



REVIEW MEMORANDUM

Date: October 13, 2021
To: Bub Fournier, City of Belfast
From: Matthew Reynolds, P.E., L.G.
Cc: Mandy Olver, Olver Associates
Subject: Review of Nordic Aquafarm Updated Water Resource Monitoring Plan-August 24, 2021

At the request of the City of Belfast Planning Department and Planning Board, Drumlin Environmental, LLC (Drumlin) has reviewed the August 24, 2021 *Updated Water Resource Monitoring Plan* (WRMP) prepared by Ransom Consulting, Inc. for the Nordic Aquafarms, Inc. (Nordic) project. This WRMP was submitted to the City to satisfy Condition of Approval #3 of the Significant Ground Water Wells Permit (Permit) approved by the Planning Board in December 2020.

Drumlin's review is intended to assess whether the WRMP will satisfy the related Conditions of Approval in the Permit. In reviewing the WRMP, Drumlin also considered the monitoring requirements identified in the Maine Board of Environmental Protection (BEP) Site Location of Development Act (SLODA) and related permits for the project.

Where action is recommended by the City or Nordic, the text is printed **in bold**.

I. Overview.

The updated WRMP provides for reasonable, comprehensive monitoring and evaluation of the potential impacts from the project on groundwater, surface water and private wells in the vicinity of the project. To the extent possible with the data currently available, the WRMP identifies threshold conditions that may pose an adverse impact and outlines proposed actions that Nordic will take if these threshold conditions are triggered by the project. Where appropriate, the WRMP describes plans to collect additional background data during construction in 2022 and 2023 to refine the threshold conditions described in the WRMP. Comments provided in the remainder of this memorandum are provided for consideration by the City Codes and Planning Department staff and Planning Board in its permit review and approval role.

II. Review of Compliance of Updated WRMP with Significant Ground Water Wells Permit Conditions of Approval.

- **Condition 3 - Revisions to the Water Resource Monitoring Plan:** This condition has been addressed by submittal of the Updated WRMP.
- **Condition 4 - Installation and Monitoring of Well BRK-203:** This Condition has been addressed and the updated WRMP includes installation and monitoring of bedrock well BRK-203 adjacent to overburden wells OVB-103S and -103D.

- Condition 5 - Monitoring Private Wells: The Condition has been addressed that required Nordic to inventory the source of water supply for developed lots along roads identified in the Permit. On June 18, 2021, Nordic submitted information to the City including an example contact letter, a tracking spreadsheet with contact information for lots in Area 1, a map of identified private wells in Area 1, and an inventory of lots in Area 2. Appendix C of the updated WRMP includes the tabulated contact summary for Area 1 lots.

Condition 5 of the permit states that in Area 1 Nordic contact all owners of developed property "...and if the property has one or more private wells, request that the owner allow Nordic to install equipment to monitoring their private well(s)..." Nordic's homeowner contact letter template provided to the City reads "If you do have a well on your property that you would like included in the monitoring program..., ideally we need to hear back from you by June 15th in order to provide detailed information about the monitoring program..." Section 2.1 of the updated WMRP indicates that "As of the date of this updated WMRP, 13 private well owners have been identified to be approached for inclusion in the monitoring program..." The tabulation included in Appendix C of the updated WRMP identifies the property owners that have acknowledged contact from Nordic.

For clarification, we recommend that Nordic expand the Appendix C table to show which property owners have asked to be included in the monitoring program and which have declined to participate.

- Condition 6 – Monitoring Information to Property Owners: This Condition has been addressed and the updated WRMP includes semi-annual reporting of private well data to the property owner and the City.

The updated WRMP also indicates that Nordic will collect baseline water quantity and quality data on private wells participating in the monitoring program during the construction phase. However, private well owners who enter the monitoring program after the start of operation will be responsible to document water quantity and quality conditions prior to Nordic's operation.

- Condition 7 – Specific Monitoring Requirements During Project Construction: This Condition has been addressed and the updated WRMP proposes to implement the monitoring program during construction to collect baseline data and develop warning and action levels.
- Condition 8 – Requirements Regarding Action Alerts: The updated WRMP describes the process that Nordic will use to gather data prior to the start of facility operations and use that data to finalize Action Alerts. Nordic proposes to submit final alert and action criteria to the City for review and approval prior to start of operations.

The updated WRMP proposes that alert (warning) and action criteria for private wells include (a) the relationship of the water level in the well to the pump and (b) the total dynamic head of the pump and plumbing system. The WRMP proposes to use these criteria to establish specific numerical thresholds for each private well in the monitoring program, once baseline information about the private well plumbing and baseline water level data are

collected. Once well-specific threshold values are determined, a written summary for each private well will be provided to the City and Maine Department of Environmental Protection (MEDEP) and the specific criteria will also be provided to each well owner.

Condition 8 requires identification of minimum flow in the Little River, which is described in the updated WRMP. Condition 8 also requires a plan to determine whether Nordic operations are influencing flows in the River and if so, a plan to maintain minimum flows within the affected reach of the River. The updated WRMP describes actions Nordic will take to maintain minimum flows, but does not describe how Nordic's influence on river flow will be determined (Also see comment on Section 3.6.3 below.)

- Condition 9 – Maximum Amount of Water Use from Groundwater Wells: The updated WRMP proposes maximum water use from groundwater wells of “up to 455 gallons per minute from the on-site bedrock production well network”, which is consistent with the table in Condition 9. The withdrawal rate and total withdrawal from each production well will be measured hourly using the supervisory control and data acquisition (SCADA) system for the facility. Withdrawal data will be reported to the City and MEDEP as part of the monthly reporting proposed in the WRMP.
- Condition 11 – Nordic Requirement to Ensure Private Property Owners are “Whole”: This is an on-going condition of operation. The updated WRMP identifies specific action criteria for private wells and includes a two-part Action Plan for private water supply wells. If the well becomes unusable, Nordic will provide a temporary alternative source of water while a permanent solution is enacted. Six potential permanent solutions are listed in the WRMP including lowering or replacing the pump, altering water use at the Nordic facility, drilling a deeper or new well and connecting the home to the municipal water system.

III Other Review Notes and Comments.

The bullets below describe general information from the updated WRMP for the City's information as well as specific comments or suggestions where appropriate. Where action is recommended by the City or Nordic, the text is printed **in bold**.

- Section 1.4 notes that the WRMP presents only preliminary alert and action criteria that will be updated after the background data collection period. Final criteria will be submitted to the MEDEP and City in an update to the WRMP for review and approval.
- Section 2.2 addresses the MEDEP request for “near real-time” monitoring data. Nordic plans to install automated data recording devices in the majority of groundwater level and surface water flow monitoring locations. Data will generally be collected hourly and uploaded to a data storage network daily.
- Section 2.2.1 and Table 1 identify that in 4 on-site monitoring wells on the eastern side of project site and in 3 private wells on Atlantic Highway and Windward Lane in Northport, the automated water level recording transducers will also measure specific conductance to monitor for possible salt water intrusion into the aquifer.

- Section 2.2.4 and Multiple Other Sections state that data and methods “will be provided to the MEDEP for approval prior to commencement of Nordic’s operation”. Other sections (e.g. Section 1.4) state that final alert and action criteria will be updated and “submitted to the MEDEP and City for review and approval”. The table below summarizes what is described in the updated WRMP regarding data and other information submitted to, and any expected input from, the MEDEP and City.

Section	Item	MEDEP	City
1.4	Final Alert & Action Criteria	Review & Approve	PB Review & Approve
2.2.4	Final River Stage/Discharge Calculation	Review & Approve	None
2.2.7	Qualitative Habitat Evaluation Index (QHEI)	Receive Submittal	None
2.3	Baseline Monitoring Data	Receive Submittal	P&C Receive Submittal
3.1	Private Well – Water quality impacts	Consult with	None
3.2	Wetland Impacts	Consult with	None
3.3	Stream Impacts	Consult with	None
3.4	Reservoir & Little River Minimum Flow	Notify	Notify P&C
3.5	Alert & Action Criteria Triggered	Notify	Notify P&C
3.6.1	Private Well Action Plan	Consult with	None
3.6.2	Lower Reservoir Action Plan	Consult with	None
3.6.3	Little River Action Plan	Consult with	None
4.2	Annual Report	Receive Submittal	P&C Receive Submittal
4.3	Monthly Reporting	Receive Submittal	P&C Receive Submittal
4.4	Private Week Data Report (Semi-annual)	None	P&C Receive Submittal
4.5	QHEI Surveys (Annual)	Receive Submittal	P&C Receive Submittal
4.6	In-Stream Flow Data (Semi-annual)	Receive Submittal	None
5.0	Changes to the Monitoring Program	Review & Approve	PB Review

Note: PB = Planning Board, P&C= Planning & Codes Department

We recommend that the Planning Board clarify its expectations for Nordic regarding submittals, consultation, review and approval of data, criteria, actions and potential future modifications related to the WRMP and that Nordic revise the WRMP accordingly.

- Section 2.3 indicates that baseline monitoring data will be provided to the MEDEP and City monthly during the baseline monitoring period.
- Section 2.4.2 describes the use of surface water monitoring location SG-4 as a backup to the upstream monitoring location SG-Mid, where an automated water height measurement device will be installed. Considering that the river elevation, water height and flow will be different at SG-Mid and SG-4 the value of data from SG-4 as a backup location is not clear. **We recommend that Nordic establish a companion backup monitoring point at SG-Mid and elimination of SG-4 to improved backup data at the SG-Mid location.**
- Section 3.1 includes a list of construction data, pump and plumbing information and system conditions that, to the extent possible, will be collected at each private well to calculate the total dynamic head (TDH), which is one of the parameters proposed in Section 3.5 as

warning and action criteria for the private wells. Specific values of TDH will be calculated once the required data has been measured at the individual wells.

Section 3.1 does not, however, describe how TDH and water level data will be evaluated for private wells where there is rapid or significant changes in the water level in the well when used by the homeowner. If this condition is encountered during the baseline period, the Final warning and action criteria to be provided to the MEDEP and City at the end of the baseline monitoring period should describe how this condition will be integrated into the criteria.

- Section 3.1 proposes to compare the private well water quality data to the Maine Residential Groundwater Remedial Action Guidelines (RAGs). If no RAG has been set, comparison to the USEPA Secondary Maximum Contaminant Level (SMCL) “will be considered”. It is not clear why no reference is made to the USEPA Primary MCLs. **For clarity, we recommend that Nordic provide a table with the specific benchmark concentration identified for each water quality parameter proposed in the monitoring program when the final warning and action criteria for private wells is provided for review and approval by the MEDEP and the City at the end of the baseline monitoring period.**
- Section 3.4 identifies the “normal high-water level” as the reference elevation for monitoring water height and possible water withdrawal volume in the Little River Reservoir. **We recommend that Nordic provide the “normal high-water elevation and how it compares to the crest elevation of the dam.**
- Section 3.4 Section 1.2 describes the allowable withdrawal from the Little River as from 70 gpm up to the instantaneous flow of the river (or the design limit of the intake). **For clarity when the City is reviewing withdrawal data, we recommend that Nordic provide a table showing the allowable withdrawal rate for various elevations of the Lower Reservoir (e.g, above normal high water, more than 1 foot below normal high water, more than 2 feet below normal high water, etc.).**
- Section 3.5.2 includes a table with flow information for the Little River calculated using StreamStats. The table includes flows calculated for the 5% Duration (i.e., flow is higher 95% of the time) and the 50% Duration (i.e., flow is higher 50% of the time). The updated WRMP proposes a “minimum” base flow between these two values, possibly to be updated after background data are collected. We anticipate that the MDEP will provide comment on this proposal. However, if a range of flows is proposed, **Nordic should provide further explanation about what actions and triggers will occur when the flow is within the proposed range.**
- Section 3.6.2 describes the Action Plan for the Lower Reservoir. However, Nordic has not proposed an Action Level for the Reservoir.
- Section 3.6.3 outlines that actions Nordic will take if the Little River drops below the Action Level due to Nordic’s operations. However, Nordic does not describe what data will be collected and how it will be evaluated to determine whether and to what degree Nordic’s

operations are influencing the flow in the Little River. **We recommend that Nordic provide this description.**

- Section 5.0 indicates that changes to the monitoring program will not be made without prior approval from the MEDEP. Condition 3 of the Significant Groundwater Well Permit requires that the City Planning Board review any amendments to the WRMP.