

Case No: 2023-0519 Date of visit: 15/11/2023

Time spent on site: 4h Main Inspector: [Redacted]

Site No: FS0853 Site Name: Lochmaddy
Business No: FB0398 Business Name: Loch Duart Ltd

Case Types: 1 REP 2 DIA 3 4 5 6

Water Temp (°C): 10.4 Thermometer No: T173 FHI 045 completed

Observations: Region: WI Water type: S CoGP MA: W-12

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:
[Redacted]

Additional Case Information:

Mortalities had been low post input (week 11 2023) until week 26 with a peak recorded on week 27 with 1760 (0.32%), mortalities continued to be elevated with a second peak noted in week 32 of 2262 (0.42%) and week 33 2259 (0.40%), numbers had decreased but then had increased in week 36 and have continued to be elevated, mixed causes failed smolts, handling and AGD.

Morts for the last five weeks have been wk 40 8074 (1.47%), wk 41 13,503 (2.5%), wk 42 20,307 (3.85%), wk 43 30,186 (6.11%) and wk 44 21,975 (4.79%). Wk 45 6279, (1.45%) These are attributed to AGD.

AGD the only identified issue on site, two FW treatments have been administered, first in August and a second in November.

Wrasse mortalities last four weeks wk 43 111 (0.83%), wk 44 408 (3.09%), wk 45 8 0.06%), wk 46 10 (0.08)

Slice administered wk 31 due to increased caligus in July 2023 leps have remained low.

A number of lethargic fish were observed in the pens inspected, some lesions were also noted.

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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	20	Facilities stocked	13	No facilities inspected	5
Species	SAL	WRA			
Age group	2023 s1	wild			
No Fish	427,000	12,775			
Mean Fish Wt	1.3kg	N/A			
Next Fallow Date (Site)	Nov 2024		Next Input Date (Site)	spring 2025	
Recent (last 4 wks) disease problems?		Y	Any escapes (since last visit)?		N
If yes, detail:	AGD,				

Movement Records

- 1. Movement records available for inspection?
- 2. Date of last inspection: **06/10/2021**
- 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: **Whiteshore cockles**
- 3. Mortality records complete and correctly entered?
- 4. Recent mortality (last 4 wks): **see additional information**
- 5. Evidence of recent increased/atypical mortalities?
- If yes, facility nos/no mortality per facility/no stock per facility/reason: **see additional information**
- 6. Any other peaks in mortality during period checked?
- If yes, detail: **see additional information**
- 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:
 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)?
 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).

Records checked between:

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	P1	P1	P1	P1	P1							
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		Clachbreac	Clachbreac	Clachbreac	Clachbreac	Clachbreac						
	Stock Origin											
Facility No	13	13	6	6	6							

Case no: 2023-0519

Site No: FS0853

Method of killing: Percussive

Date of visit: 15/11/2023

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

Additional comments:

Case No: **2023-0519** Date of visit: **15/11/2023**
 Site No: **FS0853** Inspector: **[REDACTED]**

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2 nd Insp
ISA (real time qPCR - heart & kidney) - ISAQ	1/5	20/11/2023		20/11/2023		15/12/2023		
IHN (PCR) - IHNP	0/5	20/11/2023		20/11/2023		15/12/2023		
VHS (PCR) - VHSP	0/5	20/11/2023		20/11/2023		15/12/2023		
AGD (Neoparamoeba perurans) (PCR) - AGDQ	5/5	22/11/2023		30/11/2023		15/12/2023		
IPN (PCR) - IPNM	0/5	22/11/2023		30/11/2023		15/12/2023		
Paranucleospora theridion (PCR) - PNST	5/5	22/11/2023		30/11/2023		15/12/2023		
Piscine myocarditis virus (CMS) (PCR) - PMVP	0/5	22/11/2023		30/11/2023		15/12/2023		
Salmon gill poxvirus (PCR) - SPVP	5/5	22/11/2023		30/11/2023		15/12/2023		
Salmonid alphavirus (SAV) (PCR) - SALP	0/5	22/11/2023		30/11/2023		15/12/2023		
Aeromonas spp - AERO	5/5	30/11/2023		30/11/2023		15/12/2023		
Vibrio species (culture) - VSPE	3/5	30/11/2023		30/11/2023		15/12/2023		
Amoebic gill disease (histology) - AMGD	3/5	06/12/2023		06/12/2023		15/12/2023		
Gill pathology - GPAT	5/5	06/12/2023		06/12/2023		15/12/2023		
Epitheliocystis - EPIT	2/5	06/12/2023		06/12/2023		15/12/2023		
Liver pathology - LPAT	3/4	06/12/2023		06/12/2023		15/12/2023		
Piscirickettsia salmonis (SRS) (histology) - PISH	1/5	06/12/2023		06/12/2023		15/12/2023		
Piscirickettsia salmonis (SRS) (PCR) - PISP	2/2	06/12/2023		06/12/2023		15/12/2023		
Microsporidium - MICR	0/2	12/12/2023		12/12/2023		15/12/2023		
ISA (virus isolation) - ISAV	0/1	09/01/2024				09/01/2024		

Report Summary			
Case Type	Date	Insp	2 nd Insp
Interim DIA	15/12/2023		
Final DIA	09/01/2024		

		[Redacted]	[Redacted]

FINAL FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS No	FB0398	DATE OF VISIT	15/11/2023
SITE No	FS0853	SITE NAME	Lochmaddy
CASE No	20230519	INSPECTOR	[REDACTED]n

Results

The outstanding result for this case is:

Virology: Tissue samples were tested for the presence of infectious salmon anaemia virus (ISAV) by cell culture.

The result of this test was negative.

Please refer to the previous fish health report issued on 18/12/2023 for all other results.

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

Signed:

[REDACTED]

Fish Health Inspector

Date: 09/01/2024

The Fish Health Inspectorate Service Charter detailing standards of service is available on the Scottish Government website at [Fish Health Inspectorate Service Charter - gov.scot \(www.gov.scot\)](https://www.gov.scot/policies/fish-health-inspectorate/)

INTERIM FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS No	FB0398	DATE OF VISIT	15/11/2023
SITE No	FS0853	SITE NAME	Lochmaddy
CASE No	20230519	INSPECTOR	██████████

Section 1: Summary

The site was inspected following reports of elevated mortalities occurring at the site, on inspection of stocks a number of lethargic fish were observed, five were removed for further examination and subsequent diagnostic sampling.

Histopathology examination revealed moderate gill pathology with amoebic gill disease (confirmed by qPCR) and pathology consistent with salmonid rickettsial septicaemia (SRS) (confirmed by qPCR). Two fish displayed in the musculature a few unknown structures resembling parasites.

One fish tested positive for infectious salmon anaemia virus (ISAV) by qPCR. Sequencing analysis confirmed this to be HPR0 (non-deleted type).

Gill samples tested positive for the gill related pathogens: *Paranucleospora theridion* and salmon gill poxvirus (SGPV).

Aeromonas sp. was identified on plates taken from kidney and gill material, the level and purity of growth would suggest that this bacterium would be implicated as the primary source of these lesions.

Vibrio sp. was identified on plates taken from kidney and lesion material but the level and purity of growth would not suggest that this bacterium would be implicated as the primary source of morbidity.

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

Mortalities on the site had been low post input until week 26 with a peak recorded in week 27 and a second in week 32. Numbers had remained elevated with an additional peak of 6.11% (30,186) recorded for week 43. The main cause was recorded as AGD.

On inspection of the site lethargic fish were noted in all pens inspected with some lesions evident, five were removed for diagnostic sampling.

All five fish had necrotic gills and the opercula of F2 and 4 were shortened. Lesions were present on the flanks of F1-3.

Internally the hearts of F3-5 were deformed with petechial haemorrhaging evident on the liver of F1 and 3. Splenomegaly was noted in F1-4 with yellow pseudo faeces in all fish. The tubules of the pyloric caeca of F2 were mauve in appearance and the kidney of F3-5 were swollen.

R09

Samples

Samples were collected from F1-5 fish according to the table below:

Fish number	Facility number	Species	Stage	Origin
F1-2	13	Atlantic salmon	1kg 2023 s1	Clachbreac
F3-5	6	Atlantic salmon	1kg 2023 s1	Clachbreac

Results

Bacteriology: Kidney and gill material from F1-5 and lesion material from F1-3 were inoculated onto appropriate media for the isolation of bacteria

The following bacteria were isolated:

- *Aeromonas* sp. (lesion F1 and 3, gill F1-5);
- *Vibrio* sp. (kidney F4, lesion F1 and 2).

Tissue samples of two fish were tested for segments of nucleic acid indicative of the presence of the pathogen specified below using real-time PCR (qPCR).

Piscirickettsia salmonis

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F2	19.96	20.18	20.69	20.57	POSITIVE
F3	19.36	29.66	29.72	29.82	POSITIVE

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 salmon anaemia virus

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	-	-	-	-	Negative
F2	14.21	35.00	37.38	35.42	POSITIVE
F3	-	-	-	-	Negative
F4	-	-	-	-	Negative
F5	-	-	-	-	Negative

Following the positive QPCR result for ISAV, the HPR region was sequenced. The ISA HPR type was determined to be HPR0 (non-deleted type).

Salmon gill poxvirus

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
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R09

F1	18.44	23.41	23.38	23.37	POSITIVE
F2	19.71	22.46	22.47	22.48	POSITIVE
F3	19.08	34.17	34.32	34.76	POSITIVE
F4	18.39	23.83	23.79	23.86	POSITIVE
F5	18.76	26.41	26.40	26.29	POSITIVE

The samples tested negative for infectious haematopoietic necrosis virus (IHNV), infectious pancreatic necrosis virus (IPNV), salmonid alphavirus (SAV), viral haemorrhagic septicemia 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	18.44	24.31	24.27	24.42	POSITIVE
F2	19.71	29.41	29.41	29.47	POSITIVE
F3	19.08	28.46	28.79	28.86	POSITIVE
F4	18.39	25.99	26.05	26.09	POSITIVE
F5	18.76	28.45	28.45	28.28	POSITIVE

Paranucleospora theridion

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	18.44	23.69	23.69	23.79	POSITIVE
F2	19.71	21.53	21.54	21.58	POSITIVE
F3	19.08	22.90	22.99	23.38	POSITIVE
F4	18.39	22.20	22.10	22.37	POSITIVE
F5	18.76	26.99	26.86	27.00	POSITIVE

Tissue samples from F1 and 4 were tested for the presence of Microsporidian parasites by PCR, the results of these tests were negative.

Histology: Tissue samples of gill, skin and skeletal muscle, heart, pyloric caeca, pancreas, hind gut, liver, spleen and kidney were taken from F1-5. The tissue samples were fixed in 10% neutral buffered formalin.

Histopathological examination revealed the following:

Gill: Filament hyperplasia and lamellar fusion moderate, multifocal (F1, F3, F4, F5) with necrosis, multifocal, mild and few round blue structures resembling bacteria that Gram-negative (likely *Piscirickettsia* sp.) and several amoebic cells resembling *Neoparamoeba perurans* (F1, F4, F5), several basophilic epithelial inclusions (likely epitheliocystis) (F2, F3). F3 displayed some vascular disturbances. Lamellar telangiectasia (F1, F, F4, F5) and free blood among gill filaments (F5).

Skin & Muscle: F1 displayed mild, focal, dermatitis and F2 displayed presence of few round blue structures resembling bacteria that stained Gram-negative (likely *Piscirickettsia* sp.) and F3 bacteria. F1 and F4 few small areas of myositis with several unknown parasite-like structures.

Heart: Minimal myositis (F1, F3, F4) and necrotising and some nests of basophilic nuclei (F2). Mild, epicarditis (F2) with round blue structures resembling bacteria (likely *Piscirickettsia* sp.) (F2).

Gut and pyloric caeca: Peritonitis, mild, multifocal (F2, F3) with few round blue structures resembling bacteria (likely *Piscirickettsia* sp.).

Pancreas: Some autolysis observed in F5.


Liver: Hepatocellular necrosis, mild, focal (F1, F3), F5 displayed some hepatocellular vacuolation (macrovesicles).

Kidney: Ranging from some to mild, foci of reduced interstitial cell (haemopoietic) (F1, F4) and necrosis, ranging mild to marked, multifocal (F2) with few intracellular round blue structures resembling bacteria that stained Gram-negative (likely *Piscirickettsia* sp.). Some renal tubules display some hyaline droplets (F2, F5), Some renal tubule dilation observed F4.

Spleen: Necrosis, multifocal, mild and few intracellular round blue structures resembling bacteria that stained Gram-negative (likely *Piscirickettsia* sp.) (F2).

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

Signed:



Date: 13/12/2023

Fish Health Inspector

The Fish Health Inspectorate Service Charter detailing standards of service is available on the Scottish Government website at [Fish Health Inspectorate Service Charter - gov.scot \(www.gov.scot\)](https://www.gov.scot/policies/fish-health-inspectorate/)



F1-5



F1 and 2



F3 and 4



F5



F1



F1



F2



F2



F3



F3



F4



F4



F5



F5