[2023] IEHC 129

2021 823 JR

HIGH COURT
JUDICIAL REVIEW

IN THE MATTER OF SECTION 73 OF THE FISHERIES (AMENDMENT) ACT 1997 (AS AMENDED)

BETWEEN

SALMON WATCH IRELAND CLG

APPLICANT

AND

THE AQUACULTURE LICENCES APPEALS BOARD

AND

THE MINISTER FOR AGRICULTURE, FOOD AND THE MARINE, THE MINISTER FOR ENVIRONMENT, CLIMATE AND COMMUNICATIONS, IRELAND AND THE ATTORNEY GENERAL

RESPONDENTS

AND

BRADÁN FANAD TEO TRADING AS MARINE HARVEST IRELAND
COMHLUCHT IASCAIREACHTA FANAD TEORANTA TRADING AS MOWI IRELAND
SAVE BANTRY BAY, CARE OF ALEC O'DONOVAN,
BREDA O'SULLIVAN,
JOHN BRENDAN O'KEEFFE
DENIS O'SHEA, KIERAN O'SHEA AND JASON O'SHEA
BANTRY SALMON AND TROUT ANGLERS ASSOCIATION
CHRIS HARRINGTON, VINCENT O'SULLIVAN, PETER MURPHY AND CHRIS FORKER
GALWAY BAY AGAINST SALMON CAGES
JOHN HUNT
FRIENDS OF THE IRISH ENVIRONMENT
INLAND FISHERIES IRELAND
FEDERATION OF IRISH SALMON AND SEA TROUT ANGLERS

NOTICE PARTIES

Judgment of Mr Justice David Holland delivered 16 March 2023

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INTRODUCTION

1. The Applicant ("Salmon Watch") seeks to have quashed a decision by the first respondent (ALAB) to grant an aquaculture licence under S.40 of the Fisheries (Amendment) Act 1997 (the "Impugned Decision" and "the 1997 Act") to the first Notice Party ("MOWI") to build and operate a salmon farm at Shot Head, on the north shore of Bantry Bay, near Adrigole, County Cork.

2. The licensing process was lengthy. MOWI applied for the licence in June 2011. The Minister for the Marine granted it in September 2015. 14 appeals ensued - one by Salmon Watch and the others by the second to seventeenth Notice Parties. ALAB did not determine the appeal in MOWI's favour until June 2021 and the Licence issued in January 2022. This case is for joint trial with two similar cases for 3 weeks from 18 April 2023.

3. While many grounds of judicial review are in issue, this judgment concerns only Salmon Watch's allegation that ALAB erred in law in its consideration and decision as it related to the issue of the likelihood of eutrophication, by way of excessive nitrogen enrichment, of the waters of Bantry Bay by reason of the operation of the proposed salmon farm and in the context of compliance with the Water Framework Directive[1] ("WFD"). Nitrogen is a "nutrient" for purposes of the WFD. In the case of salmon farms, it derives from the feed used to grow salmon. The issue for decision in this judgment is whether Salmon Watch should have leave to cross-examine the expert deponents of ALAB and MOWI on this issue.

[1] Directive 2000/60/EC establishing a framework for Community action in the field of water policy as amended up to and including Commission Directive 2014/101/EU.

4. It is important to state that this interlocutory judgment, as to technical issues and expert opinions, is emphatically an attempt to describe and elucidate issues and disputes and should not be read in any degree as attempting to resolve them in any degree in favour of either party. Insofar as it necessarily comments on the cases and evidence of both sides, my comments should be viewed in that light and not as a concluded view on any matter. Nor should they be taken as evincing a willingness to enter at trial into a review of the merits of the impugned decision other than as to irrationality and mistake of fact (to the limited extent such a mistake is justiciable). Nonetheless, it must be observed that this is a case in which irrationality and error of fact are pleaded. This judgment is also the product of necessarily brief interlocutory argument on a complex regulatory regime under the WFD. It should not be read as making definitive findings as to the proper interpretation of that regime and its proper application to facts. My views in those regards are necessarily both diffident and provisional pending fuller argument at trial. Nonetheless, at least some description of that regime is necessary to the decision at hand.

CROSS-EXAMINATION OF DEPONENTS IN JUDICIAL REVIEW – THE LAW

5. The law in this area is not much in dispute. The underlying general principle is that where a conflict of evidence on affidavit requires that the evidence of one witness be preferred to that of another, it is unfair to prefer the evidence of the one to the evidence of the other without giving the other an opportunity, under cross-examination, to respond to the evidence of the one and to explain any matters which might suggest that his/hers should be preferred. Where the evidence of both is on affidavit, preferring one to another is not merely unfair: it is especially unreliable as the court is deprived of an appraisal of the witnesses in person giving evidence viva voce and being tested in cross-examination. As a result, it is considered that conflicts of evidence as between affidavits can usually be resolved only by cross-examination. Clarke C.J. in **RAS Medical**[2] considered that:

> *"It is not permissible to invite a court to reject sworn testimony either on the basis that there is sworn testimony to the contrary or that the testimony might be said to be either lacking in credibility or unreliable (on the basis of, for example, a documentary record) without giving the witness concerned an opportunity, under cross-examination, to explain, if that be possible, any matters which might go to credibility or reliability."*
>
> *"Where, for example, two individuals have given conflicting affidavit evidence and where it is considered that a resolution of the dispute between those witnesses is necessary to the proper disposition of the case, then there has to be cross-examination and the onus in that regard rests on the party on whom the onus of proof lay to establish the contested fact."*

6. So if in such circumstances cross-examination does not occur, the conflict is resolved against whomever bears the onus of proof on the specific matter in dispute. As Butler J said in **Re Bayview**

[2] RAS Medical v. RCSI [2019] 1 I.R. 63.

Hotel[3] as to disputed facts, *"failure to cross-examine an opposing deponent can, and generally will, be fatal to the party bearing the onus of proof …".* The necessity of cross-examination in such circumstances was recently re-iterated in **Arderin Distillery**.[4]

7. However cross-examination is necessary only where facts – or, in the case of expert witnesses, opinions – are genuinely in dispute and resolution of that dispute is material to the determination of the proceeding. Given the inherent unpredictability of litigation and that motions to cross-examine are, as here, decided at an interlocutory stage prior to full exploration of the issues at trial, it is unsurprising that Clarke C.J. in **RAS Medical** referred to the necessity of cross-examination as to ***"****potentially"* conflicting evidence.

8. In **Somague**[5] Baker J noted that Order 40, rule 1 of the Rules of the Superior Courts[6] permits a party, with leave of the court, to serve a notice to require the attendance for cross-examination of a person making any affidavit. Baker J observed that it is not usual to have cross-examination of the deponents in a judicial review because the judge engaged in a judicial review is usually not enquiring into the facts. To which one might add that such a judge is not usually engaged either in choosing between expert opinions – especially where the impugned decision was by an tribunal expert in making such choices. Baker J cited **Seymour**[7] as the leading case - in which O'Donovan J said *"… it is impossible for a judge to resolve a material conflict of fact disclosed in affidavits."* O'Donovan J continued to the effect that where it is debateable whether cross-examination is either *"necessary or desirable, the court should tend towards permitting"* it. But the decision is in the discretion of the court - which should be exercised in favour of cross examination "*only if the court considers that it is necessary for the purpose of disposing of the issues which the court has to determine*." Baker J elaborated to the effect that O'Donovan J. did not take a restrictive view of what might be a "fact" and

- Cross-examination may be permitted not merely as to facts taken in the narrow sense, but also as to the construction of, interpretation of, or conclusions to be drawn from, facts as to which there is no real dispute.

- Thus opinions and conclusions may be tested by cross-examination.

9. Of present relevance, Baker J cited O'Donovan J. for the "*general proposition*" that if an opinion expressed in an affidavit,

> *"… is challenged, notwithstanding that the facts upon which the opinion is based are not*

[3] Re Bayview Hotel (Waterville) Limited [2022] IEHC 516.

[4] Arderin Distillery Ltd v. Revenue Commissioners [2022] IEHC 267 (High Court (General), Phelan J, 10 May 2022).

[5] Somague Engenharia S.A. v Transport Infrastructure Ireland [2015] IEHC 723 (High Court, Baker J, Ireland - High Court, 13 October 2015).

[6] "Upon any petition, motion, or other application, evidence may be given by affidavit, but the Court may, on the application of either party, order the attendance for cross-examination of the person making any such affidavit."

[7] Director of Corporate Enforcement v. Seymour [2006] IEHC 369 - followed by Kelly J. in IBRC v. Quinn [2012] 4 IR 381.

> *disputed, the court is entitled to know the mindset of the challenger and, in my view, the only way that that can be ascertained is by confronting the challenger under cross examination."*

Baker J considered that, while O'Donovan J. identified the primary purpose of cross-examination on affidavit as to allow a judge *"to resolve a material conflict of fact disclosed in affidavit", "Of more importance is the fact that O'Donovan J. suggested that the discretion of the court should be exercised when cross-examination is necessary for the disposing of the issues."*

10. Notably, in rejecting an assertion that the application was an attempt at "*fishing*", in the hope that something might "*turn up*" on cross-examination, Baker J observed that:

> *"The application to cross-examine has a narrow and identified focus and does not seek to trawl through the entire affidavit evidence of the respondent."*

She also emphasised that pleadings in judicial review precisely limit its scope and directed that cross-examination be confined to issues pleaded and those identified in her judgment.

11. In **Trafalgar**[8] Barniville J cited RAS Medical and Somague and approved **Delany & McGrath**[9] to the effect that decisions since Seymour *"have reiterated the orthodoxy that there has to be a conflict of evidence on affidavit, the resolution of which is necessary to decide an issue before the court in order for cross examination to be ordered".* Barniville J cited Kelly J in **IBRC v Moran**[10] to the effect that:

> *'It is incumbent upon an applicant for such an order to demonstrate*
> *(1) the probable presence of some conflict on the affidavits relevant to the issue to be determined and*
> *(2) that such issue cannot be justly decided in the absence of cross examination.'"*

While clearly concerned to recognise the restoration of what he considered orthodoxy, the word "*probable*" is notable in the excerpt from Moran cited by Barniville J. Perhaps it may be a somewhat more demanding standard than is indicated by the use by Clarke CJ of the word "*potentially*". But while not ruling out the possibility, I doubt that cases will be common in practice in which such a distinction will make a difference.

12. Given the facts in this case, I am grateful to Butler J for her consoling observation in **Re Bayview Hotel**,[11] that these matters are "*rarely as straightforward*" as might at first seem. She continued:

[8] Trafalgar Developments Ltd v. Mazepin [2021] IEHC 69 (High Court (General), Barniville J, 1 February 2021).
[9] Civil Procedure §21-108.
[10] Irish Bank Resolution Corporation v Moran [2013] IEHC 295.
[11] [2022] IEHC 516.

> *"Not every contested fact will be crucial to the issues the court has to determine. ..... apart altogether from the reliability or credibility of evidence, there may be other factors which have a bearing on the attitude a court might take to evidence which is, prima facie, disputed. Much will depend on exactly what the court is required to determine and on the extent to which and the basis on which the evidence is challenged. Thus, at its most simple, the contents of a statement or a document may be disputed but not the fact that the statement was made or the document served and received. The making of a statement or the existence of a document may have evidential significance independent from their contents."*

13. As Butler J noted, and as this case illustrates, the implications of RAS Medical are far-reaching.

THE PLEADINGS

14. Salmon Watch impugns ALAB's Impugned Decision on many grounds. Now in its 4th iteration, the much-amended Statement of Grounds runs to 79 pages. Mercifully, I need here consider it only as it relates to the specific issue of Dissolved Inorganic Nitrogen ("DIN") at Ground 9 and Ground 16.

15. Ground 16 impugns ALAB's Impugned Decision as "*invalid for unreasonableness and/or inadequacy of reasons, because it is based on a misrepresentation or clear error of fact in relation to breach of environmental quality standards for inorganic nitrogen*." Salmon Watch pleads that the Impugned Decision is "*irrational, misrepresents the facts, and is unreasoned or inadequately reasoned*". More specifically, and as to the Environmental Quality Standard ("EQS") for DIN in waters, 170µg/l (0.17mg/l) it asserts that:

- The evidence before ALAB was incapable of supporting ALAB's conclusion that there would be no breach of the EQS.
- The evidence before ALAB was capable of supporting the only the contrary conclusion.
- ALAB's decision was based on a clear misrepresentation of fact, evident on the face of the decision and going to ALAB's jurisdiction. MOWI used inconsistent and contradictory figures to argue that there would be no breach of the EQS. ALAB erred in law by failing to identify and correct that misrepresentation.
- ALAB's reasons for its decision are inadequate: it failed to explain how it concluded that the salmon farm could operate in compliance with the EQS without the application of a mixing zone. The reasons given for the Impugned Decision were logically incapable of leading to that conclusion.

16. Ground 9, as here relevant,[12] asserts:

- non-compliance with Article 4 WFD as to the application of the precautionary and preventive approach required by Recital 11 WFD as to deterioration of the high quality status coastal waters of Bantry Bay.

- that Article 4 requires that, before authorising a discharge, the authorising authority must satisfy itself, on a preventive and precautionary basis, that the proposed activity will not cause a deterioration in water quality.

- that deterioration occurs where a water body's status under any one of the quality criteria listed in Annex V[13] is reduced and that Annex V stipulates that coastal waters are at 'high' quality status when, in respect of general conditions, "*the physico-chemical elements*[14] *correspond totally or nearly totally to undisturbed conditions*," and, "*nutrient concentrations remain within the range normally associated with undisturbed conditions.*"

- the DIN limit (also termed an EQS[15]) for high quality status of coastal waters set by the implementing regulations[16] is 0.17mg/l (170µg/l). The salmon farm will or could cause a breach of that limit. In any event that limit is incompatible with the Annex V requirement of "*nutrient concentrations remain within the range normally associated with undisturbed conditions.*"

THE WATER FRAMEWORK DIRECTIVE & ITS DOMESTIC IMPLEMENTATION

17. Though, understandably in the time available to them at hearing, the parties did not plumb the depths of the WFD regime, it does seem to me useful to consider that regime, at least in outline, in seeking to identify what is likely to be at issue at trial. However, I again emphasise that the views which follow are provisional as expressed in an interlocutory judgment and pending further argument.

The WFD

18. The WFD operates, as here relevant, primarily via a concept of "*surface water status*". **Article 4 WFD**, as to "*Environmental Objectives*", requires Member States to protect, enhance, restore and prevent the deterioration of all surface water bodies[17] with "*the aim of achieving good*

[12] I have excluded here Ground 9 as it relates to mixing zones as ALAB and MOWI have clarified that the licence provides for no mixing zones.

[13] Amongst which is "nutrient conditions". DIN is a nutrient.

[14] Amongst which is "nutrient conditions".

[15] Whether or not accurately as a matter of nomenclature.

[16] European Communities Environmental Objectives (Surface Waters) Regulations 2009 as amended, including by the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019.

[17] By Article 2, and as to chemical status, "surface water bodies" includes territorial waters.

surface water status".[18] **Recital 11 WFD** requires the application of a precautionary and preventive approach to WFD requirements – unsurprisingly as these are general and foundational principles of EU environmental law in the attainment of the aim of a high level of environmental protection to which **Article 191(2) TFEU**[19] commits the EU – **Eco Advocacy**.[20] Those principles can, if needs be, take precedence over economic considerations, and justify even substantial adverse economic consequences - **Bayer Crop Science**.[21]

19. By **Article 2(17) WFD**, surface water status is determined by the poorer of its ecological status and its chemical status. This has resulted in the '*one out all out*' principle, according to which the status of a body of water is to be demoted a class if the ratio of one of the quality elements falls below the level for its current class – see **the Weser Case** (cited by Salmon Watch).[22] Annex V §1.1.4 WFD identifies "Nutrient Conditions" as a "*quality element*" of Coastal Waters. But the **Weser Case**[23] also confirms that the concept of '*deterioration of the status'* of a body of surface water includes deterioration which does not result in classification of that body of water in a lower class. It also confirms that no project is to be allowed to impede the acquisition or maintenance of good surface water status, or to cause deterioration of water status[24] and projects which might do so must not be permitted.

20. **Article 2(21) WFD** defines 'Ecological status' of surface waters as an expression of the quality of the structure and functioning of their aquatic ecosystems, classified in accordance with Annex V. Annex V identifies quality elements for the classification of ecological status as including "*nutrient conditions*". As to High Status Coastal Waters, Annex V requires that, in respect of general conditions "*the physico-chemical elements correspond totally or nearly totally to undisturbed*

[18] By Article 2, 'Good surface water status' means the status achieved by a surface water body when both its ecological status and its chemical status are at least 'good'. 'Good surface water chemical status' means the chemical status required to meet the environmental objectives for surface waters established in Article 4(1)(a), that is the chemical status achieved by a body of surface water in which concentrations of pollutants do not exceed the environmental quality standards established in Annex IX and under Article 16(7), and under other relevant Community legislation setting environmental quality standards at Community level.

[19] Article 191(2) TFEU reads: Union policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the Union. It shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay.

[20] Case C-721/21 - Eco Advocacy Clg – Opinion of AG Kokott §61; Case C-575/21 -Wertinvest Hotelbetriebs Gmbh v Magistrat Der Stadt Wien – Opinion of AG Collins §47; both citing Judgment Of 31 May 2018, *Commission* V *Poland* (C-526/16, Not Published, Eu:C:2018:356, §67).

[21] Judgment of the General Court of the EU 17. 5. 2018 — Joined Cases T-429/13 AND T-451/13, Bayer CropScience and others v commission §65 & §106 citing orders of 18 February 1998, *Comité d'entreprise de la Société française de production and Others* v *Commission*,T-189/97, EU:T:1998:38, paragraph 48, and of 1 June 2015, *Polyelectrolyte Producers Group and SNF* v *Commission*,T-573/14, not published, EU:T:2015:365, paragraph 32; see also, to that effect, judgment of 27 June 2000, *Salamander and Others* v *Parliament and Council*,T-172/98 and T-175/98 to T-177/98, EU:T:2000:168, paragraph 62) judgments of 9 September 2011, *Dow AgroSciences and Others* v *Commission*,T-475/07, EU:T:2011:445, paragraph 143; of 6 September 2013, *Sepro Europe* v *Commission*,T-483/11, not published, EU:T:2013:407, paragraph 85; and of 12 December 2014, *Xeda International* v *Commission*, T-269/11, not published, EU:T:2014:1069, paragraph 138).

[22] See also R (Seiont, Gwyrfai and Llyfni Anglers' Society) v Natural Resources Wales et al [2015] EWHC 3578 (Admin).

[23] Case C-461/13, Bund für Umwelt und Naturschutz Deutschland eV v Bundesrepublik Deutschland, & Freie Hansestadt Bremen. See also Paloniitty Journal of Environmental Law (2016) 28 (1): 151. Oxford University Press 2016.

[24] If no exemption has been granted under Article 4(7).

conditions," and that *"Nutrient concentrations remain within the range normally associated with undisturbed conditions."*[25] Note that this is not explicitly defined in terms of EQSs.

21. Article 2(24, 31 & 35) WFD define:

- '*Good surface water chemical status*'[26] as the chemical status achieved by a body of surface water in which concentrations of pollutants do not exceed the environmental quality standards established in Annex IX[27] and under Article 16(7)[28], and under other relevant Community legislation setting environmental quality standards.

- '*Pollutant*' as any substance liable to cause pollution,[29] in particular those listed in Annex VIII. Annex VIII sets out an Indicative List of the Main Pollutants. It includes "11. *Substances which contribute to eutrophication (in particular, nitrates and phosphates)*."[30] I understand "nitrates" to include DIN.

- '*Environmental quality standard*' ("EQS") as the concentration of a particular pollutant or group of pollutants in water, sediment or biota which should not be exceeded in order to protect human health and the environment.

22. So, Nitrogen, in the form of DIN, is a nutrient for the purposes of the WFD, the presence of which informs the ecological status of waters and for which purpose, as far as I can see, the question of an EQS does not arise as far as the WPS is concerned. However it is also, within **Annex VIII WFD** a "*Main Pollutant*", the presence of which informs the chemical status of waters. For that purpose, as far as I can see, the question of an EQS can arise – though WFD Annex V §1.2.6, in setting rules for deriving EQSs for pollutants listed in Annex VIII, excludes Nitrogen.[31]

[25] As to Good Status waters it requires that "Nutrient concentrations do not exceed the levels established so as to ensure the functioning of the ecosystem and the achievement of the values specified above for the biological quality elements."

[26] i.e. meeting the environmental objectives established in Article 4(1)(a) WFD.

[27] Annex IX - The 'limit values' and 'quality objectives' established under the re Directives of Directive 76/464/EEC shall be considered emission limit values and environmental quality standards, respectively, for the purposes of this Directive. They are established in the following Directives: (i) The Mercury Discharges Directive (82/176/EEC) (ii) The Cadmium Discharges Directive (83/513/EEC) (iii) The Mercury Directive (84/156/EEC) (iv) The Hexachlorocyclohexane Discharges Directive (84/491/EEC) and (v) The Dangerous Substance Discharges Directive (86/280/EEC)

[28] 7. The Commission shall submit proposals for quality standards applicable to the concentrations of the priority substances in surface water, sediments or biota.

[29] Article 2 WFD defines 'Pollution' as the direct or indirect introduction, as a result of human activity, of substances or heat into the air, water or land which may be harmful to human health or the quality of aquatic ecosystems or terrestrial ecosystems directly depending on aquatic ecosystems, which result in damage to material property, or which impair or interfere with amenities and other legitimate uses of the environment.

[30] I understand "eutrophication" to be the excessive enrichment of waters with plant nutrients – especially nitrogen and phosphorous. It stimulates excessive plant and algal growth which is inimical to underwater fauna.

[31] It provides that in deriving environmental quality standards for pollutants listed in points 1 to 9 of Annex VIII for the protection of aquatic biota, Member States shall act in accordance with the following provisions. In Annex VIII "Substances which contribute to eutrophication (in particular, nitrates and phosphates)." Are listed at point 11.

23. Notably, **Article 4(6) WFD** allows that "*temporary deterioration in the status of bodies of water shall not be in breach of*" the WFD – but only on various conditions, including that the deterioration be the "*result of circumstances of natural cause or force majeure which are exceptional or could not reasonably have been foreseen*". That this implies that "*temporary deterioration"* which does not meet these conditions is a breach of the WFD appears to be confirmed by the Weser Case. It holds that *"As regards the criteria for concluding that there is a deterioration of the status of a body of water, it is clear from the scheme of Article 4 of Directive 2000/60, in particular Article 4(6) and (7), that a deterioration of the status of a body of water, even if transitory[32], is authorised only subject to strict conditions. It follows that the threshold beyond which breach of the obligation to prevent deterioration of the status of a body of water is found must be low."*

24. Salmon Watch also argues that "local" deterioration is a breach of the WFD. And it says that the word "*transitory"* means that however short in point of time an exceedance of an EQS may be, it is a breach of that EQS. In this respect, Salmon Watch cites the precautionary principle which, as we have seen, is recited in the WFD as applicable. One may, I suppose, add mention of the preventive principle as also recited.

25. Indeed, Salmon Watch at hearing intimate an argument that:

- as the Weser Case confirms, no project is to be allowed to impede the acquisition or maintenance of good surface water status, or to cause deterioration of water status[33] and projects which might do so must not be permitted and

- adding reference to the precautionary and preventive principles, it follows that, in mandating a negative outcome of an application for permission in particular circumstances, the WFD regime is analogous to the Habitats Directive Appropriate Assessment regime ("AA"), such that a high standard of scientific proof is required of applicants for permission that deterioration of water quality will not result from development if permitted.

Salmon Watch suggests that this issue may require a reference to the Court of Justice of the European Communities – for which purpose need factual findings to underlie any such reference will be needed. Whether such an argument is open to Salmon Watch on the pleadings was not argued and I will not decide it now. For present purposes however, counsel for Salmon Watch relies on the analogy with AA also in pointing out that in a recent **ETI** case[34] in which AA was in issue, the applicant for judicial review failed for want of cross-examination.[35]

[32] Emphases in this judgment are added unless the contrary is indicated.

[33] if no exemption has been granted under Article 4(7).

[34] Environmental Trust Ireland v An Bord Pleanála, & ors incl Cloncaragh Investments Ltd [2022] IEHC 540 §268 et seq.

[35] See §281 et seq.

The Surface Waters Regulations

26. The WFD is transposed in Ireland by the **Surface Waters Regulations**.[36] **Article 3** defines "*good surface water chemical status*" in terms of not exceeding the EQSs established in **Schedule 6**. Schedule 6 sets no EQS for DIN. However **Articles 9 and 7** combine to require that, inter alia aquaculture licences, lay down emission limits which "*aim to achieve*" the stipulated environmental objectives, including the EQSs set out in **Schedule 5**. Schedule 5, sets "*Criteria For Calculating Surface Water Ecological Status And Ecological Potential*" and **Table 9 of Schedule 5** lists "*Physico-chemical conditions supporting the biological elements*". Under the heading "*Nutrient Conditions*" it stipulates a winter EQS for DIN in High Status[37], Salt Water, Coastal Water Bodies, such as that in issue here, of ≤ 0.17 mg N/l[38] (that equates to 170 µgN/l.[39]). I am not clear that, as far as the WFD requires, this is properly to be called an EQS – which may be a term more appropriate to chemical as opposed to ecological status. However, that may well be an issue of form/terminology rather than substance and it is described as an EQS in Article 7(a). What is clear is that the licensing application in the present case proceeded on the basis that an "EQS" had been set for DIN at ≤ 0.17 mg N/l and all parties agree it applied – though what application means in practice and in law may prove in due course to be at the heart of the dispute as to this Ground.

27. However, Table 9 itself sets no standards other than *"≤ 0.17 mg N/l*" for assessing whether the EQS is breached or met. From that position, a number of questions may arise. Is that standard to be applied as an average and if so over a specified time or over a specified number of samples or as a rolling average over a specified time or number of samples? Or will any one sample > 170 µgN/l constitute a breach? Is there a tolerance for one or a specified number of samples > 170 µgN/l in a greater number of samples? Over what unit of geographical area is the sampling to be applied? (MOWI and ALAB seem to say the entire of Bantry Bay: Salmon Watch disagrees) What is the number of samples to be taken in a specified geographical area? Is the result to be measured against the EQS an average for the area. Under what environmental conditions are samples to be taken – for example, flood tide, ebb tide? Indeed these are the questions of a layman. They may be misconceived, inapplicable and/or irrelevant. Perhaps the answers are found elsewhere. However it does seem likely that, in order to lawfully apply that EQS, those or some such methodological questions will require to be answered. RPS[40] says that the derivation and adoption of EQSs is a lengthy process. Each has been standardised and reported in the scientific literature for at least 15 years. The process involves extensive and ongoing review and assessment of data and generally

[36] European Communities Environmental Objectives (Surface Waters) Regulations 2009 As Amended, including by the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019.

[37] Schedule 4, Table 4 of the Surface Waters Regulations defines High Ecological status as follows: There are no, or only very minor, anthropogenic alterations to the values of the physico-chemical and hydromorphological quality elements for the surface water body type from those normally associated with that type under undisturbed conditions. The values of the biological quality elements for the surface water body reflect those normally associated with that type under undisturbed conditions, and show no, or only very minor, evidence of distortion. Article 37 of the Surface Waters Regulations stipulates that the Ecological status shall be calculated as follows — (inter alia) (1) A body of surface water for which the calculated ecological quality ratio values for the biological quality elements show no or only very minor evidence of distortion from undisturbed or reference conditions, and where there are only very minor anthropogenic alterations to the status of the hydromorphological quality elements and where the values for the biological and physico-chemical quality elements satisfy the relevant criteria established in Schedule 5 of these Regulations, shall be classified as being of high ecological status.

[38] i.e. less than or equal to 0.17 milligrams of Nitrogen per litre of water. A milligram is one thousandth of a gram.

[39] A microgram is one millionth (1×10^{-6}) of a gram.

[40] See below.

results in the derivation of a draft standard, prior to the final approval of an EQS. However, I have not been directed to any source of answers to any such questions.

Mixing Zone

28. Essentially, a mixing zone is a permissible and limited area, at or close to a discharge, in which, on certain conditions, an EQS can be exceeded pending dissolution and dispersion of a pollutant (using that word to include Nitrogen). The pleadings as to a mixing zone developed over time having regard to difference and doubt whether the licence allowed a mixing zone. At this point it is agreed that the Licence does not assume or allow a mixing zone. Its remaining relevance is to Salmon Watch's plea that the EQS for Nitrogen cannot be met without a mixing zone, given, as it says, the EQS will be exceeded in the immediate vicinity of the salmon farm pending dissolution and dispersion of the source of DIN.

RPS WATER QUALITY REPORT 2015, SUPPLEMENTAL EIS 2018, ALAB'S TECHNICAL ADVISOR'S REPORT 2020 & ALAB'S DETERMINATION 2021

RPS Water Quality Report 2015

29. The RPS Report[41] for MOWI, submitted with the licensing application, is a modelling report investigating the effects on water quality of further development of salmon farming in Bantry Bay - to include MOWI's proposed farm at Shot Head, taking existing salmon farming in Bantry Bay into account. Nitrogen discharges arising from fish feeds, from both ingested and waste feed sources, were modelled over 22 days[42] and a premise of the report is that, in applying the Surface Waters Regulations EQS for DIN of ≤ 0.17 mg N/l[43], a "Worst-Case Scenario" was investigated.

30. As contributing to its "Worst-Case Scenario" RPS[44]:

- modelled the month of January as in that month the farmed salmon are at their biggest and require most feed – their feed being the main source of nitrogen.
- assumed a point discharge of nitrogen at each salmon pen centre, when in reality discharges would occur across each pen and so be more dispersed and dilute at the outset of the simulation than has been assumed.

[41] Full title: Water Quality Modelling for all existing and currently proposed salmon farm sites in Bantry Bay: Water Quality Modelling Report.
[42] To include both neap and spring tidal cycles.
[43] Though it seems that RPS applies a slightly more stringent Scottish EQS of 0.168mgN/l = 168µgN/l. RPS says "the EQS's used are taken directly from SEPA's[43] Manual on Marine Cage Fish Farming". SEPA is the Scottish Environmental Protection Agency. I have not been referred to that manual. I do not know if it clarifies any of the questions posed above as to how an EQS for DIN is to be applied and, if it does, what the legal status in Ireland of that clarification might be.
[44] I do not suggest that what follows is a full account of the contribution assumptions of the Worst-Case Scenario.

- measured Total Nitrogen – whereas about 12% of that is insoluble[45], not DIN.
- applied no decay rate for nitrogen. In reality, nitrogen is readily and rapidly assimilated via plant and bacterial growth in the water column.

31. These choices by RPS are not in dispute as proper to a wors case scenario. Nor, I infer, is it disputed that they result, as RPS say, in a 4-stage compounding of worst case. However, the Applicants say that these choices do not complete the worst case scenario and that another choice made by RPS undermines the RPS analysis as representing the worst-case. Though Salmon Watch did not put it quite this way, its point would seem to be that a "bad scenario", or even a "very bad scenario", is not the same as a "worst case scenario".

32. I now turn to that other choice made by RPS and accepted by ALAB. As I understand, and simplifying no doubt, the RPS model created a "mesh" or, one might say, a mosaic, in which Bantry Bay was divided into 20m^2 nominal cells. The model predicted DIN concentrations in each such cell at 10-second intervals over the 22 days. That generated 190,000 results per cell. It will be easily seen that this resulted in vast amounts of data. To render it comprehensible for analysis and presentation, RPS generated various displays of the data. However Salmon Watch in effect argue that the mode of presentation should not be confused with the data that underlies it.

33. One presentation was *"Figure 5.1: Maximum Plume Envelope of Nitrogen Concentration arising from the Shot Head site only."* This pictorially depicted, on a map of Bantry Bay, the maximum value recorded within each cell over the 22 days modelled. The figure or "plot" is useful in showing the maximum values that can be reached at any point throughout the area covered and over the 22 days, but it does not represent a real or single situation in space or time. It is a composite of various points in time. I observe that that will be so as the maximum in a given cell may occur at, say, 08:40 on Day 3 whereas the maximum may occur in its neighbour to the north at say, 23:40 on Day 19[46] - yet both are plotted on the same figure. RPS explain this in two linguistically subtle, but nonetheless quite different ways, though both propositions may be correct:

- *"there is little likelihood of <u>any</u> of the maximum values recorded occurring simultaneously"*[47]

- *"the concentrations shown in the maximum plots would not <u>all</u> occur simultaneously."*[48]

RPS emphasise the first (and more demanding) proposition, observing that:

[45] This simplifies slightly RPS says it would be mineralised and contribute to soluble dispersals over subsequent, non-peak production months.

[46] I have given these examples merely to illustrate the principle. They are not based in any data from the RPS report.

[47] P26

[48] P30

> *"In fact, in most cases, this is very unlikely as each plume passes through the domain over the time period concerned, with the maximum concentration at its centre, undergoing dispersion and dilution as it moves in the prevailing currents.* [49]

However it does seem that each individual maximum datum which contributes to the figure/plot is a "real" (albeit modelled) situation in space and time for the individual cell to which it relates. Oddly, and while the Figure 5.1 no doubt has the utility claimed by RPS, Figure 5.1 may create a risk – or at least Salmon Watch in effect says so – that the trees are lost for the wood.

34. Salmon Watch in effect says – and I am not clear whether the Board or MOWI dispute – that Figure 5.1 does depict an area around MOWI's intended salmon pens of which the following can be said of each cell in that area: that, adding the maximum DIN value of each cell due to the salmon farm to ambient DIN,[50] the maximum Total DIN of each cell would exceed the EQS for at least one (perhaps more[51]) 10-second time step over the 22 days. That, Salmon Watch says – and the Board and MOWI dispute – is the criterion by reference to which breach of or compliance with the EQS should be measured and, Salmon Watch says, it demonstrates non-compliance.

35. RPS also provide an Average Concentration Plume Envelope generated by averaging[52] all the values recorded in all ≤10 second time steps in each cell over the 22 days. Once again, the resulting figure is not related to a given point in time.

36. As to the statistical relationship between the maximum and average plume figures/plots, RPS say they are useful, when compared, to indicate how often the maximum values occur. They say that *"For example, a high concentration may be recorded at one location and presented on the maximum envelope, but when the average plot is interrogated the value is much lower at this location. This indicates that the maximum value obtained was only experienced for a short period of time."* I presume[53] one infers the converse: that if a high maximum concentration is recorded at one location and the average at that location is close to that maximum, it indicates that the maximum value was experienced for a long period of time. By reference to this relationship between maximum and average values, I have not been referred to any actual comparisons or analysis by RPS of the data their model generated. That may well be due to the limited time available for interlocutory hearing and may be addressed at trial.

37. However in that context it seems notable that RPS say two things which, to the layperson such as myself, seem to require some explanation, if not reconciliation:

[49] i.e. that any of the maximum values recorded will occur simultaneously.

[50] Taken and agreed for present purposes as 125 µgN/l, though a lower value was used in 2015. At an ambient DIN of 125 µgN/l any additional contribution from the salmon farm of 46 µgN/l or more would exceed a total of 170 µgN/l.

[51] For example, if the maximum only slightly exceeds one or more other readings.

[52] I think as a mean.

[53] Subject of course to correction at trial.

- "*… the time for which the maximum value persists in any given mesh cell will vary and, overall, the percentage frequency of occurrence will be low due to tidal oscillation*."[54]

- A comparison of the maximum and average plots *"… suggests that the maximum values given in the Maximum concentration Plume Envelope plots do frequently occur or persist for long periods."*[55]

Counsel for ALAB suggested that the phrase above should read "*do not frequently occur"* but that seemed to be merely counsel's inference. While I do not foreclose such an argument at trial, I am not prepared to so infer for present, interlocutory, purposes.

38. The third concept adopted by RPS[56] was "*Typical Ebb and Flood Concentration Plume Envelopes*"[57]. This is important as it was the "Typical" values, modelled as produced by the salmon farm, which RPS added to the ambient values to demonstrate, as they would say, that the EQS for DIN would not be exceeded. MOWI and ALAB stand over this RPS method and Salmon Watch impugn it. RPS describe this concept as follows:

> *"In order to give an indication of the actual dispersion pattern within the Bay for each parameter, the typical flood and ebb contour plots have also been included. These are 'snapshots' from the model for a typical mid-flood or mid-ebb tide situation. Unlike the previous plots, these values can be related to real moments in time."*

39. RPS say that the relationship between the maximum and average plume diagrams is also useful "*for gauging the 'typical' values in any area*". However, the parties did not point me to any content describing what exactly "gauging" is or any method whereby such "gauging" was performed. Nor did they indicate how maximum and average plots explicitly not related to real moments in time permitted gauging of typical values which can be related to real moments in time or why specifically mid-ebb and mid-flood were chosen. Nor was I pointed to any content as to how precise or reliable was the "*indication*" cited. Counsel for Salmon Watch asserted that RPS did not set out how, and by what criteria, they deemed the scenarios they chose as typical to be "typical". Counsel for the Board and for MOWI did not contradict him. Nor could counsel point me to an explanation of how "typical" parameters ("typical" being linguistically something of an analogue to "average") could inform a worst-case scenario. In turn that prompts the question what precisely is meant by the phrase "worst-case scenario". While the phrase might initially be thought self-

[54] P26.

[55] P31 More fully, the RPS Report reads: "The plots in Figure 5.1 to Figure 5.4 all show a disparity between the maximum and average plots of around one to two contour levels in each case, which equates to maxima being two to four times the average values. In that the average plots represent the mean of the values which fall between the maximum values (given) and the minimum value (not given) in each case, this suggests that the maximum values given in the Maximum Concentration Plume Envelope plots do frequently occur or persist for long periods."

[56] In addition to Maximum and Average plumes.

[57] §5.5.2 & Figures 5.5 & 5.6. Figure 5.5: Typical Ebb Plume of Nitrogen Concentration arising from the Shot Head site only. Figure 5.6: Typical Flood Plume of Nitrogen Concentration arising from the Shot Head site only.

explanatory, a little reflection suggests that the assumptions which underlie it could perhaps include criteria such as "reasonableness" or "realistic" or similar criteria and in any event should be transparent. Again, these are the questions of a layman. They may be misconceived, inapplicable and/or irrelevant. They may be based on a misunderstanding of the RPS report. I make no findings by way of answers to them. However, where Salmon Watch's case is that it is irrational to fashion a worst-case scenario by using typical parameters rather than maxima, they seem plausible questions.

Supplementary EIS 2018

40. The Supplementary EIS ("SEIS") resulted from a recommendation in the report on an oral hearing held in 2017 for, inter alia, further "*assessment of the potential impact of salmon farm waste on water quality, having particular regard to the maintenance of 'good water status' as required under the WFD*".

41. The SEIS identifies DIN as amongst the parameters descriptive of "*salmon farm waste".*[58] It addresses DIN primarily in response to controversy at the oral hearing as to the choice of ambient DIN level – a controversy no longer live. Otherwise, as best I can discern, the SEIS as to DIN repeats reliance on the RPS Report, with the same net result.

42. The SEIS said that Maximum and Average plots[59] can be used to help "qualify" Typical plots, and to indicate whether or not they can be treated as representative of a simulation as a whole. I take it that this reference to qualification is to the "gauging" to which RPS referred and to represent a form of cross-checking to confirm, as opposed to generate, the Typical plots. The SEIS described Maximum and Average plume envelope plots as "*hypothetical, statistical plots*" – which is to say, I assume, that they were modelled. The word "hypothetical" may have been intended to refer to the fact that the plotted Maximum plume is made up of cell elements from different timesteps and may have been intended in the sense also that a mean average is inherently hypothetical – if a mean average exists in fact that is only by co-incidence. I have considered these issues above when considering the RPS report. However as Counsel for ALAB and I agreed, the output of the RPS report, including the typical values, was all modelling/simulation – hypothetical and statistical. And it was on that output that ALAB relied.

43. The SEIS asserted that, in contrast, Typical plots offer "*a real representation of dispersal, by providing values for a specific, single timestep only*". But I was not pointed to any content in the SEIS explaining how that single timestep was chosen, what made it typical or how any "typical" scenario fitted into or properly informed a "worst case" scenario. Neither was I pointed to any suggestion that that "typical" scenario was based on real as opposed to modelled data. So I am unclear as to the

[58] §3.3.3

[59] I assume "plot" to refer to the diagram/Figure in its pictorial form.

substance of the contrasting of the "hypothetical" with the "real". Again, I draw no conclusions in these regards, but they seems likely to be live issues in the case.

44. Notably, the SEIS records that:

> *"Selected from a range[60] of DIN dispersal plots available in the RPS WQ document, Figure 3.3 shows a Typical DIN plume plot on flood tide, where the peak value just clear of the proposed Shot Head site is 0.04mg/l DIN."*

The 0.04mg/l (40µg/l) DIN relates to DIN emanating from the salmon farm, but the SEIS does not explain the basis of and criteria for selection from the range of available plots or the typicality of the selection made.

45. The SEIS repeated RPS in saying that an average value for a cell much lower than the maximum implies that the maximum was rare – without articulating the converse or stating which was in fact the case as to DIN.[61]

ALAB'S Technical Advisor's Final Report 2020

46. The Technical Advisor's Report 2020 of Dr Graham Saunders describes the RPS report as using "*a worst-case scenario*". It describes the "worst-case" elements which I have described above as not being in dispute. It does not record any explanation of or interrogation by the Technical Advisor as to the incorporation of "typical" elements into the worst-case scenario or any justification of the typicality of the chosen Typical DIN plume plots.

47. The Technical Advisor (and ALAB) adopts an ambient DIN concentration of 125 µg/l – higher than that used by RPS or in the SEIS. Hence, ambient DIN concentration is no longer controversial. Other than as to ambient DIN, the Technical Advisor essentially adopts the RPS report as to DIN. Adding the RPS Typical DIN concentration of 40 µg/l due to the salmon farm (which the Technical Advisor terms a "*worst case scenario*" and a "*maximum localised nitrogen release*") yields a total DIN of 165 µg/l as the maximum localised nitrogen release – still below the 170 µg/l limit.

[60] Emphasis added.

[61] It did state that as to fish-lice (Copepods) the differences between the Maximum and Average plume plots in Figures 2.10 and 2.11 are so stark that it is evident that the majority of grid cells with density values >0.0005 Copepods/m3 in the Maximum plume plots only retain their values for very short periods of time (i.e. very few timesteps) before diluting to the lowest plotted values. I was unable to discern that it included the same analysis as to Nitrogen.

ALAB's Determination 2021

48. As relevant to the concerns of this judgment, ALAB's determination of 21 June 2021, which resulted in the issuing of the Licence dated 26 January 2022, records[62] ALAB's consideration and acceptance of:

- the RPS Water Modelling Report - to the effect that the proposed salmon farm will not negatively affect Outer Bantry Bay's and Berehaven's WFD classification/water quality status as "High" and "Good" respectively.

- the RPS Water Modelling Report and the Technical Advisor's Final Report to the effect that nutrient releases will not breach the EQS. ALAB therefore conclude that nitrogen[63] from the Site will not be a significant additional nutrient burden to Bantry Bay, will not stimulate algal blooms or enhance naturally occurring blooms and therefore presents no risk to wild or cultivated shellfish or finfish in Bantry Bay.

- the Technical Advisor's Final Report to the effect that the carrying capacity of Bantry Bay in terms of dispersion and breakdown of nutrient farm discharges and the removal of enriching nutrients from Bantry Bay is not expected to be exceeded by the addition of the proposed activity.[64]

THE AFFIDAVITS & THE CROSS-EXAMINATION SOUGHT

49. Neither Dr Saunders nor anyone from RPS has deposed in the case. Salmon Watch seeks to cross-examine two deponents: ALAB's present Technical Advisor, Dr Ciar O'Toole, as to her Affidavit sworn on 23 January for ALAB and Dr Neil Bass, Marine & Environmental Biologist to MOWI, as to his Affidavit sworn on 19 January 2023 for MOWI. Both reply to the Affidavit of John Murphy sworn on 21 October 2022.

50. Relevant elements of the relevant affidavits overlap considerably in their description of the various documents described above. It is in part to avoid repetition that I have described them above. They should therefore be taken as read in considering the following account of the relevant affidavits.

[62] §6.6.2 & 6.6.3 & 6.8.2.

[63] Also phosphorous but that is not here relevant.

[64] This paragraph also addresses issues not here relevant: effects on wild salmonids, the dispersion and breakdown of chemical, and biological farm discharges and Emamectin Benzoate.

Murphy – 10/10/22 – for Salmon Watch

51. John Murphy is a retired Fishery Manager and a director of Salmon Watch. In his affidavit sworn on 10 October 2022, he asserts professional familiarity with the risks posed to wild salmon by salmon farming activities.[65] Having cited the RPS Report, the SEIS and the Technical Advisor's Final Report, his essential point is that the "typical" DIN values RPS describes as likely to be generated by the salmon farm and which it added to the ambient DIN value[66] to produce a total for comparison with the EQS of 170 µg/l, are not maximum values and so do not represent a worst-case scenario or an appropriate element of a comparator with the EQS. He says, in essence, that the typical plume has been incorrectly converted to the "worst case" plume. He also says that what matters is not so much the plume as the maximum DIN concentration within it.

52. Mr Murphy says the correct course is to take the maximum ambient DIN level for the Bay (125µg/l or 0.125mg/l)[67] and add the maximum emission into the plume from RPS Figure 5.1 (70µg/l), giving a maximum emission figure of 195µg/l (0.195mg/l) – a clear breach, he says, of the EQS of 170 µg/l. Thus, he says, the Impugned Decision is irrational as there is no evidence capable of supporting it.

Bass – 19/1/23 – for MOWI

53. Dr Neill Bass is a zoologist and marine scientist retained by MOWI. He recites and disputes Mr Murphy's assertions as to DIN levels. He says, and seeks to demonstrate, that *"Mr Murphy's reasoning on these points is incorrect."* He asserts that *"The Technical Advisor correctly used the measurement of 40ug DIN/L, as representing the worst case nitrogen concentration that will be introduced at the Shot Head site as a consequence of the operation of the proposed farm."* As I read his affidavit, in these observations and as proceeding from his expertise as his opinion, he both impugns Mr Murphy's reasoning and vouches for the contrary view taken by the Technical Advisor – and, by implication, the view of RPS from whose report the Technical Advisor gleaned his view. Dr Bass also reviews the RPS modelling to enable the reader to "*understand why the measurement of 40 ug DIN/L represents the appropriate worst case projection*."

54. It seems clear that Dr Bass did not merely exhibit or recite the materials which had been before ALAB. He sought, properly as an expert, to deploy his expertise and express his opinion to enable MOWI to invite the Court to accept his understanding of what RPS and the Technical Advisor did - and that they were right to do it and did it correctly. Their invitation follows that the court

[65] He elaborates on his relevant academic qualifications and professional experience in his affidavit of 22/11/22.

[66] Which he criticises as being a median value of 115µg/l "selected from a range of DIN dispersal plots available", not a maximum, value – though that argument appears to have receded given the Technical Advisor's adoption of a higher ambient DIN than that suggested by RPS and the SEIS.

[67] As the Technical Advisor did.

should conclude that Mr Murphy's reasoning was "*incorrect*". Dr Bass, as he is entitled to do, clearly invites the Court to prefer his opinion on these matters to Mr Murphy's.

55. Dr Bass states that "*It is of critical importance to understand that neither the maximum, nor the average, plume modelling represented actual projections, but rather were tools employed by RPS to ensure that the typical projections at ebb and flood, which are the actual projections of nitrogen emissions expected from the Shot Head Farm once operational, were accurate.*"

56. In saying that the "*average plume modelling"* was not an actual projection, Dr Bass seems to have been saying no more than that it was an average: it is inherent in a mean that if it represents a real event that is merely a coincidence. In saying that the "*maximum plume modelling"* did not represent an actual projection, Dr Bass cited the RPS explanation. As we have seen, this elucidates that the data for each cell relates to a different timestep from the data for the other cells so that the plume/figure/plot does not represent a particular event or point in time. It is in that sense that the plume/figure/plot does not depict a real situation at a single point in time. But the maxima for each cell which contribute to the plume/figure/plot would seem to be as much "actual" data as are the modelled data which underlie the typical plume/figure/plot.

57. I am unclear in what sense Dr Bass uses the word "*actual*" of the "*typical projections".* The typical projections were modelled, just as were the maximum and average plumes. And while the typical projections each represent a single point in time, Dr Bass does not explain why they were chosen as "typical", what the criteria for "typicality" were or how they can be said to represent a worst-case scenario. Very much provisionally, it does not seem to me clear that the choice of a single point in time necessarily represents the choice of the single worst-case point in time and the word "typical" does not readily suggest a worst case.

58. Dr Bass acknowledges that the term "*maximum plume*" in the RPS report may confuse parties seeking to identify worst case projections for any environmental concern but

> *".....it remains the fact that the "maximum plume" does not identify the worst case projections for nitrogen levels at the Shot Head Farm once operational. The worst case projections were contained in the modelling of the typical ebb and flood plumes* of *nitrogen concentration arising from the Shot Head farm shown on figures 5.5 and 5.6 of the RPS Water Quality Modelling Report.*[68]*..... Consequently, 40 ug DIN/l is the worst case projection of nitrogen concentration arising from the Shot Head farm … the typical ebb and flood plumes of nitrogen concentration represented the worst case projections …"*

[68] Figure 5.5: Typical Ebb Plume of Nitrogen Concentration arising from the Shot Head site only. Figure 5.6: Typical Flood Plume of Nitrogen Concentration arising from the Shot Head site only.

Here again, though describing it as a "*fact*", Dr Bass in reality invokes his expert opinion and invites the Court to prefer it to that of Mr Murphy on the crucial issue for present purposes.

59. Dr Bass again invokes his expert opinion and invites the Court to prefer it to that of Mr Murphy when says that:

> *"… contrary to what has been averred to by Mr Murphy ..it was entirely appropriate for the Supplemental EIS to work from the modelling prepared by RPS in respect of the typical ebb and flood plumes of nitrogen concentration."*
>
> *"Accordingly, the evidence before the Technical Advisor / ALAB was that on a worst case projection, the highest level of nitrogen concentration arising at the Shot Head site once operational is 40 ug DIN/l. It was entirely appropriate for the Technical Advisor to use the figure of 40 ug DIN/L, and add it to the background level, that he had identified of 125 ug DIN/L, in order to identify what in his view would be the worst case nitrogen levels at the Shot Head Farm once it was operational and whether it would still be within the EQS limit of 170 ug DIN/L."*

O'Toole – 23/1/23 – for ALAB

60. Dr Ciar O'Toole is a zoologist and marine scientist and a successor to Dr Saunders as Technical Advisor to ALAB. She disputes Salmon Watch's entitlement to introduce arguments not made to ALAB. I consider that such an issue is to be decided at trial rather than at this interlocutory motion and, in fairness, it was not pressed as the hearing of the motion.

61. Of the DIN issue she says: "*Mr Murphy asserts that there is an error in how ALAB and its Technical Advisor calculated the nitrogen levels arising from the Shot Head site and that, contrary to ALAB's Determination, the limit for nitrogen concentrations would be breached. This is refuted."* Though the word is not universally used in the same sense, it is of at least some interest to observe that, ordinarily, to refute something is not merely to reject or dispute it – it is to prove it wrong.

62. As to Mr Murphy's assertion that the maximum, not the typical, DIN plume values should have informed the issue of EQS-compliance, Dr O'Toole says, *"it is Mr. Murphy who has misunderstood how the nitrogen levels should be calculated."* She clearly asserts and invites acceptance of her view of how "*the nitrogen levels should be calculated"* and of her view that Mr Murphy's understanding in this regard is wrong.

63. As to the substance of her view of how "*the nitrogen levels should be calculated",* Dr O'Toole invokes the RPS report, including the concepts of Maximum Concentration Plume Envelope Average Concentration Plume Envelope and the RPS method, (which I have set out above) and concludes:

- *Therefore the figures for "Maximum Concentration Plume Envelope" should not be relied upon for determining any likely concentrations of nitrogen from the fish farm.*

- *It is the typical flood and ebb contour plots that give an indication of the actual dispersion pattern.*

64. There ensues in Dr O'Toole's affidavit further analysis and invocation of the RPS report much of which I need not rehearse here but which, generally, is to be interpreted as lending it her imprimatur. Inter alia, she describes the typical plumes as "*actual*" and says, "*the maximum typical or actual value*" is the same as the "*maximum or worst case actual value*" - as to which my observations regarding Dr Bass's affidavit apply as to the concepts of "actual", "typical" and "worst-case".

65. Ms O'Toole does not merely state what RPS did – she says that they were right to do it and that Mr Murphy is incorrect to disagree with RPS as to their method. And ALAB, as an expert decision-maker, could not have granted the licence without taking the view that RPS were right to do it. It seems clear to me that, by these various averments, Dr O'Toole invokes her expert opinion and invites the Court to prefer it to that of Mr Murphy on the crucial issue for present purposes.

66. Incidentally it was mentioned, though in fairness not pressed, that the modelling software used by RPS was very well-established and used and relied upon by many and varied governmental and professional entities. Salmon Watch do not doubt that is so. But software is not mechanistic – all depends on how you use it and what choices you make in using it, what inputs you use and to what use you put its outputs. That RPS used excellent software is of course a necessary reassurance as far as it goes - but it is not, per se, an answer to the real issue.

IRRATIONALITY, ERROR OF FACT, REASONS AND ERROR OF REASONING

67. It is not necessary for present purposes to canvass in detail the nuances of the law of irrationality.[69] It suffices to observe that the general **Keegan**[70] test of "*fundamental variance from reason and common sense*" may apply or, as the Impugned Decision is of an expert tribunal, the **O'Keeffe**[71] "*no relevant material*" test may apply.

[69] See for example and recently, Jennings v An Bord Pleanála & Colbeam 2023 IEHC 14.

[70] The State (Keegan) v Stardust Compensation Tribunal [1986] I.R. 642.

[71] O'Keeffe v An Bord Pleanála [1993] 1 I.R. 39.

68. While the phrase "*no relevant material*" characterises the test in O'Keeffe, it bears remembering that the full phrase used by Finlay CJ in that case was "*no relevant material which would support its decision*". The underlined words appear to imply some degree of assessment of the capacity of the relevant material to "*support*" the decision. Humphreys J in **Holohan**[72] framed O'Keeffe as a test whether there was "*a lack of any evidence capable of supporting the decision"*. I draw attention to the word "*capable*". These formulations seem to allow an applicant for judicial review to argue that the "material" before ALAB, even if "relevant" was incapable of supporting the decision – though, as Finlay CJ said, such an argument would require "*something overwhelming*".[73]

69. The question of irrationality may also be framed as one whether the decision flows from its premises (**Keegan**[74]). The premises here arguably include that the prospect of compliance with the EQS as to DIN was to be assessed on the basis of a worst-case scenario and one arguable question being whether reliance on an overtly typical scenario could properly inform a worst-case scenario.

70. Applying the general **Keegan**[75] test of "*fundamental variance from reason and common sense*" Salmon Watch will argue that it was at that variance for ALAB to accept an RPS Report which input typical rather than maximum values into a worst-case scenario - and was all the more so when the report did not explain the choices underlying the typical values. Mr Murphy essentially says so and the case is arguable as the leave granted demonstrates. But Dr O'Toole and Dr Bass disagree and, given the onus of proof on Salmon Watch, will arguably prevail unless cross-examined.

71. Nor, as Salmon Watch pleads error of fact, is it irrelevant to note the observation by Humphreys J, in **Holohan**[76] that the Court can "*quash for material error of fact".*

72. In **Clifford**[77]**,** Humphreys J observed that experts are expected to "*show their workings*" where that is reasonably practicable, rather than to have deference demanded for assertions or conclusions merely because of the position or qualification held by the speaker. And as to the plea that the Impugned Decision was "*unreasoned or inadequately reasoned"*, in **Kevin's**[78] Humphreys J pointed out that if it can be established that the decision-maker in fact adopted an incorrect reasoning process, whether factually or legally, the outcome will not normally be upheld just because the decision-maker could have adopted a different and lawful reasoning process but didn't actually do so.

[72] Holohan v An Bord Pleanála [2017] IEHC 268.

[73] Finlay CJ citing Henchy J in Keegan citing in turn citing Lord Greene M.R. in Associated Provincial Picture Houses Limited v Wednesbury Corporation [1948] 1 K.B. 223.

[74] The State (Keegan) v Stardust Compensation Tribunal [1986] I.R. 642.

[75] The State (Keegan) v Stardust Compensation Tribunal [1986] I.R. 642.

[76] Holohan v An Bord Pleanála [2017] IEHC 268.

[77] Clifford v An Bord Pleanála, O'Connor v An Bord Pleanála [2021] IEHC 459 (High Court (Judicial Review), Humphreys J, 12 July 2021).

[78] Kevin's GAA (Flannery et al) v An Bord Pleanála [2022] IEHC 83.

73. Here, the allegation is that reliance on an overtly typical scenario could not, as a matter of proper reasoning, inform a worst-case scenario. As a matter of logic, that seems arguable. Counsel for Salmon Watch said ALAB and MOWI claim that they are factually correct that the typical is the worst-case scenario and that the question "*How can something that is merely typical be worst case?*" stated his case in a nutshell.

74. Salmon Watch also, and particularly, allege that alternative materials proper to a worst-case scenario were available in the form of modelling data to the effect that DIN levels in each of the individual cells close to the salmon farm would result in EQS exceedances on at least one occasion in each cell in the model run of 22 days.

CONCLUSION

75. Accepting that, on any version of the test for irrationality, the bar to certiorari is "*extremely high and is almost never met in practice*" (**St. Audeon's**[79]), and that the bars as to error of fact and reasoning are also high, it would be wrong to prejudge those issues against Salmon Watch at this point as a basis for holding that no issue of fact requires decision and that no dispute of fact subsists. The same observation can be made as to the differences of opinion between Mr Murphy on the one hand and Dr Bass and Dr O'Toole on the other hand.

76. Accordingly, Salmon Watch are entitled to seek to lay the evidential basis for a possible finding in their favour on those issues and they have sought to do so in the evidence of Mr Murphy. Salmon Watch seek to have the court accept Mr Murphy's view of how RPS erred in their reasoning and in their inclusion of "typical" scenarios in a proffered worst case scenario and his view that such a course was irrational in either or both of the Keegan and O'Keefe senses. Or, at very least, they assert that Mr Murphy has sufficiently raised these issues. Given that the onus of proof is on Salmon Watch and given Mr Murphy's view is disputed by Dr O'Toole and Dr Bass, the only way in which Salmon Watch can hope to have that dispute resolved in their favour and so to succeed on those issues is to cross examine Dr O'Toole and Dr Bass such that Mr Murphy's view will, as a matter of fairness, have been put to them.

77. I will therefore grant leave to Salmon Watch issue a notice for cross-examination to Dr O'Toole and Dr Bass for cross examination on the issues:

- whether it was correct to use "Typical" DIN levels,
    - in a worst-case scenario.
    - modelled as generated by the salmon farm in computing whether a breach of the 170 µgN/l DIN EQS will occur.

[79] Board of Management of St. Audeon's National School v An Bord Pleanála [2021] IEHC 453 (Simons J).

- specifically those modelled as generated by the salmon farm and chosen by RPS as Typical, in computing whether a breach of the 170 µgN/l DIN EQS will occur.
- whether data which informed the "Maximum Plume Envelope" should have been used instead of the "Typical" DIN levels.

78. While the foregoing expresses my general view of the proper subject-matter of cross-examination, I will hear the parties as to the precise form of order to be made to ensure an adequate but properly focussed cross-examination and as to the logistics of incorporating such cross-examination into the impending trial.

79. I should add that at hearing the possibility was canvassed of Dr O'Toole and/or Dr Bass withdrawing elements of their affidavits. MOWI also indicated that they would waive their right to complain of unfairness if I preferred Mr Murphy's evidence to Dr Bass's without cross-examination. On reflection, it seems to me that these are not bases on which I should refuse cross-examination. I must take the affidavits as I find them at present. Of course, having ordered cross-examination, I will hear any application which may be made in those regards.

80. Finally, I am conscious that the foregoing may seem to have concentrated on an articulation of the case and arguments of Salmon Watch. That is a function of the issue for decision here. The question whether Salmon Watch is entitled to cross-examine turns in considerable part on the substance of their case and arguments. My articulation of their case and arguments should not be mistaken for acceptance of them.

81. I will also, on hearing the parties as to the precise form of order, hear them as to the costs of the motion. I provisionally consider that Salmon Watch has succeeded on the motion and should have its costs.

DAVID HOLLAND
16 MARCH 2023