

Indian Head Hatchery Expansion Project

Environmental Registration 1975

Environmental Preview Report

Executive Summary

July 31, 2023

Mowi Canada East Inc.



Indian Head Hatchery Expansion Project Environmental Registration 1975 Environmental Preview Report

This document has been prepared for Mowi Canada East Inc. to be submitted on behalf of Northern Harvest Sea Farms Ltd. to the Province of Newfoundland and Labrador, Department of Environment and Climate Change according to the requirements of Government of Newfoundland and Labrador *Environmental Protection Act* and pursuant to the Minister of Environment and Climate Change Decision Letter of July 15, 2021.

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EXECUTIVE SUMMARY

Introduction

Project Name: Indian Head Hatchery Expansion Project

Environmental Assessment Registration: Environmental Registration (ER) 1975

Date of Registration: July 2018

Proponent

The proponent, Northern Harvest Sea Farms Ltd. (NHSF), is a Canadian company growing Atlantic salmon in the Province of Newfoundland and Labrador since the 1990's. In 2017, NHSF was purchased by Mowi Canada East Inc. (MCE).

MCE is a registered Canadian company farming salmon on the east coast of Canada including the Province of Newfoundland and Labrador.

This Environmental Preview Report (EPR) has been prepared by MCE on behalf of NHSF for the Province of Newfoundland and Labrador, Department of Environment and Climate Change, according to the requirements of Government of Newfoundland and Labrador *Environmental Protection Act* and pursuant to the Minister's decision of July 15, 2021.

Mowi is a global seafood company registered in Norway with fish farming operations in Norway, Scotland, Canada, the Faroe Islands, Ireland, and Chile. As a 100% owned subsidiary, MCE benefits from Mowi's vast knowledge and corporate integrity, as well as economic support. MCE shares and adheres to the production standards and environmental sustainability values set by Mowi.

Mowi is the largest salmon farming company in the world supplying 20% of the farm-raised Atlantic salmon with a harvest volume of 464,000 MT in 2022 and employing 11,500 people in 26 countries. As a fully integrated company raising salmon from egg to plate, Mowi ensures all aspects of production meet the highest standards in all operations globally.

Mowi's holistic approach to fish culture places the emphasis on environmental sustainability. The company leads the industry in continuous improvement in all aspects of salmon farming. Significant corporate resources are invested in innovations and improvements to improve the health and welfare of salmon, to minimize interactions with the environment, and to provide the

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best food for our customers.

In recognition of these efforts, for the fourth year in a row, Mowi has been ranked the most sustainable protein producer by the independent Collier FAIRR Protein Producer Index.

Purpose

The Indian Head Hatchery Expansion Project (Hatchery Expansion) proposes to improve the production of Atlantic salmon at the existing and fully licensed Indian Head Hatchery by increasing the number of Atlantic salmon juveniles ready to go to sea (referred to throughout this document as smolt) by 2.2 million annually and producing larger and more robust smolt, to fully utilize MCE's saltwater farm capacity within the Province of Newfoundland and Labrador, to improve environmental performance, and to enhance production security.

Project Rationale

The Hatchery Expansion is required to support business development within the province and meet the targets in the 2018 Newfoundland Salmon Farming Development Business Plan submitted to the provincial government, to enhance environmental sustainability, and to improve production and business security.

Business Development

The Hatchery Expansion's additional 2.2 million smolt will be used to fully utilize existing licensed saltwater farms in the province. Additional smolt are an important component in developing an independent self-sustaining salmon culture business in the Province of Newfoundland and Labrador that includes both freshwater and saltwater production.

Environmental Improvement

The Hatchery Expansion represents MCE's principles of continuous advancement towards more environmentally sustainable salmon farming. The project will improve the hatchery's environmental performance in the following ways.

1. Reduced potential for environmental interactions and escapes through installation of a fully enclosed Fish Transfer System to move smolt to the transport vessel.
2. Greater efficiency in use of freshwater by installing new Recirculating Aquaculture

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System (RAS) technology requiring less water per smolt grown.

3. Lowering the effluent environmental risk profile with improved wastewater treatment including additional particle removal, triple screening, and disinfection.
4. Improved production efficiencies through upgrades in existing systems for healthier fish and improved fish welfare.

Business Security

The Hatchery Expansion will increase long-term industry and business stability by producing larger (250+ g), more robust smolt. Larger smolt are the industry standard worldwide as they shorten the time that salmon spend in the ocean, minimizing exposure to sea lice and natural pathogens, and thus reducing the opportunity for potentially negative environmental impacts.

Environmental Assessment History

The Indian Head Hatchery Expansion was submitted for environmental assessment and registered as ER 1975 in July 2018. After government assessment, the project was released from further environmental review the same year and the project construction commenced. Following a legal challenge by special interest groups represented by the environmental charity Ecojustice, a court decision in 2021 overturned the 2018 release. The Minister of Environment and Climate Change (the Minister) subsequently ordered an Environmental Preview Report (EPR) to fill in the data gaps identified by the Judge.¹

MCE elected to provide an EPR, and the Minister appointed an Environmental Assessment Committee (EAC) in August 2021 to provide guidance to MCE in the preparation of the EPR. Details of the history of ER 1975 are provided in the Introduction section.

The EPR Guidelines, developed to provide direction on the information to be included in the EPR, were issued in December 2021. This EPR is an unrestricted and candid reporting of MCE fish farming practices as requested in the Guidelines.

Environmental Preview Report (EPR)

Salmon farming is complicated, highly technical, and continuously evolving. For these reasons,

¹*Salmonid Association of Eastern Newfoundland v. Her Majesty the Queen in Right of Newfoundland and Labrador*, 2020 NLSC 34, aff'd 2021 NLCA 26

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the industry is often not well understood by the public. The EAC has provided Guidelines for the EPR with topics that the public indicated more information was required.

Along with the public engagement sessions conducted during the preparation of the EPR, this document will promote greater understanding of how aquaculture is regulated within the province and MCE's farming practices.

Purpose

The purpose of the EPR is to address the information gaps identified during the legal challenge in sufficient detail for the Minister of the Department of Environment and Climate Change (the Minister) to determine if the mitigation measures manage the potential environmental interactions and no significant negative environmental effect nor significant public concern remains in connection with the proposed undertaking.

Scope

As per the direction of the Minister and the EAC, the scope of the undertaking for the purpose of the EPR includes the following.

1. The systems, technologies, and processes required to increase production at the Indian Head Hatchery from 4.5 million Atlantic salmon smolt to 6.7 million annually (as listed in the original registration).
2. The requirements for rearing Atlantic salmon through full life cycle from egg to harvest.
3. The potential effects on the surrounding environment from Atlantic salmon production through the full life cycle, from egg to harvest, and the regulatory controls and company policies in place that mitigate harmful effects.

The Undertaking

The Hatchery Expansion proposes to increase production at the existing licensed Indian Head Hatchery by 2.2 million salmon smolt (juveniles ready to go to sea) annually while improving efficiency and security of salmon production and reducing the hatchery environmental footprint. The additional smolt will all be grown to harvest on saltwater farms in the province and will be used to fully utilize existing licenced saltwater farms. A full description of all components of MCE facilities, operational procedures, and culture parameters used to grow salmon from egg to harvest is provided in Section 4.0 Description of the Undertaking.

Hatchery Expansion Construction

As a result of the timing of the Court decision that overturned the 2018 release of the undertaking, the components of the Hatchery Expansion are either partially or fully constructed. It is indicated in the list below which elements are not completed.

- **Additional fish production units** - Modular RAS Building with four independent fish culture modules each having four culture tanks and a dedicated RAS technology which cleans and reuses up to 97% of the fish culture water. These units are capable of freshwater and saltwater culture of smolt 250+ g in size.
 - Modules 1 and 2 are complete, modules 3 and 4 have not yet been constructed.
- **Improved vaccination and grading** – The improved vaccination and grading system has enclosed fish transport lines leading to and from culture systems providing better fish welfare and more efficient vaccination and grading processes.
- **Enhanced effluent management** - New Effluent Treatment Building 2 to process all fish culture wastewater with 37-micron particle removal, triple screening, and ultraviolet disinfection prior to discharge at a new deep-water outfall.
- **Secure fish culture freshwater source** – Three new freshwater wells provide additional water for the increased production. The water flows from the wells to the new Water Treatment Building where it is disinfected and stored in a reservoir prior to use in the culture systems.
- **New fish culture saltwater source** – New wells provide saline fish culture water to acclimatize the salmon for ocean rearing.
 - This system is not complete. An additional barrier well is required to increase the salinity in the production wells. The water line between the hatchery and the Water Treatment Building has not yet been installed.
- **Secure fish transfer system** - New fully enclosed Fish Transfer System runs from the Modular RAS Building to the transport vessel at the Port of Stephenville. It is a fully enclosed system for conveying fish that reduces the potential for escapes and loss of fish culture water to the environment while providing more efficient transfer to the vessel and improved fish health and welfare.
 - The section of the Fish Transfer System from the boundary of the hatchery property to the Port of Stephenville is not yet constructed.

The Hatchery Expansion components will support increased production and higher quality larger smolt that are better acclimatized to the ocean. The new technology will allow for enhanced

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management of the fish culture environment and greater efficiency in the use of freshwater. The fish culture effluent will have additional treatment including disinfection prior to discharge.

Indian Head Hatchery

Since 2011, the Indian Head Hatchery has been licensed to produce 4.5 million salmon from egg to smolt annually. The facility is fully compliant with all licence conditions and provincial and federal regulations and policies that govern freshwater salmon culture in the Province of Newfoundland and Labrador. The Indian Head Hatchery operational licences include Aquaculture Licence #1087 and Water Use Licence #WUL 18-9929.

The hatchery is ideally located in the Port of Stephenville Industrial Park with services, including power, water, fire protection, and paved roads, and a deep-water port for the vessels transporting smolt to the saltwater farms. The hatchery and the Hatchery Expansion components are all located on land owned or leased by MCE or in process to be owned or leased.

Fish Culture

Including the components of the Hatchery Expansion, the hatchery has five fish culture buildings with dedicated water influent lines and effluent lines: egg incubation and fry rearing building, three smolt rearing buildings, a new modular RAS building. There is also a grading/vaccination building used during culture.

- The grading/vaccination building is a component of the Hatchery Expansion that was fully constructed prior to the court's reversal of the release decision.
- The Modular RAS Building, which is also part of the Hatchery Expansion, is not fully constructed.

All culture systems have fish rearing tanks and recirculating aquaculture system (RAS) technology that allows for enhanced control over the fish culture environment to manage fish health and welfare. RAS technology also provides the ability to make highly efficient use of freshwater resources. With the current fish culture systems, up to 97% of the fish culture water is cleaned and re-used. The Hatchery Expansion Modular RAS Building is designed for 97% of the fish culture water to be treated and re-used. In employing the RAS technology, less than 5% of the culture water is required to be renewed each day. Traditional flow-through hatchery culture systems would require 100% new water.

Fish Culture Water Source

Freshwater for fish culture for the current production and for the proposed Hatchery Expansion is 100% sourced from a nearby aquifer. Extensive testing and modeling of the groundwater since 2018 showed the quality meets fish culture parameters with no requirement for chemical modification and has no contamination. The aquifer recharge rate is more than adequate for the current hatchery production, the proposed Hatchery Expansion, and all other users who withdraw from the same source.

The use of the groundwater is actively managed by the Department of Environment and Climate Change (ECC) Water Resources Management Division on several levels.

Extensive testing and modeling of the freshwater aquifer completed prior to submission of ER 1975 demonstrated the aquifer has the capacity to supply the additional hatchery requirements.

Conditions of the Water Use Licence WUL 18-9929, including annual water use reports.

A hydrogeologic assessment was completed and reports submitted to the Water Resource Management Division every two months and accepted by the ECC Minister.

A groundwater monitoring system, a condition of ER 1975 release in 2018, has been installed and will continue to be operated as per the Water Use Licence. This system provides data reported to the ECC for management of the aquifer use. All costs for installation, operation, and maintenance are paid for by MCE.

A real-time water quality and quantity monitoring network continues to provide water levels and selected water quality parameters with the type, number, and location of the stations to the ECC.

Water flows from the deep wells to the Water Treatment Building, a component of the Hatchery Expansion that was fully constructed prior to the court's reversal of the 2018 release. At the Water Treatment Building, the influent water is UV disinfected as a precaution and held in a reservoir prior to distribution to the fish culture units.

Fish Culture Effluent Management

The fish culture effluent management system has been designed to service the current production and the proposed additional Hatchery Expansion production. As all current and proposed hatchery fish culture systems have RAS technology, less than 5% of the volume is discarded as effluent.

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- Effluent Treatment Building 1 is pre-existing. Effluent Treatment Building 2 is a component of the Hatchery Expansion that was fully constructed prior to the court's reversal of the 2018 release decision.
- Effluent Treatment Building 2 includes enhanced technology and capacity to remove solids to 37 microns, triple screen the liquid effluent, and UV disinfect to eliminate pathogens prior to discharge at a deep-water outfall.

100% of current fish culture effluent is processed through both buildings. When the Modular RAS Building is completed and functional, the effluent from this system will be processed through Building 2 only.

Effluent is sampled monthly and tested for over 40 parameters to ensure compliance with the *Environmental Control Water and Sewage Regulations, 2003* NLR 65/03 and Best Aquaculture Practices Certification Standards, Guidelines: Finfish, Crustacean and Mollusk Hatcheries and Nurseries, Appendix A.

Fish Transport to Saltwater Farms

The proposed Hatchery Expansion includes an efficient and secure Fish Transfer System consisting of an enclosed pipe that runs from the hatchery to the transport vessel. The fish culture water used during transfer is returned to the hatchery or held with the fish in the vessel. This permanent and enclosed structure will reduce environmental impacts by reducing the potential for escapes and discharge of untreated fish culture water to the environment.

All salmon are shipped to saltwater farms via transport vessel. The standard protocol is no water exchange with the environment during transport. Water quality monitoring and aeration and oxygen systems are continuously active for the duration of the trip. The salmon arrive at the saltwater farms in the best condition and are transferred securely to net pens via enclosed lines with catch nets.

Saltwater Farms

The salmon smolt produced at the Indian Head Hatchery, including the proposed Hatchery Expansion smolt, will grow to harvest size on saltwater farms located on the south coast of the province in the Bays East and Bays West areas. Bays East has operations to the east of Harbour Breton including Harbour Breton Bay. Bays West area is to the west of Harbour Breton excluding farms in Harbour Breton Bay. Most farms are remote with access by water only,

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limited local activity, few close communities, and no nearby sources of pollution.

Thirty-nine saltwater farms owned by MCE are the full complement of farms available for production. All farms have a valid aquaculture licence, water use licence, crown lands permit, and *Navigable Waters Protection Act* (NPA) approval. These authorizations indicate each site has been thoroughly reviewed for potential environmental impacts and the use of the site as described in the application meets all environmental thresholds and regulatory standards.

Six new farm applications have been submitted but have not been approved, therefore these sites are not available for salmon culture production planning.

The licences have been attained through purchase or acquisition of other companies or through new aquaculture licence applications.

- At the submission of the Indian Head Hatchery Expansion in 2018, thirty-three farms had been acquired from the purchase of Northern Harvest Sea Farms Ltd.
- By the end of 2018, seven additional licences had been acquired and three trout licences were removed from the production plan as this species is not currently farmed by MCE.
- In 2019 and 2020, ten new licences were approved, and eight licences were dropped from production due to being in areas shared with other companies which no longer aligns with the company's Bay Management Area (BMA) principles, leaving a total of thirty-nine farms available for production.

Farm infrastructure is certified third-party engineered design with installation according to the engineered site layout to ensure strength and to maintain integrity throughout the rearing cycle and all potential weather conditions reducing opportunities for predator access and for fish escapes.

Fish are cultured at a maximum stocking density of 15 kg/m³ to provide the best environment for fish health and growth, sea lice management, and water quality management. Fish are fed on a specific schedule using calculated quantities of feed and during feeding are continuously monitored for behaviour that indicates satiation – the point at which the salmon are no longer consuming the food pellets. Once satiation has been reached, the feeding is stopped to reduce uneaten feed which has the potential for environmental impact.

Potential Environmental Interactions and Mitigations

Situations with the potential for environmental interaction were identified in the Guidelines and include use of the freshwater resource, pathogen transfer between farmed and wild salmon, management of mortalities, benthic habitat impacts, chemotherapeutant use, activities that affect species at risk, invasive species distribution, and farms salmon escapes.

A summary of the interactions identified in the Guidelines with the MCE operational measures and the regulations and policies in place to safeguard the environment can be found in Table 71 Summary of Potential Environmental Interactions and Operational Mitigations Summary in Section 6.0 Potential Environmental Interactions and Operational Mitigations.

Unless otherwise indicated, the information provided on potential environmental interactions, comprehensive regulatory controls, detailed MCE management plans, and farming operating procedures apply to the rearing of all MCE salmon in the province including the proposed Hatchery Expansion salmon.

Regulatory Environmental Safeguards

The Province of Newfoundland and Labrador has comprehensive and rigorous regulations, policies, and active administrative processes that govern salmon aquaculture with environmental sustainability as an overriding principle.

Licensing

All licensed saltwater farms in the province have had rigorous review by provincial authorities, namely Department of Fisheries, Forestry and Agriculture (FFA) and Department of Environment and Climate Change (ECC) and federal agencies, namely Department of Fisheries and Oceans (DFO) and Transport Canada (TC) as part of the aquaculture licence application process. Questions or concerns, including those raised in public consultation, are addressed during the review. Design changes are made until all agencies are satisfied.

The aquaculture licensing review process includes full assessment for the following.

- Review of benthic environment and potential impacts (DFO)
- Mitigation measures to protect the environment and the farm site (DFO, FFA)
- Wild and farmed interaction, both traditional fishery species and wild salmon (DFO)
- Operational Plans (FFA)
- Water use and environmental review (ECC)

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All MCE facilities in production are fully licensed and are fully compliant with all licensing and operational regulatory and policy requirements. In addition, the facilities have operational and management plans and policies that meet or exceed the regulatory requirements.

Bay Management Area Strategy

In 2015, the Government of Newfoundland and Labrador established the Bay Management Area (BMA) principles to enhance the health and biosecurity of saltwater farms and to preserve the environmental integrity of the ecosystem. MCE follows all regulations and government policies including the Bay Management Strategy. Examples from the strategy include the following.

- A company operating within a BMA will stock with the same year class of fish.
- Minimum of four months fallow between stockings for a BMA. Fallowing refers to the time when no fish are grown on the site after harvest and before the next stocking.
- A biosecurity management plan, that dictates the flow of materials between sites and BMAs, must be provided to FFA.
- Each company must provide Production Plans for FFA approval.
- New site separation within the BMA is 5 km apart for different companies and 1 km apart for the same company.

Aquaculture Act, Regulations and Policies

The provincial *Aquaculture Act* provides the Department of Fisheries Forestry and Agriculture (FFA) with the authority to manage and control the development of the aquaculture industry in the province. The purpose of the *Act* and associated regulations is to promote the prudent and orderly development of the aquaculture industry, secure property rights, minimize resource user conflicts, and engage in co-operative decision making with external government agencies.

The operational Aquaculture Policy and Procedures Manual provides the processes for the development, licensing, and operation of an aquaculture facility. It includes aquatic animal health responsibilities with the objective of promoting the orderly development of an environmentally sustainable aquaculture industry, establishing the province as a world leader in aquaculture health and production, and increasing public trust.

The Aquaculture Policies provide a comprehensive framework for salmonid culture in the province. MCE abides by the regulations as stated under the *Aquaculture Act* and the detailed guidance provided in the Aquaculture Policies.

Code of Containment of Salmonids

MCE respects and meets or exceeds all requirements in The Code of Containment for Culture of Salmonids in Newfoundland and Labrador (The Code). The Code is a provincial government policy that addresses salmon containment and escapes through equipment standards, handling practices, infrastructure testing and reporting requirements, inspections, and reviewing company management plans and mitigating measures.

The Code is a management strategy for the culture of salmonids and focuses on containment of farmed fish as a fundamental aspect of sustainable aquaculture.

- All salmonid culture license holders are required to abide by The Code under the authority of the *Aquaculture Act* and regulations.
- The Code represents the province's commitment to maintaining sustainable development that is transparent, responsible, and collaborative.

The Code is managed for the province by FFA and for the federal government by DFO. Both regulators are responsible for ensuring robust requirements are in place to minimize farmed fish escapes and to effectively deal with escapes if they do occur.

Certificate of Health for Fish Transfer

All salmon to be transported to saltwater farms have an extensive health assessment and a risk assessment by the provincial veterinarian prior to transport. The FFA Aquatic Animal Health Division (AAHD) determines the requirements for the health assessment and conducts the risk review. The requirements include the components required for the Certificate of Health for Fish Transfer (CoHFT) developed to ensure the health of farmed fish moved between provinces on the east coast of Canada. The required FFA Transport Permit and DFO Introductions and Transfer Licence are only issued once the AAHD provincial veterinarian is satisfied the fish meet the health standards.

Reporting

All freshwater and saltwater salmon culture operations are managed by either federal or provincial regulations or a combination of both. Reporting is a requirement of all regulatory agencies. MCE submits detailed reports regularly to these agencies. Public reporting is also a requirement of the aquaculture licence for specific situations such as an escape event.

Corporate Commitment to the Environment

Mowi's continuous improvement principles have provided support for salmon farming innovations aimed at reducing potential environmental interactions across all areas where the company farms.

Following the Mowi requirements, MCE has developed comprehensive management plans that provide or set the standards for strategies, responsibilities, and standard operating procedures for all operations. The management plans and all fish culture activities focus on rearing healthy salmon and protecting the environment.

The management plans include but are not limited to the following topics.

- Operational Environmental Mitigation
- Mitigating Potential Farm Impacts on the Environment
- Environmental Management and Waste Management
- Salmonid Fish Health Management
- Integrated Pest Management
- Sensitive Habitat and Species at Risk Management

The management plans are reviewed annually and revised to reflect MCE's continuous improvement through all practices, aligning with new standards developed by Mowi globally. The management plans are in compliance with or exceed all regulatory requirements. The management plans are also submitted to and approved by the Government of Newfoundland to ensure they meet all regulations and policies.

Environmentally Friendly Protein Production

By all indicators, salmon farming is the most environmentally efficient form of animal production with the lowest freshwater use, lowest carbon emissions, and smallest environmental footprint compared to beef or pork. The carbon footprint of farm-raised salmon is 7.9 kilogram of carbon equivalents per kilogram of edible salmon product, compared with 12.2 and 39 kilograms of carbon equivalents per edible kilogram of pork and beef respectively.²

Sustainability Strategy

The Mowi Sustainability Strategy is a company-wide policy that recognizes the value of the

²220707-Mowi-Policy-on-climate-change-and-energy-use.pdf.

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environment and the corporate responsibility in safeguarding it for the future. This strategy aligns with the UN Sustainability Development Goals. [The Sustainable Development Goals \(SDGs\) - Mowi Company Website.](#)

The Sustainability Strategy provides a framework for developing salmon rearing practices with the environment in mind. For example, Mowi's plastic waste reduction target for 2025 is for 100% of plastic packaging to be reusable, recyclable, or compostable. The Sustainability Strategy is more fully explained in the introduction to Section 6.0 Potential Environmental Interactions and Mitigations.

Global Sustainable Seafood Initiative

Mowi endorses the principles of the Global Sustainable Seafood Initiative (GSSI), a public-private partnership that works to preserve oceans for future generations and provide a sustainable source of seafood for everyone. The GSSI is aligned to implement the UN Sustainable Development Goals through collaboration of businesses, NGOs, governments, and international organizations representing the full seafood value chain.

Coller FAIRR Index

The independent [Coller FAIRR Protein Producer Index](#) evaluates sixty of the largest global meat, dairy, and aquaculture companies annually. It has recognized farmed salmon producers as the most sustainable animal protein producers in the world.

In 2022, **Mowi ASA was ranked the most sustainable protein producer globally for the fourth year in a row** and was rated “**Industry Best**” using criteria aligned to the SDGs including greenhouse gas emissions, deforestation and biodiversity, use of antibiotics, animal welfare, working conditions, food safety, and governance.

Best Aquaculture Practices (BAP) Certification

All MCE salmon harvested from the province are Best Aquaculture Practices (BAP) certified. BAP is a Global Seafood Sustainability Initiative (GSSI) recognized standard designed to reduce the impact of aquaculture activities on the environment and increase production efficacy through science and research. BAP standards provide the framework for ecological sustainability. Independent audits of each production site ensure MCE is doing everything they can to be ecologically sustainable. MCE has participated in the program since 2012. The Indian Head Hatchery was the first hatchery to be BAP certified in North America.

Wild-Cultured Interactions, Cultured Salmon Containment

It is standard Mowi policy that interaction between cultured salmon and wild salmon is to be avoided at all costs. Detailed protocols and procedures for reducing opportunities for fish escapes are included in the MCE Environmental and Waste Management Plan, Management of Wild and Farmed Salmon Interactions that are revised as needed and approved by FFA. This ensures all regulations and best practices are followed.

- Farm infrastructure is designed, and engineer certified to ensure strength and integrity throughout the rearing cycle and all potential weather conditions and to reduce the potential for equipment failure.
- All equipment meets or exceeds the conditions as determined in the provincial Code of Containment.
- Equipment is routinely inspected and promptly replaced as needed and determined by provincial and federal aquaculture regulations.
- Specific training has been designed to ensure crew and operational staff are aware of the best management and husbandry practices to safeguard salmon and reduce the potential for escape.

In managing potential environmental interactions, the robustness of salmon farming equipment is of key importance. MCE farm design is third-party engineering certified for environments similar to the south coast of the province ensuring no infrastructure will fail which could result in the potential for fish escapes.

In addition to reducing the potential for escapes, MCE exclusively uses local Saint John River stock which is the only stock approved by DFO for aquaculture in the province. DFO manages the species/stock of salmon cultured through the National Code of Introductions and Transfers of Organisms Program which requires permits for all fish movement within the province and between the Canadian Atlantic provinces in order to reduce potential effects such as introducing a non-native species.

Hatchery Expansion Potential Environmental Impacts

The Indian Head Hatchery is licensed to produce 4.5 million smolt annually. In constructing the hatchery, the production processes and environmental impacts underwent a full environmental assessment, and the project was released in 2011 (ER 1544).

The Hatchery Expansion (ER 1975) is to further improve technology and processes to increase

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production by 2.2 million smolt annually. The project has been designed to provide greater management of culture practices, reduced requirement for freshwater resources per fish, and improved quality of effluent discharge – all significantly improving the current environmental footprint of the facility. The following information addresses the potential environmental impacts of the proposed additional production of 2.2 million smolt annually from the Hatchery Expansion.

Infrastructure Construction

The Hatchery Expansion construction and infrastructure design considered the potential environmental impacts.

- The hatchery site was previously used for industrial purposes and required minimal clearing and leveling prior to construction.
 - Hatchery Expansion systems – Modular RAS Building, Vaccination and Grading Building, and Effluent Treatment Building 2 – are all located on hatchery site in close proximity to the existing buildings.
 - Sub-surface water lines were installed in the same trench to reduce the need for disturbance.
- The Hatchery Expansion components were designed specifically for the site to improve environmental performance.
 - To take advantage of the natural slope of the site towards the shoreline, the Water Treatment Building is upland from the hatchery allowing fish culture water to be gravity fed to the fish culture systems reducing the need for pumping.
 - The Modular RAS systems are designed for up to 97% fish culture water re-use. The technology reduces the amount of water required per fish.

A full description of the status of the undertaking and the remaining construction is provided in Section 4.2 Hatchery Expansion Construction.

Freshwater Culture

The proposed Hatchery Expansion smolt production will increase the volume of fish culture water required, effluent discharged, and general waste.

- Additional freshwater for fish culture.
 - All tests and continuous monitoring show the groundwater source is capable of providing the required additional volume of fish culture water.
 - The proposed new Modular RAS Building technology provides enhanced control

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over the rearing environment and treatment of fish culture water allowing for up to 97% of the water to be re-used, reducing the amount of water required per fish.

- Additional waste and fish culture effluent.
 - The Hatchery Expansion includes Effluent Treatment Building 2 with additional waste management including removal of particles down to 37 microns, triple screening, and UV disinfection to remove pathogens. Though the volume of effluent will be increased, the potential for negative environmental impact is reduced.
 - The effluent is tested monthly to ensure it conforms to Government of Newfoundland wastewater regulations and the BAP standard.
- Additional waste materials.
 - All waste is managed through an approved Waste Management Plan included in the Environmental and Waste Management Plan that is on file with FFA.

Transport

The Hatchery Expansion Fish Transfer System eliminates the need for truck transport of smolt, reducing the concern for fish escapes during transport, loss of fish culture water to the environment, and eliminating fossil fuel consumption.

It is estimated the additional 2.2 million Hatchery Expansion fish will increase the number of vessel trips to saltwater farms by 2-3 annually. The additional trips will follow the existing transport vessel use and fish transport protocols that have the following safeguards.

- All fish transported from the hatchery to saltwater farms undergo a health assessment and review by the provincial veterinarian, prior to the issuance of the mandatory federal Introductions and Transfers Licence and provincial Transport Permit.
- The transport vessel is equipped with fish life support systems. Standard practice is to run closed without water exchange for the full trip from the hatchery to the saltwater farms. All waste materials generated on board are disposed of on-land at registered disposal sites. The vessel is thoroughly cleaned and disinfected prior to making a subsequent transport.
- The fish transport vessels are under contract and fully licensed. The transport vessel crew is responsible for all registrations and authorizations required for ships working in Canadian waters. Arrangements to use the Port of Stephenville wharf are made in advance by MCE and provided to the vessel captain.

Saltwater Culture

The Hatchery Expansion smolt will be grown on saltwater farms on the south coast of the province that are individually licensed for a specific limit of production. The smolt for stocking these farms will be sourced from either the Indian Head Hatchery or from outside of the province. The source of smolt does not change the number of fish that can be reared per farm, nor does it change the rearing practices at each farm. Therefore, growing the Hatchery Expansion smolt on existing fully licensed saltwater farms will not create the potential for environmental impact in excess of what has already been evaluated in the process of granting the aquaculture licence.

- The potential for environmental interactions was evaluated during the licence application process for each saltwater farm. This included a review of the rearing practices, technology, proposed stocking plan and the maximum rearing capacity. The proposed Hatchery Expansion is to produce additional smolt to fully use capacity at existing licensed saltwater farms. Therefore, the rearing of current hatchery production and proposed Hatchery Expansion production on saltwater farms has been taken into consideration previously during the licence application process. The proposed Hatchery Expansion salmon will not significantly increase the potential for environmental interactions beyond what has been already assessed during the licence approval process.
- The MCE Environmental Management and Waste Management Plan (EMWMP) applies to all aspects of saltwater production and focuses on management of potential environmental interactions. This plan and the associated standard operating procedures (SOPs) ensure all production practices align with government regulations and policies. The EMWMP is reviewed annually, revised as needed, and submitted for review and approval by FFA.
- The MCE Salmonid Health Management Plan provides operational guidance and reporting requirements for the management of fish health issues to maintain fish health and welfare at all times.
- For the farms designated to receive the Hatchery Expansion smolt, stocking and rearing must adhere to the same regulations, reporting, policies, and permitting required for every salmon farm in the province. This is the case if the smolt originate from the Indian Head Hatchery or elsewhere.

The stocking of each farm with hatchery smolt is approved by, and production continuously monitored by federal and provincial agencies, including FFA, ECC, and DFO. Impact on the farm site from salmon production is monitored and evaluated for each production cycle.

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Renewal of the licence is dependent on receiving approval from the Government of Newfoundland and Labrador departments and federal agencies.

Veterinary Services and Chemotherapeutant Use

For both the freshwater and saltwater culture, fish health is managed by a veterinarian certified in Canada. On the rare occasions that chemotherapeutants are required, Health Canada determines the products that are available, how they are used, and when they can be used in relation to harvest. Oversight is provided by the Government of Newfoundland and Labrador. After approved treatment, reports are submitted to several federal and provincial agencies to track the use of prescription chemotherapeutants.

Prior to being transported to saltwater farms, all salmon are vaccinated against disease, which is similar to how vaccines are used in other agricultural operations and in human medicine. As a result, antibiotic use on saltwater farms is rare, employed only when other methods of sustaining fish health are not successful. Antibiotics are never used to promote growth but only used for specific situations to ensure the health and welfare of the fish.

A comprehensive MCE Integrated Pest Management Plan for sea lice management is submitted to FFA for approval annually. Each treatment is managed by a licensed veterinarian and approved by government agencies. Only drugs approved by Health Canada can be used. The application of approved drugs is strictly regulated thereby tightly managing the potential for unwanted drugs in the marine environment.

The goal of all fish rearing practices is healthy robust salmon. Fish culture technicians apply biosecurity practices as outlined in Section 4.3b Biosecurity Protocols and for the most part aquaculture fish are healthy. The veterinarian manages biosecurity and fish health assessments. For specific health events, the veterinarian determines the response, manages the treatment, and ensures regulatory reporting as required. On the rare occasion a chemotherapeutant is deemed the best choice for fish health, the veterinarian is required to prescribe the drug, to manage the treatment, and assess the efficacy.

Detailed information on chemotherapeutants legally available for aquaculture, MCE's use of anti-microbials in the past two years, and management measures to mitigate environmental interactions please refer to Section 4.3c Veterinary Services for All Life Stages, Section 4.3d Purpose and Use of Anti-microbials, Section 4.3l Integrated Pest Management Plan, and Section 6f Chemotherapeutant Management. Section 6 Potential Environmental Interactions and Mitigations includes Table 71 Summary of Potential Environmental Interactions and Operational Mitigations Summary.

Biosecurity

Biosecurity is the ongoing process of identifying, evaluating, and addressing actions or events to reduce the risk of disease transmission, to or from the culture site.

MCE has developed rigorous biosecurity protocols that are detailed in the Salmonid Health Management Plan (HMP) that is reviewed annually, revised as needed, and approved by the provincial government to ensure all regulations and policies are addressed.

All salmon harvested in the province are BAP certified. BAP standards for biosecurity are also comprehensive and include the following that apply to both freshwater and saltwater rearing of salmonids.

MCE biosecurity and health management plans include procedures for site following, cleaning of farm equipment, visitor and vessel hygiene precautions, sanitary disposal of dead fish, increased vigilance if disease is suspected, sea lice management, and management of abnormal events including elevated mortality and reportable disease events.

Training programs ensure competency for implementing the Health Management Plan (HMP) and biosecurity Standard Operating Practices (SOPs).

Potential pathogens of concern are listed in the HMP and federally reportable diseases can be found at : <https://inspection.gc.ca/animal-health/aquatic-animals/diseases/reportable-diseases/eng/1322940971192/1322941111904>.

Health status documents for all live animals are brought into the facility.

HMP includes procedures and indicators to monitor and document the health of stocks including observations of physical appearance, feeding response and mortality, or of larval development and/or growth rate at biologically relevant intervals.

HMP includes procedures for identifying diseases in hatchery stocks, diagnosis of pathogens and, where necessary, determination of susceptibility to therapeutants and treatments.

Records are kept for the health status of all animals or gametes shipped from the facility.

All holding, transport, and culture systems are designed, operated, and maintained to minimize the unintended release of eggs, larval forms, juveniles, and adult animals.

Staff members who drive boats shall be trained to avoid contact between boats and net pens.

Biosecurity is the key to having healthy fish and effectively managing potential environmental interactions. As such biosecurity precautions are prevalent in all fish culture practices. In this document, specific protocols are provided in Section 4.3b Biosecurity Protocols, Section 4.3l

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Integrated Pest Management Plan, Section 6b Mitigation Strategies to Limit Pathogen Transmission and Section 6c Elevated Mortality and Reportable Disease Event Management.

Other Marine Users

MCE saltwater farms are entirely on the water and there are no terrestrial facilities for farm rearing of salmon. MCE saltwater farms are on the south coast in remote areas with small communities accessed by water or by a limited network of roads. Farms are accessible by water only and most are more than 5 km from a community.

Public engagement events and an open-door policy provide situations where MCE staff and other users can exchange information and discuss activities. In this way, other users are known to MCE staff. To date, any issues with other marine users have been resolved satisfactorily for both parties through communication.

Activities such as fishing, boating, and accessing cabins etc. are not restricted by the farm infrastructure nor the salmon farming activities. Access to the area is not impeded as the aquaculture license conditions require the following.

- A minimum 40 m navigation channel between farm infrastructure and the shoreline on all newly developed aquaculture farms.
- Minimum depth of 10 m above all farm sub-surface moorings.
- Aids to navigation such as buoys, day beacons, lights etc. are installed as required by Transport Canada for the safety of marine resource users.
- Provisions for lobster traps to be deployed and harvested near and beneath the farm infrastructure.
- All infrastructure, surface and sub-surface, are within the boundaries of the aquaculture lease.
- Though established farms can maintain current site separation, new sites operated by different companies in one BMA must be greater than 5 km apart and new sites operated by the same company must be greater than 1 km apart.

Detailed information on other users and maps with their activities can be found in Section 6j Avoiding Interference with Other Legitimate Marine Users and Appendix D: Mowi Canada East Inc. Saltwater Farms and Other Marine Activities in the Bay Management Area.

Decommissioning and Site Restoration

MCE is committed to the establishment of an independent and self-sustaining salmon farming business unit in the Province of Newfoundland and Labrador. This information provides contingency planning for the unlikely occurrence of having to decommission a site. Detailed information is provided in Section 4.2e Construction for Site Decommissioning and Restoration and Section 7.0 Decommissioning and Site Restoration.

Indian Head Hatchery

The Indian Head Hatchery is MCE's only freshwater production facility in the province. MCE has invested significantly in the Indian Head Hatchery and this facility is a key component in the development of an independent sustainable Atlantic salmon aquaculture business in the province. Therefore, there is no plan to close this facility.

However, should decommissioning be required, a detailed plan would be developed and approved to ensure all environmental requirements are addressed.

- The modular nature of the fish culture systems allows for staged shutdown of individual culture units and/or individual buildings without affecting the functions of other units or buildings.
- Water flow and effluent also have individual lines and are managed separately for each building.
- Equipment will be moved to other MCE sites, sold, or recycled.
- A building to be decommissioned would have the same controls and procedures in place during construction that ensured limited impact on the environment.
- Any materials not reused will be recycled or disposed of as indicated in the MCE Waste Management Plan approved by FFA.

Saltwater Farms

The equipment used on the saltwater farms is designed and constructed to be accessible and taken apart for regular cleaning and repair and if necessary, replacement. These normal activities are undertaken on a defined maintenance and repair schedule as determined by FFA and DFO. Inspection reports are provided by MCE to regulatory agencies.

In the case of farm decommissioning, a Site Restoration Plan was provided to the Government

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of Newfoundland and Labrador for approval with all new site applications submitted since 2019. By the fall of 2023, all operational farms in the province will have an approved Site Restoration and Financial Assurance Plan that details the process of decommissioning and site restoration and has company financial commitments.

At the heart of the plan is collaboration with regulatory agencies to determine the infrastructure removal and schedule to meet all government requirements.

The federal *Aquaculture Activities Regulations* (AAR) protect the environment from potential negative effects. A survey is completed for every new farm site prior to licensing that includes site bathymetry, bottom type, wild species present on the site, current flow, and temperature throughout the water column. This baseline survey documents the natural state of the site prior to salmon farming and can be used to confirm no lasting detrimental effects after decommissioning.

Site components will be re-used or recycled as much as possible and disposed of according to the MCE Environmental Management and Waste Management Plan (EMWMP). This plan is reviewed annually, revised as needed and submitted to FFA for review and approval. The EMWMP is developed according to the FFA Environmental and Waste Management Guide, 2022. As of 2023, though plastics can be sent to a landfill in the province, MCE has chosen to recycle or stockpile large plastics until a recycling option is available.

Public Engagement

As part of the EPR preparation, three options were organized for the public to learn more about the project, engage with MCE representatives, ask questions, and submit comments. An in-person information meeting, a virtual live question and answer session were organized, and a project website provided project information and the opportunity for the public to provide comments. Comments received were overwhelmingly supportive.

Towns of Stephenville Support

The Town of Stephenville has provided a Letter of Support for the Hatchery Expansion in recognition of the contribution of this undertaking to the community in employment, service contracts, and taxes and municipal fees, See Appendix F: Town of Stephenville Letter of Support for the Indian Head Hatchery Expansion.

Public Support

At all events, 91-100% of the comments submitted were in support of the Hatchery Expansion.

- In-person Open House, held at Town of Stephenville, in close proximity to the Indian Head Hatchery, on April 20, 2023.
- Project website provided detailed project information and included a Comment Forum for questions and comments to be posted and for MCE representatives response from April 20-June 1, 2023.
- Virtual Live Question and Answer Session was held May 11, 2023, so the public could interact with MCE representatives in real-time, have their questions answered and post additional comments.
- In addition to public events, several Focused Events were organized at the request of various groups who wanted to discuss the Hatchery Expansion in terms of their specific requirements. These events include presentations, meetings, and hatchery tours and are ongoing.

A full description of the engagement events, participants and participant comments are provided in Section 9.0 Public Engagement.

Approval of the Undertaking

For the components of the Hatchery Expansion that are not yet fully constructed, permits and approvals were received prior to initiating construction in 2018. It is not expected that new permits will be required. When the project is released from further environmental review, the appropriate authorities including the Town of Stephenville will be advised of the schedule of the remaining work and any additional obligations will be addressed before work commences.

Approval for fish to be transported from the hatchery to the saltwater farms is arranged prior to transportation. A fish health assessment and a risk analysis by the provincial veterinarian is conducted and if required a Certificate of Health for Transfer issued. Once the health assessment is completed, a provincial Transfer Permit and a federal Introductions and Transfer Licence are required prior to fish moving from the hatchery to the saltwater farms.

All saltwater farms to receive the hatchery salmon production, including the proposed 2.2 million Hatchery Expansion smolt, are fully licensed. No further approvals or authorisations are required to plan the stocking of these farms. However, the annual production plan, which

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includes the farms to receive smolt and the number of smolt per farm for each year, is approved by FFA prior to fish being transferred to the farm.

Section 10.0 Approvals for the Undertaking provides a full description of the authorizations required to complete the Hatchery Expansion construction and culture the proposed additional salmon.

Alternatives to the Project

Prior to deciding to make the significant investment in the Indian Head Hatchery Expansion, the following alternatives to provide the additional smolt were considered.

1. Moving smolt production to another location in the province.
2. increasing smolt capacity at a hatchery outside of the province and importing the smolt to the Province of Newfoundland and Labrador saltwater farms.

The following is a recap of the information provided in Section 5.0 Project Alternatives and Section 5.2 Preferred Means for Project Delivery.

It was concluded that the Indian Head Hatchery had benefits not available elsewhere and is the best option to develop a sustainable independent salmon farming unit in the province for the following reasons.

- The facility is licensed and currently producing smolt for saltwater farms in the province.
- The facility is owned by MCE on land owned or leased by MCE or currently under negotiation.
- The staff are trained, the rearing practices established, the office and management infrastructure are in place, and the fish culture system supports, such as water lines and reservoirs, are in place.
- The hatchery is located next to a unique aquifer that has an abundant source of high-quality fish culture water that requires no additional treatment.
- The hatchery is located in an industrial park with services and amenities supplied by the Town of Stephenville and is less than 1 km from a deep-water port for transporting smolt.
- Transport to the saltwater farms is less than half the distance compared to transport from an out of province hatchery. The shorter transport time reduces cost and opportunity for negative environmental interactions.

Atlantic salmon require rearing in the ocean to complete their life cycle. All fish from the Hatchery Expansion will be stocked at approved saltwater farms on the south coast of the

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province. The south coast has deep protected bays with cold water which is ideal for salmon farming.

Extensive data is collected on water flow, temperature, ice presence, depths etc. from prospective locations and only sites with good characteristics for salmon culture are selected for the licence application process. Several government agencies verify the site is appropriate for salmon culture as part of the license application review: Fisheries and Oceans Canada, Department of Fisheries, Forestry and Agriculture, Department of Environment and Climate Change and Transport Canada.

The alternative to saltwater farming is land-based culture. Consistent and profitable production of Atlantic salmon to market size (5 kg) has so far eluded the land-based start-ups. Through the attempts, what has been documented is the much larger environmental footprint of land-based systems compared to marine farms. A greater need for power, water, and highly technical infrastructure makes this option not feasible at present.

Further, land-based production would be established near markets to reduce transportation time and costs. Key markets are currently large cities in the US. Relocating operations outside of the province is not in alignment with MCE's commitment to invest in the Province of Newfoundland and Labrador.

For the reasons presented above, the Indian Head Hatchery Expansion is the preferred option to fully utilize the MCE saltwater farms on the south coast of the province.

Conclusion

The EPR is a comprehensive compilation of information that updates the information provided in the original Hatchery Expansion submission ER 1975 and provides new information to fill the data gaps identified during the government and public review.

The EPR provides an open and comprehensive report on MCE salmon farming in the province. It is also focused on potential environmental interactions from salmon culture practices and describes how these effects are being managed through robust federal and provincial regulations and policies and salmon rearing practices developed to meet MCE's commitment to environmental sustainability.

The Hatchery Expansion proposes an essential increase in the production of Atlantic salmon smolt at the fully licensed and operating Indian Head Hatchery. The additional smolt will be used to develop approved saltwater farms on the south coast, a key step in the development of an

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independent business unit in the province. Other benefits of the Hatchery Expansion include the following.

- All fish stay in the province, smolt raised at Stephenville are to be grown to harvest at farms on the south coast.
- Improved hatchery effluent treatment - new effluent treatment with additional levels of solids removal and disinfection reduces harmful components before discharge to a new deep-water outfall.
- Real-time monitoring of the freshwater source ensures continuous high-quality water for all users and continuously provides data to government managers.
- Up to 97% of fish culture water is re-used with the new recirculating aquaculture technology reducing the volume of water required to grow each fish.
- The proposed Fish Transfer System keeps fish contained, reduces potential spillage into natural waterways and eliminates the need for truck and road transport.
- The proposed larger more robust Hatchery Expansion fish require a shorter duration to harvest and a reduced time at saltwater farms while fish health and survivability during entry to seawater are improved.

The Hatchery Expansion will not have a significant effect on the environment beyond the effects identified in the licensing review process. These concerns have established mitigations.

- Prior environmental investigation has demonstrated that the proposed use of the aquifer arising from the additional hatchery production will have no impact on the groundwater resource (yield or quality).
- Additional Hatchery Expansion smolt will be grown to harvest on existing licensed saltwater farms within the approved maximum biomass capacity and according to an FFA approved production plan - the same as smolt from other sources.
- All federal and provincial regulatory and policy requirements that focus on ensuring environmental sustainability apply to all salmon reared in the province.

The Hatchery Expansion supports and enhances the economic base of the areas where salmon are cultured.

- Local service and supply contracts are a critical part of the success of MCE's saltwater farms in the province. Examples of services that will benefit from the proposed expansion are research facilities, divers, net washers, fish movers, trucking, environmental consultants, wharves, offices, maintenance, and transportation.

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- Communities on the south coast benefit from salmon farming which brings in more people for short-term work while also providing long-term permanent employment for residents and newcomers.
- There are seven communities that maintain long-standing arrangements to provide wharf use and other services. The Indian Head Hatchery employs 25 people fulltime and the saltwater farms in the province employ up to 100 full-time staff.
- The full culture cycle for Atlantic salmon, egg to harvest, requires a ratio of about 15 farming staff to 1 million smolt produced, therefore the project 2.2 million fish would require 30 additional staff throughout freshwater and saltwater farming with 10 of the positions at the hatchery.
- In the Stephenville area, the increase in production of smolt at the hatchery will create additional business for operational services for waste management, mortality management, and office and administrative services in addition to construction for the remaining components of the Hatchery Expansion.
- To date, approximately \$86 million has been invested in the Hatchery Expansion, with construction and many other services sourced locally.
- Hatchery operational costs for 2022 were approximately \$7 million with the majority being spent locally. This will increase once the project has been completed and will be a regular influx to the economy of the area.
- In 2022, the Indian Head Hatchery property, water and sewer, and business taxes were approximately \$206,000.