Case No: 2022-0375 Date of visit: 30/08/2022

Time spent on site: 4.5 hours Main Inspector: [redacted]

Site No: FS0056 Site Name: Ardmair
Business No: FB0447 Business Name: Wester Ross Fisheries Ltd

Case Types: 1 DIA 2 REP 3 4 5 6

Water Temp (°C): 14.2 Thermometer No: T173 FHI 045 completed

Observations: Region: HI Water type: S CoGP MA: M-11

| | | |
|---|---|---|
| Dead/weak/abnormally behaving fish present? | Y | If yes, see additional information/clinical score sheet. |
| Clinical signs of disease observed? | Y | If yes, see additional information/clinical score sheet. |
| Gross pathology observed? | Y | If yes, see additional information/clinical score sheet. |
| Diagnostic samples taken? | Y | |

UNI/REG only - if unable to carry out intended visit detail reason below:

**Additional Case Information:**

Histopathology reports - 17/08/22 - waterborne or handling related damage. Signs of AGD but no amoeba detected. Gill inflammation.

Nothing found in site plankton trawls to indicate harmful plankton but health surveillance suggests otherwise.

Recent freshwater treatments - finished 28th August 2022. Had been going on for 2 weeks. No medicinal treatments.

Lice levels have been very low. A few caligus around but never had to treat.

Wrasse wild caught each day by the company - keeping numbers seasonally but suggested to keep note monthly in the movement book. Other site has a method to keep track weekly and this could be proposed for this site but company are waiting to see what Mowi want.

Paperwork and inspection completed by [redacted], supervised by [redacted]. F1 sampled by [redacted], observed by [redacted]. F2, 3 and 4 sampled by [redacted], supervised by [redacted].

Case No: 2022-0375 Site No: FS0056

Date of Visit: 30/08/2022 Inspector(s): [redacted]

**Registration/Authorisation Details**

| | |
|---|---|
| 1. Business/site details summary checked by site representative? | Y |
| 2. Changes made to details? | N |

**Site Details (include cleaner fish for all sections)**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total No facilities | | 44 | Facilities stocked | | 23 | No facilities inspected | |
| Species | SAL | WRS | | | | | |
| Age group | 2021 S0 | Wild caught | | | | | |
| No Fish | 268,941 | 2,000 | | | | | |
| Mean Fish Wt | 1.2kg | 120g | | | | | |

| | | | |
|---|---|---|---|
| Next Fallow Date (Site) | June 2023 | Next Input Date (Site) | July/August 2023 |
| Recent (last 4 wks) disease problems? | Y | Any escapes (since last visit)? | |
| If yes, detail: | AGD, complex gill disease, environmental issues | | |

**Movement Records**

| | |
|---|---|
| 1. Movement records available for inspection? | |
| 2. Date of last inspection: | 14/09/2021 |
| 3. Are records complete and correctly entered? | |
| 4. Are movement records available for dead fish and waste? | |
| 5. Are records complete and correctly entered? | |
| 6. Are health certificates for introductions (outwith GB) available? | |

**Transport Records**

1. Are any movements carried out by (or on behalf) of the business (not using a STB)?
If yes, is there a system in place for maintenance of transportation records?

**Mortality Records**

1. Mortality records available for inspection?
2. How are mortalities disposed of? Other (detail)
If other detail: Incinerated or biogas - Merkland tankers and Dunholm environmental
3. Mortality records complete and correctly entered?
4. Recent mortality (last 4 wks): Wk31: 1.76% (5657), Wk32: 3.67% (11634), Wk33: 6.58% (2005
5.60% (15,950).
5. Evidence of recent increased/atypical mortalities?
If yes, facility nos/no mortality per facility/no stock per facility/reason:
Gill health related elevated mortalities across site
6. Any other peaks in mortality during period checked?
If yes, detail: 2022 Week 30: 1.55% (5060 fish) due to environmental conditions and gill health
7. Have increased (unexplained) mortalities been reported to vet or FHI?
If yes, detail action:
8. Have 'mortality events' been reported to FHI? If no, enter details on mortality events sheet.

**Treatments and Medicines Records**

1. Recent treatments (see comment)?
If yes, detail: T.M.S.
If other, detail:
2. Medicines records available for inspection?
3. Are records complete and correctly entered?
4. Are fish in a withdrawal period?
5. If yes, what treatment(s)? T.M.S.
If other, detail:
6. Are medicines stored appropriately?

**Biosecurity Records**

1. Biosecurity records available for inspection?
2. Has the manner and frequency of mortality removal, recording and safe disposal been considered?
3. Has the manner and period in which the APB will notify Scottish Ministers or veterinary professional of any *increased* (*unexplained)* mortality at the site been included?
4. Has the action that will be taken in the event that the presence or suspicion of the presence of a listed disease is detected been included and *how* and *when* that will be notified to Scottish Ministers?
5. Has the health status of aquaculture animals being stocked on the farm site been covered (equal or higher health status, certification if required)?
6. Have the husbandry and biosecurity measures implemented between each epidemiological unit to minimise transmission of disease been covered (movement of staff, visitors, equipment, live or dead fish etc.)?
7. Is documentation available regarding the measures in place to maintain the physical containment of aquaculture animals held on site?
8. Have the biosecurity procedures been adequately implemented on site?
If no, detail:

**Results of Surveillance**

1. Has any animal health surveillance been carried out by, or on behalf of, the business?
2. If yes, are results available for inspection?
3. Any significant results?
If yes, detail (if not detailed under recent disease problems). See additional comments/recent disea

Records checked between: 14/09/2021 - 30/08/2022

23

N

Y

Y

Y

Y

N/A

Y

Y

3), Wk 34:

Y

Y

N/A

Y

Y
Y
Y
Y
Y
Y
Y
ase

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Case no: | 2022-0375 | Site No: | FS0056 | Date of visit/ Sampling: | 30/08/2022 | 30/( | | | | | | | |
| Priority samples: | VI | | BA | | PA | | MG | | HI | | | | |
| Time sampling starts/ends: | 12:56:00 | 14:15:00 | Inspector: | | VMD No. | 0 | | | | | | | |
| Environmental conditions: | 1 | Indoors | 2 | | 3 | | 4 | | 5 | | | | |
| Summary samples | HIST | Y | BA | Y | MG | Y | VI | | PA | | Total Samples | | |

**Add Fish/Pools - click**

| | Pool/Fish No | F1 | F2 | F3 | F4 | P1 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fish nos | 1 | 2 | 3 | 4 | 1-5 | | | | | | | |
| | Pool Group | P1 | P1 | P1 | P1 | | | | | | | | |
| Stock Details | Species | SAL | SAL | SAL | SAL | | | | | | | | |
| | Average weight | 1.2000 | 1.2000 | 1.2000 | 1.2000 | | | | | | | | |
| | Sex | N/A | N/A | N/A | N/A | | | | | | | | |
| | Water Type | SW | SW | SW | SW | | | | | | | | |
| | Stock Origin | Loch Merkland (FS0612) | Loch Merkland (FS0612) | Loch Merkland (FS0612) | Loch Merkland (FS0612) | | | | | | | | |
| | Facility No | B1 | B1 | B4 | B1 | | | | | | | | |

08/2022 Additional Sample Information:

Time of death: 12:10

5 Total Tests assigned 2

Case no: 2022-0375 Site No: FS0056 Method of killing: Percussive

Date of visit: 30/08/2022 Inspector(s): [redacted] Sheet Relevant: Y

**S** for strong presence: **M** for medium presence: **W** for weak presence

| Fish Number | | 1 | 2 | 3 | 4 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time sampled after death (if > 45 minutes) | | 46min | 62min | 79min | 99min | | | | | | |
| External Signs | | | | | | | | | | | |
| Behaviour | Moribund | | | | | | | | | | |
| | Lethargic | M | M | M | M | | | | | | |
| | Hanging vertical | | | | | | | | | | |
| | Spiralling | | | | | | | | | | |
| | Flashing | | | | | | | | | | |
| | Loss of equilibrium | | | | | | | | | | |
| Body | Dark | | | | | | | | | | |
| | Distended abdomen | | | | | | | | | | |
| | Anorexic | S | S | | S | | | | | | |
| | Scale Oedema | | | | | | | | | | |
| Opercula | Shortened | W | | | | | | | | | |
| | Flared | | | | | | | | | | |
| Haemorrhaging | Throat | | | | | | | | | | |
| | Ventrum | | | | | | | | | | |
| | Base of fins | | | | | | | | | | |
| | Elsewhere | | | | | | | | | | |
| Eyes | Exophthalmic | | | | | | | | | | |
| | Enophthalmic (sunken) | | | | | | | | | | |
| | Cataract | | | | | | | | | | |
| | Haemorrhagic | | | | | | | | | | |
| Gills | Pale | W | M | W | W | | | | | | |
| | Zoned | | | | | | | | | | |
| | Necrotic | | | | | | | | | | |
| Lesions | Flank | | | | | | | | | | |
| | Elsewhere | | | | | | | | | | |
| Vent | Inflamed | | | | | | | | | | |
| | Trailing faeces | | | | | | | | | | |
| Lice Load | Estimate numbers | 0 | 0 | 0 | 0 | | | | | | |
| | | | | | | | | | | | |
| Internal Signs | | | | | | | | | | | |
| Ascites | Clear | | | | | | | | | | |
| | Bloody | | | | | | | | | | |
| Oedema | In tissues | | | | | | | | | | |
| Heart | Pale/anaemic | M | M | M | M | | | | | | |
| | Granulomas | | | | | | | | | | |
| | Deformed | | | | | | | | | | |
| Liver | Petechial haem | | | | | | | | | | |
| | Gross haem | | | | | | | | | | |
| | Tissue breakdown | | | | | | | | | | |
| | Enlarged | | | | | | | | | | |
| | Colour number(s) | 2 | 2 | 4 | 1 | | | | | | |
| | Granulomas | | | | | | | | | | |
| | Lesions | | | | | | | | | | |
| Pyloric caeca | Petechial haem | | | | | | | | | | |
| | Tubules mauve | | | W | | | | | | | |
| | Lack of fat | S | | | M | | | | | | |
| Spleen | Enlarged | | | | | | | | | | |
| | Granulomas | | | | | | | | | | |
| Gut | No food present | | | | | | | | | | |
| | Yellow pseudo-faeces | S | S | S | S | | | | | | |
| | External haem | | | | | | | | | | |
| | Internal haem | | | | | | | | | | |
| Body wall | Haemorrhaging | | | | | | | | | | |
| Swim bladder | Haemorrhaging | | | | | | | | | | |
| | Fluid filled | | | | | | | | | | |
| Kidney | Swollen | | | | | | | | | | |
| | Grey | | | | | | | | | | |
| | Granular | | | | | | | | | | |
| | Liquefied | | | | | | | | | | |
| General | Parasites present | | | | | | | | | | |
| | Anaemia | | | | | | | | | | |

Case no: 2022-0375

Date of visit: 30/08/2022

**S** for strong presence: **M** for medium presence: **W** for v

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fish Number** | | | | | | | | | | | |
| **Time sampled after death (if > 45 minutes)** | | | | | | | | | | | |
| **External Signs** | | | | | | | | | | | |
| **Behaviour** | **Moribund** | | | | | | | | | | |
| | **Lethargic** | | | | | | | | | | |
| | **Hanging vertical** | | | | | | | | | | |
| | **Spiralling** | | | | | | | | | | |
| | **Flashing** | | | | | | | | | | |
| | **Loss of equilibrium** | | | | | | | | | | |
| **Body** | **Dark** | | | | | | | | | | |
| | **Distended abdomen** | | | | | | | | | | |
| | **Anorexic** | | | | | | | | | | |
| | **Scale Oedema** | | | | | | | | | | |
| **Opercula** | **Shortened** | | | | | | | | | | |
| | **Flared** | | | | | | | | | | |
| **Haemorrhaging** | **Throat** | | | | | | | | | | |
| | **Ventrum** | | | | | | | | | | |
| | **Base of fins** | | | | | | | | | | |
| | **Elsewhere** | | | | | | | | | | |
| **Eyes** | **Exophthalmic** | | | | | | | | | | |
| | **Enophthalmic (sunken)** | | | | | | | | | | |
| | **Cataract** | | | | | | | | | | |
| | **Haemorrhagic** | | | | | | | | | | |
| **Gills** | **Pale** | | | | | | | | | | |
| | **Zoned** | | | | | | | | | | |
| | **Necrotic** | | | | | | | | | | |
| **Lesions** | **Flank** | | | | | | | | | | |
| | **Elsewhere** | | | | | | | | | | |
| **Vent** | **Inflamed** | | | | | | | | | | |
| | **Trailing faeces** | | | | | | | | | | |
| **Lice Load** | **Estimate numbers** | | | | | | | | | | |
| | | | | | | | | | | | |
| **Internal Signs** | | | | | | | | | | | |
| **Ascites** | **Clear** | | | | | | | | | | |
| | **Bloody** | | | | | | | | | | |
| **Oedema** | **In tissues** | | | | | | | | | | |
| **Heart** | **Pale/anaemic** | | | | | | | | | | |
| | **Granulomas** | | | | | | | | | | |
| | **Deformed** | | | | | | | | | | |
| **Liver** | **Petechial haem** | | | | | | | | | | |
| | **Gross haem** | | | | | | | | | | |
| | **Tissue breakdown** | | | | | | | | | | |
| | **Enlarged** | | | | | | | | | | |
| | **Colour number(s)** | | | | | | | | | | |
| | **Granulomas** | | | | | | | | | | |
| | **Lesions** | | | | | | | | | | |
| **Pyloric caeca** | **Petechial haem** | | | | | | | | | | |
| | **Tubules mauve** | | | | | | | | | | |
| | **Lack of fat** | | | | | | | | | | |
| **Spleen** | **Enlarged** | | | | | | | | | | |
| | **Granulomas** | | | | | | | | | | |
| **Gut** | **No food present** | | | | | | | | | | |
| | **Yellow pseudo-faeces** | | | | | | | | | | |
| | **External haem** | | | | | | | | | | |
| | **Internal haem** | | | | | | | | | | |
| **Body wall** | **Haemorrhaging** | | | | | | | | | | |
| **Swim bladder** | **Haemorrhaging** | | | | | | | | | | |
| | **Fluid filled** | | | | | | | | | | |
| **Kidney** | **Swollen** | | | | | | | | | | |
| | **Grey** | | | | | | | | | | |
| | **Granular** | | | | | | | | | | |
| | **Liquefied** | | | | | | | | | | |
| **General** | **Parasites present** | | | | | | | | | | |
| | **Anaemia** | | | | | | | | | | |

Additional comments:

Case No: 2022-0375 Date of visit: 30/08/2022

Site No: FS0056 Inspector: [redacted]

| Results Summary | Freq. | Date of Notification | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Database | Insp | Phone | Insp | Writing | Insp | 2nd Insp |
| AGD | 4/4 | 06/09/2022 | | 06/09/2022 | | 11/10/2022 | | |
| Para Ther | 4/4 | 06/09/2022 | | 06/09/2022 | | 11/10/2022 | | |
| Salmon Gillpox | 4/4 | 06/09/2022 | | 06/09/2022 | | 11/10/2022 | | |
| MG IHN | 0/2 | 12/09/2022 | | 13/09/2022 | | 11/10/2022 | | |
| MG IPN | 0/2 | 12/09/2022 | | 13/09/2022 | | 11/10/2022 | | |
| MG ISA | 0/2 | 12/09/2022 | | 13/09/2022 | | 11/10/2022 | | |
| MG PMCV | 0/2 | 12/09/2022 | | 13/09/2022 | | 11/10/2022 | | |
| MG SAV | 0/2 | 12/09/2022 | | 13/09/2022 | | 11/10/2022 | | |
| MG VHS | 0/2 | 12/09/2022 | | 13/09/2022 | | 11/10/2022 | | |
| Vibrio Species VSPE | 4/4 and 2/4 | 16/09/2022 | | 30/09/2022 | | 11/10/2022 | | |
| Ameobic gill disease | 4/4 | 22/09/2022 | | 30/09/2022 | | 11/10/2022 | | |
| Complex gill issues | 4/4 | 22/09/2022 | | 30/09/2022 | | 11/10/2022 | | |
| Epitheliocystis | 4/4 | 22/09/2022 | | 30/09/2022 | | 11/10/2022 | | |
| LPAT | 4/4 | 22/09/2022 | | 30/09/2022 | | 11/10/2022 | | |
| GPAT | 4/4 | 22/09/2022 | | 30/09/2022 | | 11/10/2022 | | |
| Post mortem changes | 4/4 | 22/09/2022 | | 30/09/2022 | | 11/10/2022 | | |
| Adhesions | 4/4 | 22/09/2022 | | 30/09/2022 | | 11/10/2022 | | |
| | | | | | | | | |
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| Report Summary | | | |
|---|---|---|---|
| Case Type | Date | Insp | 2nd Insp |
| DIA | 11/10/2022 | | |
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# FISH HEALTH INSPECTORATE VISIT REPORT

## SUMMARY FOR INFORMATION OF SITE OPERATOR

| | | | |
|---|---|---|---|
| **BUSINESS NO** | FB0447 | **DATE OF VISIT** | 30/08/2022 |
| **SITE NO** | FS0056 | **SITE NAME** | Ardmair |
| **CASE NO** | 20220375 | **INSPECTOR** | [redacted] |

## Section 1: Summary

The above site was inspected following reports of increased mortality by the farm operator. During the physical inspection of all pens, four fish were removed for diagnostic sampling.

Histopathology examination revealed complex gill issues and some vascular disturbance. Amoebic gill disease and epitheliocystis (likely *Brachiomonas* sp.) also observed. Mild, multifocal hepatic necrosis and mild peritonitis (potentially associated with vaccine administration).

*Vibrio* sp. was identified on plates taken from kidney material of two fish, a second *Vibrio* sp. was identified as the predominant bacterium observed on plates taken from gill material of all four fish. The level and purity of growth of these isolates would not suggest they would be implicated in current morbidity.

All four fish tested positive for Salmon gill poxvirus, *Paranucleospora theridion* and *Neoparamoeba perurans* (amoebic gill disease (AGD)).

Please contact myself or the duty inspector should you require any further information, have any queries regarding this report or if any problems develop.

## Section 2: Case Detail

Observations

Following five weeks of increased mortality notifications above the reporting threshold, a site inspection was carried out and samples taken for analysis.

All four fish sampled were lethargic, with F1, F2 and F4 having an anorexic body condition. F1 had a slightly shorted opercula and all four fish had pale gills. No lice were found on any of the fish sampled.

During internal examination, all four fish had pale/anaemic hearts. When examining the pyloric caeca, F3 had mauve tubules and F1 and F3 exhibited a lack of fat. All four fish had yellow pseudo faeces present.

Samples

Samples were collected from four fish according to the table below:



Marine Laboratory, 375 Victoria Road, Aberdeen, AB11 9DB
Tel – 0131 244 3498 Fax – 0131 244 0944 Email – ms.fishhealth@gov.scot
Website - www.gov.scot/Topics/marine/science

| Fish number | Facility number | Species | Stage | Origin |
|---|---|---|---|---|
| F1, F2 and F4 | B1 | Atlantic Salmon | 1.2kg 2021 S0 | Loch Merkland (FS0612) |
| F3 | B4 | Atlantic Salmon | 1.2kg 2021 S0 | Loch Merkland (FS0612) |

Results

**Bacteriology:** Kidney and gill material from F1-4 were inoculated onto appropriate media for the isolation of bacteria.

The following bacteria were isolated:

- *Vibrio* sp. from kidney material in F2 and F4 (Isolate A).
- *Vibrio* sp. from gill material in F1, F2, F3 and F4 (Isolate B).

**Virology:** Tissue samples were tested for segments of nucleic acid indicative of the presence of the pathogens specified below using real-time PCR (qPCR).

Salmon gill pox virus

| Fish Number | Endogenous control Cp value | Cp Values | | | Reported result |
|---|---|---|---|---|---|
| 1 | 22.22 | 28.63 | 28.7 | 28.81 | POSITIVE |
| 2 | 19.19 | 25.08 | 25.58 | 25.67 | POSITIVE |
| 3 | 22.09 | 24.73 | 24.77 | 24.73 | POSITIVE |
| 4 | 22.35 | 27.77 | 27.73 | 27.93 | POSITIVE |

Samples taken from F1 and F2 tested negative for infectious haematopoietic necrosis virus (IHNV), infectious pancreatic necrosis virus (IPNV), infectious salmon anaemia virus (ISAV), Salmonid alphavirus (SAV), viral haemorrhagic septicemia virus (VHSV) and piscine myocarditis virus (PMCV). Due to failure of the endogenous control, samples from F3 and F4 could not be tested.

**Parasitology:** Tissue samples were tested for segments of nucleic acid indicative of the presence of the parasites specified below using real-time PCR (qPCR).

*Neoparamoeba perurans* (AGD)

| Fish Number | Endogenous control Cp value | Cp Values | | | Reported result |
|---|---|---|---|---|---|
| 1 | 22.22 | 32.22 | 32.16 | 32.25 | POSITIVE |
| 2 | 19.19 | 32.05 | 32.52 | 32.57 | POSITIVE |
| 3 | 22.09 | 26.49 | 26.44 | 26.64 | POSITIVE |
| 4 | 22.35 | 33.00 | 33.52 | 33.14 | POSITIVE |

*Paranucleospora theridion*



Marine Laboratory, 375 Victoria Road, Aberdeen, AB11 9DB
Tel – 0131 244 3498 Fax – 0131 244 0944 Email – ms.fishhealth@gov.scot
Website - www.gov.scot/Topics/marine/science

| Fish Number | Endogenous control Cp value | Cp Values | | | Reported result |
|---|---|---|---|---|---|
| 1 | 22.22 | 21.20 | 21.02 | 21.32 | POSITIVE |
| 2 | 19.19 | 26.68 | 26.99 | 26.72 | POSITIVE |
| 3 | 22.09 | 29.18 | 29.56 | 29.11 | POSITIVE |
| 4 | 22.35 | 22.29 | 22.44 | 22.19 | POSITIVE |

**Histology:** Tissue samples of gill, skin and skeletal muscle, heart, pyloric caeca, pancreas, hind gut, liver, spleen and kidney were taken from F1-F5. The tissue samples were fixed in 10% neutral buffered formalin.

Histopathological examination revealed the following:

Gill: Lamellar epithelial hyperplasia and hypertrophy with mild, multifocal lamellar fusion. Several small foci of cellular necrosis noted in F4. Several basophilic epithelial inclusions (likely epitheliocystis) observed in all fish and several amoeboid cells resembling *Neoparamoeba perurans* observed in F3. Lamellar telangiectasia with multifocal thrombosis and lamellar congestion. Free blood among gill filaments observed in F1.

Skin & Muscle: F2: Absence of the epidermis, some inflammatory cell infiltrated, haemorrhage and foci of necrosis in the dermal layer. Foci of unknown round-shaped structures (potentially yeast) noted. Some Gram-negative bacteria also observed.

Heart: Very minimal inflammatory cell infiltrate (F1, F4). F3: No atrium in section.

Gut and pyloric caeca: Mild peritonitis. Cell sloughing (potentially associated with post-mortem artefacts). F3: Almost pyloric caeca.

Pancreas: Within normal range. F1 reading hindered by autolysis artefacts (F1).

Liver: Hepatocellular necrosis, mild multifocal (F1-F4).

Kidney: Hyaline droplet observed in few renal tubules in F2. Some increase on the number of melanomacrophage aggregates (F1-F4).

Spleen: Within normal range.

Signed: [redacted] Date: 11/10/2022

Fish Health Inspector

The Fish Health Inspectorate Service Charter detailing standards of service is available on the Marine Scotland website at https://www.gov.scot/publications/fish-health-inspectorate-service-charter/



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