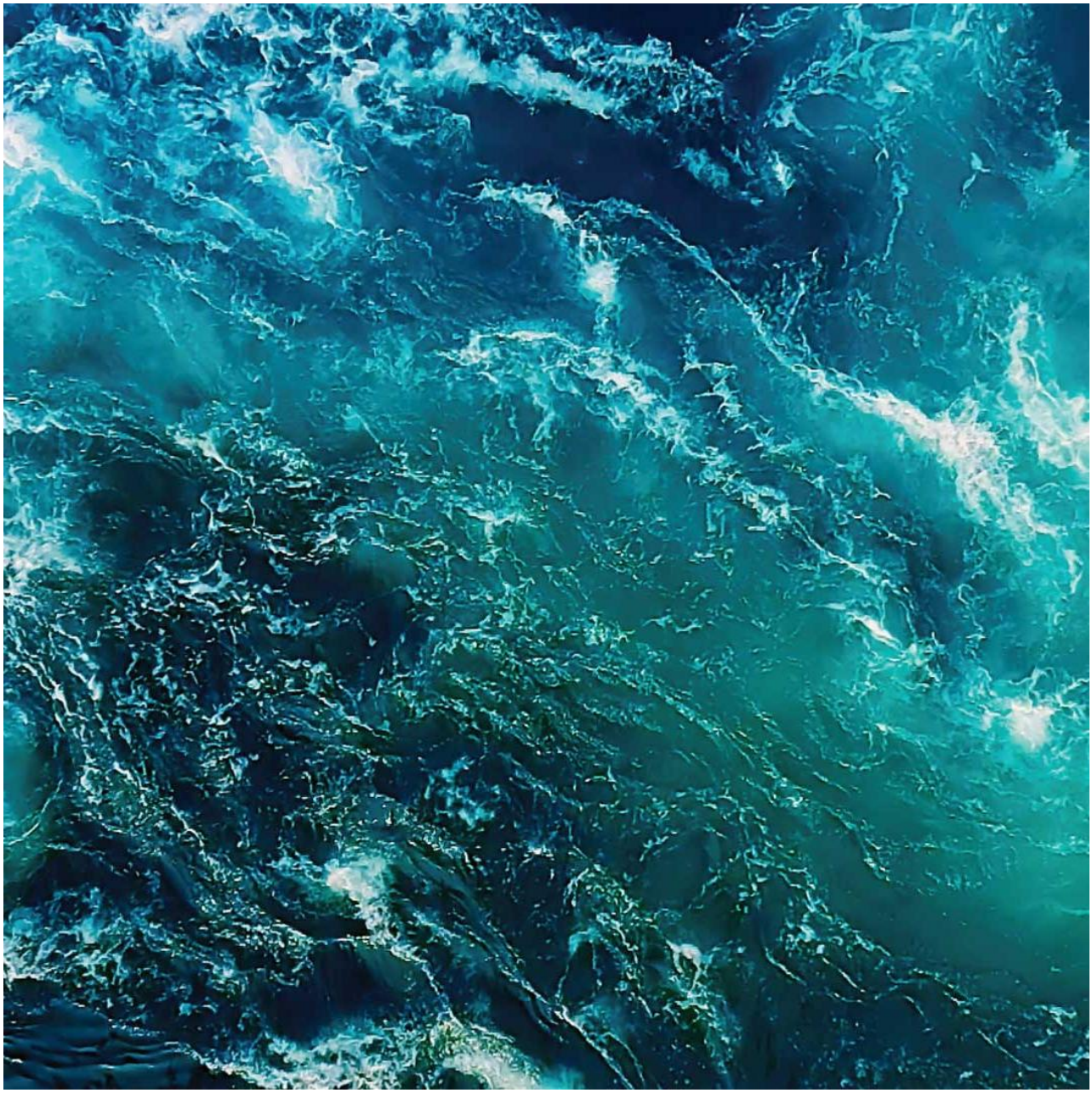
C-survey at Steinanes (max biomass), 2025

Arnarlax ehf

Akvaplan-niva AS Report: 2026 66876.01



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Arnarlax ehf. C-Survey at Steinanes, 2025.

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Summary

The results from the monitoring at the farming site Steinanes in August 2025 showed that the sediment was somewhat loaded with organic carbon and the copper level in the sediment at C1 was somewhat elevated (64.0 mg/kg) and is categorized into environmental limit II or "low values". EMB concentration at C3 was 490 ng/kg and thus exceeds the defined concentration of 272 ng/kg for stations outside the mixing zone. Accordingly, the station is not fulfilling the "good status standard". The sediment was moderately coarse to fine grained with a pelite share between 48.3 and 86.0 %.

The redox measurements (pH/Eh) gave point 0 acc. Appendix D in NS 9410:2016 for all the sampling stations. The hydrography measurements showed somewhat low oxygen conditions with 50 % saturation in the bottom layer in August 2025.

Moderate effect was recorded in the fauna at C1 and C3 and faunal index nEQR was 0.488 and 0.596. At the other stations, the nEQR values were above 0.6 indicating good faunal conditions at these stations. The diversity index H ' was below 3 at all stations and ranged from 2.64 to 2.89. The NS 9410:2016-assessment of the community in the local impact zone (C1) showed environmental condition 1 (Very good). A pollution indicator species was found among the most dominant species at C1, but not at the other stations.

The results from the present survey in October 2025 compared to previous C survey at the Steinanes in June 2023 (Mannvik & Gunnarsson, 2023) showed that the diversity index H' has decreased at the station in the impact zone and is more or less similar at the other stations. A few individuals of a pollution indicator species were found among the top ten at C1 in 2023 and the species is now the most dominant species at this station. No pollution indicator species were found at the other stations in the two surveys.

Approval

Project leader

Kamila Sztybor
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Date: 2026.01.21 07:45:59 +01'00'

Quality control

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Preface

Akvaplan-niva carried out a type C (NS 9410:2016) environmental survey at the Steinanes site. It includes pH/redox measurements (Eh), hydrography, geochemical analyses, and analyses of the bottom fauna from six stations at the fish farming site. The following personnel contributed:

Snorri Gunnarsson	Akvaplan-niva	Field work, report, project leader.
Hans-Petter Mannvik	Akvaplan-niva	Identification of bottom fauna (Echinodermata). Report, professional assessments, and interpretations.
Kamila Sztybor	Akvaplan-niva	QA report, professional assessments, and interpretations.
Rune Palerud	Akvaplan-niva	Identification of bottom fauna (Crustaceans). Statistics.
Jesper Hansen	Akvaplan-niva	Identification of bottom fauna (Varia and Mollusca).
Andrey Sikorski	Akvaplan-niva	Identification of bottom fauna (Polychaeta).
Anne Tårånd Aasen	Akvaplan-niva	Hydrographical vertical profiles
Kristine H Sperre	Akvaplan-niva	Coordination of sorting of bottom fauna.
Lisa Torske	Akvaplan-niva	Coordination of geo-chemical analyses.

Akvaplan-niva would like to thank Arnarlax ehf and Silja Baldvinsdóttir for good cooperation.

Accreditation information:

The survey was carried out by Akvaplan-niva AS with ALS Laboratory Group (Czech Republic) as a sub-contractor.

NORSK AKKREDITERING TEST 079

Akvaplan-niva AS is accredited under NS-EN ISO/IEC 17025 by Norwegian Accreditation for field sampling of sediments and fauna, analyses of TOC, TOM, TN, particle size and macrofauna, and for professional evaluations and interpretations. Our Accreditation number is TEST 079.

Czech Accreditation Institute (Lab nr 1163)

ALS Laboratory Group is accredited by the Czech Accreditation Institute (Lab nr 1163) for copper analyses.

Non-accredited services: Analyses of emamectin benzoate, hydrographical measurements and mapping of bottom topography (Olex).

1 Data Summary

Client information			
Report title:	C-Survey at Steinanes, 2025.		
Report nr.	2026 66876.01	Site:	Steinanes
Municipality:		Map Coordinates (construction):	65°40,388 N 23°28,231 V
MTB permitted:	3.805	Operations manager:	Silja Baldvinsdóttir
Client:	Arnarlax ehf		

Biomass/production status at time of survey (28.08.2025)			
Fish group:	Salmon	Biomass on examination (t):	2.246
Feed input (t):	7.586	Tonnes of produced fish:	6.725
Type/time of survey			
Maximum biomass: (t)	X	Follow up study:	
Fallow (resting period):		New location:	

Results from the C study /NS 9410 (2016) – Main results from soft bottom fauna			
Faunal index nEQR (Miljødirektoratet 2025)		**Diversity index H' (Shannon-Wiener)**	
Fauna C1 (impact zone)	0.488	Fauna C1 (impact zone)	2.74
Fauna C2	0.639	Fauna C2	2.64
Fauna C2alt	0.629	Fauna C2alt	2.87
Fauna C3	0.596	Fauna C3	2.89
Fauna C4 (deep area)	0.601	Fauna C4 (deep area)	2.72
Fauna C5	0.648	Fauna C5	2.74
Date fieldwork:	28.08.2025	**Date of report:**	21.01.2026
Notes to other results (sediment, pH/Eh, oxygen)			nTOC from 33.2 to 51.0. Copper 64 mg/kg at C1 Eh positive at all stations O_2-conditions were somewhat low in the bottom water.

2 Introduction

2.1 Background and aim of the study

On behalf of Arnarlax ehf, Akvaplan-niva completed a survey (type C) for the fish farming site at Steinanes (Figure 1), with reference to Chapter 5.0 in NS 9410:2016 which follows the methodology for C- study. The survey also fulfils the requirements of the Icelandic authorities for bottom surveys according to ISO 12878 and the requirements for environmental bottom surveys (according to Vöktunaráætlun). A survey (type C) is aimed at studying the environmental conditions of the bottom sediments along a transect sector from the fish farm that extends from the local, to the intermediate and to the regional impact zones. The main emphasis is on the study of the soft bottom fauna which is conducted according to standards ISO 5567-19:2004 and ISO 16665:2014. The obligatory parameters that are included in the survey are described in NS 9410:2016.

A classification or threshold values for this type of survey have not been developed by Icelandic officials, so it is not possible to strictly apply the classification based on Norwegian threshold values to Icelandic conditions. We do however report the results with these same indexes with reference to Norwegian threshold values, but it should be emphasized that some of these (such as NSI) are developed according to Norwegian conditions. For further descriptions of these indexes see details in Appendix 1 and guidelines from Miljødirektoratet (2025).

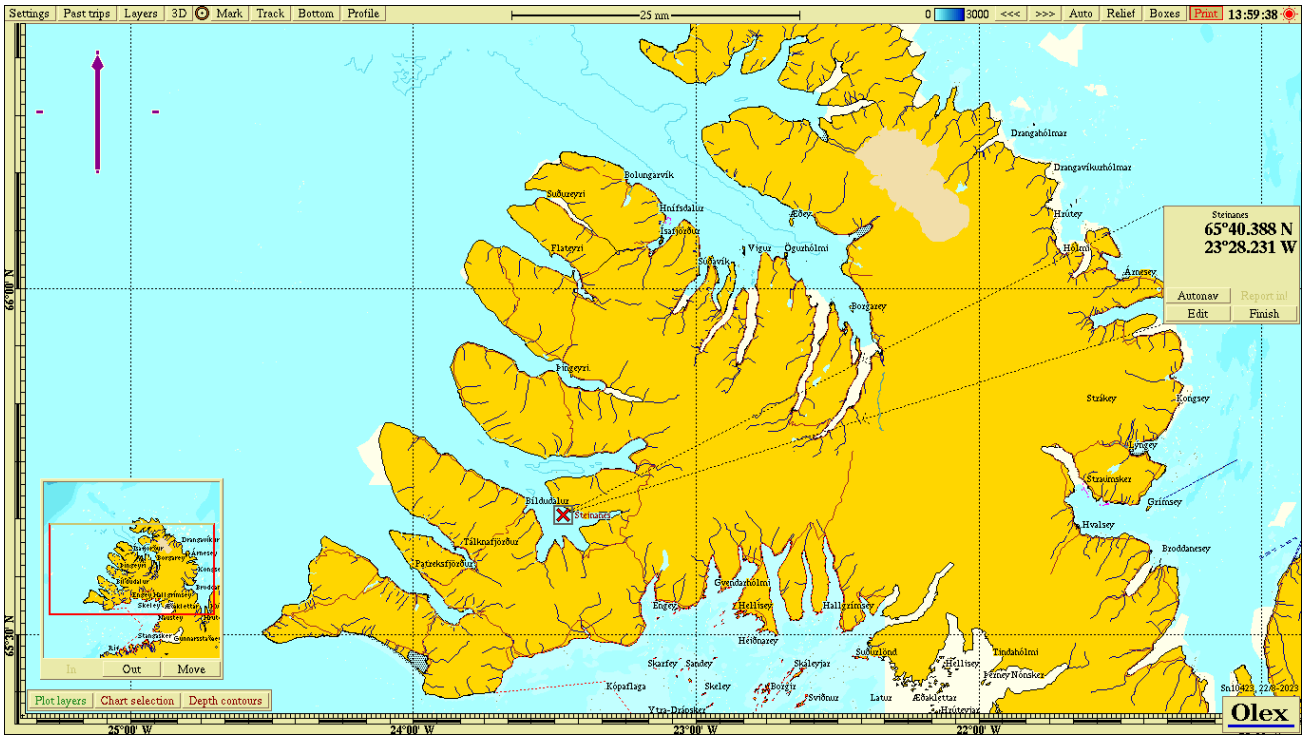

Figure 1 Overview of Westfjords Iceland with the farming site Steinanes (red cross). The map coordinates for the midpoint of the farming site are given to the right.

2.2 Site operation and feed use

The Steinanes site is located in Arnarfjörður Iceland about 5.5 km north-east from Bíldudalur. The cages are lined in a southwest direction from land (227 degrees). The depth under cages ranges from about 62 m closer to land up to about 92 further into the fjord. The shallower area of the farm is at

the northernmost part. The fish farm at the site is a one-frame mooring system in a 2 x 7 configuration, with a total of 14 cages, each with 160 m circumference.

The current generation salmon at the site is the third one farmed at Steinanes. Total feed use until the day of sampling was 7.586 tons (Baldvinsdóttir, pers. reference)

In Iceland, the MTB (maximum allowed biomass) limit is not given a site level as in Norway. The MTB limit determines how much live fish the holder of the permit can have standing in the sea at any one time. In Iceland the allowed production is regulated at two levels, site level and company level. For this site the estimated maximal standing biomass for the current generation is 3.805 tonnes, used as MTB here (Baldvinsdóttir, pers. reference).

2.3 Previous surveys

An overview of previous and current C-surveys carried out at Steinanes is shown in Table 1.

Table 1: Previous and current C-surveys at Steinanes.

Survey date	Report reference (author, year)	Production (tonnes)
28.08 2025	APN 66876.01 (Mannvik and Gunnarsson, 2026)	6.725
27.06 2023	APN 65074.01 (Mannvik and Gunnarsson, 2023)	0
12.10 2021	APN 63543.02 (Sztybor and Eriksen, 2022)	9.806
10.06 2020	APN 62254.01 (Velvin and Gunnarsson, 2020)	0
25.09 2018	APN 60256.01 (Mannvik and Gunnarsson, 2019)	8.964
27.06 2017	APN 8951.02 (Mannvik and Eriksen, 2018)	0

3 Materials and methods

3.1 Survey program

The choice of study parameters, placement of sampling stations and other criteria for the study is based on descriptions in NS 9410 (C-surveys). An overview of the planned professional program is given in Table 2.

Akvaplan-niva is accredited for field work, analyses of samples and for the professional evaluation of results in accordance with applicable standards and guidelines ("Veiledere"). For implementation and follow through, the following standards and quality assurance systems were used:

- ISO 5667-19:2004: *Guidance on sampling of marine sediments.*
- ISO 16665:2014. *Water quality – Guidelines for quantitative sampling and sample processing of marine soft-bottom macro fauna.*
- NS 9410:2016. *Miljøovervåking av bunnpåvirkning fra marine oppdrettsanlegg.*
- Internal procedures. *Quality Manual for Akvaplan-niva.*
- Miljødirektoratet (2025). Veileder for klassifisering av miljøtilstand i kyst- og ferskvann.

Table 2: Survey program for the C-survey at Steinanes, 2025. TOC = total organic carbon. GSA = grain size analysis sediment. TOM = total organic material. TN = total nitrogen. Cu = Copper. P = phosphorous. EMB = emamectin benzoate. pH/Eh = acidity and redox potential.

Station	Type analyses/parameters
C1 (local impact zone)	Quantitative analyses of bottom fauna. TOC. GSA, TOM. TN. Cu. P. pH/Eh.
C2 (transition zone outer)	Quantitative analyses of bottom fauna. TOC. GSA, TOM. TN. P. pH/Eh.
C2alt (transition zone outer)	Quantitative analyses of bottom fauna. TOC. GSA, TOM. TN. P. pH/Eh.
C3 (transition zone)	Quantitative analyses of bottom fauna. TOC. GSA, TOM. TN. P. EMB. pH/Eh.
C4 (transition zone, deep area)	Quantitative analyses of bottom fauna. TOC. GSA, TOM. TN. P. Hydrography/O_2. pH/Eh.
C5 (transition zone)	Quantitative analyses of bottom fauna. TOC. GSA, TOM. TN. P. pH/Eh.

Field work was completed on 28.08.2025.

Placement of stations and local conditions

The number of stations was calculated with reference to the sites estimated maximal standing biomass for the first generation which is 3.805 tonnes (used as MTB here). According to the standard five sampling stations should be examined. Due to relatively strong counter current in SE direction a sixth station (C2alt) was added 500 m in line with direction of the counter current. Depth and position of the stations are given in Table 3 and shown in Figure 2. The stations were placed in the direction of the main oceanic current direction at 60 m depth (Hermansen, 2020).

Table 3: Depth, distance between the nearest frame of the fish farm and sampling stations and coordinates for C-stations at Steinanes, 2025.

Station	Depth, m	Distance from frame, m	Position	
			N	W
C1	85	25	65°40.379	23°28.496
C2	86	500	65°40.550	23°28.960
C2alt	86	500	65°40.114	23°27.798
C3	86	210	65°40.441	23°28.687
C4	86	355	65°40.500	23°28.819
C5	91	65	65°40.227	23°28.545

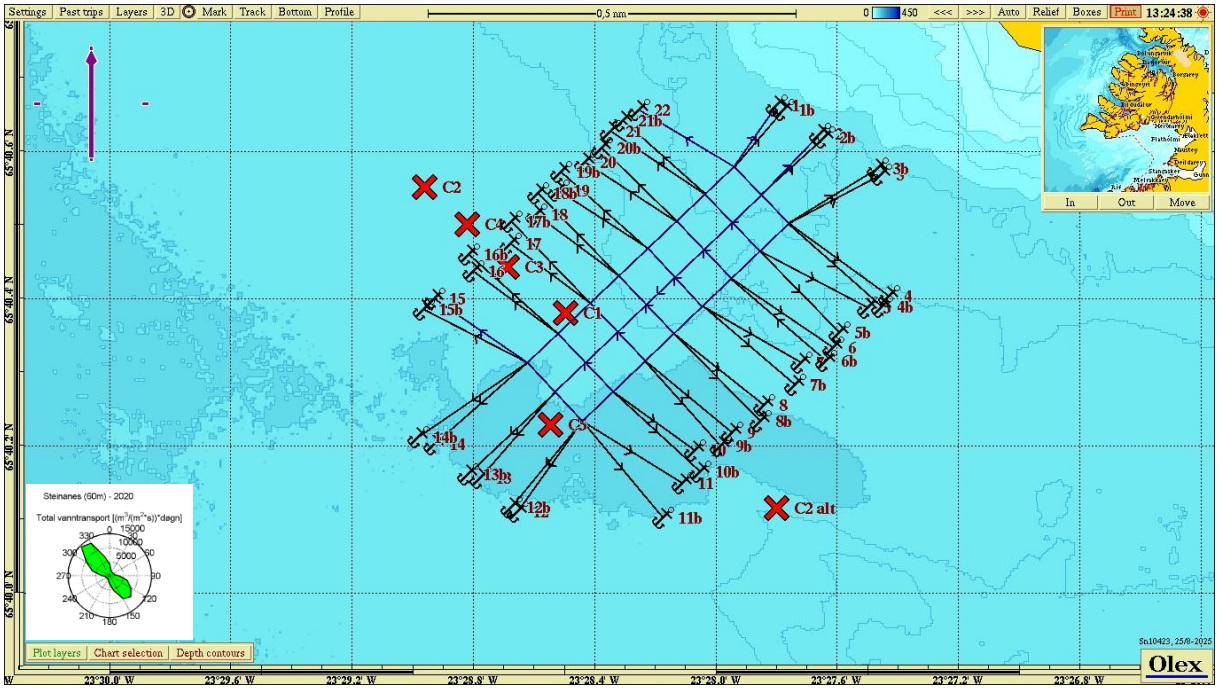

Figure 2. Map showing the sampling stations for the C-survey at Steinanes, 2025. Current measurements used were from 60 m depth (Hermansen 2020).

3.2 Hydrography and oxygen

At station C4, hydrographic measurements, salinity, temperature, density, and oxygen saturation were taken for vertical surface to bottom profiles using a Sensordata CTDO 204 probe.

3.3 Soft bottom sampling and analyses

3.3.1 Fieldwork

Sediment samples were collected with a 0.1 m^2 bottom grab (van Veen). The sample material was collected through inspection openings. Samples for TOC, TN and Cu were taken from the top 1 cm layer of the sediment and for TOM and grain size analyses from the top 5 cm using a hollow pipe. Only samples with an undisturbed surface were used. The samples were frozen prior to further processing in the laboratory.

3.3.2 Total organic material (TOM)

The amount of TOM in sediment was determined by weight loss after combustion at 495 °C. The percent weight loss was calculated. The reproducibility of the TOM analyses is checked during the analyses by using a standard sediment that contains TOM with a known level. Standard calcium carbonate was burned together with the samples as a control of the amount of carbonate that was not burned in the analyses process.

3.3.3 Total nitrogen (TN)

After drying the samples at 40°C, the amount of total nitrogen (TN) was quantified by electrochemical determination using Akvaplan niva internal method that is based on NS-EN 16168:2012 (Slam, behandlet organisk avfall og jord. Bestemmelse av totalnitrogen ved bruk av tørrforbrenning).

3.3.4 Total organic carbon (TOC) and grain size

The proportion of fine material, the fraction less than 63 µm, was determined gravimetrically after wet sieving of the samples. The results are presented as proportion of each fraction on a dry weight basis (Bale & Kenny, 2005).

After drying the samples at 40 °C, the content of total organic carbon (TOC) was determined by NDIR-detection in accordance with NS EN 17505:2022 (Investigation of solids – Temperature-dependent differentiation of total carbon (TOC_{400}, ROC, TIC_{900})). To classify the environmental conditions based on the content of TOC, the measured concentrations are normalized for the proportion of fine substance (nTOC) using the equation: nTOC = TOC + 18 (1 – F), where TOC and F represent a measured TOC value and the proportion of fine substance (%) in the sample (Aure *et al.,* 1993).

3.3.5 Metal analysis - copper (Cu)

The samples for metal analysis were freeze-dried before being placed in a microwave oven in a sealed Teflon container with concentrated ultrapure nitric acid and hydrogen peroxide. The concentration of copper (Cu) was determined by means of ICP-SFMS. The levels of copper are classified in accordance with Icelandic regulation 769:1999.

3.3.6 Emamectin benzoate (EMB)

The sediments were lyophilized prior to solvent extraction. The actual quantification was determined by high-resolution liquid chromatography coupled to tandem mass spectroscopy (HPLC-MS/MS). The LOD and LOQ are determined in accordance with the guidelines of the EU's reference laboratories for pesticide analyses, SANTE/2020/12830, 24/02/2021. The results are evaluated according to the Scottish Environmental Protection Agency (SEPA) standards (SEPA, 2022 & 2023).

3.3.7 Phosphorus (P)

Following a pre-treatment, the samples were quantified according to ČSN 720116-1 (720116) where phosphoruspentaoxide, P_2O_5 forms a phosphorusmolybden-vanadiumcomplex. The samples for

metal analysis were freeze-dried before being placed in a microwave oven in a sealed Teflon container with concentrated ultrapure nitric acid and hydrogen peroxide.

3.3.8 Redox- and pH measurements

At all the stations, a quantitative chemical examination of the sediment was carried out. Acidity (pH) and redox potential (Eh) were measured using electrodes and the YSI Professional Plus instrument. In accordance with the manual of the instrument, 200 mV was added to the measured ORP (the Oxidation Reduction Potential) value.

3.4 Soft bottom fauna investigation

3.4.1 About effect of organic material on bottom fauna

The emission of organic material from fish farms can contribute to the deterioration of conditions for many of the organisms living in the bottom sediment. Negative effects in the bottom fauna can best be assessed through quantitative bottom fauna analyses. Many soft bottom species have low mobility, and the fauna composition will largely reflect the local environmental conditions. Changes in the bottom fauna communities are a good indication of unwanted organic loads. Under natural conditions, the communities typically consist of many species. High number of species (diversity) is, amongst other things, that is dependent on favourable conditions for the fauna. However, moderate increases in organic load can stimulate the fauna and result in an increased number of species found. Larger organic loads can result in less favourable conditions where opportunistic species increase their individual numbers, while the species not suited are knocked out resulting in a reduced diversity of species. Changes in species diversity near emission points of feed and faecal matter can, to a large degree, be attributed to changes in organic content (from the feed and faecal matter) in the sediment.

3.4.2 Sampling and fixation

All the bottom fauna samples were taken with a 0.1 m^2 van Veen grab. Only grab samples where the grab was completely closed and the surface undisturbed were approved. The contents were washed through a 1 mm sieve and the remaining material fixed with 4 % formalin with Bengal Rose dye added and then neutralized with borax. In the laboratory, the animals were sorted from the remaining sediment.

3.4.3 Quantitative bottom fauna analysis

At all stations, two samples (replicates) were collected in accordance with guidelines in NS 9410 (2016). After sorting the sample material was processed quantitatively. The bottom fauna was identified to the lowest taxonomic level possible and quantified by specialists (taxonomists). The quantitative lists of species were statistically analysed. See Appendix 1 for description of analysis methods. The following statistical methods were used to describe community structure and to assess the similarity between different communities:

- Shannon-Wiener diversity index (H')
- Hurlberts diversity index (ES_{100}) – expected number of species pr. 100 individuals
- Pielou's evenness index (J)

- Sensitivities index (Ømfintlighet) (ISI_{2018}), unsuitable at low individual/species number
- Sensitivity index (NSI_{2018})
- Composite index for diversity of species and sensitivity (NQI1)
- Sensitivities index which is included in NQI1 (AMBI)
- Normalized EQR (nEQR)
- Number of species plotted against the number of individuals in geometric classes
- Cluster analyses
- The ten most dominant taxa per station (top-ten)

4 Results

4.1 Hydrography and oxygen

The hydrographical profile for the deep station C4 in August 2025 is presented in Figure 3.

Temperature dropped from 12 °C at the surface to 4 °C in the bottom layer. Oxygen saturation was 96 % in the upper layer and only 50 % in the bottom layer.

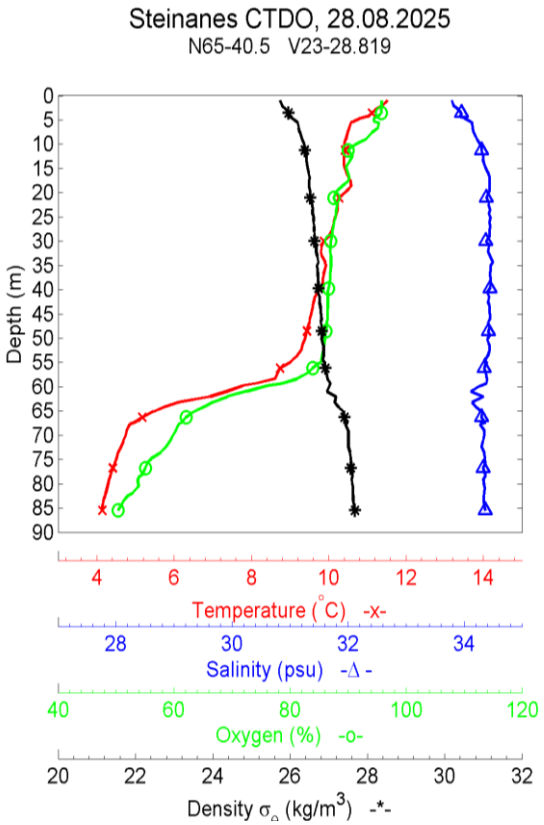

Figure 3. Vertical profiles. Temperature, salinity, density, and oxygen at C4 at Steinanes, 2025.

4.2 Sediment

4.2.1 TOC, TOM, TN, C/N, grain size and pH/Eh

Levels of total organic material (TOM), total organic carbon (TOC), total nitrogen (TN), C/N-relationship, grain size distribution in sediment (pelite) and pH/Eh in the sediment are presented in Table 4.

TOM-levels varied from 7.7 to 15.2 %. TN-levels were low (2.8 – 3.8 mg/g) while the C/N-ratios were somewhat high at most of the stations. TOC was rather high at all stations and nTOC varied from 33.2 to 51.0. The bottom sediments grain size was moderately coarse to fine with a pelite ratio ranging from 48.3 to 86.0 %.

Redox measurements (pH/Eh) gave a point of 0 for all the sampling stations according to Appendix D in NS 9410:2016.

Table 4. Sediment description, TOM (%), TOC (mg/g), TN (mg/g), C/N, grain size distribution (pelite ratio % <0,063 mm) and pH/Eh. Steinanes, 2025.

St.	Sediment description	TOM	TOC	nTOC	TN	C/N	Pelite	pH/Eh
C1	Olive green mud/sand/pebbles and some dead broken shells.	7.7	24	33.2	2.8	8.6	48.3	7.6/259
C2	Olive green mud	15.2	43	45.2	3.4	12.5	86.0	7.8/332
C2alt	Olive green mud/pebbles and some dead broken shells.	9.1	34	42.7	3.4	9.9	51.7	7.7/343
C3	Olive green mud	14.5	48	51.0	3.7	12.8	81.8	7.8/283
C4	Olive green mud.	14.3	42	44.7	3.8	10.9	84.5	7.7/323
C5	Olive green mud.	12.7	44	46.3	3.8	11.4	86.0	7.7/291

4.2.2 Copper

Levels of copper in bottom sediment at C1 are shown in Table 5. The level of copper was 64.0 mg/kg or low (limit II) according to environmental limits in Icelandic regulation nr. 796/199 (Regulation on prevention of water pollution nr. 796/1999).

Table 5. Copper (Cu), mg/kg DS. Steinanes, 2025.

St.	Cu
C1	64.0

4.2.3 Emamectin benzoate

Concentration of emamectin benzoate in sediment at C3 is presented in Table 6. Station C3 is located 210 m from the cage edge and is thus placed outside the mixing zone (SEPA 2022).

EMB concentration is 490 ng/kg and thus exceeds the defined concentration of 272 ng/kg for stations outside the mixing zone. Accordingly, the station is not fulfilling the "good status standard".

Table 6. Emamectin benzoate in the sediment at C3, ng/kg. Steinanes, 2025.

St.	Emamectin benzoate
C3	490

4.2.4 Phosphorus

Levels of phosphorus in bottom sediments at Steinanes are shown in Table 7. The level of phosphorus varied from 1400 mg/kg (C2) to 2300 mg/kg (C1).

Table 7. Phosphorus (P), mg/kg DS. Steinanes, 2025.

St.	P
C1	2300
C2	1400
C2alt	1900
C3	2200
C4	2000
C5	1600

4.3 Soft-bottom fauna

4.3.1 Faunal indices

Results from the quantitative soft bottom faunal analyses at the C-stations are presented in Table 8.

The number of individuals varied from 355 (C2) to 2126 (C1) and number of species from 24 (C2) to 49 (C1). The diversity H' varied from 2.64 to 2.89. At C1 and C3 the overall index of nEQR was lower than 0.6, while at the other stations above 0.6. The nEQR values indicate moderate condition at C1 and C3 and good conditions at the other stations.

J (Pielous evenness index) is a measure of how equally individuals are divided between species and will vary between 0 and 1. A station with low value has a "crooked" individual distribution between the species, indicating a disturbed bottom fauna community. The index varied from 0.55 to 0.65 which indicates a somewhat uneven distribution.

Table 8. Number of species and individuals pr. 0,2 m^2. H´ = Shannon-Wiener's diversity index. ES100 = Hurlberts diversity index. NQI1 = overall index (diversity and sensitivity). ISI_{2018} = sensitivity index. NSI = sensitivity index. J = Pielous evenness index. AMBI = AZTI marine biotic index (part of NQI1). nEQR = normalized EQR (excl. DI). C-stations at Steinanes, 2025.

St.	No. of individuals.	No. of species	H´	ES_{100}	NQI1	ISI_{2018}	NSI	nEQR*	AMBI	J
C1	2126	49	2.74	14.5	0.542	5.66	13.95	0.488	4.109	0.55
C2	355	33	2.64	16.8	0.659	6.89	21.13	0.639	2.505	0.59
C2alt	396	24	2.87	17.4	0.673	6.19	21.66	0.629	2.231	0.65
C3	530	34	2.89	16.4	0.650	5.98	20.89	0.596	2.698	0.62
C4	590	29	2.72	14.8	0.654	6.27	20.89	0.601	2.500	0.59
C5	515	27	2.74	16.5	0.582	6.62	21.08	0.648	2.076	0.61

* According to Norwegian national water type G/H 1-3 (Miljødirektoratet, 2025).

4.3.2 NS 9410 Evaluation of the bottom fauna at station C1 (local impact zone).

According to NS 9410 the classification of the environmental status in the local impact zone can also be evaluated based on the number of species and their dominance in the bottom faunal community (see Chapter 8.6.2 in NS 9410:2016).

The soft bottom communities were classified to environmental condition 1 "Very good". The criteria for condition 1 are that there are at least 20 species/0.2 m^2 and that none of these are in numbers exceeding 65 % of the individuals (Table 9).

Table 9. Classification of the environmental status of the soft bottom fauna at station C1 at the Steinanes site 2025.

Station	Site name	Num. species	Dominating taxa	Environmental condition-NS 9410
C1	Steinanes	49	Capitella capitata – 42 %	1 – Very good

Geometric classes

Figure 4 shows the number of species plotted against the number of individuals, where the number of individuals is divided into geometric classes. For an explanation of the concept of geometric classes is given in Appendix 1.

All curves started relatively low (≤ 17 species) and stretched out in varying degrees towards higher classes. These did not give any clear indications of fauna condition.

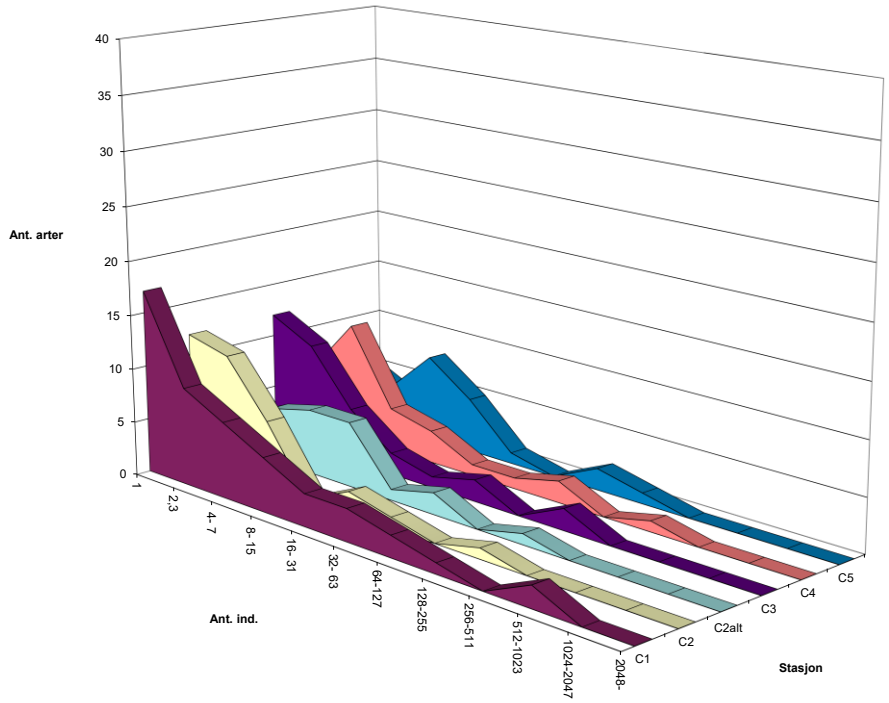

Figure 4. The soft bottom fauna shown as number of species against number of individuals pr. species in geometric classes. Steinanes, 2025.

4.3.3 Cluster analyses

To investigate the similarity of the faunal composition between the sampling stations, the multivariate technique cluster analysis was used. The results of this are presented in dendrogram in Figure 5.

The fauna composition at most of the stations was more than 71 % similar and C1 was 53 % similar to the other stations.

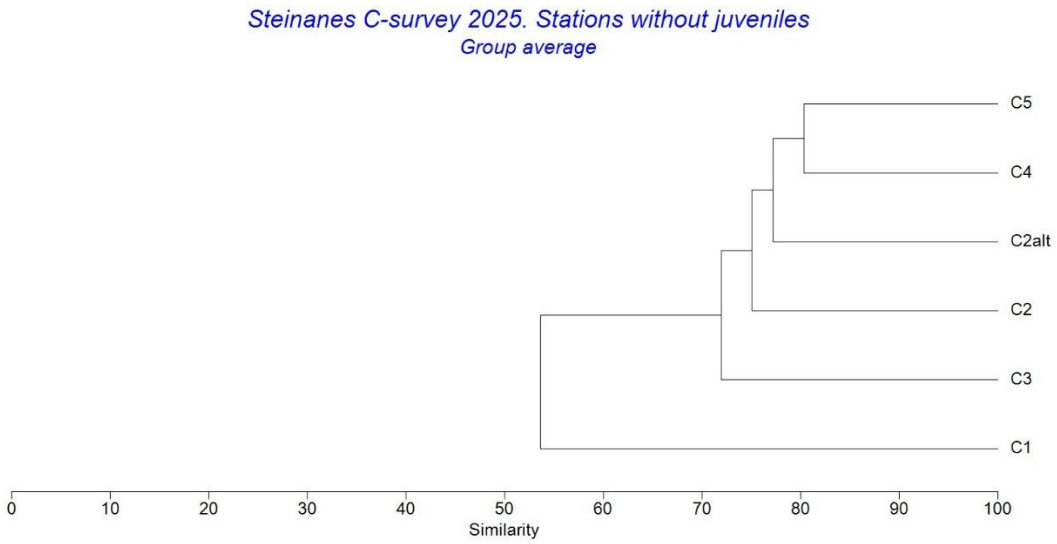

Figure 5. Cluster diagram for the soft bottom fauna at the C-stations at Steinanes, 2025.

4.3.4 Species composition

The main features of the species composition are shown in the form of a top ten species list from each station in Table 10.

In Borgersen *et al.* (2020) the species are divided into five ecological groups (EG) based on the value of the sensitivity index. These groups run from sensitive species (EG I) to pollution indicators (EG V).

The fauna at C1 was dominated by the pollution indicator species *Capitella capitata* with 42 % of the individuals. The other most dominant species at the stations were mainly a mixture of tolerant and opportunistic species.

The fauna at the other stations were dominated by polychaete *Prionospio sigvaldadottirae* (not known EG) with between 38 and 50 % of the individuals. The other most dominant species at the stations were a mixture of neutral, tolerant, and opportunistic species. No pollution indicator species were registered among the most dominants at these stations.

Table 10. Number of individuals, cumulative percentage, and ecological group for the ten most dominant species at the C stations. Steinanes, 2025.*

C1	EG	Ant. ind.	Kum.
Capitella capitata	V	893	42 %
Thyasira sarsii	IV	560	68 %
Ampharete borealis	IV	173	76 %
Prionospio sigvaldadottirae	Ik	70	79 %
Eteone flava/longa	III	69	82 %
Heteromastus filiformis	IV	61	85 %
Ophelina acuminata	III	48	87 %
Galathowenia oculata	III	44	90 %
Pholoe assimilis	II	28	91 %
Macoma calcarea	III	26	92 %

C2	EG	Ant. ind.	Kum.
Prionospio sigvaldadottirae	Ik	178	50 %
Thyasira sarsii	IV	61	67 %
Ampharete borealis	IV	27	75 %
Chaetozone sp.	III	21	81 %
Galathowenia oculata	III	6	83 %
Nephtys ciliata	III	6	84 %
Yoldia hyperborea	Ik	5	86 %
Ennucula tenuis	III	4	87 %
Lumbrineris mixochaeta	IV	4	88 %
Praxillella gracilis	III	4	89 %

C2alt	EG	Ant. ind.	Kum.
Prionospio sigvaldadottirae	Ik	195	49 %
Ampharete borealis	IV	38	58 %
Chaetozone sp.	III	33	67 %
Thyasira sarsii	IV	25	73 %
Euchone papillosa	IV	14	76 %
Nephtys ciliata	III	12	79 %
Ampharete petersenae	Ik	9	82 %
Harmothoe glabra	Ik	9	84 %
Yoldia hyperborea	Ik	9	86 %
Cistenides hyperborea	III	8	88 %

C3	EG	Ant. ind.	Kum.
Prionospio sigvaldadottirae	Ik	203	38 %
Thyasira sarsii	IV	130	62 %
Chaetozone sp.	III	45	71 %
Ampharete borealis	IV	43	79 %
Heteromastus filiformis	IV	21	83 %
Galathowenia oculata	III	15	86 %
Ennucula tenuis	III	9	87 %
Macoma calcarea	III	7	89 %
Cistenides hyperborea	III	6	90 %
Nephtys ciliata	III	6	91 %

C4	EG	Ant. ind.	Kum.
Prionospio sigvaldadottirae	Ik	259	44 %
Thyasira sarsii	IV	100	61 %
Ampharete borealis	IV	88	76 %
Chaetozone sp.	III	44	83 %
Galathowenia oculata	III	17	86 %
Heteromastus filiformis	IV	12	88 %
Ennucula tenuis	III	9	90 %
Harmothoe glabra	Ik	9	91 %
Nephtys ciliata	III	6	92 %
Macoma calcarea	III	5	93 %

C5	EG	Ant. ind.	Kum.
Prionospio sigvaldadottirae	Ik	252	49 %
Ampharete borealis	IV	71	62 %
Thyasira sarsii	IV	68	76 %
Chaetozone sp.	III	19	79 %
Ennucula tenuis	III	10	81 %
Yoldia hyperborea	Ik	10	83 %
Cistenides hyperborea	III	9	85 %
Lumbrineris mixochaeta	IV	8	86 %
Nephtys ciliata	III	8	88 %
Ampharete petersenae	Ik	7	89 %

*Ecological groups: EG I = sensitive species. EG II = neutral species. EG III = tolerant species. EG IV = opportunistic species. EG V = pollution indicator species. From Borgersen et al., 2020. Ik = ecological group unknown.

5 Summary

5.1 Summary

The results from the monitoring at the farming site Steinanes in August 2025 showed that the sediment was somewhat loaded with organic carbon and the copper level in the sediment at C1 was somewhat elevated (64.0 mg/kg) and is categorized into environmental limit II or "low values". EMB concentration at C3 was 490 ng/kg and thus exceeds the defined concentration of 272 ng/kg for stations outside the mixing zone. Accordingly, the station is not fulfilling the "good status standard". The sediment was moderately coarse to fine grained with a pelite share between 48.3 and 86.0 %.

The redox measurements (pH/Eh) gave point 0 acc. Appendix D in NS 9410:2016 for all the sampling stations. The hydrography measurements showed somewhat low oxygen conditions with 50 % saturation in the bottom layer in August 2025.

Moderate effect was recorded in the fauna at C1 and C3 and faunal index nEQR was 0.488 and 0.596. At the other stations, the nEQR values were above 0.6 indicating good faunal conditions at these stations. The diversity index H ' was below 3 at all stations and ranged from 2.64 to 2.89. The NS 9410:2016-assessment of the community in the local impact zone (C1) showed environmental condition 1 (Very good). A pollution indicator species was found among the most dominant species at C1, but not at the other stations.

5.2 Comparison with previous survey

The results from the present survey in October 2025 compared to previous C survey at the Steinanes in June 2023 (Mannvik & Gunnarsson, 2023) showed that the diversity index H' has decreased at the station in the impact zone and is more or less similar at the other stations. A few individuals of a pollution indicator species were found among the top ten at C1 in 2023 and is now the most dominant species at this station. No pollution indicator species were found at the other stations in the two surveys.

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7 Appendix (in Norwegian)

7.1 Bunndyrsindekser og artslister

Diversitetsmål

Diversitet er et begrep som uttrykker mangfoldet i dyre- og plantesamfunnet på en lokalitet. Det finnes en rekke ulike mål for diversitet. Noen tar mest hensyn til artsrikheten (mål for artsrikheten), andre legger mer vekt på individfordelingen mellom artene (mål for jevnhet og dominans). Ulike mål uttrykker derved forskjellige sider ved dyresamfunnet. Diversitetsmål er "klassiske" i forurensningsundersøkelser fordi miljøforstyrrelser typisk påvirker samfunnets sammensetning. Svakheten ved diversitetsmålene er at de ikke alltid fanger opp endringer i samfunnsstrukturen. Dersom en art blir erstattet med like mange individer av en ny art, vil ikke det gjøre noe utslag på diversitetsindeksene.

Shannon-Wieners indeks (Shannon & Weaver, 1949) er gitt ved formelen:

$$H' = -\sum_{i=1}^{s} \frac{n_i}{N} \log_2 \left(\frac{n_i}{N} \right)$$

der n_i = antall individer av art i i prøven
N = total antall individer
s = antall arter

Indeksen tar hensyn både til antall arter og mengdefordelingen mellom artene, men det synes som indeksen er mest følsom for individfordelingen. En lav verdi indikerer et artsfattig samfunn og/eller et samfunn som er dominert av en eller få arter. En høy verdi indikerer et artsrikt samfunn.

Pielous mål for jevnhet (Pielou, 1966)

har følgende formel, der symbolene er som i Shannon-Wieners indeks

$$J = \frac{H'}{\log_2 s}$$

Hurlberts diversitetskurver

Grafisk kan diversiteten uttrykkes i form av antall arter som funksjon av antall individer. Med utgangspunkt i total antall arter og individer i en prøve søker man å beregne hvor mange arter man ville vente å finne i delprøver med færre individer. Diversitetsmålet blir derved uavhengig av prøvestørrelsen og gjør at lokaliteter med ulik individtetthet kan sammenlignes direkte. Hurlbert (1971) har gitt en metode for å beregne slike diversitetskurver basert på sannsynlighetsberegning.

ES_n er forventet antall arter i en delprøve på n tilfeldig valgte individer fra en prøve som inneholder total N individer og s arter og har følgende formel:

$$ES_n = \sum_{i=1}^{s} \left[1 - \frac{\binom{N-N_i}{n}}{\binom{N}{n}} \right]$$

der N = total antall individ i prøven
N_i = antall individ av art i

n = antall individ i en gitt delprøve (av de N)
s = total antall arter i prøven

Plott av antall arter i forhold til antall individer

Artene deles inn i grupper/klasser etter hvor mange individer som er registrert i en prøve. Det vanlige er å sette klasse I = 1 individ pr. art, klasse II = 2-3 individer, klasse III = 4-7 individer, klasse IV = 8-15 individer, osv., slik at de nedre klassegrensene danner en følge av ledd på formen 2^x, x=0,1,2, ... En slik følge kalles en geometrisk følge, derfor kalles klassene for geometriske klasser. Hvis antall arter innenfor hver klasse plottes mot klasseverdien på en lineær skala, vil det fremkomme en kurve som uttrykker individfordelingen mellom artene i samfunnet. Det har vist seg at i prøver fra upåvirkede samfunn vil det være mange arter med lavt individantall og få arter med høyt individantall, slik at vi får en entoppet, asymmetrisk kurve med lang "hale" mot høye klasseverdier. Denne kurven vil være godt tilpasset en log-normal fordelingskurve.

Ved moderat forurensing forsvinner en del av de individfattige artene, mens noen som blir begunstiget, øker i antall. Slik flater kurven ut, og strekker seg mot høyere klasser eller den får ekstra topper. Under slike forhold mister kurven enhver likhet med den statistiske log-normalfordelingen. Derfor kan avvik fra log-normalfordelingen tolkes som et resultat av en påvirkning/forurensing. Det har vist seg at denne metoden tidlig gir utslag ved miljøforstyrrelse. Ved sterk forurensning blir det bare noen få, men ofte svært tallrike arter tilbake. Log-normalfordelingskurven vil da ofte gjenoppstå, men med en lavere topp og spredt over flere klasser enn for uforstyrrede samfunn.

Faunaens fordelingsmønster (Clusteranalyse)

Variasjoner i faunaens fordelingsmønster over området beskrives ved å sammenligne faunasamfunnet på hver stasjon. Til dette brukes multivariate klassifikasjons- og ordinasjons-analyser.

Analysene i denne undersøkelsen ble utført ved hjelp av programpakken PRIMER. Inngangsdata er individantall pr. art, pr. prøve. Prøvene kan være replikater eller stasjoner. Det tas ikke hensyn til hvilke arter som opptrer. Forut for klassifikasjons- og ordinasjonsanalysene ble artslistene dobbelt kvadratrot-transformert. Dette ble gjort for å redusere avviket mellom høye og lave tetthetsverdier og dermed redusere eventuelle effekter av tallmessig dominans hos noen få arter i datasettet.

For å sammenligne prøvene ble Bray-Curtis ulikhetsindeks benyttet (Bray & Curtis, 1957):

$$d_{ij} = \frac{\sum_{k=1}^{n} \left| X_{ki} - X_{kj} \right|}{\sum_{k=1}^{n} (X_{ki} + X_{kj})}$$

der n = antall arter sammenlignet
X_{ki} = antall individ av art k i prøve nr. i
X_{kj} = antall individ av art k i prøve nr. j

Indeksen avtar med økende likhet. Vi får verdien 1 hvis prøvene er helt ulike, dvs. ikke har noen felles arter. Identiske arts- og individtall vil gi verdien 0. Prøver blir gruppert sammen etter graden av likhet ved å bruke "group-average linkage". Forholdsvis like prøver danner en gruppe (cluster). Resultatet presenteres i et trediagram (dendrogram).

Sensitivitet og tetthet

NSI (Norwegian Sensitivity Index; Rygg og Norling 2013) er utviklet med basis i norske faunadata og innført i 2012 og oppdatert i 2018 (Borgersen *m. fl.*, 2019). Hver art av i alt 583 arter er tilordnet en sensitivitetsverdi).

En prøves NSI-verdi beregnes ved gjennomsnittet av sensitivitetsverdiene av alle individene i prøven. Formelen for utregning er gitt ved:

$$NSI = \sum_{i}^{S} \left[\frac{N_i * NSI_i}{N_{NSI}} \right]$$

ISI_{2018} (Indicator Species Index; Rygg og Norling 2013) en sensitivitetsindeks. Grunnlaget for beregningen av ISI (Rygg 2002) ble utvidet og artsnomenklaturen standardisert i 2012 og oppdatert i 2018 (Borgersen *m. fl.*, 2019). Hver art er tilordnet en ømfintlighetsverdi. ISI er en kvalitativ indeks som tar hensyn til hvilke arter som er til stede, men ikke individtallet av dem. En prøves ISI-verdi beregnes ved gjennomsnittet av sensitivitetsverdiene av artene i prøven hvor ISI_i er ISI_{2018} verdien for arten i og S_{ISI} er antall arter tilordnet sensitivitetsverdier.

$$ISI = \sum_{i}^{S} \left[\frac{ISI_i}{S_{ISI}} \right]$$

AMBI (Azti Marine Biotic Index; Borja m.fl. 2000) er en sensitivitetsindeks (egentlig en toleranseindeks) der artene tilordnes en toleranseklasse (økologisk gruppe, EG). EG I = sensitive arter, EG II = "indifferente" arter, EG III = tolerante arter, EG IV = opportunistiske arter, EG V = forurensningsindikerende arter. I Norge brukes AMBI bare i kombinasjonsindeksen NQI1 og har derfor ingen egen klassifisering. AMBI er en kvantitativ indeks som tar hensyn til individtallet av artene.

AMBI = (0 * EG I) + (1,5 * EG II) + (3 * EG III) + (4,5 * EG IV) + (6 * EG V) hvor EGI er andelen av individer som tilhører gruppe I, etc. Tallene angir toleranseverdiene.

Formelen for beregning av en prøves AMBI-verdi er gitt ved:

$$AMBI = \sum_{i}^{S} \left[\frac{N_i * AMBI_i}{N_{AMBI}} \right]$$

Sammensatt indeks

NQI1 (Norwegian Quality Index; Rygg 2006) inneholder indikatorer som omfatter sensitivitet (AMBI), og artsmangfold (S = antall, N = antall individer) i en prøve. NQI1 er interkalibrert mellom alle land som tilhører NEAGIG. NQI1 er gitt ved formelen:

$$NQI1 = \left[\left(0{,}5 * \left(1 - \frac{AMBI}{7} \right) + 0{,}5 * \left(\frac{\left[\frac{ln\,(S)}{ln(ln(N))} \right]}{2.7} \right) * \left(\frac{N}{N+5} \right) \right) \right]$$

I prøver som har veldig lave individtall (færre enn seks), kan ikke NQI1 brukes. Det er i slike tilfeller mulig å bruke N+2 i stedet for N i formelen for å unngå uriktige indeksverdier (Rygg et al. 2011).

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Økologisk tilstandsklassifisering basert på observert verdi av indeks (Veileder fra Miljødirektoratet (2025), ***vanntype G/H 1-3.***

Indeks	I Svært god "Very good"	II God "Good"	III Moderat "Moderate"	IV Dårlig "Poor"	V Svært dårlig "Bad"
NQI1	0,9-0,72	0,72-0,63	0,63-0,49	0,49-0,31	0,31-0
H´	5,5 - 3,7	3,7 - 2,9	2,9 - 1,8	1,8 - 0,9	0,9 - 0
ES_{100}	46 - 23	23 - 16	16-9	9-5	5 - 0
ISI_{2018}	10,2 - 6,6	6,6 - 6	6 - 4,9	4,9 - 3,6	3,6 - 0
NSI_{2018}	34 - 29	29 - 23	23 - 17	17 - 11	11 - 0
nEQR	1,0 – 0,8	0,8 – 0,6	0,6 – 0,4	0,4 – 0,2	0,2 – 0,0

7.2 Statistical results Steinanes, 2025

Benthos indices per replicate

st.nr.		C1_01	C1_02	C2_01	C2_02	C2alt_01	C2alt_02	C3_01	C3_02	C4_01	C4_02	C5_01	C5_02
no. ind.		503	1623	141	214	193	203	246	284	305	285	225	290
no. spe.		29	37	16	30	23	20	24	27	24	24	23	22
Shannon-Wiener:		2,9	2,6	2,4	2,9	2,8	3,0	2,8	2,9	2,7	2,7	2,9	2,6
Pielou		0,59	0,50	0,59	0,60	0,61	0,68	0,62	0,62	0,59	0,60	0,63	0,59
ES100		15	14	14	20	18	17	16	17	15	15	18	15
SN		1,84	1,81	1,73	2,02	1,89	1,79	1,86	1,90	1,82	1,83	1,86	1,78
ISI-2018		5,37	5,95	6,95	6,83	6,09	6,29	6,47	5,49	5,99	6,55	6,79	6,45
AMBI		4,204	4,013	2,585	2,425	2,494	1,968	2,790	2,607	2,491	2,509	2,095	2,057
NQI1		0,54	0,55	0,63	0,69	0,66	0,68	0,64	0,66	0,65	0,65	0,69	0,68
NSI-2018		14,1	13,8	21,1	21,2	22,1	21,2	20,9	20,9	21,0	20,8	21,1	21,0

Geometrical classes

int.	C1	C2	C2alt	C3	C4	C5
1	17	12	3	12	6	6
2,3	9	11	5	10	11	4
4- 7	7	6	6	5	4	8
8- 15	5	0	6	2	3	5
16- 31	3	2	1	1	1	1
32- 63	3	1	2	2	1	0
64-127	2	0	0	0	2	2
128-255	1	1	1	2	0	1
256-511	0	0	0	0	1	0
512-1023	2	0	0	0	0	0
1024-2047	0	0	0	0	0	0
2048-	0	0	0	0	0	0

7.3 Species lists

Artsliste pr stasjon

Steinanes ASC-C-survey 2025

Rekke	Klasse	Orden	Art/Taxa	Replikat: 01	02	-	Sum
Stasjonsnr.: C1							
NEMERTINI							
			Nemertea indet.	4	2	-	6
ANNELIDA							
	Polychaeta						
		Orbiniida					
			Leitoscoloplos mammosus	4	2	-	6
		Cossurida					
			Cossura longocirrata		2	-	2
		Spionida					
			Chaetozone sp.		5	-	5
			Prionospio sigvaldadottirae	3	67	-	70
			Spio limicola	2	6	-	8
		Capitellida					
			Capitella capitata	230	663	-	893
			Heteromastus filiformis	19	42	-	61
			Praxillella gracilis		1	-	1
		Opheliida					
			Ophelina acuminata	48		-	48
			Scalibregma inflatum	3		-	3
		Phyllodocida					
			Acanthicolepis asperrima	1		-	1
			Eteone barbata		2	-	2
			Eteone flava/longa	50	19	-	69
			Eulalia tjalfiensis		1	-	1
			Gattyana cirrhosa	1		-	1
			Harmothoe fragilis	1		-	1
			Harmothoe glabra		5	-	5
			Microphthalmus sczelkowii	1		-	1
			Nephtys ciliata		6	-	6
			Nephtys pente		1	-	1
			Nereis pelagica		1	-	1
			Pholoe assimilis	13	15	-	28
			Pholoe inornata		12	-	12
			Phyllodoce groenlandica	1		-	1
		Amphinomida					
			Paramphinome jeffreysii	1		-	1
		Eunicida					
			Lumbrineris mixochaeta	2	1	-	3
			Ophryotrocha sp.	2	2	-	4
			Schistomeringos sp.	6	4	-	10
		Oweniida					
			Galathowenia oculata	5	39	-	44
		Terebellida					
			Ampharete borealis	26	147	-	173
			Cistenides hyperborea		11	-	11
			Lagis koreni		2	-	2
			Melinna cristata		1	-	1
		Sabellida					
			Euchone papillosa	2	10	-	12
CRUSTACEA							
	Malacostraca						
		Cumacea					
			Leucon sp.		1	-	1
		Amphipoda					
			Caprellidae indet.		2	-	2
			Dulichiidae indet.	1		-	1
			Metopa sp.		2	-	2
		Decapoda					
			Hyas coarctatus	1		-	1
MOLLUSCA							
	Prosobranchia						
		Mesogastropoda					
			Lacuna vincta		1	-	1
	Opistobranchia						
		Cephalaspidea					
			Philinissima denticulata		3	-	3

Rekke	Klasse	Orden	Art/Taxa	Replikat:	01	02	-	Sum
		Nudibranchia						
			Dendronotus sp.		1		-	1
			Onchidoris muricata		1		-	1
	Bivalvia							
		Nuculoida						
			Ennucula tenuis		8	16	-	24
			Yoldia hyperborea			3	-	3
		Mytiloida						
			Mytilus edulis juv.		7	3	-	10
		Veneroida						
			Axinopsida orbiculata			6	-	6
			Macoma calcarea		5	21	-	26
			Thyasira sarsii		61	499	-	560
ECHINODERMATA								
	Asteroidea							
			Asteroidea indet. juv.		5	1	-	6
				Maksverdi:	230	663		893
				Antall arter/taxa:	31	39		51
				Sum antall individ:				2142

Stasjonsnr.: C2

NEMERTINI								
			Nemertea indet.			1	-	1
ANNELIDA								
	Polychaeta							
		Spionida						
			Chaetozone sp.		10	11	-	21
			Prionospio sigvaldadottirae		75	103	-	178
		Capitellida						
			Heteromastus filiformis			3	-	3
			Praxillella gracilis		4		-	4
		Opheliida						
			Ophelina acuminata			3	-	3
		Phyllodocida						
			Bylgides groenlandicus		1	1	-	2
			Eteone barbata			1	-	1
			Eteone flava/longa		1	1	-	2
			Harmothoe glabra			2	-	2
			Nephtys ciliata		1	5	-	6
		Eunicida						
			Lumbrineris mixochaeta		3	1	-	4
			Lumbrineris sp.			1	-	1
			Ophryotrocha sp.			2	-	2
			Schistomeringos sp.		1		-	1
		Oweniida						
			Galathowenia oculata		1	5	-	6
		Flabelligerida						
			Saphobranchia longisetosa			1	-	1
		Terebellida						
			Ampharete borealis		10	17	-	27
			Ampharete finmarchica		1	1	-	2
			Ampharete petersenae			2	-	2
			Laphania boecki		2	1	-	3
		Sabellida						
			Euchone papillosa			1	-	1
CRUSTACEA								
	Malacostraca							
		Cumacea						
			Leucon sp.			1	-	1
		Amphipoda						
			Metopa sp.		1	2	-	3
		Decapoda						
			Brachyura indet.			1	-	1
			Hyas coarctatus			1	-	1
MOLLUSCA								
	Prosobranchia							
		Mesogastropoda						
			Lacuna vincta			3	-	3
	Bivalvia							
		Nuculoida						
			Ennucula tenuis			4	-	4
			Nuculana pernula			1	-	1
			Yoldia hyperborea		3	2	-	5
		Veneroida						
			Macoma calcarea		1		-	1

Rekke	Klasse	Orden	Art/Taxa	Replikat:	01	02	-	Sum
			Thyasira sarsii		26	35	-	61
ECHINODERMATA								
	Asteroidea							
		Paxillosida						
			Ctenodiscus crispatus			1	-	1
				Maksverdi:	75	103		178
				Antall arter/taxa:	16	30		33
				Sum antall individ:				355

Stasjonsnr.: C2alt

NEMERTINI								
			Nemertea indet.		2	2	-	4
ANNELIDA								
	Polychaeta							
		Orbiniida						
			Leitoscoloplos mammosus		1		-	1
		Spionida						
			Chaetozone sp.		20	13	-	33
			Prionospio sigvaldadottirae		103	92	-	195
		Capitellida						
			Heteromastus filiformis		1	1	-	2
			Praxillella gracilis		2	2	-	4
		Opheliida						
			Ophelina acuminata		2		-	2
		Phyllodocida						
			Eteone flava/longa		4	1	-	5
			Harmothoe glabra		5	4	-	9
			Nephtys ciliata		6	6	-	12
		Eunicida						
			Lumbrineris mixochaeta			3	-	3
			Lumbrineris sp.		1		-	1
			Schistomeringos sp.		1	1	-	2
		Terebellida						
			Ampharete borealis		11	27	-	38
			Ampharete finmarchica		2	3	-	5
			Ampharete petersenae		7	2	-	9
			Cistenides hyperborea		4	4	-	8
			Terebellides sp.		1		-	1
		Sabellida						
			Euchone papillosa		3	11	-	14
CRUSTACEA								
	Malacostraca							
		Cumacea						
			Leucon sp.		1	4	-	5
MOLLUSCA								
	Bivalvia							
		Nuculoida						
			Ennucula tenuis		3	4	-	7
			Yoldia hyperborea		2	7	-	9
		Veneroida						
			Macoma calcarea		1	1	-	2
			Thyasira sarsii		10	15	-	25
ECHINODERMATA								
	Asteroidea							
			Asteroidea indet. juv.		1	2	-	3
				Maksverdi:	103	92		195
				Antall arter/taxa:	24	21		25
				Sum antall individ:				399

Stasjonsnr.: C3

ANNELIDA								
	Polychaeta							
		Spionida						
			Chaetozone sp.		24	21	-	45
			Prionospio sigvaldadottirae		89	114	-	203
			Tharyx killariensis			1	-	1
		Capitellida						
			Capitella capitata			2	-	2
			Heteromastus filiformis		13	8	-	21
			Praxillella gracilis		1		-	1
		Opheliida						
			Ophelina acuminata		1	2	-	3
		Phyllodocida						
			Eteone barbata			1	-	1

Rekke	Klasse	Orden	Art/Taxa	Replikat:	01	02	-	Sum
			Eteone flava/longa			2	-	2
			Harmothoe glabra		2		-	2
			Nephtys ciliata		2	4	-	6
			Nephtys pente		1		-	1
			Pholoe assimilis		1	1	-	2
		Eunicida						
			Lumbrineris mixochaeta		1		-	1
			Ophryotrocha sp.			1	-	1
			Schistomeringos sp.		1	2	-	3
		Oweniida						
			Galathowenia oculata		8	7	-	15
		Terebellida						
			Ampharete borealis		15	28	-	43
			Ampharete finmarchica		1	3	-	4
			Cistenides hyperborea		4	2	-	6
			Laphania boecki		3		-	3
			Melinna cristata			2	-	2
CRUSTACEA								
	Malacostraca							
		Cumacea						
			Leucon sp.		1	2	-	3
		Amphipoda						
			Caprellidae indet.		1		-	1
			Metopa sp.		1	1	-	2
MOLLUSCA								
	Prosobranchia							
		Neogastropoda						
			Curtitoma trevelliana			1	-	1
	Opistobranchia							
		Cephalaspidea						
			Philinissima denticulata			1	-	1
		Nudibranchia						
			Gulenia sp.			1	-	1
	Bivalvia							
		Nuculoida						
			Ennucula tenuis		2	7	-	9
			Nuculana pernula			1	-	1
			Yoldia hyperborea		2	3	-	5
		Mytiloida						
			Mytilus edulis juv.		3		-	3
		Veneroida						
			Macoma calcarea		3	4	-	7
			Thyasira gouldii		1		-	1
			Thyasira sarsii		68	62	-	130
				Maksverdi:	89	114		203
				Antall arter/taxa:	25	27		35
				Sum antall individ:				533

Stasjonsnr.: C4

NEMERTINI								
			Nemertea indet.		5		-	5
ANNELIDA								
	Polychaeta							
		Spionida						
			Chaetozone sp.		23	21	-	44
			Prionospio sigvaldadottirae		143	116	-	259
		Capitellida						
			Capitella capitata		1		-	1
			Euclymeninae indet.		1		-	1
			Heteromastus filiformis		7	5	-	12
			Mediomastus fragilis			1	-	1
			Praxillella gracilis			2	-	2
		Opheliida						
			Ophelina acuminata		1	3	-	4
		Phyllodocida						
			Eteone flava/longa		1	1	-	2
			Harmothoe glabra		7	2	-	9
			Nephtys ciliata		3	3	-	6
		Eunicida						
			Lumbrineris mixochaeta		1	2	-	3
			Schistomeringos sp.		2	1	-	3
		Oweniida						
			Galathowenia oculata		6	11	-	17
		Terebellida						
			Ampharete borealis		44	44	-	88
			Ampharete finmarchica		1	1	-	2

Rekke	Klasse	Orden	Art/Taxa	Replikat:	01	02	-	Sum
			Ampharete petersenae			1	-	1
			Cistenides hyperborea		1	1	-	2
			Laphania boecki		1	2	-	3
		Sabellida						
			Euchone papillosa			1	-	1
CRUSTACEA								
	Malacostraca							
		Cumacea						
			Leucon sp.		1	1	-	2
		Amphipoda						
			Metopa sp.		2		-	2
MOLLUSCA								
	Prosobranchia							
		Neogastropoda						
			Curtitoma trevelliana			1	-	1
	Bivalvia							
		Nuculoida						
			Ennucula tenuis		5	4	-	9
			Nuculana pernula		2	1	-	3
			Yoldia hyperborea		2		-	2
		Veneroida						
			Macoma calcarea		3	2	-	5
			Thyasira sarsii		42	58	-	100
				Maksverdi:	143	116		259
				Antall arter/taxa:	24	24		29
				Sum antall individ:				590

Stasjonsnr.: C5

ANNELIDA								
	Polychaeta							
		Spionida						
			Chaetozone sp.		10	9	-	19
			Prionospio sigvaldadottirae		106	146	-	252
		Capitellida						
			Heteromastus filiformis		2	4	-	6
			Praxillella gracilis		2		-	2
		Opheliida						
			Ophelina acuminata		1	1	-	2
		Phyllodocida						
			Eteone flava/longa			1	-	1
			Harmothoe glabra		2	2	-	4
			Harmothoe sp.		1		-	1
			Nephtys ciliata		3	5	-	8
		Eunicida						
			Lumbrineris mixochaeta		3	5	-	8
			Schistomeringos sp.		2		-	2
		Oweniida						
			Galathowenia oculata		4	3	-	7
		Terebellida						
			Ampharete borealis		26	45	-	71
			Ampharete finmarchica		1	3	-	4
			Ampharete petersenae		3	4	-	7
			Cistenides hyperborea		6	3	-	9
			Laphania boecki		2	4	-	6
			Melinna cristata			1	-	1
		Sabellida						
			Euchone papillosa		1	2	-	3
CRUSTACEA								
	Malacostraca							
		Cumacea						
			Leucon sp.		6	1	-	7
		Amphipoda						
			Metopa sp.		4		-	4
			Oedicerotidae indet.		1		-	1
MOLLUSCA								
	Bivalvia							
		Nuculoida						
			Ennucula tenuis		2	8	-	10
			Yoldia hyperborea		5	5	-	10
		Veneroida						
			Macoma calcarea			1	-	1
			Thyasira sarsii		32	36	-	68
ECHINODERMATA								
	Asteroidea							
		Paxillosida						
			Ctenodiscus crispatus			1	-	1
			Asteroidea indet. juv.		1	1	-	2

Rekke	Klasse	Orden	Art/Taxa	Replikat:	01	02 -	Sum
				Maksverdi:	106	146	252
				Antall arter/taxa:	24	23	28
				Sum antall individ:			517

7.4 Analytical report

Akvaplan niva

NORSK AKKREDITERING TEST 079

ANALYSERAPPORT

Kunde:	Arnarlax	**Rapport nr.:**	P250101
Kundemerking:	Steinanes		
Kontaktperson:		**Rapportdato**	**2025-10-17**
Prosjektnr.:	**66876**	**Ankomst dato:**	2025-09-12

Lab-id. P250101-01

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment	C1			66876 - Steinanes ASC/C and B survey 2025		2025-09-12

Analyseresultat

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet
TOC	24	mg/g TS	2025-09-23	2025-10-03	Intern metode (NS-EN 17505:2023)	±2.4
TNb	2.8	mg/g TS	2025-09-23	2025-10-03	Intern metode (NS-EN 16168:2012)	±0.61
nTOC	33.2		2025-10-03	2025-10-03	Miljødirektoratet 2025	
C/N - forhold	*8.6		2025-10-03	2025-10-03	Beregning TOC:TN	
TOM	7.7	% TS	2025-09-16	2025-09-18	Vekttap ved forbrenning. Intern metode basert på NS 4764 (1980)	
Vekt% ≥2 mm	1.9	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	
Vekt% 1 mm - <2 mm	1.1	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.500 mm - <1 mm	2.3	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.250 mm - <0.500 mm	10.5	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.3
Vekt% 0.125 mm - <0.250 mm	20.7	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.6
Vekt% 0.063 mm - <0.125 mm	15.2	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±1.3
Vekt% <0.063 mm	48.3	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±4.8
Pelitt	*48.3	wt% TS	2025-09-16	2025-09-25	Fraksjonen <0.063 mm	±4.8
Sand	*49.8	wt% TS	2025-09-16	2025-09-25	Summering av fraksjonene mellom 0.063 mm opptil 2 mm	±2.5
Grus	*1.9	wt% TS	2025-09-16	2025-09-25	Fraksjonen ≥2 mm	
Kobber (Cu) [a]	64.0	mg/kg TS	2025-09-25	2025-09-25	Intern metode	
P (Fosfor) [a]	2300	mg/kg TS	2025-09-25	2025-09-25	Intern metode	

[a] Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

* = Ikke akkreditert resultat

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Analyserapporten er digitalt undertegnet av:
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ANALYSERAPPORT

Kunde:	Arnarlax	**Rapport nr.:**	P250101
Kundemerking:	Steinanes		
Kontaktperson:		**Rapportdato**	**2025-10-17**
Prosjektnr.:	**66876**	**Ankomst dato:**	2025-09-12

Lab-id. P250101-04

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment	C2	ASC2		66876 - Steinanes ASC/C and B survey 2025	2x Cu - Agglomerering i øverste tre siktene i kornfordelingsanalysen.	2025-09-12

Analyseresultat

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet
TOC	43	mg/g TS	2025-09-23	2025-10-03	Intern metode (NS-EN 17505:2023)	±4.3
TNb	3.4	mg/g TS	2025-09-23	2025-10-03	Intern metode (NS-EN 16168:2012)	±0.75
nTOC	45.2		2025-10-03	2025-10-03	Miljødirektoratet 2025	
C/N - forhold	*12.5		2025-10-03	2025-10-03	Beregning TOC:TN	
TOM	15.2	% TS	2025-09-16	2025-09-18	Vekttap ved forbrenning. Intern metode basert på NS 4764 (1980)	
Vekt% ≥2 mm	3.3	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	
Vekt% 1 mm - <2 mm	2.8	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.500 mm - <1 mm	3.0	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.250 mm - <0.500 mm	2.4	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.125 mm - <0.250 mm	1.1	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.063 mm - <0.125 mm	1.4	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% <0.063 mm	86.0	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±8.5
Pelitt	*86.0	wt% TS	2025-09-16	2025-09-25	Fraksjonen <0.063 mm	±8.5
Sand	*10.7	wt% TS	2025-09-16	2025-09-25	Summering av fraksjonene mellom 0.063 mm opptil 2 mm	±0.5
Grus	*3.3	wt% TS	2025-09-16	2025-09-25	Fraksjonen ≥2 mm	
Kobber (Cu) [a]	59.0 59.0	mg/kg TS	2025-09-25	2025-09-25	Intern metode	
P (Fosfor) [a]	1400	mg/kg TS	2025-09-25	2025-09-25	Intern metode	

[a] Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

* = Ikke akkreditert resultat

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ANALYSERAPPORT

Kunde:	Arnarlax	**Rapport nr.:**	P250101
Kundemerking:	Steinanes		
Kontaktperson:		**Rapportdato**	**2025-10-17**
Prosjektnr.:	**66876**	**Ankomst dato:**	2025-09-12

Lab-id. P250101-07

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment	C3	ASC3		66876 - Steinanes ASC/C and B survey 2025	2x Cu - Agglomerering i øverste tre siktene i kornfordelingsanalysen.	2025-09-12

Analyseresultat

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet
TOC	48	mg/g TS	2025-09-23	2025-10-03	Intern metode (NS-EN 17505:2023)	±4.8
TNb	3.7	mg/g TS	2025-09-23	2025-10-03	Intern metode (NS-EN 16168:2012)	±0.82
nTOC	51.0		2025-10-03	2025-10-03	Miljødirektoratet 2025	
C/N - forhold	*12.8		2025-10-03	2025-10-03	Beregning TOC:TN	
TOM	14.5	% TS	2025-09-16	2025-09-18	Vekttap ved forbrenning. Intern metode basert på NS 4764 (1980)	
Vekt% ≥2 mm	1.4	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	
Vekt% 1 mm - <2 mm	2.3	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.500 mm - <1 mm	3.4	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.250 mm - <0.500 mm	3.6	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.125 mm - <0.250 mm	3.0	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.063 mm - <0.125 mm	4.5	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.4
Vekt% <0.063 mm	81.8	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±8.1
Pelitt	*81.8	wt% TS	2025-09-16	2025-09-25	Fraksjonen <0.063 mm	±8.1
Sand	*16.8	wt% TS	2025-09-16	2025-09-25	Summering av fraksjonene mellom 0.063 mm opptil 2 mm	±0.8
Grus	*1.4	wt% TS	2025-09-16	2025-09-25	Fraksjonen ≥2 mm	
Kobber (Cu) [a]	67.0 68.0	mg/kg TS	2025-09-25	2025-09-25	Intern metode	
P (Fosfor) [a]	2200	mg/kg TS	2025-09-25	2025-09-25	Intern metode	

Tabellen fortsetter på neste side...

* = Ikke akkreditert resultat

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ANALYSERAPPORT

Kunde:	Arnarlax	**Rapport nr.:**	P250101
Kundemerking:	Steinanes		
Kontaktperson:		**Rapportdato**	**2025-10-17**
Prosjektnr.:	**66876**	**Ankomst dato:**	2025-09-12

Fortsettelse av tabell fra forrige side.

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet
Emamectinbenzoat [b]	*0.49	ng/g TS	2025-10-03	2025-10-03	Intern metode	

[a] Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

[b] Prøvingen er utført av eksternt laboratorium, NIVA

Tabellen fortsetter på neste side...

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Analyserapporten er digitalt undertegnet av:
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ANALYSERAPPORT

Kunde:	Arnarlax	**Rapport nr.:**	P250101
Kundemerking:	Steinanes		
Kontaktperson:		**Rapportdato**	**2025-10-17**
Prosjektnr.:	**66876**	**Ankomst dato:**	2025-09-12

Fortsettelse av tabell fra forrige side.

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet
Lab-id. P250101-10						

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment	C4	ASC4		66876 - Steinanes ASC/C and B survey 2025	2x Cu - Agglomerering i øverste siktene i kornfordelingsanalysen.	2025-09-12

Analyseresultat						
Parameter	**Resultat**	**Enhet**	**Analysedato start**	**Analysedato**	**Standard**	**Måleusikkerhet**
TOC	42	mg/g TS	2025-09-23	2025-10-03	Intern metode (NS-EN 17505:2023)	±4.2
TNb	3.8	mg/g TS	2025-09-23	2025-10-03	Intern metode (NS-EN 16168:2012)	±0.85
nTOC	44.7		2025-10-03	2025-10-03	Miljødirektoratet 2025	
C/N - forhold	*10.9		2025-10-03	2025-10-03	Beregning TOC:TN	
TOM	14.3	% TS	2025-09-16	2025-09-18	Vekttap ved forbrenning. Intern metode basert på NS 4764 (1980)	
Vekt% ≥2 mm	5.9	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	
Vekt% 1 mm - <2 mm	3.6	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.500 mm - <1 mm	2.9	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.250 mm - <0.500 mm	1.2	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.125 mm - <0.250 mm	0.7	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.063 mm - <0.125 mm	1.1	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% <0.063 mm	84.5	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±8.4
Pelitt	*84.5	wt% TS	2025-09-16	2025-09-25	Fraksjonen <0.063 mm	±8.4
Sand	*9.5	wt% TS	2025-09-16	2025-09-25	Summering av fraksjonene mellom 0.063 mm opptil 2 mm	±0.5

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Kunde:	Arnarlax	**Rapport nr.:**	P250101
Kundemerking:	Steinanes		
Kontaktperson:		**Rapportdato**	**2025-10-17**
Prosjektnr.:	**66876**	**Ankomst dato:**	2025-09-12

Fortsettelse av tabell fra forrige side.

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet
Grus	*5.9	wt% TS	2025-09-16	2025-09-25	Fraksjonen ≥2 mm	
Kobber (Cu) [a]	69.0 65.0	mg/kg TS	2025-09-25	2025-09-25	Intern metode	
P (Fosfor) [a]	2000	mg/kg TS	2025-09-25	2025-09-25	Intern metode	

[a] Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

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Kunde:	Arnarlax	**Rapport nr.:**	P250101
Kundemerking:	Steinanes		
Kontaktperson:		**Rapportdato**	**2025-10-17**
Prosjektnr.:	**66876**	**Ankomst dato:**	2025-09-12

Fortsettelse av tabell fra forrige side.

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet
Lab-id. P250101-13						

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment	C5	ASC5		66876 - Steinanes ASC/C and B survey 2025	2x Cu - Agglomerering i øverste siktene i kornfordelingsanalysen.	2025-09-12

Analyseresultat

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet
TOC	44	mg/g TS	2025-09-23	2025-10-03	Intern metode (NS-EN 17505:2023)	±4.4
TNb	3.8	mg/g TS	2025-09-23	2025-10-03	Intern metode (NS-EN 16168:2012)	±0.84
nTOC	46.3		2025-10-03	2025-10-03	Miljødirektoratet 2025	
C/N - forhold	*11.4		2025-10-03	2025-10-03	Beregning TOC:TN	
TOM	12.7	% TS	2025-09-16	2025-09-18	Vekttap ved forbrenning. Intern metode basert på NS 4764 (1980)	
Vekt% ≥2 mm	2.9	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	
Vekt% 1 mm - <2 mm	2.7	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.500 mm - <1 mm	3.4	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.250 mm - <0.500 mm	1.7	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.125 mm - <0.250 mm	0.9	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.0
Vekt% 0.063 mm - <0.125 mm	2.4	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.2
Vekt% <0.063 mm	86.0	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±8.5
Pelitt	*86.0	wt% TS	2025-09-16	2025-09-25	Fraksjonen <0.063 mm	±8.5
Sand	*11.1	wt% TS	2025-09-16	2025-09-25	Summering av fraksjonene mellom 0.063 mm opptil 2 mm	±0.5

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ANALYSERAPPORT

Kunde:	Arnarlax	**Rapport nr.:**	P250101
Kundemerking:	Steinanes		
Kontaktperson:		**Rapportdato**	**2025-10-17**
Prosjektnr.:	**66876**	**Ankomst dato:**	2025-09-12

Fortsettelse av tabell fra forrige side.

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet
Grus	*2.9	wt% TS	2025-09-16	2025-09-25	Fraksjonen ≥2 mm	
P (Fosfor) [a]	1600	mg/kg TS	2025-09-25	2025-09-25	Intern metode	

[a] Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

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Kunde:	Arnarlax	**Rapport nr.:**	P250101
Kundemerking:	Steinanes		
Kontaktperson:		**Rapportdato**	**2025-10-17**
Prosjektnr.:	**66876**	**Ankomst dato:**	2025-09-12

Fortsettelse av tabell fra forrige side.

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet

Lab-id. P250101-18

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment	C2alt	ASCref		66876 - Steinanes ASC/C and B survey 2025	2x Cu - Mye skjell i prøven, hvilket reduserer andel av pelitt i kornfordelingen.	2025-09-12

Analyseresultat

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet
TOC	34	mg/g TS	2025-09-23	2025-10-03	Intern metode (NS-EN 17505:2023)	±3.4
TNb	3.4	mg/g TS	2025-09-23	2025-10-03	Intern metode (NS-EN 16168:2012)	±0.76
nTOC	42.7		2025-10-03	2025-10-03	Miljødirektoratet 2025	
C/N - forhold	*9.9		2025-10-03	2025-10-03	Beregning TOC:TN	
TOM	9.1	% TS	2025-09-16	2025-09-18	Vekttap ved forbrenning. Intern metode basert på NS 4764 (1980)	
Vekt% ≥2 mm	25.5	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	
Vekt% 1 mm - <2 mm	4.9	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.2
Vekt% 0.500 mm - <1 mm	3.7	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.1
Vekt% 0.250 mm - <0.500 mm	5.1	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.2
Vekt% 0.125 mm - <0.250 mm	5.2	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.2
Vekt% 0.063 mm - <0.125 mm	4.1	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±0.4
Vekt% <0.063 mm	51.7	wt% TS	2025-09-16	2025-09-25	Intern metode (Bale/Kenny 2005)	±5.1
Pelitt	*51.7	wt% TS	2025-09-16	2025-09-25	Fraksjonen <0.063 mm	±5.1

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ANALYSERAPPORT

Kunde:	Arnarlax	**Rapport nr.:**	P250101
Kundemerking:	Steinanes		
Kontaktperson:		**Rapportdato**	**2025-10-17**
Prosjektnr.:	**66876**	**Ankomst dato:**	2025-09-12

Fortsettelse av tabell fra forrige side.

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet
Sand	*22.9	wt% TS	2025-09-16	2025-09-25	Summering av fraksjonene mellom 0.063 mm opptil 2 mm	±1.1
Grus	*25.5	wt% TS	2025-09-16	2025-09-25	Fraksjonen ≥2 mm	
Kobber (Cu) [a]	56.0 54.0	mg/kg TS	2025-09-25	2025-09-25	Intern metode	
P (Fosfor) [a]	1900	mg/kg TS	2025-09-25	2025-09-25	Intern metode	

[a] Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

Lab-id. P250101-21

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment		Cu ref 1		66876 - Steinanes ASC/C and B survey 2025	2x Cu	2025-09-12

Analyseresultat

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet
Kobber (Cu) [a]	66.0 82.0	mg/kg TS	2025-09-25	2025-09-25	Intern metode	

[a] Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

Lab-id. P250101-22

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment		Cu ref 2		66876 - Steinanes ASC/C and B survey 2025	2x Cu	2025-09-12

Analyseresultat

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet
Kobber (Cu) [a]	63.0 42.0	mg/kg TS	2025-09-25	2025-09-25	Intern metode	

[a] Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

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ANALYSERAPPORT

Kunde:	Arnarlax	**Rapport nr.:**	P250101
Kundemerking:	Steinanes		
Kontaktperson:		**Rapportdato**	**2025-10-17**
Prosjektnr.:	**66876**	**Ankomst dato:**	2025-09-12

Lab-id. P250101-23

Objekt	Prøvestasjon/ID	ASC-stasjon	FU-stasjon	Prosjektnr. og prosjektnavn	Notering	Mottatt lab
Sediment		Cu ref 3		66876 - Steinanes ASC/C and B survey 2025	2x Cu	2025-09-12

Analyseresultat

Parameter	Resultat	Enhet	Analysedato start	Analysedato	Standard	Måleusikkerhet
Kobber (Cu) [a]	**58.0 86.0**	mg/kg TS	2025-09-25	2025-09-25	Intern metode	

[a] Prøvingen er utført av eksternt laboratorium, ALS Laboratory Group

Analyseansvarlig:

Katrin Bluhm

Signatur: Katrin Bluhm

Lisa Torske

Underskriftsberettiget:

Signatur: Lisa Torske

Analysene gjelder bare for de prøver som er testet. De oppgitte analyseresultat omfatter ikke feil som måtte følge av prøvetagningen, inhomogenitet eller andre forhold som kan ha påvirket prøven før den ble mottatt av laboratoriet. Rapporten får kun kopieres i sin helhet og uten noen form for endringer. En eventuell klage skal leveres laboratoriet senest en måned etter mottak av analyseresultat. Nærmere informasjon om analysemetodene (måleusikkerhet, metodeprinsipp etc.) fås ved henvendelse til Akvaplan-Niva AS

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