

Case No: 2022-0572 Date of visit: 22/11/2022

Time spent on site: 3 hours Main Inspector:

Site No: FS1260 Site Name: Sound of Harris
Business No: FB0398 Business Name: Loch Duart Ltd

Case Types: 1 REP 2 DIA 3 4 5 6

Water Temp (°C): 12.2 Thermometer No: T173 FHI 045 completed

Observations: Region: WI Water type: S CoGP MA: None

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:

Stock origin: Landcatch/Hendrix Genetics

Input of stock onto site: Wk12 2022

Treatment history:

First SLICE treatment was conducted in June (14-21/06/2022). Increase in gill health issues on site appearing in September promoted first H₂O₂ treatment from 02-07/10/2022 and 19-20/10/2022. FW treatments have been conducted between these with a duration of 3 hours. Planned H₂O₂ treatment in Wk47.

Health Issues: AGD identified on site in September following potential environmental damage which was emphasised by histology reports. Mild PRV diagnosed, as well as Branchiamonas cysticola, PGD and Tenacibaculum maritum. October health visits conducted routine health screening. Following continued issues, continued high levels of PGD and AGD were reported on 27/11/2022 by health reports with last internal visit being on 15/11/2022.

2022: June, 6; August, 605 (due to freshwater treatment); September, 54; October, 95; November, 15.

Wrasse on site sourced locally or from Isle of Skye (all wild caught). Wrasse movement records were also inspected.

Site visit: first set of 10 pens inspected. Pens 7 and 8 are the pens with the highest mortality in this first set. ~20 moribund and lethargic fish were seen around the sides of the pens worst affected, many of which were exhibiting gasping behaviour. On the second set of 10 pens, pen 13, 17 and 18 were the most affected pens. During the inspection two pens were seen receiving Paramove 50 treatments. Current plan on site is to conduct Paramove 50 treatments on all the pens in the next week fews, should weather allow. AGD is noted as the primary cause of mortality on site. Company biologist and cleanerfish coordinator on site supervising treatments. Wrasse are only creel out during FW treatments, but hides allow for wrasse to seek shelter during H₂O₂ treatments. Wrasse were seen in all of the pens and appeared to be healthy. All fish sampled were moribund and lethargic.

Case No: Site No:

Date of Visit: Inspector(s):

Registration/Authorisation Details

1. Business/site details summary checked by site representative?

2. Changes made to details?

Site Details (include cleaner fish for all sections)

Total No facilities	<input type="text" value="20"/>	Facilities stocked	<input type="text" value="20"/>	No facilities inspected	<input type="text" value="20"/>
Species	<input type="text" value="SAL"/>	<input type="text" value="WRS"/>			
Age group	<input type="text" value="S1 2022"/>	<input type="text" value="wild caught"/>			
No Fish	<input type="text" value="367,700"/>	<input type="text" value="10,493"/>			
Mean Fish Wt	<input type="text" value="1kg"/>	<input type="text" value="mix"/>			
Next Fallow Date (Site)	<input type="text" value="Autumn 2023"/>		Next Input Date (Site)	<input type="text" value="04/2024"/>	
Recent (last 4 wks) disease problems?			<input type="text" value="Y"/>	Any escapes (since last visit)?	<input type="text" value="N"/>
If yes, detail:	<input type="text" value="AGD issues on site, environmental insult primary cause."/>				

Movement Records

1. Movement records available for inspection?

2. Date of last inspection:

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?

If other detail:

3. Mortality records complete and correctly entered?

4. Recent mortality (last 4 wks):

5. Evidence of recent increased/atypical mortalities?

If yes, facility nos/no mortality per facility/no stock per facility/reason:

6. Any other peaks in mortality during period checked?

If yes, detail:

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)? Y

If yes, detail: H2O2,
T.M.S.

If other, detail:

2. Medicines records available for inspection? Y

3. Are records complete and correctly entered? Y

4. Are fish in a withdrawal period? Y

5. If yes, what treatment(s)? T.M.S.

If other, detail:

6. Are medicines stored appropriately? Y

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? Y

2. If yes, are results available for inspection? Y

3. Any significant results? Y

If yes, detail (if not detailed under recent disease problems).
September diagnosed AGD, PGD, and low level PRV on site by Pharmaq.

October internal sampling found and observed severe levels of AGD and PGD as well as positive for Brachiomonas sp.

Records checked between: 06/10/2022-22/11/2022

Case no: Site No: Date of visit/
Sampling:

Priority samples: VI BA PA MG HI

Time sampling starts/ends: Inspector: VMD No.

Environmental conditions: 1 2 3 4 5

Summary samples HIST BA MG VI PA Total Samples

Add Fish/ Pools - click

Pool/Fish No	F1	F2	F3	F4	F5							
Fish nos	1	2	3	4	5							
Pool Group												
Species	SAL	SAL	SAL	SAL	SAL							
Average weight	1kg	1kg	1kg	1kg	1kg							
Sex	N/A	N/A	N/A	N/A	N/A							
Water Type	SW	SW	SW	SW	SW							
Stock Details		Ormsary Smolt Unit (FS0575)	Ormsary Smolt Unit (FS0575)	Clachbreac (FS0375)	Clachbreac (FS0375)	Clachbreac (FS0375)						
	Stock Origin											
Facility No	7	7	8	8	8							

Case no: 2022-0572

Site No: FS1260

Method of killing: Percussive

Date of visit: 22/11/2022

Inspector(s):

Sheet Relevant: Y

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

Fish Number		1	2	3	4	5				
Time sampled after death (if > 45 minutes)										
External Signs										
Behaviour	Moribund	S	S	S	S	S				
	Lethargic	S	S	S	S	S				
	Hanging vertical									
	Spiralling									
	Flashing									
Body	Loss of equilibrium		W			W				
	Dark	W	W	W	W	W				
	Distended abdomen									
	Anorexic									
Opercula	Scale Oedema									
	Shortened									
Haemorrhaging	Flared									
	Throat									
Eyes	Ventrum									
	Base of fins									
	Elsewhere									
	Exophthalmic									
Gills	Enophthalmic (sunken)									
	Cataract									
	Haemorrhagic									
Lesions	Pale									
	Zoned	W								
Vent	Necrotic									
	Flank									
Lice Load	Elsewhere									
	Estimate numbers	0	0	0	0	0				
Internal Signs										
Ascites	Inflamed									
	Clear									
Oedema	Bloody									
	In tissues									
Heart	Pale/anaemic									
	Granulomas									
	Deformed			W						
Liver	Petechial haem									
	Gross haem									
	Tissue breakdown									
	Enlarged									
	Colour number(s)									
Pyloric caeca	Granulomas									
	Lesions									
	Petechial haem									
Spleen	Tubules mauve									
	Lack of fat									
Gut	Enlarged									
	Granulomas									
	No food present	S	S	S	S	S				
Body wall	Yellow pseudo-faeces	S	S	S	S	S				
	External haem									
	Internal haem									
Swim bladder	Haemorrhaging									
	Fluid filled									
Kidney	Haemorrhaging									
	Swollen									
	Grey									
	Granular									
General	Liquefied									
	Parasites present									
	Anaemia									

Case no: 2022-0572

Date of visit: 22/11/2022

S for strong presence: M for medium presence: W for w

Fish Number																				
Time sampled after death (if > 45 minutes)																				
External Signs																				
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	Enophthalmic (sunken)																			
Gills	Cataract																			
	Haemorrhagic																			
	Pale																			
Lesions	Zoned																			
	Necrotic																			
	Flank																			
Vent	Elsewhere																			
	Inflamed																			
Lice Load	Trailing faeces																			
	Estimate numbers																			
Internal Signs																				
Ascites	Clear																			
	Bloody																			
Oedema	In tissues																			
Heart	Pale/anaemic																			
	Granulomas																			
	Deformed																			
Liver	Petechial haem																			
	Gross haem																			
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	Granular																			
	Liquefied																			
General	Parasites present																			
	Anaemia																			

Additional comments:

Site No: FS1260
Case No: 2022-0572
Nature of non-compliance:
Action taken (FHI):
Non-compliance relevant to (delete): VirologyMolGen/Bacteriology/Histology/Parasitology



Case No: **2022-0572** Date of visit: **22/11/2022**
 Site No: **FS1260** Inspector: **[REDACTED]**

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2 nd Insp
MG_AGDQ	5/5	30/11/2022		01/12/2022		15/12/2022		
MG_IHNQ	0/5	30/11/2022		01/12/2022		15/12/2022		
MG_IPN	1/5	30/11/2022		01/12/2022		15/12/2022		
MG_ISA	0/5	30/11/2022		01/12/2022		15/12/2022		
MG_PARA_THER-Q	5/5	30/11/2022		01/12/2022		15/12/2022		
a12	0/5	30/11/2022		01/12/2022		15/12/2022		
MG_SAL_POX	5/5	30/11/2022		01/12/2022		15/12/2022		
MG_SAV	0/5	30/11/2022		01/12/2022		15/12/2022		
MG_VHS	0/5	30/11/2022		01/12/2022		15/12/2022		
ADHE	4/5	08/12/2022		15/12/2022		15/12/2022		
AMGD	5/5	08/12/2022		15/12/2022		15/12/2022		
CGDH	5/5	08/12/2022		15/12/2022		15/12/2022		
GPAT	5/5	08/12/2022		15/12/2022		15/12/2022		
LPAT	4/5	08/12/2022		15/12/2022		15/12/2022		
HPAT	3/5	08/12/2022		15/12/2022		15/12/2022		
AERO	5/5	08/12/2022		15/12/2022		15/12/2022		
VSPE	5/5	08/12/2022		15/12/2022		15/12/2022		

Report Summary			
Case Type	Date	Insp	2 nd Insp
DIAG, REP	15/12/2022		

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS No	FB0398	DATE OF VISIT	22/11/2022
SITE No	FS1260	SITE NAME	Sound of Harris
CASE No	20220572	INSPECTOR	██████████

Section 1: Summary

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

Histopathology examination revealed mild to moderate, multifocal hyperplastic branchitis associated to gill health issues and vascular disturbance. Epitheliocystis (likely *Ca. Branchiomonas cisticola*) and amoebic gill disease (AGD) were also observed. F3 also displayed lesions that could be related with the presence of gill poxvirus. Gill lesions could also be associated with environmental factors/water insults. Hepatic necrosis, mild peritonitis (likely associated with vaccine administration) and mild multifocal myocarditis also observed.

All fish tested positive for *Neoparamoeba perurans* (amoebic gill disease), *Paranucleospora theridion* and salmon gill poxvirus by qPCR. One fish tested positive for infectious pancreatic necrosis (IPNV) by qPCR.

An *Aeromonas sp.* and a *Vibrio sp.* were identified on plates taken from gill material of all fish. The level and purity of growth would suggest they are likely to be of environmental origin and not present as primary fish pathogens.

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 8 weeks of notification of increased mortality above the reporting threshold, a site inspection was conducted. Approximately 20 moribund and lethargic fish were observed around the sides of pens with pens 7 and 8 being worst affected, many of which were exhibiting gasping behaviour. Minimal lice numbers were observed on site. Gill appearance/condition was varied in fish removed for inspection and subsequently sampling. The majority of the gills were observed to have very minimal white lesions but their overall shape and condition was normal. Only one fish was observed with slightly paler and ununiform shape. In addition, on the day of the inspection, two pens were observed receiving Paramove 50 treatments.

All sampled fish were lethargic and moribund. Only one fish had zoned gills. Internally, yellow pseudofaeces was present in the hind gut of all fish sampled.

R09

Samples

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

Fish number	Facility number	Species	Stage	Origin
1-2	7	Atlantic salmon	1kg 2022 S1	Ormsary Smolt Unit (FS0575)
3-5	8	Atlantic salmon	1kg 2022 S1	Clachbreac (FS0375)

Results

Bacteriology: Kidney and gill F1 to F5 inoculated onto appropriate media for the isolation of bacteria.

The following bacteria was isolated from gill material in F1-F5:

- *Aeromonas sp.*
- *Vibrio sp.*

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

Infectious pancreatic necrosis virus (IPNV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	-	-	-	-	NEGATIVE
F2	-	-	-	-	NEGATIVE
F3	-	-	-	-	NEGATIVE
F4	-	-	-	-	NEGATIVE
F5	20.46	35.81	36.33	37.75	POSITIVE

Salmon gill pox virus

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	19.66	30.13	30.22	30.06	POSITIVE
F2	18.84	25.05	24.85	25.14	POSITIVE
F3	19.08	21.36	21.41	21.62	POSITIVE
F4	18.45	25.11	25.15	24.79	POSITIVE
F5	19.39	29.83	30.09	29.92	POSITIVE

R09

The samples tested negative for infectious haematopoietic necrosis virus (IHNV), infectious salmon anaemia virus (ISAV), salmonid alphavirus (SAV), viral haemorrhagic septicaemia virus (VHSV) and piscine myocarditis virus (PMCV).

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 (PCR)
F1	19.66	26.40	26.41	26.58	POSITIVE
F2	18.84	24.28	24.17	24.42	POSITIVE
F3	19.08	23.63	23.81	23.88	POSITIVE
F4	18.45	25.99	26.19	25.93	POSITIVE
F5	19.39	26.40	26.48	26.54	POSITIVE

Paranucleospora theridion

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	19.66	26.93	26.98	26.94	POSITIVE
F2	18.84	24.75	24.80	24.97	POSITIVE
F3	19.08	26.17	26.20	26.24	POSITIVE
F4	18.45	23.69	23.50	23.68	POSITIVE
F5	19.39	25.60	25.68	25.69	POSITIVE

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

Histopathological examination revealed the following:

Gill: Lamellar hyperplasia and fusion, mild to moderate, multifocal, lamellar necrosis, mild, multifocal (F4 & F5) and vascular disturbance (F2 & F5). Presence of several amoeboid cells resembling *Neoparamoeba perurans* (F1-F5) and few basophilic epithelial inclusions (likely epitheliocystis) (F2, F3, F4, F5). Features of nuclear karyiorhexis in the lamellar epithelial cells and cell apoptosis were also observed F3.

Skin & Muscle: Within normal range.

Heart: Minimal to mild, multifocal myocarditis (F1,F3). Mild epicarditis (F1, F5).

Gut and pyloric caeca: Peritonitis, mild (potentially associated with vaccine administration) (F1, F2, F3, F4).

Pancreas: within normal range.

Liver: hepatocellular necrosis, mild, multifocal (F2, F3, F4, F5) and haemorrhage (F2, F5) and hepatocellular vacuolation (macrovisicules), mild, diffuse (F2).

R09

Kidney: Interstitial cell (haemopoietic) necrosis very mild, multifocal (f5), several renal tubules displaying hyaline droplet observed in all fish.

Spleen: Some cuffing (F3, F4, F5).



Signed:

Date: 08/12/2022

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/>

FHI Diagnostic Sampling Photos: Sound of Harris (FS1260)



Figure 1 Overview of a) fish 1 and b) fish 2 sampled (pen 7).

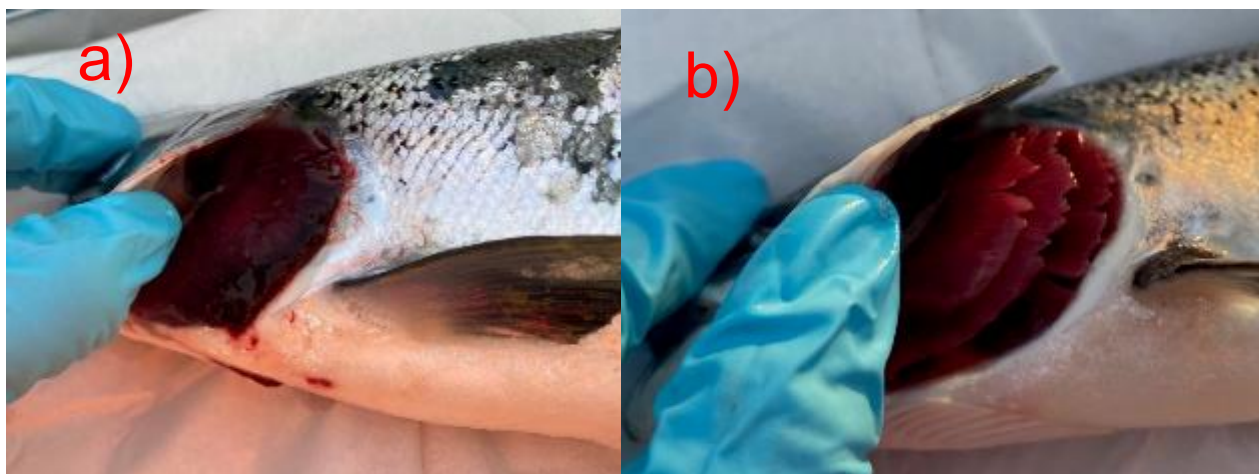


Figure 2 Gills of a) fish 1 and b) fish 2.



Figure 3 Internal view of fish 1.



Figure 4 Internal view of fish 2.



Figure 5 Overview of c) fish 3, d) fish 4 and e) fish 5 (pen 8).



Figure 6 Gills of c) fish 3 and d) fish 4.



Figure 7 Gills of fish 5



Figure 8 Internal view of fish 3



Figure 9 Internal view of fish 4.



Figure 10 Internal view of fish 5.