ASC Survey

SVARTHAMARSVÍK in Berufjörður

Post-harvest fallow survey

Prepared by DNV AS Iceland Branch
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Operator	Kaldvík hf.
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Information Table

Site	Svarthamarsvík
Fjord	Berufjörður
Operator	Kaldvík hf., Strandgata 18, 735 Eskifjörður
Contact	Erlendur Gíslason erlendur.gislason@kaldvik.is, +354 822 5056
Head of station	Óskar Ragnarsson
Survey type	Post-harvest fallow survey
Sampling date	26 February 2026
Sampling personnel	DNV AS Iceland Branch
Biological status	Site fallow (43 days post-harvest)
Biomass	0 t at sampling; peak (cycle 2023–2026): 3,160.9 t on 17 December 2024
Number of cages	16
Cage arrangement	2 × 8 cage arrangement
Fish species	Atlantic salmon (Salmo salar)
Antifoulants	Not used
Medical treatments	None
Antibiotics	None

Íslenskur útdráttur

Botnvistarfræðileg úttekt var gerð á eldissvæðinu Svarthamarsvík í Berufirði þann 26. febrúar 2026, í samræmi við kröfur ASC-staðals fyrir laxeldi. Sýnatakan var framkvæmd að hvíldartíma loknum (post-harvest fallow survey): framleiðslulota 2023–2026 hófst 1. ágúst 2023, náði hámarks lífmassa 3.160,9 tonn þann 17. desember 2024 og slátrun lauk 14. janúar 2026. Á sýnatökudegi hafði svæðið verið í hvíld í 43 daga (≈6 vikur) með núll lífmassa. Sýni voru tekin á níu stöðvum: tveimur við kvíahorn (B1, B2), þremur innan AZE (A1–A3), þremur utan AZE (Y1–Y3) og einni viðmiðunarstöð (V1).

Súrefnisstig botnsets (Eh) var mælt jákvætt á öllum stöðvum (+43,6 til +182,6 mV vs. SHE), sem þýðir að ASC-krafa 2.1.1 (Eh > 0) er uppfyllt. Súlfít var undir greiningarmörkum (<100 mg/kg DW) á öllum sýnum og engin merki um lykt, dökkt botnset, fóðurleifar eða bakteríuþekju voru sjáanleg. Áferð botnsets einkenndist af fínni leðju á öllum stöðvum.

Koparmagn í botnseti var á bilinu 48,4–61,3 mg/kg DW, yfir ASC-mörkum kröfu 4.7.4 (<34 mg/kg DW). Mynstur niðurstaðna styður þó að um náttúrulegan bakgrunn frá basaltbergi Austfjarða sé að ræða: viðmiðunarstöðin V1 (58,6 mg/kg) sem er 850 m utan áhrifasvæðis sýnir gildi í efra bili dreifingarinnar, mismunur milli stöðva fylgir ekki fjarlægð frá kvíum, engin koparbasleruð antifoulingefni eru notuð á net og TOC og súlfít-gildi staðfesta heilbrigt setbúsvæði. Öll mæld gildi falla innan flokks II (lág gildi) skv. íslenskri reglugerð 796/1999. Rök fyrir háu bakgrunnsgildi eru því notuð í samræmi við ASC-staðal.

Botnfánusamfélagið er fjölbreytt — 17 til 33 tegundir og 143 til 603 einstaklingar á hverri stöð. Shannon-Wiener fjölbreytnisvísitala (H', $\log_2$) er 2,98–3,79 á einstökum stöðvum; allar stöðvar utan

AZE (Y1, Y2, Y3, V1) sýna H' > 3,0 og uppfylla þannig ASC-kröfu 2.1.2. Allar fimm stöðvar innan AZE (A1–A3, B1, B2) sýna 5–8 tegundir með > 100 einstaklinga/m², langt yfir lágmarkskröfu 2.1.3 (≥ 2 tegundir). Ríkjandi tegundir á flestum stöðvum eru Mytilus edulis (kræklingur) og næmar setlagstegundir (Sternaspis, Maldane sarsi, Lagis koreni, Ophelina acuminata) sem allar eru dæmigerðar fyrir heilbrigt setlag á Austfjörðum. Engar mengunarvísitegundir (Capitella capitata, Malacoceros) eru ríkjandi á neinni stöð. Niðurstöðurnar staðfesta að botnvistkerfið er í hagstæðu ástandi eftir hvíldartímann og að svæðið uppfyllir ASC-kröfur 2.1.1, 2.1.2 og 2.1.3.

Main findings

An ASC compliance benthic monitoring survey was conducted at the Svarthamarsvík salmon farming site in Berufjörður on 26 February 2026 in accordance with the ASC Salmon Standard. The survey was completed during the post-harvest fallow period of the 2023–2026 production cycle. The cycle commenced on 1 August 2023, reached a peak standing biomass of 3,160.9 tonnes on 17 December 2024, and harvest was completed on 14 January 2026. At the time of sampling, the site had been fallow for 43 days (≈6 weeks) with zero standing biomass. Samples were collected at nine stations: two cage-corner stations (B1, B2), three within-AZE stations (A1–A3), three outside-AZE stations (Y1–Y3), and one reference station (V1).

Sediment redox potential (Eh) was measured positive at all stations (+43.6 to +182.6 mV vs. SHE), satisfying ASC criterion 2.1.1 (Eh > 0). Sulphite was below the detection limit (<100 mg/kg DW) at all stations, and no signs of odour, dark sediment, feed residues, or bacterial mats were observed. Sediment texture was characterised by fine mud at all stations, indicating a natural depositional environment without detectable organic enrichment.

Sediment copper concentrations ranged from 48.4 to 61.3 mg/kg DW, exceeding the ASC criterion 4.7.4 threshold of <34 mg/kg DW. The pattern of results supports a natural lithogenic origin related to East Iceland basalt geology: the reference station V1 (58.6 mg/kg DW), located 850 m outside the influence zone, shows a value in the upper part of the distribution; differences between stations do not follow distance from cages; no copper-based antifoulants are used on the nets; and TOC and sulphite values confirm a healthy sediment habitat. All measured values fall within Class II (low values) of Icelandic Regulation 796/1999. The ASC background-argument provision is therefore applied.

The benthic faunal community is diverse — 17 to 33 taxa and 143 to 603 individuals per station. Shannon-Wiener diversity (H', $\log_2$) ranges from 2.98 to 3.79 across stations; all outside-AZE stations (Y1, Y2, Y3, V1) show H' > 3.0, satisfying ASC criterion 2.1.2. All five inside-AZE stations (A1–A3, B1, B2) show 5–8 taxa with > 100 individuals/m², well above the minimum of 2 required by ASC criterion 2.1.3. Dominant taxa at most stations are Mytilus edulis (blue mussel) and sensitive sediment-dwelling polychaetes (Sternaspis, Maldane sarsi, Lagis koreni, Ophelina acuminata), all typical of healthy soft-sediment habitats in East Iceland fjords. No organic-enrichment indicator species (Capitella capitata, Malacoceros) are dominant at any station. The results confirm that the benthic ecosystem is in favourable condition following the fallow period and that the site complies with ASC criteria 2.1.1, 2.1.2 and 2.1.3.

1. Introduction

This report presents the results of an ASC (Aquaculture Stewardship Council) compliance benthic monitoring survey conducted at the Svarthamarsvík salmon farming site in Berufjörður, Iceland, on 26 February 2026. The survey was conducted by DNV AS Iceland Branch on behalf of Kaldvík hf., during the post-harvest fallow period of the 2023–2026 production cycle. The 2023–2026 production cycle began on 1 August 2023, reached a peak standing biomass of 3,160.9 tonnes on 17 December 2024, and was completed (full harvest) on 14 January 2026. At the time of sampling, the site had been fallow for 43 days (≈6 weeks) with zero standing biomass. The survey therefore documents the post-fallow recovery state of the benthic environment following a complete production cycle.

The Svarthamarsvík site comprises 16 production cages of 160 m circumference arranged in a 2 × 8 grid in inner Berufjörður. Atlantic salmon (Salmo salar) is the only species cultured on site. No copper-based antifoulants, medical treatments, or antibiotics have been used on the site.

Sampling was carried out at nine stations covering cage corners (B-stations), within the Allowable Zone of Effect (A-stations, 25 m from cages), outside the AZE (Y-stations, 55 m), and at a reference station (V1) approximately 850 m down-current of the site. The survey followed ASC standards for Salmon (v.1.4) and standard methods for benthic monitoring under aquaculture sites (NS 9410:2016 framework adapted to Icelandic conditions).

1.1 Production data

Production cycle	2023–2026 (single cycle)
Stocking date	1 August 2023
Harvest completion	14 January 2026
Production cycle duration	898 days (≈30 months)
Peak standing biomass	3,160.9 tonnes (17 December 2024)
Average standing biomass	1,674.3 tonnes
Biomass at sampling	0 tonnes — site fallow
Fallow period before sampling	43 days (14 January – 26 February 2026)
Fish species	Atlantic salmon (Salmo salar)
Antifoulants	None used
Medical treatments	None
Antibiotics	None
Production data source	Kaldvík hf. closing biomass register (B-Svarthamarsvik)

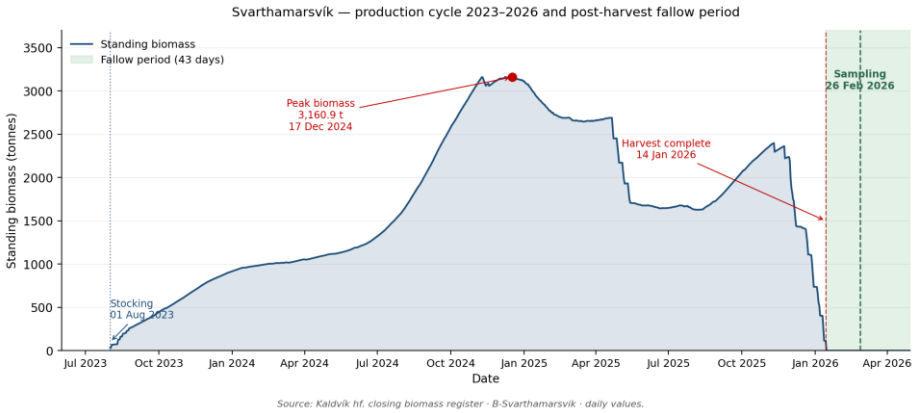

Figure A. Standing biomass at Svarthamarsvík during the 2023–2026 production cycle, showing stocking (1 Aug 2023), peak biomass (3,160.9 t on 17 Dec 2024), harvest completion (14 Jan 2026), and the 43-day fallow period preceding the ASC sampling event (26 Feb 2026). Source: Kaldvík hf. closing biomass register.

2. Methods

2.1 Sampling design

Nine stations were sampled following the ASC standard distribution: two cage-corner stations (B1, B2), three within-AZE stations at 25 m from the cage perimeter (A1, A2, A3), three outside-AZE stations at 55 m (Y1, Y2, Y3), and one reference station (V1) located approximately 850 m down-current of the site. Sediment samples were collected using a 0.1 m² Van Veen grab.

2.2 Field measurements

Sediment redox potential (ORP) and pH were measured directly in the upper 2 cm of each grab using a YSI multi-parameter probe. Reported ORP values were measured against an Ag/AgCl reference electrode and have been converted to Eh values relative to the Standard Hydrogen Electrode (SHE) by adding +199.6 mV. Sediment temperature, odour (qualitative), colour, texture, presence of feed residues, and bacterial mats (Beggiatoa-like coverings) were recorded by visual inspection. Field measurements were made in all nine sample stations. Results for all nine stations are presented in the full ORP table in Section 3.1.1.

2.3 Sediment chemistry

Sediment subsamples were collected from the upper 2 cm of each grab, stored cold and shipped to Sýni ehf. (Reykjavík, Iceland) under chain of custody. Sýni ehf. forwarded the samples to ALS Scandinavia AB (Danderyd, Sweden) for analytical chemistry. Parameters included copper (Cu, ICP-SFMS), total organic carbon (TOC), total nitrogen (Kjeldahl), total phosphorus (Ptot), sulphite (ion chromatography), and dry matter. Sýni ehf. report: K2601687, issued 28 April 2026.

2.4 Seawater chemistry

Seawater was sampled from three stations along a transect from the cage area to the reference station on 10 January 2026, at 1 m above the seabed, and analysed by Sýni ehf. (Kópavogur), with subcontracted analytical work performed by ALS Scandinavia AB (Danderyd, Sweden). The following parameters were analysed: nitrite + nitrate as N, nitrate as N, nitrate (NO_3^-), total nitrogen (Ntot), total phosphorus (Ptot / TP) and total organic carbon (TOC). Sýni ehf. report: K2600318 (ALS order ST2601887), issued 2 February 2026.

Total phosphorus (Ptot / TP) is the phosphorus metric reported in this study, in line with standard practice for nutrient monitoring at Icelandic aquaculture sites. The seawater sampling preceded the sediment survey for logistical reasons; this does not affect interpretation, as sampling took place during the fallow period when no standing biomass was present and the water column in the fjord is well mixed.

2.5 Benthic fauna

Macrobenthic infauna were sampled on 26 February 2026 by DNV AS Iceland Branch using a 0.1 m² Van Veen grab. Samples were sieved through 1 mm mesh and preserved in 4–10 % buffered formaldehyde in seawater followed by 70 % ethanol. Identification, counting and quality assurance of

fauna samples were performed by Ocean Ecology Limited (UK) under their internal NMBAQC-compliant protocol.

Project reference: BLASVA0226 · Survey: 2026 Blár Akur DNV Kaldvik SVARTHAMARSVIK Fish Farm Survey · Originator: Ocean Ecology Limited · Owner: DNV GL · QC: 100 % of extraction and identifications checked by QC analysts. Dataset stored in ABACUS (live link to WoRMS).

Univariate community indices were calculated by DNV AS Iceland Branch from the species-by-station abundance matrix. Shannon-Wiener diversity (H') is reported using $\log_2$ (the standard for Veileder 02:2018 classification). Hurlbert's expected species in 100 individuals (ES_{100}), Pielou's evenness (J') and Margalef's richness (d) are reported in accordance with standard community ecology practice. The number of taxa with > 100 individuals per m² (i.e. ≥ 10 individuals in a 0.1 m² grab) is reported for the ASC 2.1.3 verification.

2.6 Station coordinates

Station	Role	Distance (m)	Latitude (N)	Longitude (W)	Depth (m)	Description
B1	Cage corner (W)	0	64°42.891'	014°22.883'	41.6	Cage corner (W)
B2	Cage corner (E)	0	64°42.477'	014°22.251'	40.9	Cage corner (E)
A1	Within AZE	25	64°42.853'	014°22.897'	42.1	Within AZE 25 m
A2	Within AZE	25	64°42.464'	014°22.246'	41.2	Within AZE 25 m
A3	Within AZE	25	64°42.624'	014°22.707'	40.8	Within AZE 25 m
Y1	Outside AZE	55	64°42.866'	014°22.909'	43.0	Outside AZE
Y2	Outside AZE	55	64°42.499'	014°22.231'	42.0	Outside AZE
Y3	Outside AZE	55	64°42.616'	014°22.740'	40.8	Outside AZE
V1	Reference	~850	64°42.324'	014°21.278'	42.6	Reference

Coordinates given in WGS-84 datum (degrees and decimal minutes). Cage corner positions B1 and B2 correspond to the W and E corners of the 2 × 8 cage grid.

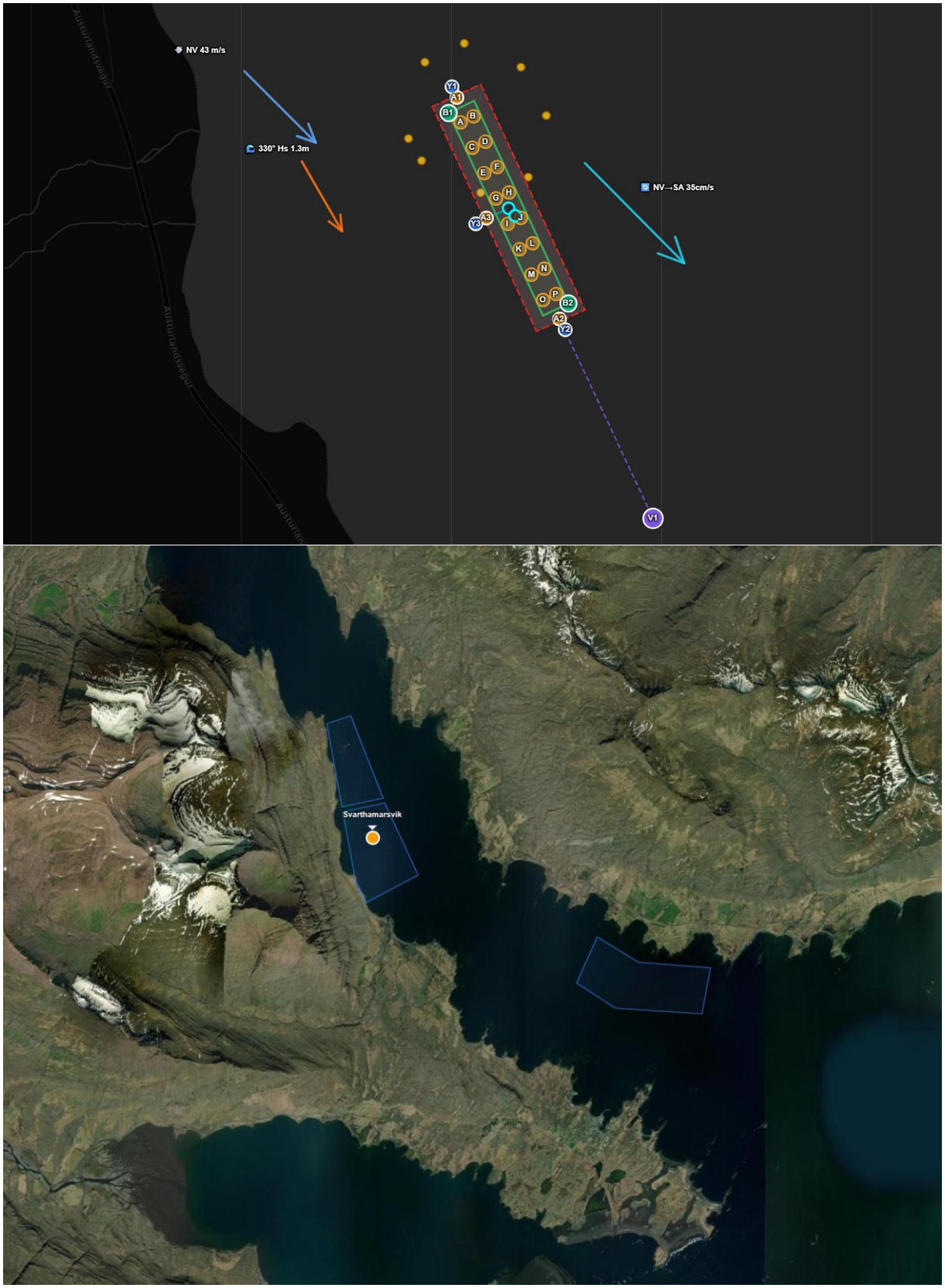

Figure 1. Location of ASC sampling stations at the Svarthamarsvík salmon farming site, inner Berufjörður.

3. Results

3.1 Sediment characterisation

3.1.1 Field measurements (ORP, pH, sediment description) — all nine stations

Field measurements were carried out on the sediment sample from each of the nine stations. Results for all nine stations are presented in the table below.

Station	ORP YSI (mV)	Eh SHE (mV)	pH	T (°C)	HTI	Odour	Texture	Colour	Bacterial mats	Comment
B1	-120	+79.6	8.00	3.4	2.3	None	Fine mud	Grey	No	—
B2	-17	+182.6	7.80	3.4	2.9	None	Fine mud	Grey	No	—
A1	-155	+44.6	7.95	3.3	2.2	None	Fine mud	Grey	No	—
A2	-51	+148.6	7.45	3.3	2.9	None	Fine mud	Grey	No	—
A3	-156	+43.6	7.25	3.3	2.6	None	Fine mud	Grey	No	—
Y1	-125	+74.6	7.90	3.2	2.9	None	Fine mud	Grey	No	—
Y2	-47	+152.6	8.20	3.2	2.7	None	Fine mud	Grey	No	—
Y3	-130	+69.6	7.80	3.2	3.7	None	Fine mud	Grey	No	—
V1	-145	+54.6	7.45	3.2	2.9	None	Fine mud	Grey	No	—

Table 3.1.1. Field measurements for all nine ASC sampling stations at Svarthamarsvík, 26 February 2026. Eh SHE = ORP YSI + 199.6 mV (Ag/AgCl to SHE conversion). All Eh values positive, in compliance with ASC criterion 2.1.1.

3.1.2 Sediment chemistry

Sediment chemistry was performed by ALS Scandinavia AB (Danderyd, Sweden) via Sýni ehf. (Reykjavík, Iceland). Sýni ehf. report: K2601687.

Station	Cu (mg/kg DW)	TOC (% DW)	TN (mg/kg DW)	P (mg/kg DW)	Sulphite (mg/kg DW)	Dry matter (%)
B1	55.3	1.37	1510	1150	<100	48.7
B2	57.6	1.42	1410	1230	<100	49.0
A1	55.2	1.34	1530	1140	<100	48.3
A2	54.4	1.13	1440	1330	<100	50.8
A3	52.8	1.37	1420	1080	<100	50.2
Y1	61.3	1.39	1620	1090	<100	51.5
Y2	52.8	1.47	1940	1740	<100	47.2
Y3	48.4	1.30	1380	988	<100	49.5
V1	58.6	1.20	1450	1070	<100	50.4

Note: TN = total nitrogen; P = total phosphorus; TOC = total organic carbon. Sulphite below the limit of detection (<100 mg/kg DW) at all stations.

3.1.3 Copper background context

Copper concentrations across all sampled stations (48.4–61.3 mg/kg DW) exceed the ASC criterion 4.7.4 threshold of 34 mg/kg DW. The spatial pattern and supporting site information indicate that these values are consistent with natural geological background rather than aquaculture-derived contamination:

- No copper-based antifoulants are or have been used on the site (operator confirmation).
- Reference station V1 (58.6 mg/kg DW), located 850 m down-current and outside the influence zone of the cages, returns a value within the upper part of the distribution observed across the survey area — i.e., not lower than cage-edge stations. A site-related accumulation gradient is therefore absent.
- No spatial gradient with distance from cages is observed: the lowest value (Y3 = 48.4 mg/kg DW) is at an outside-AZE station and the highest (Y1 = 61.3 mg/kg DW) is also outside-AZE.
- No measurable change is observed between the maximum-biomass survey (April 2025: 53.5–57.0 mg/kg DW) and the post-fallowing survey (February 2026: 48.4–61.3 mg/kg DW), which excludes accumulation from feed or antifoulant inputs over the production cycle.
- TOC values (1.13–1.47 % DW) and sulphite (<100 mg/kg DW) are well within natural background ranges, with no signs of organic enrichment that would normally accompany aquaculture-derived metal accumulation.
- East Iceland is built on Tertiary basalt, which has a naturally elevated copper background. Berufjörður itself is geologically notable: the eastern shore is formed by remnants of the Tertiary Breiðdalur central volcano, with conspicuous rhyolite intrusions alongside basaltic flows. Eason and Sinton (2009) and Gibson et al. (1982) report copper concentrations in Icelandic basalt in the range 10–200 ppm. All measured values fall within Class II (low values) under Icelandic Regulation

796/1999 (Egilsson et al. 1999), the natural background range observed across Icelandic marine sediments.

Taken together, the evidence supports interpretation of the elevated copper concentrations as natural lithogenic background associated with East Iceland basalt-derived sediments. On that basis, the ASC 4.7.4 background-argument provision is applied for this site.

3.1.4 Seawater chemistry

Seawater samples were analysed by Sýni ehf. (Kópavogur), with subcontracted analytical work performed by ALS Scandinavia AB. Sýni ehf. report: K2600318 (ALS order ST2601887), dated 2 February 2026. Sampling was performed on three stations along a transect from the cage area to the reference station on 10 January 2026. Concentrations are reported in both mg/L (laboratory original) and µg/L for ease of comparison with environmental quality standards.

The parameters analysed were nitrite + nitrate as N, nitrate as N, nitrate (NO_3^-), total nitrogen (Ntot), total phosphorus (Ptot / TP) and total organic carbon (TOC). Total phosphorus (Ptot / TP) captures all forms of phosphorus in the sample and is the standard phosphorus metric for nutrient monitoring at Icelandic aquaculture sites.

Parameter	Unit	At cage (318-1)	25 m (318-2)	850 m / Ref. (318-3)	LOQ
Nitrite + Nitrate as N	**mg/L**	<0.150	<0.150	<0.150	0.150 mg/L (150 µg/L)
	µg/L	<150	<150	<150	
Total Phosphorus as P (Ptot / TP)	**mg/L**	<0.030	<0.030	<0.030	0.030 mg/L (30 µg/L)
	µg/L	<30	<30	<30	
Nitrate as N	**mg/L**	0.093	0.08	0.12	—
	µg/L	93	80	120	
Nitrate (NO_3^-)	**mg/L**	0.41	0.36	0.52	—
	µg/L	410	360	520	
Total Organic Carbon	**mg/L**	0.83	1.06	1.08	—
	µg/L	830	1060	1080	
Total Nitrogen (Ntot)	**mg/L**	0.17	0.19	0.22	—
	µg/L	170	190	220	

Sample 318-1 = at cage; 318-2 = 25 m; 318-3 = 850 m down-current (reference). LOQ = limit of quantification. Both unit conventions are shown: mg/L is the unit reported by the laboratory; µg/L is provided for direct comparison with EQS values typically expressed in micrograms per litre. Ptot = total phosphorus; Ntot = total nitrogen.

Total nitrogen (Ntot) and total organic carbon concentrations are very low at all three sampling points and show no enrichment near the cages relative to the reference station. Both Ntot (0.17 mg/L = 170 µg/L) and TOC (0.83 mg/L = 830 µg/L) at the cage are slightly lower than at the reference station (0.22 mg/L = 220 µg/L Ntot; 1.08 mg/L = 1,080 µg/L TOC), well within natural variability. Total phosphorus (<0.030 mg/L = <30 µg/L) and nitrite+nitrate (<0.150 mg/L = <150 µg/L) are below the limit of detection at all three sampling points. These values are within normal ranges for coastal Icelandic waters and provide no indication of nutrient enrichment attributable to the cage operation. These results

corroborate the conclusion drawn from sediment ORP measurements that no aquaculture-related nutrient signal is detectable after fallowing.

3.2 Benthic fauna

Macrobenthic infauna were analysed by Ocean Ecology Limited (UK), project reference BLASVA0226. A total of 60 taxa were recorded across the nine stations, of which 58 were enumerated as counts and 2 (Nemertea, Entoprocta) recorded as presence/absence. The community indices below are based on the count data only, in accordance with standard practice for diversity calculations.

3.2.1 Univariate community indices

Station	Role	S	N	H' (log_2)	H' (ln)	ES_{100}	J'	d	# taxa >100 ind/m² (ASC 2.1.3)
B1	Cage corner	24	296	**3.57**	2.48	17.70	0.78	4.04	**8**
B2	Cage corner	27	216	**3.79**	2.63	20.43	0.80	4.84	**7**
A1	Within AZE	21	228	**2.98**	2.07	16.21	0.68	3.68	**5**
A2	Within AZE	23	151	**3.68**	2.55	19.58	0.81	4.38	**6**
A3	Within AZE	17	217	**3.12**	2.16	14.23	0.76	2.97	**7**
Y1	Outside AZE	19	239	**3.26**	2.26	15.14	0.77	3.29	**6**
Y2	Outside AZE	24	143	**3.77**	2.61	21.04	0.82	4.63	**5**
Y3	Outside AZE	20	242	**3.18**	2.21	15.66	0.74	3.46	**6**
V1	Reference	33	603	**3.14**	2.17	17.80	0.62	5.00	**9**

Note: S = number of taxa; N = number of individuals; H' = Shannon-Wiener diversity (log_2 for Veileder 02:2018, also reported with natural log); ES_{100} = Hurlbert's expected species in 100 individuals; J' = Pielou's evenness; d = Margalef's richness. The final column shows the number of non-polluting taxa with > 100 individuals/m² (i.e. ≥ 10 individuals in the 0.1 m² grab sample), as required for ASC criterion 2.1.3.

3.2.2 Dominant species

The dominant taxon at each station, with its abundance per m² and AMBI/NSI ecological group classification (Borja and Muxika 2005; Rygg and Norling 2013; Borgersen et al. 2020), is shown in Table below. Ecological groups: I = sensitive species; II = neutral species; III = tolerant species; IV = opportunistic species; V = pollution indicator species.

Station	Role	Dominant taxon	Ind. per 0.1 m²	Ind. per m²	% of N	Ecological group*
B1	Cage corner	*Mytilus edulis*	77	770	26.0	II
B2	Cage corner	*Mytilus edulis*	52	520	24.1	II
A1	Within AZE	*Mytilus edulis*	95	950	41.7	II
A2	Within AZE	*Mytilus edulis*	31	310	20.5	II
A3	Within AZE	*Mytilus edulis*	74	740	34.1	II
Y1	Outside AZE	*Mytilus edulis*	66	660	27.6	II
Y2	Outside AZE	*Lagis koreni*	24	240	16.8	II
Y3	Outside AZE	*Mytilus edulis*	82	820	33.9	II
V1	Reference	*Ophelina acuminata*	211	2110	35.0	I

** Ecological group from AMBI/NSI classification (Borgersen et al. 2020; Rygg and Norling 2013). Mytilus edulis classified as EG II (indifferent / neutral).*

The benthic community is dominated by Mytilus edulis (blue mussel) at eight of nine stations. This pattern is consistent with mussel spat settlement associated with cage structures and surrounding farm areas and does not in itself indicate organic enrichment. Mytilus edulis is classified as a neutral (indifferent) species (EG II) under the AMBI/NSI system. The reference station V1 is dominated by Ophelina acuminata (EG I) and Lagis koreni (EG II), both characteristic sediment-dwelling polychaetes of healthy soft-bottom habitats in East Iceland fjords. No pollution-indicator species (EG V, e.g. Capitella capitata or Malacoceros) are dominant at any station.

3.2.3 ASC 2.1.3 verification — non-polluting taxa with > 100 individuals/m²

Station	Role	Non-polluting taxa with > 100 ind/m²	ASC 2.1.3 (≥ 2 required)
A1	Within AZE	5	**PASS / Stenst**
A2	Within AZE	6	**PASS / Stenst**
A3	Within AZE	7	**PASS / Stenst**
B1	Within AZE (cage corner)	8	**PASS / Stenst**
B2	Within AZE (cage corner)	7	**PASS / Stenst**
Y1	Outside AZE	6	**PASS / Stenst**
Y2	Outside AZE	5	**PASS / Stenst**
Y3	Outside AZE	6	**PASS / Stenst**
V1	Reference	9	**PASS / Stenst**

All nine stations pass ASC criterion 2.1.3 with substantial margin. Inside-AZE stations (A1, A2, A3, B1, B2) all carry between 5 and 8 non-polluting taxa above the 100 ind/m² threshold — well above the minimum of 2 required by ASC.

All four outside-AZE stations (Y1, Y2, Y3, V1) show Shannon-Wiener diversity H' > 3.0 (log_2), satisfying ASC criterion 2.1.2. All five inside-AZE stations (A1, A2, A3, B1, B2) carry between 5 and 8 non-polluting taxa above the 100 ind/m² threshold, exceeding the minimum of 2 required under ASC criterion 2.1.3. The dominant taxa across all stations are sensitive (EG I) or neutral (EG II) species, including Mytilus edulis, Ophelina acuminata and Lagis koreni. No pollution-indicator taxon (EG V) is dominant at any station, and indicator species such as Capitella capitata are present only in trace numbers. Given the post-fallow timing of the survey (43 days after harvest completion), the results document benthic recovery following the 2023–2026 production cycle and support the conclusion that the site remained within its assimilative capacity during that cycle.

4. ASC Compliance Overview

ASC Criterion	Threshold	Result	Compliance
2.1.1	Eh > 0 mV (SHE) at all stations	All stations Eh +43.6 to +182.6 mV (SHE)	**PASS**
2.1.2	H' > 3.0 (log_2) at all stations outside AZE	Outside-AZE stations Y1 (3.26), Y2 (3.77), Y3 (3.18), V1 (3.14) — all > 3.0	**PASS**
2.1.3	≥ 2 non-polluting macrofaunal taxa with > 100 ind/m² inside AZE	Inside-AZE stations carry 5–8 non-polluting taxa > 100 ind/m² (see §3.2.3)	**PASS**
4.7.4	Cu < 34 mg/kg DW at all stations	Cu range 48.4–61.3 mg/kg DW	**BACKGROUND ARGUMENT INVOKED (see §3.1.3)**

Based on the evidence presented in this report, the Svarthamarsvík site meets ASC criteria 2.1.1, 2.1.2 and 2.1.3. Copper concentrations exceed the numerical threshold in ASC criterion 4.7.4; however, the evidence set out in Section 3.1.3 supports application of the background argument on the basis of natural lithogenic copper concentrations in East Iceland basalt-derived sediments and the absence of any identified aquaculture-related copper source at the site. As this survey was undertaken 43 days after harvest completion, the results document post-fallow benthic recovery following the 2023–2026 production cycle. Positive Eh values at all stations, the absence of organic-enrichment indicators in sediment chemistry, Shannon-Wiener diversity H' > 3.0 at all outside-AZE stations, and the absence of pollution-indicator taxa as dominants together support the conclusion that the site remained within its assimilative capacity during the documented production cycle.

Revision log

Rev.	Date	Description of change
0	15 May 2026	Original issue.
1	22 May 2026	Rev. 1: (i) Section 3.1.1 field-measurements table restored to include all nine sampling stations (Rev. 0 inadvertently presented only the B1 row). (ii) Sections 2.4 and 3.1.4 updated to identify the phosphorus metric explicitly as Total Phosphorus (Ptot / TP), and the corresponding row in the seawater table (§3.1.4) relabelled accordingly. Issued in response to Umhverfis- og orkustofnun review comments dated May 2026.

5. Special flags and notes

Production data	Complete biomass records for the 2023–2026 production cycle were received from Kaldvík hf. and incorporated in Section 1.1.
Notable findings	Fine mud was recorded at all stations. No black sediment, feed residues, or bacterial mats were observed. HTI values were generally class 2; station Y3 returned HTI 3.7 (class 3) at 55 m outside AZE.
Cu background note	East Iceland basalt geology elevates natural Cu background. No copper-based antifoulants used on site. All values within Class II (low) of Icelandic Regulation 796/1999.
Seawater analytical scope	The seawater analytical panel comprised: nitrite + nitrate as N, nitrate as N, nitrate (NO_3^-), total nitrogen (Ntot), total phosphorus (Ptot / TP) and total organic carbon (TOC).
Seawater units	Seawater results are reported in both mg/L (the unit issued by the laboratory) and µg/L for ease of comparison with environmental quality standards typically expressed in micrograms per litre.
Fauna analysis note	Community indices in this report were calculated by DNV AS Iceland Branch from the Ocean Ecology Limited species-by-station matrix. NSI, ISI, NQI1 and nEQR were not included in the present report.
Report language	English report with an Icelandic abstract.

Appendix A. Laboratory references

Sediment chemistry — primary lab	Sýni ehf., Víkurhvarf 3, 203 Kópavogur, Iceland (SWEDAC 1701 / ISO 17025). Report no. K2601687 issued 28 April 2026 by Magnús Snær Árnason.
Sediment chemistry — analytical lab	ALS Scandinavia AB Danderyd (SWEDAC 2030 / ISO 17025). Subcontracted analyses via Sýni ehf.
Seawater chemistry	Sýni ehf., Víkurhvarf 3, 203 Kópavogur. Report no. K2600318 (ALS order ST2601887) issued 2 February 2026 by Magnús Snær Árnason.
Benthic fauna identification	Ocean Ecology Limited (UK). Project BLASVA0226. ABACUS database export, NMBAQC-compliant protocol. Storage medium: 4–10 % formaldehyde in seawater, preserved in 70 % ethanol. Sieve mesh: 1 mm. 100 % QC of extraction and identifications.
Index calculations	DNV AS Iceland Branch (S, N, H′, ES_{100}, J′, d, ASC 2.1.3 verification). Indices calculated from the species-by-station abundance matrix provided by Ocean Ecology Limited (project BLASVA0226).
Sampling personnel	DNV AS Iceland Branch, Fjarðargata 13–15, 220 Hafnarfjörður, Iceland. Þorleifur Ágústsson (project lead).

Appendix B. References

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