the proposed Project. A two-story administrative building is located outside the proposed project area on APN 401-112-030, north of the former pulp mill. The administrative building is privately owned by and is currently leased to a commercial tenant. The administrative building is not planned to be impacted by the proposed Project.

## Existing Project Site Contamination

Investigations of soil, soil gas and groundwater associated with the proposed aquaculture facility footprint have previously been initiated by various consultants on behalf of various entities. Periodic monitoring of groundwater has also occurred at the site. USEPA removal actions from 2013 to 2016 included removal of on-site liquid wastes (~4,000,000 gallons of caustic and acidic liquids and ~10,000 tons of contaminated caustic and acidic sludges) (Ramboll 2019)." Soil and groundwater investigations and associated remediation activities were completed at Project Site by the USEPA under the general oversight of the NCRWQCB. In 2014, the NCRWQCB issued a "No Further Action" for a portion of the Project Site (former leach field, Area of Interest No.6, NCRWQCB 2014).

Further soil investigations were conducted by the USEPA in July 2019, focusing on dioxins/furans and metals. NAFC contracted additional testing of the samples for polychlorinated biphenyls (PCBs) and organochlorine pesticides (OCPs). No OCPs were detected and PCBs were detected only in a single sample. The soil sampling data reported that "all soil sample concentrations were below SLs (screening levels), or in the case of arsenic and chromium, below naturally occurring concentrations" (Ramboll 2019). Results for polychlorinated biphenyls (PCBs) and dioxins/furans in soil were below the applicable Department of Toxic Substances Control (DTSC) screening levels for commercial/industrial soil.

GHD has performed asbestos, lead and universal waste (UW) characterizations of the remaining pulp mill structures. Reporting for asbestos, lead and UW at the existing pulp mill structures was completed in May 2020. The report will be used in design of a demolition plan and specifications for the existing mill structures slated for removal.

## 2.2.2 Project Design

### Design Principles

The finfish aquaculture facility is planned to be constructed in two phases following a demolition phase and would have an annual production capacity of approximately 25,000-27,000 metric tons of head on gutted fish (HOG) once complete. The aquaculture facility would utilize water and energy efficient processes to sustainably produce fresh HOG fish and fillets for delivery to west coast regional markets. The proposed species to be produced at the facility is Atlantic Salmon, subject to approval from the California Department of Fish and Wildlife (CDFW). The proposed aquaculture facility is based on the same core designs that have been developed by NAF Groups own RAS engineering company NAF Tech. This design is similar to the proposed Belfast, Maine facility, which has obtained all permits to begin construction. NAF Groups Fredrikstad Seafoods in Norway is currently producing and selling Atlantic Salmon. NAF Groups Danish facilities produce and sell Yellowtail Kingfish. The proposed aquaculture facility would be NAF Groups fifth facility and would include a complete process, from egg to harvestable fish in a single indoor location, and would contain the following design elements:

1. A hatchery operation where eggs are hatched, and fish fry grow to juvenile size
2. Grow-out systems with integrated denitrification where fish are grown to market size
3. A fish processing facility from which fish is processed and fresh product and coproducts are shipped out 4 or 5 days a week
4. Dual fuel backup systems that would enable critical functions to continue to operate in the event of a power outage
5. Oxygen generation plant and liquid oxygen storage
6. Water intake treatment that ensures consistently clean water for the fish
7. A Best Available Technology wastewater treatment plant to treat the discharge water, including a Moving Bed Biofilm Reactor (MBBR), an ultrafiltration membrane bioreactor (MBR), and UV-C disinfection.
8. Administrative building and operations/maintenance facilities

RAS technology enables producers to establish a controlled production environment indoors. It allows for local production close to consumers, thus directly addressing the seafood trade deficit in the United States (US) and reducing pollutants including carbon dioxide otherwise generated by airfreight shipment of fresh seafood into the US. All production occurs indoors, thus minimizing noise, odor, and other potential nuisances to neighboring areas. In the proposed RAS facility, the risk of disease exposure and potential spreading of disease among fish populations is minimized with robust biosecurity and water treatment measures. Discharge of nutrients from the proposed RAS facility is controlled by removing more than 99% of total suspended solids, 99% of Biochemical Oxygen Demand (BOD), 99% of Phosphorus, and over 90% of nitrogen before the wastewater is discharged.

Utilizing RAS design principles, the proposed aquaculture facility would offer some distinct benefits, including:

1. The proposed land-based facility includes multiple redundant physical barriers that prevent fish escapes, discussed further under Section 2.2.4 under Fish Welfare and Biosecurity and shown in Image 2-12 – Screen Points for Water Exiting the Farm. The buildings containing fish are also more than 300 feet away from the water and they are built to withstand damage from potential earthquakes or tsunami. Fish release pathways are discussed further under Section 2.2.4 under Fish Welfare and Biosecurity and shown in Image 2-13 -- Fish Release Pathway to the Natural Environment.

2. Extensive ultrafiltration and disinfection of all intake and discharge water prevents pathogens or parasites from entering, establishing in, or exiting the facility. Ultrafiltration and disinfection are discussed further under Section 2.2.4 under Fish Welfare and Biosecurity and shown in Image 2-9 – Conceptual Design of RAS Unit, Image 2-11a – MBR Filtration Module at the WWTP, and Image 2-11b – MBR Filtration Schematic.
3. Water in the proposed RAS facility is recycled and continuously treated in enclosed tanks, thus greatly reducing the facility's freshwater consumption. Nordic employs the highest level of denitrification in the aquaculture industry. The proposed NAFC facility RAS systems would exchange approximately 200 liters (L) of water per kg of feed.
4. Heat generated by biological processes will be re-used to heat the proposed facility and for other appropriate processes such as the vaporization of liquid oxygen.
5. There is complete traceability within RAS facilities, as all production occurs in a single location and is subject to NAFC monitoring, California, and federal regulations.

## Key Terrestrial Components

The Project includes two key terrestrial components which shall be described individually in the following subsections. The principal Project components are summarized in Table 2-4.

***Table 2-4 Project Components***

| Key Project Component | Description | Location |
|---|---|---|
| Pulp Mill Demolition | Building demolition and infrastructure removal | APN 401-112-021 |
| Aquaculture Facility Construction | Building construction and site improvements | APN 401-112-021 |

Notes APN = Assessor's Parcel Number
See Image 2-2 for the Project conceptual site layout
See Image 2-3 for the Project building layout and phasing

## Terrestrial Project Phasing

The proposed Project terrestrial development components summarized in Table 2-4 (above) are generally planned to be completed during three phases (Phase 0, Phase 1 and Phase 2), with each phase containing one or more construction components (sub-phases). The general phases of construction are summarized in Table 2-5 and Image 2-3 below. See Figure 2-4 for the Project conceptual site layout.

***Table 2-5 Project Construction Phasing***

| Phase Number | Phase Summary | Phase Construction Components |
|---|---|---|
| Phase 0 | Brownfield Redevelopment | – Segregation, testing, and removal of contaminated materials encountered during demolition<br>– Structure demolition and infrastructure removal, including asbestos and lead abatement<br>– Waste stream characterization, transportation and disposal |
| Phase 1 | Aquaculture Facility First Stage | – Intake and outfall connections<br>– Ground densification<br>– Construction of the following:<br>• Hatchery building<br>• Phase 1 grow-out modules<br>• Fish processing and administration building<br>• Central utility plant<br>• Intake water treatment<br>• Wastewater treatment building<br>• Backup systems plant |

| Phase Number | Phase Summary | Phase Construction Components |
|---|---|---|
| | | • Oxygen generation plant<br>• Utility and infrastructure installation<br>• Excavation and soil management as necessary to facilitate ground densification and construction<br>• Other site civil work including stormwater management, LID and landscaping<br>– Onsite and offsite agency-required biological mitigation |
| Phase 2 | Aquaculture Facility Second Stage | – Additional ground densification<br>– Phase 2 grow-out module construction<br>– Removal of the existing leachfield<br>– Excavation and soil management as necessary to facilitate ground densification and construction<br>– Expansion of internal utilities |

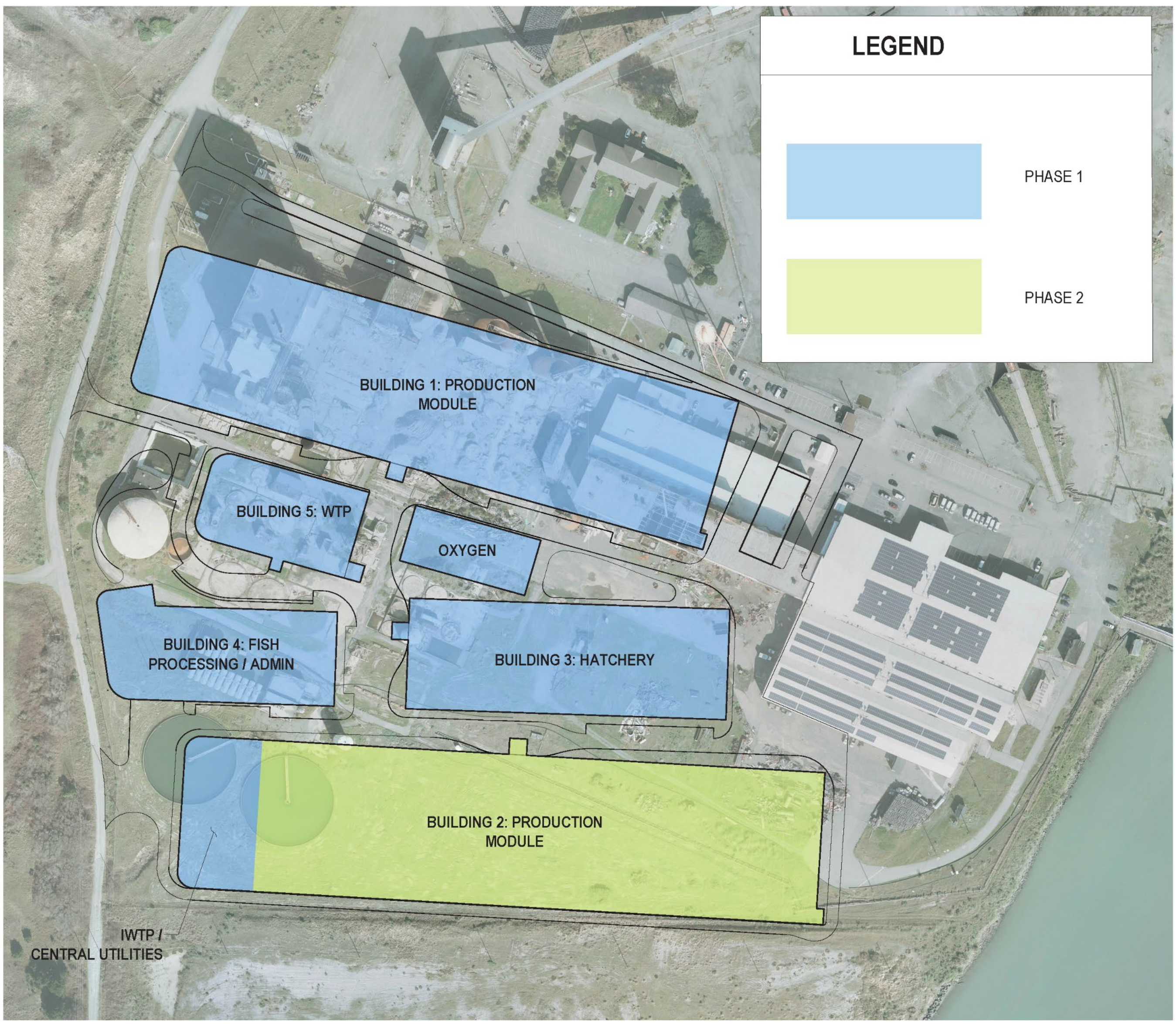



***Image 2-3 Building Project Phasing***

## Project Phasing Logistics

Demolition of existing pulp mill structures and infrastructure removal work (Phase 0) would be conducted prior to the commencement of the initial stage of aquaculture facility construction (Phase 1). Once permits are received, a demolition plan would be developed and implemented to clear the construction footprint. A similar plan would be developed for the remaining buildings and infrastructure in preparation of Phase 2 construction.

A preliminary geotechnical investigation and environmental analysis have been conducted to determine the suitability of the existing soils both in terms of structural capacity and environmental characterization. Soils that are identified to be contaminated and/or not structurally sound would be excavated and replaced with appropriate fill material or improved through ground densification. Excavated material would be either repurposed, reused onsite, or appropriately transported and disposed of at an appropriate offsite facility.

Biological and botanical surveys of the Site have been conducted and may result in the scheduling of some site activities to accommodate life cycle and nesting considerations for species identified at the Project Site.

## Project Site Assessment and Special Studies

NAFC is aware of the unique environmental and geologic considerations involved in development on the Samoa peninsula. These include unique geology, seismic / tsunami risk, wildlife, vegetation, cultural resources, pre-existing contamination, and hazardous materials. NAFC is committed to designing and developing the proposed aquaculture facility with minimal environmental impacts while remediating the legacy contamination at the Site as necessary for building demolitions, building foundations and stormwater treatment/detention. Currently NAFC expects the design to include deep foundations utilizing ground densification to mitigate the seismic / tsunami risk. The following special studies and technical investigations shown in Table 2-6 have been conducted during the Project design and permitting phase to evaluate the existing environmental conditions at the Project Site, inform design development, provide a technical basis for impact assessment under CEQA, and assess the potential for environmental impacts resultant from the Project.

***Table 2-6 Project Site Special Studies Summary Completed for the Terrestrial Development***

| Name of Study | Topic of Study | Study Author |
|---|---|---|
| Botanical, Wetland, and Sensitive Natural Communities Tech Memo | Botanical Resources, Wetlands, ESHA, and Vegetation Mapping | GHD |
| Hazardous Materials Assessment | Asbestos, Lead, and UW Assessment | GHD |
| Terrestrial Biological Resources Report | Biological Resources | GHD |
| Probabilistic Site-Specific Tsunami Hazard Analysis | Tsunami Hazards | Martin & Chock Inc. |
| Preliminary Geotechnical Investigation Report | Geological Conditions | SHN |
| Topographic and Boundary Surveys | Parcel Size and Topography | SHN |
| Landfill Gas Investigation | Potential Soil Gas Migration from Adjacent Samoa Ash Landfill | SHN |
| Archaeological and Historical Resource Investigation | Archeological, Historical and Cultural Resources | Roscoe & Associates |
| Technical Assessment of Freshwater Infrastructure | Water Quality and Design Development | Harbor District and HBMWD |
| Preliminary Stormwater Assessment | Development Design | GHD |
| Plan for Structure Demolition | Site Development | SHN |

| Name of Study | Topic of Study | Study Author |
|---|---|---|
| Interim Measures Work Plan | Soil and Groundwater Management During Construction | SHN |
| Construction Noise, Vibration, and Hydroacoustic Assessment | Noise and Vibration | Illingworth & Rodkin |
| Supplemental Soils and Anthropogenic Disturbance Investigation of Potential ESHA Memo | Anthropogenic Disturbance | GHD |
| Restoration and Monitoring Plan | On and Off-Site Mitigation | GHD |
| Bat Investigations | Bats | Wildlife Research Associates |

Notes: HBMWD = Humboldt Bay Municipal Water District

## Brownfield Redevelopment and Material Handling

As noted in Section 2.1.4, in 2019 the USEPA conducted a phase II environmental assessment on the site, focusing on shallow soil contamination. The study tested soil samples located in several areas of interest (AOIs) on site, mostly focusing on the former bleach plant (AOI-2), black liquor process and recovery area (AOI-1), and the re-causticizing area (AOI-3). Image 2-4 presents a map showing all the sample locations from this study. Samples were collected at depths ranging from 0-10 feet below surface, and analyzed for metals, and dioxins/furans; NAFC also contracted additional analysis of the samples for PCB's and OCP's. The results of the sample analysis showed that all measurements came back either non-detect (ND), or below Department of Toxic Substances Control (DTSC) screening levels for industrial sites or regional background levels.

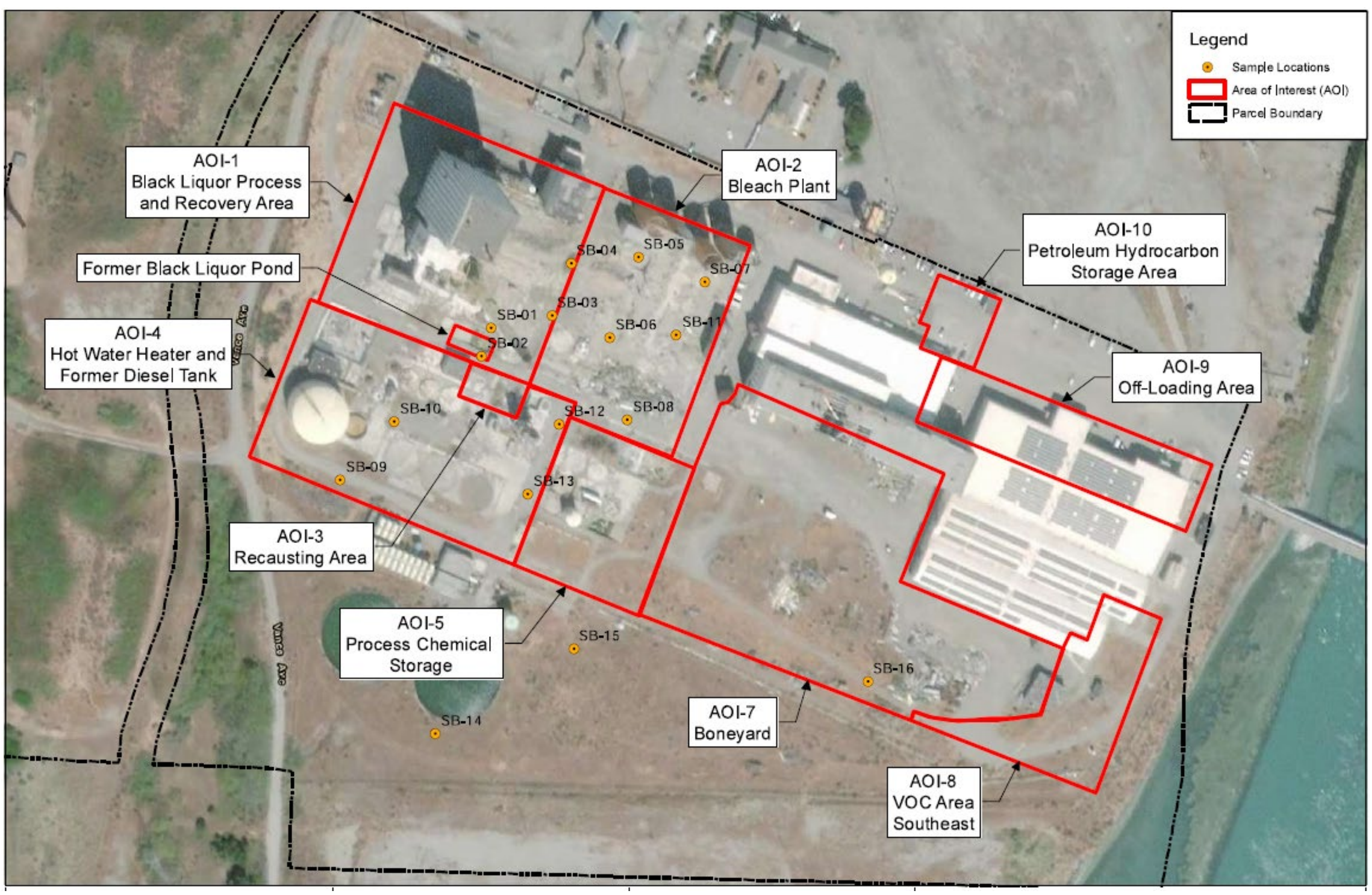



*Image 2-4 Sample Location Map from 2019 USEPA Study*

Based on the results of the 2019 USEPA study, and past clean-up efforts on the project site, NAFC found that there was low risk of significant contamination existing on the site. Despite that, NAFC remains committed to responsible environmental practices should contaminant-impacted soils, water, or debris be encountered during demolition, excavation, and construction. Excavated soils from the site would be handled appropriately and sampled for likely contaminants (SHN 2021). Soils found to contain any significant contamination would be segregated and disposed of at an appropriate waste facility, while "clean" soils would be repurposed on site. The Interim Measures Work Plan (SHN 2021) addresses material handling from demolition and construction activities in Appendix G. Proper erosion and stormwater control measures would be implemented during construction to prevent migration or leeching of any contaminated material. Much of the site would be "capped" with either structures or impervious surfaces, or landscaped and equipped with proper stormwater control measures, which would minimize any risk of contamination migration post-construction. Details of the stormwater analysis and management plan are included in Appendix H.

During demolition, asbestos and lead abatement would be conducted as necessary throughout the pulp mill site to remove existing hazardous materials from existing Project Site structures prior to building demolition. Appropriate notifications would be made to the North Coast Unified Air Quality Management District (NCUAQMD) in accordance with the National Emissions Standards for Hazardous Air Pollutants (NESHAP) requirements prior to the commencement of asbestos abatement and/or demolition work at the Projects Site. A licensed abatement contractor would be engaged by NAFC, or the General Contractor, to conduct abatement work in accordance with appropriate health and safety regulations.

Building and structure demolition would commence once hazardous material abatement work is complete, as applicable to each structure. A licensed demolition contractor would be contracted by NAFC to conduct building demolition. Appropriate dust mitigation and Best Management Practices (BMPs) would be established during demolition work, in accordance with applicable regulations and mitigation measures.

During site excavation work, monitoring of soils as outlined in the Interim Measures Work Plan will be conducted (SHN 2021). Screening of soils using hand-held field meters and the collection of samples for laboratory analysis will be implemented as part of this program to guide material handling. Soil and demolition waste streams would be appropriately segregated and characterized for determination of final disposition. Waste generated during redevelopment would be transported by a licensed waste hauler to an appropriate transportation, storage, and disposal (TSD) facility based on the waste characterization data. Concrete and asphalt generated during building demolition and site redevelopment would be characterized and recycled onsite or disposed of, as appropriate. Metal debris generated during demolition would be hauled off-site and recycled (SHN 2021). The Interim Measures Work Plan (SHN 2021) addresses material handling from demolition and construction activities in Appendix G.

## Aquaculture Facility Description

The proposed development would be based on a RAS modular production design, with local civil and infrastructure adaption. The facility design would be based on the engineering already performed for Nordic Aquafarms proposed Project to be constructed in Belfast, Maine and adapted to site specific conditions at the Samoa Peninsula Project. The layout of the aquaculture facility site is in the conceptual phase of planning and design. A potential aquaculture facility layout is shown in Figure 2-4. Note the final layout may differ slightly as environmental studies and civil design moves forward.

The largest buildings at the proposed aquaculture facility contain the grow-out modules. Construction of the grow-out modules would occur over two construction phases. Maximum building height within the facility is expected to be approximately 60 feet. The footprint of the Phase 1 and Phase 2 production modules are about 265,028 square feet, and the Phase 2 building footprint is about 286,888 square feet including the central utility functions that will be built in Phase 1. Egg raising in the hatchery would begin as early as feasible during Phase 1, followed thereafter by the completion of remaining Phase 1 construction. The hatchery facility, located in the center of the site, would raise the fish from egg to post smolt stage, after which they would be transported to the grow-out modules via underground pipes to be raised to market size. The wastewater treatment plant (WWTP) would subject all production wastewater to a stringent treatment process, including ultrafiltration, biological treatment, and UV disinfection. The Intake water treatment plant (ITWP) will be housed on the western end of what will become the Phase 2 production modules. The

IWTP will subject all industrial freshwater and saltwater to ultrafiltration, Ozone and UV disinfection. The remaining buildings house the fish processing area, administrative functions, backup power generation, and utility infrastructure needed to support operation, and are detailed later in the document. The respective building footprints (square feet) and heights (feet) are described below and total 766,530 square feet:

- Building 1 (Grow-out Module 1): 265,028 square feet; 55-feet-tall; 1 story
- Building 2 (Grow-out Module 2): 286, 888 square feet; 55-feet-tall; 1 story
- Building 3 (Hatchery): 105,085 square feet; 55-feet-tall; 1 story
- Building 4 (Fish Processing and Administration): 66,878 square feet; 60-feet-tall; 3 stories
- Building 5 (Wastewater Treatment and Backup Power): 42,651 square feet; 40-feet-tall with 40-foot backup generator exhaust stack; 2 stories.

## Solar Infrastructure Description

An approximately 4.8 MW solar array is proposed to be installed on the facility roofs unless a larger or more beneficial carbon neutral energy project becomes available to participate in such as the 4.6 gigawatt offshore wind project proposed approximately 21 miles offshore of Humboldt Bay. The electricity produced by those turbines is proposed to be landed at King Salmon. Electrical power generated by the solar array would be utilized by the aquaculture facility to help support operations. There are currently no plans to utilize batteries to store solar power as all power can be directly and immediately utilized on site.

The proposed solar array would consist of multiple rows of photovoltaic panels arranged to maximize solar insolation on approximately 657,000 square feet of facility roofs. The solar panels would be wired in series and connected to step-up transformers.

## Aesthetics

Improvements would be made to the Project Site as a consequence of this Project. Improvements to the Project Site include:

1. Removal of the remnant 270 foot smokestack currently dominating the skyline of the Samoa Peninsula
2. Removal of existing 12 story reboiler building
3. Removal of deteriorated infrastructure, demolition waste, asbestos, lead and other hazardous materials
4. Formal landscaping associated with the functional stormwater management system

The new structures would consider appropriate aesthetic integration in the area:

1. Clearing up and landscaping of the grounds to support a high-quality food operation
2. Choice of façade colors and patterns that minimize visual impact and blend into the surrounding environment
3. The exterior of the aquaculture facility would have downward cast lighting and sensor-controlled lighting systems designed to produce minimal light pollution

No trees would be removed to accommodate new buildings, landscaping, or parking lot improvements.

## Landscape Design

The overall landscape concept is to ground the project within the context of the Manila/Samoa spit dunes. The landscape plan is based on locally appropriate native species that are established in different habitat areas of the Manila dunes, including species from the dune mat, coastal brambles, and forested shore pine vegetative alliances. Extant dune mat and coastal brambles on site would be enhanced through removal of invasive species and augmented with additional plantings to fill those void spaces. Stormwater management basins would include plantings that mimic seasonal wetlands and plant communities also found in dune environments. Plant species in the landscape palette include shore pine (*Pinus contorta* ssp. *contorta*), red alder (Aln*us rubra*), wax myrtle (*Morella californica*), seaside buckwheat (*Eriogonum latifolium*), California blackberry (*Rubus ursinus*), twinberry (*Lonicera involucrata*), Western swordfern (*Polystichum munitum*), and Pacific reedgrass (*Calamagrostis nutkaensis*) among others.

### Fencing

Security fencing, likely chain-link, is proposed to enclose the inner campus. The inner campus consists of the areas located between the Project buildings. No new perimeter fencing is proposed.

## 2.2.3 Project Construction

The proposed Project's terrestrial component would be constructed as a multi-phased development project. Project construction would involve up to three phases as summarized above and would generally be completed as described in the following subsections.

### Construction Timeline

A formal construction timeline has not been developed, as the Project design is in the conceptual phase and regulatory approvals are in progress. Generally, the anticipated construction period is 22 to 25 months for each phase following 8-14 months of demolition work. Construction dates would depend on receipt of agency approvals and successful completion of the environmental permitting process.

Following receipt of permits, preparatory clearing and site work defined as Phase 0 could begin as early as September 2022. The Phase 1 construction could begin as early as 2024. Construction efforts would be ordered according to the facilities of most immediate need.

Construction work associated with Phase 1 is anticipated to begin in 2024 and extend through 2026. Phase 1 would include construction of the Phase 1 hatchery and production modules and the central utility structures, including connection to the necessary intake and discharge infrastructure needed to bring water to the facility. The construction of the Phase 1 production modules would follow, and finish with the construction of the fish processing and administrative building. Access roadways would be built and expanded during each phase of construction, as construction proceeds along the site. As the construction footprint expands, a corresponding expansion of the stormwater systems would be implemented to account for the increase in impervious surfaces.

Once Phase 1 construction and equipment installation is complete, commissioning and startup of the facility would begin. As the commissioning process is underway, the aquaculture facility site would undergo permanent stabilization measures including seeding/planting of disturbed areas and slopes, establishment of the permanent stormwater system and native landscaping. Once the Phase 1 facilities are commissioned and operational and the leach field can be decommissioned, Phase 2 construction could commence.

Construction work associated with Phase 2 is expected to begin two years after Phase 1 is started (tentatively in 2026 and extend through 2028). Prior to the beginning of Phase 2 construction additional clearing and site improvement within the proposed footprint would occur. An overall construction perimeter would be established to prevent impacts from development on the surrounding areas, and localized erosion and sediment control measures would be implemented as construction proceeds across the Project Site. The Phase 2 grow-out building footprint would be prepared for foundation and envelope construction. Access roads and supporting infrastructure would be expanded to facilitate the construction effort. The stormwater system developed for the Phase 1 facility would also be extended to encompass the Phase 2 area, with proper infiltration and sediment collection basins established. Once Phase 2 building construction is completed the site would undergo permanent stabilization measures similar to those implemented in Phase 1, and the permanent stormwater system would be completed. Prior to construction, an Operation and Construction Transportation Plan would be developed and submitted to the County for review as a condition of approval for the Coastal Development Permit. The Operation and Construction Transportation Plan may utilize various mechanisms to achieve a reduction of vehicles commuting to the site than the number of employees, including but not limited to:

1. Encourage ride-sharing and carpooling vanpooling to reduce Vehicle Miles Traveled (VMT). The operator of the facility should design and implement carpooling and ridesharing incentive program for employees. Would establish a rideshare coordinator to facilitate ridesharing or van pooling of employees.

2. Encourage employees to remain on-site during meal breaks by providing a break room with kitchen, catering options, or cafeteria.

3. Work with the local transit authority to extend bus service to the site. The current bus transit stop is approximately 2-miles away.

4. Install shower facilities and places for employees to dress for those who commute via bicycle. Installation of a transit stop in proximity to the project can be used to satisfy this requirement.

This Plan shall also implement measures to reduce congestion related to construction related vehicle trips, including, but not limited to off-hauling and materials delivery to not occur concurrently with peak travel periods. An annual report detailing the measures implemented as part of the Operation and Construction Transportation Plan shall be submitted to the Planning and Building Department by January 1 of each year.

## Staging Areas

Construction staging would occur at the former pulp mill (APN 401-112-021) and potentially other “developed” adjacent properties. The staging areas would be used for contractor parking and supply and equipment storage. Staging areas would be located strategically to provide the most efficient access for construction operations and would be setback an appropriate distance from Humboldt Bay, wetlands and/or other sensitive areas. Storm drains located within or near Project staging areas would be protected using appropriate BMPs.

To access the Project Site, access points to the staging areas would be demarcated for construction vehicles to move directly from New Navy Base Road to Vance Avenue and then to the staging areas.

## Grading and Excavation

A level building pad would be created for each new building with reused excavated soil. To the extent possible, excavated soil would be reused onsite, which would reduce the need for off hauling. Excavated materials would be screened for contaminants and hazardous materials throughout construction activities. Any contaminated materials encountered would be segregated and disposed of at an appropriate off-site facility. Existing concrete would either be pulverized and reused on site for ground densification and as base material or exported as appropriate.

Construction at the Project Site would require removal of the existing structures, concrete foundations, and the smokestack to prepare the ground surface for construction. Demolition debris, such as concrete and brick would be recycled to the greatest extent feasible. Concrete and brick that could be repurposed would be crushed and used for ground densification and structural fill where appropriate. Demolition of concrete and brick would include screening for contaminants and hazardous materials. Impacted materials would not be reused and would be disposed of at an appropriate offsite facility. Material sorting, crushing, and reuse would be conducted in a manor to mitigate dust generation, stormwater runoff, and any other potentially deleterious byproducts. Site grading would be limited to that necessary for facility and infrastructure construction, along with appropriate stormwater and erosion control measures.

Utility trenches would be excavated to bring services to new buildings within the aquaculture facility.

Dewatering is not expected but may be required during excavation. If required, the appropriate plans would be developed and submitted for regulatory approval by the County. The designs for foundations, process piping, and utilities are limited to a 12-foot maximum depth below surface to limit any work below the water table or the need for trench dewatering.

It is anticipated that sheet piling would be utilized where sufficient area is not available to slope excavations and in areas of deep excavation to stabilize the excavation and limit any dewatering that may be required. Sheet piling when needed would be installed with a vibratory hammer, to an approximate maximum depth of 30 feet below ground surface and would be removed once work in the excavation is complete.

### Foundations

Because the Project is located on the Samoa Peninsula, which consists largely of sand and sandy soils, the construction of the building foundations involves soil densification (i.e., compaction) techniques in order to adequately support the slab foundations. There are a variety of soil densification techniques available, of which the following three are considered suitable for the Project: Rammed Aggregate Piles (RAP), Vibro Displacement Columns (VDC), and Vibro Compaction. Rapid Impact Compaction, a commonly used technique, is not considered viable for this project and would not be used. The foundations would also utilize shear keys to resist lateral movement in a seismic and or tsunami event. Existing concrete would be crushed and reused for soil densification.

### Construction Stormwater Management

Management of onsite stormwater would be addressed during construction of the facility. Construction activities would be covered by obtaining coverage under the Construction General Permit Order 2009-0009-DWQ. A Stormwater Pollution Prevention Plan (SWPPP) would be developed and implemented for the duration of construction activities at the site to manage and reduce the potential for pollution from concentrated stormwater runoff from the site.

Since construction is to be phased, short term stormwater BMPs would be installed and/or modified during each phase of construction to ensure compliance with stormwater discharge requirements. Stormwater affected by construction related activities would be treated by implementing soil stabilization, sediment control, temporary tracking control, wind erosion control, non-stormwater management, waste management, and materials pollution control BMPs, as necessary, throughout the Project implementation.

As construction of the site facilities progresses temporary stormwater BMPs, such as temporary sediment basins, would either be decommissioned due to the area being developed, or finalized and incorporated as part of the permanent stormwater infrastructure.

## 2.2.4 Project Operations

The summary of project operations for the terrestrial component is preliminary and subject to results from forthcoming technical investigations and final design development internal to each production building and ancillary infrastructure. An overview of current site logistics designs is provided on Figure 2-6 and Figure 2-8 through Figure 2-12.

### Water and Utility Infrastructure

The facility would use domestic water (potable), industrial water (non-potable) and sea water at the Project Site. Both freshwater and saltwater water sources are addressed in the following subsections.

#### Domestic Water (potable)

Domestic water (potable) is to be delivered by the HBMWD through existing infrastructure to the Samoa Peninsula. The HBMWD has significant excess capacity of domestic potable chlorinated water sourced from the Mad River (HBMWD 2021).

The existing onsite domestic water service would be connected to the new buildings for potable use in showers, kitchens, restrooms, and for use in the fish processing area. Water service to the buildings would connect to an existing supply line to the Project Site. Permitting associated with freshwater use far exceeding the needs of NAFC has been completed by HBMWD.

#### Industrial Water (non-potable)

Industrial water (non-potable) is to be delivered by the HBMWD through existing infrastructure to the Samoa Peninsula. The HBMWD has significant excess capacity of industrial untreated fresh water from the Mad River (HBMWD 2021).

Industrial freshwater is provided to the Project Site by the existing HBMWD 1-MG water storage tank, located west of the site, which previously supplied water to the pulp mill. The existing onsite water service would be connected to the

Facilities Freshwater Intake Water Treatment System for complete treatment before being stored in the onsite 2-MG water tank for use in the fish rearing facilities, fire sprinklers, and irrigation. Water service to the buildings would connect to an existing underground water line running from the 1-MG tank to the Project Site. Permitting associated with freshwater use far exceeding the needs of NAFC has been completed by HBMWD. A connection to the new fire suppression line that will run parallel to the bay shore from south of RMTII to just north of the Red Tank Dock will be established. This line will be placed in the same trench as the new saltwater supply lines described below and in figure 2-14, and figure 2-15.

To treat the industrial freshwater, NAFC water treatment system would include tertiary filtration, concluding with ultra-filtration, ozone treatment, and ultraviolet disinfection. Intake water would be monitored pre, mid, and post treatment on a continuous basis with sensors. Manual testing would be conducted to ensure complete treatment is achieved and that only high-quality water that meets all NAFC criteria is introduced to the facility rearing systems.

**Saltwater**

The capacity of the Harbor District sea chests on the RMT II and Red Tank Docks is being expanded and would provide saltwater supply to the site. The Project would connect with the sea chest piping along the eastern edge of the NAFC lease area. See Figure 2-14, Figure 2-15, and Section 2.4 for additional information about the Humboldt Bay Water Intakes.

The sea chest pumps would supply saltwater through piping affixed to the existing docks. The piping infrastructure would extend onshore underground from the RMT I manifold to the NAFC manifold. The terrestrial water piping infrastructure would be located within APN 401-112-021 and APN 401-112-024, thus is entirely within the Humboldt County permit jurisdiction and CCC appeal jurisdiction.

Final design of the intake water treatment infrastructure within the aquaculture facility is subject to analysis of final source water data currently being collected. There would be separate treatment trains for industrial freshwater and saltwater. The baseline solution for intake water treatment that NAFC will operate includes:

1. First stage filtration
2. Ozone treatment
3. Ultra-filtration
4. Ultraviolet (UV-C) dosing

Intake water would be monitored pre, mid, and post treatment on a continuous basis with sensors. Additionally, manual testing will be conducted to ensure complete treatment is achieved and that only high-quality water that meets all NAFC criteria is introduced to the facility rearing systems.

NAFC would be prepared to maintain water quality and fish health within the facility in the event of sudden changes in Humboldt Bay water quality due to accidental spills, unforeseen circumstance, or natural disaster. NAFC has onsite storage to provide buffer in an emergency and the ability to alter water usage and sources as an immediate measure. An on-site 2 million gallon tank would serve as the primary freshwater storage. Additionally, the 1 million gallon tank owned by the HBMWD due west of the Terrestrial Development would provide additional freshwater storage. Several additional tanks inside the growout and smolt buildings would also support water storage.

In emergency situations feeding can be reduced to limit the need to exchange water from the RAS units to minimize water demand for short periods of time. There is also the ability to effectively stop the use of marine water and transition to exclusive freshwater use in an emergency for short periods of time. The anadromous nature of salmonid biology allows them to flourish in either salt or freshwater. Young salmonids are obligated to live in freshwater. Post smolt salmonids can be raised in fresh, brackish, or full-strength seawater. There are many examples of fish being grown under all these varying saline conditions both commercially and in research institutes. Nordic Aquafarms prefers to utilize marine water to grow fish but transitioning to freshwater for a short period of time would not have any negative impact on the effectiveness of fish health systems or wastewater treatment systems. The former mill utilized large volumes of freshwater and the infrastructure to deliver the water is still in place. For emergency operations, the industrial water supply line at the Project Site and the HBMWD are capable of providing more water than the facility would need to maintain fish health in emergency situations. The facility would have sufficient onsite water storage to operate for several days and could continue to operate for several weeks but would likely be unable to process fish.

## Water Treatment

Water treatment by NAFC of intake water and discharge water would take place in onsite buildings. All infrastructure would be placed indoors. There would be an advanced best available technology wastewater treatment plant with high levels of nutrient removal and biosecurity measures to protect receiving waters. Nordic Aquafarms has never had disease outbreaks in its existing facilities. This is accredited to the strict water treatment regimens and high biosecurity measures. Nordic always takes into account that issues could arise. In such scenarios, independent well developed Best Management Practices (BMP), Standard Operating Procedures (SOPs), and strong biosecurity on the outfall are designed to contain and prevent disease spread to receiving waters. The wastewater treatment plant is still in the design phase, but current design includes the following proven technologies:

1. Nitrogen reduction system (anoxic / bioreactor system)
2. Phosphorous removal
3. 0.04-micron Ultrafiltration Membrane Bioreactor systems (MBR)
4. 300 millijoule (mJ) end of lamp life (ELL) UV dose before water is discharged
5. Filtrate collection, dewatering, and storage system with water from filtrate dewatering returned to the WWT system for complete treatment

The total RAS and wastewater design delivers the following performance:

1. 99 percent reduction of total suspended solids, BOD, and phosphorous
2. 90± percent reduction of nitrogen discharge

Dewatered filtrate/sludge (feces and feed) rich in nutrients would be an output of the wastewater treatment process. The filtrate would be recycled for other uses such as fertilizer, biogas, etc. The filtrate is stored in sealed tanks for regular out-shipment and would not result in odor issues. The other output is filtered and treated water that would be discharged through the existing outfall pipe that extends 1.55 miles (8,200 feet) offshore from the Samoa Peninsula into the Pacific Ocean.

The discharge water treatment building would be connected to the existing outfall pipe owned by the Harbor District adjacent to the Project Site. An underground connecting pipe would be installed by NAFC connecting to the existing outfall pipe.

The aquaculture facility wastewater would be treated onsite prior to discharge offsite. The proposed wastewater treatment process generally illustrated in Image 2-5 and a proposed wastewater treatment flow diagram is provided in Image 2-6 (Note: a final piping and instrumentation diagram would be available once facility design is complete).

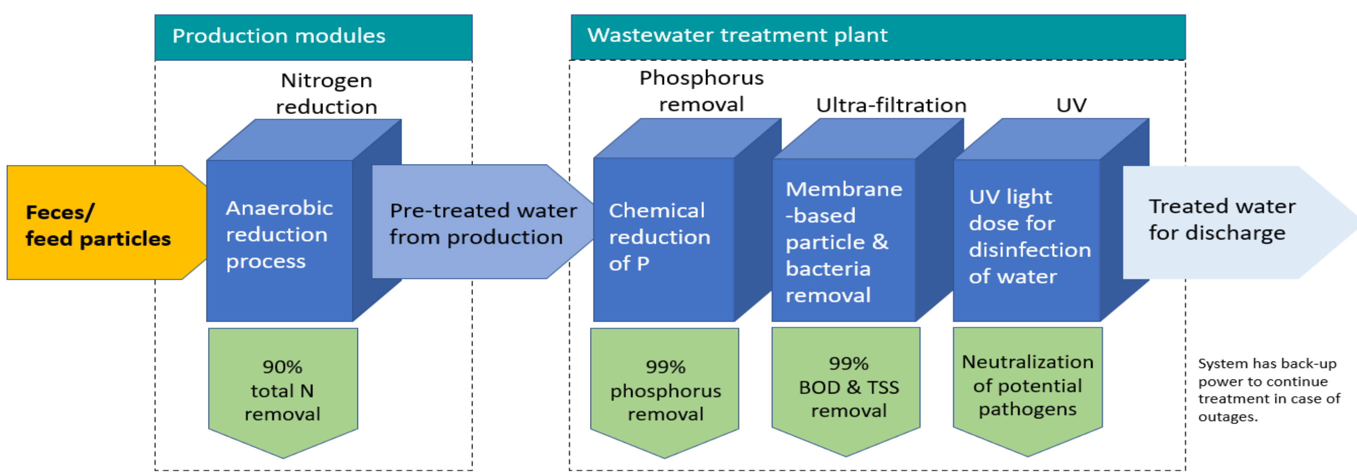
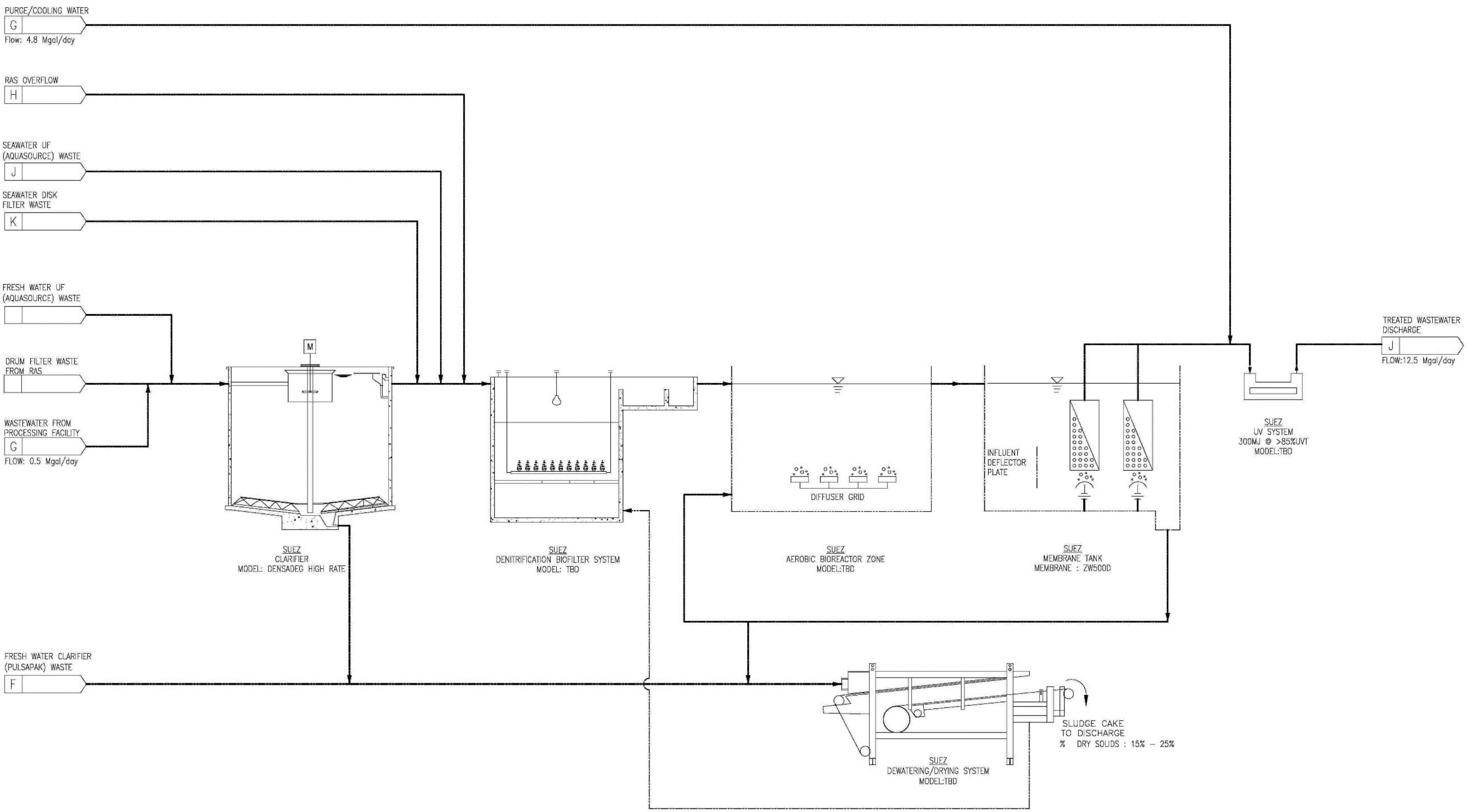



*Image 2-5 Wastewater Treatment Infrastructure*


PURGE/COOLING WATER
G
Flow: 4.8 Mgal/day
RAS OVERFLOW
H
SEAWATER UF (AQUASOURCE) WASTE
J
SEAWATER DISK FILTER WASTE
K
FRESH WATER UF (AQUASOURCE) WASTE
DRUM FILTER WASTE FROM RAS
WASTEWATER FROM PROCESSING FACILITY
G
FLOW: 0.5 Mgal/day
M
SUEZ CLARIFIER MODEL: DENSADEG HIGH RATE
SUEZ DENITRIFICATION BIOFILTER SYSTEM MODEL: TBD
DIFFUSER GRID
SUEZ AEROBIC BIOREACTOR ZONE MODEL:TBD
INFLUENT DEFLECTOR PLATE
SUEZ MEMBRANE TANK MEMBRANE : ZW500D
SUEZ UV SYSTEM 300MJ @ >85%UVT MODEL:TBD
TREATED WASTEWATER DISCHARGE
J
FLOW:12.5 Mgal/day
FRESH WATER CLARIFIER (PULSAPAK) WASTE
F
SLUDGE CAKE TO DISCHARGE
% DRY SOLIDS : 15% – 25%
SUEZ DEWATERING/DRYING SYSTEM MODEL:TBD

## Aquaculture Facility Operation

As shown in Figure 2-4, the proposed facility would be comprised of multiple buildings to house and support aquaculture operations. The following sections provide a description of each building and the associated facility functionality. It should be noted that the presented layout is preliminary, and subject to minor modifications as design for the Project progresses.

### **Buildings 1 & 2: Phase 1 and Phase 2 Grow-out Modules**

The Phase 1 production modules are proposed to be located along the northern edge of the aquaculture facility, which would contain the initial grow-out modules within Building 1 (see Image 2-3). The construction of the Phase 1 buildings and ancillary infrastructure is scheduled to be completed during Phase 1, with the remaining grow-out modules to be constructed during Phase 2. The westerly portion of Building 2 would contain the intake water treatment facility and thus would also be constructed in Phase 1. The westerly portion of Building 2 also houses the heating and cooling equipment needed to maintain proper water temperature during operation. This, along with the fresh and saltwater intake treatment systems, will be constructed in Phase 1 (see Figure 2-4).

Use of water to water-heat exchangers and heat pumps will be maximized to reduce energy demands. The production module buildings would be the largest structures onsite. The buildings would contain a series of tanks that would house the fish as they grow from juvenile to market size. Fish are transported from the Hatchery building to the grow-out buildings through dedicated underground swim-pipes. Water is recirculated, filtered, and treated twice per hour by the RAS systems. For every kilogram of feed used, 200 L of water is removed and replaced with new intake water. Removed water is piped to the wastewater treatment facility (Building 5) for additional filtration and treatment (Image 2-6) prior to being discharged into the existing outfall pipe. Utility density in this facility would be very high, necessitating careful foundation design to accommodate the many tie-in points for process and utility lines. Utilities include electrical systems, process water piping, oxygen systems, potable water systems, feeding systems, heating/cooling water piping, and fish transport piping.

### **Building 3: Hatchery**

Located in the eastern side central corridor of the site is the Hatchery building, which houses the hatchery and rearing tanks needed to grow the fish from eggs to juvenile stages (see Image 2-3). The tanks within this facility would operate similarly to those within the grow-out modules; each tank cluster would be tied to a particular stage of growth and comprised of its own recirculating treatment system. Utility density in this facility would be very high, necessitating careful foundation design to accommodate the many tie-in points for process and utility lines. Fish are transported from the Hatchery building to the grow-out buildings through dedicated underground swim-pipes.

### **Building 4: Fish Processing and Administration**

Fish are transported via underground piping from the grow-out modules to Building 4 for final processing into consumer ready head on gutted and fillets (see Image 2-3). Packaging and shipping would also occur within this building. On the upper floor of the processing facility would be administrative offices that would contain staff that oversee every aspect of the facility operation and management. All process water and floor drains in the processing area will be pretreated to remove large solids and lipids prior to being comingled with the other onsite system process water for complete treatment in the facilities WWTP.

### **Building 5: Wastewater Treatment and Backup Power**

Building 5 would house the wastewater treatment plant for the comingled saltwater and freshwater discharge waste streams from the grow-out modules, hatchery, and fish processing facilities (see Image 2-3). The discharge solids would be removed through filtration and the solid filtrate would be stored in air-tight containers located either below or above grade. The filtered wastewater would then undergo multiple treatment processes, included biological treatment, ultrafiltration, and UV disinfection prior to discharge through the outfall pipe into the Pacific Ocean.

**Oxygen Generation**

The central area of the facility would house the oxygen generation systems and store liquid oxygen (see Image 2-3). Liquid oxygen will serve as the emergency oxygen source for all systems.

**Facility Operation**

The facility is estimated to employ approximately 100 employees for Phase 1, and 150 for full Phase 2 buildout. The facility would operate 24/7. The employees would primarily work in two shifts, one early morning and one late afternoon. It is estimated that the morning shift would consist of about 60 employees in Phase 1, increasing to approximately 90 in Phase 2, and the evening shift would have about 35 employees in Phase 1, increasing to approximately 55 in Phase 2. There will be a small overnight night shift estimated consist of 5 employees. Aside from shift arrival and departure, on-site traffic would be mainly limited to personnel movement, deliveries, and outgoing shipments of products and coproducts. Fish movement within the site would be handled by subgrade piping and thus would not add to surface traffic.

**Facility Parking**

Parking at the facility would be located throughout the central campus corridor between Building 1 and Building 2 providing access to all facility buildings. The facility would include a three-truck loading dock, seven-truck unloading/loading areas,115 standard light vehicle parking spots, and six ADA accessible light vehicle parking spots. At full production there would be a maximum of 100 employees at the facility at any given time. That would include approximately 20 employees in the approximate 6,400 square foot office / management area of Building 4 and approximately 80 employees spread throughout the rest of the facility.

**Facility Truck Traffic**

Facility operations would include regular deliveries to and shipments from the facility. Shipments would include finished product to market and byproduct streams to secondary use processing sites. While the final distribution strategy for the facility is still in development, initial estimates have been made based on knowledge of existing West Coast markets in relative proximity to the project site. At full production it is currently estimated that there would be 40 outgoing product delivery trucks per week with approximately 30% going to the Seattle area, approximately 30% going to the Los Angeles area, and approximately 40% going to the San Francisco Bay Area. It is expected at full production there would be 32 outgoing trucks weekly carrying waste streams to various secondary use processing sites within 150 miles of the facility. Deliveries to the facility include fish feed, shipping materials, and process chemicals. Deliveries of fish feed would consist of 20 trucks per week. The final feed vendor would be selected later. Deliveries of shipping materials and process chemicals would consist of three trucks per week likely originating in the Redding or San Francisco Bay area. As project design progresses NAFC would refine its sourcing and distribution strategies to align with market demand and optimize logistics. Prior to construction, NFAC would submit an Operation and Construction Transportation Plan to the County for review.

## Supporting Systems and Facilities

The systems and facilities described in the following subsections would support the operation of the aquaculture facility.

**Power Backup Systems**

If grid electrical power supply is shut down to the aquaculture facility, an onsite emergency backup power system would activate to maintain all critical functions for the fish and wastewater treatment systems. NAFC anticipates that several dual fuel (natural gas and diesel) generators with a combined capacity of approximately 20 MW would be needed to supply emergency power to the fully developed facility. The natural gas would be supplied by the existing 4" main on site. Diesel fuel will be used to provide backup power if both natural gas and electricity temporarily fail. Low Sulphur diesel fuel would be supplied by two new 25,000 gallon double walled fiberglass underground storage tanks (UST). Typical double walled fiberglass USTs of this size are approximately 10 feet 6 inches outside diameter, approximately 40 feet in length. They are mounted to a concrete ballast pad or anchor designed to ensure that the tank remains seated regardless of the level of fuel in the tank and regardless the height of the groundwater outside the tank. Sea level rise and associated groundwater increases will be considered in the design of the concrete ballast. The USTs would be located under a paved area east of Building 5. The USTs would include associated piping that would provide primary and secondary containment and would be equipped with continuous vacuum, pressure, or hydrostatic (VPH) monitoring. The design and installation of the USTs would ensure that in the event of a tsunami there would be no release of fuel from the tanks. Tsunami mitigation would include anchoring and armoring the tanks, securing all ports with watertight locking hatches, and locating vents above the modeled inundation levels. Generator testing and maintenance activities would be done using primarily natural gas. Emergency operation of the generators would use natural gas, except in the event that the supply of natural gas is interrupted in which case the generators would run on diesel fuel. In this way, diesel provides a "backup to the backup." The backup generation system would be designed to rapidly respond to interruptions in the power supply to the facility and maintain critical equipment and infrastructure. The backup power generation system can run as long as necessary in the event of a prolonged power outage, but would be permitted to be used a maximum 500 hours in a given year as its intended purpose is for emergency generation. Normal operations of approximately 10 run hours per year would be typical usage to confirm functionality and maintain lubrication outside of emergency use. Additional onsite power would be generated by the proposed 4.8 MW rooftop solar installation.

**Oxygen Systems**

Onsite oxygen generation systems would be used, with additional liquid oxygen storage tanks. There would be a curb around the oxygen storage area to contain any minor spills. Spills are not anticipated, and any liquid oxygen released would quickly and harmlessly evaporate into the atmosphere. Signage will notify all employees and visitors that no smoking is allowed near the Oxygen facility. Stand-off bollards will prevent any vehicles from encroaching on the Oxygen area. Appropriate fire suppression will be installed where needed for staffed areas. The oxygen system would be dimensioned and planned in more detail in the permitting phase.

**Central Utilities & IWTP**

This facility would include required heating and cooling systems, as well as the central facility switchgear. Water-to water chilling systems will be maximized to reduce electricity use. Also located in this area is the Intake Water Treatment Plant (IWTP), which will contain the intake water treatment equipment and infrastructure for industrial freshwater and saltwater.

**Storage/Workshop Area**

A space would be reserved for various materials and equipment storage uses. This multifunctional space would additionally provide workshop space for use by operations and maintenance staff of the aquaculture facility.

**Refrigerants**

NAFC would seek to find the most responsible use of refrigerants in its facility to include water to water chilling and to examine the use of recycled refrigerants. NAFC will be fully compliant with all USEPA regulations to include the American Innovation and Manufacturing (AIM) Act and the USEPA's effort in three key areas around hydrofluorocarbons (HFCs):

1. Phasing down production and consumption
2. Maximizing reclamation and minimizing releases from equipment
3. Facilitating the transition to next-generation technologies through sector-based restrictions.

The following is publicly available information provided by the USEPA on their webpage:

> *The AIM Act was enacted by Congress on December 27, 2020. The AIM Act directs EPA to phase down production and consumption of HFCs by 85% below baseline levels by 2036 through an allowance allocation and trading program. EPA has established U.S. production and consumption baselines using a formula provided by*

*the AIM Act that considers past HFC, hydrochlorofluorocarbon (HCFC), and chlorofluorocarbon (CFC) amounts. By October 1 of each year, EPA must issue production and consumption allowances for the following calendar year, relative to those baselines.*

**Work Force Requirements**

NAFC would directly employ approximately 150 full time equivalent (FTE) positions once the facility is in full operation. NAFC anticipates that less than ten of these positions would be filled with employees relocating from outside of Humboldt County due to the highly specialized experience required and the scarcity of these resources in the market. The other 140 positions are anticipated to be filled with local resources. Many of these resources are available in the community today, and others will be qualified by participating in the Aquaculture programs at College of the Redwoods and/or Humboldt State University. NAFC is working with Humboldt State University, College of the Redwoods and Humboldt County Office of Education to support the engagement, education and training of local students and residents to help address future workforce needs. Table 2-7 shows the different positions planned at the facility, including level of experience / education necessary for the different positions.

***Table 2-7 NAFC Employment Overview***

| Position | Education / Experience | Number of positions |
|---|---|---|
| Management | | |
| President | Positions range from 5-10 years' experience and up. Educational levels are anticipated to be bachelor's and/or master's degrees. | 7-9 FTEs. Because some of these positions are highly specialized, Nordic anticipates that 3-5 of these positions may be recruited from outside of Humboldt initially. |
| Hatchery | | |
| Production | | |
| Processing | | |
| RAS / WTTP Technology | | |
| Finance | | |
| Quality Control | | |
| Human Resources | | |
| Administrative Support Staff | | |
| Community Outreach | Positions range from 3-5 years of experience to 10+ years' experience. Educational levels range from associate to master's degrees. | 10-11 FTEs. Nordic anticipates that these positions will be filled by local resources. |
| Office Manager | | |
| Controlling / Accounting | | |
| Buyer | | |
| HR / Adm / Payroll | | |
| IT Manager and Operators | | |
| Facility / Maintenance | | |
| Facility Director | Positions range from entry level to 10+ years of experience. Educational levels range from High School level to master's degrees | 11-12 FTEs. Nordic anticipates that these positions will be filled with local resources. |
| WWTP Manager / Operators | | |
| Maintenance Supervisor / Operators | | |
| Security Guards | | |
| Hatchery | | |
| Hatchery Manager | Positions range from entry level to 10+ years' experience. Educational levels range from vocational school, aquaculture certificate to bachelor's and master's degrees. | 17-18 FTEs. 1-2 positions may be filled by persons from outside of Humboldt, but the rest is anticipated to be filled with local people with background from HSU and/or CR |
| Hatchery Assistant Manager | | |
| Aquaculture Supervisors | | |
| Aquaculture Technicians | | |
| Grow Out Facilities (Phase 1 & 2) | | |
| Production Managers | Positions range from entry level to 10+ years' experience. Educational levels range from vocational school, aquaculture certificate to bachelor's and master's degrees. | 56-58 FTEs. Most of these positions may be filled with local resources. The facility will be built in 2 phases which allows us to train most of the resources in-house. |
| Assistant Production Managers | | |
| Aquaculture Supervisors | | |
| Aquaculture Technicians | | |
| Logistics & Feed Technicians | | |

| Processing | | |
|---|---|---|
| Processing Supervisors<br>Processing Operators<br>Quality Control<br>Transportation Supervisors / Coordinators | Positions range from entry level to 10+ years' experience. Educational levels range from vocational school, aquaculture certificate to bachelor's degrees. | 35-38 FTEs. Nordic anticipates that these positions will be filled with local resources. |
| **Quality / Lab** | | |
| Operational Quality Coordinator<br>Operational Quality Laboratory Manager<br>Operational Quality Technicians<br>Environmental Controller<br>Fish Health & Welfare Manager | Positions range from 3-5 years of experience to 10+ years' experience. Educational levels range from bachelor's to PhD degrees. | 8-9 FTEs. 1-2 positions may be filled by persons from outside of Humboldt, but the rest is anticipated to be filled with local people with background from HSU and/or CR |
| **Total** | | **145-155 FTEs** |

Notes: Nordic plans to employ 150 FTEs once the facility is in full operation. The exact number of positions per department will be finalized during operational planning, but Nordic expects the total number to be +/- 150 FTEs.

## Utility Improvements and Services

### Sanitary Sewer

Sanitary sewer service is not currently provided to the Project Site. An existing leach field is located at the southern portion of the Project Site as shown on Figure 2-4. The existing leach field is currently utilized by the RMT II and ancillary facilities occupying the Project Site. The leach field was designed and approved to handle a flow of 14,700 gpd of domestic wastewater generated by the employees of the pulp mill while in operation. The leach field was designed and constructed as two separate, but adjacent units. Each of the two leach field units has a distribution box and 17 4-Inch diameter, 90-foot long, perforated pipe leach lines, spaced at 10 feet on center. In 2014 the Harbor District proposed and received approval to separate the two units with one designated to receive domestic wastewater and the other receiving process wash water from RMT II operations. The capacity of the leach field utilized for domestic wastewater has a total capacity of 7,350 gpd. Current usage of the domestic wastewater leach field from RMT II and ancillary facilities operations is estimated to be between 363 gpd to 570 gpd based on current water usage from HBMWD and employee / fixture counts. Domestic wastewater production from NAFC during Phase 1 operations on the Project Site has been estimated to be less than 900 gpd, leaving a minimum excess capacity in the domestic wastewater leach field of 5,880 gpd.

The existing leach field would be used by the Project temporarily during construction and operation of Phase 1 for domestic sanitary needs of the 100 employees. The use of the leach field would be discontinued once Project Site structures are connected to the Peninsula Community Services District (PCSD) sewer line that will be constructed west of the Project Site in the Vance Ave utility corridor. Construction on Phase 2 production modules cannot begin until leach field use is discontinued, as the second production module building is proposed to be located over the existing leach field.

### Electrical, Natural Gas, and Telecommunications Services

Electrical service is currently provided to the Project Site by Pacific Gas & Electric Company transmission lines (PG&E). PG&E currently has a 4-inch steel natural gas service line located adjacent to the electrical substation at the Site. The gas line is not currently being utilized. Telecommunications service is currently available to the Project from AT&T or Sudden Link. Modernization and upgrade of the existing substation is planned to include expanding the total capacity of the switchyard to 35 MW to be utilized by NAFC and Harbor District RMT II operations. Connections to the new buildings would be made from the existing electrical switchyard located at the northwest portion of the former pulp mill site. Electrical utilities would be extended to the new building within multiple trenches or above-ground transmission lines. Electrical connections would extend from the existing switchyard to new transformer(s) to be installed in the switchyard adjacent to the new structures.

The two primary electricity providers in the area are Redwood Coast Energy Authority (RCEA) and PG&E. The electricity provided by PG&E or RCEA is subject to California's Renewables Portfolio Standard, which mandates that a portion of the power comes from renewable sources. The California Renewables Portfolio Standard is a state mandate that all power providers are required to meet or exceed. Furthermore, the Project will directly support goals established in RCEA's *Repower Humboldt Action Plan for Energy* (RCEA 2019) by using efficient technologies, all electric equipment (except for emergency power associated with short-term power interruption) and installation of a utility scale onsite solar energy generation system. NAFC is committed to the same goals as RCEA and would follow their lead when it comes to use of non-carbon and renewable energy-based sources of electricity.

**Access Roads**

The Project Site is accessed from Vance Avenue via New Navy Base Road and LP Drive. Repair, resurfacing, and striping upgrades of Vance Avenue and LP Drive to support site access, construction, and operation is expected and will be funded by NAFC. Significant expansion of the paved surface of Vance Ave is not expected through the repair and resurfacing process.

**Handling of Waste Streams**

NAFC operations are based on a responsible recycling philosophy, with the goal that all byproduct resources be recycled for secondary uses. The NAFC approach to handling of byproduct streams at aquaculture facilities is to assess potential off-take options in the region and based on that enter into agreements for off-take or to develop NAFC refinement solutions. For this facility, the following waste streams would be generated:

Processing coproducts (heads, racks, viscera, etc.) are sorted automatically in the processing steps and stored in chilled sealed containers. These are protein resources that have an economic value in pet food, biotech, supplements industry, and more. It can also be used in biogas production. It is estimated that the facility would produce between 8,000 to 12,000 metric tons of processing coproducts annually when fully operational. Processing coproducts would be maintained as food grade products and shipped on an ongoing basis from the facility by truck.

Filtrate can be dewatered to different dry matter levels depending on final use. The most likely uses in this case would be fertilizer/soil enhancement, biogas, or composting. This is also an attractive input into microalgae production. Filtrate would be shipped offsite by truck with the facility producing approximately 2 trucks per day in Phase 1 and increasing to approximately 4 trucks daily at full production. The total number of trucks is dependent on final dry matter content of the dewater filtrate.

Fish Mortalities for NAFC facilities are very low, however fish do die and are culled for a variety of reasons. In NAFC facilities dead fish are ground and stored in storage tanks with a weak acidic solution to maintain a pH of 4 to stabilize the material. This prevents odors from developing. The final product would have a variety of secondary use opportunities including biogas, compost, and fertilizer.

Domestic Wastewater from the proposed facility is estimated to produce approximately 1,470 gpd at full buildout, and less than 900 gpd for Phase 1. The site currently features an active leach-field with sufficient capacity to accommodate Phase 1 operations. Before Phase 2 construction begins the facility would be connected to the PCSD sewer line that would be constructed west of the Project Site. It is important to note that the facility's domestic wastewater would not include any captured water from the facility systems floor drains, which would be piped to the onsite wastewater treatment facility.

**Intake and Discharge Water**

Both intake water and discharge are subjected to strong biosecurity measures to prevent intake or discharge of pathogens or parasites. A detailed description of the proposed water treatment systems is provided in 2.2.4 Water Treatment. Both industrial freshwater and saltwater intakes to the facility would be subjected to 0.02-micron ultrafiltration and UV disinfection prior to being introduced to the production facilities. Within each RAS core a portion of the treated water would be continuously treated by filtering solids, ozone dosing, and UV disinfection. Wastewater from the production tanks would be directly piped to the wastewater treatment plant for final treatment prior to discharge, where it would be subjected to 0.04-micron ultrafiltration and a 300 mJ/cm2 ELL UV dose before discharge (See Image 2-6).

## Personnel and Visitor Policies

Staff at rearing facilities would consist of designated personnel only. Access to these facilities would be restricted and efforts would be made to limit the movement of personnel between facilities on any given day. A formal personnel movement plan would be developed and implemented. This movement plan would be posted in all units for quick reference. All personnel would move through keycard access biosecurity gates where proper sanitation and hand washing would be performed upon both entrance to and exit from the units. Touch free hand washing stations would be used, and facility specific attire and footwear will be donned and doffed. Operational duties in the hatchery facility and personnel performing them would generally be separate from those in the growout facilities (modules).

Non-staff visitation to rearing facilities would be limited with a focus on ensuring visitors have not visited other animal facilities, aquarium, aquaculture facilities, or other fishery related location within 48 hours. Public visitation interests would be served by a visitor's area at the front of the property, reducing the demand for non-personnel access. Access of visitor's area staff to production facilities would be limited.

## Stormwater Management

Construction and post-construction stormwater system for the NAFC facility would be managed in compliance with the California State Water Resources Control Boards' (SWRCB) Construction General Permit (CGP) and Industrial General Permit (IGP).

The preliminary stormwater design for the site has been developed using a Low Impact Development (LID) approach to mimic the site's predevelopment hydrology by using techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall with non-structural controls and conservation design measures.

The NAFC preliminary stormwater treatment system, depicted on Figure 2-4, utilizes landform grading that matches the existing topography, and incorporates vegetated bioretention/infiltration ponds, LID facilities, and subsurface infiltration piping to capture and infiltrate the stormwater runoff anticipated from up to the 100-year storm event. The preliminary stormwater treatment system has also been designed to treat the anticipated stormwater runoff associated with the 85$^{th}$ percentile storm event. The stormwater infiltration areas have been located in areas that are not anticipated to be negatively affected by regions of historical contamination at the site.

Stormwater runoff from the site currently is designed to discharge into the existing stormwater pipe network, which ultimately discharges to Humboldt Bay and the ocean outfall. The current stormwater system is in various states of disrepair and its current level of functionality has not been determined. Given the current state of disrepair and deterioration of the former pulp mill it is fair to expect the current storm water system is no longer performing as designed. The NAFC stormwater treatment facilities have been designed to infiltrate the runoff anticipated from the 100-year storm event, therefore no offsite stormwater discharge is anticipated for the facility under normal operating conditions. The majority of the existing stormwater infrastructure would be demolished as part of construction of the NAFC facility. Portions of the existing stormwater network, however, would remain in place and would be connected to the new stormwater treatment system to provide overflow discharge to the ocean outfall pipe for major storm or flood events.

The sizes and locations of the stormwater treatment areas identified in Figure 2-4 are preliminary and would be adjusted as the overall design for the site finalizes.

During operations NAFC would implement industrial stormwater BMPs such as good housekeeping, preventative maintenance, spill and leak prevention and response, material handling and waste management, erosion and sediment controls, employee training, quality assurance, sampling, and record keeping in accordance with the IGP guidelines. NAFC would also maintain and modify site wide operations BMPs, provide employee training, and complete annual reports for the facility in compliance with the IGP operations requirements.

**Odor and Noise**

The NAFC facility would not have detectable odor outside the facility. The potential sources of odor and management strategies are listed below:

– Filtrate would be stored in sealed containers before out shipment.
– Fish processing coproducts would be maintained as food grade products and stored in chilled containers for shipment.
– Ensilage (ground up fish) is held in storage tanks with a weak acidic solution to maintain a pH of 4 to stabilize the material and prevent odor. Ensilage tanks will be placed indoors.
– Fish feed would be a minor odor source. Feed is stored in indoor rodent proof silos and would not be a source of outdoor odor.

The NAFC facility would incorporate designs and best practices to store and maintain the value of byproduct resources. These practices also prevent odor.

The most notable sources of noise on site would be the ventilation units and backup generators when they are in use. The building ventilation intakes and discharge points would be located along the interior of the facility and the building rooftops, respectively, and are not expected to generate significant noise. The backup generators would be housed in an enclosed structure located in the facility interior with vibration-dampening measures in place, and therefore any noise generated would be limited to the close proximity of that structure.

**Air Emissions**

Nordic's facilities are fully electrified. The source of air emissions would be the facility generator backup systems, with anticipated limited operational use. Air emissions generated by use of electrical backup generators would be offset by NAFC efficiency and renewable energy investments, including the rooftop solar array. Authorization would be obtained from the NCUAQMD to install and operate dual fuel generators for backup power capable of running off diesel or natural gas. The authorization from the NCUAQMD would require operation of the generators to be consistent with applicable state and federal air quality policies and regulations.

## Fish Welfare and Biosecurity

**Farm Production Units**

***Hatchery Building***

The Hatchery building is operated by dedicated husbandry staff using essential equipment to manage all the life stages of salmon from egg to post-smoltification. It contains closed compartments for the hatchery unit, fry unit-1 (FF1), fry unit-2 (FF2), parr unit, smolt unit, and the fish logistics station.

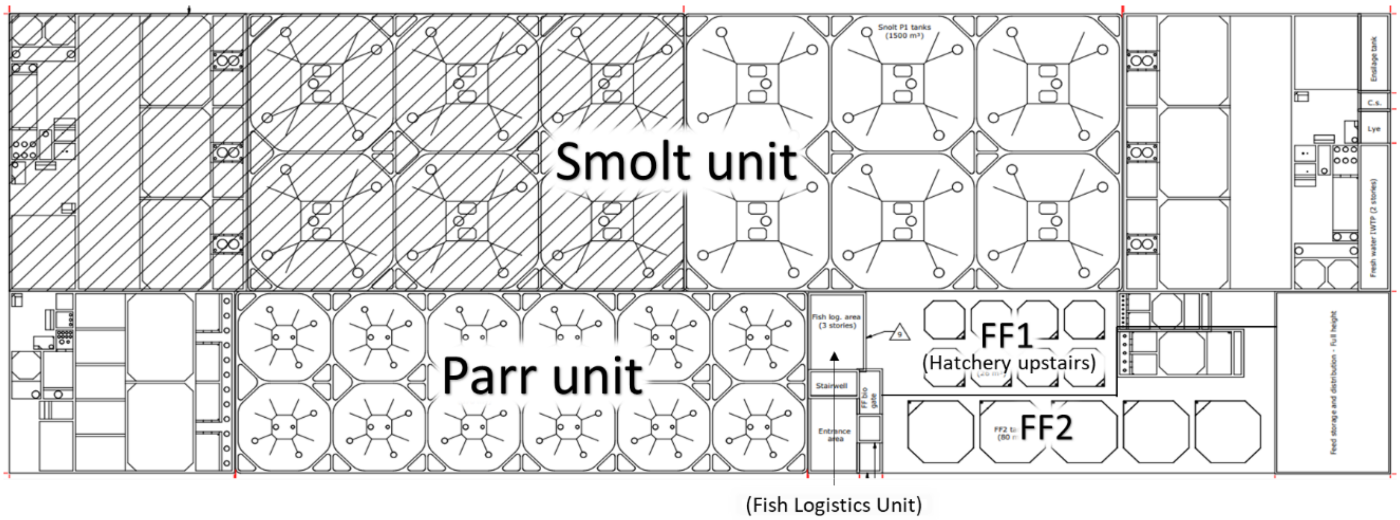



*Image 2-7 Layout of Tanks and RAS Systems in NAFC Hatchery Building*

### *Hatchery Phase*

The hatchery unit is located on the second floor above the fry culture area. Every eight weeks, a new cohort of eggs are brought into the incubation room, hatched, and housed until they are ready to initiate feeding. Eggs will be sourced from hatcheries that meet the requirements of CDFW (See Egg Importation section below). The incubation room consists of two independent, self-contained water treatment systems (RAS). Eggs commence hatching after approximately 20 days and yolk sac fry remain in the incubation room for an additional 40 days (approx.) before they are transferred to the fry culture unit.

### *Fry Culture Phase*

The fry culture unit consists of two independent, closed compartments each with a self-contained RAS system (FF1 and FF2). FF1 consists of eight rearing tanks and receives fry directly from the incubation room through transfer pipes (by gravity). In FF1, the fry establish first feeding and remain there until they reach approximately 0.5-1.0 grams (g) at which time they are transferred to the second compartment (FF2). FF2 consists of five rearing tanks where fish are raised until they reach approximately 5-10 g. The cohort is then transferred to the parr culture unit though the Central Fish Logistics Unit (Hatchery building).

### *Parr Culture Phase*

The parr unit consists of two, independent self-contained RAS systems each with 6 rearing tanks where fish are raised until they reach approximately 40-50 g. The fish are then transferred through the Central Fish Logistics Unit into the smolt culture unit.

### *Smolt Culture Phase*

The smolt unit consists of two independent, self-contained RAS systems each with 6 x 1,500 $m^3$ tanks where fish are raised until they reach approximately 500-600 g. The fish are then transferred to the Growout Buildings through underground piping.

### *Growout Buildings*

One growout building will be built in each of the two phases of the project. Growout buildings will be operated by dedicated staff and equipment. Both growout buildings will consist of 13 independent, self-contained RAS systems each with 2 x 3000 $m^3$ tanks. Fish will be housed in growout buildings for approximately one year until they reach harvest size.

## Egg Sources

### *Performance Criteria*

There currently exists no viable source of Atlantic salmon eggs in California that can supply domesticated, all-female ova in quantities required by NAFC. Because of this, NAFC will import eggs from qualified sources located outside the State based on the following criteria:

– Source hatcheries must be full cycle, closed facilities meaning broodstock and their reproductive materials (eggs, ovarian fluids, milt) are never exposed to the natural environment.
– Source hatcheries must have a comprehensive fish health screening and surveillance program maintained by a competent veterinarian authority and accredited diagnostic laboratory within their respective State/Country. Each source hatchery must show a minimum of two years health history to be free of significant pathogens of concern for Atlantic salmon. Number of samples, sampling regime, and diagnostic methods must be consistent with procedures required by AFS Blue Book and World Organization for Animal Health (OIE) guidelines for testing.
– Egg supply must be available year-round and in quantities required by NAFC.
– Eggs must be mono-sexed, all-females.
– Eggs must be derived from a multi-generational, selective breeding program focused on performance in RAS.

### *Egg Importation*

Every breeding facility to supply eggs to NAFC needs to undergo detailed risk assessment and gain approval from CDFW and the California Aquaculture Disease Committee. Standards that control the importation of salmon eggs are established by US Fish and Wildlife Agency under regulation 50 CFR section 16.13, and California Division of Fish and Wildlife under regulation CR Title 14 Section 245. Prior to transfer of eggs to NAF's hatchery, all contributing broodstock are certified free of diseases or pathogens of concern by an approved fish health inspector and in accordance with the most recent edition of "Procedures for Detection and Identification of Certain Fish Pathogens" published by the Fish Health Section of the American Fisheries Society, or the OIE Manual of Diagnostic Tests for Aquatic Animals. Only after review, approval, and specific guidance by CDFW, and with fulfillment of USFW Title 50 requirements, will a transfer permit be given to NAFC to import eggs to California.

Imported eggs will be disinfected twice at the source hatchery. First at the time of water hardening, and again within 24 hours of shipping. Disinfection is accomplished by immersion for 15 minutes in a 75ppm solution of PVP Iodine. Following disinfection, the eggs are rinsed and maintained in water free of fish pathogens including any ice that may be used for shipping. A third disinfection will be done at the NAFC facility upon entering the Egg Receiving Room of the quarantine unit (Image 2-8). Eggs are finally transferred to the second-floor hatchery by an unmanned cargo lift. All inner and outer packaging will be sanitized during unpacking and disposed of properly.

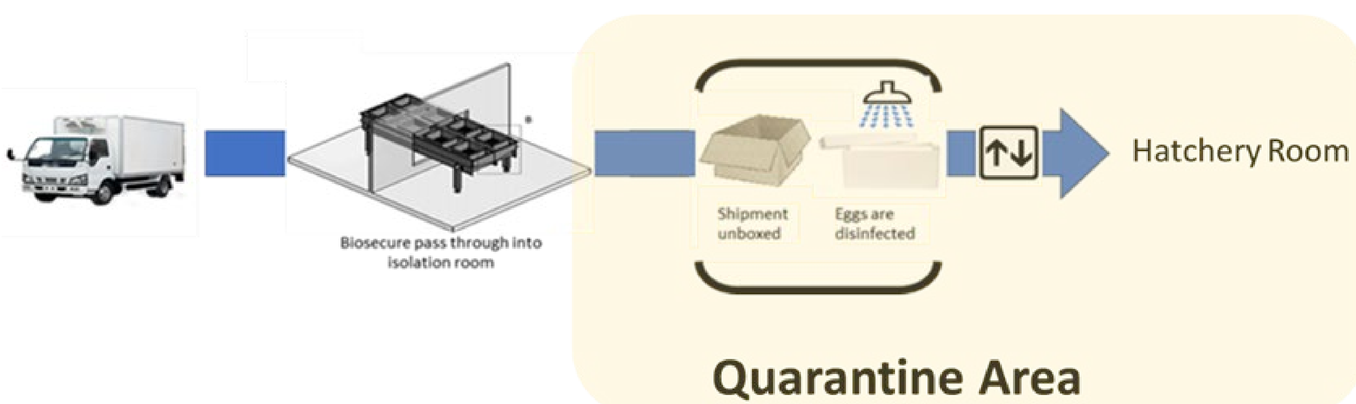



*Image 2-8 Schematic Representing the Egg Shipment Receiving Process at NAFC*

***Quarantine***

Upon arrival to NAFC, imported eggs are transferred directly to an approved quarantine area within the Hatchery Building. The quarantine area consists of three autonomous biosecurity zones: (1) Egg receiving room, (2) Hatchery room, and (3) Fry culture unit 1. Eggs remain in quarantine until the cohort of fry can be sampled for a fish health inspection by a licensed veterinarian and a State approved diagnostics laboratory. Any cohort of fry must be declared free from evidence of all diseases of regulatory concern and approved by CDFW before being transferred out of the quarantine area into the next compartment of the farm.

The quality of eggs is checked daily along with fry behavior and appearance. Any abnormal deviations will be investigated promptly. Daily mortalities are recorded. If the defined mortality threshold is reached, an investigation follows, and any occurrence of disease is contained within the quarantine and a response protocol is established and implemented with the appropriate regulatory agencies. The defined mortality threshold is established by CDFW; any cohort of fry must be declared free from evidence of all diseases of regulatory concern before being transferred out of the quarantine area into the next compartment of the farm.

***Farm Biosecurity***

All production buildings at NAFC are completely enclosed and highly compartmentalized. This design allows for control over movements of people and fish around the farm and a high standard in biosecurity, like what is done in biotechnology manufacturing. The biosecurity plan for the farm buildings is in place to prevent the introduction or spread of disease agents into, within, or out of the facility. It is continuously updated and improved through collaboration with experienced fish health professionals. Third party audits for biosecurity will occur twice per year. All production personnel undergo farm biosecurity orientation at the start of their employment at NAFC. Likewise, personnel will be subject to training refreshers on a routine basis including when any new information is implemented.

The fish rearing facilities will be secured with three physical barriers to prevent entry by unauthorized persons: 1) staffed entrance guard shack, 2) fence enclosure around the campus, and 3) keyed entry doors. Entrance to production buildings will be restricted to designated personnel. Staff will adhere to bio-security procedures for the site. Personnel will limit movements between compartments as reasonably as possible. When such movement is necessary, those personnel will adhere to all bio-security procedures. All visitors to the NAFC farming facility must be authorized in advance by the Head of Production, and any visitor will be required to sign a logbook and confirm they have not visited other aquaculture farms or aquariums within the previous 48 hours. Visitors are not permitted to carry personal items (i.e. briefcases, purses, backpacks) onto the site without permission from farm personnel.

Production buildings, and the compartments within, are only accessible through biosecurity gates. Staff and visitor entrance into the production buildings requires a change of footwear, gowning with facility specific PPE, and washing of hands. At each biosecurity gate, the staff/visitor will use touch free hand sanitizers and footbaths containing disinfectant solution upon entering the compartment. All personnel will adhere to the facility hygiene and disinfection procedures.

**<u>Fish Welfare</u>**

All decisions for NAFC operations are made with the health and welfare of the fish in mind. NAFC will afford its fish the highest standard of care and provide them the appropriate environmental conditions needed to thrive, grow, and stay healthy. NAFC's responsibility goes beyond providing for these essential needs. NAFC treats its fish with the respect they deserve as sentient animals, and it is the responsibility of every employee to be mindful of fish welfare and report any acts of livestock mistreatment to management.

Welfare indicators are used to assess the overall welfare status of the fish. Many of the welfare indicators used by NAFC are based on deviations in behavior and appearance of the fish. New employees receive training in fish welfare and are taught how to observe the swimming behavior, social interaction, and feeding behavior that salmon exhibit daily. Observational skills are critical for the early detection of small deviations from 'normal state', and any changes in behavior and physical condition of fish will be reported to site management. Early detection is key to good health management.

***Farm Health Management and Veterinary Care***

Fish health is directed by the NAFC Health Management Team that consists of the farm veterinarian, representatives from smolt production, growout production, the farm health laboratory manager, and external subject matter experts (i.e., aquatic pathologists, diagnostic laboratory). Fish health team meetings are coordinated by the fish health team leader monthly, and external partners are brought into these meetings as needed. Fish health topics are also discussed during weekly production staff meetings.

After quarantine release, fish health is monitored using targeted investigations of moribund fish, fish mortalities, as well as periodic sampling of ‘healthy’ fish to detect subclinical symptoms of infectious and noninfectious disease. The goal of the farm health program is to enable early detection of disease, build health history for each cohort, monitor pathogen landscape within each production system, and provide the foundation for biosecurity decisions. Fish that are selected for health investigation are transferred to the onsite fish health laboratory. The laboratory health team first performs a gross examination of external characteristics, and then proceeds with necropsy, wet-mount microscopy, and bacteriology. Tissue samples are collected and prepared for external diagnostics as needed. Any recognized external deviations and abnormal behaviors will be recorded on the laboratory submission form and integrated into the fish health final report.

NAFC will favor the use of preventative health tools over prescription medicines, and vaccination is one such way to protect fish against severe disease outbreak from endemic pathogens. At NAFC fish will be vaccinated for key pathogens of concern. Vaccines are biologic substances that provide fish with immunity against specific diseases. Vaccination can also protect the farm against pathogen amplification by reducing the shed of pathogens and raising the threshold of pathogen load required for infection.

NAFC takes a responsible approach to the care of its fish using professional veterinary health management. In rare cases when medicines are required through proper diagnosis of an infection and proof of efficacy against the causative agent, they are added to the feed per veterinarian prescription according to FDA Veterinarian Feed Directive Guidance #213. Only drugs approved for use in aquaculture may be used in accordance with dose standards (see FDA CVM “Green Book” for approved drug products). Medicated feed is manufactured at approved, licensed mills in accordance with FDA 12 CFR Part 512-515. All medicated feed that is not eaten by the fish is recaptured and properly disposed. No medicated feed passes on to the natural environment. FDA approved withdrawal periods between the time of treatment and harvest ensure that the medicine is no longer present in the fish when they are consumed. The requirement of a veterinary prescription ensures that the usage is documented, justified and based on a proper diagnosis thus helping to reduce the unnecessary use of antibiotics.

A comprehensive list of all potential chemicals used for cleaning and disinfecting the Facility, and aquaculture drugs, including vaccines and antibiotics, uses, and annual allowed dosages, that may be used at the Facility are fully disclosed in Section 3.9 – Hydrology and Water Quality.

***Feed Standards***

The feed given to the fish is subject to strict regulation to ensure that it is not dangerous to the animal and that it does not cause unacceptable damage to the environment. Standards for ingredients used in fish feeds for consumption aquaculture are governed by the FDA under the Federal Food, Drug, and Cosmetic Act. The standards are published in the Code of Federal Regulations (21 CFR Part 500-589) and administered by the FDA’s Center for Veterinary Medicine. This includes feeds that are made in the US or imported. In Canada, animal feed and ingredient standards are described in the Feeds Act and the Feeds Regulations (Sections IV and V) and administered through the Canada Feed Inspection Agency. Both in the US and Canada, all the ingredients used in the manufacturing of fish feeds are approved by *The Official Publication* of the Association of American Feed Control Officials (AAFCO), which is accepted by both the FDA and CFIA. NAF sources feed from manufacturers who hold quality assurance certifications such as ISO 9001, GMP (Good Manufacturing Practices), BAP (Best Aquaculture Practices) and HACCP to ensure they meet all current legal requirements of the FDA. In addition to these feed regulations, NAFC will have its own value chain quality program that routinely checks feed and finished product for nutritional specifications, and undesirable substances (PCBs, heavy metals, and pesticides).

While NAFC has not made a final decision on a feed supplier for the Samoa facility, it has established criteria which will guide the selection of the feed profile. Due to the size of the production volume, NAFC is in a position to customize its own feed formula with the feed supplier.

This guidance criteria include:

1. NAFC will use only natural carotenoid pigments that includes astaxanthin. Pigment is a vital micro-nutrient for the health of salmon and gives the orange-pink color to the fish's flesh. This pure ingredient is made through a natural fermentation process of microorganisms and has no additives, is non-GMO, and contains no preservatives.
2. NAFC will aim to avoid the use of GMO ingredients in its feed.
3. NAFC will aim to integrate the use of ingredients that are viable alternatives to harvest fisheries to the extent that it is practical such as:
    a. Vegetable proteins and oils.
    b. Insect meal
    c. Single cell proteins and oils (e.g., bacteria, yeast or microalgae-based products).
4. NAFC will utilize byproduct trimmings from consumption fisheries. Today this can be as much as 20% of the fish meal utilized in the feed formulation.
5. NAFC will be committed to supplying a product that delivers essential omega-3 health benefits. The origin of two essential long-chain omega-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) has traditionally relied on fish oil inclusion to feed. However, this is no longer an obstacle thanks to access to new alternative oils that can be used to tailor the total omega-3s and the ratios of EPA and DHA without reliance on fish oil (Algae-oils is an example of this).
6. NAFC will require that its suppliers have a monitoring program for environmental contaminants in the feed they produce and follow-up with in-house quality assurance program for feed quality.
7. NAFC will require that our feed supplier have a program of traceability for determining the origin of ingredients used in the feed. This is especially true with responsible sourcing of fish meal, fish oil, and soy ingredients.

In the aquaculture industry, various certification bodies foster and promote responsible practices throughout the value chain, from ingredient sources to farm operations. To maintain certification, members must demonstrate adherence to environmental, food safety, and social standards. Different certification bodies focus on different segments of the value chain, and some have standards which apply to multiple segments. Regarding marine ingredients, certification bodies and initiatives like the Marine Stewardship Council (MSC), International Fishmeal and Fish Oil Responsible Supply (IFFO RS), and Fisheries Improvement Projects (FIP) set standards for responsible harvesting, processing, and sourcing of marine derived raw materials. These certification systems allow feed suppliers to identify and source materials like fish meal and fish oil from responsible suppliers and maintain partnerships with companies that meet the requirements of their sustainability profile. NAFC will require its feed suppliers to participate in and be compliant with more than one of these programs.

For aquaculture farms, there are several sustainability indexes that are used to measure resource utilization or environmental impact. The Fish-In-Fish-Out ratio (FIFO) has been widely adopted to measure the ecological efficiency of feed. At the farm level, FIFO compares the tonnage of fish consumed via feed with the tonnage of fish produced. NAFC will initially set target limits for FIFO that are among the best in the industry and in line with standards for third party certification standards such as ASC, BAP, or Global GAP. These certification standards are regularly adjusted to match advances in feed and ingredient technologies.

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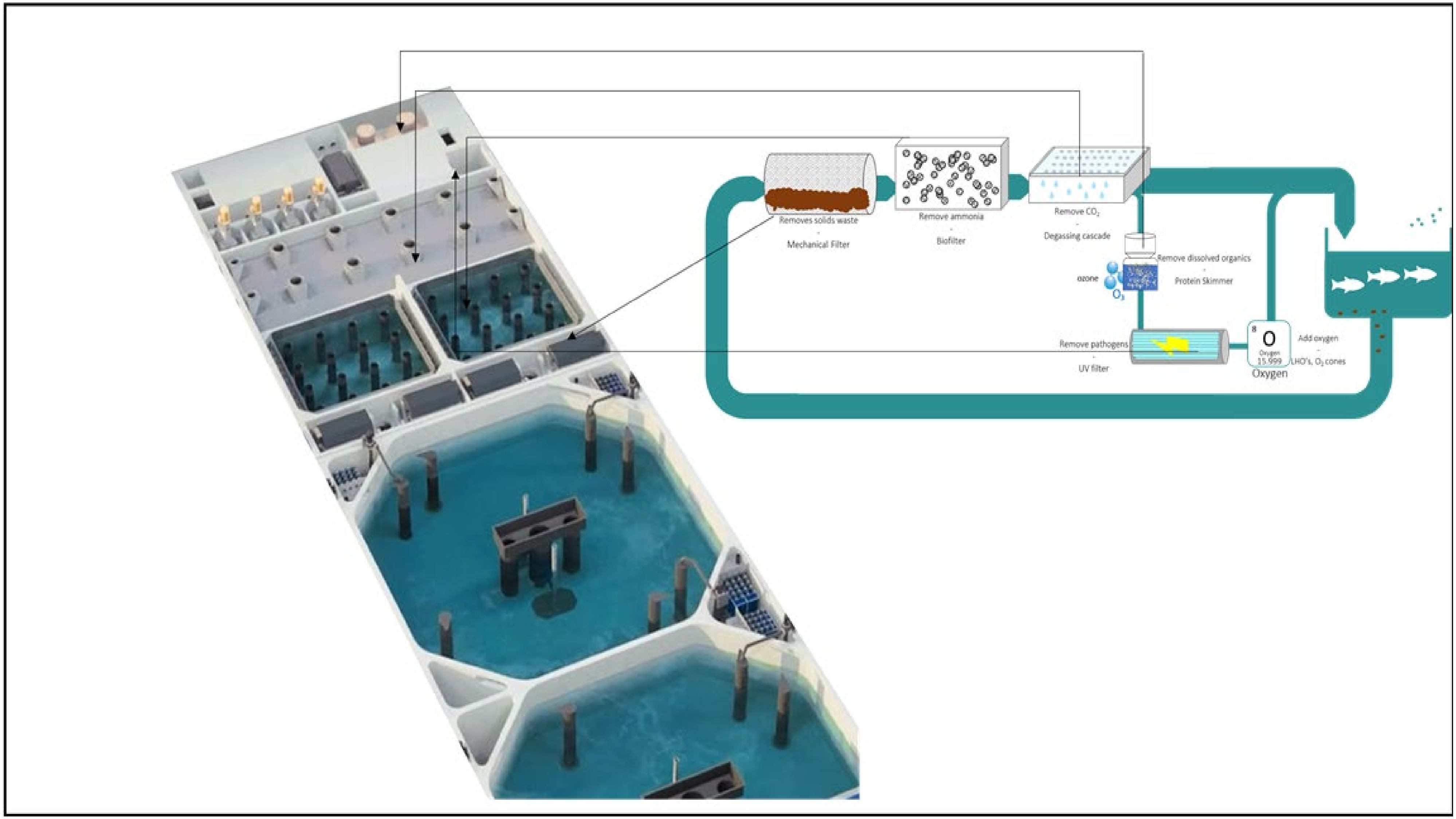
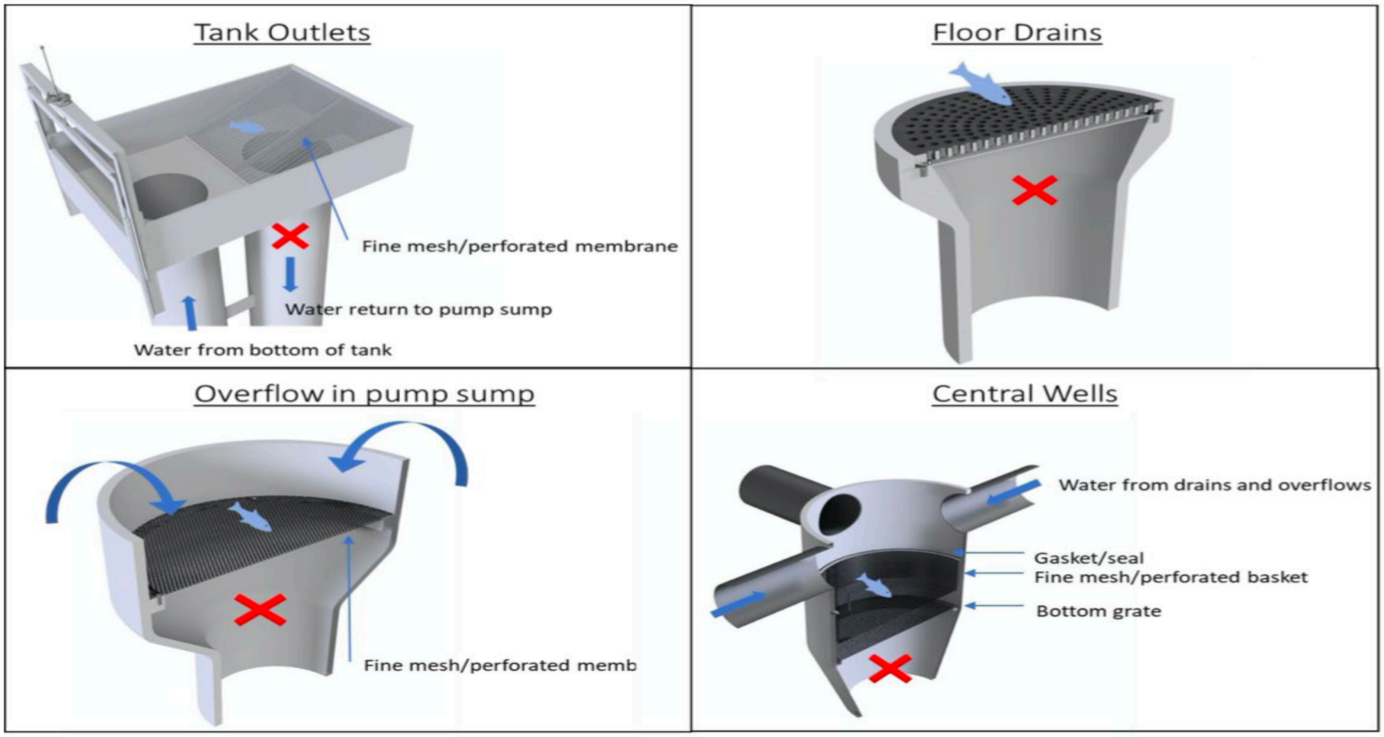



***Image 2-9 Conceptual Design of RAS Unit***




| Production area | Fish-size (gram) | Holesize max (mm) |
|---|---|---|
| Hatchery | 0,15-0,2 | 0,9 |
| Fry /first feed | 0,2-5 | 2 |
| Parr | 5-35/40 | 8 |
| Smolt | 35/40 - 150/300 | 18 |
| Pre-growout | 150/300-2000 | 27 |
| Growout | 2000- | 27 |

***Image 2-10 Screen Overflow and Drain Designs with Hole Sizing (embedded table)***

### *Escape Prevention, Containment Management, and Contingency Plan*

In Closed Containment Systems (CCS) such as NAFC's recirculating aquaculture system, the risks of fish escape are minimized inherently by design. NAFC has gone beyond most standards that require risk-based engineering, design, dimensioning, and construction to virtually arrive at an escape-proof facility and farm site. All fish on the farm are raised in RAS units. Water exits the tank and travels through a series of processing steps that include screened barriers that are too fine for fish to pass (e.g., drum filter, biofilter, degassing chamber) before returning to the tank (Image 2-9). There are no bypasses or alternative routes around this equipment. It is expected that nearly 99% of the water is recirculated back to the tank with a very small amount of water exiting the RAS unit through a screened overflow pipe – limiting further any escapement from the facility via effluent water. From the overflow pipe, effluent water directly flows to a central well which is also appropriately screened before finally exiting the building *enroute* to the waste-water treatment plant (WWTP) through underground piping

As part of the CEQA and permitting process, California-registered Geotechnical Engineers conducted studies to assess the impacts of foreseeable seismic events (e.g., earthquake, tsunami). These studies included a Preliminary Geotechnical Investigation Report and a Probabilistic Site-Specific Tsunami Hazard Analysis (SHN 2021; Martin & Chock 2020). Results from these studies have become the criteria requirement for super structure design of NAFC's buildings to survive seismic and tsunami activity and further protect against fish escapement through such an event.

The entire facility will be designed to meet all applicable tsunami design standards including the effects of sea level rise and potential land subsidence in a seismic event. In excess of the standard design requirements, the Tsunami Vertical Evacuation Refuge Structure (TVERS) area and fish containment infrastructure will utilize the Maximum Considered Tsunami (MCT) with a 2% probability of being exceeded in a 50-year period, the equivalent to a return period of approximately 2,500 years (Martin & Chock 2020) to ensure the safety of staff and ensure fish containment. Additionally, pipes that carry water and fish are placed underground and connect to above ground structures using flexible connections to absorb any seismic undulations. All filtration and plumbing components and barriers will be constructed with saltwater grade stainless steel or other corrosion resistant materials. All of these are subject to regular inspections and replacement programs.

All piping for water effluent and fish movements between buildings is located underground throughout the site (see Figure 2-12 – Concept Piping Layout). The Image below illustrates the network of piping where fish are moved from Hatchery to the Growout Buildings (purple lines), and from Growout buildings to the processing building (green lines). All fish logistic pipes terminate at their destination, and there are no connections leading offsite to the ocean or bay. All effluent water piping (solid black lines) leaves each building from the central (screened) well and terminates at the WWTP located on the farm site.

At the WWTP, effluent water goes through a series of treatment processes prior to discharging offsite through the ocean outfall pipe (black dotted line in above Image). Figure -12 and Image 2-11a below describes the treatment steps that include sludge separation, phosphorus removal, denitrification, fine particle ultrafiltration (0.04 micron) and UV disinfection. Each step represents a screened barrier, but also creates treatment chambers with environmental conditions that make it highly unlikely for fish to survive. The MBR filtration unit consists of modules of membrane fiber cassettes each containing thousands of hollow fiber membranes of 0.04 micron pore diameter that form a physical barrier to solids, bacteria and viruses (Image 2-11a and 2-11b). Effluent water must flow through these microscopic pores in the hollow fiber membranes to pass out of the MBR unit. There are no bypasses around this component of the WWTP creating a zero probability of fish (adult, fry, eggs) from passing this escapement barrier under typical operating conditions. Even in the event that one or more fibers ruptured or failed, the minute diameter of the fibers themselves would prevent passage of fish beyond the MBR outlet, thus acting as another physical barrier to escape (Suez 2021).

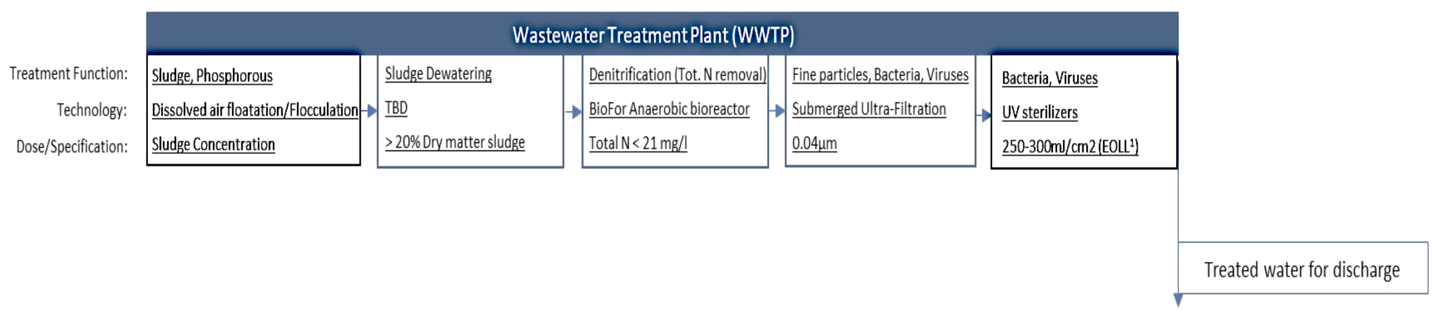



***Image 2-11  Filtration and Treatment Steps at the WWTP***

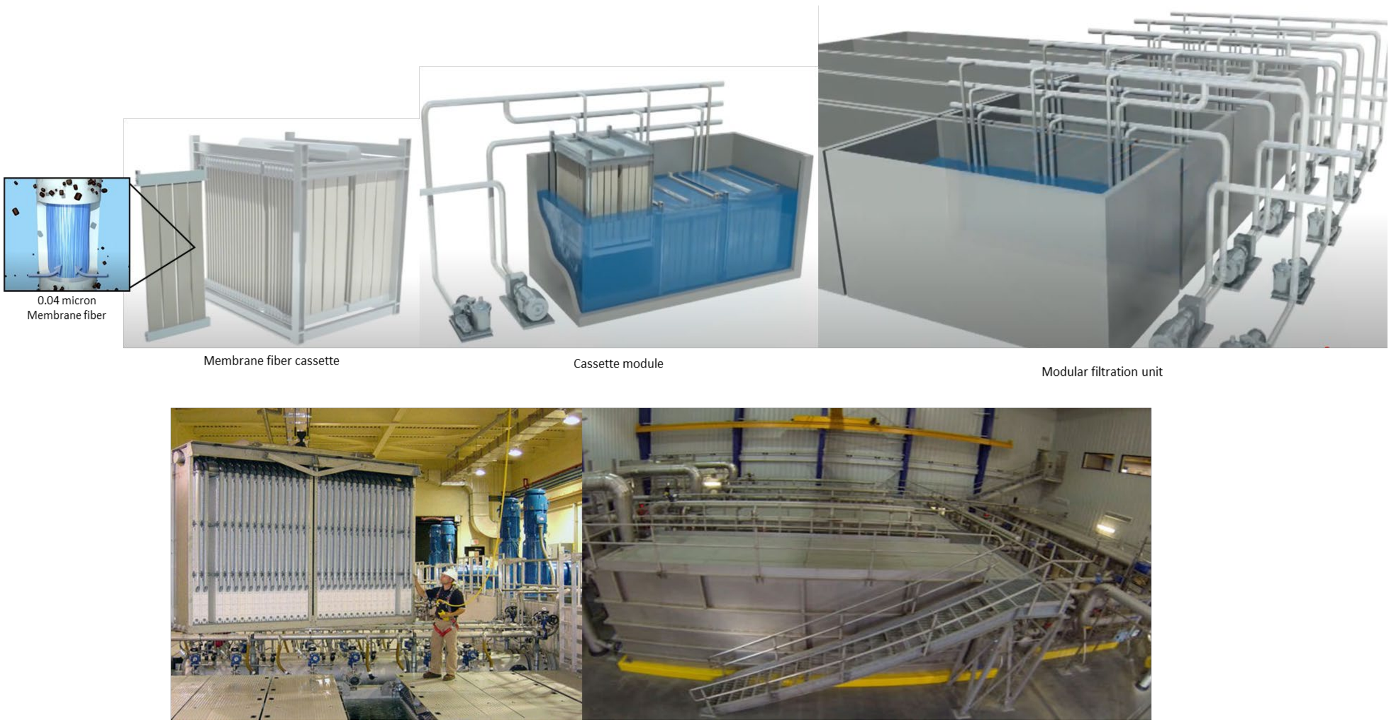



*Image 2-11a MBR Filtration Module at the WWTP*

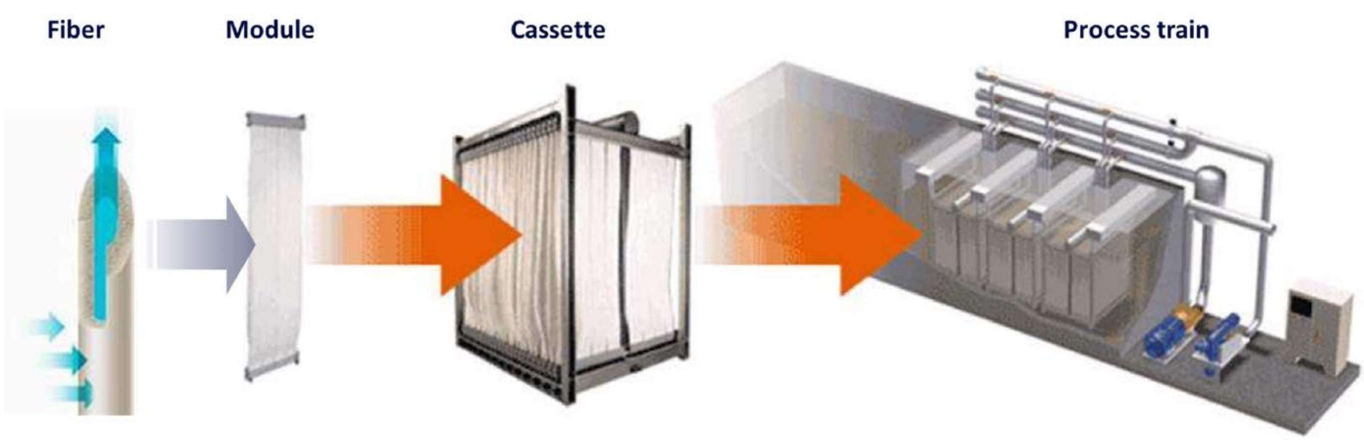



*Image 2-11b MBR Filtration Schematic*

The screened barriers summarized in the Image 2-12 below, along with drum filters, biofilter, and MBR screens act in succession on water exiting the farm to provide redundancy in the event of barrier defect. Closed buildings with secure entry, fenced farm border, and single guard gate for entry and exit from the farm along with personnel training, and contractual policy mitigates for an assisted route of escapement. Built in redundancy of critical processes and backup generators mitigate the risk of escape due to any equipment failure or malfunction. Inspection for defects in screened barriers and equipment will be part of NAF's regular facility maintenance program.

1. All rearing tanks fitted with screens to prevent passage of eggs, fry, parr, smolt, and adult fish in respective units.
2. Each unit within buildings are fitted with floor drains containing screens to prevent passage of eggs, fry, parr, smolt, and adult fish in respective units.
3. Water exiting each RAS system is screened to 60µm and sent to central well.
4. All water exits each building through a central well with screen sized to prevent passage of eggs, fry, parr, smolt, and adult fish from respective units and sent to WWTP.
5. Water is finally screened to 0.04 micron using submerged membrane ultrafiltration.

***Image 2-13 Screened Points for Water Exiting the Farm***

The risk of fish escaping from Nordic Aquafarms can be examined through a ‘pathway to release’ model shown below in Image 2-13. The purpose of the model is to identify the various pathways that can be taken for release into the natural environment, and then illustrate the sequential barriers that are put in place to disrupt movement across the pathway.

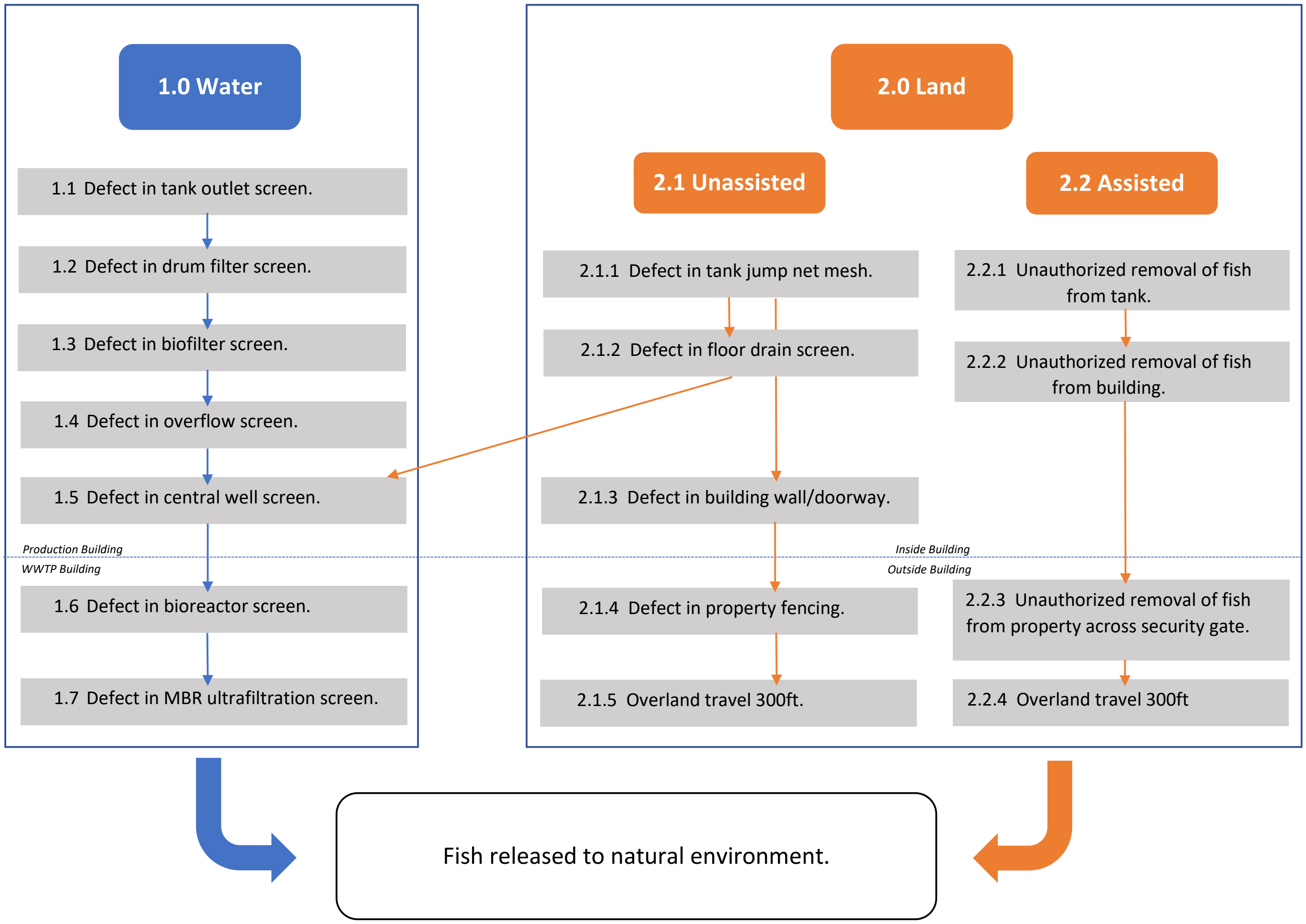



***Image 2-13 Fish Release Pathway to the Natural Environment***

Image 2-13 illustrates four pathways for escapement: (1) through water, (2) land and water, (3) over land, and (4) assisted removal over land. Each route has seven, five, four, and four barriers, respectively. Using the pathway model, the risk of escapement could be characterized as:

(1) $E_{W} = W_{1.1} * W_{1.2} * W_{1.3} * W_{1.4} * W_{1.5} * W_{1.6} * W_{1.7}$
(2) $E_{LW} = L_{2.1.1} * L_{2.1.2} * W_{1.5} * W_{1.6} * W_{1.7}$
(3) $E_{L} = L_{2.1.1} * L_{2.1.3} * L_{2.1.4} * L_{2.1.5}$
(4) $E_{LA} = L_{2.2.1} * L_{2.2.2} * L_{2.2.3} * L_{2.2.4}$

Where:

$E_{X}$ = Escapement Risk (0 = no risk to 1 = all risk)
$W_{X}$ = Probability of passing water route barrier (0 to 1)
$L_{X}$ = Probability of passing land route barrier (0 to 1).

While probabilities are not readily available for most of the above parameters, by plugging in estimated scenarios, the multiplicative factor would likely interact to produce an extremely small measure of concern. This formula, given the sequential nature of most of the mitigation factors, illustrates that the risk is reduced by many orders of magnitude across the escapement pathway. A zero probability at any barrier would negate the entire escape pathway (i.e., MBR filtration unit).

Inspection of escapement barriers will be performed daily. In succession, floors, drains, sumps, wells, and ultimately the WWTP will be inspected for fish to determine if any undetected breaks in physical barriers have occurred. If fish are detected in any of the downstream inspection points, then immediate attention will be given to determining the number of fish present at the inspection point and identifying the barrier defect. Downstream barriers will be inspected to ensure no further passage of fish has occurred.

If it is verified that escapement of fish has occurred through a land or water route, then management will respond according to the Escape Response and Reporting Plan. Actions contained in this plan are as follows:

1. Determine and correct for the cause of escapement. For suspected overland escapement, staff would be interviewed (including security guards), visitor logs and surveillance videos would be checked, and perimeter fences would be inspected. For suspected water route escapement, all physical barriers on the farm would be inspected.
2. Determine the number of escaped fish and potential location of release. Initiate protocol for contacting authorities within 24 hours.
3. In consultation with CDFW, determine if recapture is feasible. If recapture is authorized by CDFW, then recapture method will be situationally determined according to release point and readily available local resources.
4. Recapture effort will continue until it is determined that further recovery efforts are no longer practical due to dispersal of the fish or if a significant reduction in recapture rate is realized.
5. A fish escapement and recovery response report will be submitted to CDFW within 5 working days of the termination of fish recovery efforts. This will include the fish health history of the suspected cohort.

# 2.3 Ocean Discharge

Total water volume discharged at full operational capacity is estimated at a maximum of 12.5 Million gallons per day via the existing RMT II ocean outfall pipe, which extends 1.55 miles offshore to a diffuser array. The diffuser has 144 ports, each of 2.4-inch diameter. Ports are paired on either side of the pipe at a spacing of 12 ft (3.67 m) between ports. The ports discharge at a 45-degree vertical angle relative to the seabed. Currently, the RMT II diffuser is used by DG Fairhaven Power Company for intermittent batch discharges (200-400 gallons per minute (GPM)) and for treated wastewater effluent disposal from Samoa, with eight diffuser pairs maintained open (16 open ports) to allow discharge from the permitted facilities.

NAFC would open 48 additional ports on the existing ocean outfall pipe to maximize diffusion. Additional ports will be opened in conjunction with changes in discharge volume to maintain optimum port discharge velocity. The first of the 48 additional ports would be opened when the hatchery is brought online, additional ports opened for the Phase 1 growout building, and the remainder when Phase 2 is completed. The Harbor District would remain responsible for ongoing maintenance and monitoring of the ocean outfall infrastructure. Aside from opening the additional ports, no other alteration to the ocean outfall pipe is proposed.

## 2.3.1 Summary of NPDES Requirements

The discharge would be regulated under a National Pollution Discharge Elimination System (NPDES) order No. R1-2021-0026 administered by the NCRWCB, which would require ongoing operational monitoring and reporting to ensure compliance. Under the draft NPDES order, continuous sampling of effluent flow and temperature would occur prior to the treated effluent entering the ocean outfall pipe. Parameters to be sampled at the point of entry into the ocean outfall pipe at least weekly would include: biochemical oxygen demand (BOD), oil and grease, pH, total suspended solids (TSS), settleable solids, and turbidity. Parameters to be sampled monthly at the point of entry into the ocean outfall pipe include: total ammonia nitrogen, unionized ammonia as N, total organic nitrogen as N, and total nitrate nitrogen as N. Chronic toxicity will also be monitored, though the specific parameters and frequency are yet to be finalized by the NCRWCB. Ocean Plan Table 1 Pollutants would be sampled one year after commencing discharge. A biological survey would be required once per five-year permit term, with prior review and approval of the biological survey work plan by the NCRWQCB. The final NPDES order with final monitoring requirements would be issued following completion of the CEQA process.

The discharge water would be comprised of a maximum 10 MGD saltwater sourced from Humboldt Bay, and 2.5 MGD freshwater sourced from HBMWD Mad River. Freshwater would be ~2MGD of industrial water and ~0.5 MGD domestic water supplied by the HBMWD. Table 2-8 summarizes special studies prepared related to the ocean discharge. Table 2-9 provides a summary of the constituents and maximum daily loading rates for the outfall discharge effluent. Additional discussion and detail regarding required monitoring and effluent limitations under the NPDES order are discussed in Section 3.9-3 – Hydrology and Water Quality.

Ocean Plan Table 3 Pollutants would be sampled one year after commencing discharge. A biological survey would be required once per five-year permit term, with prior review and approval of the biological survey work plan by the NCRWQCB. The biological survey would occur in the Pacific Ocean and would include an evaluation of objectionable aquatic growths, floating particulates or grease and oil, aesthetically undesirable discoloration of the ocean surface, color of fish or shellfish, and any evidence of degradation of indigenous biota attributable to the rate of deposition of inert solids, settleable material, nutrient materials, increased concentrations of organic materials, or increased concentrations of Ocean Plan Table 1 substances. Under the NPDES order, the Project would operate the ultraviolet (UV) disinfection system to ensure the UV design dose is met and pathogens (e.g., fish diseases) are not discharged to receiving waters. Ultraviolet (UV) transmittance of the effluent from the UV disinfection system would be monitored continuously.

According to the draft NPDES order, the chronic toxicity in-stream waste concentration (IWC) for the Project is 0.87 percent effluent, and the Project shall conduct annual chronic toxicity tests on effluent samples at the discharge IWC in accordance with species and test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA/600/R-95/136, 1995 as cited in the draft NPDES order). Under the required methods, chronic toxicity testing would include sampling from smelt, purple sea urchin, and giant kelp.

***Table 2-8 Ocean Discharge Project Site Special Studies Summary***

| Name of Study | Topic of Study | Study Author |
|---|---|---|
| Marine Resources Biological Evaluation | Marine Biological Resources | GHD and H.T. Harvey and Associates |
| Numeric Modeling Report (Dilution Study) | Water Quality and Dilution Analysis | GHD |

***Table 2-9 Project Daily Maximum Effluent Summary***

| Effluent | Discharge | Conversion to lbs/day |
|---|---|---|
| Total Water volume | 12.5 MGD | - |
| Total Suspended Solids (TSS) | 185 KGD | 408 |
| Biochemical Oxygen Demand (BOD) | 162 KGD | 357 |
| Total Nitrogen (TN) | 673 KGD | 1,484 |
| Ammonium Nitrogen (NH4) | 0.07 KGD | 0.15 |
| Phosphorus (P) | 5.8 KGD | 13 |

Notes:
MGD = Millions of Gallons per Day
KGD = Kilograms per day
Lbs/day = Pounds per day

### 2.3.2 Additional Monitoring to be Completed by the Applicant

In addition to water quality and biological monitoring required under the NPDES order, NAFC would complete monitoring of coastal oceanography and water quality of receiving waters in the Pacific Ocean.

This additional monitoring program would be carried out over three to five years to understand interannual variability (e.g., cool vs warm years). The monitoring program would be conducted during the summer/fall period of upwelling "relaxation," when conditions are least energetic, and dilution of the discharge would thus be lowest and would include baseline, pre-discharge monitoring. Two annual surveys would occur during the summer/fall period, ideally in August or September, separated by at least two weeks. Baseline monitoring would commence one to two years prior to the discharge from the facility. Post-discharge receiving water monitoring would commence following completion of Phase 2 operations (full facility discharge) following the same methodology as the baseline monitoring. The post-discharge monitoring would continue for two to three years to provide "before-after-control-impact" or "before-after-gradient" design for the biological monitoring program.

Coastal oceanographic data would be gathered with an acoustic doppler current profiler (ACDP) to measure current velocities (deployment and retrieval during the first and second surveys of each year, respectively), and the use of a conductivity, temperature, and depth (CTD) profiler to characterize spatial patterns of temperature and salinity of the ambient waters and any effects in proximity to the discharge. CTD profiles would be collected at approximately 100 to 300 feet (near diffuser) to approximately 500 to 1,000 feet (distant from diffuser), and reference profiles would be collected greater than one mile from the diffuser. The deployment of the ADCP would be within 0.5 mile of the diffuser at a similar depth.

Water quality monitoring of nutrients ($NH_x$, $NO_x$, TN), suspended solids and turbidity, and chlorophyll would be conducted during each survey to confirm the predicted area of effect. Near surface (~1-3 ft below surface and near-seabed (approximately 5 feet above bottom) grab samples would be collected at half of the profiling stations (proportionally by near the diffuser, far from the diffuser, and reference profiles) and analyzed by an appropriately accredited laboratory.

In addition to the biological sampling required under the NPDES permit, supplemental biological sampling would be conducted to determine if effluent discharge is having a significant effect on biota in the Ocean Discharge Study Area, defined as the proximal marine waters as modelled in Appendix E. Supplemental biological sampling would occur concurrently with water quality monitoring. The study approach would utilize visual methods, either a remotely operated vehicle (ROV) and/or a drop camera with laser lights for scale. Transects and point surveys would be conducted at a height of two to five feet above the bottom. Surveys would be conducted outside of the zone of influence estimated in Appendix E for this time period (e.g., reference sites), and within the zone of influence, and along the discharge pipe, at approximately the 82 feet (25 meter) isobath.

Annual reporting would be completed following each post-discharge monitoring event by a qualified consultant and shared with Project stakeholders, outside the NPDES order reporting requirements.

## 2.4 Humboldt Bay Water Intakes

### 2.4.1 Description

The Harbor District proposes to modernize the operation of two Humboldt Bay water intake structures formerly operated to supply saltwater for various upland uses. The Project would include retrofit of the sea chests, upgrading water pipe runs on docks, reinforcing dock pipe mounting, modernizing electrical power systems, improving the sea chest intake infrastructure, and installation of piping (both for water intakes and fire suppression) along the shoreline as part of the multi-year plan to improve access to key water resources for current and future tenants of the Harbor District aquaculture business park.

These modifications would increase water withdraw capacity and add features that reduce environmental impacts of aquatic species entrainment and impingement with installation of new 1.0 mm wedge wire intake screens. Updates to create upland connections would support growth of the Harbor District aquaculture business park as well as other allowable uses by potential future Harbor District tenants, including NAFC. Additionally, installation of a new, extended fire suppression water line would aid fire control. An existing freshwater fire suppression line is currently provided to the site from the HBMWD.

Water intakes would supply saltwater through piping affixed to the existing docks located one-half mile apart, Redwood RMT II and Red Tank Dock (Figure 2-5). The piping infrastructure would extend onshore underground from Red Tank to RMTII and southeast to the NAFC lease area. The aquaculture facility would tie into the sea chest piping south of the RMT II building. Supporting studies used to design the water intakes are summarized in Table 2-10.

***Table 2-10 Water Intake Project Site Special Studies Summary***

| Name of Study | Topic of Study | Study Author |
| --- | --- | --- |
| Conceptual Designs for Intake Screens on the RMT II and Red Tank Docks | Water Intake Design | SHN (8/6/2021) |
| Empirical Transport Modeling of Potential Effects of Icthyoplankton Due to Entrainment at the Proposed Samoa Peninsula Water Intakes and Addendums | Potential Water Intake Entrainment | Tenera Environmental (5/13/2021) (7/14/2021) (12/13/2021) |

## 2.4.2 Existing Conditions

The Project includes two dock facilities, owned by HBDA, located on two separate parcels (APN 401-112-011 and APN 401-031-040) from the landward RMT II facility (APN 401-112-021). The RMT II dock is approximately 16-foot wide wooden dock situated immediately east of the RMT II facility and extends approximately 600 feet into Humboldt Bay. The RMT II dock is currently utilized for commercial aquaculture and operated by an RMT II tenant (Taylor Seafoods). The dock includes a sea chest water intake (sea chest), consisting of a screened marine intake and pumping infrastructure, which provides bay water to the RMT II facility via dock-mounted piping. The Red Tank dock is a 12-foot wide wooden dock located approximately 2,900 feet to the north of the RMT II Dock and extends approximately 150 feet into Humboldt Bay. The dock includes a sea chest water intake, consisting of a screened marine intake and pumping infrastructure.

The RMT II dock and Red Tank dock intake structures are currently designed with openings on the face of the structures with vertical guide channels to hold flat screens over the intake openings, as seen in Image 2-14 through Image 2-18. Based on the required intake flow rates, flat screens would not be of sufficient surface area to provide the required intake flow rates while meeting guidelines to reduce entrainment and impingement of aquatic species.

The saltwater intakes would modernize existing water intake structures. Existing flat intake screens would be replaced with modern intake screens which are designed to reduce entrainment and impingement of aquatic species. Water delivery to upland locations would be through new bay water pipe, utilizing the same trench as the industrial freshwater fire suppression water line.

A saltwater line would provide water from the RMT II Dock and Red Tank dock water intakes to manifolds at RMT I, RMT II and Nordic Aquafarms. NAFC and other aquaculture users would connect to the manifolds to receive saltwater. The saltwater line and industrial freshwater fire suppression water line would be trenched except at one point where they would cross a stormwater feature and where the water lines would daylight and be attached to a crossing structure as appropriate. The industrial freshwater fire suppression water line would terminate near the RMT I manifold, RMT II manifold, and at Red Tank dock.

The existing RMT II dock intake structure is constructed of wood that has some deterioration. The wooden structure would likely need repairs to seal cracks that would allow flow into the intake structure other than through the intake screen.

The piping associated with the bay intakes and fire suppression system will be excavated just west of the Humboldt Bay shoreline. Trenches will be sufficient to maintain pipes at least 3 feet below the ground surface, and above the water table, being installed by the Harbor District. Soil excavated for the saltwater intakes and fire suppression pipelines will adhere to material management guidelines as outlined in the Interim Measures Work Plan (SHN 2021). Field monitoring and the collection of samples from excavated soils for laboratory analysis will occur to ensure compliance with environmental regulations for material reuse or offsite disposal.

***Image 2-14 RMT II-Existing Water Intake Pumps***

***Image 2-15 RMT II-Existing Wooden Sea Chest***

***Image 2-16 RMTII-Existing Water Intake Screen***

*Image 2-17 Red Tank-Existing Concrete Sea Chest*

*Image 2-18 Red Tank-Existing Concrete Sea Chest and Screens*

## 2.4.3 Trench Details

The fire suppression water line would have a maximum outside diameter of 12 inches. The saltwater line would range from 18 to 36 inches in maximum outside diameter. Image 2-19 shows the outside pipe diameters and volume of water that would travel through different sections of the bay water line. Image 2-20 and Image 2-21 show the conceptual design for approximately 4,000 linear foot  trench segments (i.e., areas where there are two pipes or one pipe in the trench). The maximum width of ground disturbance would be 19 feet in sections where both pipes occur and 17 feet where only one pipe occurs.

There is an existing walkway across the stormwater feature that the pipes must cross. The two pipes would be attached to this walkway or to a replacement structure of the same size or smaller to minimize and avoid ground disturbance in the stormwater feature.

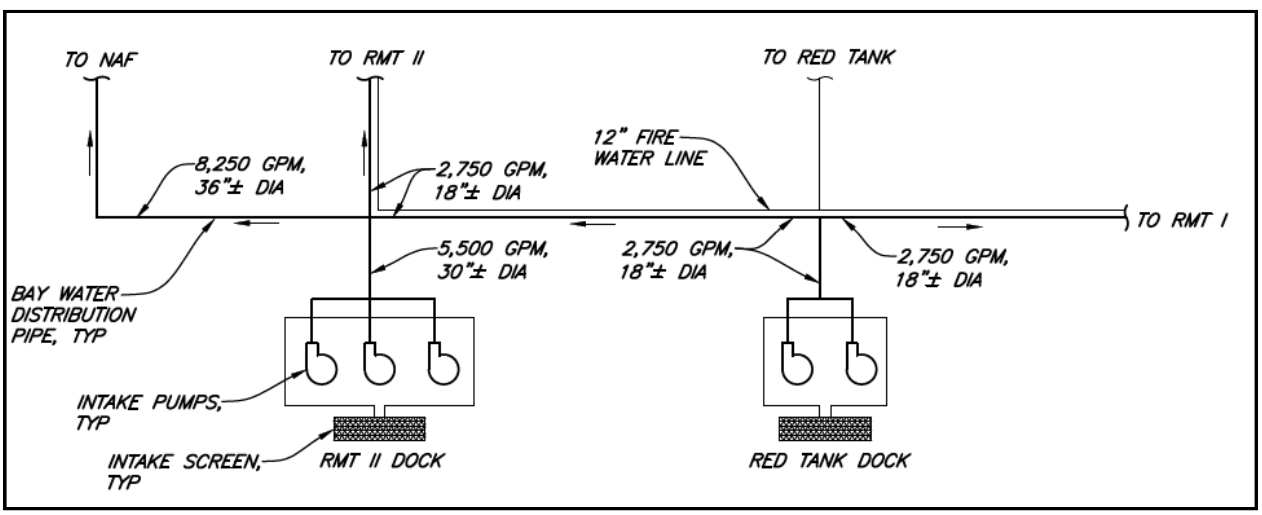



*Image 2-19 Pipe Diameter and Volume of Water that Would Travel Through Different Sections of the Bay Water Line*

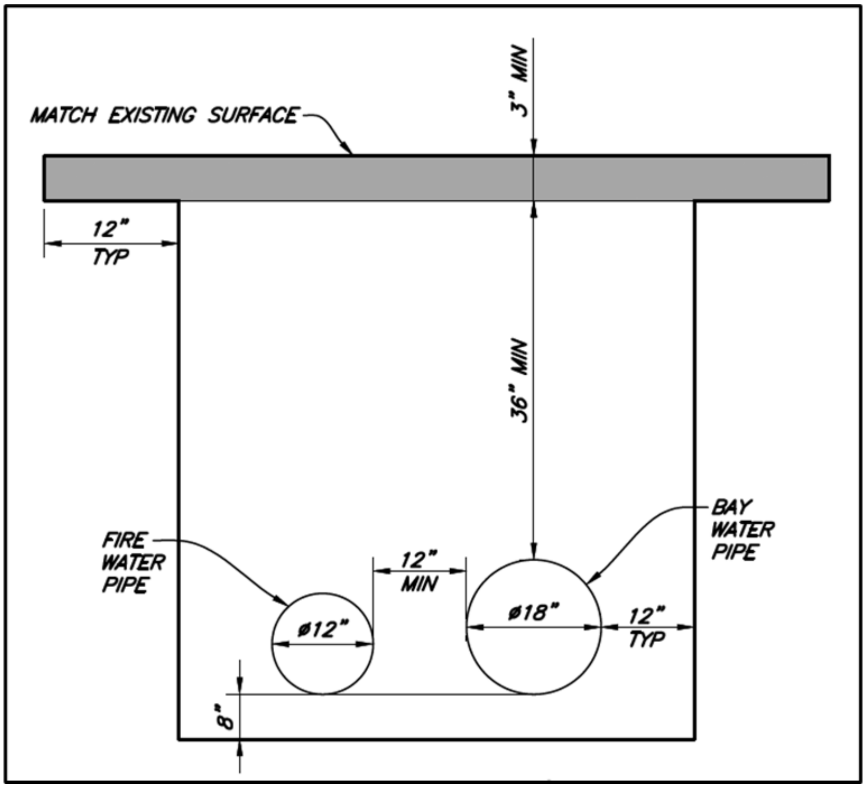



***Image 2-20 Conceptual Trench Details in Areas Where the Bay Water Line and Fire Suppression Line Would Occur***

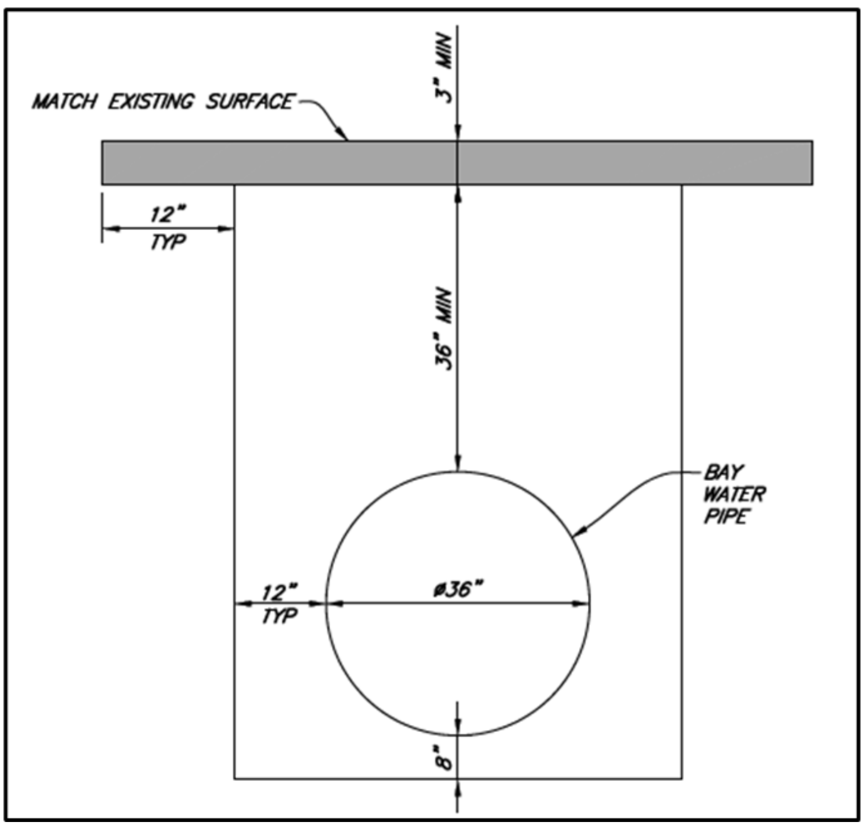



***Image 2-21 Conceptual Trench Detail in the Area Where Only the 36" Bay Water Line Would Occur***

## 2.4.4 Intake Design Conditions

Site-specific design conditions include minimum and maximum water depths and the elevation of the pier where the pumps and mounting equipment would be located. Elevations reported below in Table 2-10 for the RMT II dock intake structure are from the original design drawing (Georgia- Pacific Corporation 1966 cited in SHN 2020b). Elevations reported below in Table 2-11 for the Red Tank dock intake structure are from manual measurements collected April 1, 2020, at 8:15 a.m. as tied to the tidal water surface elevation reported from the NOAA North Spit tide station (9418767). Original design elevations for the RMT II dock were given in reference to the National Geodetic Vertical Datum of 1929 (NGVD29). Current design elevations are typically in reference to the North American Vertical Datum of 1988 (NAVD88). NGVD29 is 1.013 meters (3.32 feet) lower than NAVD88 at RMT II (NOAA2019); that is, NAVD88 = NGVD29 – 3.32 feet. Table 2-11 includes tide elevations and existing intake structure elevations.

***Table 2-11 Tidal Data[1] and Intake Structure Elevations***

| Description | Abbreviation | RMT II Dock Elevation (feet, NAVD88)[2] | Red Tank Dock Elevation (feet, NAVD88) |
|---|---|---|---|
| Existing Pump Base Elevation | N/A[3] | 13.68 | 11.20 +/- |
| Existing Pump Discharge Pipe Center Line Elevation | N/A | 9.93 | N/A |
| Highest Astronomical Tide, December 31, 1986 | HAT | 8.52 | 8.52 |
| Mean Higher High Water | MHHW | 6.51 | 6.51 |
| Mean High Water | MHW | 5.80 | 5.80 |
| Mean Sea Level | MSL | 3.36 | 3.36 |
| Mean Low Water | MLW | 0.91 | 0.91 |
| North American Vertical Datum of 1988 | NAVD88 | 0.00 | 0.00 |
| Mean Lower Low Water | MLLW | -0.34 | -0.34 |
| Lowest Astronomical Tide, May 25, 1990 | LAT | -2.73 | -2.73 |
| National Geodetic Vertical Datum of 1929 | NGVD29 | -3.32(4) | -3.32 |
| Existing Intake Structure Invert Elevation | N/A | -8.82 | -4.38 +/- |
| Bay Bottom Adjacent to Intake Structure | N/A | -14.82 | -5.90 +/- |

1. National Oceanic and Atmospheric Administration (NOAA) Station 9418767 North Spit, CA
2. NAVD88: North American Vertical Datum of 1988
3. N/A: not applicable
4. NGVD29 is 1.013 meters (3.32 feet) lower than NAVD88 according to the NOAA VERTCON orthometric height conversion tool (https://www.ngs.noaa.gov/cgi-bin/VERTCON/vert_con.prl) for 40.804624 North Latitude, 124.193127 West Longitude.

The direction of tidal flow in the bay channel varies 180-degrees, four times per day. The proposed orientation of the new screen is parallel to the direction of tidal flow. General intake screen design criteria are outlined in the National Marine Fisheries Service (NMFS) document, *Fish Screening Criteria for Anadromous Salmonids* (NMFS 1997). Through consultation with the California Department of Fish and Wildlife, SHN determined that intake screens must meet the design criteria assuming the presence of anadromous salmonid fry and juvenile longfin smelt. This resulted in an intake screen design of 1.00 mm slot size, rather than the Ocean Plan requirements of 1.75mm.

The two sea chests would be modernized to meet applicable design criteria for fish screens from NMFS (1997), summarized below.

A. Flow Rate

Maximum Intake Flow Rate:

- RMT II Dock intake Screen: 5,500 gallons per minute (GPM)
- Red Tank Dock Intake Screen: 2,750 GPM

B. Structure Placement

- The screened intake shall be designed to withdraw water from the most appropriate elevation, considering juvenile fish attraction, appropriate water temperature control downstream, or a combination thereof. The design must accommodate the expected range of water surface elevations.
- Water velocity from any direction toward the screen shall not exceed the allowable approach velocity. Where possible, intakes would be located where sufficient sweeping velocity exists. This minimizes sediment accumulation in and around the screen, facilitates debris removal, and encourages fish movement away from the screen face.

C. Maximum Approach Velocity

- Self-cleaning screens: 0.2 feet per second (fps)
- Non self-cleaning screens: 0.05 fps
- The screen design must provide for uniform flow distribution over the surface of the screen, thereby minimizing approach velocity.

D. Screen Orientation

- For screen lengths greater than six feet, screen-to-flow angle must be less than 45 degrees.

E. Screen Face Material

- Perforated plate: screen openings shall not exceed 3/32 inches (2.38 mm), measured in diameter.
- Profile bar: screen openings shall not exceed 0.0689 inches (1.00 mm) in width.
- Woven wire: screen openings shall not exceed 3/32 inches (2.38 mm), measured diagonally. (e.g.: 6-14 mesh).
- Screen material shall provide a minimum of 27% open area.
- The screen material shall be corrosion resistant and sufficiently durable to maintain a smooth and uniform surface with long term use.

F. Civil Works and Structural Features

- The face of all screen surfaces shall be placed flush with any adjacent screen bay, pier noses, and walls, allowing fish unimpeded movement parallel to the screen face.
- Structural features shall be provided to protect the integrity of the fish screens from large debris. Trash racks, log booms, sediment sluices, or other measures may be needed. A reliable on-going preventive maintenance and repair program is necessary to ensure facilities are kept free of debris and the screen mesh, seals, drive units, and other components are functioning correctly.

G. Operations and Maintenance

- Fish Screens shall be automatically cleaned as frequently as necessary to prevent accumulation of debris. The cleaning system and protocol must be effective, reliable, and satisfactory to NMFS. Proven cleaning technologies are preferred.
- The head differential to trigger screen cleaning for intermittent type systems shall be a maximum of 0.1 feet (0.03 m), unless otherwise agreed to by NMFS.
- The completed screen and bypass facility shall be made available for inspection by NMFS, to verify compliance with design and operational criteria. The intake screens will be removable from the wetted environment to support regular inspection for serviceability and maintenance. Thus, the need for in-water inspection and divers would be reduced.
- Screen and bypass facilities shall be evaluated for biological effectiveness and to verify that hydraulic design objectives are achieved.

The baseline solution for intake water treatment included in NAFC operations would include:

– First stage filtration
– Ozone treatment
– Ultrafiltration
– Ultraviolet (UV-C) dosing.

## Proposed Intake Screen Design

The RMT II dock and Red Tank dock intake structures are currently designed with openings on the face of the structures with vertical guide channels to hold flat screens over the intake openings. Based on the required intake flow rates, flat screens would not be of sufficient surface area to meet design criteria required to reduce entrainment and impingement of aquatic species. Therefore, the Harbor District is proposing to install tee-style intake screens over the intake openings. The tee screens would be mounted to flat plates that can be slid down into place over the intake openings, providing significantly greater screen surface area. The proposed intake screens also include an automated air burst self-cleaning system, which would keep the screens clean and maintain the screen surface area (Figure 2-13 through Figure 2-16).

Hendrick Screen Company, specialized in intake screen design, provided SHN with a preliminary design for an intake screen that meets the design criteria described above. A similar intake screen design is proposed for both locations with the exception that the RMT II Dock screen would be 36-inch diameter with a maximum intake flow rate of 5,500 GPM, and the Red Tank Dock screen would be 24-inch diameter with a maximum intake flow rate of 2,750 GPM.

The proposed screen includes the following features:

– 316 stainless steel profile bar screen material; 0.0689-inch spacing between bars
– 0.2-feet per second (fps) maximum approach velocity at maximum intake flow rate
– Compressed air automatic self-cleaning system
– Flow modifier to evenly distribute intake flow rates and velocities over the entire screen face

The screen manufacturer indicates head loss through the screen would be approximately 0.17 pounds per square inch (psi); 0.44 feet. Therefore, the water level inside the intake structure would be a minimum of 0.44 feet lower than the tidal water level outside the structure. As material builds up on the screen, head loss would increase, and the water level inside the intake structure would decrease accordingly, until the air burst cleaning system clears the screen of obstructions. The setpoint for when the air burst cleaning system actuates would be manually adjusted to clean the screen when the head difference inside and outside the intake structure is a maximum of 0.1 feet per the design criteria listed above.

## Proposed RMT II and Red Tanks Docks Intake Structure Conceptual Design

Conceptual design information for the Red Tank dock and RMT II dock water intakes were developed by SHN (2021b), as summarized below.

### Red Tank Dock

Red Tank dock is located approximately 0.5 miles north of the RMT II dock. Up to two pipes (water supply and fire suppression) may be used to pump bay water from Red Tank dock to land to support various uses. The direction of tidal flow in the bay channel varies 180-degrees, four times per day. The proposed orientation of the new screen is parallel to the direction of tidal flow. The new intake screen would be placed approximately 1 foot off of the existing bay bottom, which would put the top of the screen near the lowest astronomical tide elevation. The manufacturer recommends a minimum of 12 inches clear water be maintained above and below the top and bottom of the screen. The tidal water level would need to be monitored to ensure the intake pumps do not operate if the water level drops below 12 inches above the top of the screen. Leaving 1 foot between the bottom of the intake screen and the bay bottom would reduce the potential for pumps to draw sediment into the interior of the intake structure.

The Red Tank dock intake structure is currently configured to house up to two intake pumps mounted above the intake structure on a concrete pad. The proposed design includes up to two new vertical turbine pumps, providing up to a maximum of 2,750 GPM. The pumps would operate on variable speed drives in order to provide a variable flow rate depending on demand and pipe pressure. The new compressor would be installed on the dock, adjacent to the new pumps. The compressor would be located as close as possible to the intake screen to minimize head loss through the compressed air piping.

The new intake screen would be bolted to a large, square steel plate that would slide into the vertical guide channels, creating a seal to cover the 4-foot-tall by 2-foot-wide structure opening, restricting the opening to the inner diameter of the intake screen flange. This would allow the new tee screen to be lowered and raised using a crane or hoist located above on the pier. Red Tank dock intake structure currently includes two openings: one opening is proposed to be used for the new screen, and the second opening would be sealed off using a blank steel plate.

The Red Tank dock intake screen is located on the open channel side of the dock, exposed to possible damage from large logs and debris that may flow by the structure in the channel of the bay. It may be necessary to place piles or other protective measures around the perimeter of the intake screen to prevent impacts and damage from logs and debris floating by, or from vessels unaware of the location of the screen.

**RMT II Dock**

The proposed RMT II water intake design would construct the intake screen approximately 3 feet above the invert elevation of the existing intake structure (Table 2-10). The bottom elevation of the bay outside of the intake structure is approximately 6 feet below the bottom of the intake structure and may vary over time as sediment moves; however, there is sufficient depth between the invert of the existing structure and the mean lower low water (MLLW) elevation to provide 3 feet of clearance between the bottom of the new screen and the invert of the existing intake structure. This would provide room for sediment accumulation and prevent the new screen from drawing sediment from the bottom of the bay while maintaining complete submergence during all tides. The manufacturer recommends a minimum of 18 inches clear water be maintained above and below the top and bottom of the screen.

The proposed intake elevation would also be below the lowest astronomical tide level, which is the lowest expected water level at this location. The proposed RMT II dock intake structure design would include up to four vertical turbine pumps, with a maximum combined flow rate of 5,500 GPM. The existing wood and concrete pump pad would likely need to be replaced to accommodate additional vertical turbine pumps. The pumps would operate on variable speed drives in order to provide a variable flow rate depending on demand and pipe pressure. The four intake pumps would include redundant/backup pumps and duty pumps. The new compressor would be installed on the dock, adjacent to the new pumps. The compressor should be located as close as possible to the intake screen to minimize head loss through the compressed air piping. A new pump house would be constructed to house all of the new equipment and protect it from the harsh marine environment.

New discharge piping would be required. SHN recommends that stainless steel and PVC piping be used for this application due to the severe marine environment. The new intake screen would be bolted to a large, square steel plate that will slide into the vertical guide channels, creating a seal to cover the 8-foot-tall by 3-foot-2-inch-wide structure opening, restricting the opening to the inner diameter of the intake screen flange. This would allow the new tee screen to be lowered and raised using a crane or hoist located above on the pier.

The RMT II dock intake screen is located between the pier and the shore of the bay such that large logs and debris that may damage the screen are unlikely to occur at this location. However, if it is determined that large debris is of concern, protective measures, excluding piles, may be placed around the outside of the screen to prevent damage.

### 2.4.5 Project Construction

The intakes would be upgraded, new pumps installed, and pipeline installed prior to becoming operational for Phase 1. The intake structures would require manual sediment removal from within the structures. Sediment would be removed via heavy equipment or a diver. Construction would be staged from the dock or a barge or similar watercraft.

Pipes would be installed as shown in Images 2-19 through 2-22 and will be installed with a backhoe or equal and the piping would be placed in bedding material and then backfilled and compacted.

### Construction Timeline

It is anticipated that the bay intakes would be constructed in the summer/fall of 2022. Construction, including trenching, is anticipated to take 3-4 months.

### Staging Areas

Staging for intake installation would occur in previously disturbed areas and on docks. Staging for piping installation would occur on previously disturbed areas (i.e., gravel or paved areas).

## 2.4.6 Project Operations

The Red Tank dock pumps would be 75-100 hp, and RMT II dock pumps would be 100-125 hp. The pumps would operate continuously except during maintenance and cleaning activities. Power for the pumps and compressors would be supplied from the NAFC facility to ensure operation during periods of grid power outage.

In the wetted environment, the screens would be cleaned with an air burst or brush system. A winch would be used to lift the screens out of the water and onto the respective docks for periodic inspection, maintenance, and repair. Once on the dock, any additional required cleaning of the screens would be completed with a pressure washer and/or brushes.

## 2.4.7 Off-Site Compensatory Restoration

The Harbor District plans to complete compensatory off-site habitat restoration activities which is anticipated to be required by permitting agencies to (1) offset a small reduction in the Humboldt Bay's biological productivity as a result of entrainment of non-special status larval species, and (2) compensate for the potential take of longfin smelt (LFS) larvae during the operation of the two sea chests. The habitat restoration is expected be a condition of approval required under the Harbor District permits. Compensatory off-site habitat restoration would include pile removal, and Spartina removal. Spartina removal is not a requirement of the Terrestrial Development Project, but has been fully analyzed in the EIR as it is part of the Harbor District's Coastal Development Permit. Compensatory off-site habitat restoration would be implemented in associated with the phased withdrawal of water through the two water intakes as follows:

- **Phase I.** For cumulative water withdrawal by the intakes between 0-694 gallons per minute (gpm), no compensatory habitat restoration would be required. Effects of this small amount of water withdrawal are considered de minimis and habitat restoration to offset impacts to bio-productivity are not necessary.
- **Phase II.** For cumulative water withdrawal by the intakes between 695-1,250 gpm, the Harbor District would compensate for project-related impacts to biological productivity by restoring up to one acre of tidal wetlands in Humboldt Bay through the eradication of the invasive non-native plant species *Spartina densiflora* (Spartina) or remove an equivalent number of piles.
- **Phase III.** For cumulative water withdrawal by the intakes between 1,251 to 8,250 gpm, pile removal at the Kramer Dock would be conducted. Up to 1,004 piles would be removed under Phase III. The Harbor District would consult with other regulatory agencies to further develop details of the habitat restoration prior issuance of permits required for pile removal. Removal of the creosote treated piles would have water quality benefits and increase the quality and quantity of mudflat and eelgrass habitats in Humboldt Bay.

### Spartina Removal

Spartina removal would be conducted under existing permits issued to the Harbor District (Harbor District Permit 14-05 and Coastal Development Permit 1-14-0249). It is expected that the NCRWQCB would issue a waiver for the habitat restoration work. Mechanical (not chemical) methods would be used as described in the certified Final Programmatic Environmental Impact Report for the Humboldt Bay Regional Spartina Eradication Plan (SCH# 2011012015). Mechanical methods include top mowing, grinding, tilling, excavating, disking, crushing, flaming, and covering Spartina plants. Spartina removal would increase native species diversity and improve the habitat quality of salt marsh habitats. It is anticipated that up to one acre of Spartina will be removed.

## Pile Removal

Pile removal would occur at the Kramer Dock property, located in Fields Landing and owned by the Harbor District. Under existing conditions, creosote piles are abundant along the shoreline (Image 2-22).

***Image 2-22 Existing Piles at the Kramer Dock, Fields Landing During Low Tide on September 28, 2021***

Pile removal would be conducted from shore and/or from a barge. An excavator with a vibratory hammer and timber clamp would be used to remove the piles. Piles that break off above the bottom would be reattached to the vibratory hammer and removed. In the event that a pile cannot be fully extracted, it would be cut off below the mudline using a saw.

– Removal with barge: An excavator with the equipment referenced above would operate from a barge. The barge would be approximately 80 feet by 100 feet with an estimated four foot draft and would be moved with assistance of a small support boat. After being placed on the barge, the piles would be transferred to land, and then transported to an appropriate disposal facility.

– Removal from shore: An excavator with the equipment referenced above would operate from the shore immediately adjacent to the Humboldt Bay. The piles would be transferred to a truck and transported to an appropriate disposal facility.

There are a total of approximately 1,324 creosote piles over 2.3 acres at the Kramer Dock. A minimum of 1,004 piles shall be removed for the compensatory off-site restoration, of which four (4) piles are required to be removed for LFS mitigation. Staging would occur south of South Bay Depot Drive in Fields Landing, in upland areas only. Wetlands previously mapped by Stantec (Stantec 2018) would not be temporarily or permanently impacted by the pile removal effort.

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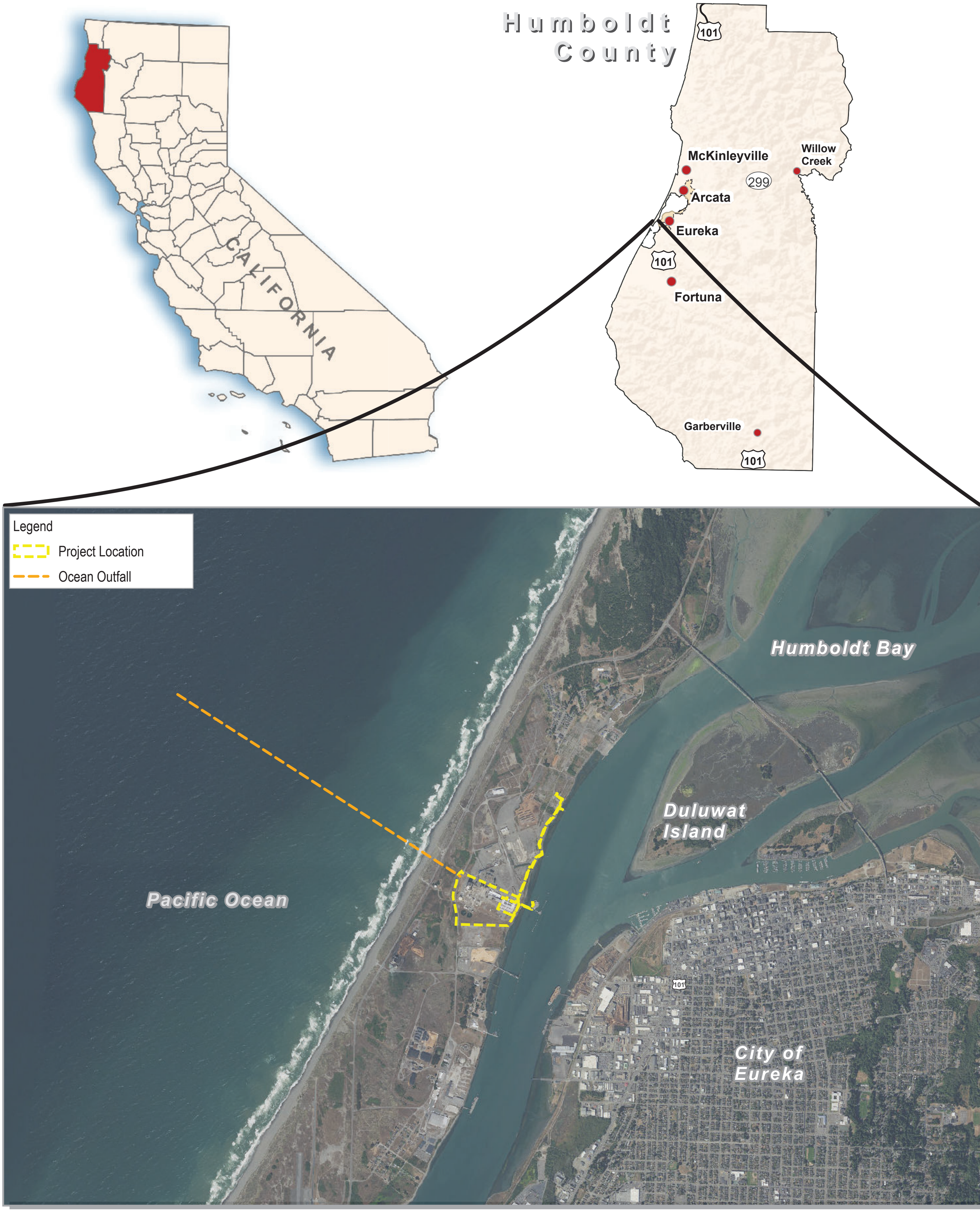


Paper Size ANSI A

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

**Nordic Aquafarms California, LLC**
**Samoa Peninsula Sustainable**
**Aquaculture Development Project**
**Samoa, Humboldt County, California**

**Vicinity Map**

Project No. **11205607**
Revision No. **-**
Date **Sep 2021**

**FIGURE 2-1**

\\ghdnet\ghd\US\Eureka\Projects\561\11205607\GIS\Maps\Deliverables\11205607_EIR\11205607_EIR.aprx - 11205607_02-1_VicinityMap_RevA
Print date: 29 Sep 2021 - 09:33

Data source: APE, June 11, 2021; 2018 NAIP imagery; Terrain: Sources: Esri, USGS, NOAA. Created by: jlopez4


Paper Size ANSI A

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

**Nordic Aquafarms California, LLC**
**Samoa Peninsula Sustainable Aquaculture Development Project**
**Samoa, Humboldt County, California**

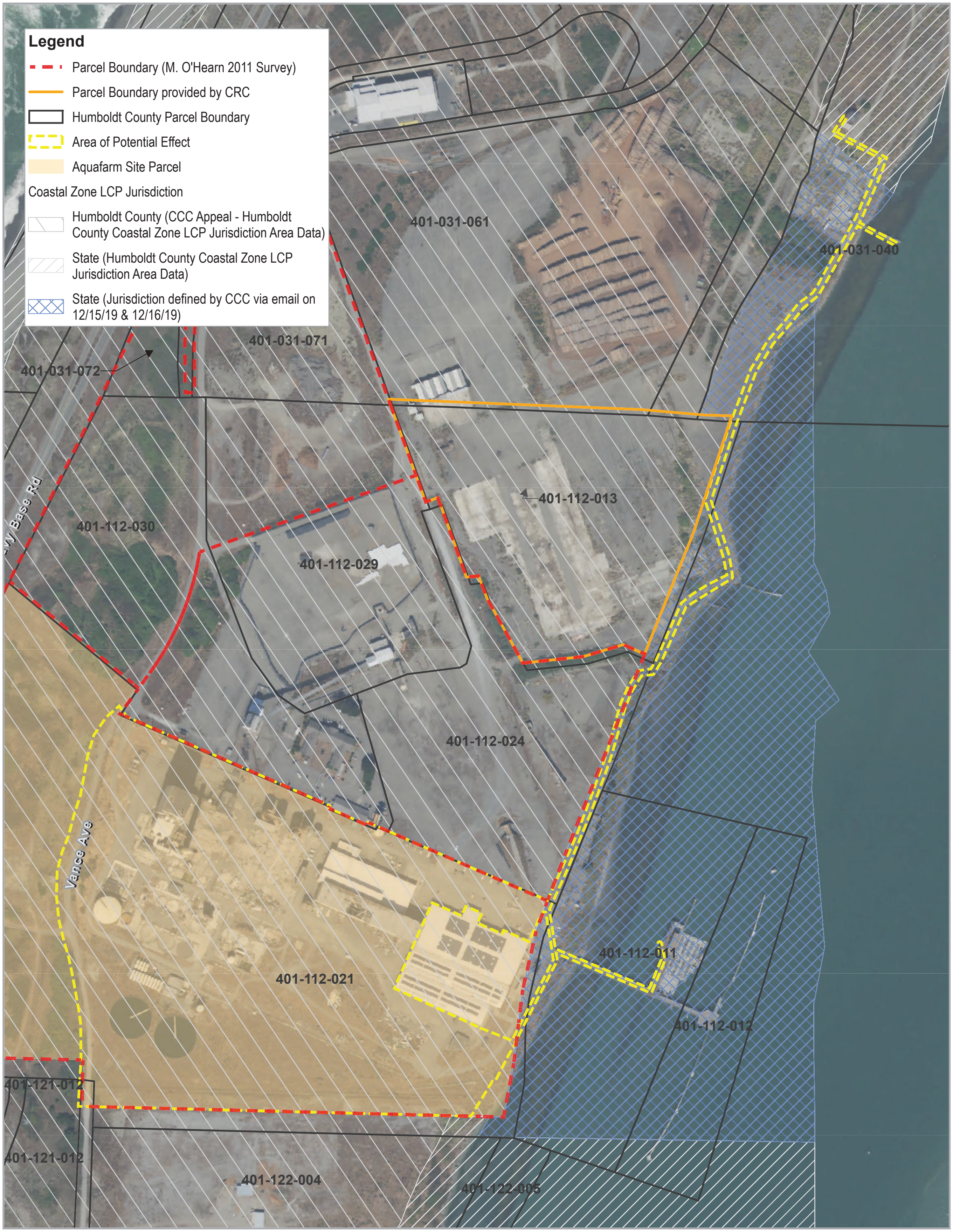
Project No. **11205607**
Revision No. **-**
Date **Sep 2021**

## Area of Potential Effect

## FIGURE 2-2

\\ghdnet\ghd\US\Eureka\Projects\561\11205607\GIS\Maps\Deliverables\11205607_EIR\11205607_EIR.aprx - 11205607_02-2_APE_RevA
Print date: 29 Sep 2021 - 09:43

Data source: Project design elements, April 1st, 2021; APE, June 11, 2021; USDA, NAIP Imagery, 2018; Humboldt County Parcel Dataset, 2019. Created by: jlopez4




Paper Size ANSI A

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

**Nordic Aquafarms California, LLC**
**Samoa Peninsula Sustainable**
**Aquaculture Development Project**
**Samoa, Humboldt County, California**

**Jurisdictional Boundaries**

Project No. **11205607**
Revision No. **-**
Date **Jul 2021**

**FIGURE 2-3**

N:\US\Eureka\Projects\561\11205607\GIS\Maps\Deliverables\11205607_EIR\11205607_EIR.aprx - 11205607_02-3_Jurisdictional_RevA
Print date: 06 Jul 2021 - 09:27

Data source: APE, June 11, 2021; USDA, NAIP Imagery, 2018; Humboldt County Parcel Dataset, 2019; Site Survey. Kelly-O'Hern Assoc., 2012; Humboldt County. Coastal Zone LCP Jurisdiction, 2017 . Created by: jclark2


Paper Size ANSI A

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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GHD

Nordic Aquafarms California, LLC
Samoa Peninsula Sustainable
Aquaculture Development Project
Samoa, Humboldt County, California

## Proposed Aquafarm Site Layout

Project No. 11205607
Revision No. -
Date Jul 2021

## FIGURE 2-4

N:\US\Eureka\Projects\561\11205607\GIS\Maps\Deliverables\11205607_EIR\11205607_EIR.aprx - 11205607_02-4_AquafarmLayout_RevA
Print date: 06 Jul 2021 - 10:21

Data source: Project design elements, April 1st, 2021; APE, June 11, 2021; USDA, NAIP Imagery, 2018; Humboldt County Parcel Dataset, 2019. Created by: jclark2


Paper Size ANSI A

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

**Nordic Aquafarms California, LLC**
**Samoa Peninsula Sustainable Aquaculture Development Project**
**Samoa, Humboldt County, California**

Project No. **11205607**
Revision No. **-**
Date **Jul 2021**

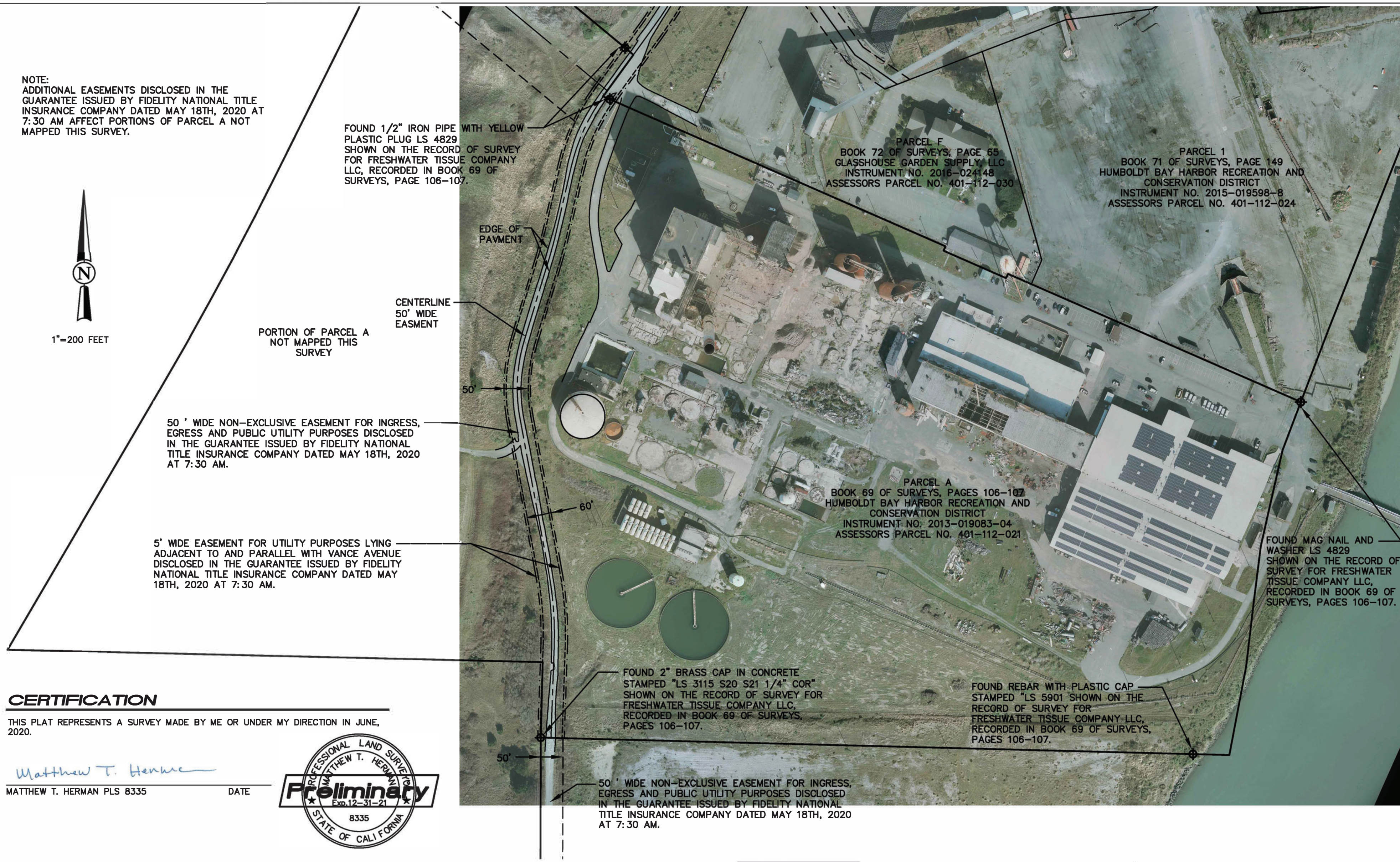
**Humboldt Bay Water Intakes-Sea Chests**

**FIGURE 2-5**

N:\US\Eureka\Projects\561\11205607\GIS\Maps\Deliverables\11205607_EIR\11205607_EIR.aprx - 11205607_02-5_SeaChest_RevF
Print date: 14 Jul 2021 - 16:03

Data source: HBHD design elements, June 2021; USDA, NAIP Imagery, 2018; Humboldt County Parcel Dataset, 2019. Created by: jclark2

NOTE:
ADDITIONAL EASEMENTS DISCLOSED IN THE GUARANTEE ISSUED BY FIDELITY NATIONAL TITLE INSURANCE COMPANY DATED MAY 18TH, 2020 AT 7:30 AM AFFECT PORTIONS OF PARCEL A NOT MAPPED THIS SURVEY.




## CERTIFICATION

THIS PLAT REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN JUNE, 2020.

Matthew T. Herman

MATTHEW T. HERMAN PLS 8335 DATE

PROFESSIONAL LAND SURVEYOR
MATTHEW T. HERMAN
Preliminary
Exp.12-31-21
8335
STATE OF CALIFORNIA

| | | |
|---|---|---|
| SHN | Nordic Aqua Farms<br>Samoa, California | Figure 2-7: Boundary and Easement Plot<br>SHN 019146 |
| June 2020 | 019146-RECORD GND | Figure 2-7 |

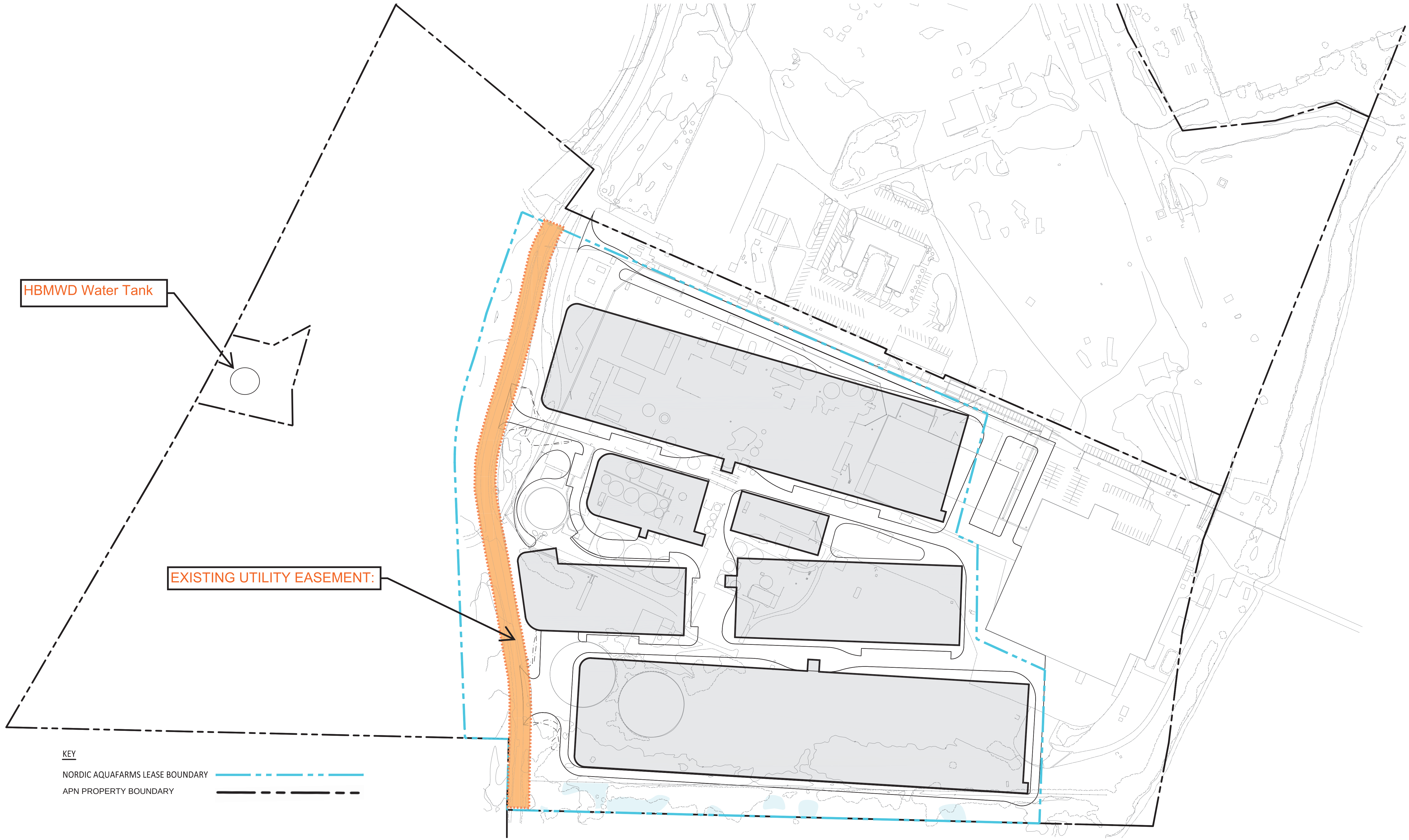



**Figure 2-6: UTILITY EASEMENTS**
Nordic Aqua Farms, Samoa, California
September 2021

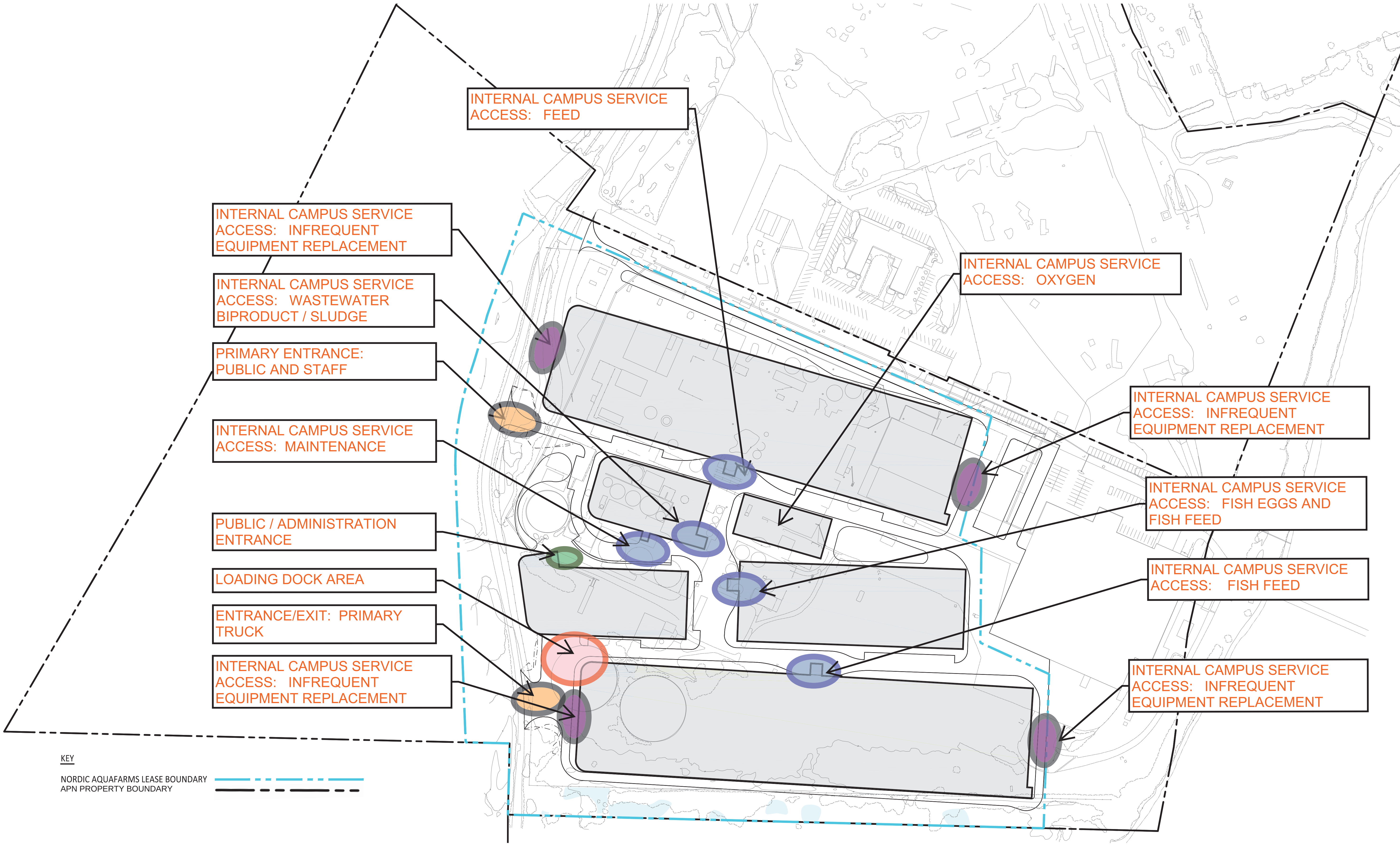



**Figure 2-8: SITE LOGISTICS**

Nordic Aqua Farms, Samoa, California

September 2021

NORDIC AQUAFARMS SUSTAINABLE AQUACULTURE

SMRT PROJECT NO. 19120

0 50' 100' 200' 300'

N

SMRT

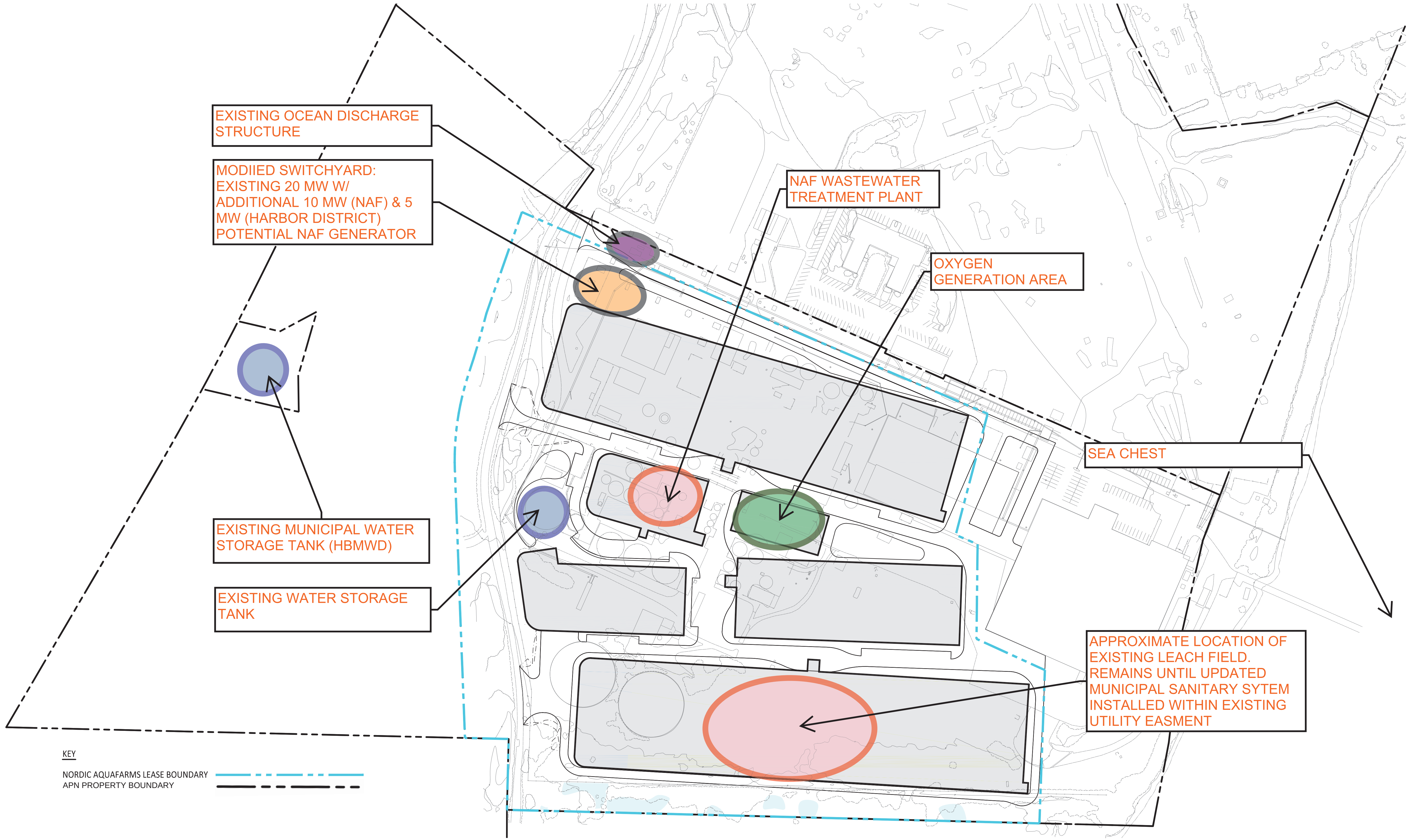



**Figure 2-9: SITE INFRASTRUCTURE**
Nordic Aqua Farms, Samoa, California
September 2021

NORDIC AQUAFARMS
SMRT

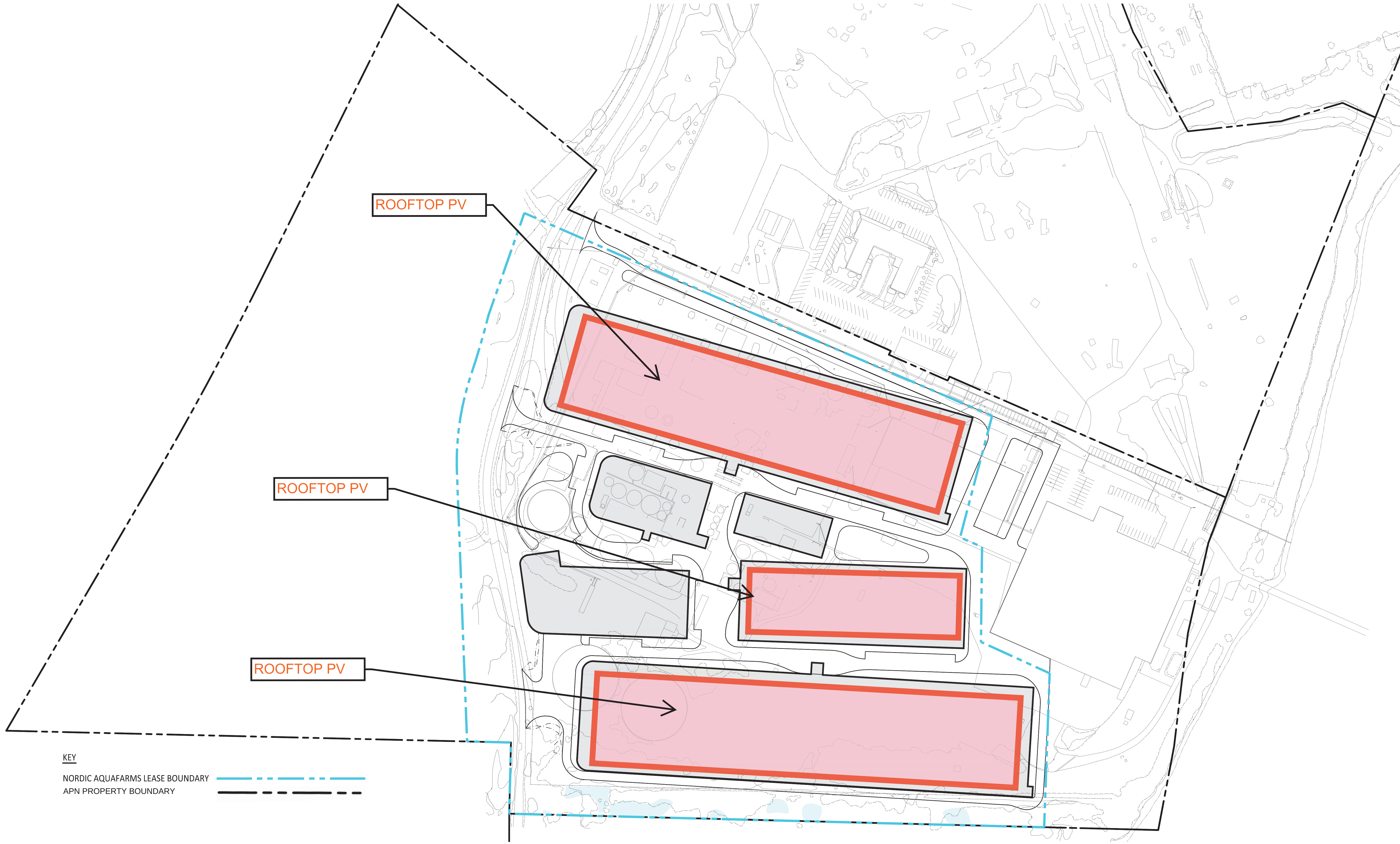



**Figure 2-10: ROOFTOP PV LOCATIONS**

Nordic Aqua Farms, Samoa, California

September 2021

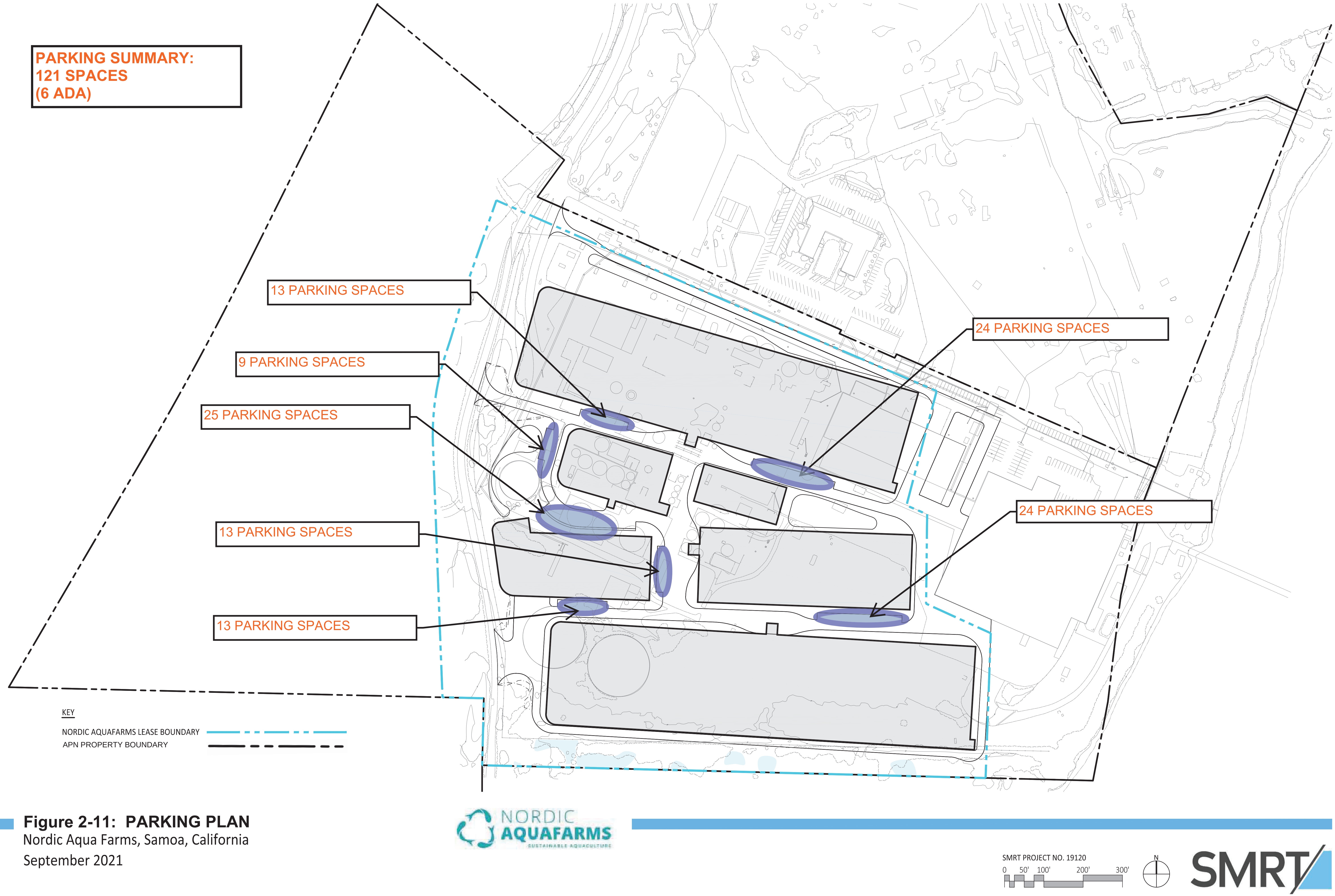



**Figure 2-11: PARKING PLAN**
Nordic Aqua Farms, Samoa, California
September 2021

NORDIC AQUAFARMS SUSTAINABLE AQUACULTURE

SMRT

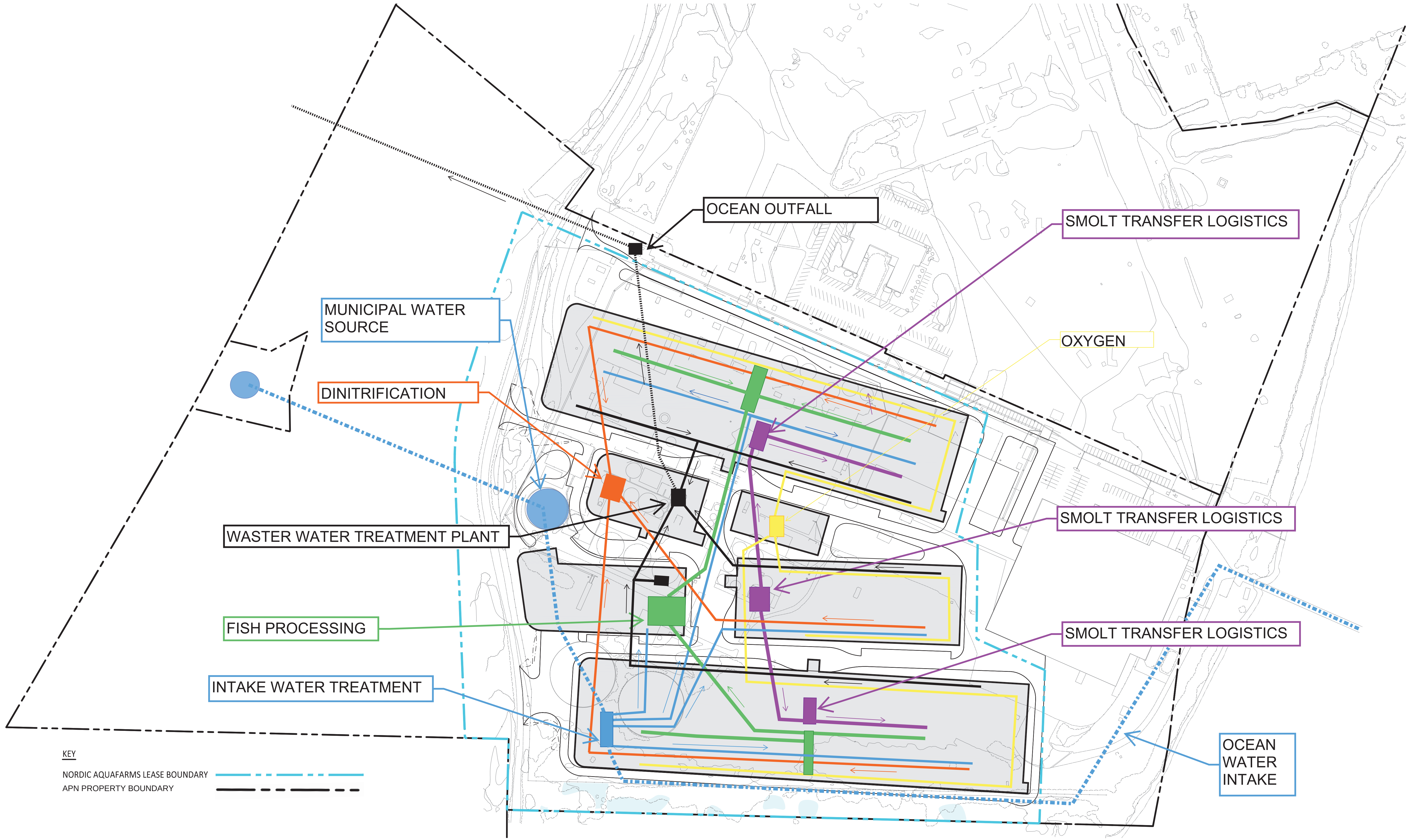



**Figure 2-12: CONCEPT PIPING LAYOUT**

Nordic Aqua Farms, Samoa, California

September 2021

NORDIC AQUAFARMS SUSTAINABLE AQUACULTURE

SMRT

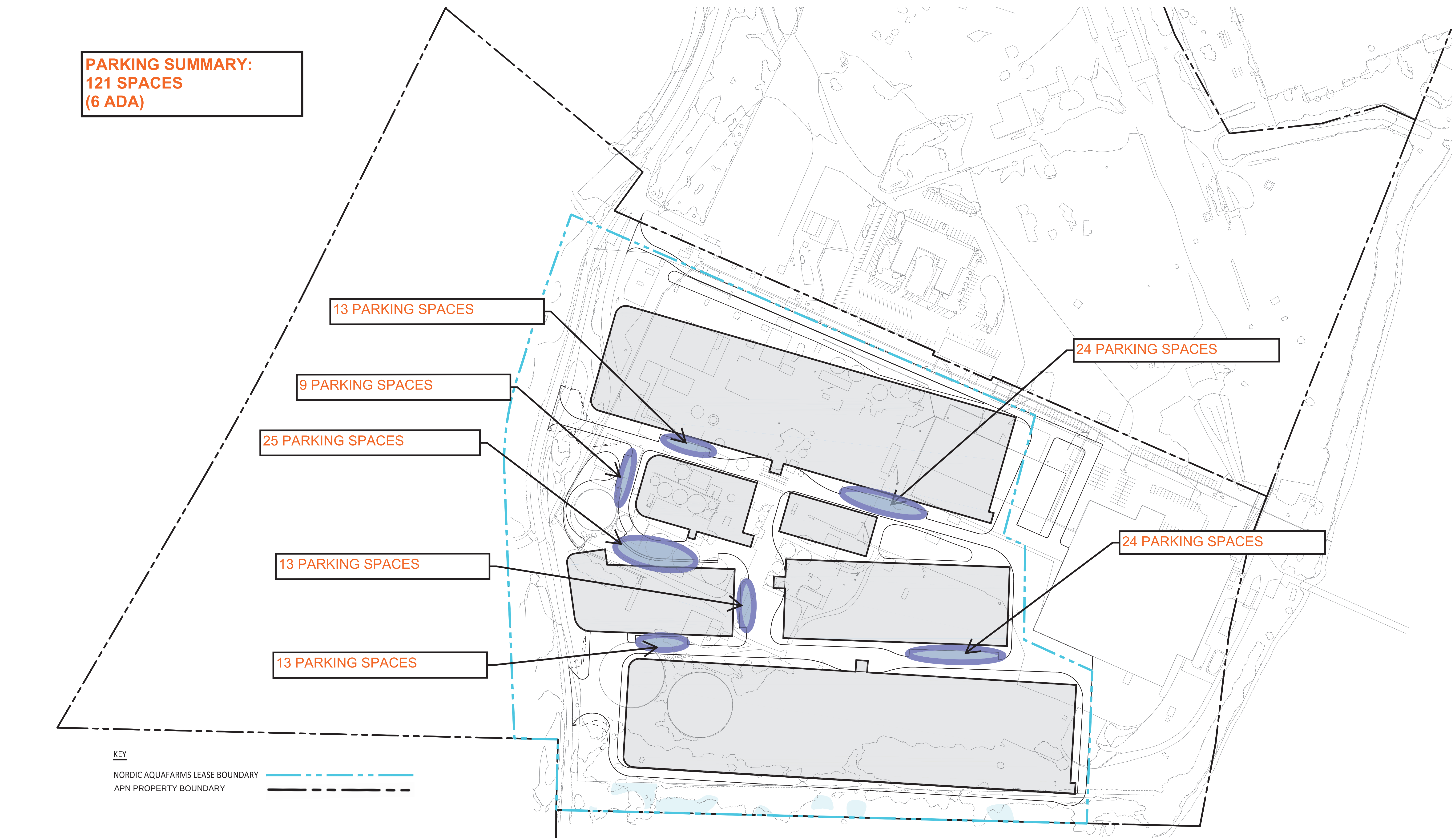



**Figure 2-11: PARKING PLAN**
Nordic Aqua Farms, Samoa, California
September 2021

NORDIC AQUAFARMS

SMRT PROJECT NO. 19120

SMRT

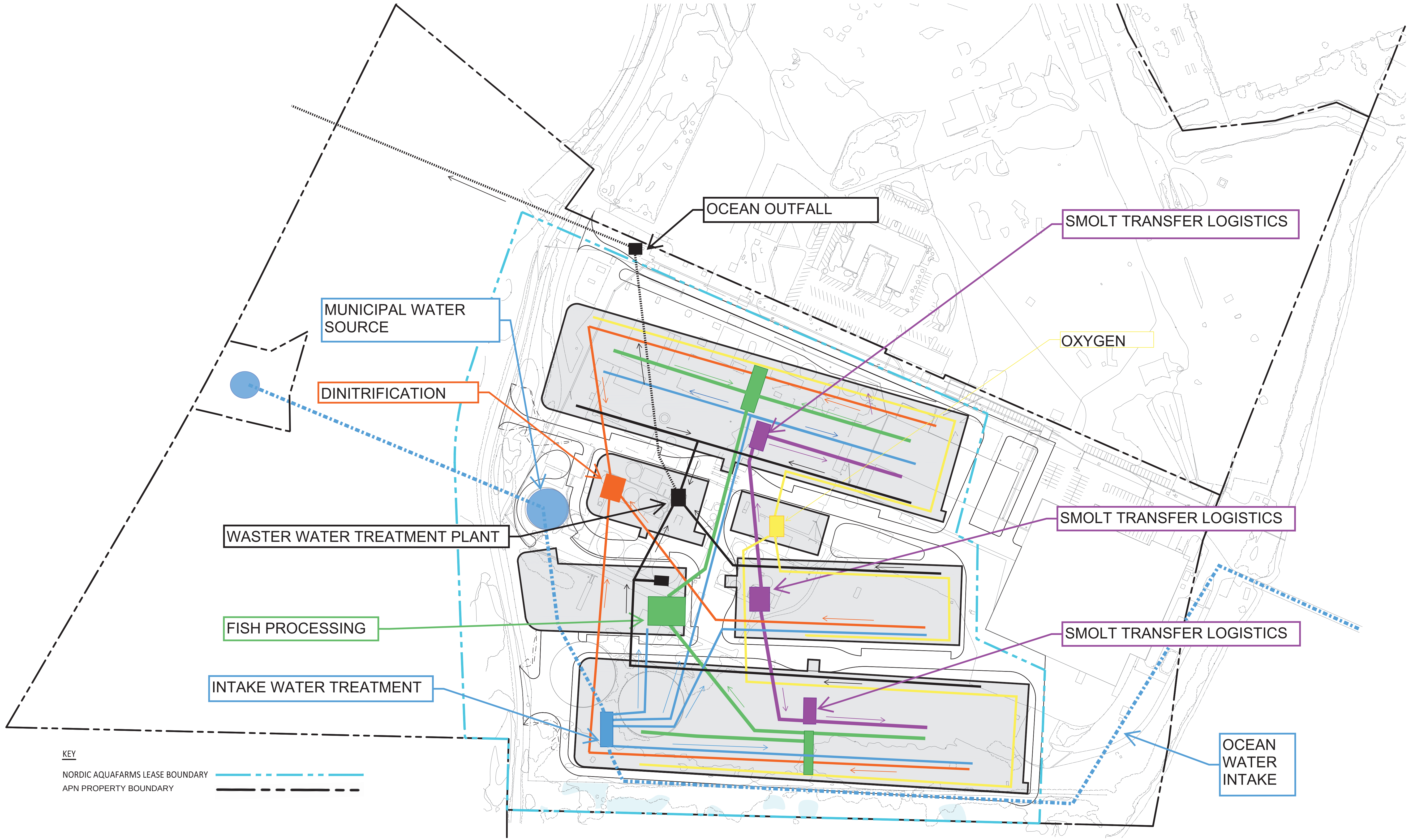



**Figure 2-12: CONCEPT PIPING LAYOUT**
Nordic Aqua Farms, Samoa, California
September 2021

NORDIC AQUAFARMS

SMRT PROJECT NO. 19120

0 50' 100' 200' 300'

N

SMRT

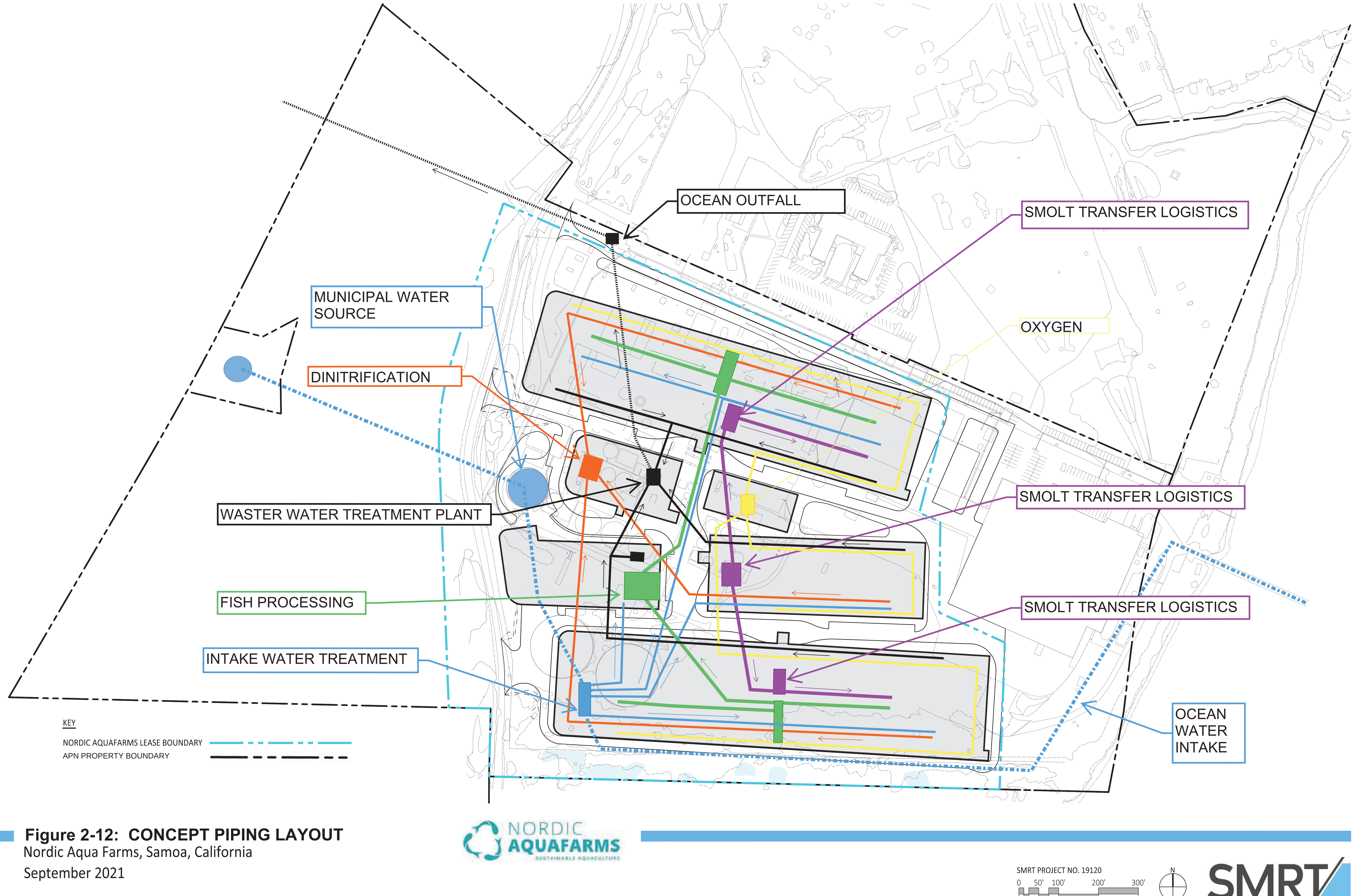
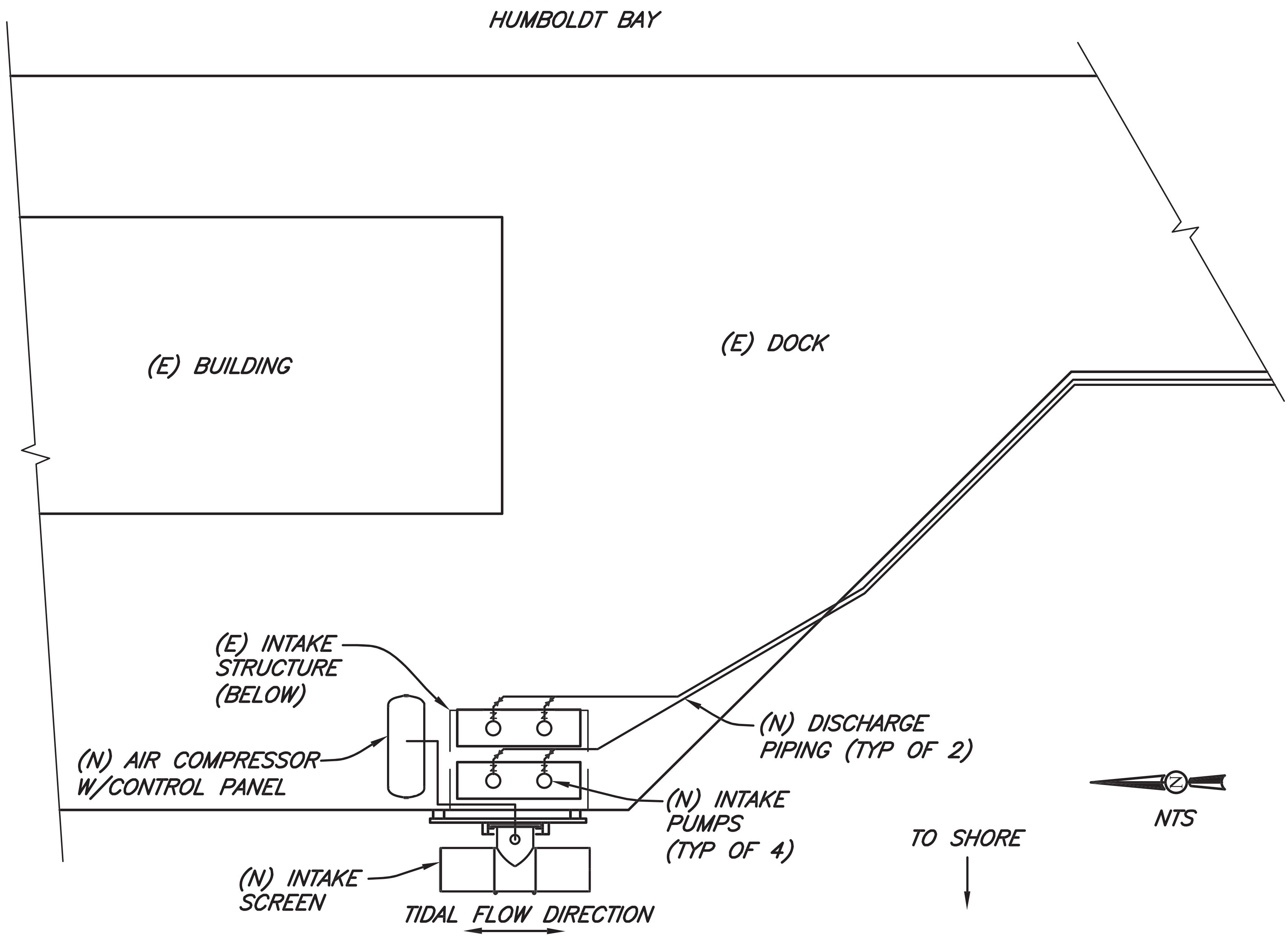



**Figure 2-12: CONCEPT PIPING LAYOUT**
Nordic Aqua Farms, Samoa, California
September 2021



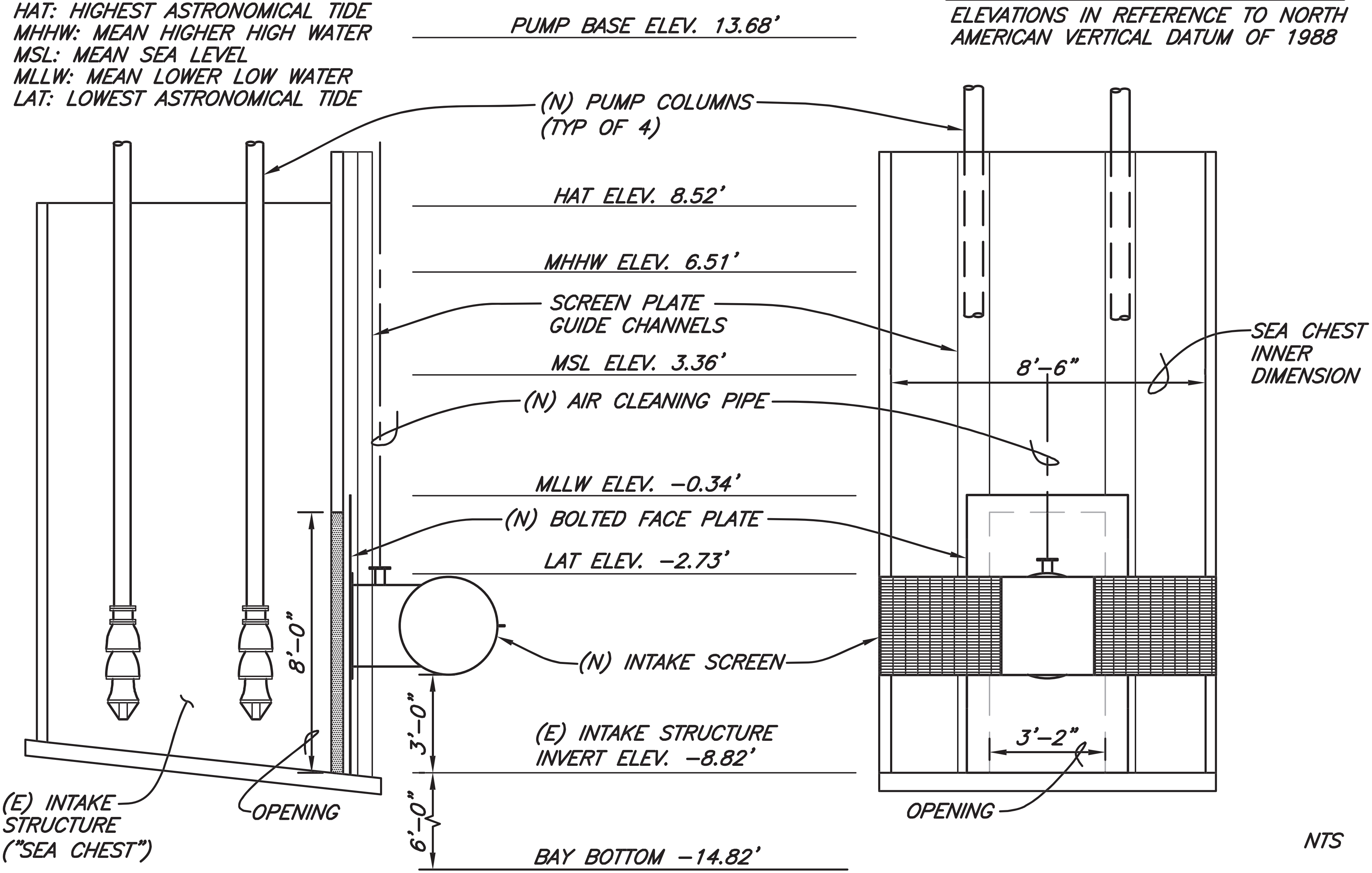

| | | |
|---|---|---|
| Humboldt Bay Harbor District<br>Sea Chest Intake Screens<br>Samoa, California | | RMT II Intake Screen<br>Conceptual Site Plan<br>SHN 016240.003 |
| April 2020 | 016240-003-SEA-CHEST | Figure 2-13 |

## DEFINITIONS

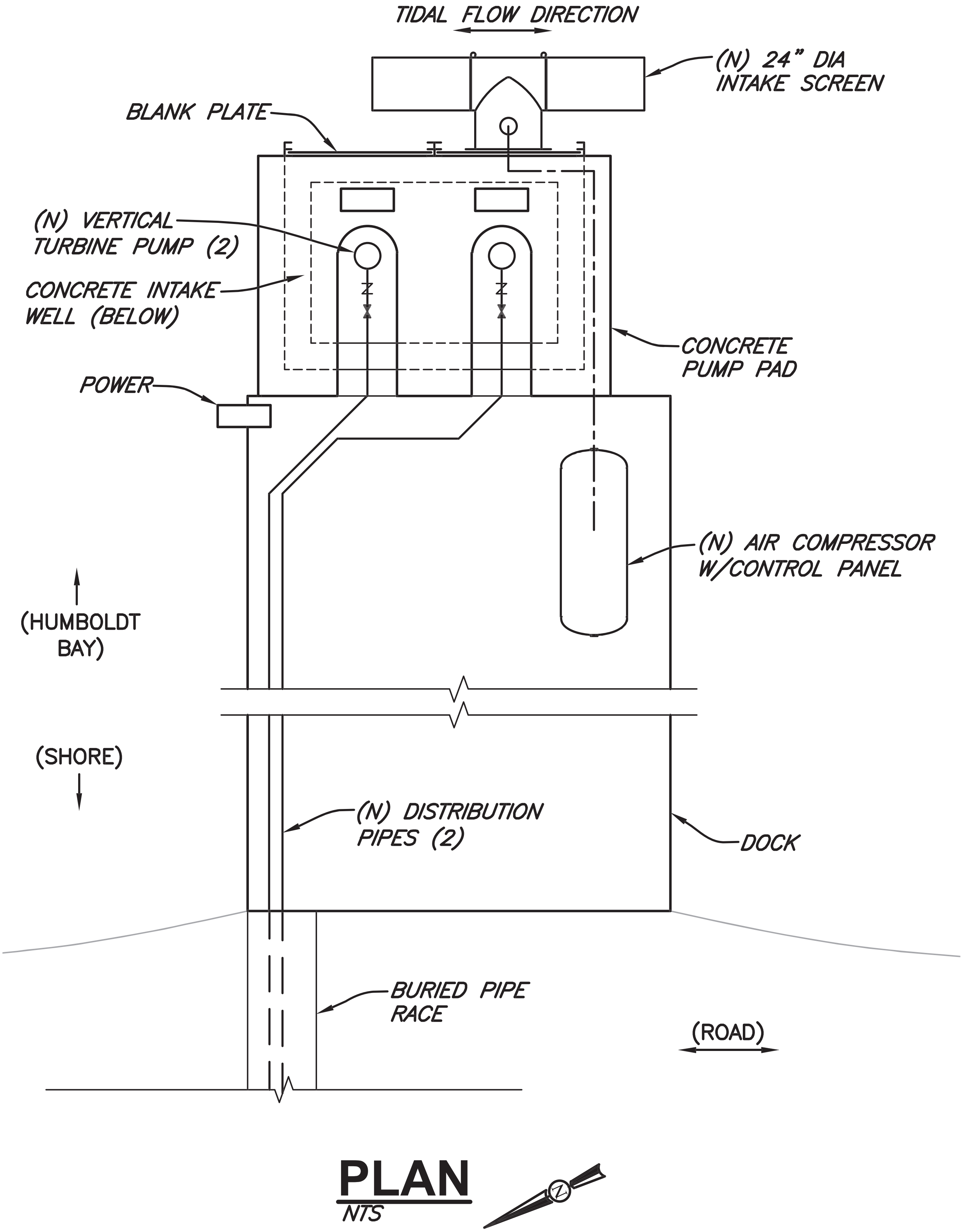
HAT: HIGHEST ASTRONOMICAL TIDE
MHHW: MEAN HIGHER HIGH WATER
MSL: MEAN SEA LEVEL
MLLW: MEAN LOWER LOW WATER
LAT: LOWEST ASTRONOMICAL TIDE

## NOTES

ELEVATIONS IN REFERENCE TO NORTH AMERICAN VERTICAL DATUM OF 1988




| | | |
|---|---|---|
| SHN | Humboldt Bay Harbor District<br>Sea Chest Intake Screens<br>Samoa, California | RMT II Intake Screen<br>Conceptual Elevations<br>SHN 016240.003 |
| | March 2020 / 016240-003-SEA-CHEST | Figure 2-14 |





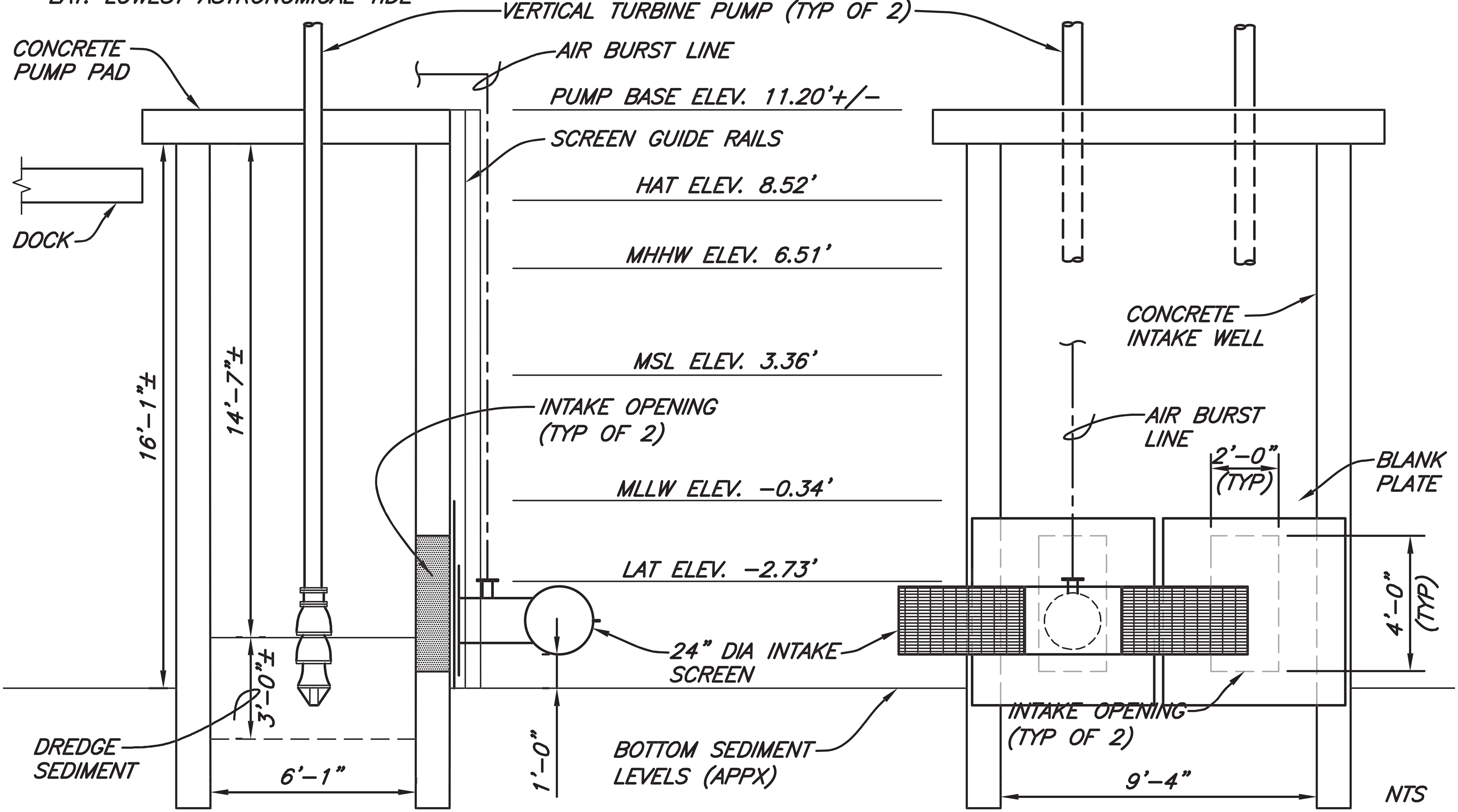

| | | |
|---|---|---|
| SHN | Humboldt Bay Harbor District<br>Sea Chest Intake Screens<br>Samoa, California | Red Tank Dock Intake Screen<br>Conceptual Site Plan<br>SHN 016240.003 |
| May 2020 | 016240-REDTANKDOCK | Figure 2-15 |

## DEFINITIONS

HAT: HIGHEST ASTRONOMICAL TIDE
MHHW: MEAN HIGHER HIGH WATER
MSL: MEAN SEA LEVEL
MLLW: MEAN LOWER LOW WATER
LAT: LOWEST ASTRONOMICAL TIDE

## NOTES

ELEVATIONS IN REFERENCE TO NORTH AMERICAN VERTICAL DATUM OF 1988




| | | |
|---|---|---|
| SHN | Humboldt Bay Harbor District<br>Sea Chest Intake Screens<br>Samoa, California | Red Tank Dock Intake Screen<br>Conceptual Elevation<br>SHN 016240.003 |
| | May 2020 / 016240-REDTANKDOCK | Figure 2-16 |