An Bord Achomhairc Um Cheadúnais Dobharshaothraithe
Aquaculture Licences Appeals Board

MOWI Ireland

Site T6/202

Appeal

Cúirt Choill Mhinsí, Bóthar Bhaile Átha Cliath, Port Laoise, Contae Laoise, R32 DTW5
Kilminchy Court, Dublin Road, Portlaoise, County Laois, R32 DTW5

Guthán/Telephone: 057 8631912 R-phost/Email: info@alab.ie Láithreán Gréasáin/Website: www.alab.ie

NOTICE OF APPEAL UNDER SECTION 40(1) OF FISHERIES (AMENDMENT) ACT 1997 (NO. 23)

Appeal Form

Please note that this form will only be accepted by REGISTERED POST or handed in to the ALAB offices	
Name of Appellant (block letters)	Silver King Seafoods Limited, trading as Mowi Ireland, a wholly owned subsidiary of Comhlucht Iascaireachta Fanad Teoranta, trading as Mowi Ireland
Address of Appellant	Registered Office: Fanad Fisheries, Kindrum, Fanad, Letterkenny, Co. Donegal. Correspondence: Mowi Ireland, Kindrum, Fanad, Letterkenny, Co. Donegal.

Phone:	[redacted]	Email:	[redacted]
Mobile:		Fax:	N/A

Fees

Fees must be received by the closing date for receipt of appeals	Amount	Tick
Appeal by licence applicant	€380.92	Yes
Appeal by any other individual or organisation	€152.37	
Request for an Oral Hearing * (fee payable in addition to appeal fee) * In the event that the Board decides not to hold an Oral Hearing the fee will not be refunded.	€76.18	
(Cheques Payable to the Aquaculture Licences Appeals Board in accordance with the Aquaculture Licensing Appeals (Fees) Regulations, 1998 (S.I. No. 449 of 1998))		
Electronic Funds Transfer Details	IBAN: IE89AIBK93104704051067	BIC: AIBKIE2D

Subject Matter of the Appeal

The purported determination of the Minister of Agriculture, Food and the Marine (the "**Minister**") dated April 12th, 2019 (the "**Determination**"):

(1) That there has been a breach of condition 2(e) of Licence T06/202 (the "**Licence**") for the culture of salmon in cages at a site east of Deenish Island, Ballinskelligs Bay, Co. Kerry (the "**Deenish Site**");

(2) That the statutory entitlement of Silver King Seafoods Limited (a wholly owned Company of Comhlucht Iascaireachta Fanad Teoranta) ("**MOWI Ireland**") to continue aquaculture operations

at the Deenish Site under the provisions of Section 19(A)4 of the Fisheries (Amendment) Act 1997 (as amended) (the "**Fisheries Act**") is discontinued for breach of condition 2(e) of the Licence.

This appeal is made strictly without prejudice to Mowi Ireland's position that, for the reasons outlined below, the Minister was not entitled or empowered to make the Determination discontinuing the statutory entitlement of Mowi Ireland to continue aquaculture operations at the Deenish Site pursuant to section 19A(4) of the Fisheries Act, and accordingly the Determination is ultra vires and of no effect.

For the avoidance of doubt, Mowi Ireland intend to institute judicial review proceedings challenging the Determination of the Minister the subject of this appeal. As part of those proceedings, Mowi Ireland intends to apply to the High Court for an Order staying this appeal pending the resolution of the judicial review proceedings.

Site Reference Number:- (as allocated by the Department of Agriculture, Food and the Marine)	T6/202

Appellant's particular interest in the outcome of the appeal:

The appellant is the holder of the Licence.

Outline the grounds of appeal (and, if necessary, on additional page(s) give full grounds of the appeal and the reasons, considerations and arguments on which they are based):

Pursuant to section 40 of the Fisheries Act, Mowi Ireland request the Aquaculture Licences Appeals Board (the "**Board**") to:

1. Substitute for the Minister's Determination that there was a breach of condition 2(e) of the Licence, its own decision that there has been no such breach;

2. Substitute for the Minister's Determination to discontinue Mowi Ireland's statutory entitlement to continue aquaculture operations at the Deenish Site pursuant to Section 19(A)4 of the Fisheries Act, its own decision that Mowi Ireland's statutory entitlement is continuing; and

3. Substitute for the Minister's Determination to discontinue Mowi Ireland's statutory entitlement to continue aquaculture operations at the Deenish Site pursuant to Section 19(A)4 of the Fisheries Act, its own decision to amend the Licence to provide for the control of production by reference to a maximum Standing Stock Biomass ("**SSB**"), otherwise known as a Maximum Allowable Biomass ("**MAB**").

PRELIMINARY [LEGAL] OBJECTIONS TO THE MINISTER'S DETERMINATION

1. **Minister does not have the power to discontinue Mowi Ireland's statutory entitlement to continue aquaculture operations at the Deenish Site**

The aquaculture licence in respect of the Deenish Site was first issued on 30 January 1995 and was renewed on 4 August 2004 for the period up to and including 15 February 2007. On 5 February 2007, Mowi Ireland submitted an application for a renewal of the Licence. By virtue of section 19A(4) of the Fisheries Act, Mowi Ireland was entitled to continue aquaculture operations at the Deenish Site subject to the terms and conditions of the licence pending the determination of the licence application. The application to renew the Licence has still not been determined more than 12 years later.

On 9 March 2017, the Department wrote to Mowi Ireland, alleging a breach of condition 2(e) of the Licence and advised that

> *"consideration is not being given to the possibility that your statutory entitlement to operate at the above site under the provisions of Section 19A(4) of the Fisheries (Amendment) Act 1997 (as amended) may not have ceased, on account of the breach of a condition of the licence."*

Mowi Ireland was afforded 28 days from the date of notification to make submissions to the Minister in relation to the proposed cessation of its statutory entitlement.

On 3 April 2017, Mowi Ireland made a submission which disputed the power of the Minister to treat the entitlement to continue operations as having ceased. The following points were also made in the letter:

a) Mowi Ireland is properly maintaining the Deenish Site with the application of best available techniques.
b) The Licence terms are out of date, inappropriate and contrary to supporting best practices.
c) Mowi Ireland did not "*harvest*" at the Deenish Site.
d) Zero blood water is spilled from the farm into its local environment.

There is no express provision in the Fisheries Act that allows the Minister to bring an end to the statutory entitlement contained in section 19A(4), nor is there any basis for implying such a power. Furthermore, there is no express provision allowing the Minister to bring an end to that statutory entitlement for breach of a condition which the Minister has purported to do in this case. Absent an express entitlement to do so, the Minister has no power to discontinue the statutory entitlement contained in section 19A(4) of the Fisheries Act. Accordingly, the Determination of the Minister which purports to discontinue Mowi Ireland's statutory entitlement to continue aquaculture operations at the Deenish Site pursuant to section 19A(4) of the Fisheries Act is *ultra vires*.

2. **Breach of the requirements of the Fisheries Act**

Without prejudice to Mowi Ireland's position that the Minister has no power to discontinue the statutory entitlement contained in section 19A(4) of the Fisheries Act, it is clear that the process employed by the Minister in making the Determination does not meet the requirements of the Fisheries Act.

The only issue raised by the Minister in the letter of 9 March 2017 was an alleged breach of condition 2(e) of the Licence. This issue was addressed by Mowi Ireland in its letter of 3 April 2017.

However, and as is evident, from the Determination, the Minister based his decision to discontinue Mowi Ireland's statutory entitlement on other matters which were not raised in the letter of 9 March 2017 and which Mowi Ireland was not given the opportunity to address. The Minister is required, under the principles of fair procedures and natural and constitutional justice, to identify all matters upon which he intends to rely in making a decision whether or not to discontinue Mowi Ireland's statutory entitlement and to allow Mowi Ireland made submissions on those issues. Mowi Ireland was denied the opportunity to address matters which the Minister clearly considered to be significant.

These include the following matters:

a) The alleged "*extent*" of the breach;
b) The temporary amendment to facilitate a pilot project in 2012 was a "*once off pilot for this site only" and Mowi Ireland were aware of this*"
c) An increase in the stock harvested from the site must increase the effluent discharge from the site.

As the High Court has made clear (see *Murphy's Irish Seafood* case ([2017] IEHC 353), the Minister is required to give notice of the matters upon which he will rely and to afford the affected party an opportunity to make submissions when making a decision of the type at issue in this appeal.

Had the Minister identified these issues in his notice of 9 March 2017, Mowi Ireland would have addressed them. In particular, Mowi Ireland would have submitted the relevant technical reports to demonstrate that there had been no effluent discharges from "*harvesting*". The Minister's incorrect assumption of increased effluent discharge from the farm is merely an assertion, unsupported by any evidence, and which is contradicted by the environmental data submitted by the company over all the years that Mowi Ireland has operated this site – including that reported as part of the trial to which he refers. [1] [2] [3]

Furthermore, the Minister's Determination did not address any of the matters raised by Mowi Ireland's submission of 3 April 2017. Mowi Ireland relies on the entire content of that submission in full for the purposes of this appeal.

GROUNDS OF APPEAL

The grounds of appeal set out below are without prejudice to the preliminary [legal] objections set out above.

1. No breach of condition 2(e)

The Department in its letter of 9 March 2017, allege that condition 2(e) of the Licence had been breached. Condition 2(e) provides as follows:

"the Licensee shall not harvest more than 500 tonnes (dead weight) of salmon in any one calendar year."

The letter alleged that a breach of this condition had occurred as the total dead weight harvest for the Deenish site in the calendar year 31 December 2016 was 1,108,907.36kg (1,108.91 tonnes). This figure had been provided to the Department by Mowi Ireland in an email dated 24 February 2017.

The Minister's Determination that there has been a breach of condition 2(e) of the Licence is simply wrong in law and in fact. No "*harvesting*" took place at the Deenish Site in 2016 and accordingly there could be, and has not been, any breach of condition 2(e).

Condition 2(e) of the Licence refers to the amount of salmon that can be harvested at the site in any one calendar year. The term "harvest" is not defined in the Licence. However, when the Licence was originally issued in 1995 "*harvesting*" of salmon (ie, the killing of live salmon) took place at the pens and this resulted in the release of blood-water at the site during the harvesting operations. Accordingly, conditions like condition 2(e), were required to ensure there was no adverse effect on the environment arising out of the harvesting of salmon on site. It is clear, moreover, that the Minister accepts that the term "*harvesting*" refers to the killing of salmon in circumstances where he has assumed that the increased in the amount of "*harvesting*" will necessarily lead to an increase in the amount of effluent discharged.

In 2016, "*harvesting*" as understood when the Licence was issued in 1995, did not take place at the pens. In 2016 when the alleged breach occurred, there was no killing of live salmon at the Deenish Site. Instead a local sub-contracted well-boat (the Christina R) collected live fish from the Deenish Site and then moored at the pier in Castletownbere where the live fish were pumped off into a mobile and temporary harvest station. In this harvest station the fish were killed, by means of a hydraulic bolt to the head, and bled. Following this procedure the fish and blood water enter purpose built and food grade stainless steel HGV tankers which contain a mixture of ice and water and were then transported to a processing plant at Rinmore in County Donegal. It should be noted that this procedure has changed since 2016, when the alleged breach occurred, and the fish are now killed in a specialised boat at the Deenish Site. There are no discharges of effluent or waste from the boat to the water and instead the blood water is treated on land at a registered facility.

In the circumstances, there has been no harvesting within the meaning of licence at all at the site for some years and, therefore, no breach did or could have occurred of any harvesting limit.

2. No adverse environmental effects arising from the operation of the Deenish Site

The Determination states that:

"An increase of 121% in the stock harvested from the site must increase the effluent discharge from the site. The extent of the discharge is open to argument. However it is not open to the Company to interpret the licence conditions any way it wishes"

Firstly, there was no evidence before the Minister which would allow him conclude that there was an increase in the effluent discharged from the site as a result of the number of stock harvested. This appears to have simply been an incorrect assumption by the Minister based, at least in part, on a misunderstanding of the processes engaged in at the Deenish site.

Secondly, Mowi Ireland were not afforded the opportunity to address this point in its letter of 3 April 2017. At no point did the Minister indicate that he was considering basing his decision on a purported increase in effluent discharge. As noted above, Mowi could readily have established based on the detailed evidence on environmental impacts available due to its ongoing environmental monitoring that there was no increase in effluent discharge at all associated with the volume of salmon removed from the Deenish facility.

In this regard, it is not understood what the Minister means by his assertion that it is

> *"the extent of the discharge is open to argument. It is not open to interpret the licence condition any way it wishes."*

The issue of the extent of the discharge didn't form part of the complaint or the reply to it and wasn't therefore the subject of "*argument*" at all. Therefore, the question of interpretation of the licence simply didn't arise in this context.

Thirdly, there is in fact no environmental justification nor reason for treating Mowi Ireland's statutory entitlement to continue operating the Licence as discontinued. The Deenish Site has achieved exemplary compliance with the Department protocols which are designed to protect the public interest.

The Department and its technical experts, the Marine Institute, have been furnished with annual benthic studies that confirm there have been no adverse effects on the local environment arising from the operation of the Deenish Site. Furthermore, the Department commissioned an independent sub-aqua inspection in December 2016[4], which confirmed that the operation was in good condition with no evidence of any adverse effects on the local environment.

The site has benefited from Aquaculture Stewardship Council ("**ASC**") certification since 2015.[5] [6] ASC certification is the highest environmental and social standard which can be achieved for an aquaculture site and demonstrates Mowi Ireland's commitment to responsible and sustainable aquaculture.

In 2011, the Department agreed to a temporary increase in stocking for a trial period. The decision of the Department was confirmed on appeal by the Board (reference AP1/2011 – T6/202) and upheld in subsequent Judicial Review proceedings. [7] The Board found that that amendment

> *"...would pose an insignificant impact on the environment, statutory status and man-made heritage value of the area. Furthermore, the Board believes the proposed change would have positive effects in the economy in the surrounding area."*

The "trial" objective was to establish that stocking the same total number of juveniles every second year as part of an "*all in – all out*" production cycle did not cause any deleterious effect on the environment. The practical outcome of this cycle is that salmon are transferred from the Deenish Site every second year (i.e. 2012, 2014, 2016) and in the intervening year (ie, 2013. 2015 and 2017) there is no transfer of salmon from the Deenish Site.

All the technical studies taken into account by the Board as part of appeal AP1/2011 (including the report prepared by the Board's technical advisors, RPS, and the Natura Impact Statement submitted by Mowi

Ireland) and the technical monitoring carried out at the Deenish Site since 2013 demonstrate that there are no adverse environmental impacts caused at this site by the operation of an *"all in – all out"* two-year gestation period.[8]

Mowi Ireland requested to repeat this trial or have a more permanent amendment ("the trial" having proven that there were no adverse environmental effects), also in respect of the sister site at Inishfarnard, but these requests were rejected out of hand by the Department. The additional environmental data collected as part of the trial gives ample comfort that the temporary amendment at that time did not cause any adverse effects on the environment.

As the evidence demonstrates, the aquaculture operation at Deenish is being properly maintained with the application of best available techniques.

3. Adverse effects of the Minister's Determination on the economy of the area

The Determination will have very serious and significant social and financial consequences for the local community.

The Deenish Site makes a significant contribution to the local and Irish economy. The Deenish operation employs 6 full time staff directly (total of €250,000 per year) in which can be described as a remote area of County Kerry. The average service of Mowi Ireland's employees at Deenish is seven years (most were employed by the previous owner of the company and have a long track record at this operation). Their average age is 56 years. The Deenish site is also serviced by sub-contracted sub aqua divers (total payment between €110,000 - €130,000 per year) who also undertake net maintenance function, which equates to a further four full time employees.

If the Deenish Site were to cease operation it would result in the loss of 10 jobs to the local economy. According to Teagasc the multiplier effect for such rural jobs is 2.06 thus totalling an equivalent impact of at least 20 jobs. [9] Other impacts would be:

4. Loss to local Kerry suppliers of €130,000 per year;
5. Loss to Chartered Harvesting of €127,000 every second year[1];
6. Loss of €180,000 to a Donegal-based transport company every second year;
7. Loss of €342,000 to Galway and Northern Ireland-based transport companies every second year;
8. Loss of part-time processing staff wages of approximately €220,000 every second year (the equivalent of 8 full time people).

In tandem with the Determination, the Department has invoked the suspension of the organic certification of the stock at Deenish, which certification is administered by the approved organic inspection body SAI Global on behalf of the Department[10]. With certification the current stock once it is processed which will occur in

[1] This loss will occur every second year as the transfer of fish from the Deenish Site only takes place every second year as discussed in section 2 above.

2020, would have a value of approximately €13.7 million. However, in the absence of certification the value of the same stock will be just over €6 million. The suspension of the organic certification will result in a financial loss to the company of some €7.7 million in 2020.

The current capital investment at the Deenish Site is €2.8 million (equipment) and while much of this could notionally be re-deployed elsewhere, there are no other locations to operate this equipment in Ireland. The mooring frame would be written off and the removal costs are estimated at approximately €400,000 to €500,000.

The Minister's Determination would also require the wasteful killing of the current stock of 385,000 juvenile salmon. This raises issues of stock welfare, ethics and environmental sustainability. The immediate write down costs of the stock is €832,000 per its accumulated costs to date, excluding disposal costs. This is an ever-increasing value of course as the stock are fed and cared for as they should be.

The Minister's Determination will have substantial impacts on the overall operation of Mowi Ireland and as outlined in its submission to the Department on 3 April 2017 potentially undermines the long-term viability of Mowi Ireland. If the current stock was to be culled, then this would represent a loss of sales in 2020 of €13.7 million (with organic certification reinstated). This typically represents 20% of Mowi Ireland's expected turnover in 2020 (such an effect being felt every other year). This has serious consequences for the overall company with fixed costs and a processing facility that operates at half capacity.

3. The Public Interest - Department's lack of progress in determining licence applications.

The Minister sought to rely on the public interest in maintaining integrity in the regulation of aquaculture in seeking to justify the reason for his Determination. Given the failure of the Minister to implement his Department's own commitments to improving and modernising the regulation of the industry, this assertion is particularly difficult to accept.

Treating Mowi Ireland's statutory entitlement to operate the Licence as discontinued is clearly disproportionate and contrary to the public interest. This is particularly the case where the Department could have, but has failed to, determine applications for the renewal of Licences in a timely fashion.

There is immense frustration throughout the industry with the lack of progress in licensing. Some of Mowi Ireland applications to renew licences have been with the Department since 2000. Little or no information has been provided regarding the progress of these applications over the years.

Government policy is to develop Aquaculture, but this appears to be failing (IFA press release - attached) as a consequence of a negative focus and a lack of understanding of the industry's needs. Several independent and constructive reports on aquaculture licensing do not appear to have brought any benefit or change, eg, the Independent Aquaculture Licensing Review Group ("**IALRG**") report, "*Review of the Aquaculture Licensing Process*" May 2017[11] and "*Steering a New Course*" report by Noel Cawley, December 2006.[12]

The Department has failed to embrace the May 2017 IALRG report which has some 30 recommendations. The Minister has stated an undertaking to eliminate the backlog in determining licence applications , but to date this has excluded finfish licence determinations. The IALRG report makes clear recommendations to

implement a MAB for finfish licences in order to support best environmental and fish health practices. This lack of progress for the salmon sector, which represents two thirds of the value of the aquaculture industry, does not support the Department's stated ambition and responsibility to instil public confidence in the regulatory system.

At the Joint Oireachtas Committee hearing for an update on the implementation of the IALRG's report[13], the Minister gave no commitment to implement any of the recommendations apart from addressing a back-log in primarily the shellfish industry. There is no implementation plan.

The Minister's Determination was made two weeks after an IFA press release, dated March 29th, 2019, which stated:

> *"We are now asking the Department how many finfish licences have been issued in the last five years and how many applications are waiting in the system? IFA is aware of applications which were submitted in 2005 which still haven't been processed 14 years later. This ongoing lack of progress with new licences as well as renewals rests with the Department. It also raises serious questions about the effectiveness of BIM...*
>
> *...Ireland's failure to meet the targets has had a critical impact on the aquaculture sector. The opportunity to create and sustain 1,300 jobs has been wasted. According to BIM's figures, Irish aquaculture is now 20% below 2010 volumes and based on Government targets of 7.8% yearly growth, this means the industry is a staggering 82% below stated Government policy targets"*

In the circumstances, any argument that a purported failure to comply with a licence condition which does not reflect best practice (see below) undermines public confidence in the regulation of aquaculture is simply unsustainable.

4. **Condition 2(e) of the Licence should be substituted with a condition which provides for the control production by reference to a maximum SSB**

The Board will be aware that the Minister has previously amended conditions in expired licences pursuant to which operators are continuing aquaculture operations pursuant to section 19A(4) of the Fisheries Act (see, for example, Mowi's Inishfarnard licence (T5/233)in 2017 and Deenish (on a temporary basis) in March 2011.

Condition 2(e) provides as follows:

> *"the Licensee shall not harvest more than 500 tonnes (dead weight) of salmon in any one calendar year."*

Condition 2(d) of the Licence is also relevant and that provides:

> *"the stock of fish in the cages shall not exceed such quantity as may be specified by the Minister from time to time, the number of smolts to be stocked at the site should not in any event exceed 400,000. Licensed stocking densities are not to be exceeded and will be subject to inspection at any time by the Department of the Marine."*

Condition 2(e) is out of date, inappropriate, not fit for purpose and in fact is not consistent with condition 2(d). The only reason why condition 2(e) continues to apply to the Deenish Site is because the Department has failed to determine the application lodged in February 2007[14], for which Environmental Impact Statements were submitted.

Mowi Ireland has fully complied with this season's input of juveniles which took place in February 2019. The current stock at Deenish totals circa 385,000 young fish (at 180g average weight), which is below the limit in condition 2(d). The existing wording of the Licence allowing stocking and "*harvesting*" on an annual basis is environmentally unsustainable. The inappropriate structure of the Licence wording was previously commented on by Professor Randolph Richards who is amongst the world's most eminent aquaculture experts. Professor Richards' report[15] was provided to the Department in Mowi Ireland's submission of 3 April 2017.

It is Mowi Ireland's position that instead of the Minister discontinuing its statutory entitlement to continue operating the Licence, the Department should have either determined its Licence application that has been pending since February 2007 or amended the Deenish Licence to substitute condition 2(e) with a condition which provides for the control production by reference to a maximum SSB.

Mowi Ireland propose that the maximum SSB for the Deenish Site should be 2,200 tonnes, based on a yield of up to 5.5Kg per the limited annual juvenile input of 400,000 defined in the existing condition 2(d) of the Licence. Considering that current best practices provide that an aquaculture site is stocked only once every two years (and not annually every 12-month period) this SSB actually represents a diminution from the currently permitted input limit.

Accordingly, Mowi Ireland suggests that an appropriate amendment would be to delete the existing conditions 2(d) and 2(e) of the Licence and that the wording below would be substituted as a new condition 2(d) of the Licence:

> *"The pens shall be subject to the stocking limit of 2,200 tonnes standing stock biomass (otherwise described as the Maximum Allowable Biomass, MAB). The stocking of the site will be subject to inspection at any time by the Department of Agriculture, Food and the Marine."*

Such a condition is consistent with the decision of the Board in appeal AP1/2018 – T5/233 which related to the Inishfarnard amendment in 2018 and which resulted in a MAB parameter being substituted into the Inishfarnard Licence. The Inishfarnard site is currently stocked with circa 350,000 salmon and complies with the requirements of the revised condition. The precedent of the Inishfarnard amendment provides a straightforward and constructive solution to overcome the ambiguity of the out of date wording of the Licence. The Department was asked to comment on the Inishfarnard amendment (see attached email)[16], and while receipt of this email was acknowledged, no substantive response was ever issued. An amendment to the Deenish Licence, as per the terms of the Inishfarnard Licence, will secure best practice in the interest of all stakeholders.

MAB has previously been recognised as the most appropriate parameter to control finfish aquaculture production by the Minster and the Department. On the 5th of December 2011[17], Minister Coveney launched new aquaculture templates and is quoted in his press release as stating:

"Key new features of the licence templates include: . . . . a move to Standing Stock Biomass (same as MAB) for finfish as a means of measuring production capacity at an aquaculture site; and

Standing Stock Biomass is recognised internationally as the appropriate metric for assessing loading at an aquaculture production site and can be measured on a real time basis thus facilitating effective regulation and management of sites"

Mowi Ireland is alarmed by the disproportionate and destructive approach adopted by the Department and the threat which the Minister's Determination poses to the wider industry. A simple amendment to the terms of the Licence to allow for the application of a MAB would have regularised the Deenish Licence and would facilitate internationally recognised sustainable farming practices.

Signed by appellant: [redacted] Date: 3rd of May 2019

Please note that this form will only be accepted by REGISTERED POST or handed in to the ALAB offices

Fees must be received by the closing date for receipt of appeals

This notice should be completed under each heading and duly signed by the appellant and be accompanied by such documents, particulars or information relating to the appeal as the appellant considers necessary or appropriate and specifies in the Notice.

DATA PROTECTION – the data collected for this purpose will be held by ALAB only as long as there is a business need to do so and may include publication on the ALAB website

Extracts from Act

40.—(1) A person aggrieved by a decision of the Minister on an application for an aquaculture licence or by the revocation or amendment of an aquaculture licence may, before the expiration of a period of one month beginning on the date of publication in accordance with this Act of that decision, or the notification to the person of the revocation or amendment, appeal to the Board against the decision, revocation or amendment, by serving on the Board a notice of appeal.

(2) A notice of appeal shall be served—

(*a*) by sending it by **registered post** to the Board,

(*b*) **by leaving it at the office of the Board**, during normal office hours, with a person who is apparently an employee of the Board, or

(*c*) by such other means as may be prescribed.

(3) The Board shall not consider an appeal notice of which is received by it later than the expiration of the period referred to in subsection (1)

41.—(1) For an appeal under *section 40* to be valid, the notice of appeal shall—

(*a*) be in writing,

(*b*) state the name and address of the appellant,

(*c*) state the subject matter of the appeal,

(*d*) state the appellant's particular interest in the outcome of the appeal,

(*e*) state in full the grounds of the appeal and the reasons, considerations and arguments on which they are based, and

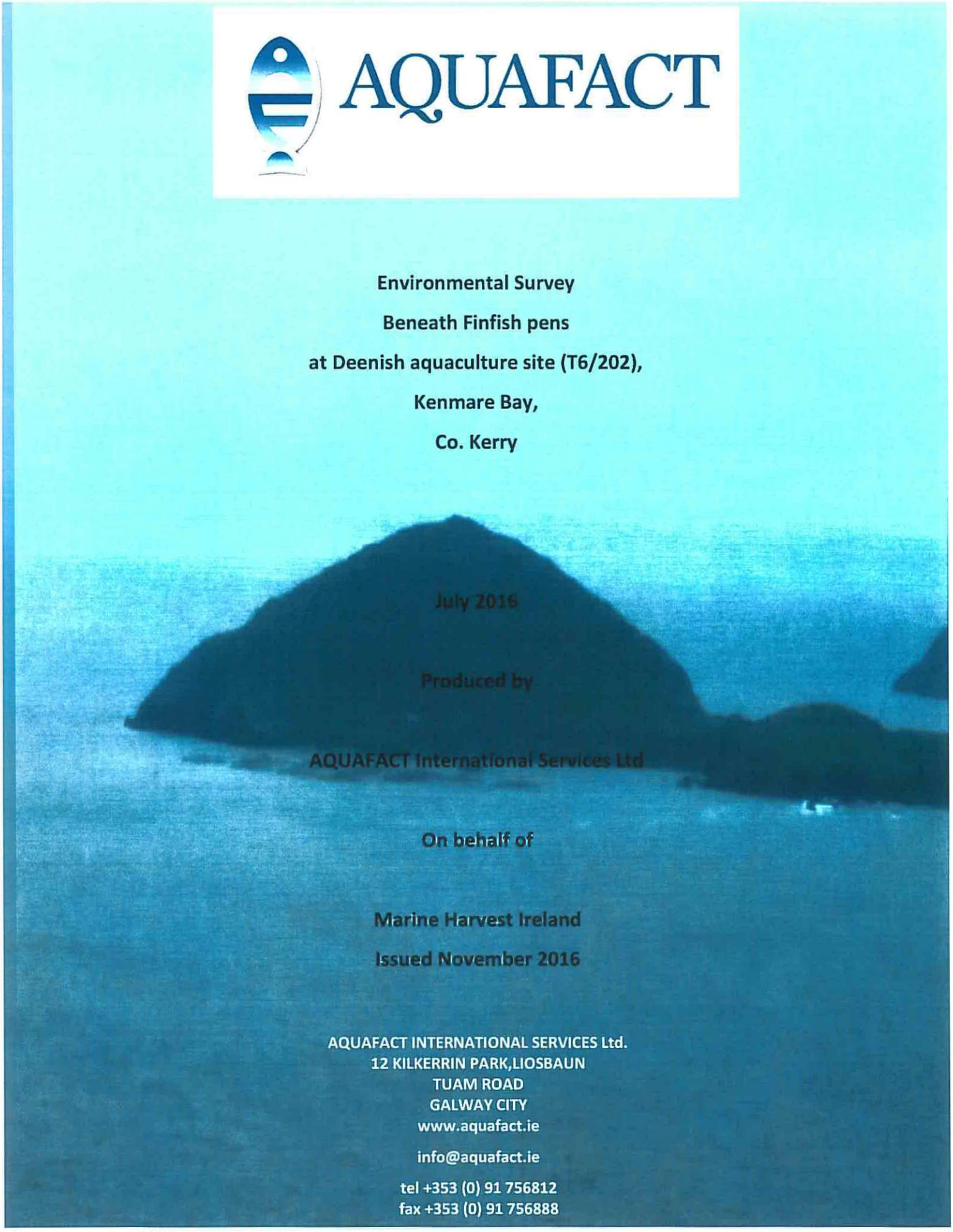
(*f*) **be accompanied by such fee**, if any, as may be payable in respect of such an appeal in accordance with regulations under *section 63*, and shall be accompanied by such documents, particulars or other information relating to the appeal as the appellant considers necessary or appropriate.

Appendices:

[1] 2016 Environmental Survey Report beneath Finfish pens at Deenish Aquaculture site (T6/202), Kenmare Bay, Co. Kerry.
[2] 2017 Environmental Survey Report beneath Finfish pens at Deenish Aquaculture site (T6/202), Kenmare Bay, Co. Kerry
[3] 2018 Environmental Survey Report beneath Finfish pens at Deenish Aquaculture site (T6/202), Kenmare Bay, Co. Kerry
[4] DAFM Underwater Inspection Report Deenish & Inishfarnard 011216.
[5] ASC005 MHI Deenish Certificate 2015
[6] Certificate-ASC farm v1 - MHI Deenish
[7] Waterville v ALAB and MHI - Leave Application Judgment of Hogan J (29 July 2014)
[8] Deenish 13S1 Stock Report
[9] https://www.teagasc.ie/media/website/publications/2014/Economic_Impact_of_the_Irish_Bioeconomy.pdf
[10] Suspension of Organic (CQA) Certification - Deenish Salt Water Site
[11] http://www.fishingnet.ie/media/fishingnet/content/ReviewoftheAquacultureLicensingProcess310517.pdf
[12] http://www.bim.ie/media/bim/content/publications/corporate-other-publications/BIM_Steering,a,New,Course,-,National,Seafood,Strategy.pdf
[13] https://www.oireachtas.ie/en/debates/debate/joint_committee_on_agriculture_food_and_the_marine/2018-10-23/4/
[14] Acknowledgement of renewal applications Inishfarnard & Deenish 08.02.2007
[15] Prof. R. H. Richards opinion on issues concerning site licencing at MHI
[16] Email from Mr Feenstra to Mr Quinlan.
[17] Minister Coveney Press release on new aquaculture licence templates.

AQUAFACT

Environmental Survey
Beneath Finfish pens
at Deenish aquaculture site (T6/202),
Kenmare Bay,
Co. Kerry



July 2016

Produced by

AQUAFACT International Services Ltd

On behalf of

Marine Harvest Ireland

Issued November 2016

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1. Introduction

This report documents the environmental conditions of the seabed at a Marine Harvest Ireland finfish (Atlantic salmon *Salmo salar*) aquaculture site (Aquaculture Licence Reference T6/202) in Kenmare Bay, Co. Kerry recorded during surveys undertaken by AQUAFACT on 20th July 2016 (see Figure 1.1). The aquaculture site is situated close to Deenish Island, County Kerry on the northern shore of Kenmare River.

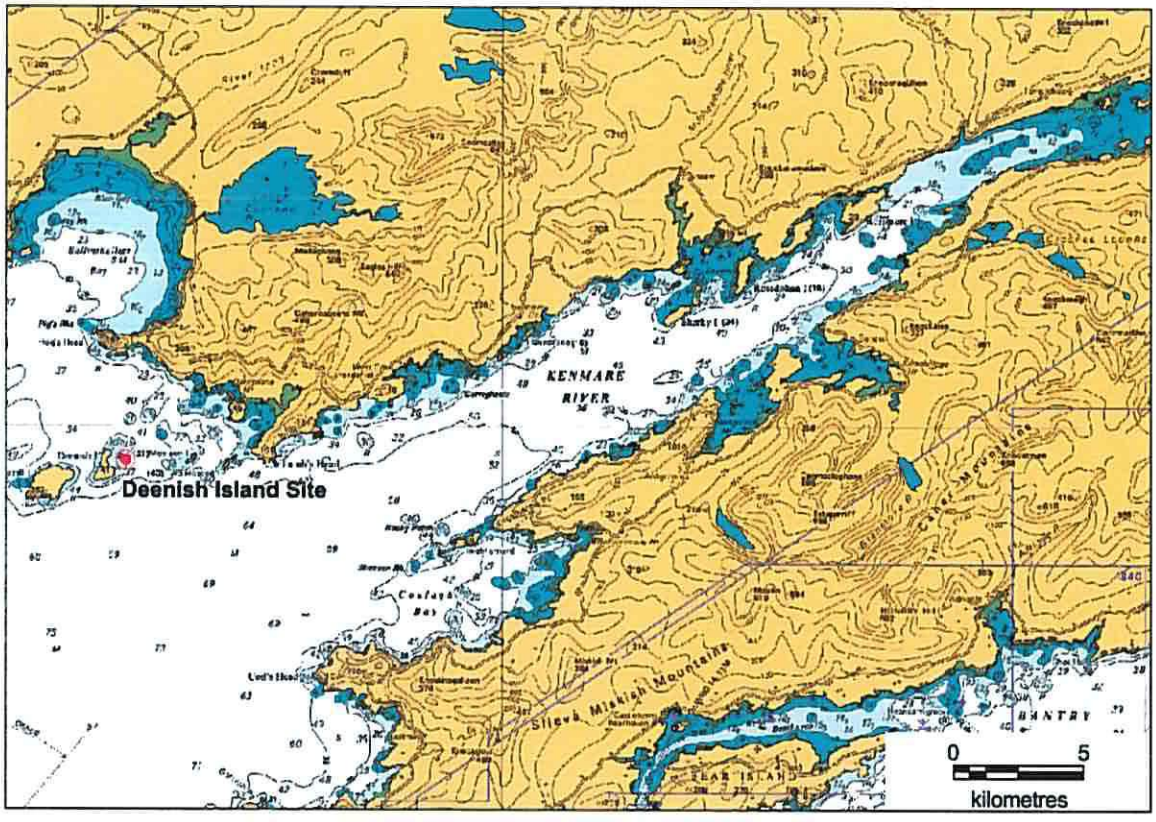

Figure 1.1: Map showing the location of the Deenish site surveyed in Kenmare Bay

1.1. Site description

Kenmare Bay, Co. Kerry, is a long and narrow, south-west facing bay. It is a deep, drowned glacial valley and the bedrock is mainly old red sandstone which forms reefs along the middle of the bay throughout

its length. Exposure to prevailing winds and swells at the mouth diminishes towards the head of the bay while numerous islands and inlets provide further areas of additional shelter.

Deenish Island is part of two Natura 2000 sites (see Figure 1.2), namely the Kenmare River cSAC (Site code: 002158) and the Deenish Island and Scariff Island SPA (Site code: 004175).

The diversity of environmental conditions, from exposed to ultra sheltered, that characterises Kenmare River cSAC results in the presence of a wide range of marine habitats including three listed on Annex I of the EU Habitats Directive, namely reefs, large shallow bay and caves. According to the cSAC site synopsis (available from www.npws.ie) Kenmare Bay is host to a high number of rare and notable marine species present (24) and some uncommon communities. The Kenmare River cSAC is the only known site in Ireland for the northern sea-fan, *Swiftia pallida* and is the only known area where this species and the southern sea-fan *Eunicella verrucosa* co-occur. Midway along the south coast of Kenmare River, a series of sea caves stretch back into the cliff, typically supporting a diversity of epifauna including encrusting sponges, ascidians and bryozoans.

Deenish Island and Scariff Island are small to medium size islands situated between 5 and 7 km west of Lamb's Head off the Co. Kerry coast and thus very exposed to the force of the Atlantic Ocean. The site is a Special Protection Area (SPA) under the E.U. Birds Directive due to its special conservation interest for seabirds including fulmar, Manx shearwater, storm petrel, lesser black-backed gull and Arctic tern. Scariff is the larger of the two islands, with very steep sides rising to a peak of 252 m with the highest cliffs located on the south side. Deenish is less rugged than Scariff, and rises to 144 m in its southern half; the northern half being lower and flatter. The vegetation is mostly grassland, with some heath occurring on the higher ground. Old fields are now overgrown with bracken and bramble. The sea areas within a 500m radius of both islands are included inside the SPA boundary to provide a 'rafting' area for shearwaters.

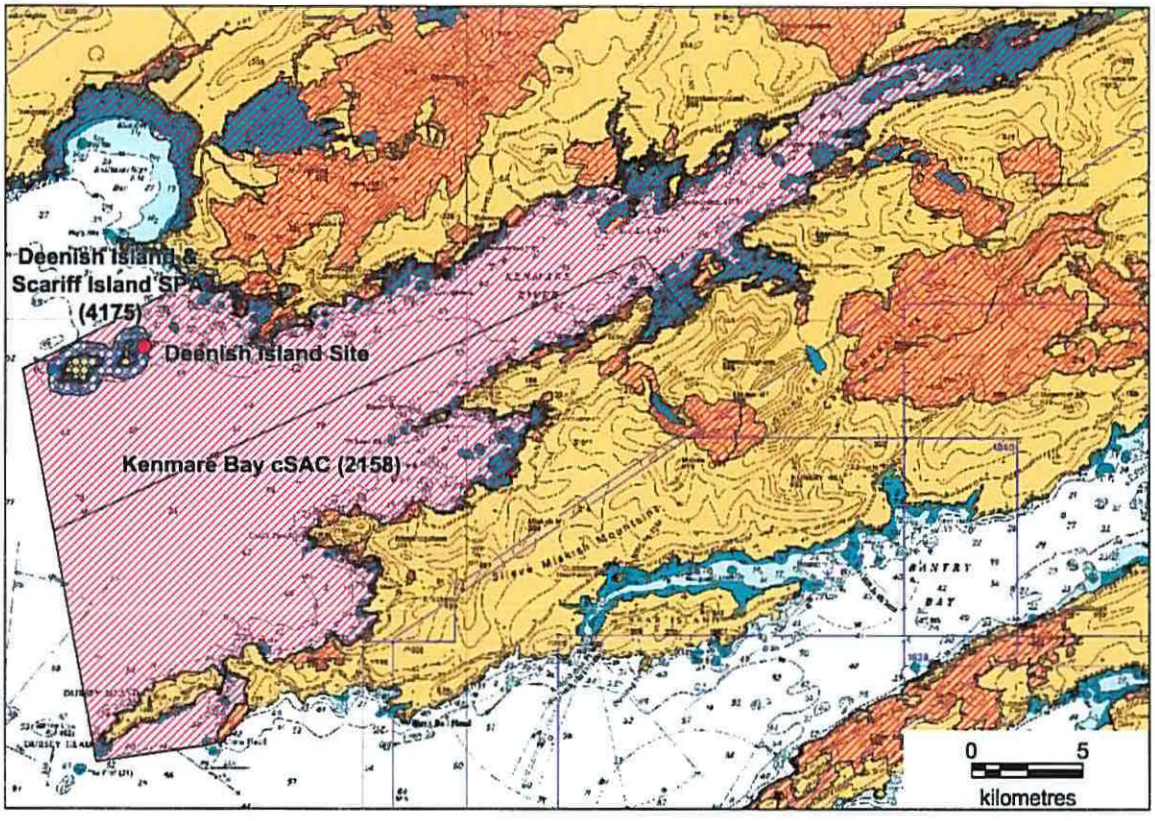

Figure 1.2: Map showing the locations of the relevant cSAC and SPA near Kenmare Bay, Co. Kerry.

1.2. Offshore finfish farms – benthic monitoring

The main objective of the survey was to assess the overall state of the environment in relation to the salmon production process. The sites were surveyed according to the revised Benthic Monitoring Guidelines laid down by the Department of Agriculture, Fisheries and Food (December 2008). The benthic monitoring requirements at a fish farm are dependent on the level of biomass held at the site and the local hydrography. Table 1.1 below sets out the level of benthic monitoring required based on tonnage produced and mean current speeds at a fish farm:

Table 1.1. Matrix of production tonnage versus current speed to determine level of benthic monitoring required

	Mean Current Speed (cms^{-1})		
Tonnage	<5	5-10	>10
0-499	Level I	Level I	Level I
500-999	Level II	Level I	Level I
>1000	Level II	Level II	Level I

The current speed is a mean value calculated from maximum current measurements over spring and neap tidal cycles at the surface and near the bottom. The tonnage refers to the maximum biomass predicted for each site. An annual survey must be carried out at each site (production and smolt) operated by a company. A level I or level II survey may be carried out as follows:

Level I: Video/photographic and visual observations and recordings shall be made at the following stations:

- At a minimum of 2 sites directly beneath the pens
- At the edges of the pens
- Two transects at right angles to each other. Along each transect sampling stations at +/- 10m, +/- 20m, +/- 50m and + 100m from the pens
- At a control site

In addition to the above, the following samples/measurements shall be taken at the same stations as above. These will be used to calculate sediment quality parameters.

- A minimum of one Redox potential reading shall be made at each sampling station.
- A single sediment sample for Organic Carbon measurement.

Level II: In addition to the above, two replicate grab samples shall be captured at each of the sample stations for faunal analysis. The exact locations of sampling points should be agreed in advance with the Department of Agriculture Fisheries and Food (DAFF). The identification and abundance of macro-faunal invertebrates shall be estimated and tabulated. Identification of fauna to the level of species will be

required.

It is important to take note that the exact position of the individual pen structures are not permanently fixed to a single position and there is a relatively large lateral movement due to depth, wind, currents and tides. For this reason bottom stations particularly those under, at the edge and 10 m away from the pens are taken at the time of sampling but may vary relative to the overlying pen position under various environmental conditions.

2. Sampling Procedure & Processing

All survey work at the Deenish site took place on 20th July 2016. The dives were conducted at a maximum depth of 20.8 m and underwater visibility on the day was good at approximately 5m. Pen layouts at the time of survey, dive entry points and benthic transects followed by the divers are shown in Figure 2.1.

Mean current speed at the Deenish finfish aquaculture site is 30 cm sec^{-1} (Marine Harvest pers.com.). The fish biomass present in the pens at the time of survey was 1517.5 tonnes. The survey was carried out at Level 1 as per the guidance matrix displayed in Table 1.1.

Disinfection

Prior to each dive survey for each location all diving equipment, suits and boats are thoroughly disinfected utilising both a dipping and spraying protocol.

2.1. Dive survey

Two dive transects were laid out from the sea surface at each site using a boat equipped with a GPS mapper. Pen locations were noted as DGPS positions. The underwater survey involved direct observation, sampling and recording (through photographs and *in situ* annotations) of benthic conditions by highly experienced, qualified marine biologists and scientific divers. The notes taken *in situ* were transcribed to logs upon surfacing. In addition to standard SCUBA gear the divers were equipped with:

- A high end dSLR Nikon D200 in a Subal ND20 underwater housing fitted with a 12-24mm

lens and two INON strobes. The camera was used to photograph the epibenthos and seafloor features;

- A diver operated dSPI camera for photographing sediment profiles of the seafloor and calculate redox measurements. This unit uses a Canon EOS 450D camera with Nikkor optics;
- A compass for underwater navigation;
- Pre-labelled bags to store sediment samples for organic carbon analysis;
- Dive slates, torches and waterproof pencils for making observations/notes.

The divers photographed representative areas of the sediment and fauna and recorded observations in situ at the various stations investigated. Notes were completed immediately on surfacing and a map of the dive track was drawn up. Observations recorded during the dive included:

- Presence of bacterial mats and uneaten food;
- Presence of farm-derived litter;
- Presence of gas bubbles or anoxic areas;
- Animals visible or evidence of their presence;
- Macroalgae visible;
- Sediment characteristics, including colour and texture.

The seafloor was photographed at the following stations along two transects at the site (Figure 2.1):

A. Directly under the pens;
B. Under the edge of the pen;
C. At 10m, 20m, 50m and 100m (on T1) from the pens along the transects.

A reference station was also assessed for each pen block to give a representation of ambient benthic conditions in the area immediately surrounding the pen installations for comparison purposes. The reference station was taken at a distance greater than 150 m from the pen installations to represent the assumed 'undisturbed' condition of the seafloor surrounding the sites.

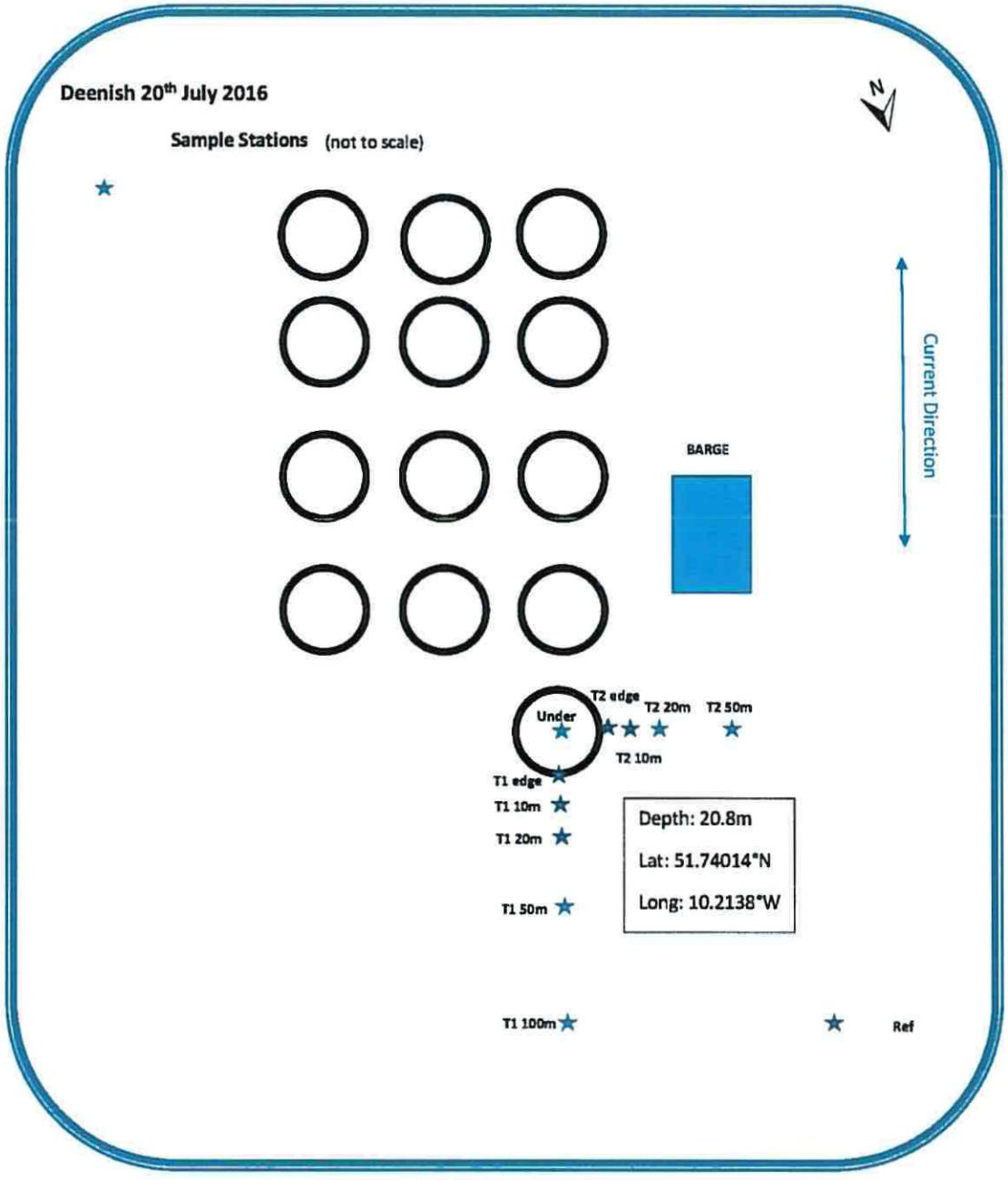

Figure 2.1: Transect seafloor station layout, Deenish finfish aquaculture site, Kenmare Bay, 20th July 2016

2.2. *Sediment Profile Imagery (SPI)*

Sediment profile images (SPI) obtained for each station along with ARPD depth measurements taken from the images were acquired using a diver-deployed sediment profile imaging camera system. This system is comprised of a digital SLR camera in a water-tight pressure vessel that is mounted above a prism that penetrates the upper 25 cm of sediment (see Figure 2.2). The sediment profile is viewed through a plexiglass window and the image is reflected to the camera lens via a plane mirror. Illumination is provided by an internally-mounted strobe. The prism unit is filled with distilled water – thus ambient water clarity is never a limiting factor in image quality. Upon arrival, the diver depresses the SPI unit into the seafloor and manually triggers the camera. This process is repeated at each station investigated.

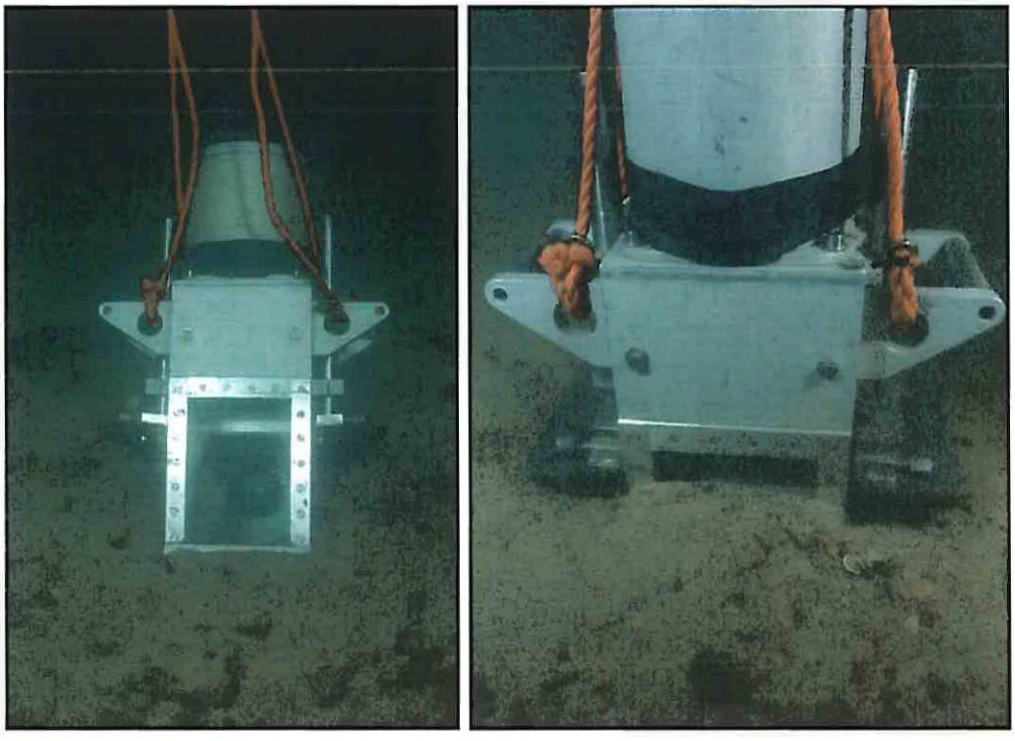

Figure 2.2: Diver operated Sediment Profile Imaging camera. The left-hand image gives a view of the camera at the sediment surface. The right-and image shows the SPI camera when inserted into the sediment

A great deal of information about benthic processes is available from sediment profile images. Measurable parameters, many of which are calculated directly by image analysis, include physical/chemical parameters (i.e. sediment type measured as grain size major mode, prism penetration

depth providing a relative indication of sediment shear strength, sediment surface relief, condition of mud clasts, redox potential discontinuity depth and degree of contrast, sediment gas voids) and biological parameters (i.e. infaunal successional stage of a well documented successional paradigm for soft marine sediments (see Pearson and Rosenberg, 1978), degree of sediment reworking, dominant faunal type, epifauna and infauna, depth of faunal activity, presence of microbial aggregations).

For the purposes of the current survey the primary feature of interest is the depth of oxygen penetration into the sediments in the vicinity of the finfish pens (this information is required to satisfy the requirements of the Benthic Monitoring Protocol (DAFF, 2008). In this case the apparent redox potential discontinuity or ARPD depth is measured. Features of particular interest that may be gleaned from SPI images taken in sediments in the vicinity of finfish pens include the presence of:

- uneaten feed pellets (and depth of this material, see Figure 2.3)
- faecal casts
- and depth of shell gravel deposits
- of gas voids in the sediment

Figure 2.3: Typical sediment profile images with examples of features relevant to aquaculture operations

2.3. *Sampling for organic carbon analysis*

Sediment samples for organic carbon analysis were collected at all stations. Samples were stored in pre-labelled plastic bags, kept in cold freezer boxes onboard the vessel and frozen at -20°C on return to the laboratory. Organic carbon analysis was carried out by ALS laboratories using the Loss on Ignition (LOI) technique. This method involves oven drying the sediment sample in a muffle furnace (450°C for a period of 6 hours) after which time the organic content of the sample is determined by expressing it as a percentage the weight of the sediment after ignition over the initial weight of the sediment.

3. Results

3.1. *Recent Stocking History*

At the time of the audit, 1517 tonnes of fish were stocked on site having been input to the site in January 2015 following a seven week fallow period.

Figure 3.12: View of pens at Deenish Island site, 20th July 2016

3.2. Seabed physical and biological characteristics

The seabed was composed of a mix of sediment types with areas of fine to medium sand with shelly sand.

3.2.1. Photographic record; Transect 1

This transect began beneath the north western most pen moored on site (see Figure 2.1) and ran for a distance of 100 m north. A total of six stations were investigated.

3.2.1.1. Under pen

The seafloor consisted medium sand and coarse shelly gravel (Figure 3.2) with a thin covering of fine sediment. Drift algae was spread over the area. There was no obvious signs of impact from the farm operations.

Figure 3.2: T1 – Under pen station, Deenish Island site, 20th July 2016

3.2.1.2. Edge of pen

The seafloor at the edge station consisted of medium sand with a high proportion of coarse shelly material and drift algae with a patchy cover of fine material. There were no signs of impact from the farm operations.

Figure 3.3: T1 – Pen edge station, Deenish Island, 20th July 2016

3.2.1.3. 10 m from pen

The seafloor at the 10m station was composed of shelly sand that was formed into small waves and troughs by the action of tidal currents. Drift algae was accumulated in the troughs. A swimming crab, *Liocarcinus depurator* was imaged in the photo (Figure 3.4).

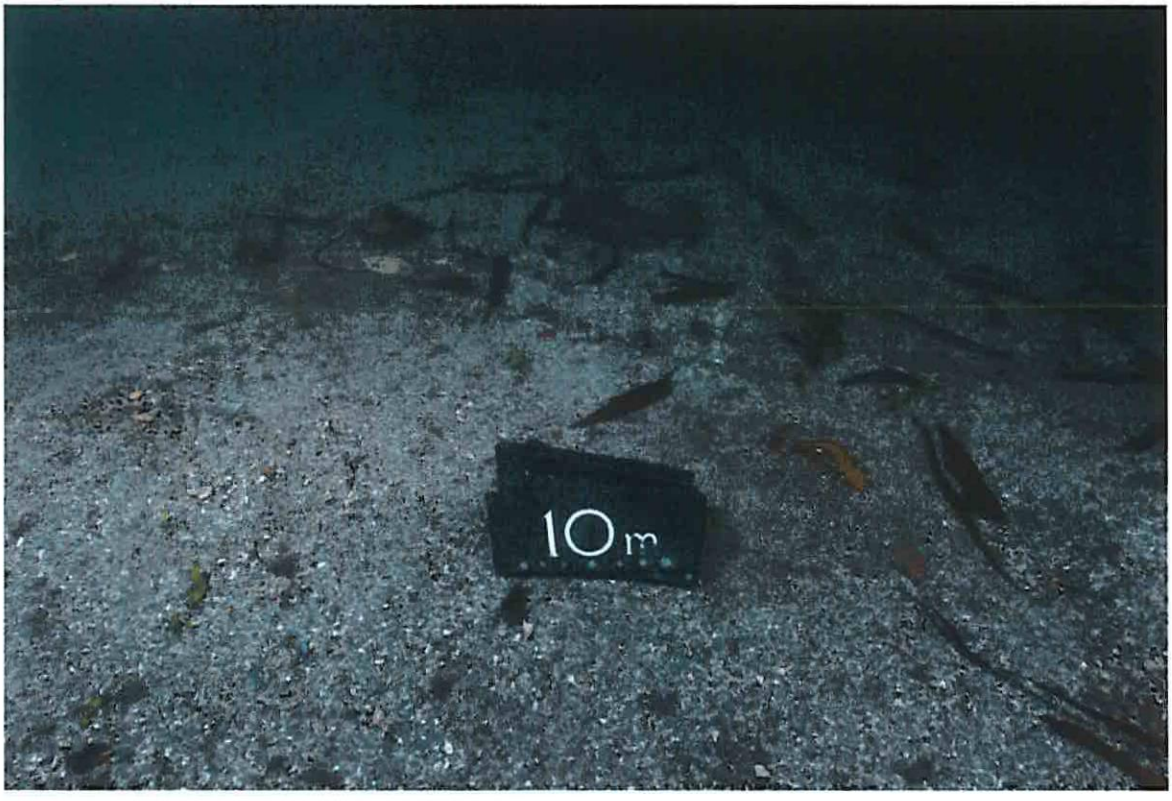

Figure 3.4: T1 – 10m, Deenish Island, 20th July 2016

3.2.1.4. 20 m from pen

There was little change in bottom conditions on moving 20 m along Transect 1 with a substrate composed of shelly sand formed into waves and troughs. Large bivalve shell and drift algae accumulated in the troughs. Anemones, *Cerianthus lloydii*, were recorded buried in the sediment. There was no obvious impact from the farming operations.

Figure 3.5: T1 – 20 m station, Deenish Island, 20th July 2016

3.2.1.5. 50 m from pen

The seafloor at the 50 m station was composed predominantly of undulating shelly sand with scattered patches of shell and algal debris in the troughs. The dominant faunal species was the burrowing anemone *C. lloydii*. Red algae (*e.g. Cryptopleura ramosa, Rhodymenia* sp., *Phycodris rubens*) were also noted attached to pebble and the larger shell fragments (Figure 3.6). There were no obvious signs of impact from the farming operations.

Figure 3.6: T1 – 50 m station, Deenish Island, 20th July 2016

3.2.1.6. 100 m from Pen

This station was dominated by sand, gravel and bivalve shell forming small crests and troughs created by prevalent hydrodynamic conditions. The site was dominated by red algae attached to pebble and shell accumulated in the troughs and occasional anemones *C. lloydii*. There were no apparent signs of impact from the nearby finfish rearing operation.

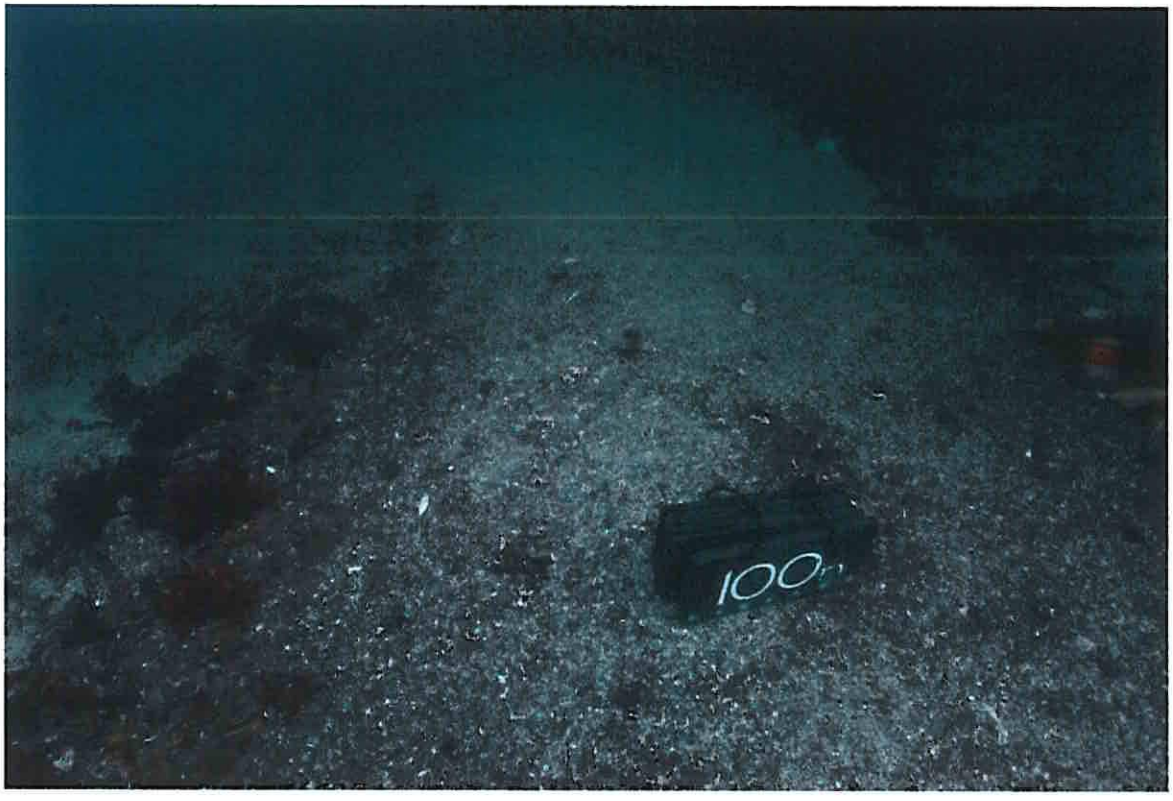

Figure 3.7: T1 – 100 m station, Deenish Island, 20th July 2016

3.2.2. Sediment Profile Imagery – Transect 1

Figure 3.8 presents sediment profile images taken at the six stations visited on Transect 1 of the Deenish site. Substrate composition ranged from fine and medium sand at the under pen station to a coarser shelly gravelly sand at the outer end of the transect. The seafloor at this site is probably relatively mobile due to winter surges.

The images display a single image and the maximum and minimum apparent redox potential discontinuity (ARPD) depths measured at each station. Each image is 15.5cm × 25cm. ARPD depths ranged from a minimum of 0.0 cm (T1 20m & 50m) to a maximum of greater than 5.7 cm (T1 Edge).

Due to the coarse nature of the seafloor the SPI camera achieved relatively low penetrations. The ARPD ranged from 2.3 cm at the under station to 7.9 cm at the 100 m station.

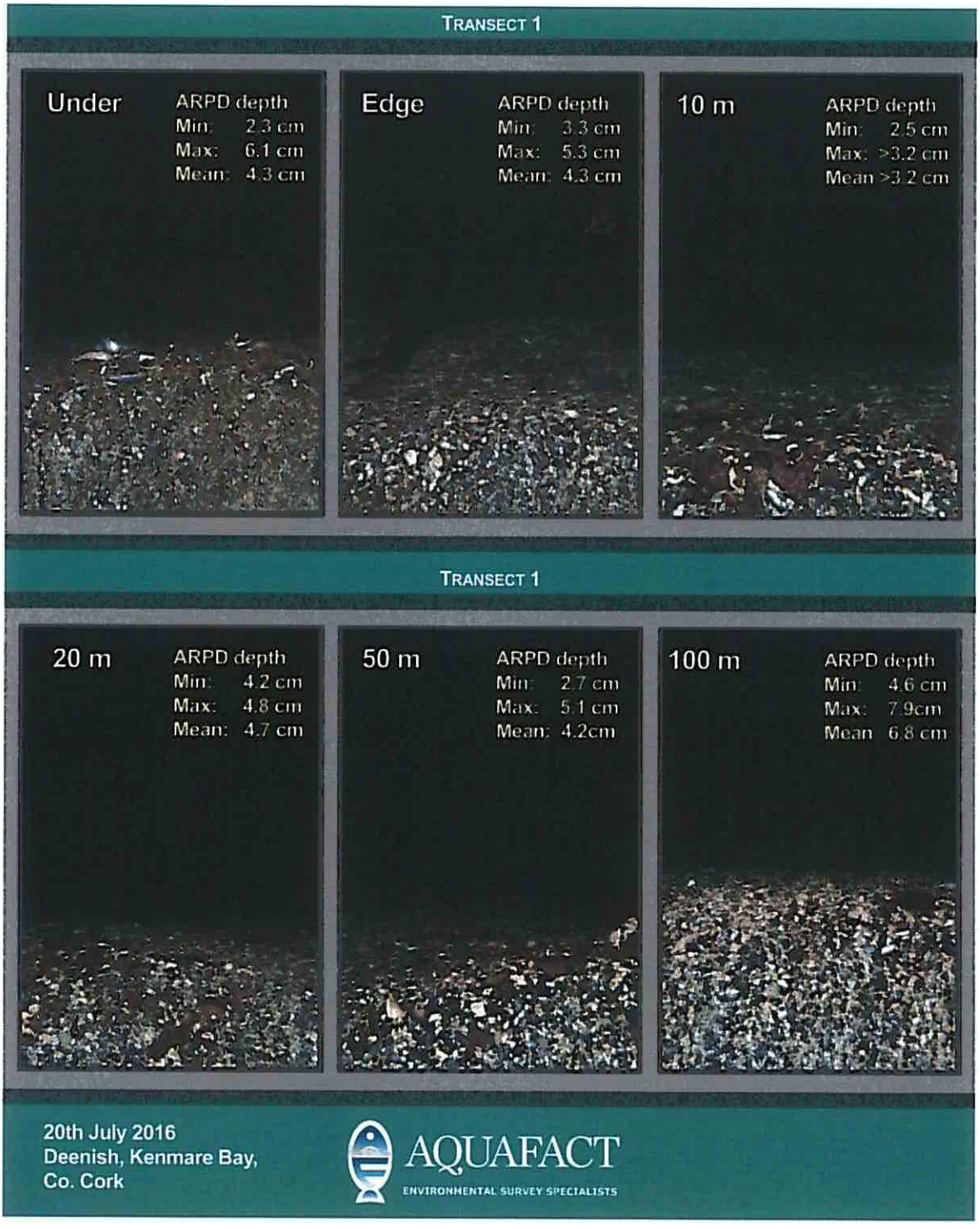

Figure 3.8: Representative photographs of the seafloor taken along Transect 1 by Sediment Profile Imagery (SPI)

3.2.3. Photographic Record; Transect 2

This transect began beneath the same pen as Transect 1 and ran for a distance of 50m west. A total of five stations were investigated on Transect 2 with an additional (Reference) station investigated just *c.* 180 m north of the pen edge (See Figure 2.1).

3.2.3.1. Under pen

The seafloor consisted of troughs and ridges of medium sand and coarse shelly gravel with a patchy layer detrital soft material and drift algae. The burrowing anemone *Cerianthus lloydii* was occasionally recorded (Figure 3.9). There was no signs of impact from the farm operations overhead.

Figure 3.9: T2 – Under pen station, Deenish Island, 20th July 2016

3.2.3.2. Edge of pen

The seafloor substrate consisted of shelly gravel and medium sand, shell and occasional pebble and small stones with a light cover of drift algae. The burrowing anemone *C. lloydii* was occasionally recorded and one is noted beside the tags in the photograph taken at this station (Figure 3.10).

Figure 3.10: T2 – Pen edge station, Deenish Island, 20th July 2016

3.2.3.3. 10 m from pen

The seafloor consisted of shelly sand with occasional pebble. The anemones *C. lloydii* were occasionally recorded. There was no signs of impact from the farm operations.

Figure 3.11: T2 – 10 m station, Deenish Island, 20th July 2016

3.2.3.4. 20 m from pen

The seafloor at the 20 m station consisted of coarse to medium sand and shell gravel with scattered empty bivalve shell. The biotic community was characterised by the presence of burrowing anemone *Cerianthus lloydii* and some red algae. There were no obvious signs that indicated the presence of the nearby finfish farm.

Figure 3.12: T2 – 20 m station, Deenish Island, 20th July 2016

3.2.3.5. 50 m from pen

The seafloor at this station consisted of shelly gravel and medium sand overlaid by empty bivalve shell. Red algae and occasional *C. lloydii* (Figure 3.13) were present. There was no obvious impact from the farming operations.

Figure 3.13: T2 – 50 m station, Deenish Island, 20th July 2016

3.2.3.6. Reference station

The seafloor at the reference station consisted of a substrate composed of sand, stones, empty shell and shell gravel forming broad shallow sand waves with attached foliose and encrusting red algal species with large drift algae (*Laminaria saccharina*) moving over the bottom. The benthic faunal community was dominated by the anemone *C. lloydii* (Figure 3.14)

Figure 3.14: Reference station, Deenish Island, 20th July 2016

3.2.4. Sediment Profile Imagery – Transect 2 & Reference

Figure 3.15 presents sediment profile images taken at the five stations visited on Transect 2 of the Deenish site and the reference station on 12th June 2015. The figure displays a single image and the maximum and minimum apparent redox potential discontinuity (ARPD) depths measured at each station. Each image is 15.5 cm × 25 cm.

Sediment type varied from fine/medium sands under and close to the pen compared with higher proportions of gravel and shell with increasing distance from the pen. Due to the hard and compact nature of the substratum SPI penetration was low and, consequently, ARPD depths were difficult to ascertain. Nonetheless, and based on prism penetration, the oxidised sediment layer at the site was regarded to be relatively deep, estimated to range from a minimum of 0.5 cm ns to 7.3 cm recorded at the under pen location. ARPD depths at the Reference station ranged from 7.3 cm to 8.3 cm.

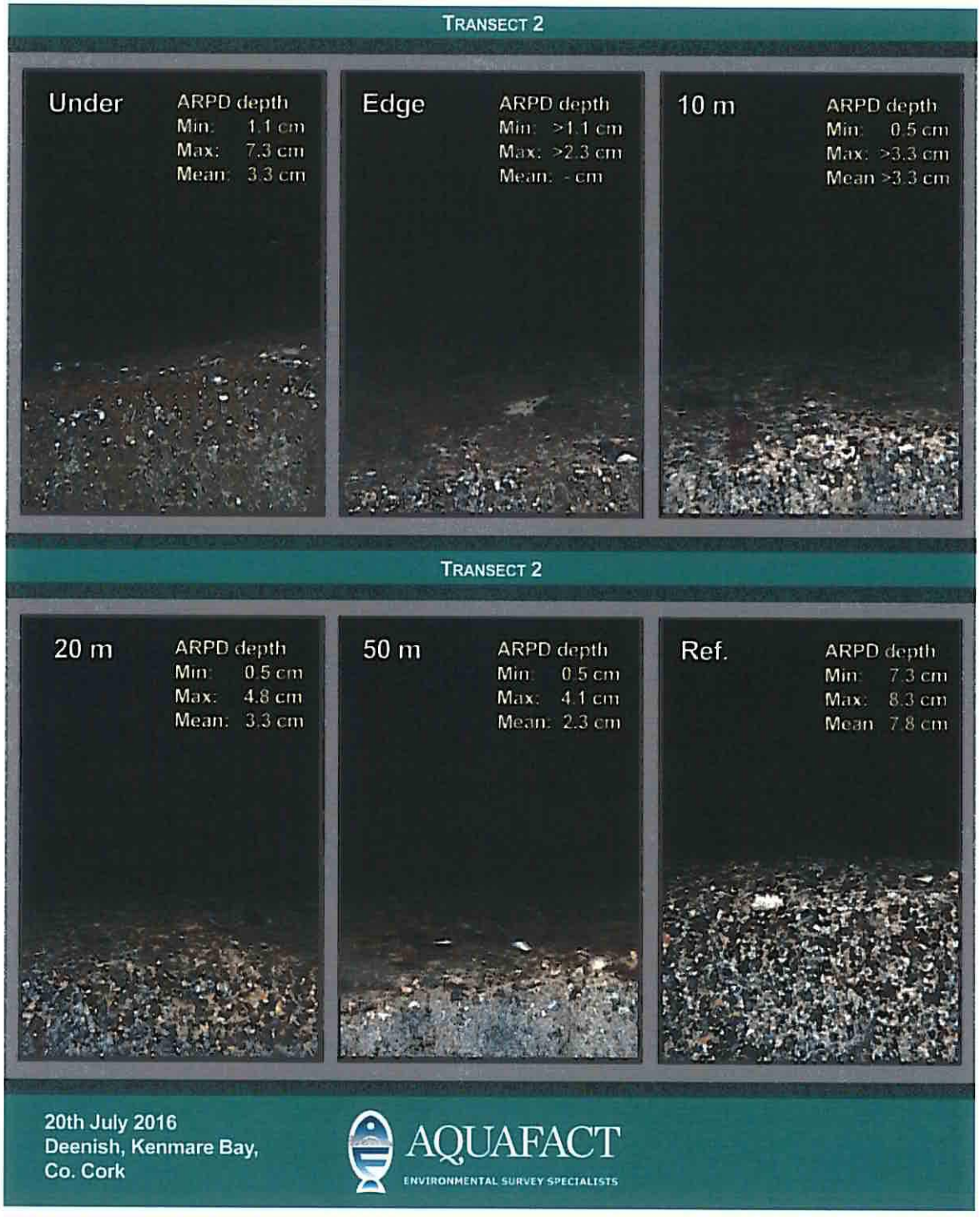

Figure 3.15: Representative photographs of the seafloor taken along Transect 2 by Sediment Profile Imagery

3.2.5. Transect Species List

Table 3.1 shows a list of species observed during the dives at the Deenish fish farm site on this and previous occasions.

Table 3.1: Species noted during dives on the seabed beneath the Deenish pens

Group	Species	Common Name
(Cnidaria) Hexacorallia	*Cerianthus lloydii*	Tube anemone
(Annelida) Polychaeta	*Pomatoceros* sp.	Tube worm
	Lanice conchilega	The sand mason
	Chaetopterus variopedatus	Parchment tube worm
(Mollusca) Bivalvia	*Pecten maximus*	King scallop
	Faceliniidae	Sea slugs
	Aeolidiida	Sea slugs
	Nudibranch	Sea slugs
(Arthropoda) Decapoda	Paguridae	Hermit crab
Echinodermata	*Luidia ciliaris*	Seven armed starfish
	Asterias rubens	Common starfish
	Marthasterias sp	Starfish
	Ophiura sp.	Brittlestar
	Amphiuridae sp.	Brittlestar
(Chordata) Osteiichthyes	*Pomatoschistus* sp.	Gobies
	Trisopterus minutus	Poor Cod
	Labrus bergylta	Ballan Wrasse
Rhodophyta	*Delesseria sanguinea*	Sea beech
	Phycodrys rubens	Sea oak
	Cryptopleura ramose	
	Calliblepharis ciliata	
	Lythophyllum sp.	
Ochrophyta	*Alaria esculenta*	Edible kelp

3.2.6. Organic Carbon Analysis & ARPD Depths

Table 3.3 shows the organic carbon results from the Deenish stations. Organic carbon levels ranged from 2.03% (T2 50m) to 8.4% (T1 Under). Table 3.7 shows in tabular form the ARPD depths from the SPI images from Deenish (see Sections 3.1.4 and 3.1.7).

Table 3.2: Organic carbon results for Deenish (% values, Loss on Ignition at 450°C).

T1	Under	Edge	10m	20m	50m	100m
LOI %	8.4	6.34	4.34	3.37	2.94	3.02
T2	Under	Edge	10m	20m	50m	REF
LOI %	-	7.89	4.31	3.06	2.03	2.99

Table 3.3: ARPD Depths for Deenish, Kenmare Bay, 20th July 2016

Station		Transect 1	Transect 2
Under	Range (cm)	2.3 – 6.1	1.1 – 7.3
	Mean (cm)	4.3	3.3
Edge	Range (cm)	3.3 – 5.3	>1.1 - >2.3
	Mean (cm)	4.3	N/A
10m	Range (cm)	2.5 - >3.2	0.5 - >3.3
	Mean (cm)	N/A	N/A
20m	Range (cm)	4..2 – 4.8	0.5 – 4.8
	Mean (cm)	4.7	3.3
50m	Range (cm)	2.7 – 5.1	0.5 – 4.1
	Mean (cm)	4.2	2.3
100m	Range (cm)	4.6 – 7.8	
	Mean (cm)	6.8	
Reference	Range (cm)		7.3 – 8.3.
	Mean (cm)		7.8

4. Discussion

The extent to which an overlying fish farm impacts the seafloor is largely dependent on:

- the feeding regime at that farm, i.e. the amount of food that eventually ends up on the seafloor;
- the degree of current movement at the site in question; and
- the depth of water at that site.

These factors combine to form either erosional or depositional locations where organic material is either dispersed or it accumulates, and subsequently affects the receiving environment (*i.e.* the seafloor). The type of biotic community living at a particular site will also play a role in determining bottom conditions there. The influence of feeding activities of populations of starfish, polychaete worms, anemones, crabs and finfish at the Deenish site largely determine the level of impact of overlying farm operations on the benthos there.

Faunal feeding activity can remove large amounts of waste organic material from the seabed beneath a farm facility – with groups of mobile fauna capable of consuming large quantities of material. The fallowing schedule at a site also has a large bearing on benthic impact – most notably the length of time pens have been on site since the last fallow period. The presence of opportunistic deposit feeders such as *Capitella* sp., most notably at the under pen and pen edge stations will tend to help keep the benthic organics in a state of equilibrium at the fish farm sites. Sedimentary organic carbon levels in general are relatively higher at the under and edge of pen conditions at the Deenish site.

Mobile epibenthic scavengers such as starfish, fish and crabs also help in reducing the amount of waste material on the seafloor. This potential speed of the removal of waste was demonstrated in a previous study where photographic evidence was collected showing that epibenthic macrofauna were capable of removing, in less than 7 days, fish feed pellets spread at a density of 3.4 kg dry weight per m^2 on the sediment under a marine fish farm (Smith *et al.*, 1997).

Based on the benthic photographic records taken during the current survey, little habitat degradation is

obvious beyond the edge station on both transects at the Deenish site. Results from previous years surveys of the seafloor beneath the Deenish Island pen blocks indicated little change year on year on and showed few obvious signs of impact outside the areas of the seafloor immediately underneath the fish pens.

5. Conclusion

Benthic audit surveys were carried out at the Deenish fish farm site operated by Marine Harvest Ireland on 20th July 2016. The Deenish survey followed the DCMNR Level I monitoring protocols. In the present surveys beneath the pen blocks there no obvious signs of impact from the farming operation on the benthos other than elevated organic carbon levels at the under and edge stations with associated fine sediment layer over the coarse shelly sand recorded at the majority of the site.

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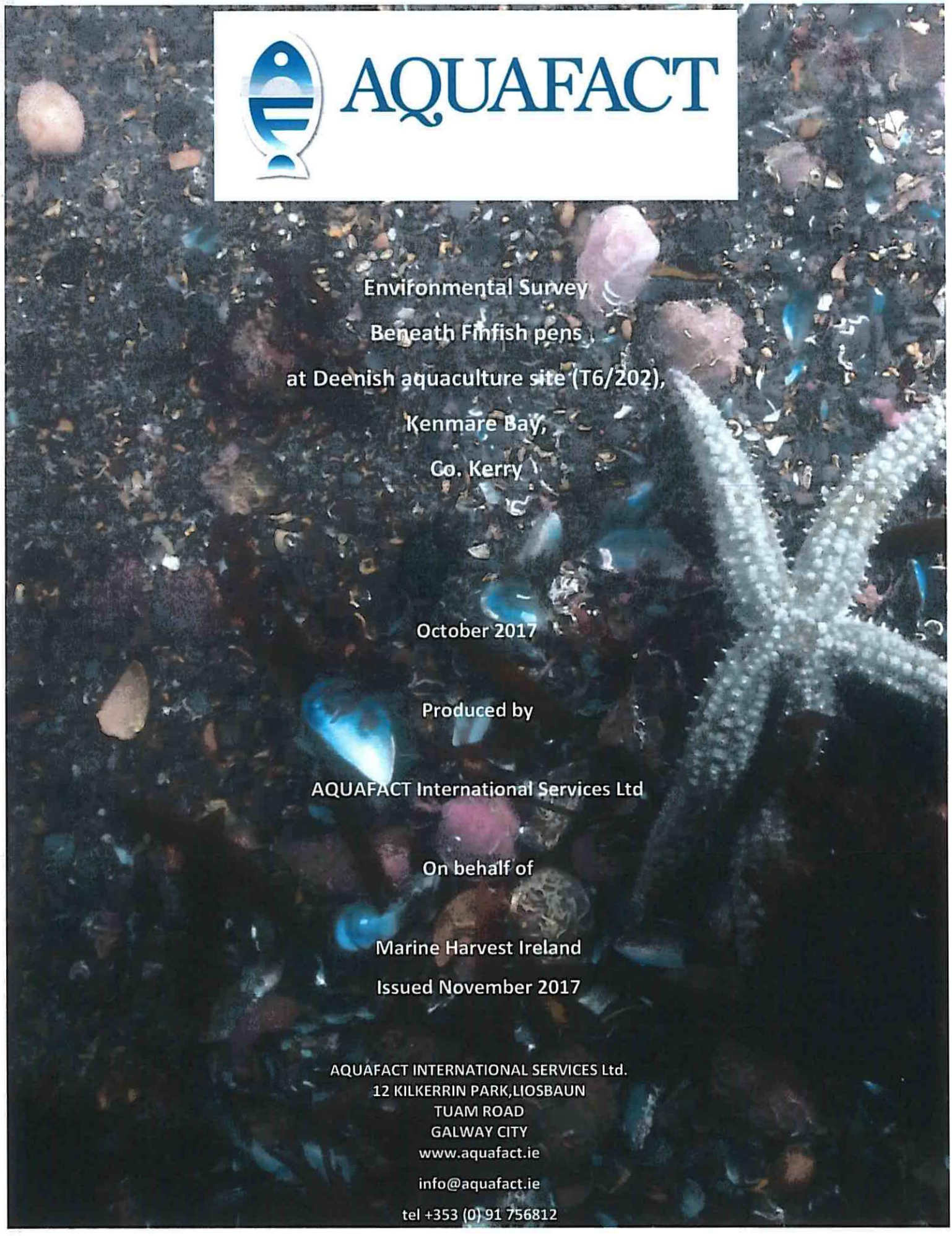

Environmental Survey Beneath Finfish pens at Deenish aquaculture site (T6/202), Kenmare Bay, Co. Kerry

October 2017

Produced by

AQUAFACT International Services Ltd

On behalf of

Marine Harvest Ireland

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1. Introduction

This report documents the environmental conditions of the seabed at a Marine Harvest Ireland finfish (Atlantic salmon *Salmo salar*) aquaculture site (Aquaculture Licence Reference T6/202) in Kenmare Bay, Co. Kerry recorded during surveys undertaken by AQUAFACT on 26th October 2017 (see Figure 1.1). The aquaculture site is situated close to Deenish Island, County Kerry on the northern shore of Kenmare River.

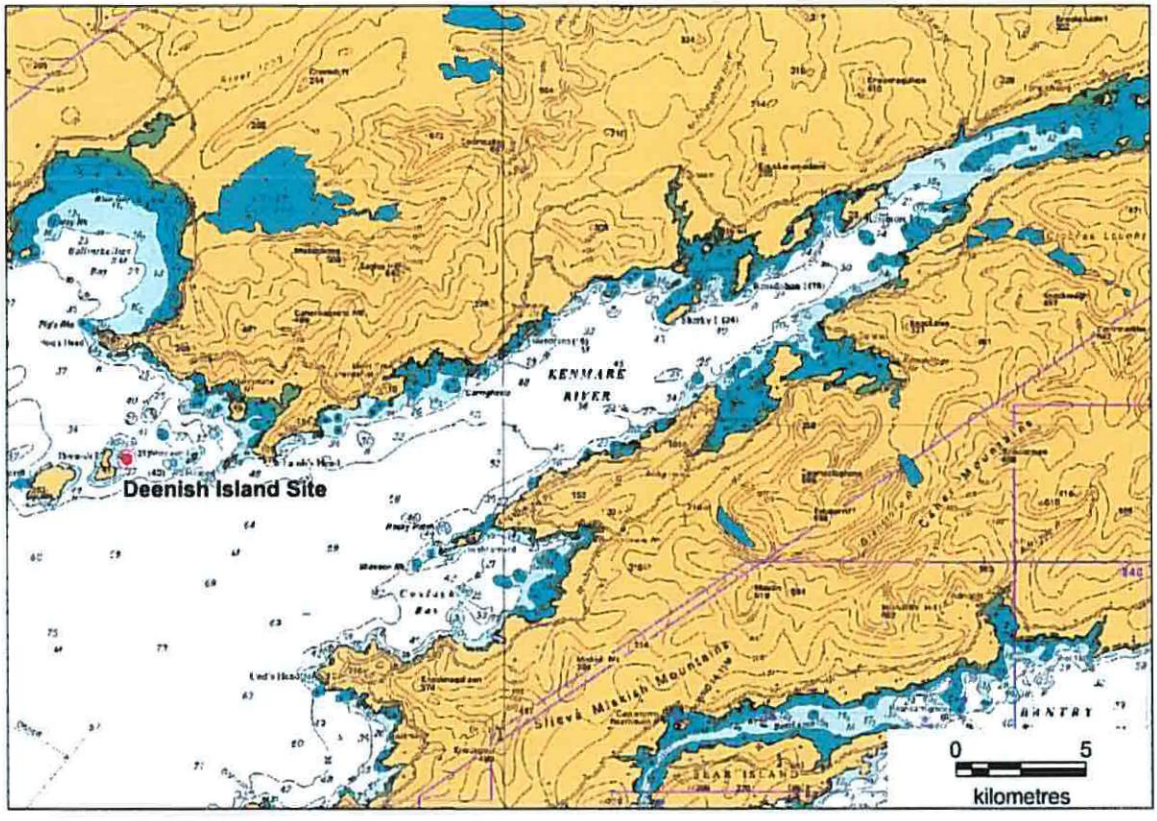

Figure 1.1: Map showing the location of the Deenish site surveyed in Kenmare Bay

1.1. Site description

Kenmare Bay, Co. Kerry, is a long and narrow, south-west facing bay. It is a deep, drowned glacial valley and the bedrock is mainly old red sandstone which forms reefs along the middle of the bay throughout

its length. Exposure to prevailing winds and swells at the mouth diminishes towards the head of the bay while numerous islands and inlets provide further areas of additional shelter.

Deenish Island is part of two Natura 2000 sites (see Figure 1.2), namely the Kenmare River cSAC (Site code: 002158) and the Deenish Island and Scariff Island SPA (Site code: 004175).

The diversity of environmental conditions, from exposed to ultra sheltered, that characterises Kenmare River cSAC results in the presence of a wide range of marine habitats including three listed on Annex I of the EU Habitats Directive, namely reefs, large shallow bay and caves. According to the cSAC site synopsis (available from www.npws.ie) Kenmare Bay is host to a high number of rare and notable marine species present (24) and some uncommon communities. The Kenmare River cSAC is the only known site in Ireland for the northern sea-fan, *Swiftia pallida* and is the only known area where this species and the southern sea-fan *Eunicella verrucosa* co-occur. Midway along the south coast of Kenmare River, a series of sea caves stretch back into the cliff, typically supporting a diversity of epifauna including encrusting sponges, ascidians and bryozoans.

Deenish Island and Scariff Island are small to medium size islands situated between 5 and 7 km west of Lamb's Head off the Co. Kerry coast and thus very exposed to the force of the Atlantic Ocean. The site is a Special Protection Area (SPA) under the E.U. Birds Directive due to its special conservation interest for seabirds including fulmar, Manx shearwater, storm petrel, lesser black-backed gull and Arctic tern. Scariff is the larger of the two islands, with very steep sides rising to a peak of 252 m with the highest cliffs located on the south side. Deenish is less rugged than Scariff, and rises to 144 m in its southern half; the northern half being lower and flatter. The vegetation is mostly grassland, with some heath occurring on the higher ground. Old fields are now overgrown with bracken and bramble. The sea areas within a 500m radius of both islands are included inside the SPA boundary to provide a 'rafting' area for shearwaters.

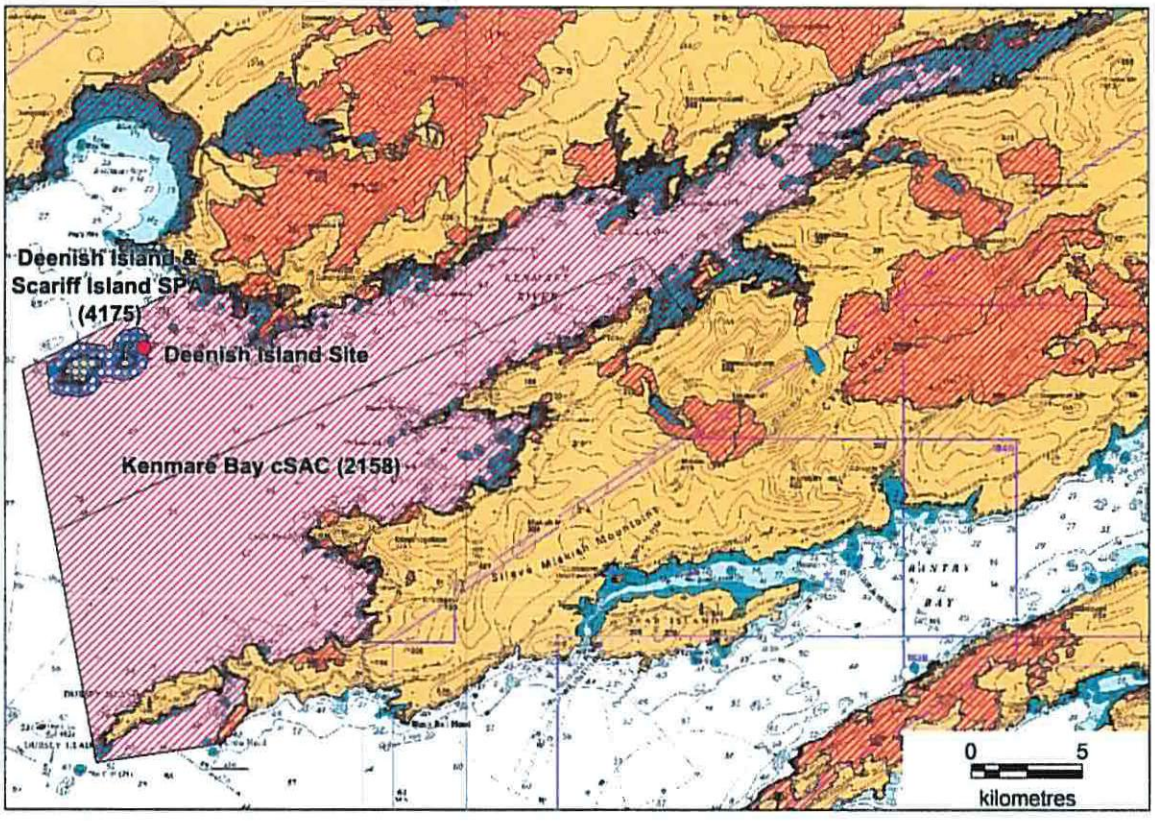

Figure 1.2: Map showing the locations of the relevant cSAC and SPA near Kenmare Bay, Co. Kerry.

1.2. Offshore finfish farms – benthic monitoring

The main objective of the survey was to assess the overall state of the environment in relation to the salmon production process. The sites were surveyed according to the revised Benthic Monitoring Guidelines laid down by the Department of Agriculture, Fisheries and Food (December 2008). The benthic monitoring requirements at a fish farm are dependent on the level of biomass held at the site and the local hydrography. Table 1.1 below sets out the level of benthic monitoring required based on tonnage produced and mean current speeds at a fish farm:

Table 1.1. Matrix of production tonnage versus current speed to determine level of benthic monitoring required

	MEAN CURRENT SPEED (CMS^{-1})		
TONNAGE	<5	5-10	>10
0-499	Level I	Level I	Level I
500-999	Level II	Level I	Level I
>1000	Level II	Level II	Level I

The current speed is a mean value calculated from maximum current measurements over spring and neap tidal cycles at the surface and near the bottom. The tonnage refers to the maximum biomass predicted for each site. An annual survey must be carried out at each site (production and smolt) operated by a company. A level I or level II survey may be carried out as follows:

Level I: Video/photographic and visual observations and recordings shall be made at the following stations:

- At a minimum of 2 sites directly beneath the pens
- At the edges of the pens
- Two transects at right angles to each other. Along each transect sampling stations at +/- 10m, +/- 20m, +/- 50m and + 100m from the pens
- At a control site

In addition to the above, the following samples/measurements shall be taken at the same stations as above. These will be used to calculate sediment quality parameters.

- A minimum of one Redox potential reading shall be made at each sampling station.
- A single sediment sample for Organic Carbon measurement.

Level II: In addition to the above, two replicate grab samples shall be captured at each of the sample stations for faunal analysis. The exact locations of sampling points should be agreed in advance with the Department of Agriculture Fisheries and Food (DAFF). The identification and abundance of macro-faunal invertebrates shall be estimated and tabulated. Identification of fauna to the level of species will be

required.

It is important to take note that the exact position of the individual pen structures are not permanently fixed to a single position and there is a relatively large lateral movement due to depth, wind, currents and tides. For this reason, bottom stations particularly those under, at the edge and 10 m away from the pens are taken at the time of sampling but may vary relative to the overlying pen position under various environmental conditions.

2. Sampling Procedure & Processing

All survey work at the Deenish site took place on 26th October 2017. The dives were conducted at a maximum depth of 20.8 m and underwater visibility on the day was good at approximately 5m. Pen layouts at the time of survey, dive entry points and benthic transects followed by the divers are shown in Figure 2.1.

Mean current speed at the Deenish finfish aquaculture site is 30 cm sec^{-1} (Marine Harvest pers.com.). The fish biomass present in the pens at the time of survey was 558 tonnes. The survey was carried out at Level 1 as per the guidance matrix displayed in Table 1.1.

Disinfection

Prior to each dive survey for each location all diving equipment, suits and boats are thoroughly disinfected utilising both a dipping and spraying protocol.

2.1. Dive survey

Two dive transects were laid out from the sea surface at each site using a boat equipped with a GPS mapper. Pen locations were noted as DGPS positions. The underwater survey involved direct observation, sampling and recording (through photographs and *in situ* annotations) of benthic conditions by highly experienced, qualified marine biologists and scientific divers. The notes taken *in situ* were transcribed to logs upon surfacing. In addition to standard SCUBA gear the divers were equipped with:

- A high-end dSLR Nikon D200 in a Subal ND20 underwater housing fitted with a 12-24mm

lens and two INON strobes. The camera was used to photograph the epibenthos and seafloor features;

- A diver-operated dSPI camera for photographing sediment profiles of the seafloor and calculate redox measurements. This unit uses a Canon EOS 450D camera with Nikkor optics;
- A compass for underwater navigation;
- Pre-labelled bags to store sediment samples for organic carbon analysis;
- Dive slates, torches and waterproof pencils for making observations/notes.

The divers photographed representative areas of the sediment and fauna and recorded observations in situ at the various stations investigated. Notes were completed immediately on surfacing and a map of the dive track was drawn up. Observations recorded during the dive included:

- Presence of bacterial mats and uneaten food;
- Presence of farm-derived litter;
- Presence of gas bubbles or anoxic areas;
- Animals visible or evidence of their presence;
- Macroalgae visible;
- Sediment characteristics, including colour and texture.

The seafloor was photographed at the following stations along two transects at the site (**Error! Reference source not found.**):

A. Directly under the pens;
B. Under the edge of the pen;
C. At 10m, 20m, 50m and 100m (on T1) from the pens along the transects.

A reference station was also assessed for each pen block to give a representation of ambient benthic conditions in the area immediately surrounding the pen installations for comparison purposes. The reference station was taken at a distance greater than 150 m from the pen installations to represent the assumed 'undisturbed' condition of the seafloor surrounding the sites.

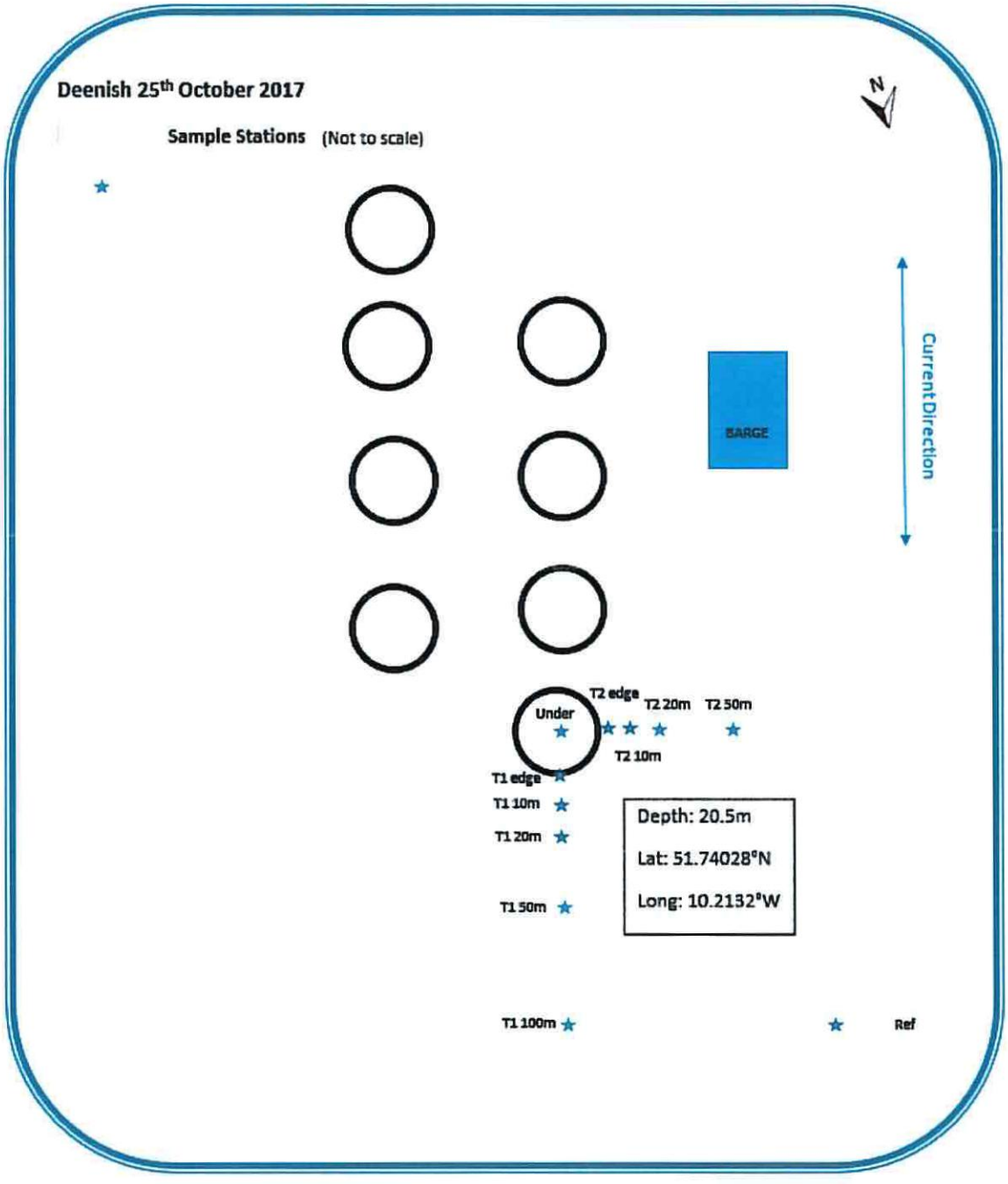

Figure 2.1: Transect seafloor station layout, Deenish finfish aquaculture site, Kenmare Bay, 25th October 2017

2.2. *Sediment Profile Imagery (SPI)*

Sediment profile images (SPI) obtained for each station along with ARPD depth measurements taken from the images were acquired using a diver-deployed sediment profile imaging camera system. This system is comprised of a digital SLR camera in a water-tight pressure vessel that is mounted above a prism that penetrates the upper 25 cm of sediment (see Figure 2.2). The sediment profile is viewed through a plexiglass window and the image is reflected to the camera lens via a plane mirror. Illumination is provided by an internally-mounted strobe. The prism unit is filled with distilled water – thus ambient water clarity is never a limiting factor in image quality. Upon arrival, the diver depresses the SPI unit into the seafloor and manually triggers the camera. This process is repeated at each station investigated.

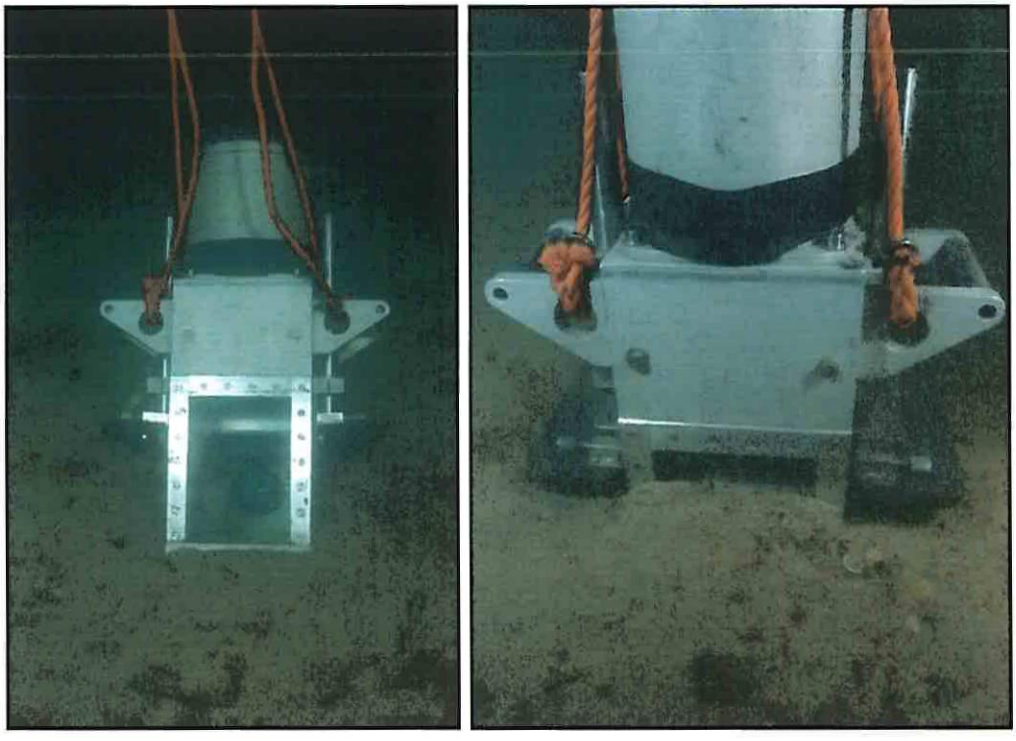

Figure 2.2: Diver operated Sediment Profile Imaging camera. The left-hand image gives a view of the camera at the sediment surface. The right-and image shows the SPI camera when inserted into the sediment

A great deal of information about benthic processes is available from sediment profile images. Measurable parameters, many of which are calculated directly by image analysis, include physical/chemical parameters (i.e. sediment type measured as grain size major mode, prism penetration

depth providing a relative indication of sediment shear strength, sediment surface relief, condition of mud clasts, redox potential discontinuity depth and degree of contrast, sediment gas voids) and biological parameters (i.e. infaunal successional stage of a well documented successional paradigm for soft marine sediments (see Pearson and Rosenberg, 1978), degree of sediment reworking, dominant faunal type, epifauna and infauna, depth of faunal activity, presence of microbial aggregations).

For the purposes of the current survey, the primary feature of interest is the depth of oxygen penetration into the sediments in the vicinity of the finfish pens (this information is required to satisfy the requirements of the Benthic Monitoring Protocol (DAFF, 2008). In this case, the apparent redox potential discontinuity or ARPD depth is measured. Features of particular interest that may be gleaned from SPI images taken in sediments in the vicinity of finfish pens include the presence of:

- uneaten feed pellets (and depth of this material, see Figure 2.3)
- faecal casts
- and depth of shell gravel deposits
- of gas voids in the sediment

Figure 2.3: Typical sediment profile images with examples of features relevant to aquaculture operations

2.3. *Sampling for organic carbon analysis*

Sediment samples for organic carbon analysis were collected at all stations. Samples were stored in pre-labelled plastic bags, kept in cold freezer boxes onboard the vessel and frozen at -20°C on return to the laboratory. Organic carbon analysis was carried out by ALS laboratories using the Loss on Ignition (LOI) technique. This method involves oven drying the sediment sample in a muffle furnace (450°C for a period of 6 hours) after which time the organic content of the sample is determined by expressing it as a percentage the weight of the sediment after ignition over the initial weight of the sediment.

3. Results

3.1. *Recent Stocking History*

At the time of the audit, 558 tonnes of fish were stocked on site having been input to the site in March 2017 following a 10 week week fallow period.

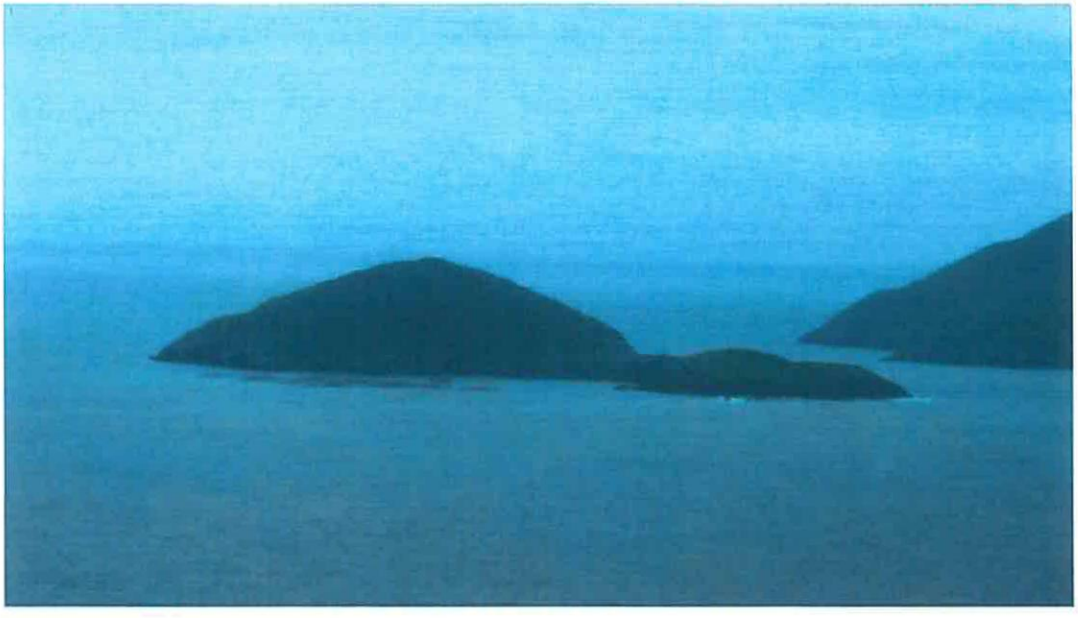

Figure 3.12: View of pens at Deenish Island site.

3.2. Seabed physical and biological characteristics

The seabed was mainly composed of coarse sand with a shell gravel constituent, the majority of which was composed of the shell of the edible mussel *Mytilus edulis* amongst other species.

3.2.1. Photographic record; Transect 1

This transect began beneath the northeastern most pen moored on site (see Figure 2.1) and ran for a distance of 100 m north. A total of six stations were investigated.

3.2.1.1. Under pen

The seafloor located directly beneath the pens was characterised by a gravel and shell covering mainly made up of the shell of the edible mussel *M. edulis*. Drift brown and red algae was common on the seabed. The anemone, *Cerianthus lloydii*, was noted as common. There were no direct impacts from the aquaculture operations observed at the time of the survey.

Figure 3.2: T1 – Under pen station, Deenish Island site, 25th October 2017

3.2.1.2. Edge of pen

The station located to the edge of the pen along Transect 1, was characterised by an undulating seafloor created by the prevailing tidal current of the area. The burrowing anemone, *C. lloydii* was present in the sediment. There were no immediate signs of impact from the adjacent aquaculture activities observed at this station, and in general the sediment appeared to be well oxygenated and in a stable condition.

Figure 3.3: T1 – Pen edge station, Deenish Island, 25th October 2017

3.2.1.3. 10 m from pen

The conditions observed 10 m along Transect 1 were very similar to the conditions observed at the edge station of the same transect. The sediment was composed of a coarse gravel with a high percentage of shell fragments, most of which was derived from the edible mussel *M. edulis*. Brown drift algae and phytodetrital debris was accumulated in the troughs of the sediment waves. There were no signs of farm derived material, and in general the benthic environment appeared to be in good condition.

Figure 3.4: T1 – 10m, Deenish Island, 25th October 2017

3.2.1.4. 20 m from pen

The station located 20 m along Transect 1 was characterised by a coarse gravel seafloor with a percentage of shell fragment, most of which originated from the edible mussel *M. edulis*. The seafloor had an undulating appearance that had been formed by the prevailing tidal current, which has formed a series of shallow peaks and troughs. Some drift brown algae had accumulated in the troughs (Figure 3.5) and the burrowing anemone *C. lloydii* was buried in the sediment waves. There were no visible signs of any anthropogenic influence.

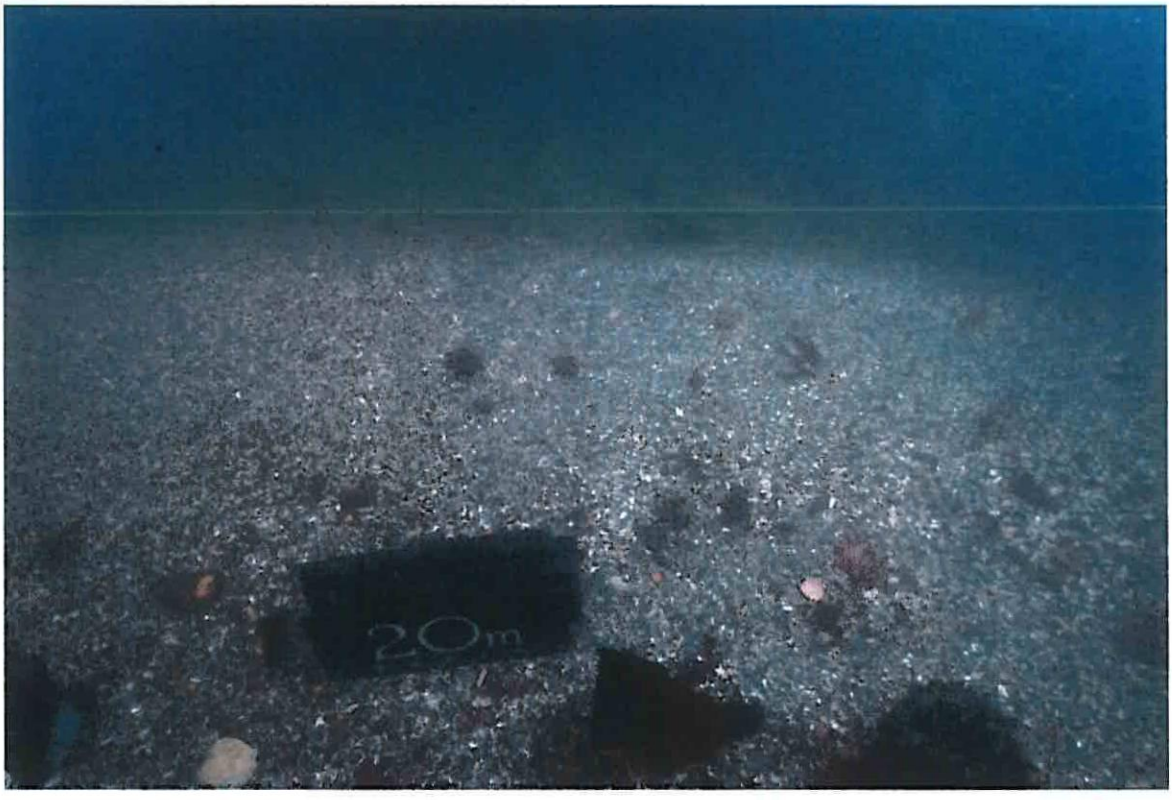

Figure 3.5: T1 – 20 m station, Deenish Island, 25th October 2017

3.2.1.5. 50 m from pen

The seafloor at the 50 m station along Transect 1 was similar to the previous station although with coarser material accumulated in the sand troughs along with some drift algae. There were no obvious signs of impact from the aquaculture activities and the seafloor had an oxygenated appearance.

Figure 3.6: T1 – 50 m station, Deenish Island, 25th October 2017

3.2.1.6. 100 m from Pen

The conditions observed towards the end of Transect 1 at the 100 m station were markedly different from the previous stations in that the general size of the pebble and shell gravel sediment was larger with more intact shell fragments. Red algae were present on the seafloor along with drift brown algae and other phytodetrital material. There were no obvious signs of impact from the aquaculture activities and in general the benthic environment appeared to be in good health (Figure 3.7).

Figure 3.7: T1 – 100 m station, Deenish Island, 25th October 2017

3.2.2. Sediment Profile Imagery – Transect 1

Figure 3.8 presents sediment profile images taken at the six stations visited on Transect 1 of the Deenish site. The substrate of the site was composed of fine and medium grained sand with shell gravel at the under pen station which gradually gave way to a coarser shelly gravelly sand with intact shell at the outer end of the transect. The energy levels experienced by the seafloor in this area is more than likely quite high particularly during winter storms.

The images display a single image and the maximum and minimum apparent redox potential discontinuity (ARPD) depths measured at each station. Each image is 15.5cm × 25cm. ARPD depths ranged from a minimum of 1.2 cm (T1 20m) to a maximum of greater than 3.9 cm (T1 Under).

Due to the relatively coarse nature of the seafloor, the SPI camera achieved relatively low penetrations.

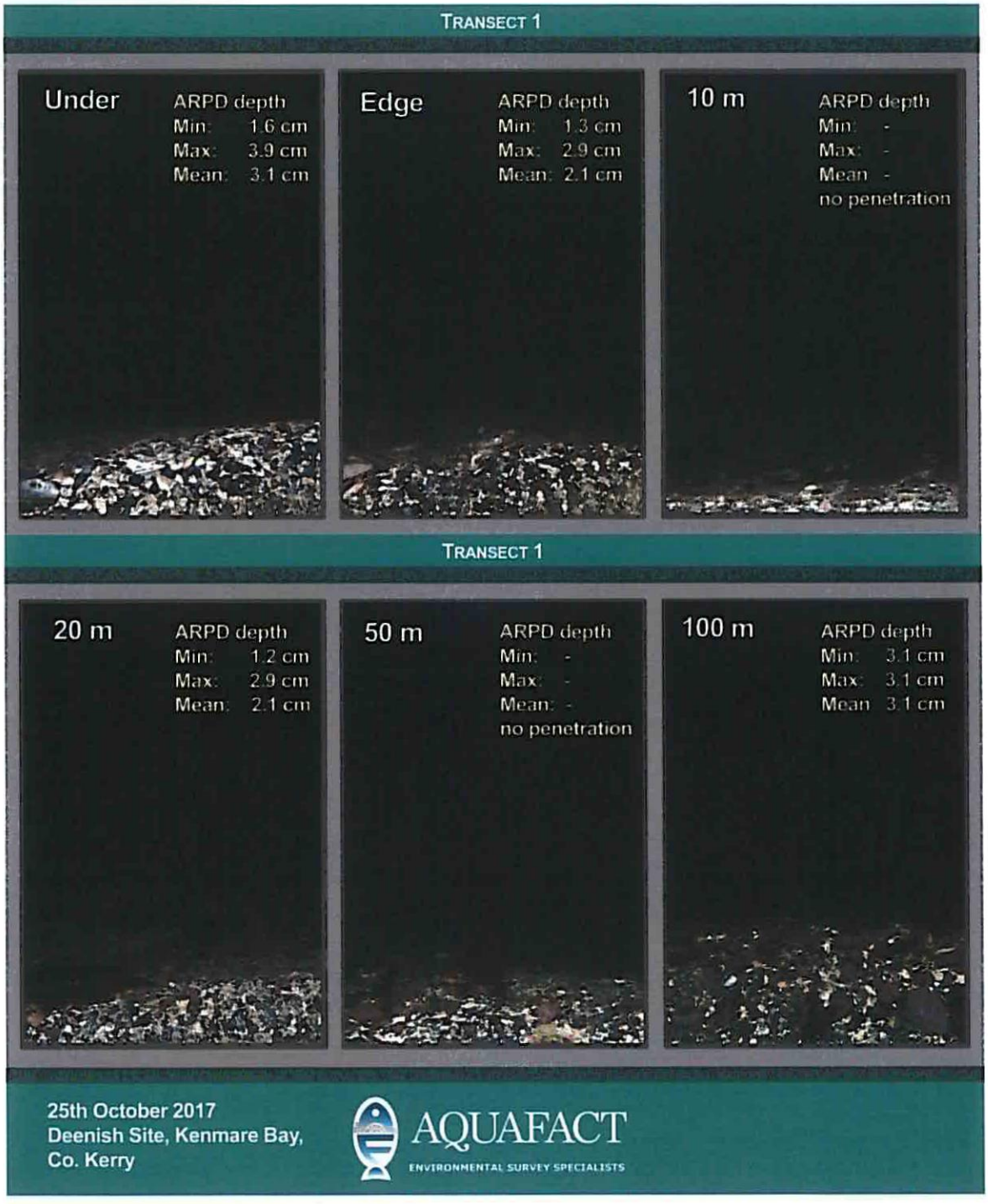

Figure 3.8: Representative photographs of the seafloor taken along Transect 1 by Sediment Profile Imagery (SPI)

3.2.3. Photographic Record; Transect 2

This transect began beneath the same pen as Transect 1 and ran for a distance of 50m west. A total of five stations were investigated on Transect 2 with an additional (Reference) station investigated just *c.* 150 m north of the pen edge (See Figure 2.1).

3.2.3.1. Under pen

The under pen conditions recorded at the beginning of Transect 2 were very similar to those observed at the Under station at the beginning of Transect 1. The sediment is mainly composed of shell fragment and forms an undulating profile of peaks and troughs influenced by the prevailing tidal current of the area. There were no immediate signs of waste material from the adjacent aquaculture activity.

Figure 3.9: T2 – Under pen station, Deenish Island, 25th October 2017

3.2.3.2. Edge of pen

The Edge of pen station along Transect 2 was characterised by a course grained sand with a considerable percentage of shell fragment. Drift algae and phytodetrital material had accumulated in the trough of the sand waves along with whole shells of the edible mussel *M. edulis*. No signs of impact from the overhead pens were appreciable, and the benthic environment appeared to be in good health.

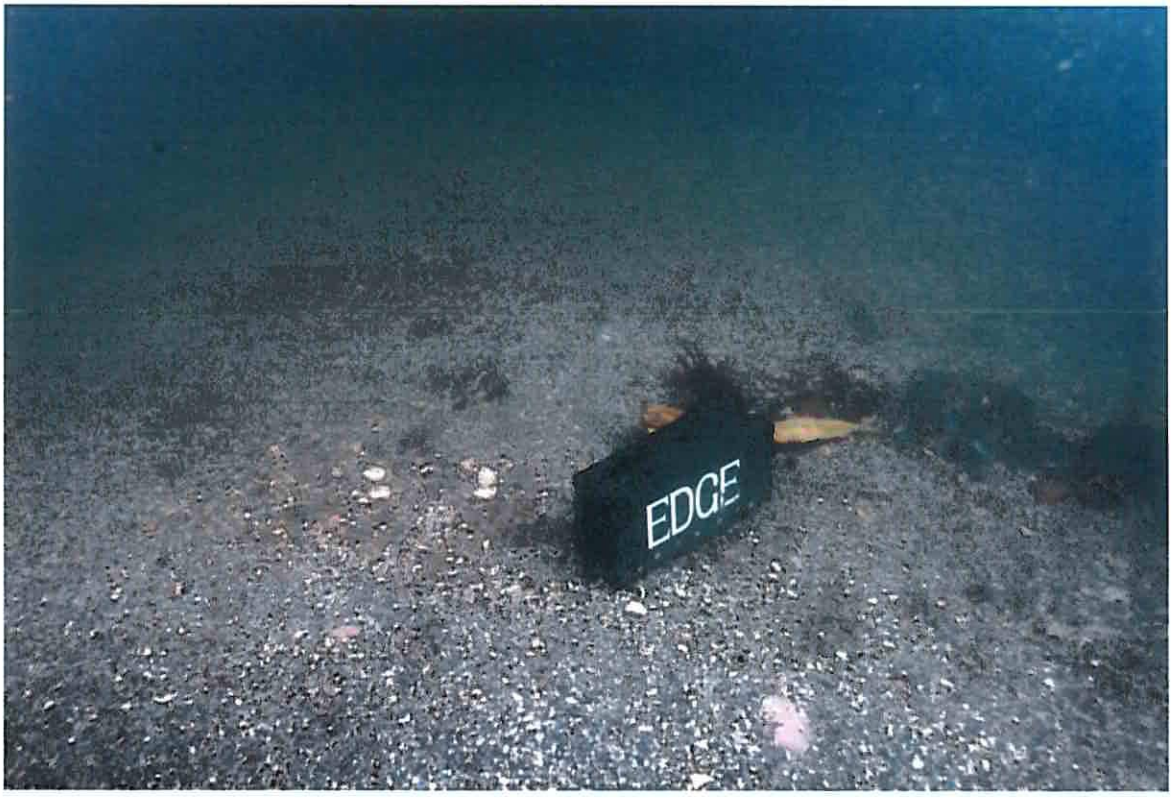

Figure 3.10: T2 – Pen edge station, Deenish Island, 25th October 2017

3.2.3.3. 10 m from pen

Moving to the 10 m station along Transect 2 the sediment changed from medium grained sand to a coarser sand with a larger percentage of intact clam shells scattered along the seabed. Clumps of drift algae and phytodetrital material were also present. The anemone, *C. lloydii*, was common buried in the sand. There were no observations of waste material from the adjacent aquaculture site visible on the seabed. In general, the benthic environment of the area seemed to be in good condition.

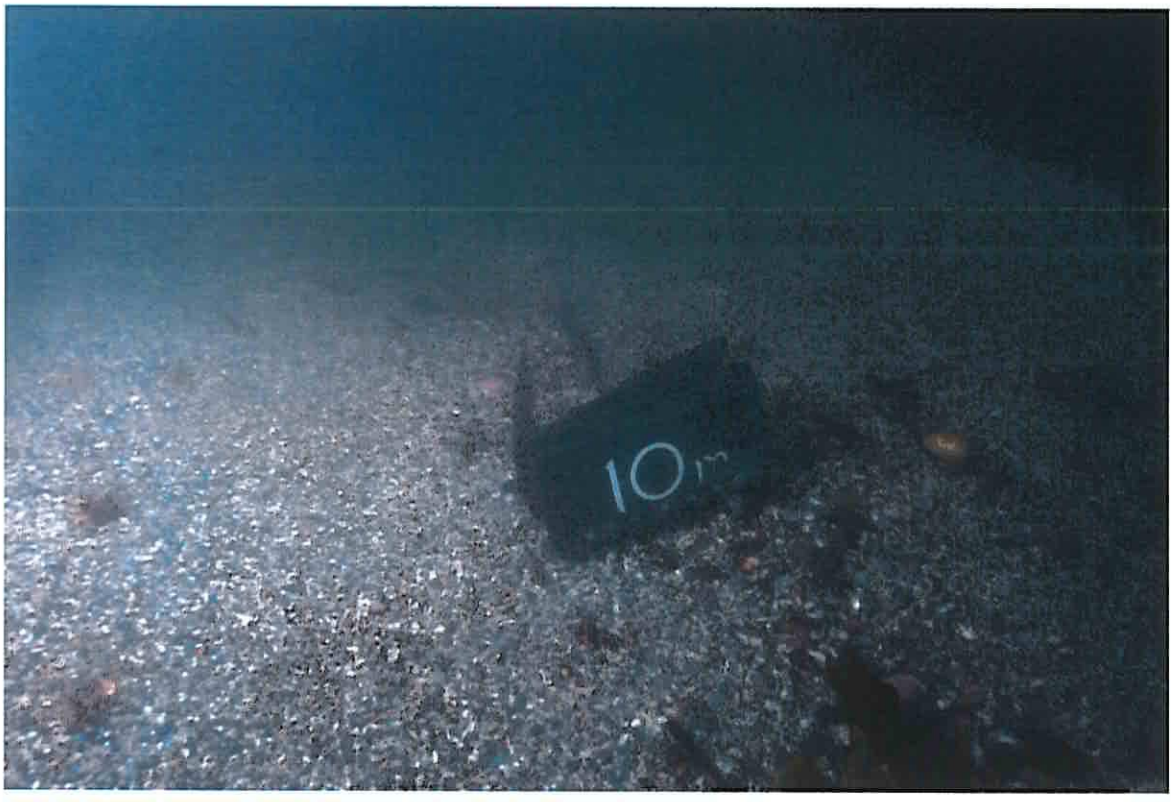

Figure 3.11: T2 – 10 m station, Deenish Island, 25th October 2017

3.2.3.4. 20 m from pen

The seafloor located 20 m along Transect 2 was characterised by a medium grained sand sediment with a mixture of larger stones and intact shells throughout. The profile of the seafloor was wavy in appearance due to the prevailing tidal current creating peaks and troughs. The anemone, *C. lloydii*, was common buried in the sand. There were no signs of impact from the adjacent finfish farm and the benthic environment appeared to be relatively unaltered.

Figure 3.12: T2 – 20 m station, Deenish Island, 25th October 2017

3.2.3.5. 50 m from pen

The seafloor 50 m along Transect 2 was characterised by a seafloor where the sediment was more uniform than previous stations with fewer large empty shell fragments. The anemone, *C. lloydii*, was not as frequent as in the previous stations but a number of individuals were noted.

Figure 3.13: T2 – 50 m station, Deenish Island, 26th October 2017

3.2.3.6. Reference station

The reference site was chosen to provide an example of the natural conditions present at the site. The sediment was composed of numerous flat pebbles mixed with shell fragments. Drifting brown algae was distributed along the seafloor. As would be expected the influence of the adjacent aquaculture had no bearing on the benthic environment of the site.

Figure 3.14: Reference station, Deenish Island, 25th October 2017

3.2.4. Sediment Profile Imagery – Transect 2 & Reference

Figure 3.15 presents sediment profile images taken at the five stations visited on Transect 2 of the Deenish site and the reference station on 25th October 2017. The figure displays a single image and the maximum and minimum apparent redox potential discontinuity (ARPD) depths measured at each station. Each image is 15.5 cm × 25 cm.

Sediment type varied from medium sands under and close to the pen compared with higher proportions of gravel and shell with increasing distance from the pen. It was difficult to estimate ARPD depths from the station due to the nature of the substrate which didn't allow sufficient prism penetration of the SPI. Despite this, penetration was achieved on all stations and the oxidised sediment layer at the site was considered to be relatively deep, estimated to range from a minimum of 1.2 cm to a maximum of 12.2 cm recorded at the 20 m pen location. ARPD depths at the Reference station ranged from 2.6 cm to 5.1 cm and a mean ARPD of 3.9.

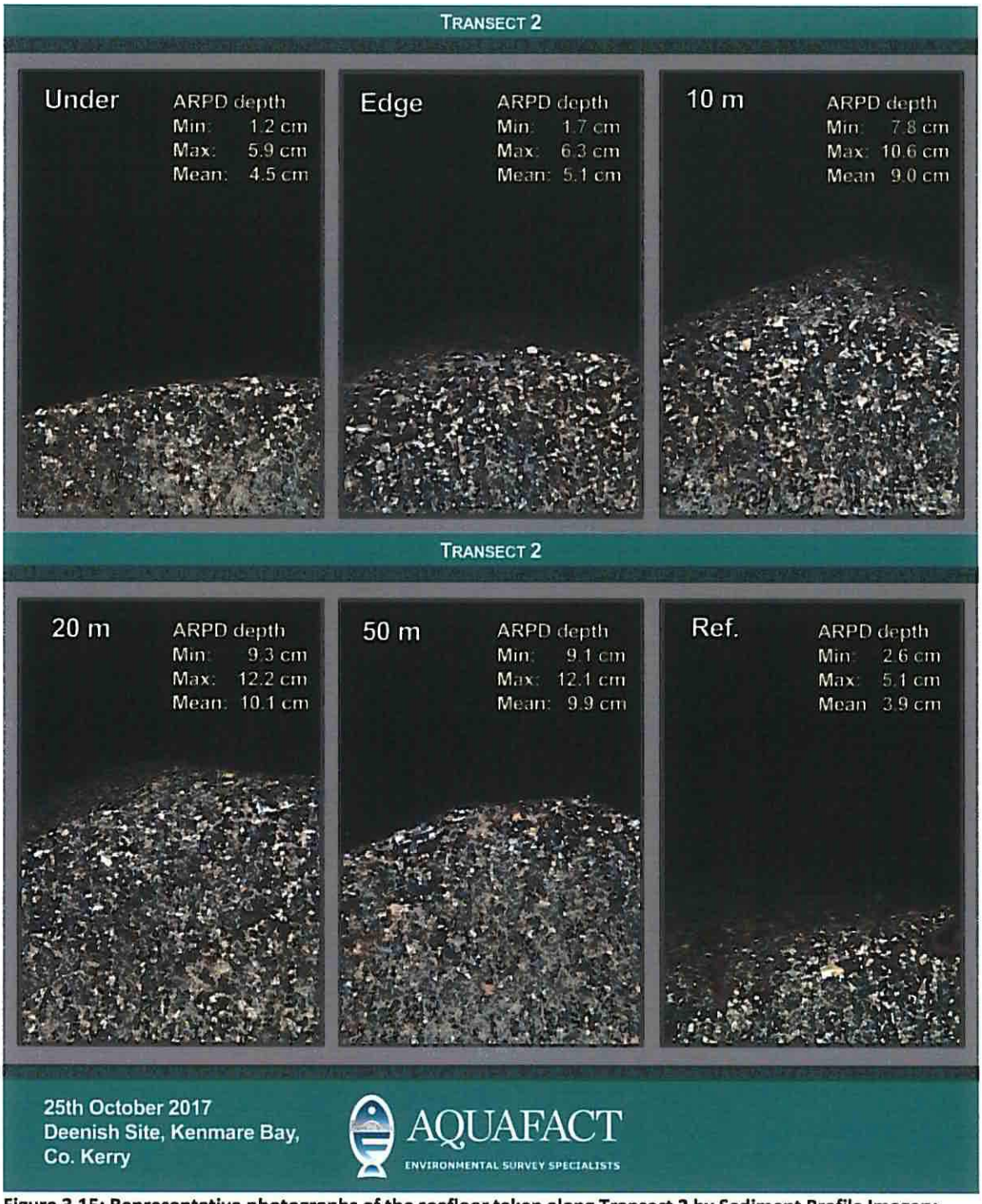

Figure 3.15: Representative photographs of the seafloor taken along Transect 2 by Sediment Profile Imagery

3.2.5. Transect Species List

Table 3.1 shows a list of species observed during the dives at the Deenish fish farm site on this and previous occasions.

Table 3.1: Species noted during dives on the seabed beneath the Deenish pens

Group	Species	Common Name
(Cnidaria) Hexacorallia	*Cerianthus lloydii*	Tube anemone
(Annelida) Polychaeta	*Spirobranchus* sp.	Tube worm
	Lanice conchilega	The sand mason
	Chaetopterus variopedatus	Parchment tube worm
(Mollusca) Bivalvia	*Pecten maximus*	King scallop
	Faceliniidae	Sea slugs
	Aeolidiida	Sea slugs
	Nudibranch	Sea slugs
(Arthropoda) Decapoda	Paguridae	Hermit crab
Echinodermata	*Luidia ciliaris*	Seven armed starfish
	Asterias rubens	Common starfish
	Marthasterias sp	Starfish
	Ophiura sp.	Brittlestar
	Amphiuridae sp.	Brittlestar
(Chordata) Osteiichthyes	*Pomatoschistus* sp.	Gobies
	Trisopterus minutus	Poor Cod
	Labrus bergylta	Ballan Wrasse
Rhodophyta	*Delesseria sanguinea*	Sea beech
	Phycodrys rubens	Sea oak
	Cryptopleura ramose	
	Calliblepharis ciliata	
	Lythophyllum sp.	
Ochrophyta	*Alaria esculenta*	Edible kelp

3.2.6. Organic Carbon Analysis & ARPD Depths

Table 3.2 shows the organic carbon results from the Deenish stations. Organic carbon levels ranged from 2.28% (T2 50m) to 6.47% (T1 Under). Apart from the levels directly under the pens, organic carbon values are similar to that recorded at the Reference station.

Table 3.2: Organic carbon results for Deenish (% values, Loss on Ignition at 450°C).

T1	Under	Edge	10m	20m	50m	100m
LOI %	6.47	5.51	3.82	3.1	2.55	3.8
T2	Under	Edge	10m	20m	50m	REF
LOI %	-	3.87	2.69	2.84	2.28	3.04

Table 3.7 shows in tabular form the ARPD depths from the SPI images from Deenish (see Sections 3.1.4 and 3.1.7).

Table 3.3: ARPD Depths for Deenish, Kenmare Bay, 25th October 2017

Station		Transect 1	Transect 2
Under	Range (cm)	1.6-3.9	1.2-5.9
	Mean (cm)	3.1	4.5
Edge	Range (cm)	1.3-2.9	1.7-6.3
	Mean (cm)	2.1	5.1
10m	Range (cm)	-	7.8-10.6
	Mean (cm)	-	9.0
20m	Range (cm)	1.2-2.9	9.3-12.2
	Mean (cm)	2.1	10.1
50m	Range (cm)	-	9.1-12.1
	Mean (cm)	-	9.9
100m	Range (cm)	3.1-3.1	-
	Mean (cm)	3.1	-
Reference	Range (cm)	-	2.6-5.1
	Mean (cm)	-	3.9

4. Discussion

The extent to which an overlying fish farm impacts the seafloor is largely dependent on:

- the feeding regime at that farm, i.e. the amount of food that eventually ends up on the seafloor;
- the degree of current movement at the site in question; and
- the depth of water at that site.

These factors combine to form either erosional or depositional locations where organic material is either dispersed or it accumulates, and subsequently affects the receiving environment (*i.e.* the seafloor). The type of biotic community living at a particular site will also play a role in determining bottom conditions there. The influence of feeding activities of populations of starfish, polychaete worms, anemones, crabs and finfish at the Deenish site largely determine the level of impact of overlying farm operations on the benthos there.

Faunal feeding activity can remove large amounts of waste organic material from the seabed beneath a farm facility – with groups of mobile fauna capable of consuming large quantities of material. The fallowing schedule at a site also has a large bearing on benthic impact – most notably the length of time pens have been on site since the last fallow period. The presence of opportunistic deposit feeders such as *Capitella* sp., most notably at the under pen and pen edge stations will tend to help keep the benthic organics in a state of equilibrium at the fish farm sites. Sedimentary organic carbon levels in general are relatively higher at the under and edge of pen conditions at the Deenish site.

Mobile epibenthic scavengers such as starfish, fish and crabs also help in reducing the amount of waste material on the seafloor. This potential speed of the removal of waste was demonstrated in a previous study where photographic evidence was collected showing that epibenthic macrofauna were capable of removing, in less than 7 days, fish feed pellets spread at a density of 3.4 kg dry weight per m^2 on the sediment under a marine fish farm (Smith *et al.*, 1997).

Based on the on the observations during the current survey, It is evident that very little if any habitat degradation has occurred at the Deenish site. The results obtained from the previous year's survey in 2016 yielded similar results and the influence of the aquaculture was proposed to have minimal effect on the surrounding environment.

5. Conclusion

On the 25th of October 2017, a benthic audit survey was carried out on the Deenish fish farm site operated by Marine Harvest Ireland. The Deenish survey followed the DCMNR Level I monitoring protocols. The results from the current survey conclude that the overlying aquaculture had little to no influence on the seafloor. Stations observed at the edge of each transect and beyond had ARPD depths very similar to the reference station and the site can be considered of good environmental status.

6. References

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Environmental Survey

Beneath Finfish pens

at Deenish aquaculture site (T6/202),

Kenmare Bay,

Co. Kerry

May 2018

Produced by

AQUAFACT International Services Ltd

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Report Approval Sheet

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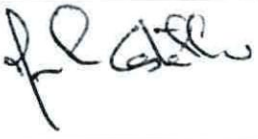
2	Final	9/11/2018	JN1471 Deenish 2018 Audit	Hugh O'Sullivan	
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AQUAFACT

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1. Introduction

This report documents the environmental conditions of the seabed at a Marine Harvest Ireland finfish (Atlantic salmon *Salmo salar*) aquaculture site (Aquaculture Licence Reference T6/202) in Kenmare Bay, Co. Kerry recorded during surveys undertaken by AQUAFACT on 24th May 2018 (see Figure 1.1). The aquaculture site is situated close to Deenish Island, County Kerry on the northern shore of Kenmare River.

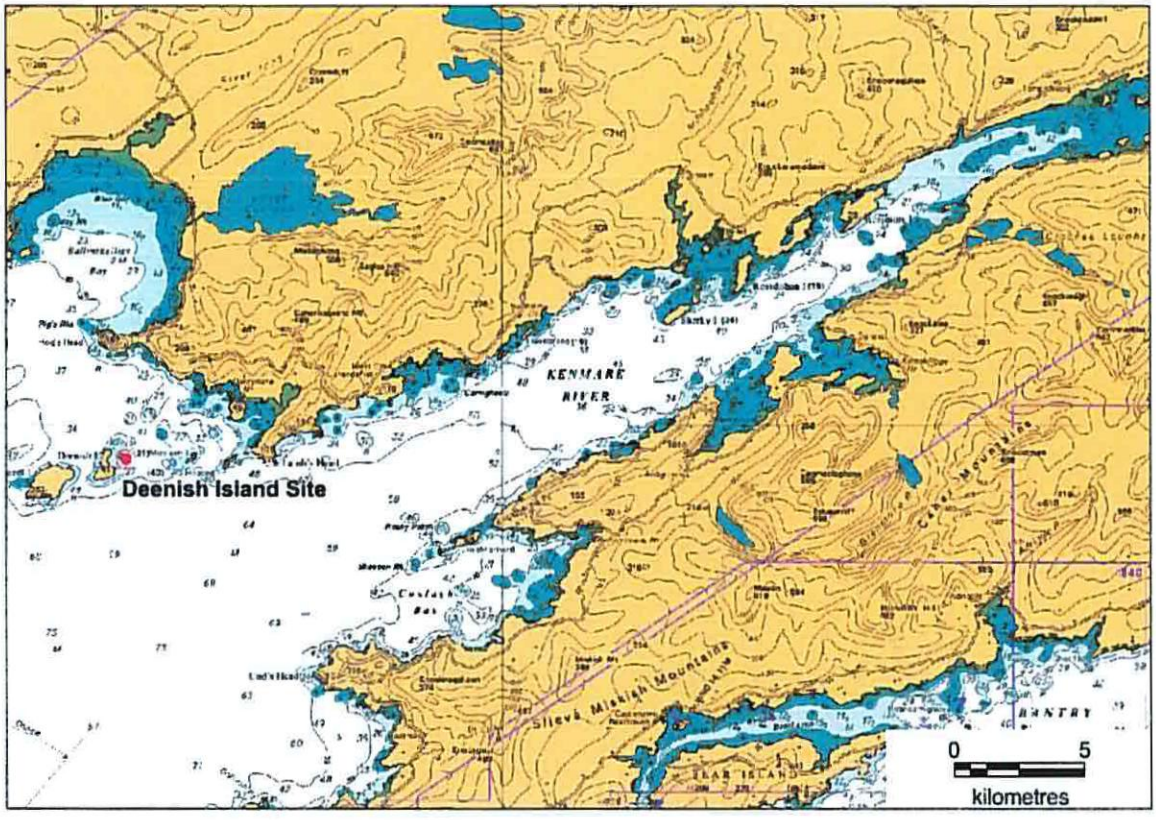

Figure 1.1: Map showing the location of the Deenish site surveyed in Kenmare Bay

1.1. Site description

Kenmare Bay, Co. Kerry, is a long and narrow, south-west facing bay. It is a deep, drowned glacial valley and the bedrock is mainly old red sandstone which forms reefs along the middle of the bay throughout

its length. Exposure to prevailing winds and swells at the mouth diminishes towards the head of the bay while numerous islands and inlets provide further areas of additional shelter.

Deenish Island is part of two Natura 2000 sites (see Figure 1.2), namely the Kenmare River cSAC (Site code: 002158) and the Deenish Island and Scariff Island SPA (Site code: 004175).

The diversity of environmental conditions, from exposed to ultra sheltered, that characterises Kenmare River cSAC results in the presence of a wide range of marine habitats including three listed on Annex I of the EU Habitats Directive, namely reefs, large shallow bay and caves. According to the cSAC site synopsis (available from www.npws.ie) Kenmare Bay is host to a high number of rare and notable marine species present (24) and some uncommon communities. The Kenmare River cSAC is the only known site in Ireland for the northern sea-fan, *Swiftia pallida* and is the only known area where this species and the southern sea-fan *Eunicella verrucosa* co-occur. Midway along the south coast of Kenmare River, a series of sea caves stretch back into the cliff, typically supporting a diversity of epifauna including encrusting sponges, ascidians and bryozoans.

Deenish Island and Scariff Island are small to medium size islands situated between 5 and 7 km west of Lamb's Head off the Co. Kerry coast and thus very exposed to the force of the Atlantic Ocean. The site is a Special Protection Area (SPA) under the E.U. Birds Directive due to its special conservation interest for seabirds including fulmar, Manx shearwater, storm petrel, lesser black-backed gull and Arctic tern. Scariff is the larger of the two islands, with very steep sides rising to a peak of 252 m with the highest cliffs located on the south side. Deenish is less rugged than Scariff, and rises to 144 m in its southern half; the northern half being lower and flatter. The vegetation is mostly grassland, with some heath occurring on the higher ground. Old fields are now overgrown with bracken and bramble. The sea areas within a 500m radius of both islands are included inside the SPA boundary to provide a 'rafting' area for shearwaters.

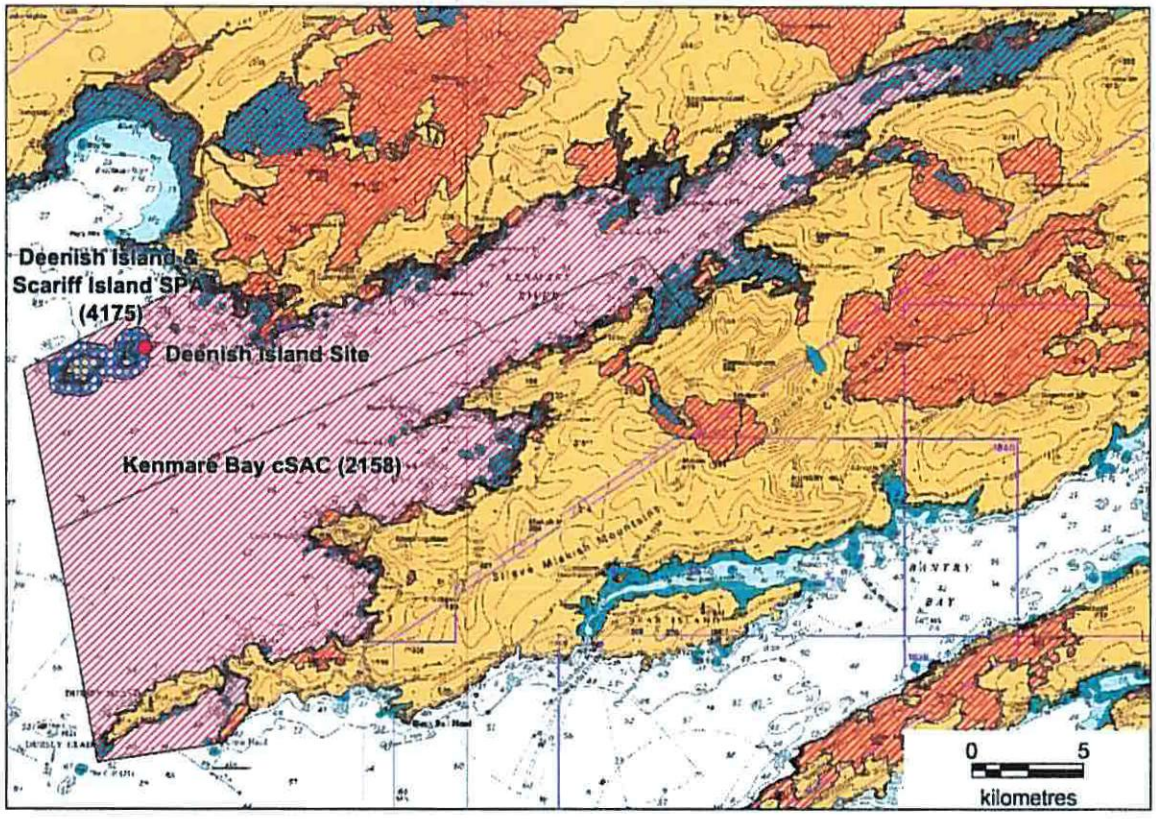

Figure 1.2: Map showing the locations of the relevant cSAC and SPA near Kenmare Bay, Co. Kerry

1.2. Offshore finfish farms – benthic monitoring

The main objective of the survey was to assess the overall state of the environment in relation to the salmon production process. The sites were surveyed according to the revised Benthic Monitoring Guidelines laid down by the Department of Agriculture, Fisheries and Food (December 2008). The benthic monitoring requirements at a fish farm are dependent on the level of biomass held at the site and the local hydrography. Table 1.1 below sets out the level of benthic monitoring required based on tonnage produced and mean current speeds at a fish farm.

Table 1.1: Matrix of production tonnage versus current speed to determine level of benthic monitoring required

	MEAN CURRENT SPEED (CMS^{-1})		
TONNAGE	<5	5-10	>10
0-499	Level I	Level I	Level I
500-999	Level II	Level I	Level I
>1000	Level II	Level II	Level I

The current speed is a mean value calculated from maximum current measurements over spring and neap tidal cycles at the surface and near the bottom. The tonnage refers to the maximum biomass predicted for each site. An annual survey must be carried out at each site (production and smolt) operated by a company. A level I or level II survey may be carried out as follows:

Level I: Video/photographic and visual observations and recordings shall be made at the following stations:

- At a minimum of 2 sites directly beneath the pens
- At the edges of the pens
- Two transects at right angles to each other. Along each transect sampling stations at +/- 10m, +/- 20m, +/- 50m and + 100m from the pens
- At a control site

In addition to the above, the following samples/measurements shall be taken at the same stations as above. These will be used to calculate sediment quality parameters.

- A minimum of one Redox potential reading shall be made at each sampling station.
- A single sediment sample for Organic Carbon measurement.

Level II: In addition to the above, two replicate grab samples shall be captured at each of the sample stations for faunal analysis. The exact locations of sampling points should be agreed in advance with the Department of Agriculture Fisheries and Food (DAFF). The identification and abundance of macro-faunal invertebrates shall be estimated and tabulated. Identification of fauna to the level of species will be

required.

It is important to take note that the exact position of the individual pen structures are not permanently fixed to a single position and there is a relatively large lateral movement due to depth, wind, currents and tides. For this reason, bottom stations particularly those under, at the edge and 10 m away from the pens are taken at the time of sampling but may vary relative to the overlying pen position under various environmental conditions.

2. Sampling Procedure & Processing

All survey work at the Deenish site took place on 24th May 2018. The dives were conducted at a maximum depth of 22.8 m and underwater visibility on the day was good at approximately 5m. The prevailing current direction at the site is north-south and as a result Transect 1 is orientated in this direction. Pen layouts at the time of survey, current direction, dive entry points and benthic transects followed by the divers are shown in Figure 2.1. Mean current speed at the Deenish finfish aquaculture site is 30 cm sec^{-1} (Marine Harvest *pers.comm.*). The fish biomass present in the pens at the time of survey was 1,532.7 tonnes. The survey was carried out at Level 1 as per the guidance matrix displayed in Table 1.1.

Disinfection

Prior to each dive survey for each location all diving equipment, suits and boats are thoroughly disinfected utilising both a dipping and spraying protocol.

2.1. Dive survey

Two dive transects were laid out from the sea surface at each site using a boat equipped with a GPS mapper. Pen locations were noted as DGPS positions. The underwater survey involved direct observation, sampling and recording (through photographs and *in situ* annotations) of benthic conditions by highly experienced, qualified marine biologists and scientific divers. The notes taken *in situ* were transcribed to logs upon surfacing. In addition to standard SCUBA gear the divers were equipped with:

- A high-end dSLR Nikon D200 in a Subal ND20 underwater housing fitted with a 12-24mm lens and two INON strobes. The camera was used to photograph the epibenthos and seafloor features;
- A diver-operated dSPI camera for photographing sediment profiles of the seafloor and calculate redox measurements. This unit uses a Canon EOS 450D camera with Nikkor optics;
- A compass for underwater navigation;
- Pre-labelled bags to store sediment samples for organic carbon analysis;
- Dive slates, torches and waterproof pencils for making observations/notes.

The divers photographed representative areas of the sediment and fauna and recorded observations in situ at the various stations investigated. Notes were completed immediately on surfacing and a map of the dive track was drawn up. Observations recorded during the dive include:

- Presence of bacterial mats and uneaten food;
- Presence of farm-derived litter;
- Presence of gas bubbles or anoxic areas;
- Animals visible or evidence of their presence;
- Macroalgae visible;
- Sediment characteristics, including colour and texture.

The seafloor was photographed at the following stations along two transects at the site (see Figure 2.1):

A. Directly under the pens;
B. Under the edge of the pen;
C. At 10m, 20m, 50m and 100m (on T1) from the pens along the transects.

A reference station was also assessed for each pen block to give a representation of ambient benthic conditions in the area immediately surrounding the pen installations for comparison purposes. The reference station was taken at a distance greater than 150 m from the pen installations to represent the assumed 'undisturbed' condition of the seafloor surrounding the sites.

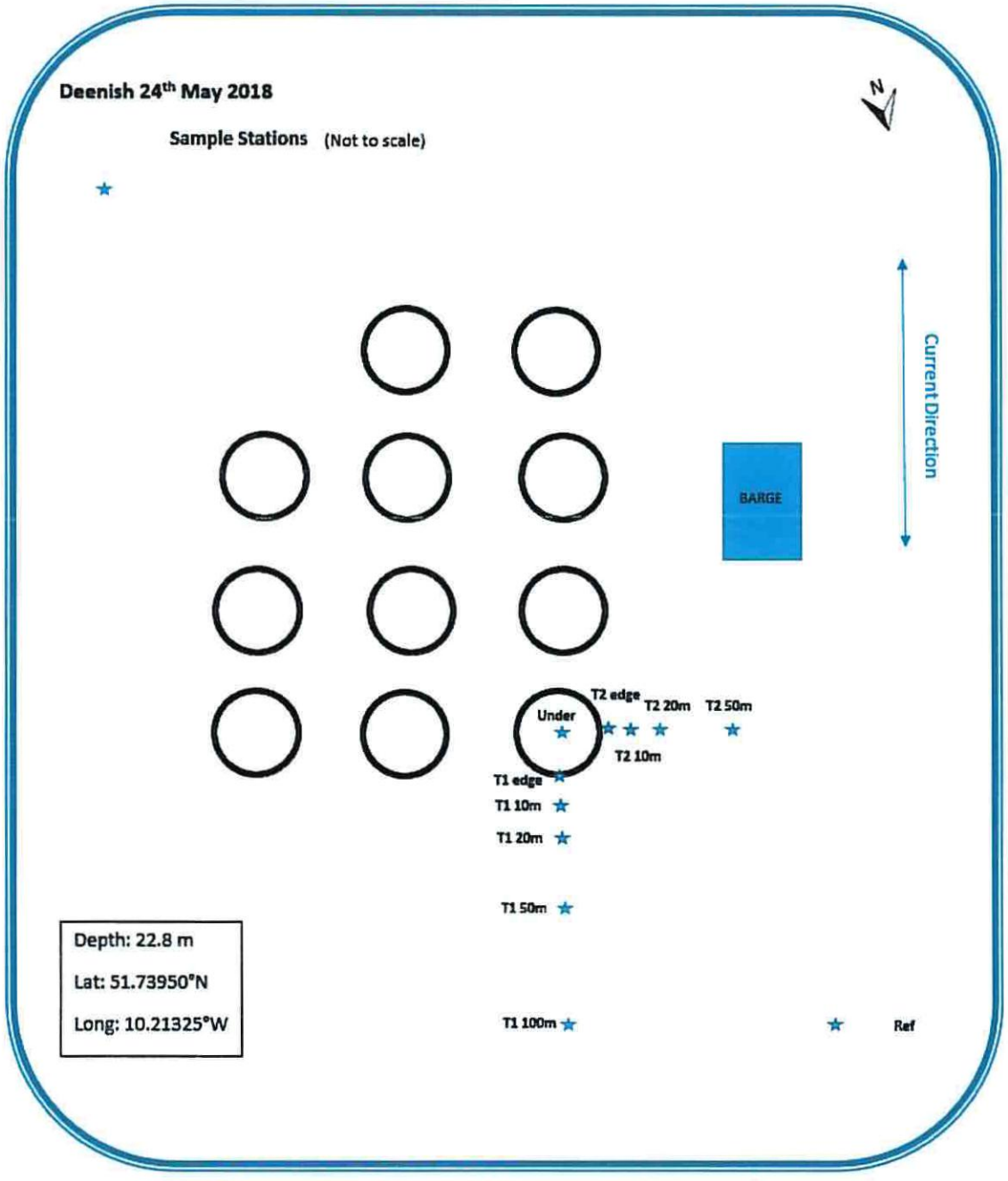

Figure 2.1: Transect seafloor station layout, Deenish finfish aquaculture site, Kenmare Bay, 24th May 2018

2.2. *Sediment Profile Imagery (SPI)*

Sediment profile images (SPI) obtained for each station along with ARPD depth measurements taken from the images were acquired using a diver-deployed sediment profile imaging camera system. This system is comprised of a digital SLR camera in a water-tight pressure vessel that is mounted above a prism that penetrates the upper 25 cm of sediment (see Figure 2.2). The sediment profile is viewed through a plexiglass window and the image is reflected to the camera lens via a plane mirror. Illumination is provided by an internally-mounted strobe. The prism unit is filled with distilled water – thus ambient water clarity is never a limiting factor in image quality. Upon arrival, the diver depresses the SPI unit into the seafloor and manually triggers the camera. This process is repeated at each station investigated.

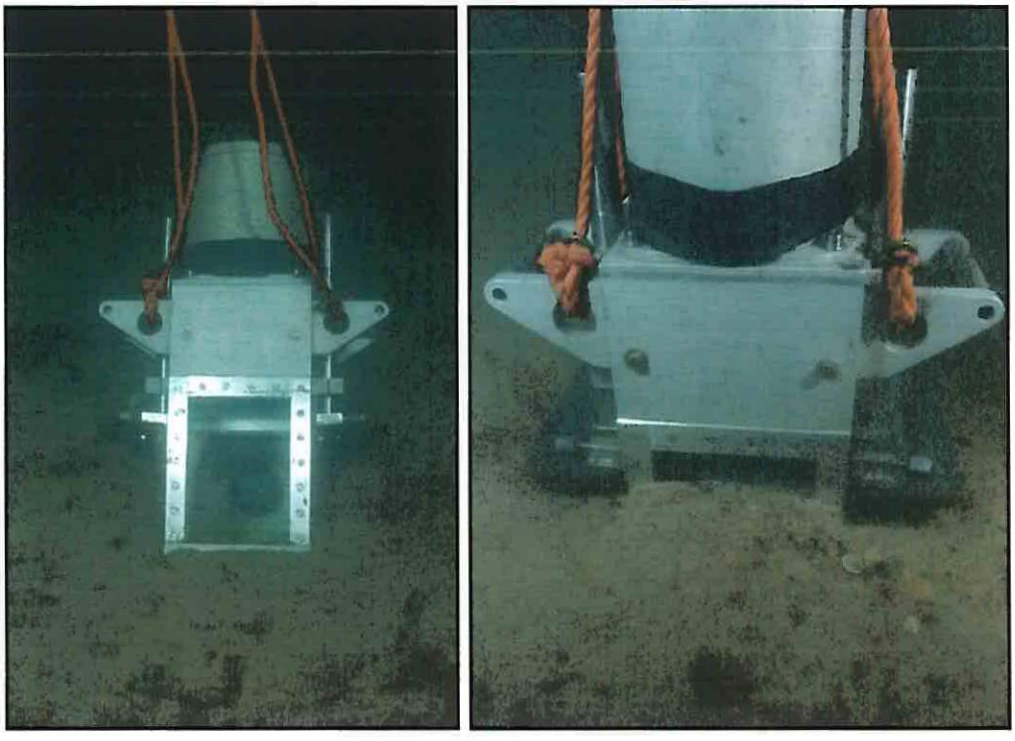

Figure 2.2: Diver operated Sediment Profile Imaging camera. The left-hand image gives a view of the camera at the sediment surface. The right-and image shows the SPI camera when inserted into the sediment

A great deal of information about benthic processes is available from sediment profile images. Measurable parameters, many of which are calculated directly by image analysis, include physical/chemical parameters (i.e. sediment type measured as grain size major mode, prism penetration

depth providing a relative indication of sediment shear strength, sediment surface relief, condition of mud clasts, redox potential discontinuity depth and degree of contrast, sediment gas voids) and biological parameters (i.e. infaunal successional stage of a well documented successional paradigm for soft marine sediments (see Pearson and Rosenberg, 1978), degree of sediment reworking, dominant faunal type, epifauna and infauna, depth of faunal activity, presence of microbial aggregations).

For the purposes of the current survey, the primary feature of interest is the depth of oxygen penetration into the sediments in the vicinity of the finfish pens (this information is required to satisfy the requirements of the Benthic Monitoring Protocol (DAFF, 2008). In this case, the apparent redox potential discontinuity or ARPD depth is measured. Features of particular interest that may be gleaned from SPI images taken in sediments in the vicinity of finfish pens include the presence of:

- uneaten feed pellets (and depth of this material, see Figure 2.3)
- faecal casts
- and depth of shell gravel deposits
- of gas voids in the sediment

Figure 2.3: Typical sediment profile images with examples of features relevant to aquaculture operations

2.3. Sampling for organic carbon analysis

Sediment samples for organic carbon analysis were collected at all stations. Samples were stored in pre-labelled plastic bags, kept in cold freezer boxes onboard the vessel and frozen at -20°C on return to the laboratory. Organic carbon analysis was carried out by ALS laboratories using the Loss on Ignition (LOI) technique. This method involves oven drying the sediment sample in a muffle furnace (450°C for a period of 6 hours) after which time the organic content of the sample is determined by expressing it as a percentage the weight of the sediment after ignition over the initial weight of the sediment.

3. Results

3.1. Recent Stocking History

At the time of the audit, 1,532.7 tonnes of fish were stocked on site having been input to the site (44.6 tonnes) in March 2017 following a 10 week week fallow period. This gave an onsite biomass production of approximately 1,488 tonnes prior to the survey.

Figure 3.1: View of pens at Deenish Island site

3.2. Seabed physical and biological characteristics

The seabed was mainly composed of fine sand under and immediate vicinity of the pen with coarse sand with a shell gravel constituent, the majority of which was composed of the shell of the edible mussel *Mytilus edulis* amongst other species, at the stations further along the transects.

3.2.1. Photographic record; Transect 1

This transect began beneath the northwestern most pen moored on site (see Figure 2.1) and ran for a distance of 100 m north. A total of six stations were investigated.

3.2.1.1. Under pen

The seafloor located directly under the pens was characterised by a medium to fine sand that had a bumpy/dotted appearance due to the presence of a dense polychaete community (*Capitella* spp. complex). Drift brown and red algae were common on the seafloor. The lugworm, *Arenicola marina*, was also present. There were some observations of uneaten feed pellets and waste faecal matter from the above aquaculture pens. No observations of bacterial mats or outgassing were observed.

Figure 3.2: T1 – Under pen station, Deenish Island site, 24th May 2018

3.2.1.2. Edge of pen

The seafloor at the edge station was characterised by soft medium grained sand. As with the under station the surface was dotted with the surface tubes of the opportunistic polychaete infaunal community with a number of *A. marina* casts also present. Drift brown and red algae were scattered over the surface with some uneaten food pellets (see Figure 3.3). No outgassing or bacterial mats were observed at the station.

Figure 3.3: T1 – Pen edge station, Deenish Island, 24th May 2018

3.2.1.3. 10 m from pen

The seafloor conditions observed 10 m along Transect 1 were very similar to those observed at the edge station of the same transect. The sediment was composed of a fine grained sand with a dotted appearance due to the infaunal community. Brown drift algae and phytodetrital debris were also present. In general the benthic environment appeared to be in good condition.

Figure 3.4: T1 – 10m, Deenish Island, 24th May 2018

3.2.1.4. 20 m from pen

The seafloor conditions at the 20 m station along Transect 1 were characterised by fine grained sand. Brown, red and green drift algae were recorded on the seafloor while *A. marina* casts were common. The burrowing anemone *Cerianthus lloydii* was observed with feeding tentacles extended. The presence of the opportunistic *Capitella* sp. complex community indicated the organic input from the aquaculture activity although the seafloor had a healthy oxygenated appearance.

Figure 3.5: T1 – 20 m station, Deenish Island, 24th May 2018

3.2.1.5. 50 m from pen

On moving approximately 50 m away from the pens the seafloor conditions changed considerably, the fine grained sand gave way to coarser more shell dominated sediment. Drift algae and phytodetrital material were present along with the burrowing anemone *C. lloydii*. In general the sediment appeared oxygenated with some darker areas were the ARPD was closer to the surface. There were no obvious signs of impact from the aquaculture activities.

Figure 3.6: T1 – 50 m station, Deenish Island, 24th May 2018

3.2.1.6. 100 m from Pen

The seafloor conditions observed at the 100m station were similar to those observed at the 50m station along Transect 1. There was a high percentage of shell gravel predominately from the mussel *M. edulis*, generally accumulated in troughs with finer medium sand forming peaks. The burrowing anemone *C. lloydii* was common as was the lugworm *A. marina*. In general, the seafloor had an oxygenated appearance and the benthic environment appeared to be in good health (Figure 3.7).

Figure 3.7: T1 – 100 m station, Deenish Island, 24th May 2018

3.2.2. Sediment Profile Imagery – Transect 1

Figure 3.8 presents sediment profile images taken at the six stations visited on Transect 1 of the Deenish site. The substrate of the site was composed of fine and medium grained sand with shell gravel at the under pen station which gradually gave way to a coarser shelly gravelly sand with intact shell at the outer end of the transect. The energy levels experienced by the seafloor in this area is more than likely quite high particularly during winter storms.

The images display a single image and the maximum and minimum apparent redox potential discontinuity (ARPD) depths measured at each station. Each image is 15.5cm × 25cm. ARPD depths ranged from a minimum of 0.1 cm (T1 20m) to a maximum of greater than 13.2 cm (T1 Under). The dense *Capitella* sp. complex community is clearly evident in the under, edge and to a lesser extent 10 m stations. These species increase the ARPD by their bioturbating activity that increases the oxygen content of the sediment.

Due to the relatively coarse nature of the seafloor, the SPI camera achieved relatively low penetrations.

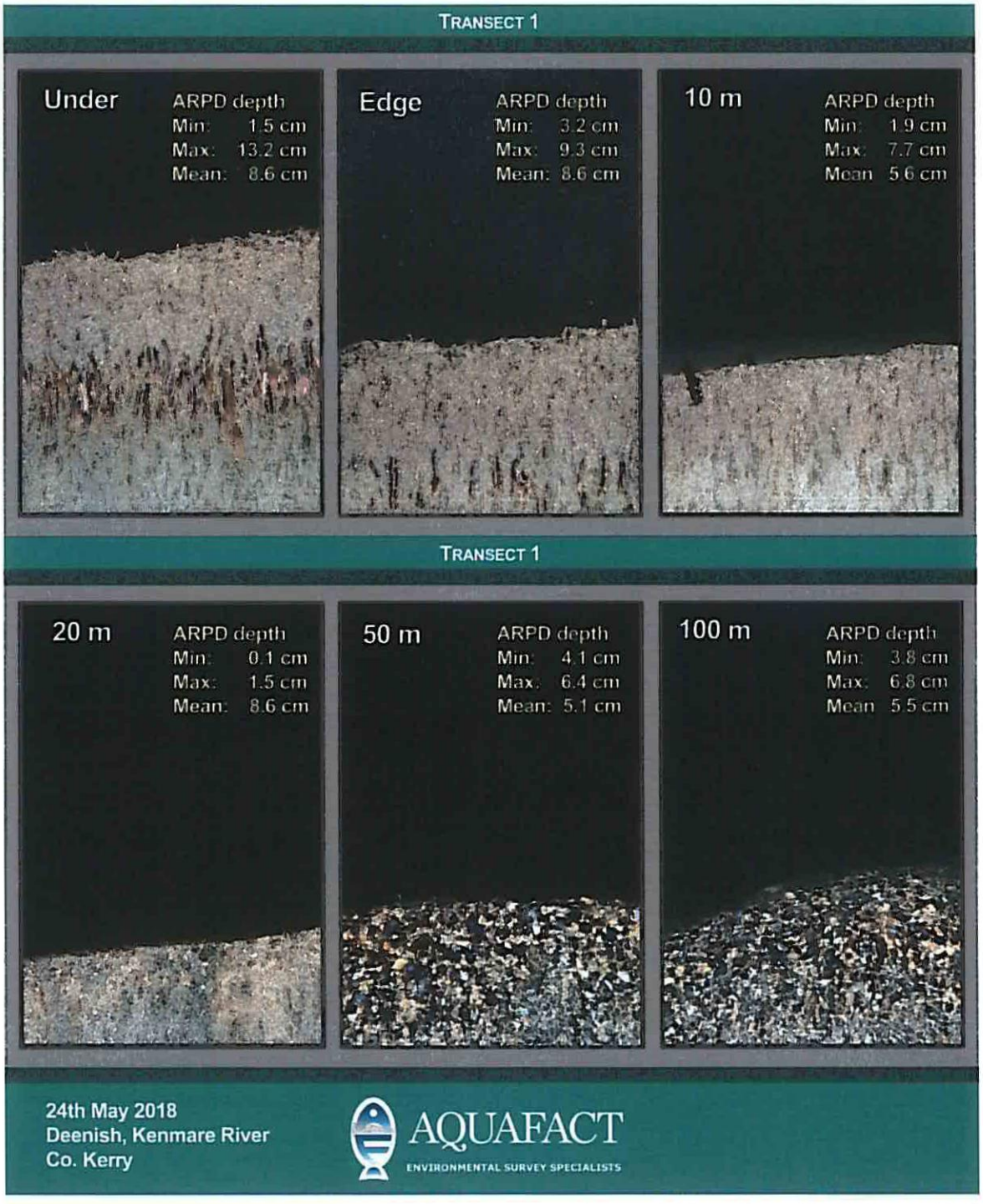

Figure 3.8: Representative photographs of the seafloor taken along Transect 1 by Sediment Profile Imagery (SPI) apparatus. Marine Harvest finfish aquaculture site, Deenish, Kenmare River, Co. Kerry, 24th May 2018.

3.2.3. Photographic Record; Transect 2

This transect began beneath the same pen as Transect 1 and ran for a distance of 50m west. A total of five stations were investigated on Transect 2 with an additional (Reference) station investigated just *c.* 150 m north of the pen edge (See Figure 2.1).

3.2.3.1. Under pen

The seafloor directly beneath the salmon pens on Transect 2 was very similar to the Under pen conditions observed on Transect 1. The sediment was made up of fine grained sand that had a dotted appearance due to the small tubes of the infaunal polychaetes protruding from the sediment surface. The red tentacles of these worms can be seen protruding from the tubes in places. *A. marina* casts were also observed on the sediment surface.

Figure 3.9: T2 – Under pen station, Deenish Island, 24th May 2018

3.2.3.2. Edge of pen

The Edge of pen station along Transect 2 was characterised by a fine grained sand. Drift algae and phytodetrital material were common along with *A. marina* casts resulting from the bioturbating activity in the sediment. Apart from some uneaten feed pellets scattered on the sea bed there were no obvious signs of impact from the overhead pens, and the benthic environment was in relatively good condition.

Figure 3.10: T2 – Pen edge station, Deenish Island, 24th May 2018

3.2.3.3. 10 m from pen

The seafloor conditions at the 10m station on Transect 2 were characterised by fine grained sand with a small amount of shell gravel mainly originating from the blue mussel *M. edulis*. Patches of darker sediment were observed where the deeper less oxygenated sediment had been bioturbated and brought to the surface by the worm *A. marina*. There were no observations of waste material from the adjacent aquaculture site visible on the seabed. In general, the benthic environment of the area seemed to be in good condition.

Figure 3.11: T2 – 10 m station, Deenish Island, 24th May 2018

3.2.3.4. 20 m from pen

Seafloor conditions at the 20m station on Transect 2 were characterised by fine grained sand with a light oxygenated appearance. However, there were some darker patches where the bioturbating activity of *A. marina* had brought less oxygenated sediment to the surface. The anemone *C. lloydii* was common buried in the sand. There were no obvious signs of impact from the above salmon farm activity, with no signs of waste faecal matter or uneaten feed pellets. In general the benthic environment appeared to be in good condition.

Figure 3.12: T2 – 20 m station, Deenish Island, 24th May 2018

3.2.3.5. 50 m from pen

The seafloor at the 50m station on Transect 2 was characterised by fine grained sand with a light oxygenated appearance. The arms of *Amphiura* sp. were observed suspended above the sediment surface feeding. The benthic environment appeared to be in good health.

Figure 3.13: T2 – 50 m station, Deenish Island, 24th May 2018

3.2.3.6. Reference station

A reference station was chosen to provide an example of the natural conditions that occur in the area with the absence of the aquaculture site. The sediment at this station was courser than at previous station, a considerable percentage of shell fraction was observed predominantly composed of *M. edulis*. Drift algae was scattered across the seafloor with the anemone *C. lloydii* and lugworm A. marina buried in the sediment.

Figure 3.14: Reference station, Deenish Island, 24th May 2018

3.2.4. Sediment Profile Imagery – Transect 2 & Reference

Figure 3.15 presents sediment profile images taken at the five stations visited on Transect 2 of the Deenish site and the reference station on 24th May 2018. The figure displays a single image and the maximum and minimum apparent redox potential discontinuity (ARPD) depths measured at each station. Each image is 15.5 cm × 25 cm.

Sediment type varied from medium sands under and close to the pen compared with higher proportions of gravel and shell with increasing distance from the pen. It was difficult to estimate ARPD depths from the station due to the nature of the substrate which didn't allow sufficient prism penetration of the SPI. Despite this, penetration was achieved on all stations and the oxidised sediment layer at the site was considered to be relatively deep, estimated to range from a minimum of 0.5 cm (T2 20m) to a maximum of 11.8 cm (T2 Under). ARPD depths at the Reference station ranged from 5.5 cm to 8.9 cm and a mean ARPD of 6.8 cm. The Capitella sp. complex community is evident at the under, edge and 10m stations while the arms of *Amphiura* sp. are noted protruding into the water column at both the 20m and 50m stations.

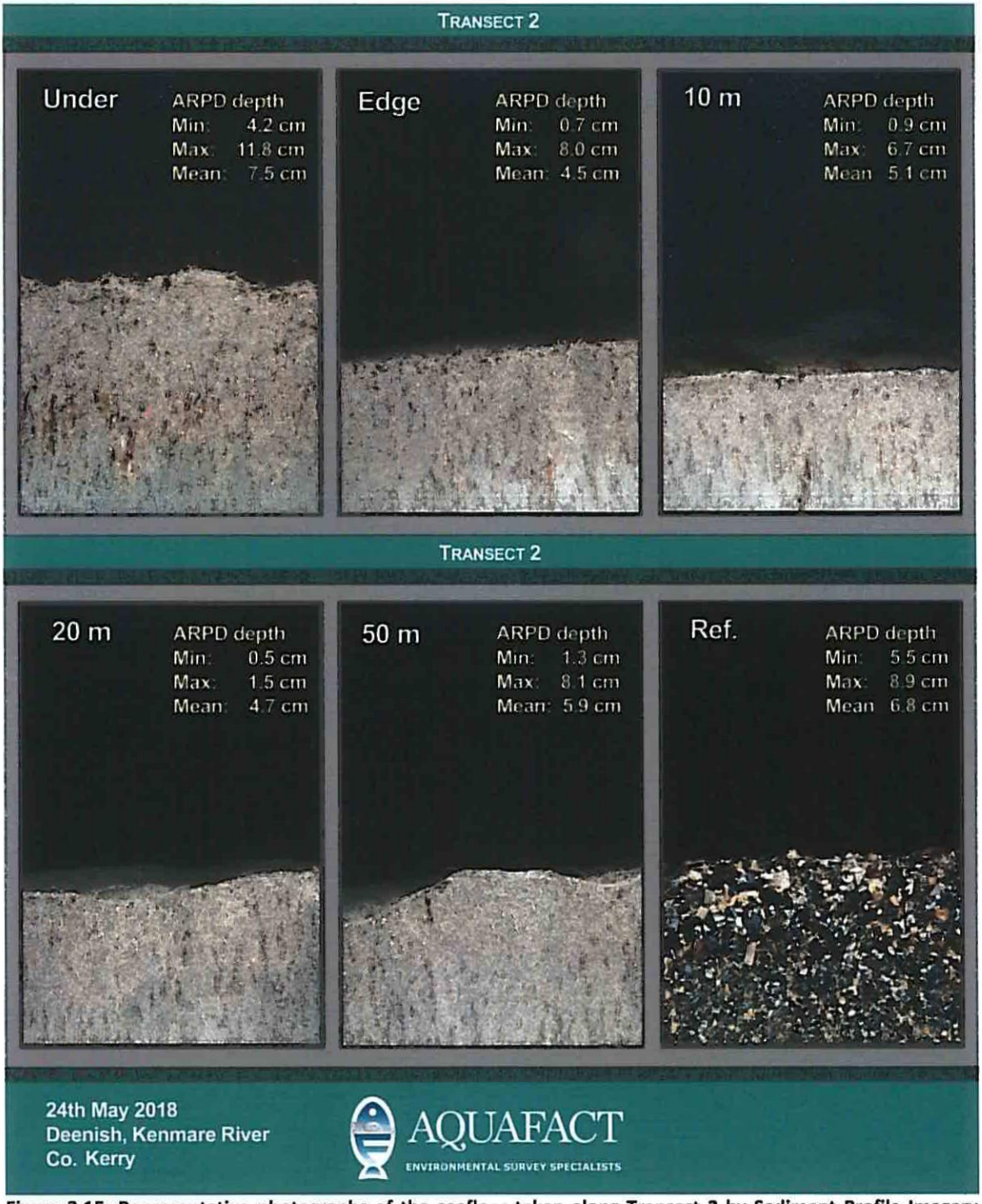

Figure 3.15: Representative photographs of the seafloor taken along Transect 2 by Sediment Profile Imagery (SPI) apparatus. Marine Harvest finfish aquaculture site, Deenish, Kenmare River, Co. Kerry, 24th May 2018.

3.2.5. Transect Species List

Table 3.1 shows a list of species observed during the dives at the Deenish fish farm site on this and previous occasions.

Table 3.1: Species noted during dives on the seabed beneath the Deenish pens

Group	Species	Common Name
(Cnidaria) Hexacorallia	*Cerianthus lloydii*	Tube anemone
(Annelida) Polychaeta	*Spirobranchus* sp.	Tube worm
	Lanice conchilega	The sand mason
	Chaetopterus variopedatus	Parchment tube worm
	Arenicola marina	Lugworm
(Mollusca) Bivalvia	*Pecten maximus*	King scallop
	Faceliniidae	Sea slugs
	Aeolidiida	Sea slugs
	Nudibranch	Sea slugs
(Arthropoda) Decapoda	Paguridae	Hermit crab
Echinodermata	*Luidia ciliaris*	Seven armed starfish
	Asterias rubens	Common starfish
	Marthasterias sp	Starfish
	Ophiura sp.	Brittlestar
	Amphiuridae sp.	Brittlestar
(Chordata) Osteiichthyes	*Pomatoschistus* sp.	Gobies
	Trisopterus minutus	Poor Cod
	Labrus bergylta	Ballan Wrasse
Rhodophyta	*Delesseria sanguinea*	Sea beech
	Phycodrys rubens	Sea oak
	Cryptopleura ramose	
	Calliblepharis ciliata	
	Lythophyllum sp.	
Ochrophyta	*Alaria esculenta*	Edible kelp

3.2.6. Organic Carbon Analysis & ARPD Depths

Table 3.2 shows the organic carbon results from the Deenish stations. Organic carbon levels ranged from 2.2% (T2 20m) to 5.91% (T1 Edge). Levels were higher beneath the cages when compared with the reference site (2.92%) and became lower the greater the distance from the aquaculture site.

Table 3.2: Organic carbon results for Deenish (% values, Loss on Ignition at 450°C).

T1	Under	Edge	10m	20m	50m	100m
LOI %	5.06	5.91	4.9	3.31	3.13	3.2
T2	Under	Edge	10m	20m	50m	REF
LOI %	-	4.42	3.18	2.2	2.3	2.92

Table 3.3 shows in tabular form the ARPD depths from the SPI images from Deenish (see Sections 3.2.2 and 3.2.4).

Table 3.3: ARPD Depths for Deenish, Kenmare Bay, 24th May 2018

Station		Transect 1	Transect 2
Under	Range (cm)	1.5-13.2	4.2-11.8
	Mean (cm)	8.6	7.5
Edge	Range (cm)	3.2-9.3	0.7-8.0
	Mean (cm)	8.6	4.5
10m	Range (cm)	1.9-7.7	0.9-6.7
	Mean (cm)	5.6	5.1
20m	Range (cm)	0.1-1.5	0.5-1.5
	Mean (cm)	8.6	4.7
50m	Range (cm)	4.1-6.4	1.3-8.1
	Mean (cm)	5.1	5.9
100m	Range (cm)	3.8-6.8	-
	Mean (cm)	5.5	-
Reference	Range (cm)	-	5.5-8.9
	Mean (cm)	-	6.8

4. Discussion

The extent to which an overlying fish farm impacts the seafloor is largely dependent on:

- the feeding regime at that farm, i.e. the amount of food that eventually ends up on the seafloor;
- the degree of current movement at the site in question; and
- the depth of water at that site.

These factors combine to form either erosional or depositional locations where organic material is either dispersed or it accumulates, and subsequently affects the receiving environment (*i.e.* the seafloor). The type of biotic community living at a particular site will also play a role in determining bottom conditions there. The influence of feeding activities of populations of starfish, polychaete worms, anemones, crabs and finfish at the Deenish site largely determine the level of impact of overlying farm operations on the benthos there.

Faunal feeding activity can remove large amounts of waste organic material from the seabed beneath a farm facility – with groups of mobile fauna capable of consuming large quantities of material. The fallowing schedule at a site also has a large bearing on benthic impact – most notably the length of time pens have been on site since the last fallow period. The presence of opportunistic deposit feeders such as *Capitella* sp., most notably at the under pen and pen edge stations will tend to help keep the benthic organics in a state of equilibrium at the fish farm sites. Sedimentary organic carbon levels in general are relatively higher at the under and edge of pen conditions at the Deenish site.

Mobile epibenthic scavengers such as starfish, fish and crabs also help in reducing the amount of waste material on the seafloor. This potential speed of the removal of waste was demonstrated in a previous study where photographic evidence was collected showing that epibenthic macrofauna were capable of removing, in less than 7 days, fish feed pellets spread at a density of 3.4 kg dry weight per m^2 on the sediment under a marine fish farm (Smith *et al.*, 1997).

In light of the observations obtained during the current survey, it appears that very little if any habitat

degradation has occurred at the Deenish Island site. Results obtained from both previous studies in 2016 and 2017 yielded similar results and it is proposed that the influence of salmon aquaculture has had a minimal effect on the surrounding benthic environment.

5. Conclusion

On the 24th of May 2018, a benthic audit survey was carried out on the Deenish fish farm site operated by Marine Harvest Ireland. The Deenish survey followed the DCMNR Level I monitoring protocols. The results from the current survey conclude that the overlying aquaculture had little or no effect on the seabed. Stations examined along each of the transects had ARPD depths that were very similar to those recorded at the reference and the site can be considered of good environmental status.

6. References

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Inspection of two Marine Harvest sites in Kenmare Bay for the Department of Agriculture, Food and the Marine, Tralee

1st of December 2016 Underwater Inspection Report

MARINE SPECIALISTS
COMMERCIAL DIVING & MARINE CONTRACTORS
Loughnageer, Foulksmills,
Co. Wexford, Ireland
Tel: 00 353 (0)51 56 2061
Fax: 00 353 (0)51 564 986

Submitted: 23rd February 2017

TABLE OF CONTENTS

CLIENT –

Noel Dillion
Marine Engineering Division
Department of Agriculture, Food and the Marine
Reen Point
Blennerville
Tralee, Co Kerry

APPROVED BY:

DIARMUID ODONOVAN

CONSULTANT –
Marine Specialists Ltd.
Loughnageer,
Foulksmills,
Co. Wexford

EXECUTIVE SUMMARY

The commercial dive team of Marine Specialist Ltd. was asked to carry out a visual survey of two fish farm sites in Kenmare Bay to assess the condition of the netting and to report the deepest point in the fish cages.

The dive survey was carried out on 1st December 2016.

The two fish farm sites appear to be in good order. There was no debris or rubbish in the direct vicinity of the two sites. All the fish pins that were dived on showed no visual signs of defects and the netting appeared to be in good order. The general layout of the two sites appeared to be clean and well maintained.

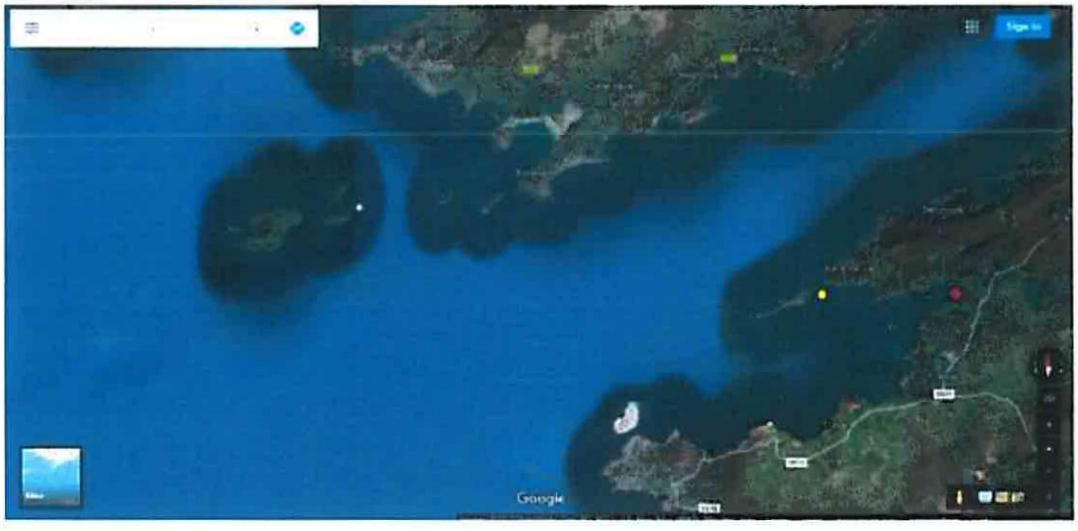


Figure 1: A map of the area and location of the fish farms

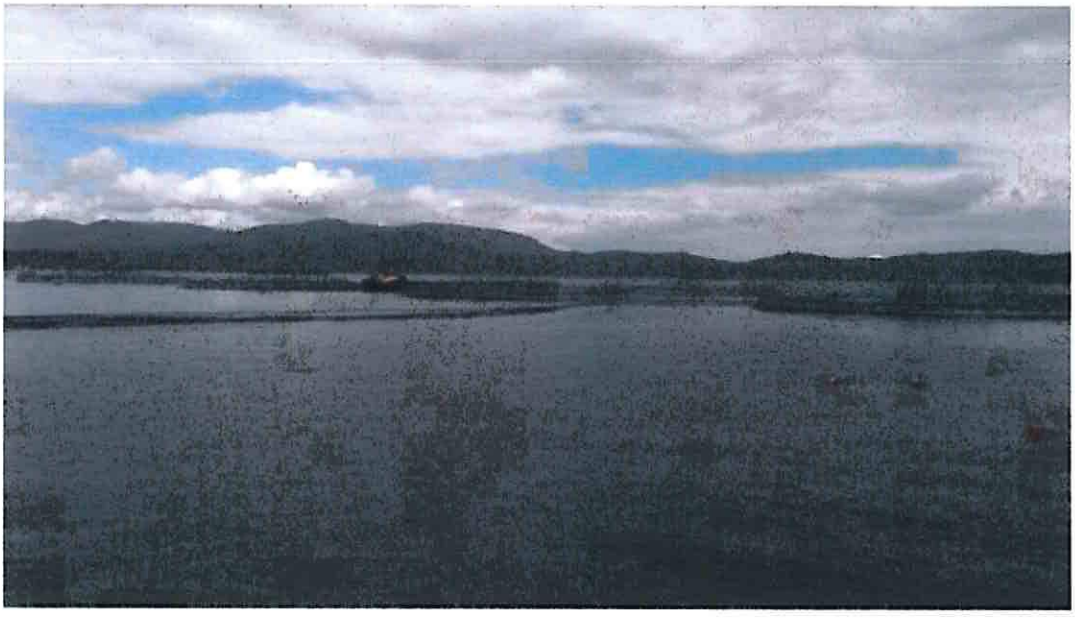
Red point – departure point

Yellow point – Inishfarnard site

Pink point – Deenish site

1.0 INTRODUCTION

This report contains the findings of an inspection of two fish farm sites in Kenmare Bay conducted on 1st of December 2016. One is located near Inishfarnarad island. The other is located east of Deenish island on the Kerry side of the bay. The dive team was mobilized from Ballycrovane pier near Eyeries and was transported to and from the site by our own passenger vessel. The weather conditions on the day of the survey were good and the visibility in the water was very good 10 meters plus.
After the completion of the dive survey the dive team demobilized again back to Ballycrovane pier.



2.0 METHODOLOGY

A four person dive team conducted the underwater inspection. Our own rib was used as a dive platform and rescue boat. The diver carried out a visual inspection of the cage and was to find the deepest point of the netting and record a depth on his dive computer. The diver was also to scan the netting to assess for damage and the general condition of the netting. This was only a visual survey and no video was recorded during the survey. The survey was witnessed by Noel O'Murchu from the Department of Agriculture, Food and the Marine.

3.0. SUMMARY OF INSPECTION FINDINGS

3.1. Inishfarnard site:

10 fish cages in total, each cage circumference = 126m

8 cages with fish, 2 cages empty

4 random cages were chosen and were surveyed

Cage 1: depth at the deepest point in the cage: 20.2m. No visual signs of defects and the netting appeared to be in good condition.

Cage 2: Depth in the deepest point in the cage: 19.0m. No visual signs of defects and the netting appeared to be in good condition.

Cage 3: Depth in the deepest point in the cage: 19.9m. No visual signs of defects and the netting appeared to be in good condition.

Cage 4: Depth in the deepest point in the cage: 21.0m. No visual signs of defects and the netting appeared to be in good condition.

3.2. Deenish site

10 fish cages in total, each cage circumference = 126m

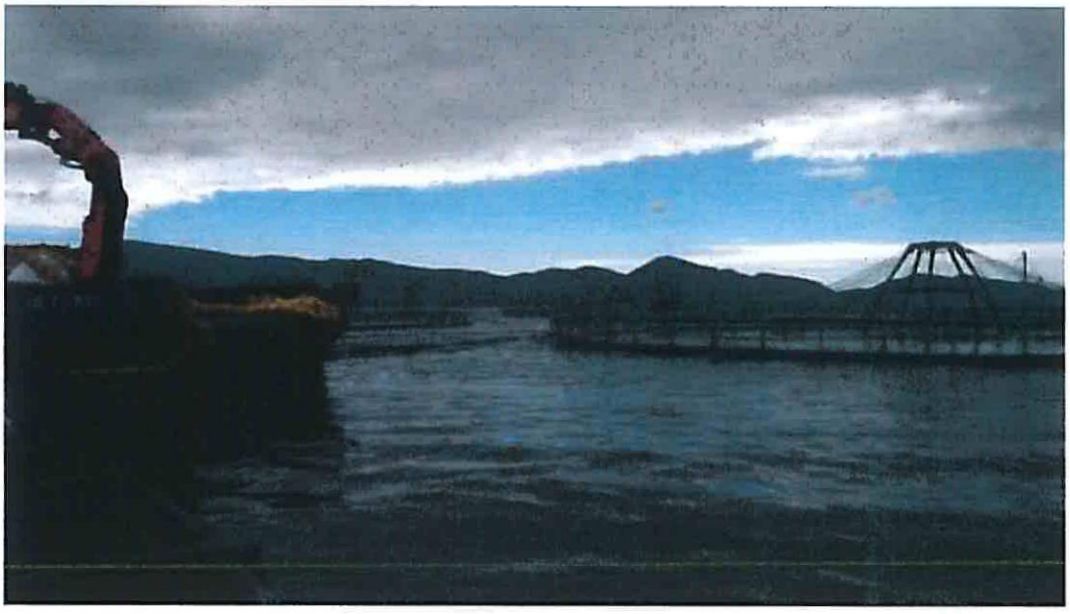
2 cages with fish, 8 cages empty

2 random cages were chosen and were surveyed

Cage 1: depth at the deepest point in the cage: 19.5m. No visual signs of defects and the netting appeared to be in good condition.

Cage 2: Depth in the deepest point in the cage: 19.5m. No visual signs of defects and the netting appeared to be in good condition.

The two fish farm sites appear to be in good order. There was no debris or rubbish in the direct vicinity of the two sites. All the fish pins that were dived on showed no visual signs of defects and the netting appeared to be in good order. The general layout of the two sites appeared to be clean and well maintained.



CERTIFICATE OF CONFORMITY

This is to certify that the aquaculture operation of:

Marine Harvest Ireland

Site: Deenish Farm Site
Head Office: Rinmore, Ballylar, Letterkenny, Co. Donegal

Has been evaluated by SAI GLOBAL Assurance, ASI Accreditation Code ASC-ACC-006, and found to comply with the requirements of the Aquaculture Stewardship Council (ASC):

ASC Salmon Standard Version 1.0 June 2012

For the following Scope:

Production of Atlantic Salmon

Point at which certified products may enter a Chain of Custody:

Where salmon is entering harvest and processing line directly.

For the full list of product groups covered please refer to: ***http://www.asc-aqua.org/finalfarmauditreports***

Certificate No: ASC-SAI-005 (Issue 0.0)

Certificate Issue Date: 10th March 2015

Certificate Expiry Date: 9th March 2018

Aquaculture Stewardship Council

Signed on behalf of SAI Global Assurance:

Mr Bill Paterson, General Manager

The validity of this certificate shall be verified on http://www.asc-aqua.org/finalfarmauditreports

This certificate itself does not constitute evidence that a particular product supplied by the certificate holder is ASC-certified. Products offered, shipped or sold by the certificate holder can only be considered covered by the scope of this certificate when the required ASC claim is clearly stated on invoices and shipping documents. The certificate shall remain the property of SAI Global, and the certificate and all copies or reproductions of the certificate shall be returned or destroyed if requested by SAI Global.

SAI GLOBAL

CERTIFICATE OF CONFORMITY

This is to certify that the aquaculture operation of:

Marine Harvest Ireland

Site: Deenish Farm Site
Head Office: Rinmore, Ballylar, Letterkenny, Co. Donegal

Has been evaluated by SAI GLOBAL Assurance, ASI Accreditation Code ASC-ACC-006, and found to comply with the requirements of the Aquaculture Stewardship Council (ASC):

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SAI GLOBAL

Certificate

Marine Harvest Ireland

Rinmore, Ballylar PO, Leterkenny, Co.
F92 T677 Donegal
Ireland

Operation: Deenish Farm

ASC Registration number:
ASC-SGS-F-004

This is to certify that the ASC processes of the above mentioned organisation have been verified to comply with the requirements of the:

ASC Salmon Standard

v1.1 - April 2017

Scope of certification: Atlantic Salmon (Salmo salar)

Point at which certified products may enter the Chain of Custody:
Marine Harvest Ireland's processing facility in Rinmore Co. Donegal (ASC-C-00661)

The validity and most up to date status of the scope of this certificate is displayed at http://asc.force.com/Certificates/

This certificate is valid from 02 November 2018 until 01 November 2021
Certified with SGS since 02 November 2018

ASI-ACC-009

Authorized by
J. van Looij-van der Lelij
Certification Manager

SGS Nederland B.V.
Product & Process Certification
P.O. Box 200
3200 AE Spijkenisse, The Netherlands
t +31(0)88-2143285 f +31(0)88-2143572 www.sgs.com

THE HIGH COURT

[2013 No. 40 J.R.]

BETWEEN

WATERVILLE FISHERIES DEVELOPMENT LIMITED

APPLICANT

AND

AQUACULTURE LICENSES APPEALS BOARD AND THE MINISTER FOR AGRICULTURE, FOOD AND THE MARINE (No.2)

RESPONDENTS

AND

(BY ORDER) SILVER KING SEA FOODS LIMITED T/A MARINE HARVEST IRELAND

NOTICE PARTY

JUDGMENT of Mr. Justice Gerard Hogan delivered on 25th July, 2014

1. This is an application for leave to apply for judicial review in respect of a decision of the Acquacultural Licenses Appeals Board ("the Board") dated 31st October, 2012. By that decision the Board confirmed an earlier decision of the Minister for Agriculture, Fisheries and Food on 22nd March, 2011, to grant a temporary licence for the amendment of operating procedures to the notice party, Silver King Seafoods Ltd. ("Silver King") in respect of the latter's salmon farming site at Deenish Island, Ballinskelligs Bay, Co. Kerry.

2. This is now the second judgment on this application for leave. In the first judgment delivered on 8th April, 2014 ([2014] IEHC 248) I held that the applicant had the requisite *locus standi* to pursue this application for judicial review. I also ruled that the proceedings were not in themselves irregularly constituted and were valid. It had been agreed that those issues should be finally determined by me on a preliminary basis (subject, of course, to the question of any appeal).

3. It is further agreed that I should now determine the remaining issues in a slightly different way, so that I would adjudicate on the question of whether the applicant could demonstrate the existence of substantial grounds within the meaning of the statutory test contained in s. 73(2)(b) of the Fisheries (Amendment) Act 1997 ("the 1997 Act") for contending that "the decision or determination is invalid or ought to be quashed" in respect of the substantive grounds on which it seeks this relief. This application has been heard on notice to both the Board and Silver King.

4. That salmon farm itself first become operational in 1989. Silver King acquired the farm in 2005 and operated the farm pursuant to a Licence No. T 6/202 AQ 199. In January, 2010 the Waterville Fisheries Development Group ("the Group") complained to the Minister contending that this licence should be revoked. Following the making of submissions by the relevant parties, the Minister made a decision on 9th April, 2010, not to revoke the licence. On the 28th April, 2010, the Minister informed the parties that the licence was not to be revoked.

5. In February, 2011 Silver King applied to the Minister for permission to amend the licence to permit new stocking arrangements at the farm. Silver King maintained that this new stocking arrangements would allow for what is termed an "all out, all in" arrangement which would permit the stocking of 800,000 smolt every two years rather than the existing arrangement of 400,000 smolt per year. While Silver King contend

that this would lead to an amelioration of the environmental impact of the farm and that this would be in line with best international practice, this is hotly disputed by the applicant and others.

6. As it happens, the Minister granted the licence amendment on 22nd March, 2011, but this was appealed by a number of objectors (including the Group) to the Board. In a letter dated 9th May, 2011, the Group sought an oral hearing and paid the requisite fee.

7. So far as the remaining issues are concerned, the principal objection relates to the manner in which the Group's application for an oral hearing was rejected by the Board and the failure to give reasons for this refusal. The applicant expressly abandoned any suggestion of bias on the part of the Board.

8. Section 49(1) of the 1997 Act provides in relevant part that the Board:

> "... of its own motion or at the request of a party, shall have an absolute discretion to hold an oral hearing of an appeal under this Chapter."

9. Section 49(5) further provides that:

> "Where the Board is requested to hold an oral hearing of an appeal and decides to determine the appeal without an oral hearing, it shall serve notice of its decision on the person who requested the hearing, on each other party to the appeal and on each person who, in accordance with section 45, made submissions or observations to the Board in relation to the appeal."

10. At the hearing, counsel for the applicants, Mr. Mulloy S.C. made three separate points regarding the question of an oral hearing. First, he submitted that the Board had not been made properly aware of the fact that the applicants had made a

request for an oral hearing. Second, he submitted that the Board had not given reasons for the failure to hold an oral hearing. Third, he submitted that the Board had not complied with the requirements of s. 49(5) of the 1997 Act in that the applicants were informed of the refusal to hold an oral hearing only after receiving notification that their objection to the grant of the temporary licence had been rejected by the Board. For their part, counsel for the Board, Mr. Galligan S.C., and counsel for the notice party, Mr. Mulcahy, stressed the wide amplitude of the discretionary powers vested in the Board by s. 49(1). Against that background, it seems appropriate first to consider the nature of the discretion conferred on the Board by s. 49(1).

The nature of the discretion conferred on the Board by s. 49(1)

11. In their submissions concerning the nature of the discretionary power contained in s. 49(1) of the 1997 Act, Mr. Galligan S.C, and Mr. Mulcahy not unnaturally emphasised the fact that the Board's discretion regarding the holding of an oral hearing is described as "absolute". Yet s. 49(1) cannot be literally read in this fashion. As Article 5 of the Constitution makes clear, the State is a democracy. A central element of this guarantee of democratic government is that the State is governed by the rule of law. It has been in any event axiomatic since the Supreme Court's decision in *East Donegal Co-Operative Ltd. v. Attorney General* [1970] I.R. 317 that the Constitution requires all discretionary powers must be exercised fairly, reasonably and in accordance with their statutory purposes. The whole scheme of the Constitution pre-supposes that citizens can have recourse to the judicial branch to ensure that these statutory powers are exercised in this manner.

12. If, accordingly, the Oireachtas purported to vest the Board with an essentially arbitrary or even autocratic power, this would amount in itself to a violation of the

guarantee of democratic government in Article 5. On this basis, therefore, if s. 49(1) was to be read entirely literally, it would be unconstitutional insofar as purported to give the Board an absolute power which, on this definition, could be exercised in a fashion which did not require objective justification by reference to principles of *vires*, reasonableness and fair procedures. The Board would be thereby effectively rendered immune from judicial scrutiny and oversight in the manner in which it exercised this power and it would freed, for example, from the constitutional obligation to abide by the principles of fair procedures.

13. Section 49(1) must, of course, be given a constitutional interpretation where it is reasonably possible to do so without doing actual violence to the statutory language. Applying, therefore, the double construction test (*McDonald v. Bord na gCon* [1965] I.R. 217), s. 49(1) must accordingly be read as if it merely vested the Board with a wide and flexible power to decide whether to hold an oral hearing. It cannot be read as granting the Board any wider power, nor can the Board be dispensed from the obligation to give reasons for its decision not to hold an oral hearing.

14. These principles were, in any event, confirmed by the Supreme Court in its seminal decision in *Mallak v. Minister for Justice and Equality* [2012] IESC 59. In that case the Minister for Justice contended that the absolute discretion vested in the Minister by s. 15 of the Irish Nationality and Citizenship Act 1956 meant that he was not required to give reasons for his decisions as to whether to grant citizenship to an application seeking naturalisation in this fashion. Fennelly J. rejected the argument the "absolute" nature of the discretion enabled the Minister to dispense with the obligations to give reasons:

"It cannot be correct to say that the "absolute discretion" conferred on the Minister necessarily implies or implies at all that he is not obliged to have a reason. That would be the very definition of an arbitrary power. Leaving aside entirely the question of the disclosure of reasons to an affected person, it seems to me axiomatic that the rule of law requires all decision-makers to act fairly and rationally, meaning that they must not make decisions without reasons. As Henchy J. put it, in a celebrated passage in his judgment in *The State (Keegan) v Stardust Victims' Compensation Tribunal* [1986] I.R. 642, 658, "the necessarily implied constitutional limitation of jurisdiction in all decision-making which affects rights or duties requires, inter alia, that the decision-maker must not flagrantly reject or disregard fundamental reason or common sense in reaching his decision."

In similar vein but with slightly different emphasis, Walsh J., in his judgment in *East Donegal Co-Operative Marts Ltd. v Attorney General* [1970] I.R. 317, 343-4 said of the powers conferred on a Minister, under consideration in that case, which were exercisable "at his discretion" or "as he shall think proper" or "if he so thinks fit" are powers which may be exercised only within the boundaries of the stated objects of the Act; they are powers which cast upon the Minister the duty of acting fairly and judicially in accordance with the principles of constitutional justice, and they do not give him an absolute or an unqualified or an arbitrary power to grant or refuse at his will."

The fact that a power is to be exercised in the "absolute discretion" of the decision-maker may well be relevant to the extent of the power of the court to review it. In that sense, it would appear potentially relevant principally to

questions of the reasonableness of decisions. It could scarcely ever justify a decision-maker in exceeding the limits of his powers under the legislation, in particular, by taking account of a legally irrelevant consideration. It does not follow from the fact that a decision is made at the absolute discretion of the decision-maker, here the Minister, that he has no reason for making it, since that would be to permit him to exercise it arbitrarily or capriciously. Once it is accepted that there must be a reason for a decision, the characterisation of the Minister's discretion as absolute provides no justification for the suggestion that he is dispensed from observance of such requirements of the rules of natural and constitutional justice as would otherwise apply. In this connection I agree with the following remarks of Hogan J., regarding the provision under consideration in this case, in his judgment in *Hussain v. Minister for Justice* [2011] IEHC 171:

"This description nevertheless cannot mean, for example, that the Minister is freed from the obligations of adherence to the rule of law, which is the very "cornerstone of the Irish legal system": *Maguire v. Ardagh* [2002] 1 I.R. 385 at 567, per Hardiman J. Nor can these words mean that the Minister is free to act in an autocratic and arbitrary fashion, since this would not only be inconsistent with the rule of law, but it would be at odds with the guarantee of democratic government contained in Article 5 of the Constitution."

15. A similar approach is to be found in *Murphy v. Ireland* [2014] IESC 19, [2014] 1 I.L.R.M. 457. In that case the Supreme Court held, following the analysis of Fennelly J. in *Mallak*, that Director of Public Prosecutions must, in principle, at least, give reasons for her decision to transfer an accused person for trial from the ordinary

courts to the Special Criminal Court. As O'Donnell J. explained ([2014] 1 I.L.R.M. 457, 486):

> "Nevertheless, trial by jury is a constitutional requirement in those cases to which it applies. A decision which has the effect of removing a case which would otherwise be tried by a jury to be tried by a judge or judges alone is a decision which must comply with the dictates of the Constitution. Accordingly, the Court considers that it is necessary in such a case that the Director of Public Prosecutions, if requested, should either give such reason, or, as contemplated in *Mallak*, justify a refusal to do so."

16. Applying these principles to the present case, it is plain that the Board is required to give reasons for its decision not to hold an oral hearing or, at the very least, be prepared to justify its failure to give such reasons. These reasons need not be elaborate, but it is clear from *Mallak* that they must nonetheless either be given or the failure to do so must be objectively justified. In that respect, therefore, the applicant can demonstrate that the Board erred in law in failing to give such reasons or otherwise justify its failure to give such reasons in respect of the decision not to have an oral hearing.

Other aspects of the decision not to hold an oral hearing

17. I cannot accept Mr. Mulloy S.C.'s submission that the Board were actually unaware that an oral hearing had been requested. It is true that section 3 of the Technical Advisers Report (which, as the name implies, was a specialist group whose report was designed to give the Board specialist and technical advice) stated:

> "At this time an oral hearing has not been called for nor requested by any appellant or the applicant. As this licence application constitutes a change in operation only, it is unlikely that an oral hearing would be required."

18. The Board nonetheless determined that an oral hearing would not be required and said so in its letter of 31st October 2012 rejecting the applicant's objections. In my view, this was sufficient compliance with the requirements of s. 49(5).

Does the failure to give reasons in respect of the decision not to hold an oral hearing give rise to substantial grounds for contending that the decision is invalid or ought to be quashed for the purposes of s. 73 of the 1997 Act?

19. While I have found that in the wake of the Supreme Court's decision in *Mallak* that the Board was obliged to give reasons for its failure to grant an oral hearing and that it did not do so, this does not necessarily mean that the applicant has established the existence of substantial grounds for contending that the licensing decision is invalid or ought to be quashed. The failure to give reasons for the decision not to hold an oral hearing is, of course, one stage removed from the actual decision itself. If, of course, the Board had wrongly declined to grant an oral hearing in respect of the licensing application when it should have done so, then that would be another matter entirely.

20. Can it be said, however, that the Board improperly declined to hold an oral hearing when it ought to have done so?

21. In this context it must be recalled that what was at issue here was an operational change to an existing licence. The application required the Board to survey the likely impact of the grant of the licence, while weighing a range of environmental, economic and other pertinent considerations. This may be contrasted with many of the cases dealing with the right to an oral hearing where the administrator in question was effectively called upon to adjudicate on the legal rights of parties - sometimes in circumstances not very different from that which might obtained in a court of law – where crucial facts were in dispute.

22. It is in the latter type of case that the necessity for some form of oral hearing is perhaps more obvious, for the simple reason that the administrator cannot fairly resolve those disputed facts without the assistance of an oral hearing. This is clear from a series of decisions to this effect involving the Financial Services Ombudsman where on the facts an oral hearing has been held to be necessary: see, e.g., *Hyde v. Financial Services Ombudsman* [2011] IEHC 422, *Lyons v. Financial Services Ombudsman* [2011] IEHC 454, *Smith v. Financial Services Ombudsman* [2014] IEHC 40 and *O'Neill v. Financial Services Ombudsman* [2014] IEHC 454.

23. In all of those cases there was a stark conflict of facts, the fair resolution of which was essential to the outcome. In *Lyons*, the appellants complained that they had been given certain oral assurances by a financial institution regarding interest only loans. The financial institution in question had emphatically denied that any such assurances had been given. The FSO concluded that there was no reason to doubt the assurances given by the bank and concluded that no oral hearing was necessary in the circumstances. I found that, viewed objectively, this amounted to a breach of the appellant's constitutional right to fair procedures:

> "It must, after all, be recalled that the existence of an oral agreement or understanding regarding a supposed entitlement on the part of the appellants to an interest-only loan deal for a ten year period was of the essence of the appellants' complaint....in the present case..... the appellants could not realistically hope to establish the underlying merits of their case without an oral hearing."

24. A similar approach had been previously taken by Cross J. in *Hyde.* In that case the appellant contended in her complaint to the Ombudsman that the credit institution in question had agreed to advance the sum of €965,000 for a property transaction.

Some €715,000 was required for the actual purchase of the property and it was envisaged - or so the appellant maintained - that the balance would be paid for renovations. She further contended that the bank had represented orally that the balance of €250,000 would be paid down subsequently, but that it had resiled from this commitment when difficulties or disagreements arose in relation to the servicing of the €715,000 mortgage. Cross J. held that "without an oral hearing, I do not see this how the appellant's complaint....could be fairly or properly determined".

25. The decision of Barrett J. in *Smith* is also in similar terms. Here a couple in their late 50s contended that they had been advised by a financial institution to invest in what they contended was a highly unsuitable (and high risk) investment vehicle known as Jubilee Consortium, the precise terms of which investment they had not been properly advised. Just as in *Lyons*, the financial institution had denied the assertions made by the complainants. The FSO rejected the complaints without an oral hearing.

26. Barrett J. set aside this decision, saying:

> "There are assertions and counter-assertions by Mr. and Mrs. Smith and Ulster Bank and by declining to hold an oral hearing the Financial Services Ombudsman in effect denied Mr. and Mrs. Smith the opportunity to test by way of cross-examination various factual issues arising between the parties, the determination of which was necessary to enable the Smiths to establish the merits of their case. Such issues include but are not limited to: whether Mr. and Mrs. Smith or either of them had any meaningful contact with Mr. Goodman before they invested in the Jubilee Consortium; what advice, if any, Mr. McHugh gave Mr. and Mrs. Smith before they invested in the Jubilee Consortium; whether Mr. and Mrs. Smith acted on the advice of Mr. McHugh

when they invested in the Jubilee Consortium; whether Mr and Mrs Smith received an information memorandum in advance of their investment in the Jubilee Consortium; and whether Mr. and Mrs. Smith were apprised of the high risk nature of the Jubilee Consortium investment before they participated in same. The failure by the Financial Services Ombudsman to allow these issues to be tested at an oral hearing denied Mr. and Mrs. Smith the opportunity to establish the merits of such case as they sought to make and thus is an error of such significance as to vitiate the finding. As the question of whether there should be an oral hearing is a matter that is not within the specialised area of knowledge of the Financial Services Ombudsman, the issue of the deference to be accorded to that expertise does not arise."

27. The decision in *O'Neill* was also along the same lines, given that the conflict of fact arose from a stark disagreement between vehicle assessors as to whether the engine of the claimant insured's motor vehicle had in fact been damaged by flood waters.

28. The present case is totally different, as no conflict of fact which is central to the outcome of the licensing process has been identified. In these circumstances, the Board was entitled to conclude that no oral hearing was necessary.

29. Against that background, therefore, it cannot be said that – at least so far as the present case is concerned - the failure to give reasons in respect of the decision not to hold an oral hearing is likely to render the substantive decision invalid or liable to be quashed in circumstances where there was no underlying obligation to hold such a hearing. The Board certainly erred in law in failing to provide such reasons (or, alternatively, not providing objective justification for the failure to do so). Yet there is no nexus between this procedural failure - important and significant as it admittedly is

– and the ultimate decision regarding the grant of the temporary licence. This is especially so given that there was no obligation to hold an oral hearing in the circumstances of this case.

Other grounds relied upon by the applicant

30. The other grounds pleaded by the applicant are effectively generic pleas pleaded at a high level of generality. The applicant contended that the "environmental perils posed by acquaculture are such that the precautionary principle of EU law and the provisions of the Habitats Directive requires maximum prudence and caution." This ground was not, however, advanced with any vigour at the hearing. As matters stand, this pleading is, in any event, simply too vague for the purposes of judicial review proceedings and it could not realistically ground the grant of leave for this purpose: *cf.* by analogy the comments of Murray C.J. and Denham J. for the Supreme Court in *AP v. Director of Public Prosecutions* [2011] IESC 2, [2011] 1 I.R. 729.

31. The applicant further pleaded that the Board's decision was flawed by manifest error. Here again, having regard to the comments in *AP*, the pleading is simply too vague and generic to admit of a ground on which leave to apply for judicial review could properly be granted.

Conclusions

32. For all the reasons stated, therefore, I am not satisfied that the applicant can meet the substantial grounds threshold contained in s. 73 of the 1997 Act in respect of the grounds in respect of which it seeks leave. I would accordingly refuse to grant the applicant the leave which it seeks.

Approved

Gerard Hogan

29th July 2014

marineharvest

Deenish 13S1 Stock Report

LICENCE REF. T6/202; AP1/2011
20.01.2015

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Introduction

On October 31st 2012, Marine Harvest Ireland was granted a 2 year amendment to Aquaculture licence No. AQ199 which was assigned to Silverking Seafoods Ltd., permitting the cultivation of salmon at Deenish Island, Ballinskelligs Bay, co. Kerry, subject to the enforcement of special conditions.

Under the terms of this amended licence a crop of Fanad/Mowi strain of salmon smolts was moved from Altan Smolt Unit, Co. Donegal to Deenish in April 2013 and moved from the Deenish site for harvest by November 30th 2014.

This report summarises the Key performance indicators of this crop in addition to the assessed impact on the local marine benthos.

Site Natural Features:

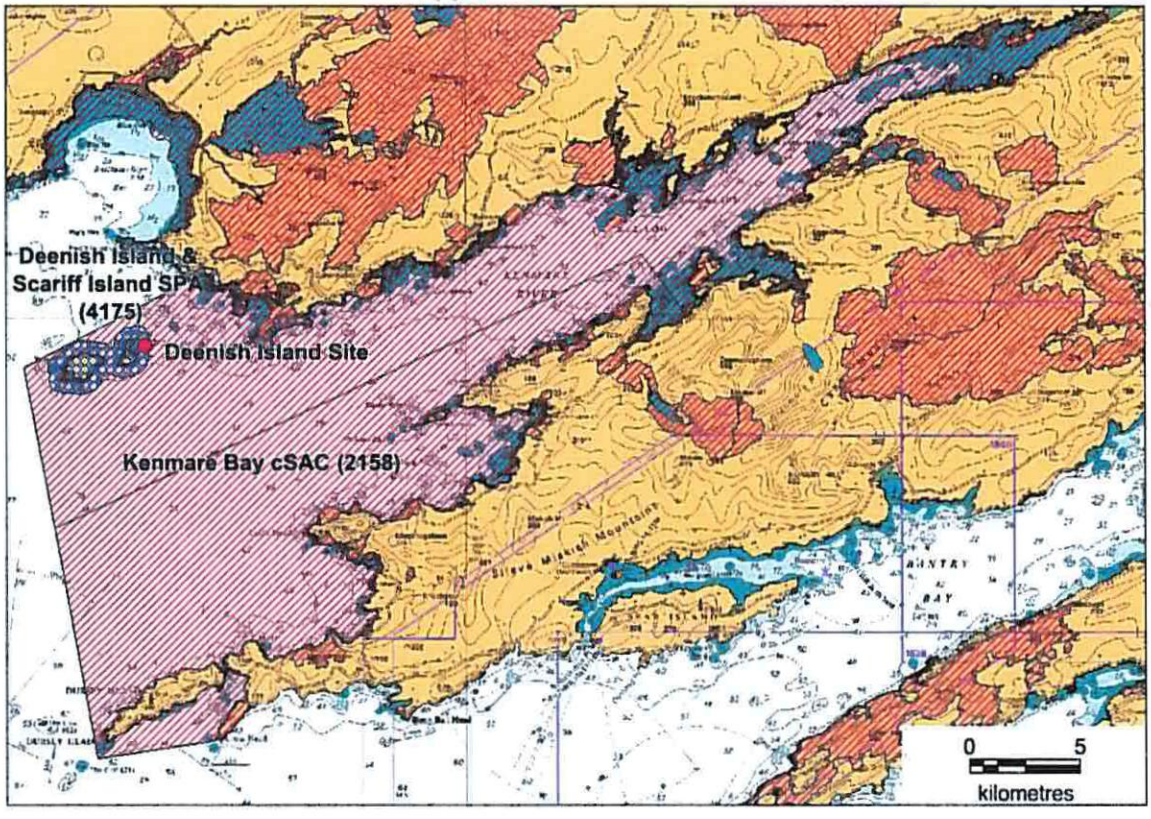

Figure 1:

Kenmare Bay, Co. Kerry, is a long and narrow, south-west facing bay. It is a deep, drowned glacial valley and the bedrock is mainly Old Red Sandstone which forms reefs along the middle of the bay throughout its length. Exposure to prevailing winds and swells at the mouth diminishes towards the head of the bay. Numerous islands and inlets along the length of the bay provide further areas of additional shelter in which a variety of habitats and unusual communities occur.

Two Natura 2000 sites are of relevance for the Deenish site (see Figure 2.2). Deenish Island is located in the outer reaches of the Kenmare River cSAC (Site code: 002158) and the island forms part of the Deenish Island and Scariff Island SPA (Site code: 004175).

Kenmare River cSAC has a very wide range of marine communities from exposed coast to ultra-sheltered areas. The site contains three marine habitats listed on Annex I of the EU Habitats Directive, namely reefs, large shallow bay and caves. There is also an extremely high number of rare and notable marine species present (24) and some uncommon communities. Kenmare River is the only known site in Ireland for the northern sea-fan, Swiftia pallida and is the only known area where this species and the southern sea-fan Eunicella verrucosa co-occur. Midway along the south coast of Kenmare River, a series of sea caves stretch back into the cliff. They typically support encrusting sponges, ascidians and bryozoans.

Deenish Island and Scariff Island are small- to medium-sized islands situated between 5 and 7 km west of Lamb's Head off the Co. Kerry coast; they are thus very exposed to the force of the Atlantic Ocean. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Fulmar, Manx Shearwater, Storm Petrel, Lesser Black-backed Gull and Arctic Tern. Scariff is the larger of the two. It is steep-sided all the way around and rises to a peak of 252m. The highest cliffs are on the south side. The island vegetation is a mix of maritime grassland, areas dominated by Bracken and heathy areas with Ling Heather. There are the ruins of a monastic settlement and a cottage in the north-east sector of the island. Deenish is less rugged than Scariff, and rises to 144m in its southern half; the northern half is lower and flatter. The vegetation is mostly grassland, with some heath occurring on the higher ground. Old fields are now overgrown with Bracken and brambles. The sea areas to 500m around the islands are included inside the SPA boundary to provide a 'rafting' area for shearwaters.

Site Layout and equipment:

A total of 14 Aqualine plastic pens along with associated grid frame and moorings were laid out in a 3 x 5 grid pattern, within the licenced area. One pen was not stocked. A feed barge which also houses a small canteen and office was moored on the western site of the grid layout and in the lee of Deenish Island. Refer to the following sketch map. Fig. 2

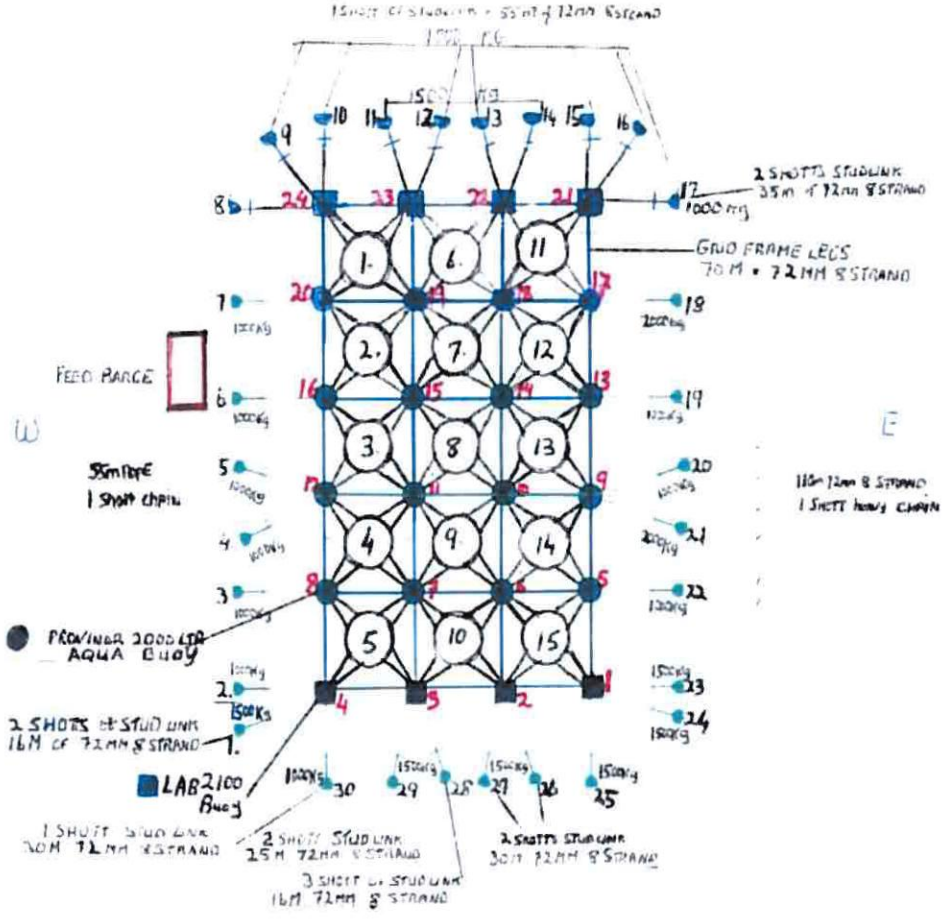

Figure 2

Site Staffing:

The Deenish site was staffed by 8 staff including a site Manager. Additional sub aqua diving and mooring services was provided by an additional 5 staff employed or subcontracted by MHI. In addition, the site was serviced by engineers and electricians based in Castletownbere.

Key Performance Indicators:

Stock Input	834,000 Fanad Mowi smolt
Total input biomass	49 tons
Total Harvest biomass	2,270 tons live weight (1,884 gutted weight)
Economic Feed Conversion Ratio (EFCR)	1.36
Biological Feed Conversion ratio (BFCR)	1.2
Relative Growth Index:	91.2%

Total mortality:	36.4%
Principal causes of mortality:	Jellyfish, harmful algal blooms and Amoebic Gill Damage.
Lice treatments	None
Escaped fish	None
Lost Time Injuries	None
AGD Freshwater baths	3
Superior quality Grade	93.5%
Ordinary Quality Grade	4.29%

Sea Lice monitoring and control:

In accordance with MHI Sealice monitoring and control procedures and when weather conditions allowed, at least 10 fish were sampled weekly from each of a minimum of three pens on site. Sea lice counts were conducted up to the point of commencement of harvest thus counts cover a period of 80 weeks from April 2013 to November 2014. When average numbers of gravid lice reach 0.2 per fish or total lice numbers exceed 5, a treatment is required. For organic production, this is subject to permission from the organic certifying bodies.

However, in the case of Deenish 13S1 crop, sea lice levels remained below treatment trigger levels and thus did not require any lice removal treatments. Sea lice levels for the 13S1 crop are summarised on the following graph.

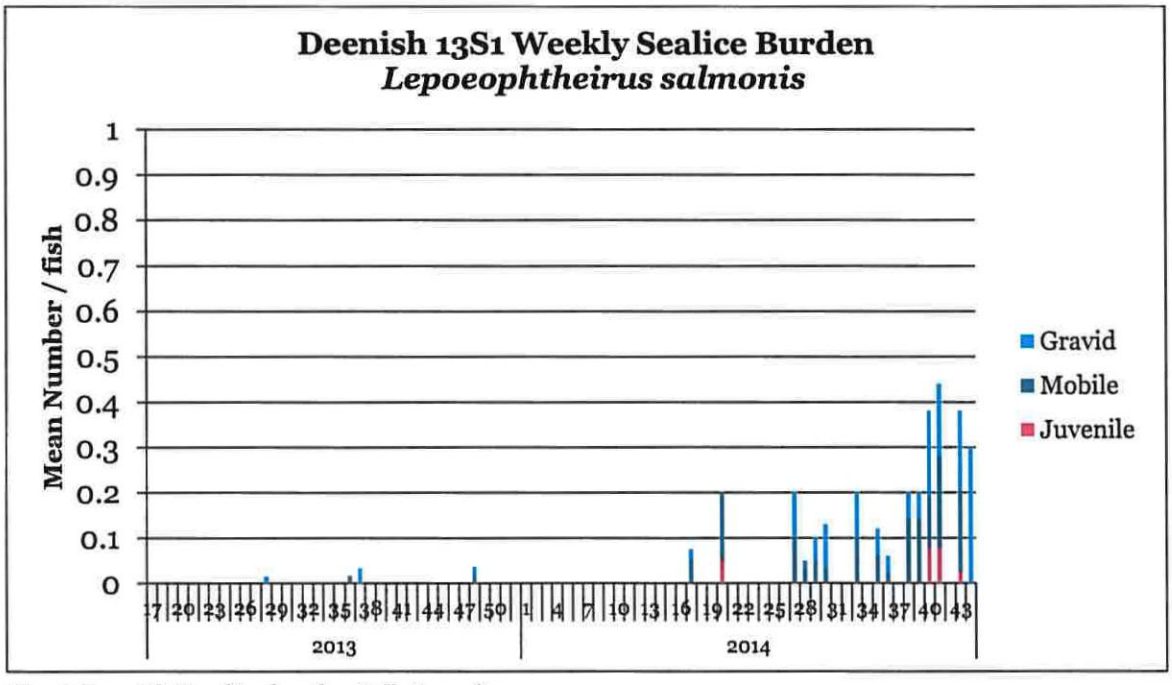

Fig. 3 Deenish Sea lice burden (all stages)

Fish Health Management:

The health of the Deenish 13S1 fish was closely monitored and recorded at four levels:

1. Daily observations by the site manager and feeding operatives of fish behaviour during routine operations such as feeding and net changing. Any unusual behaviour was recorded on the daily feeding sheets and reported immediately to the Operations Manager and the Marine Fish Health Manager.

2. Professional divers examined the behaviour and general health of the fish on a regular basis. Diver observations and a breakdown of mortality numbers by likely cause of death were recorded on the 'Mortality Record' sheets.

3. The company veterinarian (Vet-Aqua International) carried out a total of 16 site visits. In addition to this all sites was visited at least monthly by the South West Fish Health Surveillance biologist. During visits, fish would be clinically examined for general behaviour, body condition and external abnormalities, by anaesthesia. Samples were screened for skin, gill and internal parasites and recent mortalities also post-mortemed for any unusual findings. Full laboratory support was provided by the designated veterinary practice.

4. The stock performance (e.g. feeding rate, mortality rates) were assessed at least once a week by the Production Manager for any indication of disease/abnormalities in the stock

Benthic Monitoring and Impact:

During the 20 month production period, two benthic surveys were carried out on the Deenish site by Environmental consultants, Aquafact Ltd.

On 28th August 2013 a benthic survey was carried out on the Deenish site. The survey followed the DCMNR Level I monitoring protocols. The site was fallow for approximately three weeks before an onsite biomass production of 249.5 tonnes in the four month period prior to the survey. Mean current speed at the site is approximately 0.3ms^{-1}.

The seabed was composed of a mix of sediment types with areas of of fine-medium sand and areas of slightly coarser sand shell gravel mix as can be seen in the follwoing images.

Figure 4: Sea bed images

The composition of sediments at each station can be seen in the sediment profile imagery (SPI) images with fine sand at the under pen station to a coarser shelly gravelly sand at the outer end of the transect. (Fig. 4). ARPD depths ranged from a minimum of 0.2cm (T1 Under, T1 Edge, T1 20m and T1 50m) to a maximum of >6.5cm (T1 100m). (Fig. 5).

Figure 5: ARPD depths

Organic carbon values ranged from 1.88 % (T2 50 m) to 7.08 % (T1 100 m) with the reference station recording a value of 1.56 %

In August 2014 Aquafact Environmental consultants carried out a DCMNR Level 2 survey with the addition of an Aquaculture Stewardship Council (ASC) standard survey as requested by MHI. This additional ASC survey was required in partial fulfilment of the second principle of the ASC Aquaculture Standard which is;

Principle 2: Conserve natural habitat, local biodiversity and ecosystem function

The fulfilment of Criterion 1: of ASC Principle 2 - Benthic biodiversity and benthic effects was the purpose of this assessment.

At the time of the survey, the standing biomass on site was 2,067 tons. A total of 9 sample stations at the Deenish fish farm site on the 7th August 2014 were sampled for faunal and sediment analyses.

Redox potential values met the standard of >0 mV at all stations except stations S5 and S2 (replicate A). Shannon Weiner diversity values met the standard of >3 at 6 of the stations, with stations S1, S4 and S5 returning values below the standard. AMBI scores met the standard of ≤3.3 at 6 of the stations, with stations S1, S2 and S4 returning values >3.3. These 3 stations were closest to the pen and as expected were the most impacted and returned a disturbance classification of 'Moderately Disturbed'. The remaining stations were all classified as 'Slightly Disturbed' with the Reference station classified as 'Undisturbed'. Five of the 9 stations met the standard for numbers of non-pollution indicator species present at frequencies of ≥100/m2.

When compared to the 2012 and 2013 benthic surveys, results for this site indicate little habitat degradation is obvious beyond the edge station on both transects at the Deenish site. Results from previous years surveys of the seafloor beneath the Deenish Island pen blocks indicated little change year on year on and showed few obvious signs of impact. In general the surface appearance of the seafloor was devoid of any indication of the overlying pens beyond the immediate footprint of the pens.

Water Column nutrient monitoring:

In accordance with Monitoring Protocol No. 2. for offshore finfish farms water column monitoring, water samples w recollected at three points in the centre of the farm site and one control sample was collected at a distance from the site. Results are summarised in the following table;

Sample point	GPS location	DATE	WEEK	NO_2 ug/L	NO_3 ug/L	Phosphorous ug/L	TAN ug/l	Chlorophyll ug/L
1m below surface	Lat. 51-44-18 Long. 10-13-04	17-Dec-13	51	0.89	66.51	24.62	0.45	0.00
		10-Jan-14	2	1.17	85.52	18.33	3.58	0.00
		17-Feb-14	8	0.98	28.63	20.35	17.22	0.00
		06-Mar-14	10	1.56	19.53	20.35	5.71	0.17
Mid depth		17-Dec-13	51	1.74	73.03	24.62	0.0	0.00
		10-Jan-14	2	1.17	62.91	12.66	2.58	0.00
		17-Feb-14	8	1.27	34.63	20.35	5.71	0.00
		06-Mar-14	10	1.86	55.73	29.03	6.75	0.00
1m above seabed		17-Dec-13	51	1.45	66.38	29.95	0.45	0.00
		10-Jan-14	2	0.91	67.45	14.55	1.59	0.00
		17-Feb-14	8	0.98	35.47	18.18	8.84	0.00
		06-Mar-14	10	1.86	63.14	39.88	9.89	0.00
Control	Lat 51-44-90 Long 10-0-10	10-Jan-14	2	2.52	95.33	18.33	12.53	0.00
		17-Feb-14	8	1.06	74.64	12.42	5.82	0.00
		06-Mar-14	10	0.5	29.45	16.45	3.56	0.00

Site Inspections and Certifications:

The 13S1 crop was reared under EU Organic rules in accordance with EC 710/2009 in addition to Naturland (German Private Label) and BioSuisse (Swiss) Organic aquaculture standards with certificates awarded after independent audit verification during 2013 and 2014. In addition the site was audited and awarded the Global GAP aquaculture standard.

The integrated Quality, Environmental and HES management systems for the site also audited by the NSAI under ISO 9001, ISO 14001 and OHSAS 18001 standards.

During November 2014, the first Aquaculture Stewardship Council aquaculture audit in the Irish Aquaculture industry was carried out on the Deenish 13S1 crop.

The Aquaculture Stewardship Council (ASC) sets an unprecedented standard for sustainable food production. This Salmon standard provides guidelines for responsible salmon farming which minimises negative impacts on the environment and enhances local communities. The ASC standard includes guidelines for the protection of the health and genetic integrity of wild populations, responsible use of resources, disease management, social responsibility, and community and stakeholder engagement are included to ensure compliance by aquaculture companies worldwide. The ASC certification decision for this site is expected in February 2015.

Conclusions:

Concerning stock husbandry, management of sea lice and benthic impacts this pilot project worked very well. By stocking Deenish with one smolt input to grow out within a 21 month period with no additional stock inputs, this has allowed the effective control of sea lice without the use of any therapeutic interventions.

In addition, the environmental benthic surveys have shown no difference in impact compared to previous inputs and with an increased standing biomass in excess of 2,000 tons.

Appendices:

O:\Benthic Monitoring Marine\2014\JN1263 Deenish 2014 ASC Audit.pdf
O:\Benthic Monitoring Marine\2014\JN1263 Deenish 2014 Audit.pdf
O:\Benthic Monitoring Marine\2013\JN1208 Kenmare Bay 2013 Audit.pdf
O:\Benthic Monitoring Marine\2012\JN1160 Kenmare Bay 2012 Audit.pdf
I:\Aquaculture licenses\Deenish Aquaculture licenses\ALABDeenishDecision311012.pdf
Deenish amendment 2011.pdf
O:\Certifications 2014\Bio Suisse\Bio Suisse 2014 SW.pdf
O:\Certifications 2014\CQSORG\CQSORG1029 MHI Deenish Cert 020715.pdf
O:\Certifications 2014\Global GAP\GGAP Certificate MH Ireland 110614.pdf
O:\Certifications 2014\Naturland\Naturland 2014 2015.pdf
O:\Certifications 2014\ISO Certs\ISO 14001 cert exp 110116.pdf
O:\Certifications 2014\ISO Certs\ISO 9001 cert exp 110116.pdf

SAI GLOBAL

Certification Decision Letter

No Ref: CQA1029 / GG0003/ 4050373193195 / NAT1004 / Bio 103 (Deenish SW Site)

Date 19-Apr-19

Catherine McManus
Mowi Ireland
Kindrum,
Cashel,
Letterkenny,
Co. Donegal

RE: Suspension of Certification - Deenish Salt Water Site.

Dear Catherine

It has been brought to SAI Global's attention that there has been a failure by your organisation to meet the conditions for certified organisations.

We refer to the SAI Global Terms and Conditions that set out the conditions of contract between SAI Global and your Organisation. The situation described below constitutes a breach of these contractual terms.

Reason for Suspension:

- **DAFM Notification: Breach of condition 2(e) of the applicable aquaculture licence.**

  The relevant condition is condition 2(e) which states: ***"the Licensee shall not harvest more than 500 tonnes (dead weight) of salmon in any one calendar year"***

  It is noted that the Dead Weight Harvest for 2016 was 1,108,907.36kg (1,108.91 tonnes). This harvest figure is 121.78% in excess of what is permitted under licence condition 2(e).

Please take note that your organisation (in relation to the Deenish SW Site) must:

1. Immediately cease displaying the SAI Global Certification Mark in any way, including removing all references to the Mark from websites, letterheads, business cards, stationery, advertising material or elsewhere. In the case of Certified Product obliterate the certification trademark completely from the Product and destroy the product and dispose of securely;

2. Remove the SAI Global Certificates of Approval (including any copies) from locations where they are displayed forthwith;

3. Cease making any representation in advertising or otherwise (whether oral or in writing, express or implied) that Organisation and/or the Product is certified/registered by SAI Global.

4. In the case of non-conforming Certified Product the Organisation must:
   i. Immediately quarantine the non-conforming Certified Product;
   ii. Rectify all defects and re-test to verify compliance to the Standard and provide in writing copies of such tests to SAI Global before the suspension can be lifted;
   iii. Where the non-conforming Certified Product has been released or sold then the following requirements must be followed for the suspension to be lifted:
      a. Promptly notify SAI Global in writing the with action(s) being taken,
      b. Immediately investigate the problem to determine its nature and severity,
      c. If indications of non-compliance remain, immediately withdraw and quarantine the Certified Products concerned or remove the certification mark from the released Product and action as requested by SAI Global;
5. Records of all steps taken in the recall shall be maintained and made available to SAI Global.

It would also be appropriate for your organisation to examine their contract review procedures to ensure no logo / claim to Product Certification or to the Certified Product is inadvertently made. If your organisation has forms of advertisement please ensure that the next edition does not include any reference to SAI Global Certification and/or Certification Marks.

The suspension lasts for ninety (90) calendar days from the date this letter was signed and is therefore in effect until 18th July 2019. If the problem is resolved and the required appropriate actions were taken, the suspension will be lifted. If your organisation fails to resolve the situation by this date, then we will have no choice but to withdraw your certificate and de-register your organisation for the Deenish SW Farm Site.

In the event that you fail to comply with the above, SAI Global reserves its rights to commence legal proceedings against your organisation including for injunctive relief, damages and full payment of all legal costs incurred. We kindly request your acknowledgment in writing that any display of the SAI Global certificate and Certification Mark has been discontinued.

You will find that your organisation's rights to appeal against any certification decision made by SAI Global are set out in the applicable SAI Global procedures and rules that are available upon request.

Yours sincerely,

GMcKenna

Georgina McKenna
Operations Manager, Ireland

An Roinn Cumarsáide,
Mara agus Acmhainní Nádúrtha
Baile Átha Cliath 2.

Department of Communications,
Marine and Natural Resources
Dublin 2.

08th February 2007

Our Ref: T5/233 & T6/202

Ms Geraldine Harrington
Silver King Seafoods
The Pier
Castletownbere
Co. Cork

Dear Ms Harrington

I wish to acknowledge receipt of your applications and fee of €380.92 in respect of the renewal of two aquaculture and foreshore licences for sites at Inishfarnard, T5/233 and Deenish, T6/202.

Your applications are receiving attention and the Department will be in contact with you again in due course.

Yours sincerely

V. Connaughton

Valerie Connaughton
Coastal Zone Management Division.

Leeson Lane Dublin 2
Lána Chill Mochargan
Baile Átha Cliath 2

Telephone + 353 1 678 2000
LoCall 1890 44 99 00
Fax + 353 1 678 2449

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Silver King Seafoods
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t + 353 (0) 27 70216/70218
f + 353 (0) 27 70188
e silverkingseafoods@eircom.net

Carmel Daly
Coastal Zone Division
Dept. Communications, Marine &
Natural Resources
Leeson Lane
Dublin 2

5th February 2007

Dear Carmel

As per our telephone conversation today, I enclose payment of fees for the renewal applications for Inishfarnard T5/233 and Deenish T6/202 totalling €380.92

Best regards,

Geraldine Harrington

PROFESSOR R.H. RICHARDS. C.B.E., M.A., Vet.M.B., Ph.D., C.Biol., F.S.B., F.R.S.M., M.R.C.V.S., F.R.Ag.S., F.R.S.E.

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November 29, 2016

ISSUES CONCERNING SITE LICENSING AT MARINE HARVEST IRELAND

Abstract

A short review of a sample of salmon aquaculture licences held by MHI in the south west of Ireland concludes that their wording is out of date, inappropriate and contrary to supporting best practices. Using terms such as 'growers' and 'smolts' is confusing and erroneous in biological terms. It is recommended that a MAB (Maximum Allowable Biomass) should be the key parameter to limit production on all salmon production sites as is the International Standard. The MAB relates directly to the EIS (Environmental Impact Statement) and environmental loading as well as the annual benthic monitoring, while enabling market led production. Licences should promote "all in all out" and fallowing between generations of stock as opposed to being scheduled to a calendar timeframe that is unrelated to the production cycles.
It is further recommended that a young industry such as aquaculture benefits from regular reviews and modifications between the regulator and licensees, as is practised in Scotland and Norway.

Historical Perspective

The licensing of Fish Farming Sites in the marine environment has been carried out by Government Agencies since the early days of salmon farming in the 1970s.
Norway pioneered these developments and initially licensed farm sites according to the allowable surface area of the ocean to be covered by pen structures. No account was taken of total numbers of fish to be stocked into the sea or total biomass to be present at a site at any one time. At that time, farmers chose to maximise production by increasing the depth of the nets being used . Significant problems were experienced with disease, in particular the bacterial disease furunculosis and the parasitic disease caused by sea lice infection. A mortality rate in excess of 50% was often experienced, causing farmers to double the number of fish stocked in anticipation of such high mortality. This often led to very high stocking densities being used, resulting, especially in inshore sites with poor water circulation, in significant deterioration of the benthic and water column quality. Subsequent control of numbers stocked or tonnage produced was used in order to avoid environmental deterioration and the risk of disease development.

It was also common practice to use inshore, protected sites to stock fish from the freshwater environment in the first year and subsequently transfer the partially grown stock to other less-protected sites for their second and even third year of sea production. The industry in both Ireland and Scotland consisted of a large number of smaller companies, usually operating independently in the same bays or bodies of water. There was little coordination of husbandry procedures such as treatment for sea lice and, as a result, disease agents often circulated around sites in the same bay. Disease control became very problematical.

Development of Code of Good Practice

An outbreak of the exotic notifiable disease Infectious Salmon Anaemia in Scotland in May 1998, which resulted in the slaughter of large numbers of fish, led to the establishment of the Joint Government / Industry Working Group on Infectious Salmon Anaemia, the purpose of which was to identify the measures required to prevent or minimise the impact of further outbreaks of ISA. The conclusions of the group are presented in document number ISBN 0 7480 8950 0. Available literature on the topic was assessed and epidemiological modelling used to produce a risk assessment of husbandry procedures in use at that time and provide recommendations as to future husbandry practice. This work also formed the basis of the current Code of Good Practice for Scottish Finfish Aquaculture.
The application of the principles outlined has also drastically reduced the spread of other disease conditions and forms the basis of international salmon production methodology.

Key principles of the Code of Good Practice

- A general presumption against seawater to seawater movement. This may occur, exceptionally, followed the application of a documented risk assessment.
- Delineation of management areas, defined hydrologically, where ideally, all sites in a management area are controlled by a single company. If more than one company is present, a management agreement should be in place to ensure the coordination of procedures such as sea lice treatment and fallowing.
- The stocking of sites with fish from a single source, or if that proves impossible, a restricted number of sources.
- Well boat movements are also a source of transfer of infection and 'bus-stop' deliveries going from site to site are discouraged unless sites are managed by the same entity and even then, only when fish are stocked into appropriately fallowed sites.
- The use of site-specific equipment and staff and, if equipment or staff have to be shared between sites, the use of approved disinfection procedures.
- Agreed methods for monitoring and recording of sea lice numbers.

All the above have resulted in the licensing of sites being based on MAB (Maximum Allowable Biomass), established in Scotland through modelling of environmental parameters by the Scottish Environmental Protection Agency (SEPA). Ongoing monitoring takes place to ensure that the effects predicted by the model are not exceeded and involves a mixture of monitoring being carried by experts employed the aquaculture company and also by SEPA. Permissions may be adjusted according to the monitoring results. As seawater to seawater movements are

considered particularly risky, an input of fish from freshwater to a marine site usually remains at that site until harvest, unlike the earlier systems used.

Interaction between the aquaculture industry and government

Scotland provides an excellent example of the development of a working relationship between government and industry regarding aquaculture.
A formal government/ industry working group was established at the time of the first outbreak of Infectious Salmon Anaemia. The group involved experts from the aquaculture industry, government health officials, academics, and other interested parties such as SEPA. The group met regularly and eventually produced an agreed detailed report and recommendations which formed the basis of the current Code of Good Practice for Scottish Finfish Aquaculture, which is regularly updated.

This was seen to be a very successful way of promoting interaction between government and industry and was followed by the Ministerial Working Group on Aquaculture which has met regularly and convenes subgroups as necessary to evaluate issues of interest or concern.
This group has contributed significantly to the development of aquaculture legislation in Scotland, and particularly the Aquaculture and Fisheries (Scotland) Acts of 2007 and 2013, and the Aquatic Animal Health (Scotland) Regulations 2009. The latest Working Group to be established is the Scottish Government/Industry Working Group on Integrated Sea Lice Management in 2016.

In addition, representatives of the SSPO meet regularly (approximately monthly) with scientific staff at Marine Scotland in Aberdeen to review current issues and ensure that officials are aware of industry developments.

Licences currently held by Marine Harvest Ireland Ltd.

I have been provided with historical details of licences currently held by Marine Harvest Ireland, specifically licences 198 (Inishfarnard), 199(Deenish), and 444 D & E (Bantry Bay). The licences were originally issued to Gaelic Seafoods and subsequently transferred to Murpet, then to Silver King and eventually to Marine Harvest Ireland. Earlier licences were held by the Electricity Supply Board.

Initial terms of the licences generally included :-

- The farming of only salmon or trout.
- Allowance of passage of migratory fish and no interference with fishing or navigation.
- Chemicals and antibiotics to be controlled and recorded.
- Notification of the presence of disease or any abnormal losses.
- Disposal of dead fish according to local authority requirements.
- Application of 30 day fallowing periods.
- Notification of escapes.
- Details of benthic and water quality monitoring to be reported and reviewed.
- Details of sea lice monitoring and control.
- Sale or disposal only to be carried out with written permission of the authorities.
- Ongoing precautionary measures against algal blooms.

Smolt Numbers and Tonnage

I note that the licences also contain details of allowable stocking in terms of either smolt numbers and/or grower production in tonnage terms in a calendar year and these figures are those allowed in the licences in 1995 and have not subsequently been modified. This takes no account of the accepted methodology of single year class stocking at a site which depends on fish remaining at the site from original input to final harvest. As explained earlier, the use of seawater to seawater movement is considered very high risk – it will increase the risk of disease spread and will also considerably stress the fish, leading to increased likelihood of disease development. I believe that the practice of rearing of stock from transfer to harvest has been carried out at these sites since before Marine Harvest Ireland acquired them, in keeping with industry norms. Should the Maximum Allowable Biomass approach be taken, following practice elsewhere, the number of smolts to be transferred from freshwater would be determined by the producer based on expected harvest weight and anticipated mortality rate during the ongrowing phase at sea. A margin of error would be applied in case of unexpected losses, and if survival was higher than expected, harvest of fish earlier than expected could be undertaken in order to remain within the consented limits. Initial stocking would be based on expected market requirements and should the market change, earlier harvest could again be undertaken. The key issue is the requirement to remain within the consented maximum biomass at any time in order to avoid any possible environmental degradation.

I am not sufficiently acquainted with the marketing plans of Marine Harvest Ireland to know of their market requirements but harvesting at 4.5 kilos bodyweight with an average loss of 25% stock in the saltwater phase would be a reasonable industry average, suggesting that approximately 300 smolts would be required to be transferred from freshwater for each tonne of eventual production. This would tend to equate to the numbers of fish stocked in relation to eventual biomass at sites 444D and 444E, where 2000 tonnes would be reared at each site from an initial stocking of 600,000 fish.

The eventual tonnage produced from stocking 400,000 fish at sites 198 and 199 would be approximately 1350 tonnes, not 500 tonnes and so in this case, there is little correlation between smolt numbers and expected tonnage. Sites with as little as 500 tonnes capacity would not be justified financially in terms of the costs of boats, staff and shore support and even the 1350 tonnage seems undersized considering the very open and exposed location of these sites.

I also believe that the terminology used in the licences is confusing and erroneous in biological terms. The definition of a smolt applies only to a fish in freshwater which has adapted to allow it to be transferred to saltwater through changes in gills and kidney. The basic changes include the development of 'chloride cells' in the gills to allow active transport of sodium and chloride ions out of the gill and changes in the glomerulus of the kidney which lead to a decreased glomerular filtration rate and decreased urine production. The fish are recognised by aquaculturists and fisheries biologists by the silvered appearance of the skin and testing is carried out to determine whether fish to be transferred are capable of adapting to the saltwater environment. Fish in saltwater should all be considered as 'salmon' or 'growers'. It could be that the use of 'smolts' was meant to indicate the number of smolts to be transferred from fresh water, but at sites 444D and 444E, there is no meaningful relationship between numbers of smolts consented and tonnage consented. As there is no certain means of establishing the final

tonnage that will result from stocking with a given number of smolts, then allowable biomass is a much more meaningful measure. The maximum allowable biomass (MAB) would also be relevant to stocking biomass at any time in the cycle in the sea, whereas total tonnage allowed may be interpreted as a total maximum tonnage to be produced in a calendar year rather than that being held at any point in time. This is the current state of the licences at sites 198 and 199 which stipulate tonnage on a calendar year basis and take no account of the total harvest taking place in year 2 in the sea.

The MAB can be calculated for each site by using the environmental impact statements submitted by the aquaculture producers to the authorities as part of the licence requirements.

Fallowing

It is also important to remember that the period of time that fish would be expected to remain at an individual site would be close to two years and would then result in triggering the fallow process. This does not equate to annual fallowing as is possibly suggested in the current licences, which would result in movement of fish at sea, producing considerable stress and the increased risk of disease development.

There is an increasing tendency to use heat and light control in hatcheries in order to produce larger smolts and thus reduce the timescale of the marine phase of production.

My personal opinion would be that it is necessary to modify the licences to allow stocking to be based on Maximum Allowable Biomass and allow fallowing to be carried out at the end of the production cycle, as is practised in other countries. Synchronous fallowing should also be undertaken in an individual management area.

Professor Randolph Richards.

Feenstra, Jan C

From:	Quinlan, John <John.Quinlan@agriculture.gov.ie>
Sent:	06 September 2018 16:37
To:	Feenstra, Jan C; Reilly, Eimear; Hodnett, Kevin
Cc:	McManus, Catherine; Brennan, David; Beamish, Cecil
Subject:	RE: Housekeeping and budgeting information - Inishfarnard License T5/233

Hi Jan,

Thank you for your message below. A substantive response will issue to you as soon as possible.

Regards
John

John Quinlan
Principal Officer, Aquaculture and Foreshore Management Division

An Roinn Talmhaíochta, Bia agus Mara
Department of Agriculture, Food and the Marine

National Seafood Centre, Clogheen, Clonakilty, Co. Cork, P845 TX47
An Lárionad Bia Mara Náisiúnta, An Cloichín, Cloich na Coillte, Corcaigh, P85 TX47

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From: Feenstra, Jan C [mailto:Jan.Feenstra@marineharvest.com]
Sent: 06 September 2018 16:09
To: Reilly, Eimear; Hodnett, Kevin; Quinlan, John
Cc: McManus, Catherine; Brennan, David
Subject: Housekeeping and budgeting information - Inishfarnard License T5/233

Dear AFMD,

In reference to the above license and the amendment determined by ALAB (AP1/2018) on the 4th of May this year, we would like the Department to:

a.) Confirm that it has registered and accepted this amendment.

b.) Confirm, in light of ALAB's amendment, whether the Department still requires the company to submit the monthly information as outlined it its letter of December 11th, 2017:

"1. *Stock numbers introduced to the site and held on site during the month*
2. *Details of stock during the month (broken down by the category Smolts, ova, fry, others)*"

We can continue to supply this information but see little relevance in continuing the current monthly stock declaration given ALAB's amendment to this license.

c.) Inform the company of the future fee structure that will apply to this license since the parameter to which the previous fees referred to (harvest tonnage), has been deleted from the license.

Yours sincerely and with regards,

Jan

Office of the Minister for Agriculture, Food and the Marine, Dublin 2.

Oifig an Aire Talmhaíochta, Bia agus Mara, Baile Átha Cliath 2.

Mr Alf-Helge Aarskog
Chief Executive Officer
MOWI ASA
PO Box 4102 Sandviken
5835 Bergen
NORWAY

16 April 2019

Re: Aquaculture Licence (T06/202) Deenish, County Kerry, Ireland

Dear Mr. Aarskog,

I wish to refer to the aquaculture site operated by MOWI Ireland for the cultivation of salmon at Deenish in County Kerry and to the determination of the Minister for Agriculture, Food and the Marine to treat as discontinued the statutory entitlement of Silver King Seafoods Limited, a wholly owned company of Comhlucht Iascaireacta Fanad Teoranta (MOWI Ireland), to carry out aquaculture operations under the provisions of Section 19(A)4 of the 1997 Fisheries (Amendment) Act.

The Minister wishes to discuss with you the matter of compliance with licence conditions by MOWI Ireland and accordingly you are invited to a meeting with the Minister and senior officials at an early date to discuss this issue.

Please contact this office with a view to establishing a suitable date. An early response would be appreciated.

Yours sincerely,

Graham Lennox

Graham Lennox
Private Secretary

Telephone: (01) 607 2884 LoCall 1890 200 510 Facsimile (01) 661 1013
E-mail minister@agriculture.gov.ie

Oifig Faisnéise
Áras Talmhaíochta
Sráid Chill Dara
Baile Átha Cliath 2

Tel: (01) 607 2802
Fax: (01) 662 1165

Department of
Agriculture,
Food and the Marine
An Roinn
Talmhaíochta,
Bia agus Mara

Press/Information Office
Agriculture House
Kildare Street
Dublin 2

E-mail: info@agriculture.gov.ie
Website: www.agriculture.gov.ie

PRESS RELEASE

5 December, 2011

244/11

MINISTER COVENEY LAUNCHES

NEW AQUACULTURE LICENCE TEMPLATES

The Minister for Agriculture, Food and the Marine, Simon Coveney TD, today launched new aquaculture and companion foreshore licence templates. The new templates, which are species specific, have been introduced to address the technological, environmental and legal issues that have come to the fore since the first licences were issued under the Fisheries (Amendment) Act, 1997. A new template for the accompanying foreshore licence has also been devised.

The new templates will be introduced as individual licences come up for renewal and as new licences are issued.

Speaking at the launch, the Minister said *"the new templates contain significant new terms and conditions which are designed to reflect the technical advances that have taken place in the industry and the enhanced environmental protection now required under EU and national legislation. They will form the basis for sustainable development of the industry and the creation of long-term jobs into the future."*

Key new features of the licence templates include:

- a move to Standing Stock Biomass for finfish as the means of measuring production capacity at an aquaculture site;
- enhanced provisions on environmental monitoring;
- greater clarity on the requirements for operators in relation to operational conduct and monitoring;
- the possibility for the group-marking of sites for navigational purposes;
- specific provisions covering company registration/dissolution, tax certificates, payment of fees etc.

Information Seminars for industry are currently being rolled out by the Department.

ENDS

"Minister launches new Aquaculture Licence Templates"

Background Note

1.0 New Aquaculture licence templates have been devised to take account of the technological, environmental and legal issues that have arisen since the first licences were issued under the Fisheries (Amendment) Act 1997 – the core legislation governing aquaculture licensing. The templates were developed by a Working Group established to address these issues. The Working Group consisted of the Department's Aquaculture and Foreshore Management Division, Engineering Division, Legal Services Division, the Marine Institute and BIM.

New Template Types

2.0 Seven aquaculture templates have been developed:

- Marine based shellfish e.g. mussels, typically using longlines
- Marine based shellfish sea-bed bottom culture e.g. mussels, oysters, scallops – no structures are used
- Marine based shellfish inter/sub tidal e.g. oysters, typically using bags and trestles
- Marine based aquatic plants/fish food e.g. seaweed using longlines
- Marine finfish e.g. salmon, rainbow trout, cod – using cages
- Land based finfish (freshwater), mainly hatcheries for salmon farms
- Marine multi species – to provide for cases where multi method or multi species are used e.g. a combination of longlines and trestles, mussels and oysters etc

Core Changes

3.0

- Change from licensing by Annual Harvested Tonnage (i.e. the dead weight of fish harvested from a site in a calendar year measured in tonnes) to Standing Stock Biomass for Finfish (the weight of live fish on a site at any given time, measured in tonnes) Standing Stock Biomass is recognised internationally as the appropriate metric for assessing loading at an aquaculture production site and can be measured on a real time basis thus facilitating effective regulation and management of sites

- New provision on environmental monitoring taking account that most aquaculture sites are located in Natura 2000 areas – protected by European Birds and Habitats Directives

- Enhanced requirement in relation to operational conduct and monitoring

- Potential for sites to be marked on a group basis
- Licences not assignable for 3 years following grant – except in exceptional circumstance
- A company incorporated outside the State will be required to register with the CRO within one month of being granted a licence
- Requirement to produce a current Tax Clearance Certificate on demand
- A provision that when a company dissolves, its associated Aquaculture Licence cease to exist
- Licences will be species specific

ENDS