# Veterinary Health and Welfare Plan

DOL Ref LOG 1691 v6

Objective – to maximize fish welfare and health through optimum farm stockmanship, reduction of disease risk and decreased mec

This VHWP follows the format and recommendations of the VHWP Guidelines, GUI - 373 on DOL, and this document should be re VHWP.

Complete the VHWP as appropriate to your farm. A new VHWP must be started for each cycle. A formal VHWP review must take p cycle. It is the responsibility of the Site Manager to initiate the review (contact the relevant Health Manager or Veterinarian) at the e

The VHWP must be updated on a constant basis with respect to the guidance notes and the general principal of constantly improvi and improvements relevant to this must be entered under the relevant headings below.

All communications relevant to VHWP matters should be retained in a folder with the VHWP document for inspection at any time.

This VHWP has been produced by the Site Manager in collaboration with the Mowi Scotland Vet (via the VWHP Guidelines GUI 37

The VHWP must be "LIVE" at all times!

[REDACTED]

| | Name/Date |
|---|---|
| Site Name | Carnasserie |
| Site Manager | [REDACTED] |
| Site Health Observer | [REDACTED] |
| Site Veterinary Surgeon | [REDACTED] |
| Marine Scotland FHI duty inspector | Duty inspector |

| | |
|---|---|
| Date VHWP drawn up | 04/10/2023 |
| Dates(s) of stock input and year class | 2021-22 Smolt Input / 2023-24 spawning |
| Date (s) of fish delivery | 31/10/23-1/11/23 |

Summary of VHWP Review:-

Stock and site history

1. This generation of broodstock were stocked as elite eggs received from Mowi Ireland into Inchmore Hatchery in January 2021. M incubation (3.2%) and from first feeding to parr output (2.4%). The fish were transferred to Loch Garry up until smolt output in Nov The smolts were transferred to Torridon sea water production farm. Mortality was high at Torridon throughout the autumn months i (21.6% total from smolt input to onward transfer). Some fish were harvested from this population and the remainder were then trar December 2022 and April 2023. Maturing fish will be selected from this population and transferred to Carnasserie at the end of Oc

2. Carnasserie has previously been used by Kames Fish Farming to stock rainbow trout broodstock. The site was fallowed in Febr diffusers and monitoring probes were removed by Kames for use elsewhere. Mowi replaced the oxygen monitoring and dosing sys The tank shade nets were all removed and replaced with new nets. All ancillary equipment being used by Kames was either remov been thoroughly cleaned, degreased and disinfected. All drain lines have been scoured using a drain cleaning pressure washer ar inlet pipework to the tanks was all removed below the valves and new pipework installed. A new oxygen generator and injector has stripping shed has been cleaned and re-painted both internally and externally.

3. No artificial lighting or temperature control will be applied to the fish tanks The broodstock will experience the normal ambient ph daylength and water temperature will stimulate full maturation and spawning.

Transfer to tanks

1. Fish will be gently anaesthetised in the lorry tanks. Staff will then enter the lorry tanks in waders or a dry suit to gently lift the fish support both the tail and head. The fish will then be slid down a piping system that will be constructed to carry the fish from the lorr will be pumped into this pipeline to flush the fish into the tanks. A maximum of 85 fish will be stocked in each tank (<50kg/m3).

Checking and stripping

1. Fish will be partially anaesthetised.
2. A crowding screen will be used to slowly crowd the fish into one quarter of the tank.

3. Staff will enter the tank and gently lift the fish onto an inspection table beside the tank. The fish will be checked to assess if it is belly and looking to ascertain if eggs or milt are ready to be expelled from the vent.

4. If the fish is deemed ready a sample of ovarian fluid or milt will be taken and sent to a laboratory for PCR testing. A fin tag will b so they can be identified.

5. Fish ready for spawning will be returned to a separate tank. Unripe fish will be passed to the other side of the crowding screen in

6. The following day after checking the fish will again be gently anaesthetised in the tank and this time lifted into a harvest bin cont The bin will be taken to the stripping shed and the fish hung up on an abattoir rail. The body cavity will be opened and eggs remov

7. The fish will be inspected internally by the health manager or veterinarian. If any fish is suspected to have any disease issue the disposed.

8. The bags containing eggs will be inflated with oxygen, sealed and labelled for transport to the hatchery. Milt will stored in aspira stored in a cooled incubator. A refrigerated van will be used for transport to the hatchery.

| **BIOSECURITY** | | |
|---|---|---|
| Issue Identified (as per VHWP Guidelines GUI 373) | Actions/Improvements that will be made | |
| Disinfection during fallow period | Site fallow Feb 2023 to Nov 2023. During fallow period site was disinfected in line with Disinfection Guide (Version VI) (MarLab). Additional measures to remove old equipment that would be difficult to disinfect are described in the summary of the VHWP review | PRO 709 Procedu |

| | | |
|---|---|---|
| General Biosecurity issues encountered during normal business activities | Site Biosecurity Management Plan in place | PRO 287 |
| Disease certification of fish prior to stocking | The broodstock fish will be subject to extensive screening prior to movement to Carnasserie. The pathogens included in the screening and the number of fish sampled will be determined by the health team depending on risk profile. The results will be held on file at Carnasserie and the sending site. Routine health visits to the broodstock seawater site will be conducted and any unexplained mortality will be investigated. | Inspectio |
| Staff, visitors and vehicle movements | Only site staff, authorised visitors, and essential vehicles will be allowed within restricted areas. | The bios areas ar |
| | Staff and visitors must pass through appropriate disinfection facilities (footbaths and disinfectant hand gels must be available). | Provisio and visib |
| | All disinfectants must be replenished regularly. | Replenis the site c |
| | All visitors must sign the site Visitor book, which should be kept visible. | Updated |

| | | |
|---|---|---|
| | All visitors must be provided with site-specific protective clothing and footwear, which must be marked clearly. | Regular<br>necessa<br>clothing |
| Sanitation | Adequate hand washing and toilet facilities must be available. | |
| Movement of equipment and staff between sites | All equipment must be appropriately disinfected before leaving site. | Seek wri<br>Request<br>before e<br>be direct |
| | Any equipment received at site coming from other sites must be accompanied by the above authorization. | Copy of<br>forms to |
| | Staff moving between sites must use site-specific PPE. | |
| Cleaning and disinfection of buildings, PPE and other equipment | Site equipped with washing machine and appropriate cleaning products and disinfectants. | Site disir |
| | Immediate cleaning (after termination of procedures) of surfaces and PPE that have been contaminated with any organic material (i.e. dead fish, fish faeces, mucus, blood, etc.) | |
| **DISEASE CONTROL MEASURES** | | |
| Issue Identified (as per VHWP Guidelines GUI 373) | Actions/Improvements that will be made | |

| | | |
|---|---|---|
| Daily observations, including physical damage monitoring | Daily monitoring of fish behaviour and physical damage must be carried out by the site HO. | Observat<br>weekly F<br>and conc |
| Regular health monitoring of stock | Site health checks and regular site visits by vet. | Sampling<br>database |
| | Routine sampling for pathogens/ biomarkers, must be carried out. | Health D |
| Parasite checks | HO or SM to be sufficiently competent in parasite identification. | Site heal<br>vet. |
| | Report any significant findings to the site vet. | Regular |
| Water quality observations | Monitoring in place | Adverse<br>reported |
| Investigation and follow up of disease trends | Vet to investigate any suspicion of disease outbreak. | HM to re |
| | Appropriate treatments prescribed if deemed necessary by the vet. | Site diary |
| | If a listed disease is suspect on site or confirmed it is a legal requirement that this is reported to Marine Directorate duty inspector immediately by telephone followed in writing. | The Aqu<br>Regulatio<br>Procedu |
| | Site health to be discussed during weekly meetings (involving both broodstock production and vet). | Meeting |
| Mortality removal/disposal | Mortalities to be removed daily. | Recorde |
| | Mortalities must be categorized for cause of death. | Recorde |
| | All mortalities to be incinerated or ensiled. | Appropri |

| | | |
|---|---|---|
| List of potential diseases includes | Furunculosis, ERM, IPN,BKD, PKD, fungal infection, PRV, CMS, costia, flavo bacteria, poxvirus, branchiomonas. | |
| Action triggers | Background levels set at 0.2% weekly. | SM / HM backgrou |
| Humane destruction | Moribund fish must be humanly destructed. | Specific |
| Medicinal products | Will only be used under veterinary prescription. | Receipt |
| | Respect of withdrawal times. | Treatme |
| | Only Approved medicines will be used. | Medicine |
| | | Treatme |
| | Record all treatments. | Treatme |
| **STOCK MANAGEMENT** | | |
| Issue Identified (as per VHWP Guidelines GUI 373) | Actions/Improvements that will be made | |
| Routine inspection of fish and equipment, and methods of recording | Daily inspection of stocks by the site HO. | Observa diary and |
| | All site staff will be aware of potential health issues which might occur. | Report a SM. |
| | Regular visits by the vet (every fortnight if possible). | Reports and a c |
| | Health related equipment (i.e. oxygen meters) must be checked and appropriately calibrated before each use. | Site calib |

| | | |
|---|---|---|
| Methods of handling fish | Fish must be handled as little as possible and in a way that is not stressful or damaging. | Appropri<br>Any dam<br>and prop<br>necessa |
| | During maturation checking operations the fish are anaesthetised. A light sedation will be used in the fish tank and then staff will manually lift the fish into a harvest bin beside the tank with a stronger dose of anaesthetic to ensure they are fully unconscious before checking. Unripe fish will be passed back into the tank and those ready for stripping will be moved to a separate tank. | Staff to b<br>handle th<br>correct d<br>Oxygen l<br>and anae<br>procedur<br>Any dam<br>and prop<br>necessa |
| Procedures for crowding fish | Avoid stress as much as possible. | Staff mu<br>recognis |
| | Monitor oxygen levels during crowding and provide extra oxygen if necessary. | Check ox |
| | Avoid crowding fish repeatedly. | Careful p |
| | Monitor fish for adverse signs during crowding. | Staff mu |
| Agreed maximum stocking densities for each system | Maximum stocking densities regulated | RSPCA A<br>consent |
| Acoustic Deterrent Devices | | N/A |
| Lighting | No artificial lighting will be used. The fish will experience the ambient autumn/winter photoperiod which will stimulate maturation. | Site diary |

| Training | | |
|---|---|---|
| Issue Identified (as per VHWP Guidelines GUI 373) | Actions/Improvements that will be made | |
| Recognition of signs of poor welfare or disease symptoms and monitoring of fish health | HO must be have training on fish health, anaesthetic use, and oxygen monitoring. | In-house of vet du training r annual a |
| Investigation of health and welfare problems | Appropriately qualified HM or vet. | |
| Administration and recording usage of medicinal and other products | Appropriate training of SM and farm technicians. | On-the-jo courses. |
| Handling, crowding, grading and culling fish | Appropriate training of farm technicians. | On-the-jo |
| Humane slaughter | Appropriate training of farm technicians. | On-the-jo |
| **OTHER** | | |
| Issue Identified (as per VHWP Guidelines GUI 373) | Actions/Improvements that will be made | |
| | | |
| | | |

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|---|
| |
| dicine use. |
| ead during completion of the |
| place before the start of each new<br>nd of each cycle. |
| ing health and welfare. All Actions |
| |
| 73). |
| |
| |
| Phone Number |
| [REDACTED] |
| [REDACTED] |
| [REDACTED] |
| [REDACTED] |
| 0131 244 3498 (out of office<br>0131 244 1833 ) email<br>MS.FishHealth@gov.scot) |

Mortality was low throughout
vember 2021 (total mortality 1.4%).
in 2022 due to CMS and gill issues
nsferred to Ardessie A in
tober 2023.

uary 2023. The in-tank oxygen
stem with an entirely new system.
ved or disposed. The tanks have
nd left to soak in disinfectant. The
s also been installed. The

notoperiod. The decreasing

n from the water making sure to
ry tank to the fish tanks. Water

ready to spawn by palpitating the

e secured to those fish sampled

ı the same tank.

:aining lethal dose of anaesthetic.
'ed.

ɛ eggs from that fish will be

ıted flasks.  Milt flasks will be

How is this verified?

ɔ Farm Fallow Disinfection
re

| |
|---|
| 7 BMP |
| |
| on of stock prior to transfer by HM. |
| ecure zone and reception/public e defined with the BMP. |
| n of adequate disinfection facilities le signs. |
| shment date should be logged in diary. |
| Visitor book. |

| |
|---|
| checking and replacement (when<br>ry) of site-specific protective<br>and footwear. |
| |
| tten permission using Movement<br>Forms from authorized approvers<br>quipment is moved. Requests to<br>ed to [REDACTED]@mowi.com |
| approved Movement Request<br>be sent to the SM. |
| |
| nfection log / cleaning schedule |
| |
| |
| How is this verified? |

| |
|---|
| tions should be recorded onto the<br>ish Health Log LOG218 and any<br>cerns raised to the SM and vet. |
| g and results recorded on health<br>e |
| atabase |
| lth checks and regular site visits by |
| site visits. |
| water quality to be immediately<br>to SM and vet |
| port on health database |
| y / health database. |
| atic Animal Health (Scotland)<br>ons 2009. Notifiable Diseases<br>re PRO 274 |
| minutes. |
| d on Mercatus Farmer |
| d on Mercatus Farmer |
| ate equipment on site |

| |
|---|
| to liaise if levels above<br>und |
| training of site staff. |
| of VI |
| nt records and Mercatus Farmer |
| e Positive List GUI 528 |
| nt Register GUI 1366 |
| nt records and Mercatus Farmer |
| |
| How is this verified? |
| tions must be recorded in the site<br>d reported to the SM. |
| ny changes or concerns to the |
| posted in the Health Database<br>opy to be issued to the SM. |
| oration records |

| |
|---|
| ate training of staff. |
| ıages will be reported to the vet<br>ɔerly investigated if considered<br>ry. |
| ɔe properly trained in how to<br>ıe large broodstock fish and the<br>lose of anaesthesia to be used. |
| levels to be monitored in the tank<br>esthetic bath throughout the<br>re. |
| ıages will be reported to the vet<br>ɔerly investigated if considered<br>ry. |
| st be appropriately trained to<br>e signs of stress. |
| xygen meter before crowding. |
| ɔlanning of procedures. |
| st be appropriately trained. |
| Assured Standard and site<br>limits apply |
| |
| y |

| |
|---|
| How is this verified? |
| training and regularly assistance ring site visits. Individual staff needs should be reviewed in the ppraisal. |
| |
| ob training and specific training |
| ob training |
| ob training |
| |
| How is this verified? |
| |
| |

| May-23 | | |
|---|---|---|
| Issue Identified (refer to VHWP which section?) | Actions/Improvements that will be made | How will the success of these changes be measured? |
| | | |
| | | |
| | | |

Date: _____

Dear Farm Manager,

I agree to oversee the health of the salmon stocks on this farm, _____
To achieve the requirements of the soil association standards
If these standards cannot be met, I will discuss this with the farm manager and quality depar
I agree to deal with any health challenges proportionatley,
and visit the farm at minimum once per annum.

Signed

_____
[REDACTED]
Veterinarian / Health Manager

# Classification of mortality

The following categories are available on

| Category |
|---|
| ***Background mortality*** |
| ***IPN*** |
| ***Fungus*** |
| ***Deformities*** |
| ***Without diagnosis-decomposed*** |
| ***Clumping*** |
| ***Cull*** |
| ***Environmental*** |
| ***ERM*** |
| ***Event mortality*** |
| ***Handling*** |
| ***Gill/gut fungus*** |
| ***Hatch morts*** |
| ***HSS*** |
| ***Hatch fail*** |
| ***Moribund*** |
| ***Parasite*** |
| ***PKD*** |
| ***Poor performer*** |
| ***Predation*** |
| ***RTFS*** |
| ***Transport damage*** |
| ***Unviable eggs & alvins*** |
| ***Vaccination*** |

ı Aquafarmer. Mortality cause should be registered when entering mortality data onto Aquafarmer.

| Definition |
|---|
| Mortality not attributable to other causes, and within levels considered normal and not significant for the site. |
| Mortality due to Infectious Pancreatic Necrosis Virus. Clinical signs of IPN include: Darkening of the skin, exophthalmos, abnormal swimming (corkscrewing/spiral), distended abdomen (ascites), swollen intestine, containing catarrhal exudate (yellowish), faecal casts, multifocal petechiae in visceral fat, pale (milky) liver. |
| Infectious caused by Saprolegnia spp. Clinical signs of saprolegniasis include: white growth (cotton like) on body |
| Mortality with signs of any malformation (mainly spine and jaw). |
| Mortality is in poor condition, making mortality cause not determinable. |
| Mortality due to suffocation caused by fish forming clumps. |
| Mortality due to selective slaughter. |
| Mortality due to inadequate environmental parameters. |
| Mortality due to Enteric Red Mouth or Yersiniosis. Clinical signs of ERM include: Haemorrhages inside the mouth, haemorrhages at fin bases, exophthalmia, distended, gas or fluid-filled belly, dark colouration, listless |
| Mortality peak that does not last in time, usually related to factors external to the fish themselves. |
| Mortality due to husbandry practices (i.e. crowding, pumping…) |
| Mortality due to internal fungal infections (in the gills and gastrointestinal tract). Saprolegnia, fusaria, and penicillu |
| Mortality due to unsuccessful hatch. |
| Mortality due to Haemorrhagic Smolt Syndrome (unknown aetiology). Clinical signs of HSS include: petechiae or |
| Mortality due to eggs that do not hatch. |
| Moribund fish removed from the tanks/pens and humanly culled. |
| Mortality due to parasite (external or internal) infestations (except PKD). |
| Mortality due to Proliferative Kidney Diseased (caused by Tetracapsuloides bryosalmonae). Clinical signs of PKD include: Dark colouration, abdominal swelling, exophthalmos, pale gills, respiratory distress, granulomas in the kidney |
| Runts |
| Mortality due to predation (usually by birds, small carnivores, or wild fish). |
| Mortality due to Rainbow Trout Fry Syndrome (caused by Flavobacterium psycrophilum). Clinical signs of RTFS include: dark pigmentation, erosion and ulceration on the peduncle/fins (exposure of spinal cord in worse cases), anaemia (pale gills), swollen spleens, ascites, spinal/jaw deformities in older fish, abnormal swimming. |
| Mortality due to transport physical damage. |
| Egg/alvins mortality other than hatch fail, hatch morts, fungus or parasite. |
| Mortality resulting from vaccination. |

ı viscera and skeletal muscle, together with pale gills and reddening on fin base.

**Mortality reporting**

| Cycle | Stage Description | Stage in estimated time |
|---|---|---|
| Freshwater | Egg to 1st feed | 10 weeks |
| | 1st feed to 5g | 10 weeks |
| | 5g to smolting | 20 weeks |
| | | |
| Seawater | Smolt transfer | <= 6 weeks |
| | <750g | N/A |
| | >750g | N/A |

Breaches of mortality thresholds must be reported. Atlantic salmon morta

The Head of Fish Health will report Marine Scotland within 7 days by ema

| Mortality Threshold |
| --- |
| 6% weekly |
| 3% weekly |
| 1.5% weekly |
| |
| N/A |
| 1.5% weekly, 6% on a 5 week rolling average |
| 1% weekly, 4% on a 5 week rolling average |

lies must be reported to RSPCA on a weekly basis by Head of Fish Health via email to help@rspcaass

ıil.(msfishhealth@gov.scot )or formal phone call to [REDACTED] [REDACTED] for Atlantic Salmon moı

ured.org.uk

# Carnassarie Cleaning Rota 2023

| | | | Lab | | Stripping Room | | Changing Room | | Canteen | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Worktop | Floor | Worktop | Floors | PPE | Floors | Table | Floors |
| Monday | 30-Oct | REDACTED] | | | | | | | | |
| Tuesday | 31-Oct | REDACTED] | | | | | | | | |
| Wednesday | 01-Nov | REDACTED] | | | | | | | | |
| Thursday | 02-Nov | REDACTED] | | | | | | | | |
| Friday | 03-Nov | REDACTED] | | | | | | | | |
| Saturday | 04-Nov | REDACTED] | | | | | | | | |
| Sunday | 05-Nov | REDACTED] | | | | | | | | |
| Monday | 06-Nov | REDACTED] | | | | | | | | |
| Tuesday | 07-Nov | REDACTED] | | | | | | | | |
| Wednesday | 08-Nov | REDACTED] | | | | | | | | |
| Thursday | 09-Nov | REDACTED] | | | | | | | | |
| Friday | 10-Nov | REDACTED] | | | | | | | | |
| Saturday | 11-Nov | REDACTED] | | | | | | | | |
| Sunday | 12-Nov | REDACTED] | | | | | | | | |
| Monday | 13-Nov | REDACTED] | | | | | | | | |
| Tuesday | 14-Nov | REDACTED] | | | | | | | | |
| Wednesday | 15-Nov | REDACTED] | | | | | | | | |
| Thursday | 16-Nov | REDACTED] | | | | | | | | |
| Friday | 17-Nov | REDACTED] | | | | | | | | |
| Saturday | 18-Nov | REDACTED] | | | | | | | | |
| Sunday | 19-Nov | REDACTED] | | | | | | | | |
| Monday | 20-Nov | REDACTED] | | | | | | | | |
| Tuesday | 21-Nov | REDACTED] | | | | | | | | |
| Wednesday | 22-Nov | REDACTED] | | | | | | | | |
| Thursday | 23-Nov | REDACTED] | | | | | | | | |
| Friday | 24-Nov | REDACTED] | | | | | | | | |
| Saturday | 25-Nov | REDACTED] | | | | | | | | |
| Sunday | 26-Nov | REDACTED] | | | | | | | | |
| Monday | 27-Nov | REDACTED] | | | | | | | | |
| Tuesday | 28-Nov | REDACTED] | | | | | | | | |
| Wednesday | 29-Nov | REDACTED] | | | | | | | | |
| Thursday | 30-Nov | REDACTED] | | | | | | | | |
| Friday | 01-Dec | REDACTED] | | | | | | | | |
| Saturday | 02-Dec | REDACTED] | | | | | | | | |
| Sunday | 03-Dec | REDACTED] | | | | | | | | |
| Monday | 04-Dec | REDACTED] | | | | | | | | |
| Tuesday | 05-Dec | REDACTED] | | | | | | | | |
| Wednesday | 06-Dec | REDACTED] | | | | | | | | |
| Thursday | 07-Dec | REDACTED] | | | | | | | | |
| Friday | 08-Dec | REDACTED] | | | | | | | | |
| Saturday | 09-Dec | REDACTED] | | | | | | | | |
| Sunday | 10-Dec | REDACTED] | | | | | | | | |
| Monday | 11-Dec | REDACTED] | | | | | | | | |
| Tuesday | 12-Dec | REDACTED] | | | | | | | | |
| Wednesday | 13-Dec | REDACTED] | | | | | | | | |
| Thursday | 14-Dec | REDACTED] | | | | | | | | |
| Friday | 15-Dec | REDACTED] | | | | | | | | |
| Saturday | 16-Dec | REDACTED] | | | | | | | | |
| Sunday | 17-Dec | REDACTED] | | | | | | | | |

**Procedure for Tank/Equipment Cleaning**

**Purpose**

Cleaning of tanks and equipment after or before use ensures the constant hygiene requirements and biosecurity of the site relating to fish health and welfare.

**Detail** **Disinfectants Used are 2% Sodium Hydroxide, 1% Virkon**

**1** **Tanks**

All water should be drained from the tank prior to starting the cleaning process. The surfaces should then be scrubbed clean of all organic material such as algae and feed debris in the feeders and feed delivery units. If required additional cleaning using 2% Sodium Hydroxide solution (caustic) solution should be used to remove any stubborn or dried on material prior to final disinfection at the appropriate concentration.

**When caustic solutions are used care must be taken with aluminium fittings and equipment due to the aggressive actions between the materials.**

The tank and all its associated equipment should be coated with the appropriate amount of chemical to allow full disinfection to take place.i.e. 10mins before rinsing.

At the end of a cleaning session unless it is required immediately the tank should be left tidy with the equipment stored in a safe area and the bottom stub left in with water brought to this level to stop the tank being lifted by ground water.

**3** **Equipment.**

Buckets ,nets, and brushes etc should all be cleaned regularly and left in the appropriate place provided for them.

**4** **PPE**

Correct PPE should be used at all times in accordance with the safety data sheets for the products in use for the process.

**5** **Records**

All records of chemical use and tank completion should be filled in as required.

marinescotland science

Scottish Government
Riaghaltas na h-Alba
gov.scot

T: +44 (0)131 244 2500 F: +44 (0)131 244 0944
Email: MS.FFPlanning@gov.scot

Our ref: PC-21-013
Your ref: Broodstock

22/12/2021

Dear [REDACTED],

**Pre-application advice for proposed broodstock sites**

We have reviewed the submitted request for pre-application discussion, and based on the limited information available we offer the following comment. Please be aware that any advice / assessment provided in response to a statutory consultation request will be based on the information presented at that time and may vary from that which is detailed below.

**Environmental Impacts**

**Loch Torridon**

The information submitted indicates that the proposed site would be located within the Locational Guidelines categorised area of Loch Torridon.

Should the applicant progress an application, assessment of the following aspects is likely to be required:

Benthic impacts – relevant modelling to demonstrate the acceptability of any proposal and proposed biomass.

Water column impacts – ECE assessment of any proposed site including a cumulative assessment of all consented biomass in the categorised area. Full details of calculations should be included with any application. Loch Torridon is currently a Locational Guidelines category 3 water body, however further assessment would be required to determine the effect any increase in biomass would have on the current classification.

Sea lice efficacy – A sea lice efficacy statement supported by modelling to demonstrate quantities of chemotherapeutants likely to be available for use at any site without breaching relevant EQS or alternatively, confirmation should be provided if no chemotherapeutants are being applied for.

**Inverpolly**

The information submitted indicates that the proposed site would be located out-with a Locational Guidelines categorised water body.

Should the applicant progress an application, assessment of the following aspects is likely to be required:

Benthic impacts – relevant modelling to demonstrate the acceptability of any proposal and proposed biomass.

Water column impacts – ECE assessment of any proposed site including a cumulative assessment of all relevant consented biomass. Full details of calculations should be included with any application.

Sea lice efficacy – A sea lice efficacy statement supported by modelling to demonstrate quantities of chemotherapeutants likely to be available for use at any site without breaching relevant EQS or alternatively, confirmation should be provided if no chemotherapeutants are being applied for.

**Isle Ewe**
The information submitted indicates that the proposed site would be located within the Locational Guidelines categorised area of Loch Ewe.

Should the applicant progress an application, assessment of the following aspects is likely to be required:

Benthic impacts – relevant modelling to demonstrate the acceptability of any proposal and proposed biomass.

Water column impacts – ECE assessment of any proposed site including a cumulative assessment of all consented biomass in the categorised area. Full details of calculations should be included with any application. Loch Ewe is currently a Locational Guidelines category 3 water body, however further assessment would be required to determine the effect any increase in biomass would have on the current classification.

Sea lice efficacy – A sea lice efficacy statement supported by modelling to demonstrate quantities of chemotherapeutants likely to be available for use at any site without breaching relevant EQS or alternatively, confirmation should be provided if no chemotherapeutants are being applied for.

**Aquaculture Animal Health**
Inverpolly - E206589.8, N915973.10
Isle Ewe - E186289, N885444
Torridon - E182343, N855906

The above locations were provided for pre application advice for proposed broodstock sites and are shown on the map attached.

Broodstock sites should be isolated from production farms in their own disease management area, as detailed in A Code of Good Practice for Scottish Finfish Aquaculture and A Code of Practice to Avoid and Minimise the Impact of Infectious Salmon Anaemia (ISA) and outlined below. Further information on the establishment and designation of disease management areas is also available on our website.

Chapter 1, Section 1.2 of A Code of Good Practice for Scottish Finfish Aquaculture (CoGP) states - “New pen or marine-linked land-based broodstock sites established after 2010 should be located more than two tidal excursions away from any production farms. If, through an appropriate risk assessment (which gives due consideration to relevant hydrodynamic information), it can be shown that the risk of spread of pathogens is satisfactorily low, and all farmers within the Farm Management Area agree, the establishment of such a site within two tidal excursions may be acceptable.”

Section 2 of A Code of Practice to Avoid and Minimise the Impact of Infectious Salmon Anaemia (ISA) states – "Live fish may be moved into a SW broodstock farm from another SW farm, but the broodstock farm must be situated at least 5 km or one tidal excursion (whichever is the greatest) from another farm, harvesting station or processing plant. Broodfish must not leave the site for on-growing elsewhere. Movements of live broodfish to freshwater (FW) sites are allowed."

From the coordinates provided there are currently no active sites at the Inverpolly location (E206589.8, N915973.10) and this would therefore reactivate the 10a Enard Bay DMA and comply with the CoGP requirement. Both of the other locations contain active fish farm production sites. The Isle Ewe location (E186289, N885444) in DMA 10c – Ewe, which contains one active site (FS1084) operated by Mowi and the Torridon location (E182343, N855906) is that of Mowi's existing Torridon site (FS0234) in DMA 11a – Torridon also includes several Scottish Salmon Company sites within this DMA.

Exactly what is proposed in terms of facilities and stocking age/regime at the given locations has not yet been provided and further details would be required in order to provide specific advice.

Generally, the risks associated with holding broodstock arise from the extended periods of stocking without fallow which can bridge different inputs of fish resulting in multi-year class sites or areas increasing the risk of disease occurrence and spread, and parasite infestation. It should also be noted that the CoGP has a presumption against seawater to seawater transfers, particularly those between farm management areas to minimise risk of disease spread.

It is proposed that sites may be semi-enclosed or "isolated"; however information on how this will be achieved has not yet been provided. For the purposes of disease and parasite control a semi enclosed site would still be considered as part of the wider disease or farm management area.

If a site is to hold fish as "potential broodstock" which may be used as broodstock in the future an appropriate risk assessment should be provided addressing how the site will not prolong stocking within the existing area and create a multi-year class site or area without fallowing on a single year class basis.

**Wild Fisheries**

Should the applicant wish to progress an application MSS would require further information on the impacts of the development in regards to wild salmonids. In addition to this we would require an Environmental Management Plan (EMP) that outlines how the interactions with wild salmonids will be assessed; requirements for an EMP provided on request.

Notes to applicants:

*The Aquatic Animal Health (Scotland) Regulations 2009 requires the authorisation of all Aquaculture Production Businesses (APB's) in relation to animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals. The authorisation procedure is undertaken on behalf of the Scottish Ministers by the Fish Health Inspectorate (FHI) at Marine Scotland Marine Laboratory. To apply for authorisation for an APB or to amend details of an existing APB or any site that an APB is authorised to operate at, you are advised*

*to contact the FHI as follows: Fish Health Inspectorate, Marine Scotland Marine Laboratory, 375 Victoria Road, Aberdeen, AB11 9DB. Tel: 0131 244 3498; Email: ms.fishhealth@gov.scot*

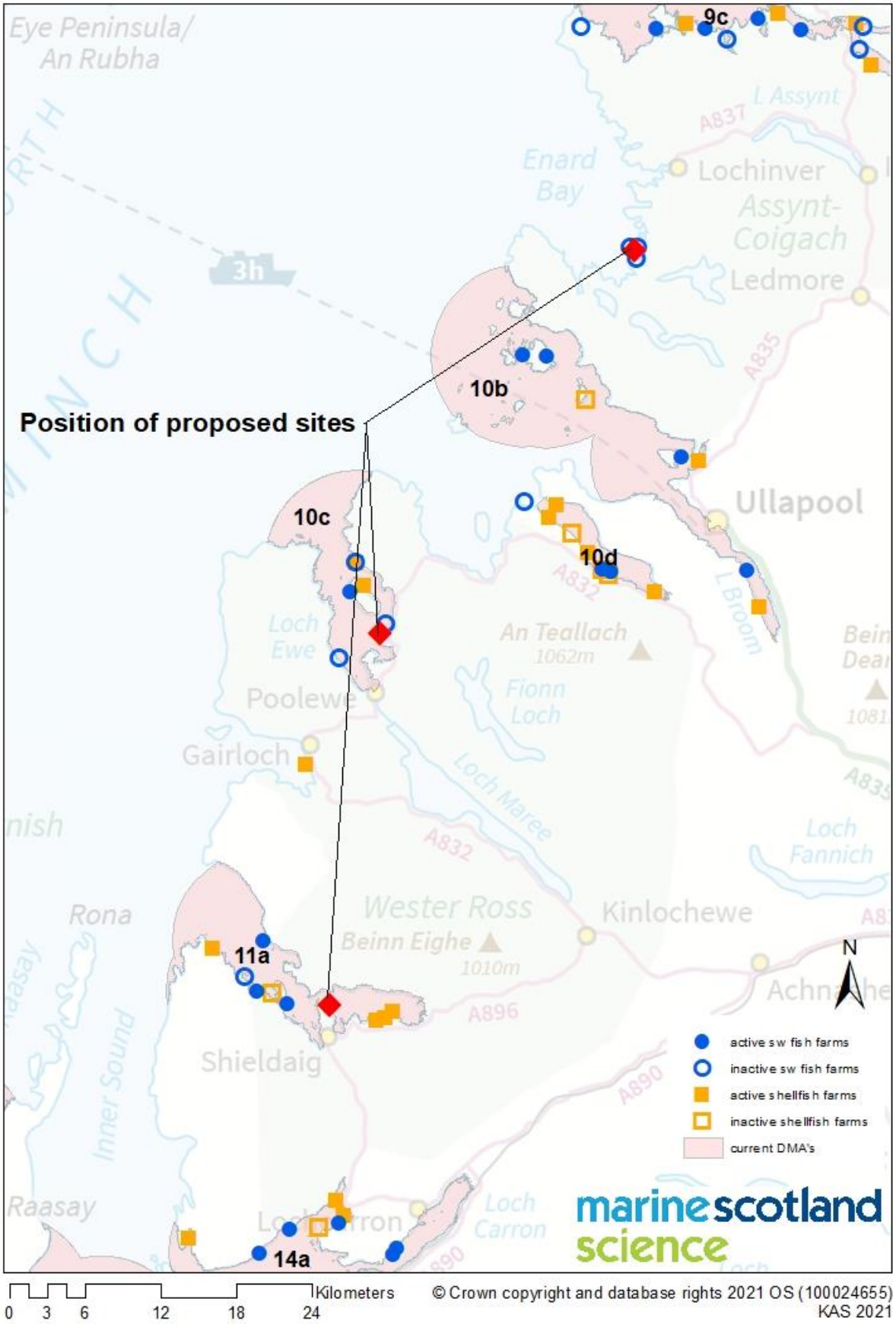
*All marine farms, whether finfish, shellfish or algal, are required to apply for a marine licence under Part 4 of the Marine (Scotland) Act 2010. To apply for a marine licence, or to amend details of an existing marine licence (formally Coast Protection Act 1949 – Section 34 consent), please visit the Scottish Government's website at http://www.gov.scot/Topics/marine/Licensing/marine/Applications where application forms and guidance can be found. Alternatively you can contact the Marine Scotland Licensing Operations Team (MS-LOT) by emailing MS.MarineLicensing@gov.scot; or calling 0300 244 5046.*

Yours sincerely

Marine Scotland Science

Appended:
Map: Aquaculture sites in the vicinity of proposed sites at Inverpolly, Isle Ewe and Torridon

## Aquaculture sites in the vicinity of proposed sites at Inverpolly, Isle Ewe and Torridon




Marine Laboratory, 375 Victoria Road,
Aberdeen AB11 9DB
www.gov.scot/marinescotland

Meeting on 3/5/23 via TEAMS

Attendees: [REDACTED]

- [REDACTED – NOT IN SCOPE]
- [REDACTED – NOT IN SCOPE]
- [REDACTED – NOT IN SCOPE]
- Advise was also provided on the marine pen sites to be used alongside the proposed land based broodstock site at Ardessie. A separate information note was sent following the meeting outlining the guidance provided.

marinescotland science

Email: MS.FFPlanning@gov.scot

Our ref: FFP-23-003
Your ref: 22/06182/FUL

01/02/2023

Dear [REDACTED]

**Fish Farm Brood Stock Facility: including Main Production Building, Egg incubation Building, Staff Welfare and Shorebase building, Offices, Plant, Car parking and Landscaping on site of existing Fish Farm (shorebase for Ardessie sites)**

We have reviewed the application submitted and offer the following comment:

**Aquaculture Animal Health**
Application for new land based finfish broodstock facility using freshwater RAS at Ardessie, Dundonnell by Mowi Scotland Ltd./Wester Ross Fisheries Ltd.

**Site Location**
There are currently 2 sites registered with Marine Scotland Science within the vicinity of the proposed new site. The sites are both seawater pen sites located in Little Loch Broom; Ardessie A is located ~750m west and Ardessie B located ~1500m west of the proposed new site. Both sites are operated by the applicant and are active Atlantic salmon sites.

To the knowledge of the FHI, there are currently no sites proposed in the planning system within 1000m of this proposed new site.

*It should be noted that all measurements are taken from the mid point of site coordinates.*

**Authorisation**
Wester Ross Fisheries Ltd. already possess authorisation to farm at their existing active sites. The historic Ardessie Hatchery site operated by Ardessie Fisheries has been inactive for over 20 years. An amendment to the applicant's authorisation must be sought to include any newly approved site, prior to the commencement of farming operations at the new site. Please contact the FHI at Marine Scotland to request this amendment should permission for the new site be granted.

The two existing pen sites (Ardessie A and Ardessie B) in Little Loch Broom are currently the only sites in disease management area 10d. The charts provided suggest that the Ardessie A seawater pen site will be stocked with the maturing brood fish, however confirmation of which site will be stocked with broodfish is requested. Authorisation details for the seawater pen site holding broodfish will need to be updated to include the growth stage of broodstock.

**Water and waste treatment**

It is proposed that the old hatchery buildings will be demolished and a new purpose built facility constructed. The applicant propose to abstract freshwater and use Recirculating Aquaculture Systems (RAS) on site. Permissions for freshwater abstraction are already in place through CAR licence for the old building, to which the applicant state the new site will adhere to the conditions of. The use of RAS will limit the amount of freshwater required to be abstracted; each individual tank in the broodstock unit will have its own RAS and waste water treatment plant. Waste production from the broodstock is expected to be minimal. Following stripping of broodfish, eggs are fertilised and quarantined. Any blood water created during this process will be collected and ensiled. Following the quarantine period, eggs will be incubated in a separate building on site which has separate RAS units, prior to being moved off site to production hatcheries.

Intake water will pass through water treatment facility, undergoing filtration from drum and sand filters as well as ozone and UV treatment prior to supplying the broodstock and egg RAS. Water from each individual RAS undergoes mechanical and biological filtration through the individual waste water treatment plant prior to being pumped back into the tank. As most of the water being used is recirculated, and waste produced from broodstock and eggs is very low, effluent is minimal. The majority of the effluent arises from backwash of the RAS filters which is directed to a settling tank; settled particulates are collected and uplifted for disposal; there is already a CAR licence in place for the discharge of the liquid effluent, as to which the new site will comply with.

Seawater abstraction is also proposed on site, for which a CAR licence will be sought. However, it is stated that this is purely for the purpose of chilling the freshwater and seawater will not come in contact with the aquaculture animals. Therefore, the intake, use and discharge of seawater on site with regard to the impacts on fish has not been assessed.

**Stocking**
From the information given in the application, it is not possible to calculate the proposed stocking density. Details of proposed maximum biomass and stocking density should be provided.

Details of the proposed future use of the Ardessie B site (or whichever site will not hold the broodfish) should also be provided. Where live fish are to be moved into a seawater broodstock site from another seawater site, the broodstock site should be at least two tidal excursions from other production sites (section 1.19 A Code of Good Practice for Scottish Finfish Aquaculture). Should one site be operated for production whilst the other holds broodstock further considerations may be required with regard to stocking and fallowing periods to reduce the risk of disease spread.

**Husbandry**
Details on the method and frequency of removing mortalities on site and how they are disposed of are required and should be submitted.

**Containment**
The equipment and procedures proposed to ensure containment of stocks in individual tanks and within site as a whole should be provided, including details of the suitability of equipment for purpose, screens in place for relevant life cycle stages, back-up systems should screens fail and contingencies proposed for potential major events - burst pipes or tanks, flooding etc.. Information should also be provided on methods for exclusion of predators from site.

The implementation process for 'A Technical Standard for Scottish Finfish Aquaculture' (STS) is still being delivered; however due to the costs and timeframes involved in aquaculture site development, the industry should be working towards meeting the guidance provided within the STS to ensure compliance when implementation occurs, further guidance on STS can be viewed online; land based sites are referenced in section 9 https://www.gov.scot/publications/technical-standard-scottish-finfish-aquaculture/.

*For information: Operations and records on site must meet the requirements of The Aquatic Animal Health (Scotland) Regulations 2009, The Aquaculture and Fisheries (Scotland) Act 2007, The Fish Farming Businesses (Record Keeping) (Scotland) Order 2008, The Fish Farming Business (Reporting) (Scotland) Order 2020 and The Aquaculture and Fisheries (Scotland) Act 2013. Compliance with this will be inspected during routine visits by the Fish Health Inspectorate.*

**Summary of information required**

- Confirmation on which existing marine pen site will hold broodfish and clarification on the proposed use of the other pen site.
- Details of proposed maximum biomass and stocking density on site.
- Details on the method and frequency of removing mortalities on site and how they are disposed of.
- Details of equipment and procedures proposed to ensure containment of stocks.
- Information on methods for exclusion of predators from site.

Notes to applicants:

*The Aquatic Animal Health (Scotland) Regulations 2009 requires the authorisation of all Aquaculture Production Businesses (APB's) in relation to animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals. The authorisation procedure is undertaken on behalf of the Scottish Ministers by the Fish Health Inspectorate (FHI) at Marine Scotland Marine Laboratory. To apply for authorisation for an APB or to amend details of an existing APB or any site that an APB is authorised to operate at, you are advised to contact the FHI as follows: Fish Health Inspectorate, Marine Scotland Marine Laboratory, 375 Victoria Road, Aberdeen, AB11 9DB. Tel: 0131 244 3498; Email: ms.fishhealth@gov.scot*

*All marine farms, whether finfish, shellfish or algal, are required to apply for a marine licence under Part 4 of the Marine (Scotland) Act 2010. To apply for a marine licence, or to amend details of an existing marine licence (formally Coast Protection Act 1949 – Section 34 consent), please visit the Scottish Government's website at http://www.gov.scot/Topics/marine/Licensing/marine/Applications where application forms and guidance can be found. Alternatively you can contact the Marine Scotland Licensing Operations Team (MS-LOT) by emailing MS.MarineLicensing@gov.scot; or calling 0300 244 5046.*

Yours sincerely

Marine Scotland Science

marinescotland science

Email: MS.FFPlanning@gov.scot

Our ref: FFP-23-003
Your ref: 22/06182/FUL

27/02/2023

Dear [REDACTED]

**Fish Farm Brood Stock Facility: including Main Production Building, Egg incubation Building, Staff Welfare and Shorebase building, Offices, Plant, Car parking and Landscaping on site of existing Fish Farm (shorebase for Ardessie sites)**

We have reviewed the additional information submitted in relation to this application and offer the following comment:

**Summary of information requested**

**Details of proposed maximum biomass and stocking density on site.**
Stocking density is proposed at a maximum of 30kg/$m^3$ for broodstock individuals held in tanks on site. As the site will operate using a RAS, the water quality and environmental parameters should be closely monitored to ensure tanks are maintained at optimal conditions, as small changes to RAS can have a considerable impact on the welfare of the aquaculture animals, particularly at higher biomasses. Information on how this is achieved and monitored should be described in the Veterinary Health and Welfare Plan and include information on steps to be taken should the animals show signs of deteriorating health or welfare.

**Details on the method and frequency of removing mortalities on site and how they are disposed of.**
Tanks will be checked at least twice per day for any mortalities, which will be removed by hand net. Access to the centre of the tank is facilitated by a walkway over the tanks. Mortalities will be ensiled on site on the same day they are collected and the ensiled liquor collected by approved waste contractors for disposal at licensed facilities.

**Details of equipment and procedures proposed to ensure containment of stocks.**
Tanks are constructed of concrete with stainless steel central drainage screens. Due to the significant size of the broodfish there is no possibility that broodfish could escape through the screens and drainage pipe. Detailed information has been provided on the mechanisms in place throughout the system to prevent any release of eggs from the tanks. Furthermore, details are provided on the stripping process to ensure no release of gametes, this includes a bunded floor in the broodstock area, floor drains which are screened and also separate from the main drainage system draining into a holding tank which is pumped to the ensiler for disposal during the stripping period. The level of screening in the egg building also appears sufficient for ensuring containment.

Considerations have also been made for mechanical failures, power outages and flooding; these are deemed satisfactory as far as can reasonably be foreseen.

**Information on methods for exclusion of predators from site.**
Tanks and egg silos are housed within secure enclosed buildings with only one door locked using keypad entry for authorised personnel therefore no access to birds or larger mammals. The building will be sealed to prevent small rodent ingress and pest control will be in place to monitor any rodent issues.

**Summary**
No further information required.

Yours sincerely

Marine Scotland Science

# Broodstock Production Facility: Ardessie Response to planning application comments

Mowi Scotland Limited
February 2023

**Contents**

**1. Marine Scotland**

**Details of the proposed maximum stocking density:**

The facility consist of 14 x 150m3 tanks for stocking the female fish and 2 x 50m3 tanks for the male fish. The maximum stocking density is set to 30kg/m3. In general the fish will average 13kg each therefore 350 females and 115 males will be stocked per tank. In total therefore around 4900 females will be stocked and 230 males.

**Details on the method and frequency of removing mortalities and how they are disposed of:**

The tanks will be checked at least twice daily and any mortalities will be removed by hand net. The centre of the tanks can be accessed via the walkway above the tanks shown on the main building floor plans. As mentioned in chapter 15 of the Project Description Document a small scale sealed ensiling unit (<10m3 storage capacity) will be installed at the facility to process any slaughtered fish or mortalities. The carcasses will be ensiled on the same day they are collected to prevent any decomposition which could give rise to offensive odours. Ensiled liquor will be collected from the site by approved waste carriers for disposal at appropriately licensed facilities.

**The equipment and procedures proposed to ensure containment of stocks in individual tanks and within site as a whole should be provided, including details of the suitability of equipment for purpose, screens in place for relevant life cycle stages, back-up systems should screens fail and contingencies proposed for potential major events - burst pipes or tanks, flooding etc..**

The broodstock will stocked in concrete tanks with a robust stainless steel central drainage screens. The gaps in the drainage screen will be 50mm which is considerably smaller than the mature broodstock fish (12-15kg) so there is no possibility that the fish could escape through the drainage screen. If in the very unlikely event that the drainage screen were to fail then the drainage pipe directs the effluent water to the Recirculating Aquaculture System (RAS) water treatment plant. The drain water is filtered through a drum filter then a protein skimmer, a moving bed biofilter and finally a trickle filter before it reaches the point that there is an overflow from the system that discharges to the external environment. All of these filtrations steps contain screens or pipework that are much smaller than the broodstock fish.

If an unfertilized egg were to be expelled from the vent of the fish which is possible especially during maturation checking operations then this could pass through the tank drainage screen. The drum filter screen (60µm) would however prevent the eggs from passing through. If there was a hole in the drum filter screen both the moving bed biofilter and the trickle filter have inlet screens of 3mm. The eggs diameter is greater than 5mm and so these screens will prevent the eggs from reaching the system overflow if there should be an issue with the drum filter. If an egg should be captured in the drum filter and then be discharged via the drum filter backwash effluent line then it would travel through the effluent pipework to a central collection manhole. With this manhole will be two baskets one inside the other each with 2mm screens. Any eggs which could be discharged from the drum filter backwash waste will be collected in this basket. The two basket arrangement ensures that if one should fail the secondary basket will ensure the eggs are retained. In the effluent manhole the water is then pumped to a belt filter which removes the small amount of particulate waste the broodstock fish produce. The pump will draw the water from the other side of the egg

screening baskets. If both baskets were to fail the effluent belt filter then acts as third line of defence. The screen size on this filter (40 µm) will also prevent eggs from passing through. It should also be emphasized that any egg that might go through the tank drain screen and be captured as described above with not be fertilised and it would therefore not develop into a young salmon.

When the broodstock are ready to spawn or during grading operations they will be manually lifted from the tank and passed through a portal in the tank wall into an anaesthetic tank. The fish will either be anaesthetised so they are unconscious and then lifted onto the grading table to assess the maturation stage or if they are ready to spawn the fish will be euthanized using a lethal dose of anaesthetic and taken to the stripping area. In this area the fish are hung up on an abattoir rail and the body cavity will be opened so the eggs can be removed. A similar process is conducted for the male fish to remove the milt. The eggs are then fertilized and stocked into the egg incubators in the quarantine area. A vet will be present during stripping operations to take samples so that all the parent fish can be tested for various pathogens using PCR analysis. If these tests confirm the parent fish were disease free then the eggs will be moved to the egg incubation building if otherwise then the eggs will be disposed of at this stage. The floor slab in the broodstock tank area, the egg stripping, fertilization and egg quarantine areas is surrounded on all sides by a 150mm upstand which effectively forms a bund around these areas. This ensures that any water spilled in these areas does not flood under the partition walls but it also ensures any eggs which may have been accidentally dropped are retained in this area. Linear floor drains are proposed in all of these areas and the floor surface will have a slight slope towards theses drains to direct any spilled water into the drain. If eggs should spill onto the floor and enter the floor drain they will proceed to a manhole that collects all of the floor drain water from the main building. Inside this manhole there will be two perforated baskets (2mm gap) one inside the other to provide two levels of screening to ensure that the eggs can not escape through the floor drains into the natural environment. The floor drain in the stripping area is separate to the other drains and it discharges into a holding tank. Any blood generated during the stripping process therefore will be collected through this drain to the holding tank. The blood water will then be pumped into the ensilor for disposal as described above. This will be of relatively small volume. At the peak of spawning we expect that we will strip around 300 females per day.

When the eggs are moved between the main building and the egg incubation building they will remain within the egg incubation silo. This will be disconnected from the inlet and drain in the quarantine area and lifted into a trolley with a cradle used to support the silos in an upright position. The 10 litres silos will then be moved across to the egg incubation building and plugged into the inlet and drain pipework in one of the three Recirculating Aquaculture Systems (RAS) in this building.

In the egg incubation RAS the water draining from the egg silos first goes through a 2mm perforated screen that is integral to the egg silo. If this should fail it is unlikely the eggs would escape down the drain as the water is upwelling through the silos and overflows out of the silo into the drainage pipework. The velocity of the water is such that the eggs remain in the bottom of the silo and are not lifted upwards towards the drain. Nonetheless if an egg were to escape an egg silo through the drainage pipework then this directs water to sand filters, moving bed biofilters and trickle filters before it reaches the overflow from the system. The sand filters screen the water down to 15 µm and so they are completely impassable to the eggs. Similarly the biofilter and trickle filter have 2mm inlet screens. If an egg were to become trapped in the sand filter and then flushed out during a

backwash operation then the backwash waste is all directed to a manhole where there will be two levels of screening as described above. Similarly the floor drains in the egg incubation building are all directed to a separate manhole where there will again be two levels of screening.

The floor drain and effluent manholes for both the main building and the egg incubation building will be checked daily and if any eggs are discovered in the screening baskets they will be humanely culled and disposed of in the ensilor.

The egg silos are designed specifically for salmon egg incubation and are made of roto-moulded plastic to ensure a smooth surface throughout. The fish tanks will be lined with a polyurea coating to ensure a smooth finish in order to avoid any abrasion to the fish. The RAS systems linked to the fish tanks and egg incubation systems are design to ensure optimal water quality for the fish and eggs. The systems are modular and all critical elements have in place a full standby system should the primary system fail. If the standby system should fail a stock of replacements will be available on site at all times. Using RAS ensures that the fish and eggs can be maintained at the optimal water temperature depending on the stage of development. Any changes in temperature can be closely controlled and gradual to ensure there is no stress to the fish or eggs. The chilled water systems also have in place multiple redundancies so that any mechanical breakdown will not impact on the temperature in the process water. Standby generators will back-up the main power. Should there be a power cut the generators will automatically start to take over the load. There will be three generators. Two are capable of running all the critical systems so if one should fail some of the ancillary systems can be switched off to ensure the life support to the fish and eggs is not compromised. In worst case scenario if two or all of the generators should fail then there is connection for diesel pumps into each of the RAS and so the water flow could maintained using these. There is also an emergency oxygen system installed in the tanks and in the egg incubation RAS. The control valve that allows flow to the oxygen diffusers will fail open in the event that there is no power to the site thus allowing oxygen into the systems to keep the fish and eggs alive.

The building floor levels have been set accounting for potential flood risk. The design coastal flood level of the site has been assessed at 5.14m (Above Ordnance Datum). A 600 mm freeboard has been applied to account for uncertainties including building settlement and wave action, such that finished floor levels at or above 5.74 m AOD will be sufficient to protect against coastal flood risk. The lowest finished floor level is 5.8m AOD which ensures none of the buildings are at risk of coastal flooding. In addition the analysis demonstrates that the proposed buildings are not at risk of flooding from the Allt Airdeasaidh burn as the flood would stay within the banks of the burn or at least the higher ground beyond the bank, between the bank and the building. Cross sections through the burn provided in the flood risk assessment detail the flood levels in relation to the topography and the building finished floor levels. Finally the floor level around the tanks in the main broodstock building is elevated further. This was done to achieve gravity flow through the RAS treatment plant before the water is then pumped back to the tanks in order to avoid pumping the water twice as an energy saving measure. However it also ensures that there is additional protection against floor risk with the floor level in this area set at 7.1m AOD.

The equipment inside the building will be installed upon elevated concrete plinths upon a concrete floor slab. The floor slab will be installed with a gradual slope towards linear drainage channel. Any leakage in the pipework or pumps therefore should not flood the installed equipment.

**Information should also be provided on methods for exclusion of predators from site.**

The fish and eggs will all be housed within tanks or egg silos inside enclosed buildings. There will be no access therefore for any birds or large predators. There is only one access door to these buildings with the other doors acting only as fire escapes which can only be opened from the inside. The fire escape doors will be fitted with a security alarm to alert of and discourage any unauthorised use of an escape exit. The main access doors will have a security key pad to ensure only authorised personnel can enter the facility. Small rodent ingress will be prevented by ensuring all service penetrations and gaps under the doors are sealed. Mowi will organise a pest control contract to monitor and control any issue with rodents.

**2. Contaminated Land**

**Asbestos containing materials may be present within the fabric of the building to be demolished. Prior to commencing any new development, the Applicant shall submit an Asbestos Refurbishment/Demolition Survey for the building. Any asbestos containing material shall be removed to a licensed facility in accordance with the Control of Asbestos Regulations 2012. Copies of SEPA waste consignment notes shall be submitted to demonstrate that the material has been removed and disposed of appropriately.**

A demolition warrant has been granted for the demolition of the existing building. The link below provides access to the drawings, specification and the demolition warrant REF 23/00147/NDOM7

https://download.4projects.com?LinkID=c6691b95-88f0-4cb1-bf4b-388477672017

A full dilapidations survey will be conducted to identify any areas of asbestos. The contractor appointed to these works will submit a method statement for approval which will detail the means of safe removal and disposal of any asbestos in accordance with the relevant regulations.

**3. SEPA**

**We recommend that water resistant and resilient materials and forms of construction are used to reduce the impact of flooding to development. We would also recommend that the unnamed watercourse culvert is upgraded as described in the Flood Risk Assessment (FRA) to further reduce the risk at the site.**

The upgrade of the culvert is part of the planned works to ensure the water does not spill from the culvert during a flood event. This water could flow down the slope and impact the shore-base building in particular. This is scheduled to be one of the first elements completed on site along with the excavation of the dry swale which runs along the western margin of the site to help protect the construction site from any possible flood events. The facility and supporting smaller support buildings will generally be constructed of simple steel frames founded on reinforced in-situ concrete foundations overclad with proprietary roof and wall cladding. All of these materials are water resistant. The equipment inside the building will be installed upon elevated concrete plinths upon a concrete floor slab. The floor slab will be installed with a gradual slope towards linear drainage channel.

**The FRA is based on appropriate methods and its representation of flood risk at the site is in line with all other evidence that is currently available. Therefore, we have no objection provided the finished floor levels are set at a minimum 5.75mAOD via condition.**

The lowest floor level is set to 5.8m AOD and the site will be constructed to these levels.

**4. Environmental Health**

**All plant, machinery and equipment associated with ventilation, air-conditioning, heating and refrigeration services or similar and including fans, ducting and external openings shall be so installed, maintained and operated such that any associated operating noise does not exceed NR 20 when measured or calculated within any noise-sensitive property with windows open for ventilation purposes.**

With reference to paragraph 10 in the Project Description Document:

The entire plant will be located inside insulated buildings so any machine noise will be kept to a minimum. The development will use water-cooled chillers at this location rather than air-cooled chillers to avoid any noise arising from the air flow required to cool the condensers. The chillers will also have installed acoustic jackets over the compressors and will be located in a plant room with insulated composite cladding to prevent any noise breakout. The majority of operations involving the use of a small forklift will be carried out inside the main broodstock building thus the noise of vehicle movements on the site will be minimal. There will be standby generators on the farm, which will only function in event of a power cut. The generators selected will be designed to reduce any operational noise as far as possible, with exhaust gas, air inlet and outlet attenuators and silencers installed.

The background noise level for the purposes of assessing compliance with BS4142:2014 will be measured at the nearest noise receptor which is approximately 130m distant. All installations will ensure compliance with BS4142:2014 and/or NR20 regulations so that noise from the farm is not significantly higher than background levels.

The generator and chiller installation has been designed to ensure 70dB at 1m.

An initial assessment of the noise in this rural location assessed the background noise level is likely to be around 35dB. This needs to be confirmed with a more detailed survey. Assuming the noise is 70dB at source then allowing for the attenuation over 130m (roughly the distance to the nearest noise receptor) this reduces the noise level by around 30dB allowing further attenuation through an open window of 12dB and adding 4dB penalty for the tonal nature of the noise this results in a noise level of 32dB which would be below background levels. This is only an initial assessment and further detailed surveys will be conducted. If the noise level is assessed to be above the required level further measures can be installed which include noise absorbing acoustic barriers and further insulation to the plant room areas.

**The external lighting system shall be designed and installed in accordance with the best practice contained in the Institute of Lighting Professionals document Guidance Notes for the Reduction of Obtrusive Light.**

The only external plant lighting will be around the area of the oxygen tanks and backup generators to allow for maintenance operations should an issues occur during the night time hours. These lights will be on manual switches and so will only be used in the very rare occurrence that a breakdown occurs during the night. The lighting will also be designed taking all of the recommendations from the guidance notes for the reduction of obtrusive light ensuring the lights are mounted at a high level to direct the beams only the relevant area and that the correct wavelength and intensity of light is emitted by the selected luminaire.

The only other external lighting will be above the fire escapes and this will only come on in response to a fire alarm as required by the building regulations. The LED used within the fire escape lighting to indicate it is operational will be mounted on the underside of the lighting panel to minimise its visibility from afar.

Otherwise staff will access using torch light at night. There will be no general lighting of the external area. All operations are conducted inside of the proposed buildings. The buildings have a very limited number of windows which are restricted only to the staff welfare areas. This is due to the fact that we need to control the photoperiod for the fish and ensure low level lighting for the eggs. Therefore the building is sealed to ensure no ambient light can spill into the production halls and as consequence no lighting from inside the building will leak out. The only exception being the windows in the staff areas where blinds will installed that will be closed at night.

**5. Flood Risk Management Team**

Comments concerning the flood risk have been discussed in the response to the comments from SEPA above.

**Surface water runoff should be managed to minimise pollutants reaching the watercourse and should be provided with the appropriate levels of SuDS treatments to receive this. Please visit SEPA's Website for further information for treatments and General Binding Rules. xi). The FRM Team suggest Building Standards are also consulted with regards to the foul and surface water drainage.**

All details of the surface water and foul water drainage were submitted with the planning application. These will be further assessed and developed through the building warrant application.

The Development Drainage Impact Assessment Report and associated drawings and specifications detail all of the measures proposed to treat the surface water and foul water at the proposed development site.

**6. Public Comments**

[Redacted]

**I would like to ask if the 90 tons of fish feed used during their time in the sea - be hormone enhanced feed- or contain any growth hormones that could effect the natural biodiversity of the sea?**

Mowi do not use hormones in any of their salmon feed.

**To continue with this thread-The feed that drops to the bottom not eaten -is this cleared or collected?**

This development is not proposing to change any of current license conditions at the existing sea site and it is only referred to for information purposes within the planning application. The planning application is limited to the proposed land based development. As further comment however the broodstock fish slow and eventually stop feeding as they mature. As a consequence the feed usage in the sea site will reduce slightly due to the stocking of the broodstock fish rather than the production fish that are currently stocked.

**There is only one reference to the site being in the MPA-Marine Protected area- this is of very great importance as the fish farm in right in the centre of the MPA- but no reference has been made to the impact on the protected species?**

This is a land based development and so its impact on the marine environment is limited only to the effluent water from the proposed facility into the Allt Airdeasaidh burn and from there into the sea. There is already a SEPA abstraction and discharge license in place for this site and the new development will be fully compliant with this. At the point the broodstock fish transfer into freshwater they have stopped feeding completely and so the waste they produce is minimal compared to feeding fish. The eggs only excrete some dissolved waste. The farm will employ Recirculation Aquaculture Systems (RAS), this is process whereby the effluent water draining from the fish tanks or the egg silos is cleaned through various process to ensure it is of good enough quality to return to the fish tanks. The small amount of effluent water this process creates will be filtered mechanically through 40 µm screens and will be subject to two stages of biofiltration to remove the dissolved waste the fish and eggs produced. The retained solid waste will be uplifted and used on arable land as a fertiliser. This will all ensure the effluent is very clean and will not impact the burn or marine environment.

**I notice that another site has been deemed unsuitable due to its high diversity of Priority Marine features. It does not seem to have been recognised that Little Loch Broom is also home to PMFs- we have the most extensive live maerl bed on the west coast, flame mussels, eel grass, horse mussells, the three types of sea pens found in the North Atlantic, sepulids, native oysters, and native scallops to mention but a few. when this application was submitted had a survey been conducted to see if these PMF existed here in this loch? I would like to know how the criterium is drawn up for a Loch with too many PMFs against another? Please could you let me see the sea species report ?**

As mentioned this application proposes no change to the current infrastructure or maximum biomass allowed in the sea site and it will continue to operate within the current license conditions.

**I notice that there is no mention of the fish farm being used as a farm for culling for food-is this fish farm site now not going to be used for farming and just as a hatchery?**

The proposed land based farm will be used to house the broodstock fish which are the mature fish that produce the next generation of eggs. The early stages of egg incubation will also be completed at this site before they are shipped to the production hatcheries.

**I did not see any documentation to possible light pollution- please can you tell me if there will be any from lights over the hatchery? this would be a great concern as this area was being possibly considered for a "Dark Skies Area"- something that all residents love and of course tourism relies on especially in the winter for the northern lights.**

See chapter above in the response to Environmental Health comments.

**There is no data referencing the fish farms that the hatchery is to supply- are there new farms going to be created for the hatchery to supply- this is of very great concern?**

This facility will be used to supply eggs to existing sites. It will allow Mowi to produce its own eggs rather than purchasing them from third party sources.

[Redacted]

**I object to this proposal on the grounds of environmental damage: light pollution will occur all night and should not be happening in the Geopark which is a Dark Skies area. Also, outflow of waste material from the hatchery will pollute the loch and damage maerl beds and other organisms in what is a Marine Protected Area. The development is incompatible with the concept of the Geopark and the MPA.**

See responses regarding light pollution and the broodstock site effluent above.

[Redacted]

**I wish to object to this development.**
**This area is part of the Marine Protected Area and the environmental concerns of this development are significant. Past incidents do not augur well for the future avoidance of pollution.**
**This site is also part of the Wester Ross Biosphere where Dark Skies are promoted as an attribute. The lighting proposed would compromise this causing extensive light pollution.**

See comments above on the processes in place to ensure the site effluent water will not impact upon the environment and concerning light pollution.

**The arboricultural report advises that replanting will be constrained by the geomorphology but with deer fencing more extensive planting, beyond the flat field areas would be possible. As there will be extensive tree removal as much replanting as possible should be required.**

The Forestry Officer has also recommended a more extensive compensatory planting scheme. This is being drafted and will fully comply with their recommendations.

[Redacted]

**The intrusion of light pollution for security reasons (not visible from the road) and large industrial buildings would be in full view from this side. And would effectively be in front of the National Scenic Area. The unwelcome presence of the fish farm in the waters as viewed from the road is already damaging to this National Scenic Area and the impact of making this worse should be investigated.**

See comments on light pollution mitigation above.

[Redacted]

**It would seem that the effluent collection from this site is not efficient and the effluent discharge is not minimal as stated in the Marine Protection document. On those grounds alone I object to any expansion of the fish farm which will inevitably increase the amount of effluent.**

This application is concerning a new land based site. Mr Bairstow's comments concern the sea site. The staff at the sea site have no knowledge of the incident Mr Bairstow reports. This was not communicated to the staff at the time. See previous responses for information on the proposed treatment of the effluent from the new facility

**We will also be affected by light pollution from external security lighting on all buildings as noted in another objection from Mr and Mrs Soos.**

See previous comments on how any light pollution will be minimised and controlled.

[Redacted]

**Night time security lighting is indicated on all large buildings.**
**Would these be on continuously ?**

There is no mention of security lighting in the planning application see previous comments regarding the mitigation against possible light pollution.


# Broodstock Production Facility: Ardessie Broodstock Production Document

Mowi Scotland Limited
December 2022

# Contents

## Broodstock Production

The broodstock are the adult salmon which produce the fertilised eggs which are then used to produce all the fish which will be reared through our production farms until harvest. Broodstock production begins with supply of specially selected eggs from our family breeding unit. The parent fish that produce these eggs are maintained so that there is a high degree of genetic variability across the different families. This ensures that we have a broad range of genetic diversity to choose from when selecting the fish that will become the production broodstock.

These "elite" eggs are stocked in one of our hatcheries at Lochailort or Inchmore, they are grown up to the parr stage where at around 60g in weight we use an ultrasound machine to separate the fish into males and females. The fish are then stocked into one of our freshwater loch sites until they reach the smolt stage at which point they will transfer to sea.

The broodstock candidates will then continue to be grown on in one of the seawater farms alongside the normal production fish. Before the site needs to harvest out the production fish the broodstock will be graded mechanically at first to separate out the largest fish and then by hand to remove any fish which are showing signs of maturing early or that might have any other visible issue. At the same time the fish are re-vaccinated and a tissue sample is taken for DNA analysis and each individual is tagged so the DNA sample can be traced back to a particular fish. This will refine and reduce the population to be between ten and twenty thousand females and between one and two thousand males. These fish will then be transferred to a separate seawater broodstock site.

In the broodstock site the fish grow on to a larger size and begin to mature. The fish are then graded again by hand to remove any of those that are not going to mature and ultrasound is used again to identify those fish most advanced in maturation. These fish are separated and exposed to 24hour lighting to further advance maturation. Finally the DNA samples taken earlier will have been analysed to select those individuals with the genetic profile most suited to perform optimally within our farming systems. These individuals are then identified by the tags and only they will then transfer into the land based freshwater system.

The advanced fish will transfer into the freshwater system first where they will remain on 24 hours light for around 8 weeks before the hours of light exposure and water temperature are reduced until the fish are only exposed to 8 hours of light and 16 hours darkness and the water temperature is 8oC. This will stimulate the fish to spawn. The remaining fish transfer on land a month or two later. The degree of readiness to spawn is again checked using ultrasound and the fish are graded into separate tanks depending on the projected spawning date. The male fish are much more rigorously selected for the ideal genetic profile as one male fish can fertilise the eggs from many female fish. The male fish are stripped of milt in advance of the female spawning and this is preserved to be used once the female fish become ready. Once the females are ready to spawn they are removed from the tanks and humanely killed before the eggs are removed and then fertilised.

The eggs will then be held in a quarantine egg incubation facility where each females eggs are incubated separately whilst samples from the parent fish are PCR analysed for any disease issue. If a negative result is returned the eggs are then pooled in larger silos together in the egg incubation building. Any positive test will result in the eggs being disposed. The eggs are held in the incubators until they reach the stage where the eye of the developing embryo can be seen inside the egg. At this point the unfertilised and unviable eggs can be separated and removed. Finally the eggs are sorted, packaged into boxes and transported to the production hatcheries where they will continue the cycle.

## Recirculating Aquaculture System

The proposed facility is a Recirculating Aquaculture System (RAS). In a conventional land based farm the water flows through the fish tanks where the fish are being fed, the effluent draining from the fish tanks is treated and then discharged back into the environment in a single pass. This arrangement is known as a flow through facility.

In a RAS the effluent water discharging from the fish tanks is cleaned by various mechanical and biological filtration process within a Waste Water Treatment Plant (WWTP) before it is then pumped back to the fish tanks. In this way there is a standing body of water being recirculated between the fish tanks and WWTP in a continuous loop. Some water is lost during the filtration process and needs to be replaced. A small amount of water is therefore abstracted and disinfected to provide the new water to the RAS. This is a very much reduced volume of abstraction when compared to a flow through facility and as such it is possible to disinfect the water economically to protect the fish from any pathogens in the natural environment. The effluent water arising from the filtration is similarly of small volume making it possible to treat before discharge back to the environment. In this way there is very little environmental impact in terms or abstraction or discharge.

## Ardessie Broodstock farm

### Broodstock Main Building

The proposed facility takes the form of 14 x 8.8m diameter, 2.8m deep concrete fish tanks for the female fish and 2 x 6m diameter 2.1m deep plastic tanks for the male fish . Each tank is within its own RAS unit and has associated with it a WWTP where the water is first mechanically filtered through a drum filter, it then passes through a protein skimmer to remove fine particulate, then a Moving Bed Bioreactor (MBBR) where biofiltration removes the dissolved waste and finally a trickling degasser which removes the carbon dioxide the fish produce.

Each fish tank/WWTP unit is effectively a separate RAS so we can control the temperature in each tank individually and this is important as we can then manipulate the fish in each tank to spawn at different times as the development of maturation is controlled by the temperature and photoperiod.

The main broodstock building also contains changing rooms, an office/control room, a plant room a laboratory and toilet facilities. In addition there is an area where the mature fish which have reached the spawning stage are stripped of their eggs. In this area the fish are euthanised and hung up on a rail. The body cavity is opened and the eggs are removed into a bucket. The process will generate some blood water and this is directed towards the floor drains which in turn discharge into collection sump where the blood water is retained and then pumped into an ensiling system for disposal. The eggs are fertilised and stocked in the egg quarantine room located in the main building adjacent to the stripping line.

### Green Egg Building

When the eggs are released from quarantine they are housed in a separate building where the fertilised eggs are incubated until stocking to the production hatcheries. In this building there are three RAS units to enable three different incubation temperature regimes. The development of the eggs is also determined by the temperature of the external environment and so this can manipulated to extend the period over which the eggs can be delivered to the production hatcheries. The WWTP in this case compromises of sand filters, MBBR biofilter, trickling degasser and UV filter. This building

also contains the staff canteen, managers office, store room, male and female toilets an area for egg sorting and finally a room for boxing and dispatch of the eggs when ready for transport.

## Intake water disinfection and effluent treatment

The water supply to the main broodstock building and the egg incubation building is first processed through an intake water treatment facility. All of the water is first mechanically filtered through drum filters and sand filters. In the disinfection system the water flows through a concrete ozone contact tank in a single pass to remove the majority of the dissolved organic particulate. The water then passes through a U.V filter for disinfection and then enters a storage tank before supplying the broodstock and egg incubation RAS.

The effluent arising from the facility is minimal as the broodstock fish are not feeding at the point they return to freshwater. The eggs are only producing a very small amount of dissolved ammonia and no particulate waste. The effluent arises from the backwash from the RAS units drum filters, sand filters and protein skimmers. This will be directed to a settling tank with the supernatant from this tank being discharged to the location already licensed for effluent discharge. Any settled particulate of which there will be very minimal volume will be collected and occasionally uplifted by tanker for disposal.

## Chillers

The broodstock RAS, egg quarantine and green egg systems will all require a degree of chilling. This is provided by water cooled industrial chillers located in a separate annex of the egg incubation building. The chilled water is pumped from the chillers to heat exchangers in each system. The process water is passed through the other side of the heat exchanger and picks up the chilling energy within the heat exchanger which is then transferred into the process water in order to maintain the required temperature. In order to cool the chillers themselves, the proposal is to abstract some seawater which will be pumped through the condenser circuit of the chiller to condense the refrigerant gas. The condenser circuit is composed of stainless steel or titanium and is therefore inert and resistant to corrosion. The abstracted seawater will therefore pass through unchanged except for a temperature increase of between 1 and 3oC before it is discharged back to the sea.

## Shore base

The site is currently being used as shore base for the adjacent seawater site. The old hatchery building is being used as a feed store. As mentioned this will be demolished to make way for the new broodstock building, a new building will therefore be constructed to serve as the shore base for the seawater site with an area for feed storage, changing facilities, an office, a canteen and toilets. The broodstock will transfer to the Ardessie sea water site in Autumn and spend their second winter at sea in this location before being moved ashore into the broodstock freshwater tanks the following spring.