# Water Supply Memo

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Based on the changing environmental needs of salmon through their life cycle, process water will include freshwater and a larger component of saltwater sources. Freshwater sources are proposed to include an on-site groundwater extraction well network, additional off-site supply from the BWD, and on-site surface water withdrawal from Belfast Reservoir Number One as back-up. Collectively, the project is anticipated to use a combined maximum of 1,205 gallons per minute (gpm) for freshwater and 3,925 gpm for saltwater on a continuous basis at full operational capacity. It is important to note that each proposed withdrawal value is a maximum, not an average. This is to evaluate worst-case3 impacts on each resource, and the typical operations will not reach peak demand in these resources at the same time. The anticipated maximum water usage distribution is summarized below in **Table 1**.

| Planned Use | Composition | Source | Usage Rate |
|---|---|---|---|
| Domestic | Freshwater | Belfast Water District Municipal Supply | 500 gpm<br>720,000 gpd |
| Process | Freshwater | On-Site Groundwater Well Network | 455 gpm<br>655,200 gpd |
| Process | Freshwater, back-up | Belfast Reservoir Number One Surface Water Withdrawal | 250 gpm<br>360,000 gpd |
| Process | Saltwater | Belfast Bay Ocean Pipeline | 3,925 gpm<br>5,652,000 gpd |

**Table 1**: Anticipated project water usage at full operational capacity.

GPM = gallons per minute, GPD = gallons per day

The water usage rates presented above in **Table 1** are anticipated to be reliable and sustainable water supply sources at the proposed usage rates. However, should water supply sources, particularly groundwater and surface water sources, require changes to the proposed withdrawal rates during operation (e.g. inflow to Belfast Reservoir Number One falls well below estimated baseflow), the project has been designed with the flexibility to account for decreased fresh process water by increasing saltwater intake rates and increasing the salinity of the process water. Similarly, as discharge from the Little River into Belfast Reservoir Number One increases above baseflow, groundwater withdrawals can be slowed and more of the total process water can be supplied by surface water if needed. This flexibility provides considerable operation leeway to allow for system maintenance (e.g. well maintenance or repairs) and hydrologic variability (e.g. decreased surface water inflows) without undue risk to overall facility production or natural resources.

## Domestic Water

The project will require potable domestic water mainly for sanitization, fish processing, and domestic utilities. Domestic water will be supplied by the Belfast Water District (BWD) at an agreed maximum of 500gpm. This maximum value was provided by BWD and is well in excess of anticipated needs for the development. The BWD has the ability to provide this amount as stipulated in the signed January 29, 2018 Water Supply and Purchase Agreement between Nordic Aquafarms and BWD, the March 7, 2019 Capacity to Serve letter from BWD, and as approved by the Maine Public Utilities Commission.

**Groundwater**

Maximum usage rates for groundwater sources were selected based on hydrogeologic investigations, research, and modeling detailed in the 2019 Hydrogeologic Investigation Report by Ransom Consulting, Inc. This investigation included a test well drilling program based on interpretation of a Sitewide electrical resistivity survey, four separate aquifer pumping tests, and development of a numerical groundwater flow model for the Site. Based on the work performed, the project proposes to extract 455 gallons per minute (gpm) of groundwater from the bedrock aquifer underlying the Site from a production well network comprised of three production wells located on the eastern and southeastern portions of the Site. This well configuration and withdrawal rates were found to be a conservative maximum at which groundwater could be used for the facility in a sustainable manner. Further confirmation of sustainability is proposed through a robust water resource monitoring plan that has will be further developed as part of the DEP NRPA/SLODA permit conditions.

**Surface Water**

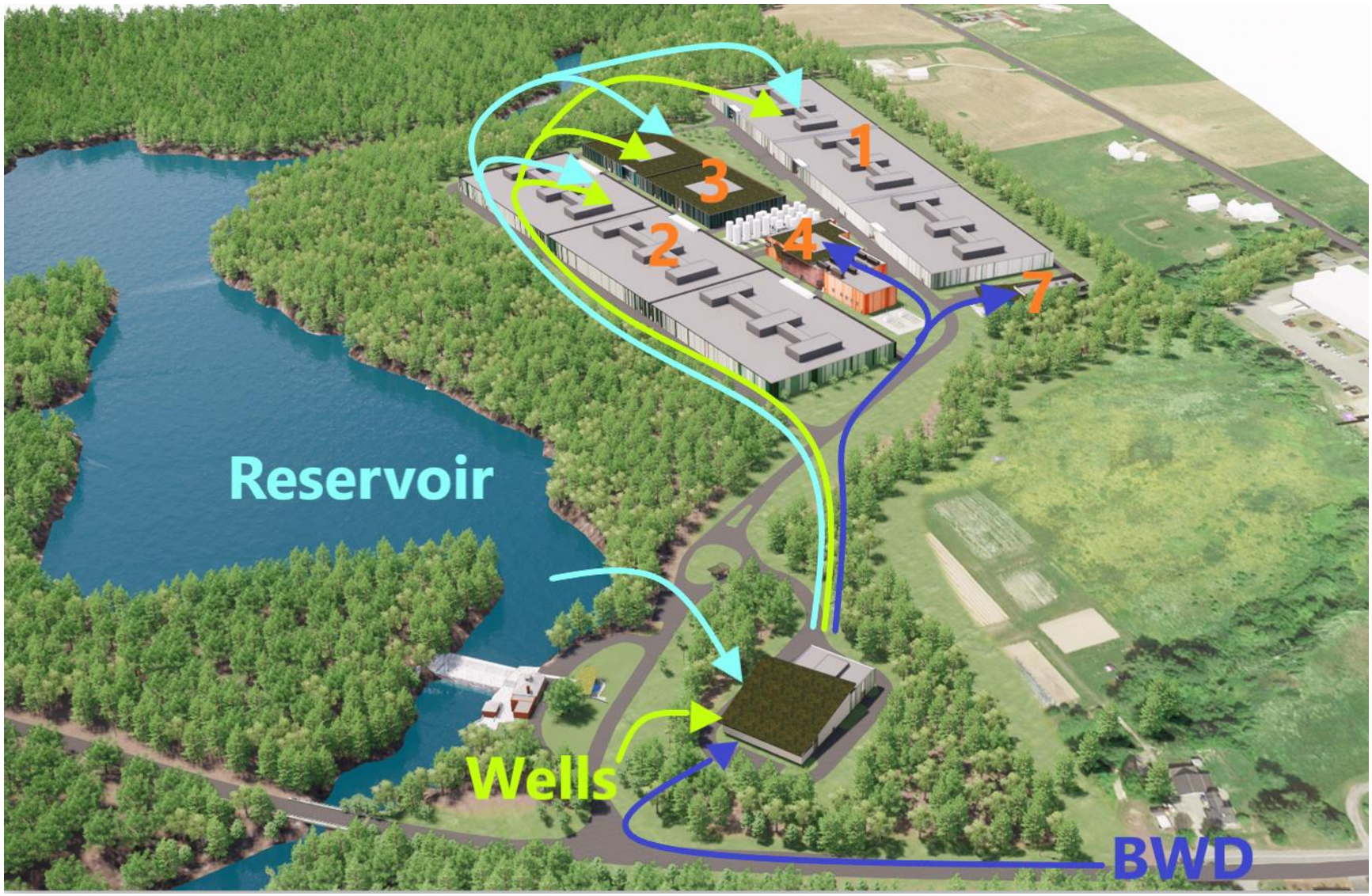
The proposed 250 gpm surface water withdrawal rate is an estimated use to replace another source temporarily, if needed, and represents 50% less than 500 gpm used historically when this reservoir was the primary drinking water supply for Belfast. The anticipated surface water withdrawal is based on rules set forth in Maine Department of Environmental Protection (MEDEP) Chapter 587 allowing for a withdrawal of 70 gpm plus inflows to Belfast Reservoir Number One (also known as the Lower Reservoir). In order to account for inflows into Belfast Reservoir Number One in the planning process, a rate of 250 gpm is presented in **Table 1** as a conservative estimate of the baseflow of the Little River. This rate is derived from the estimated 5% duration flow of the Little River.

**Seawater**

The saltwater needs for the facility will be drawn from Penobscot Bay using two parallel 30-inch diameter pipelines which extend approximately 6,400-feet from the shore access point to the intake point. The saltwater intake structures will be located about 10-feet above the seafloor and will feature 1-inch screen mesh to prevent entrainment of larger particulates or sea life. The pipelines will transport saltwater to a pump station located beneath the water treatment plant.

# Attachment 1

# Freshwater Supply Figure


Reservoir
Wells
BWD
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