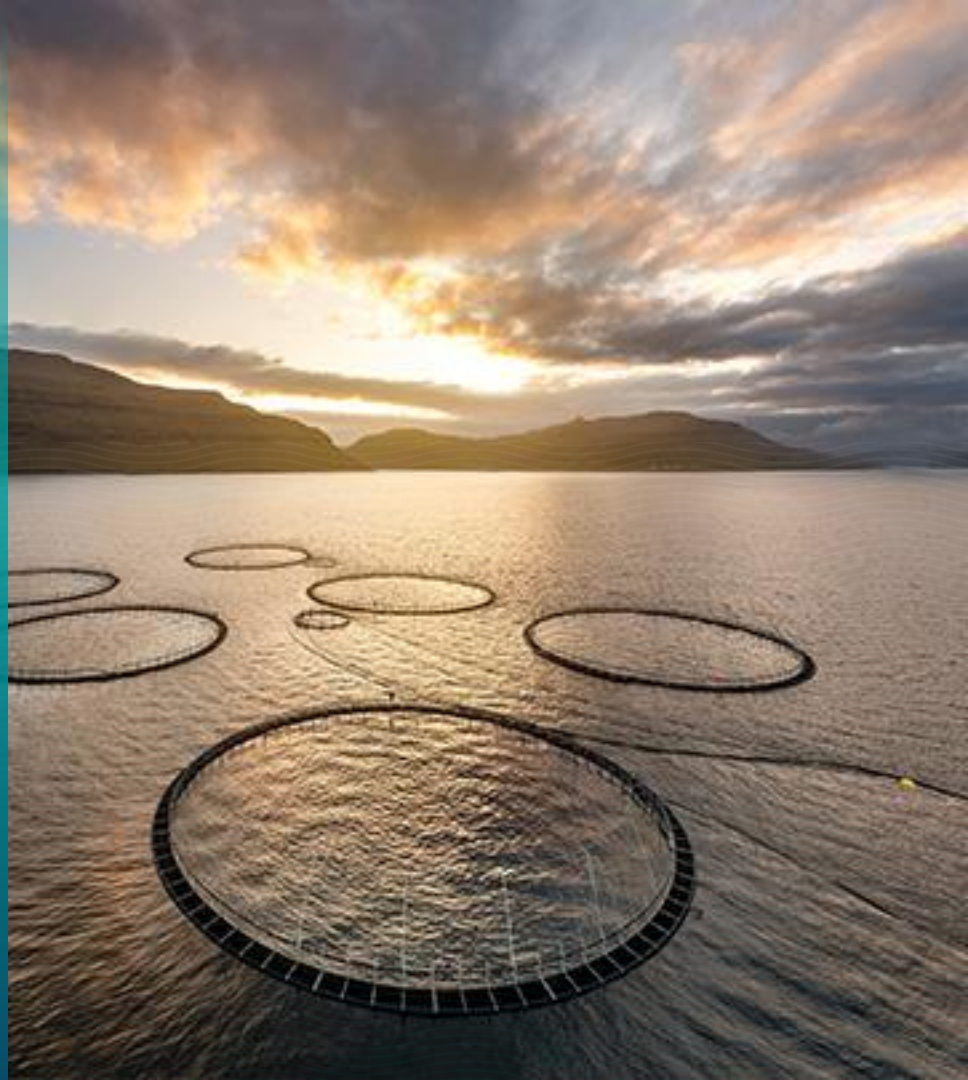
IN DEPTH

2.6 Water Quality



Stakeholder Consultation April 2024

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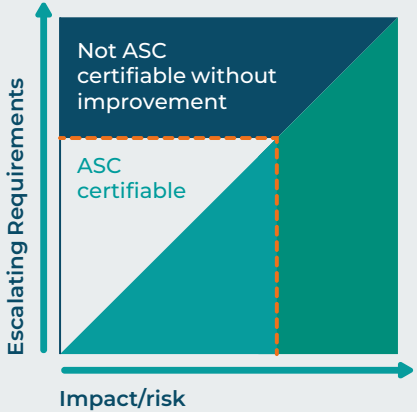
The issue and ASC's approach

The issue

- Water quality is decreasing globally, mainly through inputs of nitrogen and phosphorus from human activities
- Excessive amounts of nitrogen and phosphorus overstimulate the growth of algae and water plants in a process called 'eutrophication'. This decreases the amount of oxygen in the water, resulting in the waterbody becoming less habitable and negatively impacting biodiversity
- Aquaculture releases nitrogen and phosphorus directly into the aquatic environment and plays a role in the wider effects of eutrophication with significance dependent on the region and situation
- Effective management of water quality is only possible through collective actions that address the cumulative impacts caused by all users of a waterbody

Our approach

- Classification of waterbody type, with stricter requirements for more sensitive waterbodies
- Collective, area-based management to address cumulative impacts on water quality for the most sensitive waterbodies
- Coordinated actions where there is a decline in water quality
- Measurement and monitoring processes for all waterbody types



Categorisation by waterbody risk

Farms are required to classify the waterbody in which they are sited

Water Type	Characteristic	Hydraulic retention time	Flow Rate/Total Suspended Solids	Example
A	Sensitive freshwater and marine lentic	> 5 days		Most lakes and reservoirs, many fjords, lagoons and some estuaries and embayments
B	Sensitive lotic	< 5 days		Some rivers and other channelised systems
C	Less sensitive freshwater and marine	< 5 days	Flow rate > 1000m3/s Or TSS > 20mg/l at low flow	Alluvial floodplain rivers, some estuaries, well flushed near and offshore marine systems

Type A: At-risk waterbodies where both farm-level and waterbody level requirements apply

Types B and C: Only farm level requirements apply

Sensitive freshwater or marine lentic

Slow flow rates
OR
Long flushing times

e.g. lake, reservoir, fjord

At Farm Level (Type A)

1. Limits set on nitrogen and phosphorous released per ton of production
2. Adherence to low threshold of dust and fragments in feed
3. Daily monitoring of dissolved oxygen on-farm and downstream
4. Requirements for siting of cages based on depth/current velocity
5. Treating effluent from point source releases

Quarterly monitoring of water quality at the area level

Area Management Level

1. Define the boundaries of the waterbody
2. Implement a framework to collaborate with other ASC certified farms and certificate holders on area management
3. Continue to monitor the quality of the water body for worsening status – ASC's water quality calculator will help facilitate this
4. Develop and implement corrective actions if there is an upward rate of change in the trophic status of the waterbody

Sensitive lotic

Short flushing times

e.g. alluvial floodplain rivers, some estuaries

At the Farm Level

1. Verify water body is a river or channelised system, or has a short flushing time
2. Limits set on nitrogen and phosphorous released per ton of production
3. Adherence to low threshold of dust and fragments in feed
4. Daily monitoring of dissolved oxygen on-farm and downstream
5. Requirements for siting of cages based on depth/current velocity
6. Measure nutrient flows into receiving water at inflow and outflow from point source releases
7. Treating effluent from point source releases and increasing inflow to outflow ratio

Less sensitive freshwater and marine

Short flushing times

e.g. offshore marine

At the Farm Level

1. For freshwater, provide evidence of short flushing times and fast flow rates OR high level of suspended solids at slow flow rates. For marine, verify short flushing times and high level of suspended solids at slow flow rates
2. Limits set on nitrogen and phosphorous released per ton of production
3. Adherence to low threshold of dust and fragments in feed
4. Daily monitoring of dissolved oxygen on-farm and downstream
5. Requirements for siting of cages based on depth/current velocity
6. Treating effluent from point source releases

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No Area Management Requirements for Type B and Type C

Type A waterbody requirements

There are more rigorous requirements for Type A waterbodies

Type A	Initial Audit	1st Surveillance Audit	2nd Surveillance Audit
Farms with baseline data	Water unit of measurement (WUM) defined as A, B or C and 12 or 24-month baseline data provided at initial audit Where area management agreement (AMA) is not in place, timeline is presented for establishing AMA and evidence of outreach	24 months baseline data provided AMA established, which includes certified farms and non-certified farms belonging to certified companies	24 months rolling baseline data provided Quarterly monitoring of the WUM and farm-level variables to demonstrate no upward transition of trophic status
Farms without baseline data	Proposed sampling methodology is presented for collecting the 12 and 24-month baseline data Where AMA is not in place, timeline is presented for establishing AMA and evidence of outreach	12 months of baseline data provided AMA established, which includes certified farms and non-certified farms belonging to certified companies	24 months baseline data provided, which will become rolling for subsequent audits Quarterly monitoring of the WUM and farm-level variables to demonstrate no upward transition of trophic status

Type A Waterbodies

Further information for certificate holders in type A waterbodies

- Farms located in jurisdictions with regulations and management measures for water quality can present evidence to demonstrate compliance with these regulations during audits to determine whether the evidence provided meets the intent of applicable Indicators
- An ad-hoc Water Quality Advisory Committee (AWQAC) will resolve issues in relation to the justification and dispute resolution of initial WUM characterisation (for Type A waterbodies only) and subsequent revisions where there is a lack of clarity around the WUM boundaries
- The AWQAC will reduce complexity for sites and Conformity Assessment Bodies (CABs) by providing resolutions outside of the audit process

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ASC Water Quality Calculator

ASC producer support tool

- The Water Quality Calculator will provide a mechanism for producers to submit data to obtain the baseline characterisations at the waterbody unit of management (WUM) and farm level
- The Calculator will also allow for quarterly monitoring data to be submitted and provide support with the spatial elements associated with defining the waterbody type and mapping the WUM
- Aims of the Calculator:
  - Reduce cost and complexity for producers – methodologies for water quality monitoring will be embedded within the Calculator
  - Ensure consistent outputs
  - Allow data sharing between members of an Area Management Agreement and relevant CABs for producers within a waterbody

Improvements on current species standards

The ASC Farm Standard addresses water quality more rigorously

Existing species standards

- Focus only on farm level measures, which are not sufficiently effective at addressing water quality
- Lack a risk and area-based approach which considers the effect of multiple users

New ASC Farm Standard

- Classifies farms into one of three waterbody types, based on sensitivity to nutrient inputs
- Works at the waterbody and farm level for at-risk, Type A waterbodies and requires farms to:
  - Monitor the trophic status of their waterbody
  - Take coordinated management actions when the quality of the waterbody deteriorates
  - Farm level requirements are largely the same

The benefits

Why ASC is taking this approach

- Minimisation of risk of negative impact on water quality
- Introduction of a risk and area-based approach which addresses cumulative impacts on the most sensitive waterbodies
- Collaboration strengthened between ASC farms and certificate holders through Area Management Agreements
- Corrective action required to address deterioration of water quality
- Water Quality Calculator tool to support producers

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How to get involved?

Email: consultation@asc-aqua.org

Materials are available in English, Spanish, Vietnamese, French, German, Turkish, Japanese, Korean

In depth topic slides on:
2.4 Alien Species
2.6 Water Quality
2.10 Energy Use & GHG Emissions
2.14 Pre-grow Out
3.9 Working Hours
4.3-4.4 Fish and Shrimp Health and Welfare - Slaughter

ASC Farm Standard Slides (link)

Full ASC Draft Farm Standard (link)

Survey [link]

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Indicators

Refer to appendices

Indicator 2.6.1 Receiving water classification by sensitivity to nutrient loading.	
Indicator 2.6.1	The UoC shall classify the receiving water (RW) body into Type A, B or C, according to its sensitivity to nutrient enrichment (**Appendix 8 (1.1)**): ○ Type A - Sensitive freshwater and marine **lentic**: ○ Hydraulic retention time (HRT) > five days (low nutrient flushing rates) (**Appendix 8 (1.2)**) ○ Examples: most lakes, reservoirs, many fjords, lagoons and some estuaries and embayments (**Appendix 8 (1.4)**) ○ Type B – Sensitive **lotic**: ○ HRT < five days ○ Examples: some rivers (including **headwaters**) and other channelised systems ○ Type C – Less sensitive freshwater and marine: ○ HRT < five days and flow rate > 1000m³/s, or TSS > 20mg/l at low flow (**Appendix 8 (1.3)**) ○ Examples: alluvial flood plain rivers, some estuaries, well flushed near and offshore marine systems

Indicators

Indicators 2.6.2 - 2.6.10 Area-level and farm-level mitigation of trophic shifts. **Sub-scope:** farms releasing effluents to Type A (sensitive freshwater and marine lentic) receiving waters.	
Indicator 2.6.2	The UoC shall be party to an area management agreement (AMA) (**Appendix 8 (2.2)**), including commitments to the following collective actions: 1. Characterisation of a Waterbody Unit of Management (WUM), by initial entrant(s) (**Appendix 8 (2.1)**). 2. Coordinated environmental monitoring including limiting nutrient(s), carrying capacity assessment and planning response measures within the WUM (**Appendix 8 (2.2)**). 3. Sharing of data with other parties of the AMA (**Appendix 8 (2.2)**). 4. Outreach to other users contributing to nutrient loading of the WUM to participate in actions under points 2 and 3 above. 5. The AMA shall designate a focal point responsible for communicating with ASC, including reporting of all collated water quality data (**Appendix 8 (2.2)**).
Indicator 2.6.3	The UoC shall present the AMA's 24-month WUM baseline monitoring survey[27], including the parameters dissolved oxygen (DO), Secchi disk (SD) depth, Chl-a, total nitrogen (TN) and total phosphorus (TP) nutrient concentrations (**Appendix 8 (2.3)**).
Indicator 2.6.4	The UoC shall present the WUM-level baseline characterisation (**Appendix 8 (2.3.2)**) and perform its own farm-level baseline characterisation (**Appendix 8 (2.3.1)**): 1. Run the 24-month initial WUM baseline monitoring survey (Indicator 2.6.3) through the ASC water quality calculator, to determine the following: • Limiting nutrient(s); N-, P- or co-limited; • Trophic status; hyper-eutrophic, eutrophic, mesotrophic, oligotrophic, or ultra-oligotrophic (**Appendix 8 (2.3.4)**); • Depths of the zone of oxygen depletion (DO ≤4mg/l) and anoxia (DO ≤2mg/l); • Modelled BOD. 2. Record the number of (i) adverse turnover events and (ii) harmful algal blooms over the last 10 years (**Appendix 8 (2.3.3)**).
Indicator 2.6.5	The UoC shall perform quarterly monitoring of DO, TN, TP, SD and Chl-a (**Appendix 8 (2.3.1, 2.3.2 and 2.3.5)**), to populate the ASC water quality calculator as required in Indicators 2.6.6 -2.6.8.

Indicators

Indicators 2.6.2 - 2.6.10 Area-level and farm-level mitigation of trophic shifts. **Sub-scope:** farms releasing effluents to Type A (sensitive freshwater and marine lentic) receiving waters.	
Indicator 2.6.6	Using the ASC water quality calculator, the UoC shall demonstrate annually that there is no upward transition of trophic status (**Appendix 8 (2.3.4)**) compared with the initial WUM and farm-level baseline characterisation (Indicator 2.6.4).
Indicator 2.6.7	Using the ASC water quality calculator, the UoC shall demonstrate annually that neither the limiting nutrient(s) nor Chl-a indicate an upward rate of change > 15% at the WUM or farm level over the previous 24 months.
Indicator 2.6.8	If one or more of the following scenarios apply, the UoC shall present the aquaculture sectoral contribution to nutrient loading in the WUM (**Appendix 8 (2.3.4)**): • The WUM is ≤5 index points[28] below a TSI limiting nutrient or Chl-a breakpoint, indicating an approaching upward transition of trophic status, i.e., approaching the assimilative capacity limit of the waterbody (**Appendix 8 (2.3.4)**), OR • Limiting nutrient(s)or Chl-a concentration increase >15%, OR • The depth of the zone of oxygen depletion[29] or anoxia[30] has decreased by ≥25%, OR • There has been ≥1 adverse turnover event or ≥1 harmful algal bloom(s) over the last 10 years [31] (Indicator 2.6.4) (**Appendix 8 (2.3.3)**).
Indicator 2.6.9	*Indicator scope: applicable when **one or more of the scenarios under Indicator 2.6.8 apply.*** If the aquaculture sectoral contribution to WUM nutrient loading (Indicator 2.6.8) is >30%, the UoC shall present the AMA plan to: • Increase the nutrient loading efficiency limits (Indicator 2.6.10); or • Reduce allowable nutrient loading by AMA farms, in order to reduce the rate of change and prevent an upward transition of trophic status.

Indicators

Indicators 2.6.10 - 2.6.14 Management of nutrient loading to receiving waters.	
Indicator 2.6.10	The UoC shall adhere to species-specific limits on annual TN and TP load per tonne of production over the previous 24-month period (**Appendix 8 (3.1)**).
Indicator 2.6.11	The UoC shall ensure that the feed fed contains < 1% fines (**Appendix 8 (3.2)**).
Indicator 2.6.12	*Indicator scope:* ***point source*** *effluent release only* The UoC shall ensure that water released goes through a treatment system capturing ≥65% of suspended solids originating from feed or fertiliser used, and that the concentration of settleable solids in effluent water is <3.3ml/L, if any of the following apply (**Appendix 8 (4.2 and 4.3)**): • using aeration over >90% of the production cycle; • exchanging >10% of culture water per day; • exchanging all water once per week or more during **peak biomass**; • using stocking densities >2kg/m^3.
Indicator 2.6.13	*Indicator scope: point source effluent release only* The UoC shall not release or dispose of nutrient containing materials, e.g., sludge and sediments, to public waterways, wetlands or other natural ecosystems.
Indicator 2.6.14	*Indicator scope: cages* The UoC shall maintain open culture systems in water that is at least twice the cage depth or ≥10m above the waterbody floor, whichever is less, unless it can be demonstrated that mean current velocity below the cage system is >0.1 m/s during periods at >75% peak biomass (**Appendix 8 (4.1)**).

Indicators

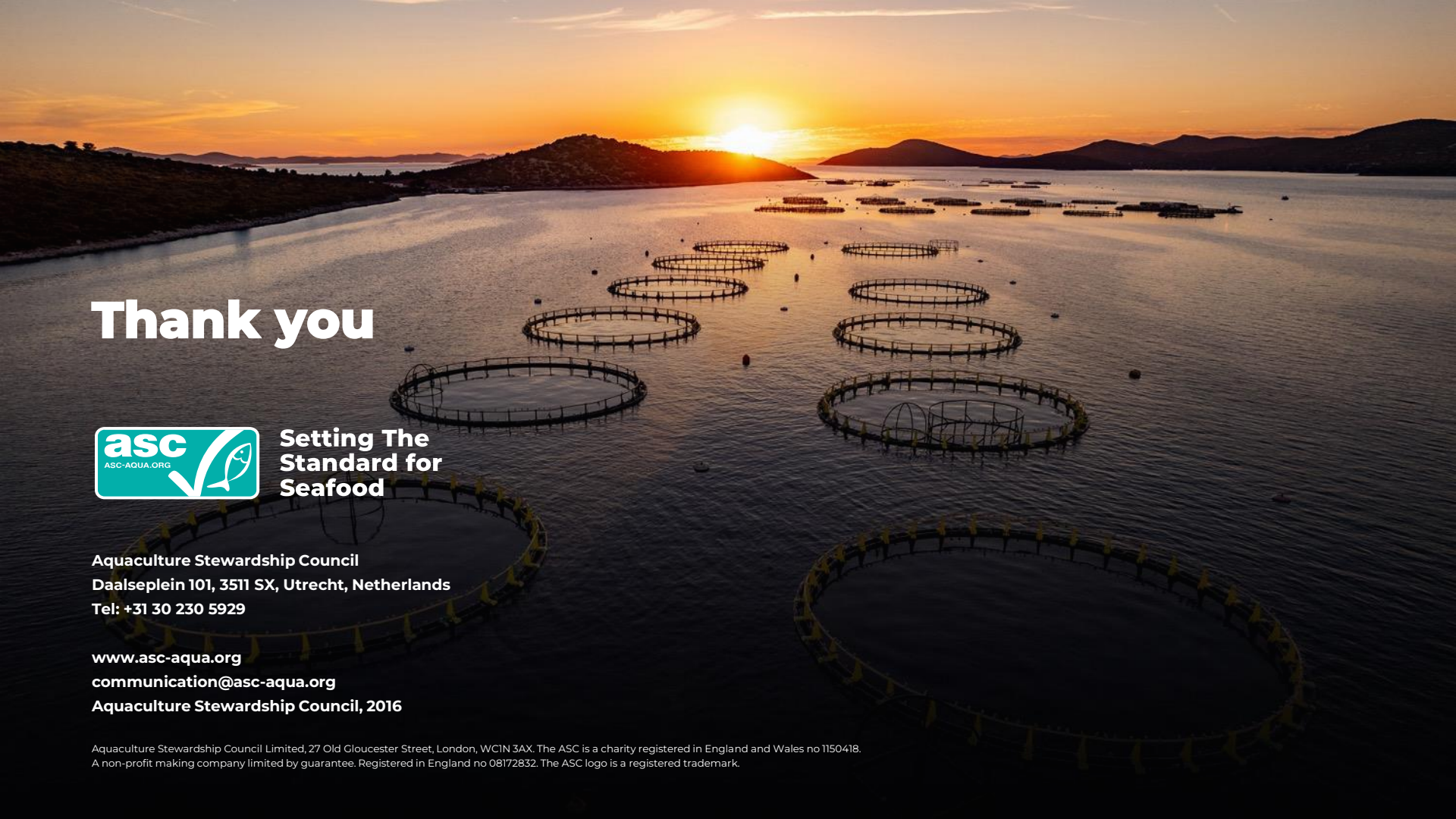
Indicators 2.6.15 - 2.6.17 Farm-level management of downstream nutrient concentrations. **Sub-scope:** only farms releasing effluents to Type B (sensitive lotic) receiving waters.	
Indicator 2.6.15	*Indicator scope: point source effluent release only* Using the ASC water quality calculator, the UoC shall annually estimate the percentage farm effluent flow contribution to the receiving water (RW) flow (m^3/sec)[32] (**Appendix 8 (1.3)**).
Indicator 2.6.16	*Indicator scope: point source effluent release only* If the "farm effluent flow" contribution to the "RW flow" estimated in Indicator 2.6.15 is >10%, the UoC shall quarterly, and concurrently, measure RW flow, TN, TP and TSS at inflow (**RWFI**) and effluent outflow (**RWFE**) sites (**Appendix 8 (2.3.5)**).
Indicator 2.6.17	*Indicator scope: point source effluent release only* If the "farm effluent flow" contribution to the "RW flow" estimated in Indicator 2.6.15 is >10%, the UoC shall annually demonstrate, using the ASC water quality calculator, that TN, TP or TSS (**Appendix 8 (2.3.5)**) indicates <25% increase between upstream and downstream sample sites of the farm.

Indicators

Indicators 2.6.18 – 2.6.20 Farm level management of DO at impacted downstream sites	
Indicator 2.6.18	The UoC shall demonstrate, through daily monitoring of DO concentration and saturation immediately downstream of the farm (diffuse-source effluent release) (**Appendix 8 (4.2)**) or **RWFA** (point-source effluent release) (**Appendix 8 (4.3)**), that the weekly average of daily DO saturation is ≥65% in freshwater and ≥70% in seawater[33].
Indicator 2.6.19	The UoC shall annually demonstrate, using the DO measurements from Indicator 2.6.18, that ≤5% of the weekly averages of daily DO concentrations are 2mg/l.
Indicator 2.6.20	*Indicator scope: point source effluent release only* The UoC shall demonstrate, through monthly DO monitoring at RWFA (**Appendix 8 (4.3)**), that daily diurnal DO (DDDO) fluctuation is ≤65% saturation level.

Indicators

Requirements on disclosure and reporting	
Indicator 2.6.21	*Indicator scope:* ***Type A*** The AMA focal point shall annually report to ASC (**Appendix 8 (2.1 and 2.2)**): • A map of the WUM identifying its boundary and farm site locations. • The 12- or 24-month WUM level water quality monitoring data. This shall be provided by the focal point of the WUM (**Appendix 8 (2.3.2)**).
Indicator 2.6.22	*Indicator scope:* ***Type A*** The UoC shall annually report to ASC the farm-level water quality monitoring results (**Appendix 8 (2.3.1)**), in accordance with ASC data submission procedures.



Thank you

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Aquaculture Stewardship Council
Daalseplein 101, 3511 SX, Utrecht, Netherlands
Tel: +31 30 230 5929

www.asc-aqua.org
communication@asc-aqua.org