Water Framework Directive Compliance Report of the intensive finfish aquaculture licence application T06-202 at Deenish Island, Co. Kerry.

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WFD Compliance

Water quality and quantity in Irish rivers, lakes, groundwaters, estuaries and coastal waters is assessed under the Water Framework Directive (WFD) 2000/60/EC, as amended by Directives 2008/105/EC, 2013/39/EU and 2014/101/EU. The Directive was transposed in Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 3002) (as amended).

There are two principal objectives of the WFD:

- The first objective requires that all waterbodies must reach at least 'good' overall status, subject to a defined deadline. For surface waters, including coastal and transitional waters, status is assigned as the poorer of its ecological status (or potential) and chemical status.
- The second objective requires that the status of each water body, including all the quality elements which make up overall status, must not deteriorate relative to the baseline reported in the relevant River Basin Management Plan (RBMP).

The WFD is implemented through the River Basin Management Plans (RBMP) which comprises a six-yearly cycle of planning, action and review. The current baseline quality (referred to as the current 'status') of all waterbodies is reported every six years as part of the RBMP cycle in Ireland. The first RBMP cycle in Ireland covered the period 2009 to 2015. The second cycle plan covered the period 2018-2021, and a third cycle RMBP covers the period 2022-2027.

The water quality of Ireland's transitional (estuaries) and coastal waters is assessed by the EPA, using information from the EPA, MI, IFI, and NPWS. The water areas are broken down into manageable units called waterbodies, and these waterbodies are assessed to provide an overall indication of the quality (status) of Ireland's waters.

The "ecological" status of the waterbodies are classified into 5 quality categories; High (not polluted); Good; Moderate; Poor; and Bad (most polluted).

The 'ecological status' of a waterbody is assessed according to (Figure **Error! No text of specified style in document.**-1[1]):

- The condition of biological elements, for example phytoplankton, benthic invertebrates, aquatic flora, and fish.

[1] *EPA (Environmental Protection Agency), 2008. 2008 State of the Environment Report. Environmental Protection Agency, Johnstown Castle Estate, Wexford, Ireland. Available at: https://www.epa.ie/ pubs/reports/indicators/irlenv/ .*

- The condition of supporting physico-chemical elements, for example nutrient and oxygenation conditions.
- Concentrations of river-basin specific pollutants such as metals (SI 272 of 2000 Table 10).
- The condition of the hydromorphological quality elements, including flow and tidal conditions and the morphological conditions including substrate.

The 'chemical status' of a waterbody is established according to compliance with the Environmental quality standards (EQSs) for priority substances and priority hazardous substances established at a Europe wide level (Dir 2008/105/EC as amended by Dir 2013/39/EC). Chemical Status is assigned as good or not-good based on the one out all out principle.

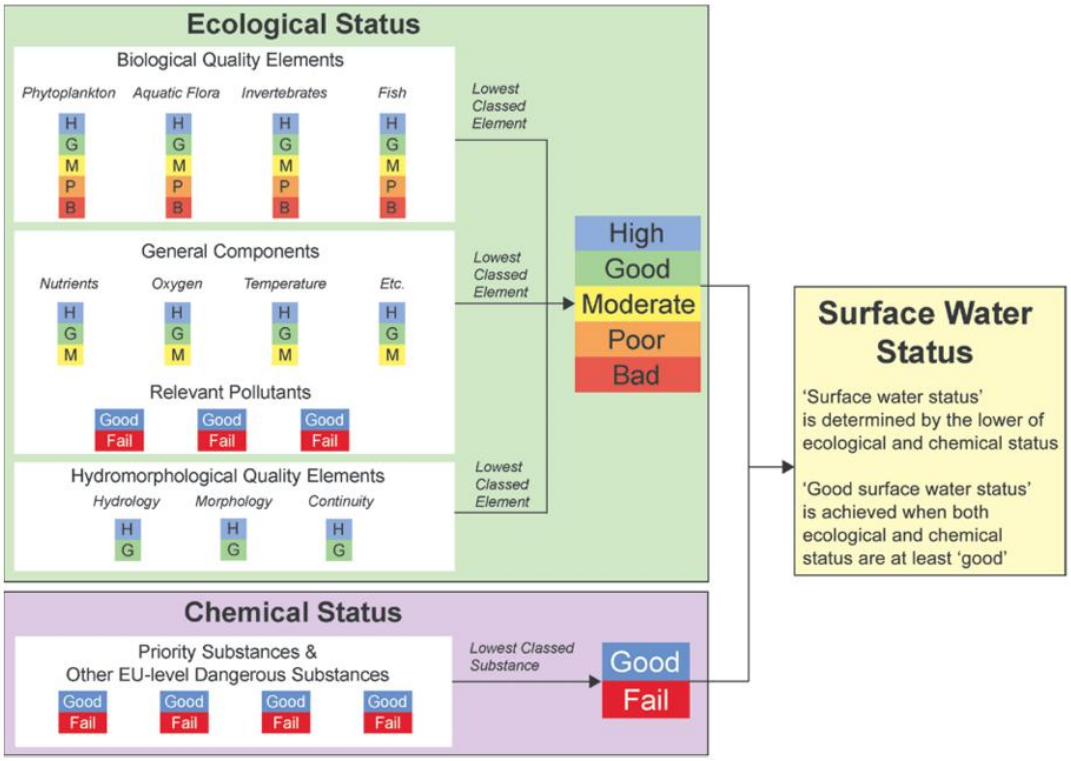

Figure Error! No text of specified style in document.**-1 Elements of the WFD status.**

In addition to achieving good ecological and chemical status, a waterbody must achieve compliance with standards and objectives specified for protected areas, which include areas designated by the Bathing Water Directive; the Urban Wastewater Treatment Directive; the Shellfish Waters Directive; the Habitats Directive; and the Birds Directive. Waterbodies that are compliant with WFD standards, but that contain protected areas that are non-compliant with protected area standards are downgraded to 'less than good' status.

Priority substances and certain other River Basin Specific Pollutants are monitored and assessed against EQSs as part of the WFD compliance monitoring programme for transitional and Coastal water. In general, Ireland has low levels of priority substances or priority hazardous substances in its waterbodies, 75% of surface water bodies assessed are in good chemical status, and this increases to 99% when ubiquitous priority substances are omitted[2]. Veterinary Medicine used in salmon farming are controlled by the Health Products Regulation Authority (HPRA)[3] and are only permitted on a Prescription Only Medicine basis. None of the currently licenced medicines are on the priority substances or priority hazardous substances list (Dir. 2013/39/EU).

In WFD terminology, an effect on waterbody status means either; a deterioration across a status class boundary at the scale of the waterbody (for example from good to moderate; or from moderate to poor; or from good to fail of an individual element or substance; OR a modification or alteration, which prevents or compromises the achievement of an improvement in status that could otherwise reasonably be expected (e.g. because of measures proposed in the River Basin Management Plan).

All new developments in Ireland that may have an impact on the water environment are required to comply with objectives of the WFD. This includes ensuring that no changes occur that cause a deterioration of the current status of any waterbody, and that the development does not prevent the achievement of the future status objectives of any waterbody. Waterbody status deterioration can occur as a result of deterioration of any of the quality elements that make up the overall status (e.g. biological, physicochemical or hydromorphological elements for surface waters).

The purpose of this WFD compliance report is to determine whether specific components or activities associated with the Deenish aquaculture licensable activity (T06-202) will compromise WFD objectives or result in a deterioration or prevent the improvement of the status of any waterbodies in the vicinity of the proposed aquaculture site. This assessment will determine the waterbodies with the potential to be impacted, describe any proposed mitigation measures, and determine if the project is in compliance with the objectives of the WFD.

[2] *https://www.gov.ie/pdf/?file=https://assets.gov.ie/199144/7f9320da-ff2e-4a7d-b238-2e179e3bd98a.pdf*
[3] *Health products regulation authority – www.hpra.ie link*

Assessment method

Any activity that is part of the project and that could have the potential to lower the status of any of the quality elements of a water body or preclude the measures necessary to achieve good status must be assessed to determine its compliance with the WFD.

There are no currently published methodologies in Ireland for the assessment of plans or projects in relation to undertaking WFD assessments. There is an EU-level guidance document "*Water Framework Directive Project assessment checklist tool*" (2018)[4], published by the Joint Assistance to Support Projects in European Regions (JASPERS). The UK also provides guidance in their *Guidance - Water Framework Directive assessment: estuarine and coastal waters*[5] document. This assessment draws on elements from these guidance documents. This assessment processes consists of 4 steps, as below.



This Context stage identifies the details of the proposed activity, and the relevant potential hazards associated with it.

The Screening stage determines if the activity will have impact pathways to WFD waterbodies or other relevant protected areas. This stage identifies the waterbodies that can potentially be impacted, providing information on the current status of those waterbodies, along with identifying cause and effect mechanisms. The source-pathway-receptor (S-P-R) model will be useful in terms of considering the potential risk of a proposed development causing further deterioration of the waterbody's current status, for example, if the proposed development includes a source (e.g. risk of pollution), is there a pathway (i.e. hydrological connectivity via water body) and is there a receptor (i.e. water body at risk).

The Scoping stage identifies whether there is a risk to any of the waterbodies identified in the screening stage and is undertaken separately for each waterbody and each activity. Scoping considers the risk to the WFD elements from the proposed activities, along with the potential risk to sensitive habitats, including designated sites and habitats with particular ecological

[4] *Water Framework Directive Project assessment checklist tool* Link
[5] *Guidance - Water Framework Directive assessment: estuarine and coastal waters, UK.* Link

importance, and to protected areas such as Bathing Waters. The scoping stage is designed such that the spatial extent of any risk associated with the activity (e.g. the likelihood and severity of any potential impact) is not central to the decision. If any risk is identified, the quality element will be taken through to Stage 4 for a detailed impact assessment. Here waterbodies and activities can be scoped out of the impact assessment if it can be satisfactorily demonstrated that there is no risk to the waterbody status.

The Scoping Stage considers the following:

- The potential risk to waterbody status (within and between status classes) of adversely affecting biological, hydromorphological and/or physico-chemical quality elements.
- The potential for activities to prevent delivery of WFD status objectives by impacting upon proposed improvement measures.
- The potential risk to sensitive habitats, including designated sites and habitats with particular ecological importance.

The scoping considers if the possible effects of the stressor pose a risk in the context of the information about the waterbody.

- Considerations include the temporal nature of the effect – will the effect be temporary? Is the WFD element expected to recover within a short period of time? Is there long-term or permanent adverse consequence and is further deterioration in the status of the element is expected? (any effects that last longer than 6 years (i.e. equivalent to a full WFD planning cycle) should be considered as 'long term').
- Will the effect be insignificant in the context of the waterbody? Particularly for the biological quality elements, the spatial characteristics of the element within the context of the waterbody need to be taken into account in determining whether an effect is significant at the scale of the waterbody. Especially in large waterbodies, the effects of a project may be relatively local in extent. A decision on whether such local effects are significant in the context of the waterbody can only be made with certainty if information about the locations of biological quality element species or their supporting habitats is also available. If there is uncertainty, it should not be concluded that effects are insignificant.
- Can it be concluded that there are no potential in-combination effects? For projects that potentially affect a waterbody in several locations the cumulative impacts assessment should start with potential upstream effects and progress downstream.

The above considerations can determine if there is a risk to the potentially affected element, and wither further assessment is necessary for that element. Key elements regarding the conclusions are if an effect is not temporary or if it is confirmed to be insignificant in the context of the waterbody, and if in-combination effects are identified.

Similarly, if there are no implications for a water-dependent EU protected area, no further assessment of that protected area is needed. Note that the WFD is concerned with water-dependent, EU protected areas. However, if potential impacts on an EU protected area are properly assessed as part of the EIA, it is unlikely that further additional work will be required to satisfy the WFD. The same applies to Habitats Directive assessments covering water-dependent features in Special Areas of Conservation or Special Protection Areas. As long as such assessments have been scoped with the WFD requirements in mind, additional WFD-specific work may not be needed.

The Impact Assessment stage carries out an impact assessment for each receptor identified during scoping as being at risk from the activity, for compliance with the objectives of the WFD (i.e. it will not cause or contribute to deterioration of status or jeopardise the waterbody achieving good status). This involves the identification of aspects that may affect a waterbody; understanding the factors that threaten or maintain the WFD objectives; an assessment of the impact of the development on the relevant objectives; and conclusions. The impact assessment will describe any mitigation measures required to deal with any residual risk, where negative impacts on a waterbody cannot be fully avoided or uncertainty remains of the extent of impact, to prevent the potential to cause deterioration of its status or jeopardise its attaining good status.

Context

The Deenish fish farm site is located in Kenmare River, to the east of Deenish island (Figure **Error! No text of specified style in document.**-1). The aquaculture site has been in operation since 1995, the licenced expired on 15/02/2007 and has been operational under Section 19A(4) of the Fisheries (Amendment) Act, 1997[6] since that time. The T06-202 proposed licence application requests to grow Atlantic salmon (*Salmo salar*) in open net pen aquaculture to:

- a maximum allowable biomass (MAB) of 2,200 t at the site, which is a change from the existing licence which allows for an annual harvest of 500 t.
- an expansion of the boundaries of the licensed area from 14.5 ha to 33.5 ha.
- a maximum number of 15 pens.

[6] https://www.lawreform.ie/_fileupload/RevisedActs/WithAnnotations/HTML/en_act_1997_0023.htm#SEC19A

The net pens will be of heavy duty polyethylene structure and mesh nets, set out in a 5x3 grid arrangement. The pens will have a 126m circumference and a net wall depth of 11m and a depth to the cone of 20, except for two pens in the northwest of the site that will each have a net wall depth of 8m and a depth to cone of 12m, due to the water depth in that area. The total capacity will be in the region of over 250,000 m^3. These will be supported within heavy duty polyethylene or steel base frames set at regular intervals around the floatation ring, upon which stanchions will be mounted to support the heavy duty handrail that runs around the pen. Pen nets, mooring, bridles and sinker ropes will be supported off the base frames. Fence nets and bird (top) nets will be supported off the handrails and stanchions. The submerged mooring grid is a heavy-duty rope-work structure comprising a series of squares, each of which supports a pen, and is anchored to the sea bed. Each corner will be supported by a buoy. Each mooring will comprise a heavyweight braided nylon rope running from each grid corner, attached to a length of heavy-duty anchor chain and a 1 t to 1.5 t anchor. Radar reflectors and navigational lights (4 sec 2 mile) will be positioned on the four corners of the grid block, also corner buoys with navigation lights will mark the 4 outer comers of the proposed site. The lights will be attached to the stanchion of the pens, or moored independently.

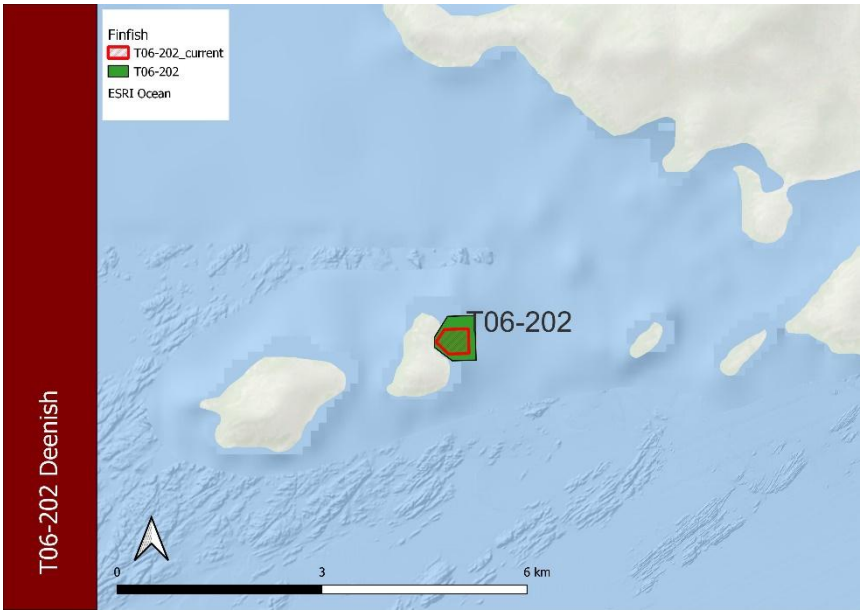

Figure Error! No text of specified style in document.**-2 Location of the application site, and current site.**

The site will be operated under a 2-year production cycle. Month 1 (Mar y1) to month 16 (Jun y2) will be used for growing salmon, months 17 (Jul y2) to month 21 (Nov y2) will be for harvesting. There will be a fallow period of 2+ months from month 22 (Dec y2) through to month 24 (Feb). The proposed production cycle will produce approximately 2,672 T of salmon per growth cycle (of 22 months). The mean cycle Feed Conversion Rate for the stock held at the site is projected to be

1.25. The maximum stocking density of the applicants salmon farms in Ireland is 10 kg/m^3, in line with their organic standards - as stated in the Food and Agricultural Organisation Salmo Salar cultured aquatic species fact sheet "Maximum stocking densities of up to 20 kg/m^3 are usual." (FAO-Salmo salar[7]). For comparison, RSPCA welfare standards for Farmed Atlantic salmon state a maximum of 17 kg/m^3 per pen and 15 kg/m^3 per site.

A feed barge (length 24 m x beam 10 m) would be used to feed the stock automatically via a pipe distribution system using compressed air.

Nets will be made of knotless nylon sheeting, no net antifouling treatment will be used. The mesh size will range from 16mm to 24 mm depending on life stage of the stock. Nets will be cleaned *in-situ using* a pressure washer, with regular diver inspections for maintenance and condition. Top nets, used to protect stock from potential predators, have a mesh size of 80mm.

Harvesting will be on-board a dedicated harvest vessel moored alongside the pen, and the harvest vessel will transfer the fish (along with all the ice and water contained in the well tanks) into chilled tankers for road transit to the packing station in Letterkenny, Co. Donegal.

Freshwater treatments at Deenish would be carried out using a well-boat. The *Ronja Fjord* and *Aqua Transporter* well-boats have been used for this purpose at Deenish in the past. The *Aqua Transporter* has the capacity to desalinate saltwater and can transfer freshwater to the Ronja Fjord if that is needed.

The proposed Deenish operation will use the harbours at Westcove and Derrynane Pier in County Kerry and Ballycrovane, Travara, and Castletownbere in County Cork.

The operations since 2007 have been on the 14.5 ha site. This site is to be fully overlapped by this proposed application. Production cycles varied over the period, but all were equal or lessor impacting than the all-in-all-out 24 month, 2,200 t per cycle, currently proposed in this application. The information and the conclusions set out in this report are relevant and apply to both the assessment of the proposed aquaculture activities and the aquaculture activities undertaken since the licence went operational under Section 19A(4).

Screening

This stage identifies those waterbodies with potential to be affected by the proposed project. It provides detail of the status of each water affected body (each quality element, where available), and reasons for not achieving good status or measures to attain good status, where relevant and available. For the purposes of this WFD Assessment, waterbodies that are within, intersect or

[7] https://www.fao.org/fishery/docs/CDrom/aquaculture/I1129m/file/en/en_atlanticsalmon.htm

which are hydrologically connected to the marine elements of the project have been identified and considered as relevant waterbodies for the different stages of this assessment.

The proposed activity of intensive finfish aquaculture, as described, has no clear pathway to be a causal mechanism to have a significant direct, or indirect, effect on the hydromorphological elements of the waterbodies (to cause significant physical alterations to depth, current direction, wave exposure, intertidal zone structure) or the physico-chemical supporting elements (thermal or salinity conditions) in the waterbodies, based on the size of the operation relative to the size of the waterbody and the localised impacts from the proposed site. The biological quality fish element, is not relevant for Coastal waters.

WFD Waterbodies

The project application supplies the outputs from a water quality dispersion model which identify maximum plume concentration envelopes for the site, regarding various water chemistry and biological elements. This model is used to identify waterbodies that may be potentially affected by the project. The greatest impacting plume (predicted maximum BOD concentration envelope in this case) is identified in Figure **Error! No text of specified style in document.**-3. Waterbodies overlapping this, along with waterbodies that may be significantly hydrologically connected are considered in the vicinity of the site.

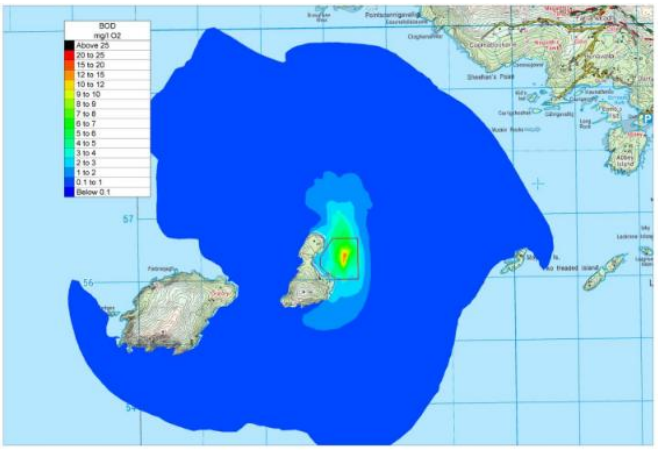

Figure Error! No text of specified style in document.**-3 Greatest impacting plume identified from the model outputs.**

The proposed site is located within the South Western Atlantic Seaboard (HAs 21;22) [IE_SW_150_0000} waterbody. It is 4.4 km from Ballinskelligs Bay [IE_SW_200_0000] and 5.6 km from Outer Kenmare River [IE_SW_190_0000], which are conservatively considered here (Figure **Error! No text of specified style in document.**-4).

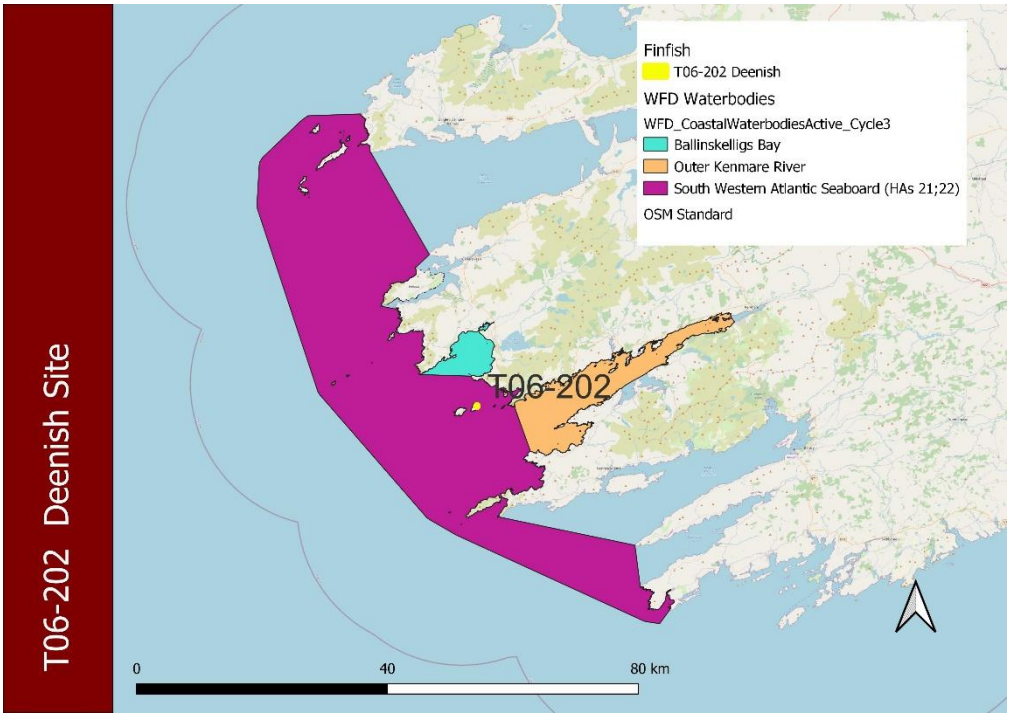

Figure Error! No text of specified style in document.**-4 WFD waterbodies in vicinity of the site.**

The waterbody status results for each of these waterbodies are compiled in Table **Error! No text of specified style in document.**-1, for the most recent and historical reports, along with the future risk assessment status.

The overall status of the South Western Atlantic Seaboard waterbody is *High*, with future status of *Not at risk*. '*Not At Risk*' waterbodies are currently achieving environmental objectives.

The Ballinskelligs Bay waterbody is currently *High*, with future status considered as *Review*. 'Review' waterbodies may be unmonitored and further evidence is required to determine risk. For monitored waterbodies, there may be some evidence of improvement, or measures are planned or are recently implemented, and more time is needed to assess the effectiveness of such measures. Additional monitoring and/or assessment is considered needed.

The Outer Kenmare River waterbody status is currently classed as *Good* status, with future status considered *At risk*. 'At risk' waterbodies are not achieving their environmental objective, or there is a trend that indicates that they may no longer meet their objectives by the end of the cycle. The impacts and issues are known. Actions to restore water quality are required. This *At risk* categorisation is based on '*PBDE - unspecified isomers Failure for Chemical Status IE_SW_190_0000*'. PBDE is Polybrominated diphenyl ethers which are a class of synthetic organobromine compounds which were widely used as flame retardants in a wide range of textile

and polymeric products[8]. PBDEs are ubiquitous, persistent, bioaccumulative and toxic (uPBT) and due to concerns about their environmental impact they were banned in Europe in 2004. Since the ban their main sources are from the disposal of PBDE treated products. PBDE are considered to be persistent ubiquitous substances, which are characterised by their ability to persist in the environment for many years, in some cases decades, even after their production has ceased or been greatly reduced. Due to their uPBT properties and low EQS, PBDEs widely exceed EQS in Europe. As occurrence of uPBT compounds can show wide regional trends but may not reflect specific local water-body management issues, uPBT compounds are reported separately to other priority substances in assessing chemical status. Trend assessments show evidence of decreasing trends[9] in Irish marine waters following Europe-wide regulation of PBDE production and use. Details of the Status and assessment of each waterbody is shown in Table **Error! No text of specified style in document.**-12.

The hazards from the proposed activity are organic enrichment, settled solid waste, and chemical stressors. These could pose a risk to the biological elements (phytoplankton, aquatic flora, macro algae, and invertebrates), the nutrient conditions (nitrogen, phosphorous, orthophosphate), and the supporting chemical conditions (oxygenation and dissolved oxygen) of all 3 waterbodies.

Other protected areas

There are no nutrient sensitive rivers or areas, or drinking water protected areas within the vicinity of the proposed activity.

The proposed site overlaps both the Kenmare River SAC and Deenish Island and Scariff Island SPA in some part. The Appropriate Assessment document[10] identified 3 SAC and 12 SPAs within the zone of influence of the project. The potential of likely significant effects from the proposed project on Natura 2000 or "European" sites has been considered extensively in the Appropriate Assessment documents (Screening document, NIS document, and Appropriate Assessment document) accompanying this application. For the reasons set out in those documents the proposed site will not have any adverse effects on the qualifying interests of any European site and will not compromise the WFD objectives or result in a deterioration or prevent the improvement of the status of any waterbodies in the vicinity of the proposed site.

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[8] EFSA 2024. Update of the risk assessment of polybrominated diphenyl ethers (PBDEs) in food. EFSA Journal, 22: e8497. https://doi.org/10.2903/j.efsa.2024.8497 and EC Scheer committee e39028dd-37ee-4960-a4de-65bf1edd15d4_en

[9] OSPAR QSR and MSFD https://dome.ices.dk/ohat/

[10] Appropriate Assessment for Intensive Aquaculture (T06-202) in Kenmare River SAC [Site Code: 002158] and Deenish Island and Scariff Island SPA [Site Code 004175]. Marine Institute. Oct 2025.

There are 3 regulated Bathing Water Quality locations identified within the vicinity of the proposed site[11]. They are Doire Fhíonáin (Derrynane), Trá na hUíne (Inny Strand, Waterville), and Baile an Sceilg (Ballinskelligs). Doire Fhíonáin (Derrynane) is >5km from the proposed site, and Trá na hUíne (Inny Strand, Waterville) and Baile an Sceilg (Ballinskelligs) are >10km and >9km away respectively. The categories used to classify water quality at beaches and lakes are *Excellent*; *Good*, *Sufficient* or *Poor*, and are based on the water quality results covering a four-year period. All 3 of the beaches identifies above were classified as achieving *Excellent Water Quality* in 2023 based on the assessment of bacteriological results for the period 2020 to 2023, and have achieved an *Excellent Water Quality* rating for the four consecutive years 2020 to 2023[12]. The modelled plume from the proposed site extends to just beyond 3 km from the proposed site. The model results indicate that it is not likely that there would be any significant hazard posed from the site at a distance of 5 km or greater, that would significantly impact on the parameters for Bathing Water Quality locations (*E. coli* and Intestinal Enterococci levels).

WFD Shellfish Areas are to protect or improve shellfish waters in order to support shellfish life and growth. The nearest Shellfish Area is the Kenmare River/Sneem/Ardgroom area, which is greater than 12 km from the proposed site. The modelled plume from the proposed site extends to just beyond 3 km from the proposed site. The model results indicate that it is not likely that there would be any significant hazard posed from the site at a distance of 12km or greater, that would significantly impact on the parameters for WFD Shellfish Areas (*E coli*, heavy metals and organohalogens, salinity, dissolved oxygen, pollution).

Screening conclusions

The screening process identified impact pathways with the following WFD waterbodies:

- South Western Atlantic Seaboard.
- Ballinskelligs Bay.
- Outer Kenmare River.

Hazards to the biological elements (phytoplankton, aquatic flora, macro algae, and invertebrates); the nutrient conditions (nitrogen, phosphorous, orthophosphate); and, the supporting chemical conditions (oxygenation and dissolved oxygen) were identifies for all 3 waterbodies.

[11] *https://gis.epa.ie/EPAMaps*
[12] *www.beaches.ie*

Table Error! No text of specified style in document.**-1 Current and historical status of identified waterbodies.**

Waterbody	SW 2007-2009	SW 2010-2012	SW 2010-2015	SW 2013-2018	SW 2016-2021	Risk for 2027
South Western Atlantic Seaboard[13] - Coastal						
-Ecological Status or Potential	Unassigned	Unassigned	Unassigned	High	High	Not at risk
-Supporting Chemistry Conditions					High	
-General Conditions					High	
-Nutrient Conditions					High	
This waterbody is not on a published monitoring programme.						
Ballinskelligs Bay[14] - Coastal						
-Ecological Status or Potential	Unassigned	Unassigned	Unassigned	High	High	Review
This waterbody is not on a published monitoring programme.						
Outer Kenmare River[15] - Coastal						
-Ecological Status or Potential	High	Good	Good	Good	Good	At risk
--Biological Status or Potential	High	Good	Good	Good	Good	
---Phytoplankton Status or Potential	High	High	High	High	High	
---Other Aquatic Flora Status or Potential	High	High	High			
----Macroalgae Status or Potential	High	High	High			
---Invertebrate Status or Potential	High	Good	Good	Good	Good	
-Hydromorphological Conditions	Good	High	High			
-Supporting Chemistry Conditions	High	High	High	High	High	
--General Conditions	High	High	High	High	High	
---Oxygenation Conditions	High	High	Moderate	Moderate	Moderate	

[13] *https://www.catchments.ie/data/#/waterbody/IE_SW_150_0000?_k=7fammd*
[14] *https://www.catchments.ie/data/#/waterbody/IE_SW_200_0000?_k=e2h0hc*
[15] *https://www.catchments.ie/data/#/waterbody/IE_SW_190_0000?_k=qgzejp*

----Dissolved Oxygen (% Sat)	High	High	Moderate	Moderate	Moderate	
----Other determinand for oxygenation conditions	High	High	High	High		
---Nutrient Conditions	High	High	High	High	High	
----Other determinand for nutrient conditions	High	High	High	High		
----Nitrogen Conditions					High	
----Phosphorous Conditions	High	High	High	High		
Orthophosphate	High	High	High	High		
-Specific Pollutant Conditions	Pass		Pass	Pass	Pass	
-Chemical Surface Water Status			Good	Good	Failing to achieve good -Status Failures Reasons - PBDE - unspecified isomers Failure for Chemical Status IE_SW_190_0000	

Scoping

The Scoping stage identifies whether there is a potential risk to any of the waterbodies identified in the Screening Stage, and is undertaken separately for each water body and each activity. Here waterbodies and activities may be scoped out of the impact assessment if it can be satisfactorily demonstrated that there is no risk to the waterbody.

South Western Atlantic Seaboard

For this waterbody the hazards identified from the proposed activity are organic enrichment, settled solid waste, and chemical stressors. The elements with potential risk are the biological elements (phytoplankton, macro algae, aquatic flora, invertebrates); the nutrient conditions (nitrogen, phosphorous, orthophosphate); and, the supporting chemical conditions (oxygenation and dissolved oxygen).

This waterbody has a status of **High** for all the reported elements, and is classified as **Not at risk**. No significant issues, pressures or areas for action are identified for this waterbody[16]. The area of the waterbody is 155,802.9 ha. The proposed site will be 33.5 ha within the waterbody, equalling 0.02% of the waterbody area.

The impacts from organic enrichment, settled solid waste, and chemical stressor will be periodic on the waterbody, with fallow periods of 2 months in each 24-month cycle, while the licence is active. The biomass on site will grow over the stocking period, from fish input at <100g per fish to a maximum permitted biomass of 2,200 t at around months 17 to month 21 of the production cycle (fish at 2.5kg and greater). Chemotherapeutant use will be ad-hoc, individual events to support the health and disease management of the stock. Chemotherapeutants are regulated by HPRA and their use is on a prescription only basis, from the modelling their use is not likely to be significant on a waterbody and WFD reporting level. The chemotherapeutants are not included in the current lists of priority substances or River Basin Specific Pollutants used to assess surface water status.

Based on the applicant-provided nutrient data in the EIA, there does not appear to be a significant elevation of nutrient concentrations on the wider area resulting from farm inputs. Model outputs indicate that the area of influence around the pens is limited to the licenced area and the close surrounding area to the north of the licenced area. Predicted maximum concentrations for both DIN and phosphate are predicted to dissipate within the boundary of the licenced site. This is

[16] *https://www.epa.ie/publications/monitoring--assessment/freshwater--marine/update-on-pressures-impacting-on-water-quality.php*

supported by other studies[17,18]. Median nutrient concentrations are predicted to be within WFD objectives for high status, even at the edge of the licenced site, even with conservative dilution only modelling approach at a period of maximum production. The combination of modelling and review of annual water-quality monitoring data for the existing site indicates that nutrient discharges from the fish farm will not significantly impact on surrounding water bodies.

There are no other intensive finfish sites within this waterbody, and the nearest other site to this waterbody is T05-233 at an approximate distance of >15 km. Based on the modelled plume from this proposed site, there is not a likelihood of in-combination effect with this site, and it will not combine to any extent to impact WFD elements.

It is concluded that the effects of the proposed site will be insignificant in the context of the waterbody and the proposed site does not pose a risk to the WFD objectives, and will not result in a deterioration or prevent the improvement of the status of this waterbody.

Ballinskelligs Bay

For this waterbody the hazards identified from the proposed activity are organic enrichment, settled solid waste, and chemical stressors. The elements with potential risk are the biological elements (phytoplankton, macro algae, aquatic flora, invertebrates); the nutrient conditions (nitrogen, phosphorous, orthophosphate); and, the supporting chemical conditions (oxygenation and dissolved oxygen).

This waterbody has a status of **High** for all the reported elements, and is classified as **Review** (this status is in regard to the level of monitoring). No significant issues, pressures or areas for action are identified for this waterbody[19]. The area of the waterbody is 4,918.8 ha. The proposed site will be 33.5 ha at a distance of 4.4 km from the edge of this waterbody.

The impacts from organic enrichment, settled solid waste, and chemical stressor will be periodic on the waterbody, with fallow periods of 2 months in each 24-month cycle, while the licence is active. The biomass on site will grow over the stocking period, from fish input at <100g per fish to a maximum permitted biomass of 2,200 t at around months 17 to month 21 of the production cycle (fish at 2.5kg and greater). Chemotherapeutant use will be ad-hoc, individual events to

[17] H. M. Jansen, O. J. Broch, R. Bannister, P. Cranford, A. Handå, V. Husa, Z. Jiang, T. Strohmeier, Ø. Strand. 2018. Spatio-temporal dynamics in the dissolved nutrient waste plume from Norwegian salmon cage aquaculture. Aquaculture Environment Interactions 10: 385–399.

[18] Price, C., Black, K., Hargrave, B., and Morris, J. 2015. Marine cage culture and the environment: effects on water quality and primary production. Aquaculture Environment Interactions, 6: 151–174

[19] *https://www.epa.ie/publications/monitoring--assessment/freshwater--marine/update-on-pressures-impacting-on-water-quality.php*

support the welfare and disease management of the stock. Chemotherapeutants are regulated by HPRA and their use is on a prescription only basis, from the modelling their use is not likely to be significant on a waterbody and WFD reporting level. The chemotherapeutants are not included in the current lists of priority substances or River Basin Specific Pollutants used to assess surface water status.

Based on the applicant-provided nutrient data in the EIA, there does not appear to be a significant elevation of nutrient concentrations on the wider area resulting from farm inputs. Model outputs indicate that the area of influence around the pens is limited to the licenced area and the close surrounding area to the north of the licenced area. Predicted concentrations for both DIN and phosphate are predicted to dissipate within the boundary of the licenced site. This is supported by other studies[20,21]. Median nutrient concentrations are predicted to be within WFD objectives for high status, even at the edge of the licenced site, even with conservative dilution only modelling approach at a period of maximum production. The combination of modelling and review of annual water-quality monitoring data for the existing site strongly suggests that nutrient discharges from the fish farm will not significantly impact on surrounding water bodies.

There are no other intensive finfish sites within this waterbody. The nearest site to this waterbody is T05-233 at an approximate distance of 5 km. Based on the modelled plume from this site, there is not a likelihood of in-combination effect with this site, and it will not combine to an extent to impact WFD elements.

It is concluded that the effects of the proposed site will be insignificant in the context of the waterbody and the proposed site does not pose a risk to the WFD objectives, and will not result in a deterioration or prevent the improvement of the status of this waterbody.

Outer Kenmare River

For this waterbody the hazards identified from the proposed activity are organic enrichment, settled solid waste, and chemical stressors. The elements with potential risk are the biological elements (phytoplankton, macro algae, aquatic flora, invertebrates); the nutrient conditions (nitrogen, phosphorous, orthophosphate); and, the supporting chemical conditions (oxygenation and dissolved oxygen).

[20] H. M. Jansen, O. J. Broch, R. Bannister, P. Cranford, A. Handå, V. Husa, Z. Jiang, T. Strohmeier, Ø. Strand. 2018. Spatio-temporal dynamics in the dissolved nutrient waste plume from Norwegian salmon cage aquaculture. Aquaculture Environment Interactions 10: 385–399.

[21] Price, C., Black, K., Hargrave, B., and Morris, J. 2015. Marine cage culture and the environment: effects on water quality and primary production. Aquaculture Environment Interactions, 6: 151–174

This waterbody has a status of **Good or High** for reported elements except Oxygenation Conditions and Dissolved Oxygen which are **Moderate**. This water body is classified as **At risk**. An *unknown impact type* and *unknown* pressure is listed for this waterbody[22], while this *At risk* categorisation is based on '*PBDE - unspecified isomers Failure for Chemical Status IE_SW_190_0000*'.

The area of the waterbody is 19,264 ha. The proposed site will be 33.5 ha at a distance of 5.6 km from the edge of this waterbody.

The impacts from organic enrichment, settled solid waste, and chemical stressor will be periodic on the waterbody, with fallow periods of 2 months in each 24-month cycle, while the licence is active. The biomass on site will grow over the stocking period, from fish input at <100g per fish to a maximum permitted biomass of 2,200 t at around months 17 to month 21 of the production cycle (fish at 2.5kg and greater). Chemotherapeutant use will be ad-hoc, individual events to support the welfare and disease management of the stock. Chemotherapeutants are regulated by HPRA and their use is on a prescription only basis, from the modelling their use is not likely to be significant on a waterbody and WFD reporting level. The chemotherapeutants are not included in the current lists of priority substances or River Basin Specific Pollutants used to assess surface water status.

Considering the location of the proposed site, being greater than 5km, the proposed site is not likely to have an impact on oxygen parameters in this waterbody. *PBDE* are banned from use and the proposed site and activities will not be a source of PBDE.

Based on the applicant-provided nutrient data in the EIA, there does not appear to be a significant elevation of nutrient concentrations on the wider area resulting from farm inputs. Model outputs indicate that the area of influence around the pens is limited to the licenced area and the close surrounding area to the north of the licenced area. Predicted concentrations for both DIN and phosphate are predicted to dissipate within the boundary of the licenced site. This is supported by other studies[23,24]. Median nutrient concentrations are predicted to be within WFD objectives for high status, even at the edge of the licenced site, even with conservative dilution only modelling approach at a period of maximum production. The combination of modelling and

[22] *https://www.epa.ie/publications/monitoring--assessment/freshwater--marine/update-on-pressures-impacting-on-water-quality.php*

[23] H. M. Jansen, O. J. Broch, R. Bannister, P. Cranford, A. Handå, V. Husa, Z. Jiang, T. Strohmeier, Ø. Strand. 2018. Spatio-temporal dynamics in the dissolved nutrient waste plume from Norwegian salmon cage aquaculture. Aquaculture Environment Interactions 10: 385–399.

[24] Price, C., Black, K., Hargrave, B., and Morris, J. 2015. Marine cage culture and the environment: effects on water quality and primary production. Aquaculture Environment Interactions, 6: 151–174

review of annual water-quality monitoring data for the existing site strongly suggests that nutrient discharges from the fish farm will not significantly impact on surrounding water bodies.

There are 4 other intensive finfish sites within this waterbody. Based on the modelled plume from this site, there is not a likelihood of in-combination effect with this site, and it will not combine to an extent to impact WFD elements in this waterbody.

It is concluded that the effects from the proposed site will be insignificant in the context of the waterbody and the proposed site does not pose a risk to the WFD objectives, and will not result in a deterioration or prevent the improvement of the status of this waterbody.

Assessment Conclusion

The WFD status for Coastal and Transitional waterbodies hydrodynamically linked to the proposed site are outlined above. There are no hazards identified that pose a significant risk to the waterbody to meet the WFD objectives or to maintain its current status. Following assessment, it is considered that the proposed activity:

- is compliant with the requirements of the Water Framework Directive.
- will not cause a deterioration in the status of the Coastal waterbodies assessed.
- does not jeopardise the objectives to achieve ‘Good’ biological status in the waterbodies.
- does not jeopardise the attainment of 'Good’ chemical status in the waterbodies.
- does not permanently exclude or compromise the achievement of the objectives of the WFD in other waterbodies.
- will not compromise achievement of water quality objectives for protected areas within these waterbodies.