REPORT

Under Oslo

WP1 – CONTAINER EXPERIMENTS – YEARLY REPORT 2022

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Summary

Container experiments investigating leaching from alum shale under different conditions were started autumn 2020 as a part of the Under Oslo project at NGI (SP13). Furthermore, leaching from alum shale mixed with different amounts of rhomb porphyry was investigated, giving a total of 14 containers. The black shale in these containers were taken out from a road cut by E16 at Kleggerud autumn 2020. Additionally, 5 containers set up by the Norwegian Public Road Authorities (Statens vegvesen, SVV) in 2014 and 2015 to investigate leaching from alum shale and Galgeberg shale originating from the construction of the tunnel at Gran, Rv. 4, were taken over by NGI and measurements of leachate quality were resumed in November 2020. Autumn 2021 another two containers from SVV were taken over by NGI.

The main questions that were sought to be answered with these experiments are

- How long does it take for black shale exposed to natural weather conditions to develop acid rock drainage and exhibit a drop in measured leachate pH?
- When taking out naturally mixed masses, at which % alum shale is the rock masses expected to produce acid rock drainage when exposed to natural weather conditions?
- How is leaching from containers open to air compared to leachate concentrations in containers where alum shale is stored covered with water, giving less access to oxygen?
- How is leaching of metals and oxidation of alum shale affected by storage in fresh water compared to storage in salt water (not sea water)?
- How is the leaching affected by the grain size of the alum shale?

After 24 months, pH below 6 was not measured in the leachate from any of the containers set up with freshly blasted (unweathered) rock by NGI in 2020, and acid rock drainage (ARD) had thus not started. However, increasing conductivity, sulphate, and metal levels with time in the leachate from the mixed-masses and pure alum shale containers indicate that weathering processes are accelerating. Leaching of zinc, nickel, cadmium, cobalt, manganese, molybdenum and uranium seemed to increase with the amount of alum shale in the container.

Concentrations of nickel, cadmium, cobalt, barium, molybdenum and uranium were higher in leachate from the saltwater treatment than in the freshwater treatment. No elements seemed to leach in higher concentrations to the freshwater than the salt water. For both treatments covered with water, concentrations of sulphate, zinc, nickel, cadmium, and cobalt in the leachate were several times lower than what was seen in the last samples of the open containers.

For the SVV containers, low pH has been observed continuously after NGI started measurements in two containers with Alum shale from the tunnel at Gran as well as in the container with Galgeberg shale. Two containers have alum shale from a road cut, and one of these has larger rock pieces compared to the other and compared to the

other containers. The container with smaller pieces of these two (i.e., the same as the other containers, normally distributed grain size due to blasting) seem to exhibit a seasonal variation with leachate pH about 3 in summer and > 6 in winter, likely due to temperature dependence of the sulphide oxidation reactions. The pH in leachate from the container with larger pieces dropped below 6 for the first time in autumn 2022, down to about 4.5.

Leachate concentrations of a range of metals were, as expected, much higher in the SVV-containers with low leachate pH compared to the containers from SVV and NGI that have neutral leachate pH.

Results from the two containers that were taken over additionally from SVV autumn 2021 are briefly presented. Due to unknown storage conditions as well as unknown identity for one of them, these containers were decided to be discarded in June 2023.

The experiments were performed in Østlandet, Norway, and the results thus represents these weather conditions. The container experiments will continue until 2028 as a part of SFI earthresQue. This report summarises the results from the first two years of the NGI-experiments and includes results for the SVV containers from previous years.

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Appendix

Review and reference page

1 Introduction

Container experiments investigating leaching from alum shale under different conditions were started autumn 2020 as a part of "Under Oslo", an internally funded project at NGI (SP13). Alum shale was provided by Skanska AS and originates from the construction of E16 at Kleggerud (figure 1). This report contains the leachate data from 2022, in addition to older data.

14 containers were set up by NGI, with two replicates of seven different treatments. Ten containers were open, with rain running through the rock masses, and these had varying content of alum shale: 0, 5, 10, 20 or 100 %. The other masses in the containers were rhomb porphyry from Bjønndalen Bruk in Nittedal (Feiring AS). Another four containers were set up with pure alum shale and filled with either fresh water or salt water. The setup of the experiments is described in detail in NGI report 20200436-09-R (2023).

Five containers that were set up for similar experiments by the Norwegian Public Road Authorities (Statens vegvesen SVV) with rock from Gran (Rv. 4) (figure 1) in 2014 and 2015 as part of the Nordic road water (NORWAT) project were transported to NGI for resuming measurements. These contained alum shale from the tunnel (AT1 and AT2), alum shale from a road cut with all size fractions (A3) or only larger pieces (A1) as well as Galgeberg shale from a road cut (G2). Our gratitude towards SVV for giving us the containers and for sharing their data. These containers were also sampled by two master students in 2016 (Børresen, 2017; Erstad 2017), and we are grateful for being able to use their data.

Two extra containers were taken over from SVV autumn 2021, G4H and unknown (G5H/A4H/A5H). These contained mixed masses, but due to uncertain storage conditions of both and uncertain identity of one, we decided to discard these two in June 2023.

The main questions that were sought to be answered with these experiments are

- How long does it take for black shale exposed to natural weather conditions to develop acid rock drainage and exhibit a drop in measured leachate pH?
- When taking out naturally mixed masses, at which % alum shale is the rock masses expected to produce acid rock drainage when exposed to natural weather conditions?
- How is leaching from containers open to air compared to leachate concentrations in containers where alum shale is stored covered with water, giving less access to oxygen?
- How is leaching of metals and oxidation of alum shale affected by storage in fresh water compared to storage in salt water (not sea water)?
- How is the leaching affected by the grain size of the alum shale?

See also NGI-report 20200436-03-R (2022b) for information about the Under Oslo project and use of these results.

NGI

In 2022, all the containers were transported to NOAH Langøya for continuation of the experiments as part of earthresQue centre for research-based innovation (https://www.nmbu.no/tjenester/sentre/earthresque). The containers will be sampled until 2028, giving a total of 8 years of sampling for the containers started by NGI, and 13-14 years of sampling (though not continuously) for the containers started by SVV.

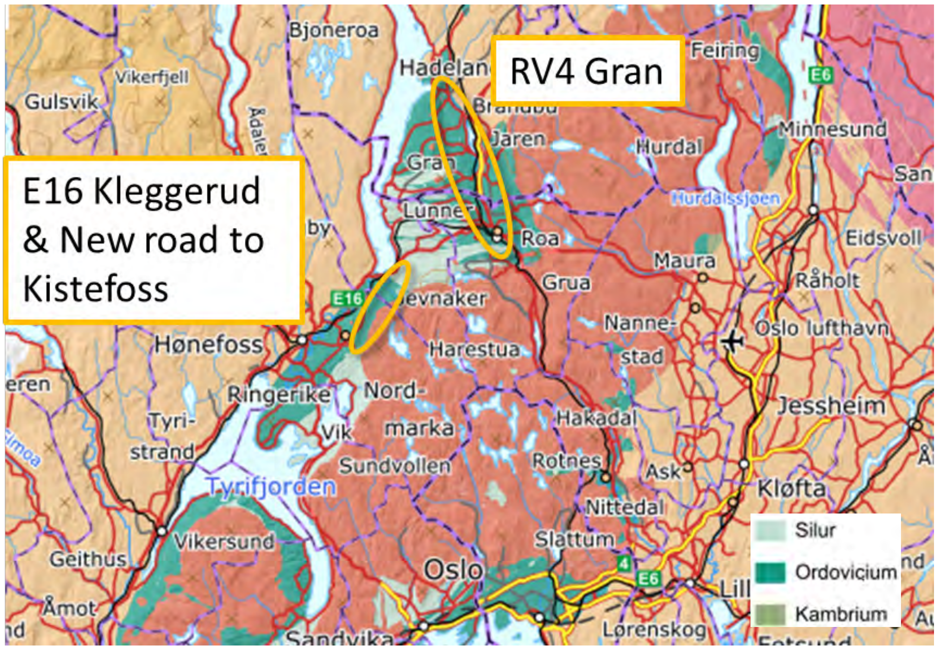

Figure 1 Map of the sites where black shales were collected for the experiments. Colours in the background map shows geological formation age (http://geo.ngu.no/kart/berggrunn/).

2 Method

Method for setting up containers are described in the yearly report of 2021 (NGI, 2023). A summary of the most important aspects and overview of the different containers are provided here. Furthermore, events and sampling in 2022 are described below.

2.1 Container experiment Kleggerud (NGI)

Several scenarios/hypotheses were investigated in this experiment (see Table 1 for overview of treatments):

- Different mixing ratios between alum shale and rhomb porphyry (0, 5, 10, 20 and 100 % alum shale) were used to investigate the development of metal leaching and acid production in different amounts of naturally mixed masses (containers RM, B5, B10, B20 and VAS).

- Comparison of dry storage of alum shale (TAS) with alum shale stored exposed to rain (VAS)
- Leaching from rock masses considered clean/unreactive (RM, 100 % rhomb porphyry) for comparison with reactive rock masses (VAS, 100 % alum shale)
- Disposal of alum shale submerged in fresh water (DF) and salt water (DS). While disposal of alum shale in the sea/salt water is expected to reduce the risk of a pH drop due to the neutralizing capacity of the salt water, increased leaching of various metals at neutral pH could occur due to chloride complexation.

Sampling was only planned once a year after the first year, but has been performed also in 2022, see ch. 2.4.

Table 1 Experimental set-up at NGI with Kleggerud alum shale and rhomb porphyry

Name	Content	Treatment	Replicates	Alum shale (% V/V)	Water addition	Start date	Alum shale got wet before experiment?	Sampling times full water analysis*	Sampling times pH, temperature, conductivity, redox
TAS	200 L AS	Closed	2	100	At the end of the experiment	21.10.2020	No	At the end of the experiment	At the end of the experiment
VAS	200 L AS	Open	2	100	Rain	21.10.2020	No (VAS_1 got wet the day before the experiment started - should not have an effect)	1 day, 2, 4, 8 weeks, 6 months, 1, 2, 3, 4, 5, 6, 7, 8 years	First 8 weeks: weekly. First year: Monthly Later: 3-4 per y.
B5	10 L AS 190 L RP	Open	2	5	Rain	21.10.2020	No	1 day, 2, 4, 8 weeks, 6 months, 1, 2, 3, 4, 5, 6, 7, 8 years	"
B10	20 L AS 180 L RP	Open	2	10	Rain	21.10.2020	No	1 day, 2, 4, 8 weeks, 6 months, 1, 2, 3, 4, 5, 6, 7, 8 years	"
B20	40 L AS 160 L RP	Open	2	20	Rain	10.11.2020	No	0 days, 2, 4, 8 weeks, 6 months, 1, 2, 3, 4, 5, 6, 7, 8 years	"
RM	200 L RP	Open	2	0	Rain	21.10.2020	No	1 day, 2, 4, 8 weeks, 6 months, 1, 2, 3, 4, 5, 6, 7, 8 years	"
DF	200 L AS	Closed, submerged	2	100	860 L tap water	30.10.2020	Yes, was wet a few weeks before experiment startup	3 days, 2, 4, 8 weeks, 6 months, 1, 2, 3, 4, 5, 6, 7, 8 years	"
DS	200 L AS	Closed, submerged	2	100	860 L tap water with 3,5 % NaCl	30.10.2020	Yes, was wet a few weeks before experiment startup	3 days, 2, 4, 8 weeks, 6 months, 1, 2, 3, 4, 5, 6, 7, 8 years	"

AS: alum shale RP: Rhomb porphyry *Sampling times in grey are planned but have not yet happened.

2.2 Container experiments Gran (SVV)

A road tunnel was constructed at Gran, Hadeland in 2013-2015 to take Rv4 around Gran centre. The tunnel is cutting through the alum shale horizons.

Container leaching experiments with black shale was started by the Norwegian Public Road Authorities (SVV) in 2014 and 2015 with rock masses from the tunnel and from a road cutting north of the tunnel (Table 2) (Statens vegvesen, 2017). The containers (600 L) had 200 L rock each, were set up at Gran and sampled at irregular intervals until mid-2015. Experimental setup and results are described in Statens Vegvesen (2017). The containers were moved to Roa 15.09.2016, and the sampling was resumed by two master students for a limited time autumn 2016, see Børresen (2017) and Erstad (2017).

Since 2016, the containers have been standing at Roa without any further sampling or other treatment. Five of the containers from these experiments were transferred to NGI 06.11.2020 (see Table 2), and sampling was started at NGI 11.11.2020. Note that the AT1 and AT2 containers were started in 2015 while the other three were started in 2014. For further details see NGI (2023).

Table 2 The experimental set-up for container experiments started by SVV and continued by NGI.

Container	Rock	Source of rock	Start date	Experiment period reported by SVV 2)	Experiment period reported in master theses 3)	Sampling by NGI 4)
A1 1)	Alum shale horizon 2	Blast from road cuttings north of tunnel at Gran	01.08.2014	Day 0-244 (19.05.2015)	Day 735-777	Days 2233-2690), 7, 8, 9, 10, 11, 12, 13, 14 years
A3	Alum shale horizon 2	Blast from road cutting north of tunnel at Gran	01.08.2014	Day 0-244 (19.05.2015)	Day 735-777	Days 2233-2690), 7, 8, 9, 10, 11, 12, 13, 14 years
AT1	Alum shale horizon 3a	Blast from tunnel at Gran, chainage 9354	21.05.2015	Day 0-28 (18.06.2015)	Day 489-531	Days 2001-2458), 7, 8, 9, 10, 11, 12, 13 years
AT2	Alum shale horizon 3a	Blast from tunnel at Gran, chainage 9354	21.05.2015	Day 0-28 (18.06.2015)	Day 489-531	Days 2001-2458), 7, 8, 9, 10, 11, 12, 13 years
G2	Galgeberg shale horizon 3bβ	Blast from tunnel at Gran, chainage 8514-8520 and 8586-8589	01.08.2014	Day 0-244 (19.05.2015)	Day 735-777	Days 2233-2690), 7, 8, 9, 10, 11, 12, 13, 14 years

1) Less fragmented alum shale
2) Statens vegvesen (2017)
3) Erstad (2017), Børresen (2017)
4) Sampling times in grey are planned but not yet executed. Actual sampling has so far been performed more often than yearly and is discussed in Ch. 2.4.

2.2.1 Extra containers from SVV autumn 2021: G4H and unknown (G5H/A4H/A5H)

Autumn 2021 containers G4H and A4H/A5H/G5H were transferred to NGI and sampling of these were started on 21.11.2021. The exact identity of container A4H/A5H/G5H is not possible to decide, and it is either Alum shale or Galgeberg shale mixed with Huk limestone (SVV, 2017). As can be seen in figure 2, the containers were filled with water when NGI were there in October 2020. The taps were then opened to allow for the water to drain, but it means that the storage conditions from sampling by master students in 2016 until October 2020 are unknown. Likely, the taps of the containers have been closed since 2016 and the rocks have been covered with water all or parts of the time.

Figure 2 Picture of containers how the two "new" containers looked when NGI visited Roa to look at SVV's containers in October 2020. The taps of containers GH4 (bottom) and unknown/A4H/A5H/G5H (top) were closed and the containers filled with water.

To try to identify the unknown container, rock samples were collected 17.12.2021 to see if the black shale is Galgeberg shale or Alum shale. Medium sized black shale rocks with little visible weathering were chosen. The Huk limestone should be visibly different from the black shale and the two rock types seemed to be easily distinguishable. Results from classifying the A4H/A5H/G5H container were however not clear (Appendix B), and the sample placed itself as Huk Kalkstein (3c), Galgeberg shale (3bβ) or Elnes (4a). It had high NP:AP ratio and was clearly not acid-producing. Most likely, a mix of the two types of rock in the container has been sampled. When considering the container content again 24.02.2022, the black shale might have mainly disintegrated to smaller pieces (figure 4). It was also observed that there are iron precipitates on the sides of G4H (figure 3) and the unknown container (figure 4).

Figure 3 Pictures of container G4H taken 24.02.2022. Top: the disintegration of black shale can be seen. Bottom: iron precipitates on the side of the container.

Figure 4 Pictures of unknown container (G5H/A4H/A5H) taken 24.02.2022. On the left, the disintegration of black shale can be seen. On the right, iron precipitates on the side of the container.

2.3 Transport of container experiments to Langøya

08.03.2022 all containers were moved from NGI Ullevål to Langøya (NOAH AS) for a more permanent storage space. Figure 5, figure 6 and figure 7 shows loading of containers for transport and the empty pallets after removal.

Figure 5 Moving of containers from NGI/Ullevål.

Figure 6 Containers loaded for transport.

Figure 7 All containers experiments were transported to NOAH Langøya.

2.4 Sampling 2022

The summer was dry and in some periods no water could be collected. At 30.05.2022 water was added to get a sampling point. Overview of sampling performed in 2022 is given in Table 3. Photos and observations from some sampling events are presented in chapters 2.4.2 and 2.4.4 below.

Table 3 Overview of sampling and other important events for the container experiments in 2022.

Date	Containers	What/comments
20.01.2022 (NGI)		Containers with frozen water thawed before measurement of field parameters
11.02.2022 (NGI)		Containers with frozen water thawed before measurement of field parameters
08.03.2022	*All*	*Transport of containers to Langøya. DF and DS containers were refilled to 800 L after losing water in transport and did not have proper lids after moving.*

29.03.2022 (NOAH)	DF, DS	Sampling for metals, ions and field parameters. Other containers too dry for sampling.
30.05.2022 (NOAH)	Open containers (i.e. not DF, DS)	Water was sprinkled over rock masses to get samples. Field parameters, ions and metals.
03.08.2022 (NOAH)	Open containers (i.e. not DF, DS) Little water in G2	Field parameters, ions and metals.
15.09.2022 (NOAH)	Open containers (i.e. not DF, DS)	Field parameters (all containers), ions and metals (only SVV containers). These samples were likely sampled two weeks later, but 15.09 is the sampling date in the analysis report.
22.09.2022 (NGI/NOAH)	All containers. No water in AT1, AT2, A3, G2, G4H, G5H/A4H/A5H.	Field parameters, ions and metals (samples sent to ALS)
01.11.2022 (NGI)	All containers	Field parameters
Winter 22/23	*DF, DS*	*Containers covered with tarpaulin to avoid precipitation, dust/contamination and evaporation.*

2.4.1 Analyses

When the containers were sampled at NGI, ICP-MS analyses were performed on both filtered and unfiltered samples and all analyses except field parameters were made by ALS Laboratory.

After the containers were moved to Langøya, ICP-MS analyses were only performed on filtered samples, and the analyses were mainly made by NOAH in their laboratory.

2.4.2 After arrival at Langøya: water filled containers

For the water-filled reference/storage containers, water was lost during transport. The containers were also not completely full before transport, due to evaporation or other loss of water. After arrival at Langøya, the containers were filled to 800 L in March 2022. They should have been filled to 1000 L. The quality of the water (saltwater/seawater/tap water) that was used for refill is not known. It is also not known if the containers were filled more times this year.

The water loss during transport will have affected the concentrations of the water in the following sampling points (after replacement of the water) but is not expected to significantly affect the time before a pH drop. Low water levels in the containers can lead to increased oxidation rates due to faster oxygen diffusion through a thinner layer of water.

The container DS_1 did not have a lid and evaporation was substantial (figure 8). Due to a misunderstanding, the DF and DS containers did not get covered with the shuttering boards after arrival at Langøya, and in the period March 2022 until sometime winter 22/23 they were not sufficiently well covered and were prone to evaporation, rain water intrusion and potentially contamination. See also photos in chapter 2.4.4.

Figure 8 Water levels in containers (from top left) DF_1 (710 L), DF_2 (790 L), DS_1 (580 L) and DS_2 (800 L) some time after refill to 800 L after transport from Ullevål to Langøya. Photo: Kristofer Larsen, NOAH AS, ca. 11.04.2022.

2.4.3 Photos and observations from sampling 22.09.22 Langøya

Pictures from sampling 22.09.2022 are presented in figure 9, figure 10 and figure 11.

Figure 9 Picture of the drained containers in 22.09.2022, as they were standing on Langøya. Note that not all containers belong to Under Oslo, but some are also connected to PhD student Cathrine Eckbo's experiments, also connected to earthresQue.

Figure 10 Container G2 is marked with the wrong name. G1 was an identical container set up by SVV but has not been taken over by NGI/Under Oslo/earthresQue.

Figure 11 Precipitations observed in can collecting leachate from container G2 on 22.09.2022. It is unknown if this is new precipitate or leftover from the winter. Earlier, such precipitates have been observed after freezing periods.

2.4.4 Photos and observations from sampling 01.11.2022 Langøya

Water was sampled from all containers and pH and conductivity was measured. Rock samples were taken from all containers with pure rock types (A1, A3, G2, AT1, AT2, VAS_1, VAS_2, RM_1, RM_2, DF_1, DF_2, DS_2 and DS_2). These rock samples have not been sent for analyses but stored for future reference. For the containers with mixed masses, it was considered unlikely that we could get a representative sample for total chemistry and these were not sampled. At a later sampling point, it could be considered to sample single rocks also from the mixed containers, to investigate weathering degrees, secondary minerals or similar.

Looking at the content of container B5_1, it was found rocks with large visible minerals that likely are pyrite on pieces of rhomb porphyry (Figure 12). This was also seen on other rhomb porphyry pieces in this and other containers. Pyrite was not detected in the rhomb porphyry by XRD (NGI, 2023). The rhomb porphyry is delivered from a quarry where the stone is CE-certificated for use as aggregate where the sulphur content must be low. It is therefore assumed that this is a normal deviation. This discrepancy can be caused by heterogeneity and representative sampling, or by high detection limits. Possibly, the pyrite is part of an intrusion, and not representative of the main part of the masses. Quartz is also seen in the photo, while in the XRD results for the rhomb porphyry only traces of quartz are present (NGI, 2023).

Figure 12 Likely pyrite on rhomb porphyry, from container B5_1. Photo: FMW 01.11.2022.

DF and DS containers had been standing without a proper lid since containers were moved to Langøya 08.03.2022, i.e. almost 8 months, and the containers have been contaminated with unknown dust, see photos below. When taking out sample of the rock masses (figure 18), mixing layers were visible in the water, probably meaning that the water samples taken out from the top are diluted with rainwater and the water column is not mixed. There was heavy rain in November, which likely can explain this.

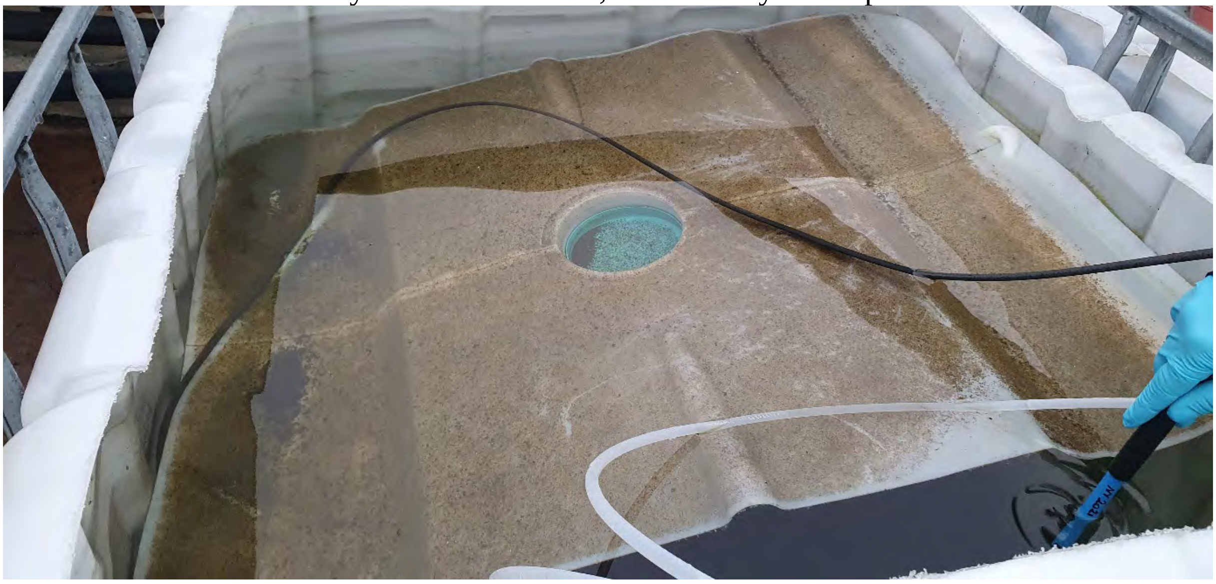

Figure 13 DS_2 photo taken 01.11.2022 FMW.

Figure 14 Measurement of field parameters directly in the containers 01.11.2022. FMW.

Figure 15 DF_1 photo taken 01.11.2022. FMW.

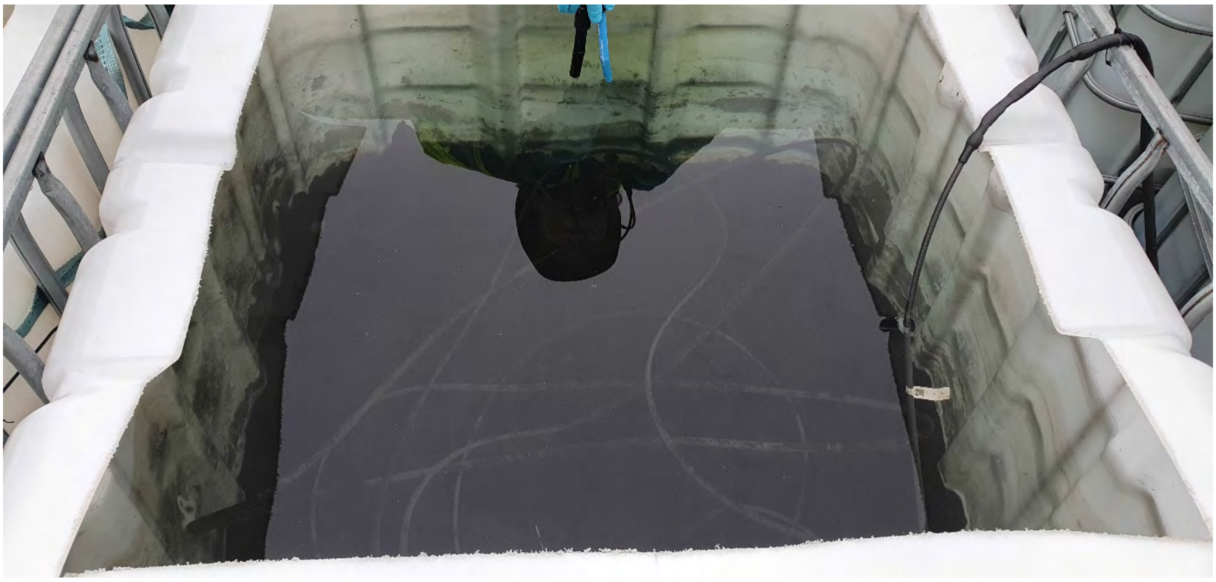

Figure 16 DS_1 had no lid 01.11.2022. FMW.

Figure 17 DF_2 was the container that was best covered, but also here rainwater and contamination is likely to have intruded. FMW.

Figure 18 Sampling of rock from the DF and DS containers was done with this, but it was not very well suited. The metal part was a bit too long, and to collect a sample, the whole shaft and the holding hand had to be submerged. For the next sampling, use something with shorter tip or longer handle.

Rock samples were taken from the top ~5 or ~10 cm of the containers and are not representative of the whole container. About 5 subsamples were mixed to get one sample. The rock samples were stored in plastic bags for three days and then air dried at room temperature (Figure 19). The rock samples from the DS and DF containers were soaking wet, and water was poured out before drying. Some fine particles were lost.

These rock samples were taken for reference and are stored but not yet analysed.

Figure 19 Air drying of rock samples taken from the containers 01.11.2022. Photo 04.11.2022 FMW.

3 Results

When describing results, focus is on the results from 2022 and overall trends. For description of results from 2021 and earlier, see report for last year (NGI, 2023).

Some artefacts occur in the results due to change of analysing laboratory. For example, vanadium in the VAS samples have until end of 2021 been reported to vary from 0.06 and 0.7 µg/L, while the reported limit of detection (LOD) by the NOAH laboratory is 5 µg/L. The samples analysed by NOAH will therefore appear as 0 in the graphs, while the actual concentration could be anywhere below 5 µg/L.

3.1 Leachate quality for NGI containers: alum shale, mixed and clean masses

These containers are set up to investigate time before pH drops in pure alum shale, the acid producing potential of mixed masses and leaching from pure rock (rhomb porphyry).

3.1.1 pH, conductivity, redox, alkalinity, TOC, SS

Measurements of pH with time is presented in Figure 20. After 24 months, leachate from all containers was still neutral. Containers with alum shale varied around a pH of 7 compared to around 8 in the beginning of the experiment. While the end-pH of the mixed masses is uncertain, for the containers with pure alum shale (VAS) a drop in pH is expected. The long time that has passed without a pH drop being observed in these containers is in accordance with observations from the SVV containers (ch. 3.3.1).

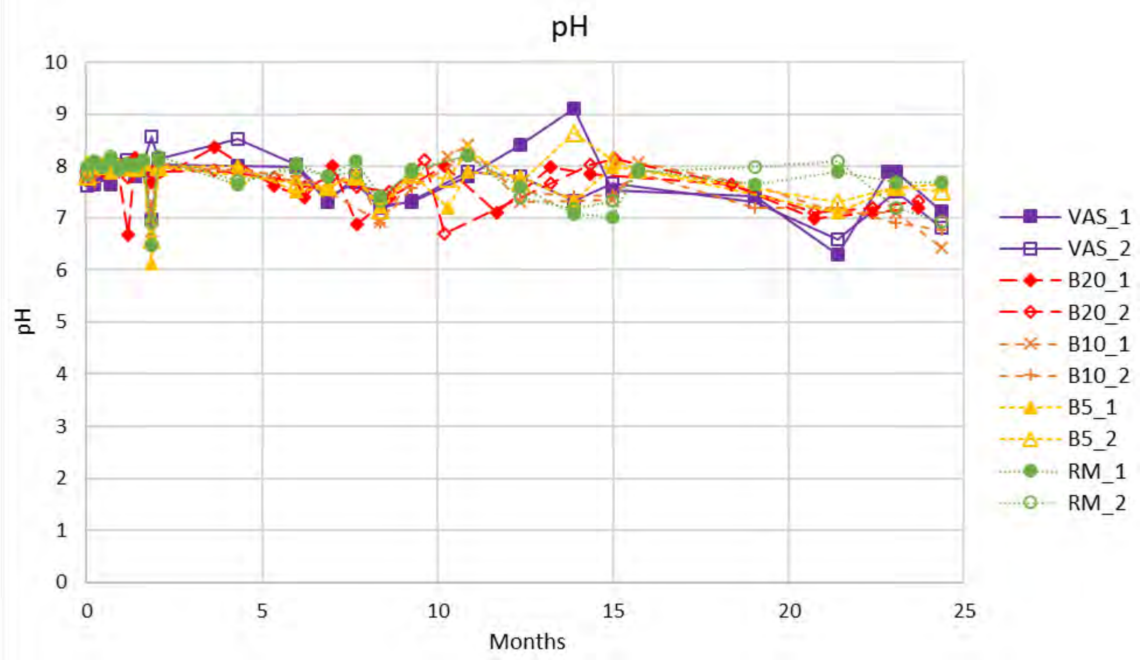

Figure 20 pH values measured with time for the first 24 months of the containers experiments with alum shale from Kleggerud mixed with rhomb porphyry. VAS = pure alum shale, RM = rhomb porphyry, B20 has 20 % alum shale and so on.

For conductivity (Figure 21), there is a clear trend towards higher values with higher alum shale content and increasing values with time. Conductivity in the leachate from the containers with clean masses was stable and relatively low.

The conductivity tends to be highest at the end of the summer before it decreases in winter, which is expected due to the temperature dependency of the reaction rates.

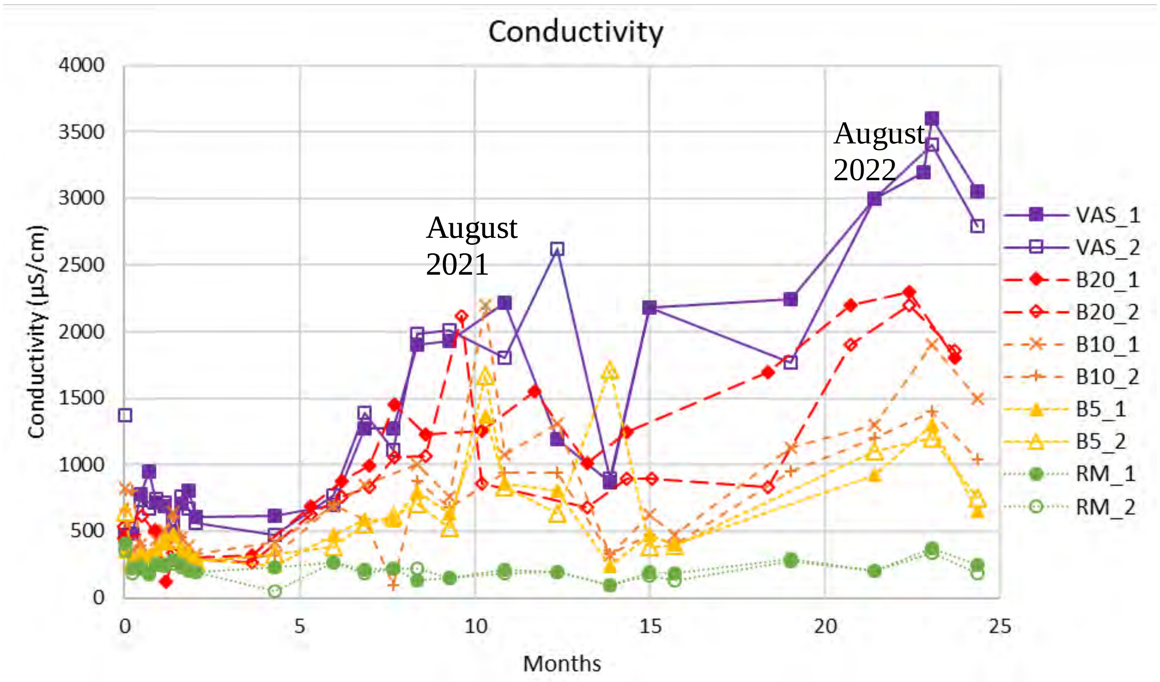

Figure 21 Conductivity measured with time for the first ~24 months of the containers experiments with alum shale from Kleggerud mixed with rhomb porphyry. VAS = pure alum shale, RM = rhomb porphyry, B20 has 20 % alum shale etc.

Alkalinity (Figure 22) was increasing with content of alum shale in the first period and has decreased with time for all treatment with alum shale. The alkalinity leachates from the rhomb porphyry containers has been more stable, and for the last sampling point these have the highest alkalinity, despite also showing signs of declining. The carbonates in the alum shale may be more mobile and readily available for acid neutralization than the carbonates in the rhomb porphyry, but as the weathering proceeds the alum shale carbonates are depleted.

TOC concentrations were varying and a bit high, also for the rhomb porphyry samples. Content of suspended solids was high for some samples in the beginning. Redox is presented as E_h which is calculated from measured oxidation-reduction potential. There seem to be some variation in the E_h, but as redox measurements are unprecise and should be interpreted qualitatively instead of quantitatively, it is not known if this is drift in the instrument or if this represents for example a seasonal variation.

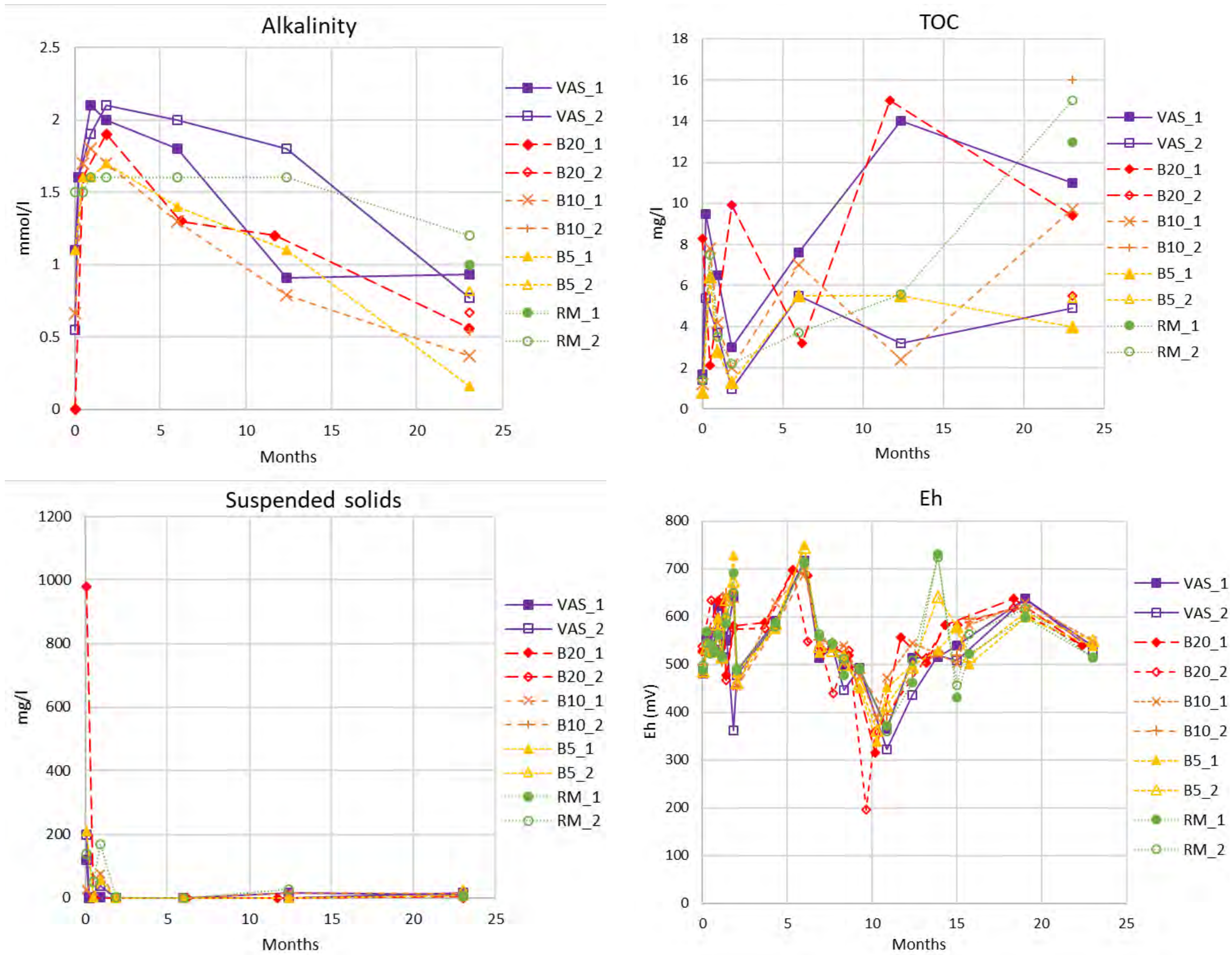

Figure 22 Alkalinity, TOC, E_h and suspended solids (SS) for the first ~24 months of the container experiments with alum shale from Kleggerud mixed with rhomb porphyry. VAS = pure alum shale, RM = rhomb porphyry, B20 has 20 % alum shale etc.

3.1.2 Main anions and cations

Sulphate indicates sulphide oxidation rates and increases with time and content of alum shale. Leaching of sulphate from the rhomb porphyry is comparatively low, which is expected as no sulphides were detected by XRD in these masses (NGI, 2023). Pyrite grains were seen on certain rhomb porphyry rocks in the containers (see ch. 2.4.4), but it is believed that this is from an intrusion and not representative for the rhomb porphyry.

Nitrate and fluoride seem to decrease with content of alum shale. Fluoride and nitrate have both increased in the last year. For chloride it is difficult to see any trends.

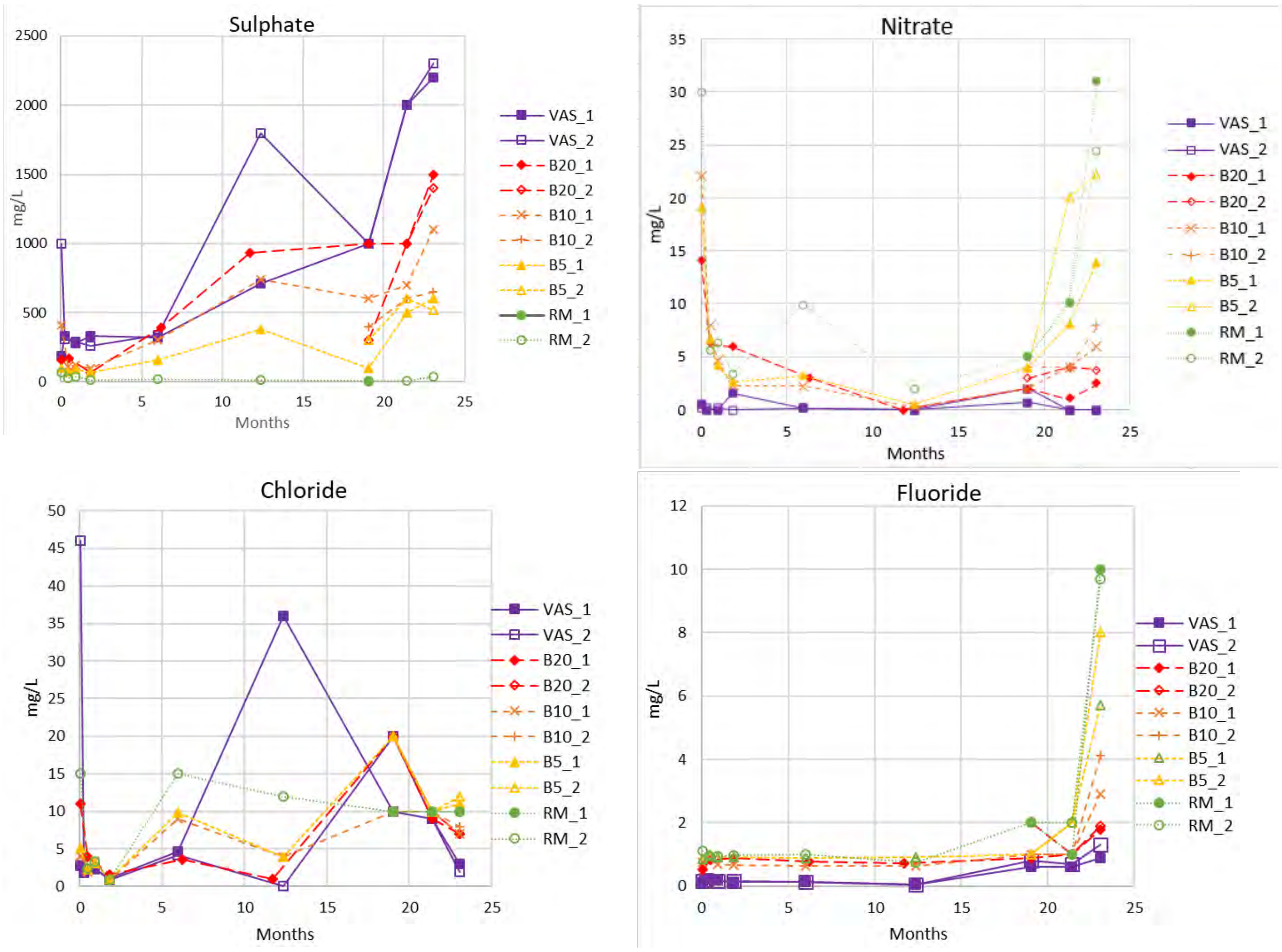

Figure 23 Main anions for the first ~24 months of the containers experiments with alum shale from Kleggerud mixed with rhomb porphyry. VAS = pure alum shale, RM = rhomb porphyry, B20 has 20 % alum shale etc.

Leaching of calcium, magnesium and potassium increased with time and content of alum shale. The leaching of sodium was varying the first year, then increased several times between the measurements at 12 months and 23 months. While sea salt deposition could be the reason for such an increase, the same trend was not seen for chloride making this an unlikely source.

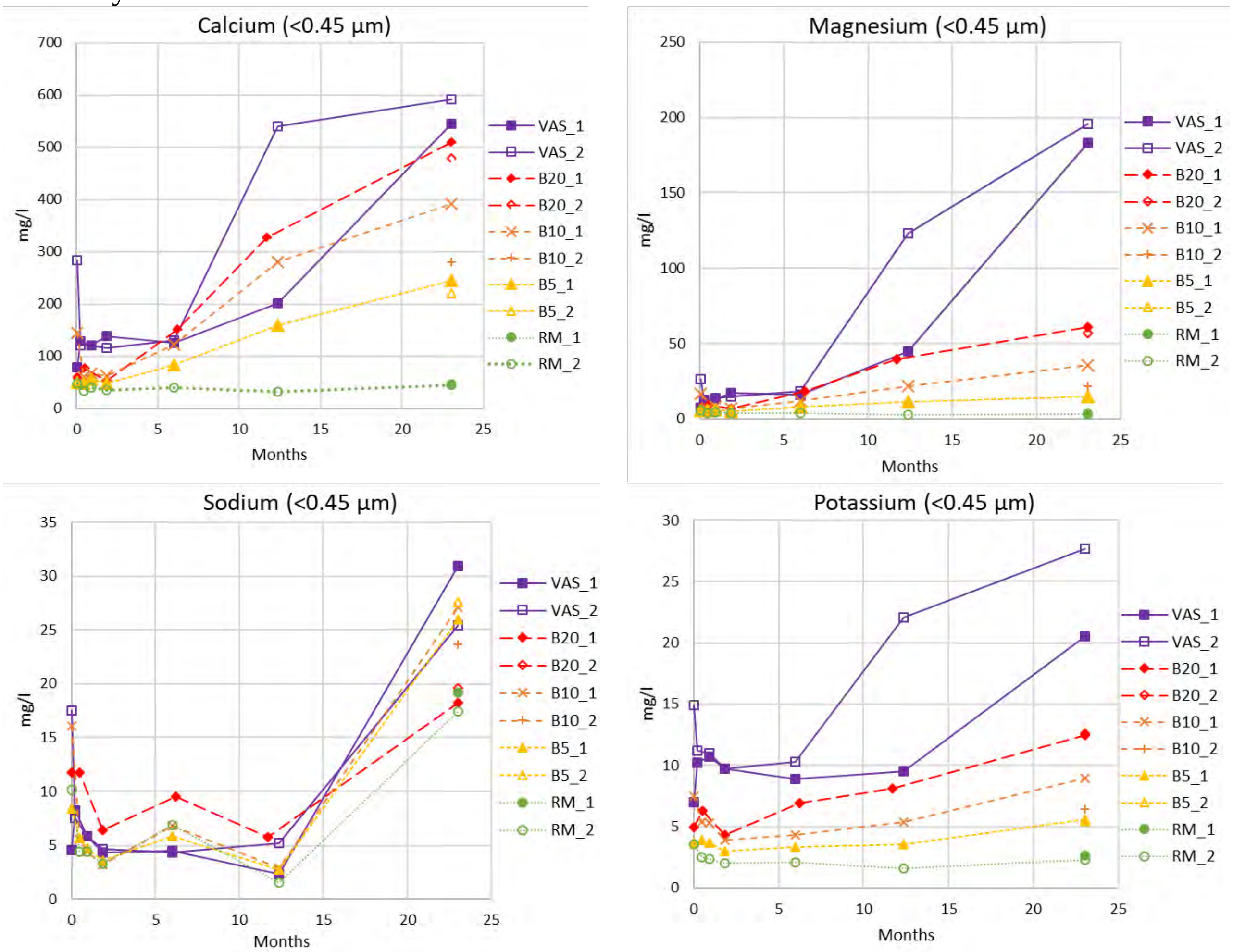

Figure 24 Main cations for the first ~24 months of the containers experiments with alum shale from Kleggerud mixed with rhomb porphyry. VAS = pure alum shale, RM = rhomb porphyry, B20 has 20 % alum shale etc.

3.1.3 Element leaching with time

There are no measurements for strontium and silicon in 2022, as NOAH does not measure it and it was not ordered for analysis when samples were sent to ALS. Phosphorus has been measured sporadically, both as elemental and as phosphate ion. The results don't seem to fit together and are not presented here. For the coming years, it is better to stick to one measurement method and present results that can be compared.

Iron and aluminium concentrations have increased in the last year (Figure 25), but most for the samples that have less alum shale.

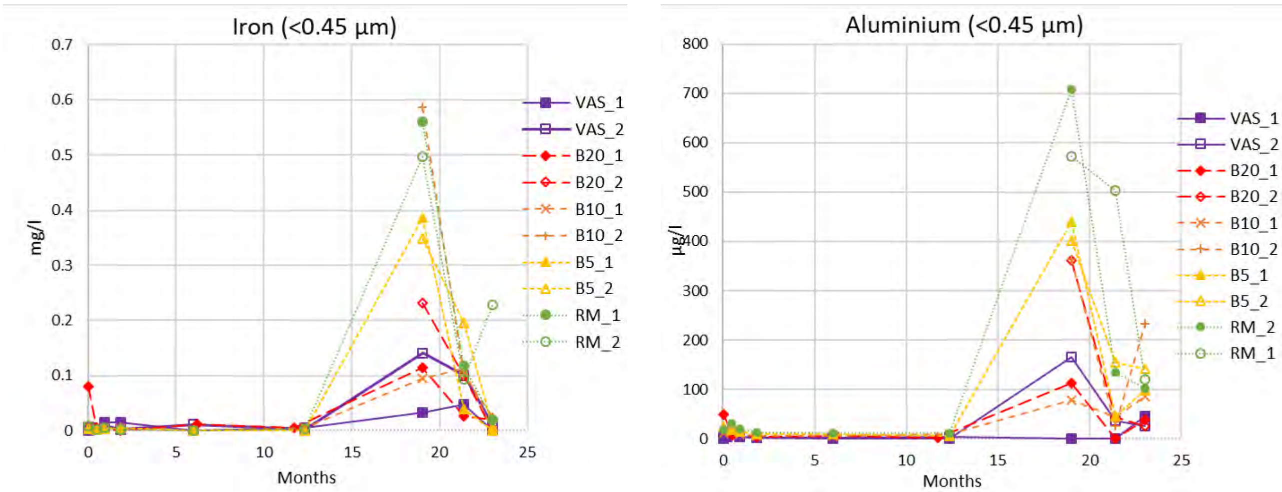

Figure 25 Leaching of iron and aluminium for the first ~24 months of the containers experiments with alum shale from Kleggerud mixed with rhomb porphyry. VAS = pure alum shale, RM = rhomb porphyry, B20 has 20 % alum shale and so on.

The concentrations of zinc, nickel, cadmium, manganese and cobalt increased in the last year (Figure 26) and was highest for the containers with higher content of alum shale. In the last sampling (23 months), B10_1 stands out with high concentrations of all elements presented in Figure 26 as well as lead (Figure 27) and uranium (Figure 28). This can be real concentrations, but it can also be contamination of particles in the sample as aluminium (Figure 25) is also high. The somewhat lower pH of 6.3 in this sample may also be an explanation.

In the last year, concentrations of arsenic, vanadium, lead and barium were higher in the leachate from containers with less alum shale. The drop in vanadium concentrations at 19 and 21 months is caused by the high detection limit (5 µg/L) in the method of NOAH, and the samples appear as 0 in the graph.

Concentrations of molybdenum (Figure 27) and uranium (Figure 28) increased with content of alum shale but not with time, and especially molybdenum concentrations has decreased. Concentrations of thorium are in general low.

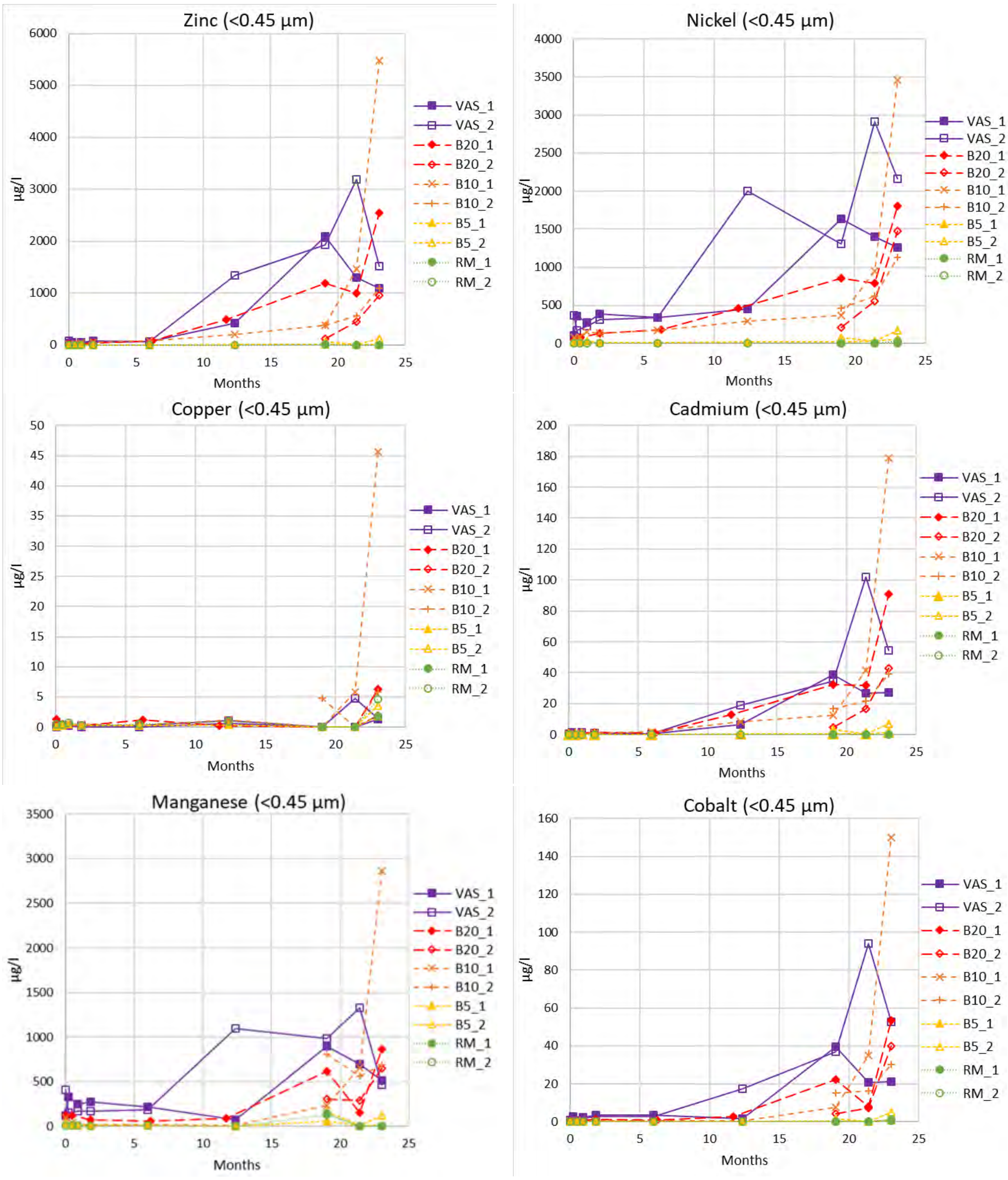

Figure 26 Leaching of zinc, nickel, copper, cadmium, manganese and cobalt for the first ~24 months of the containers experiments with alum shale from Kleggerud mixed with rhomb porphyry. VAS = pure alum shale, RM = rhomb porphyry, B20 has 20 % alum shale and so on.

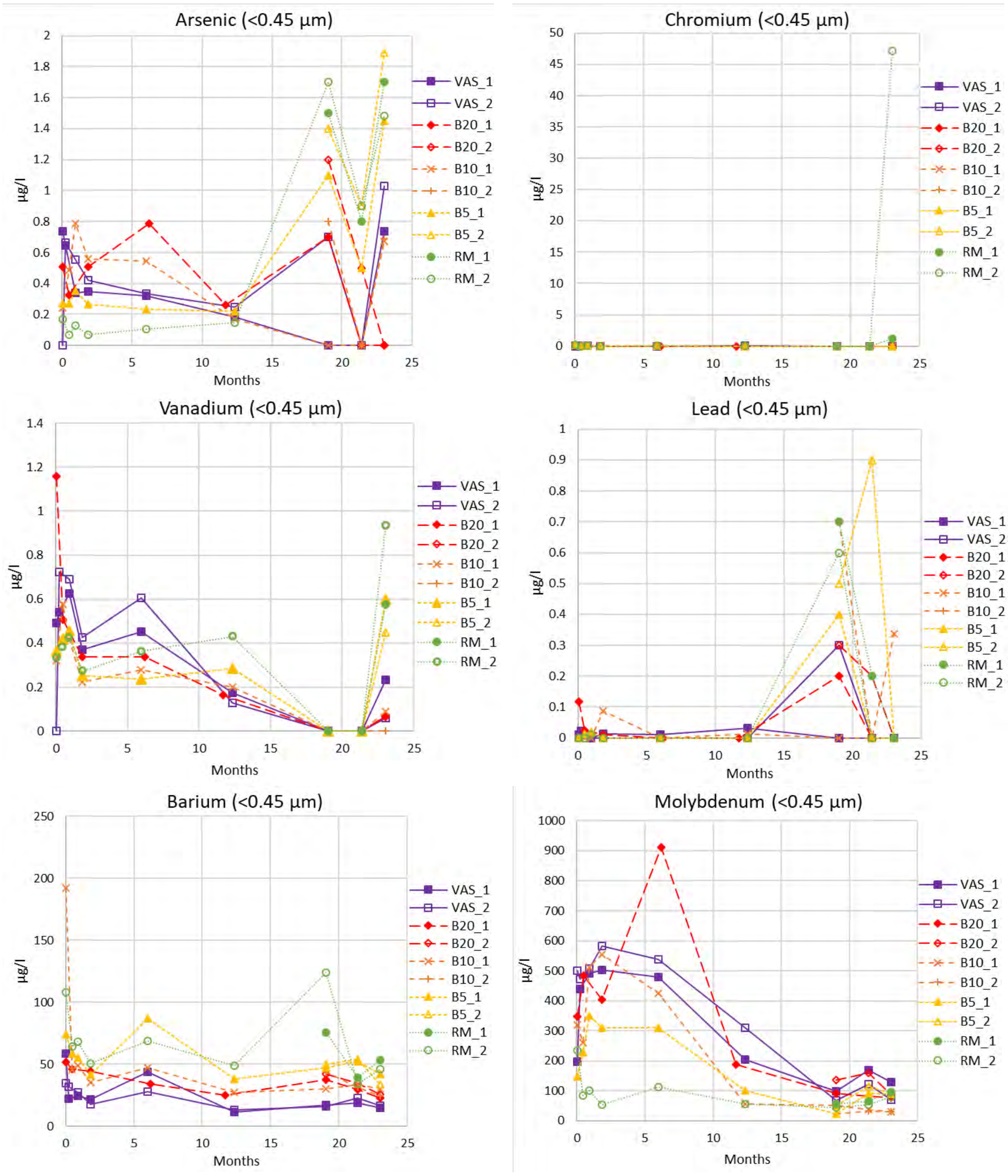

Figure 27 Leaching of arsenic, chromium, vanadium, lead, barium and molybdenum for the first ~24 months of the containers experiments with alum shale from Kleggerud mixed with rhomb porphyry. VAS = pure alum shale, RM = rhomb porphyry, B20 has 20 % alum shale and so on.

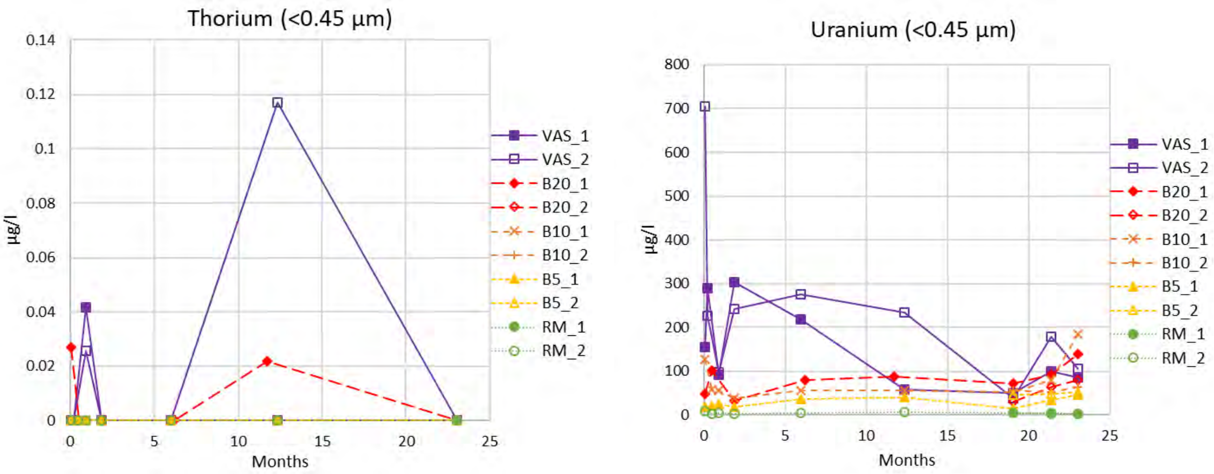

Figure 28 Leaching of thorium and uranium for the first ~24 months of the containers experiments with alum shale from Kleggerud mixed with rhomb porphyry. VAS = pure alum shale, RM = rhomb porphyry, B20 has 20 % alum shale and so on.

3.2 Leachate quality for NGI containers: storage in fresh water and seawater

The experiments with alum shale in water-filled containers were set up to compare the time before pH drop in shale submerged in water compared to shale with open access to air, as well as investigating the difference between storage in salt- and freshwater. Note that salt water has been used for the experiment, and not seawater which would have higher concentrations of e.g. sulphate and alkalinity.

The first few measurements in the reference/storage containers were taken from the bottom tap, and these results deviate from the rest. For this reason, these measurements are displayed in grey in the figures below.

3.2.1 pH, conductivity, redox, alkalinity, TOC, SS

The conductivity in the containers with alum shale and salt water (DS) varied a lot and was generally higher in the DS_1 container compared to the DS_2 container. The last drop, at 24 months, was likely caused by dilution with rainwater as the lids at this time were inadequate and visible mixing layer were seen during sampling 01.11.22 (see chapter 2.4.4 for details). The drop at 13-14 months happened when the containers were standing with better covers at Ullevål and is not likely to be caused by dilution with rainwater.

The conductivity in the fresh water containers fluctuated less. It increased with time and was higher in DF_1 compared to DF_2. There has been greater loss of water due to leaking from DF_2 compared to DF_1 (NGI, 2023), and this could be the explanation.

The steeper increase in conductivity in water in DF_1 in 2022 can also be caused by the lack of lid and therefore increased evaporation after transport to Langøya (ch. 2.4.2).

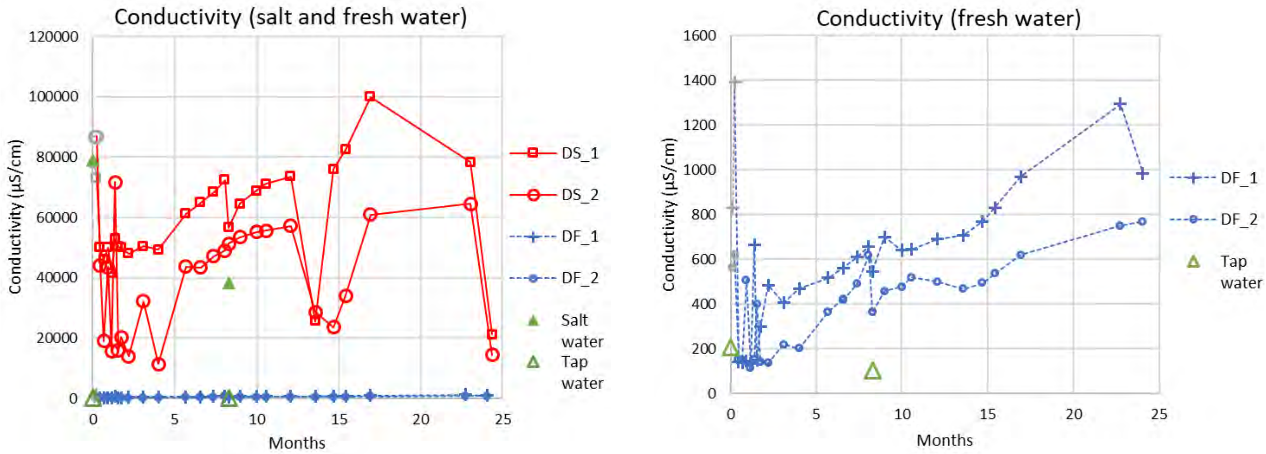

Figure 29 Conductivity in the first 24 months in the containers investigating alum shale stored in salt water (DS) and fresh water (DF). Green triangles represent measurements made of the water used to start the experiment and added later to refill the containers. Note that the figures have different y-axis for readability.

pH was still neutral in the water-filled containers after 24 months (Figure 30) and was maybe somewhat lower for the saltwater container compared to the fresh water containers for the last few samples. Alkalinity is varying and seemed to have a peak in the first 6 months. TOC and suspended solids are somewhat higher in the DS compared to the DF containers. E_h is varying and somewhat difficult to interpret.

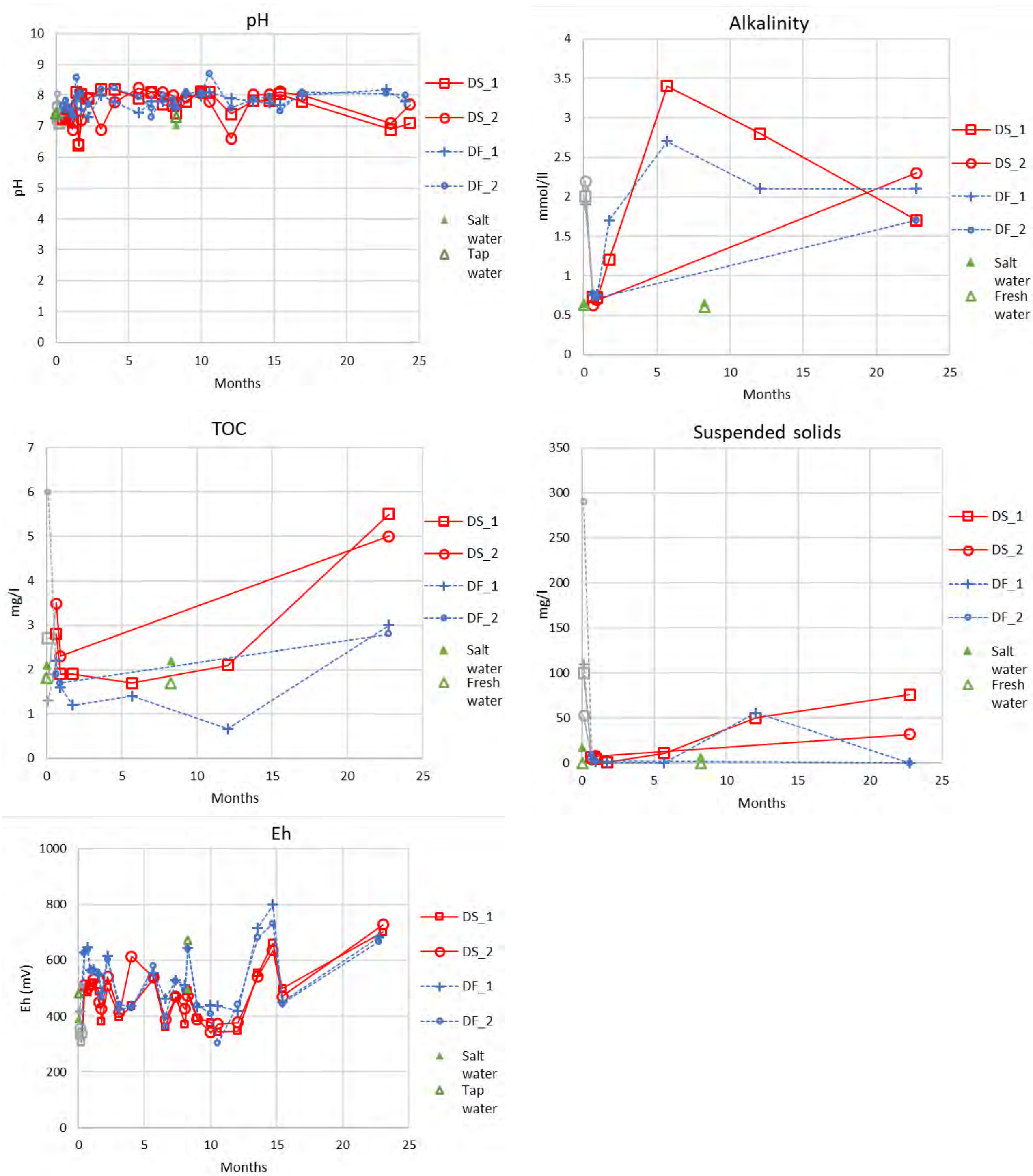

Figure 30 pH, alkalinity, TOC, suspended solids and Eh for the first 24 months in the containers investigating alum shale stored in salt water (DS) and fresh water (DF). Green triangles represent measurements made of the water used to start the experiment and added later to refill the containers.

3.2.2 Main anions and cations

Higher concentrations of chloride (Figure 31) and sodium (Figure 32) probably explains the higher conductivity in DS_1 compared to DS_2. For the freshwater containers, the higher conductivity in DF_1 compared to DF_2 is probably explained by sulphate, chloride, calcium and magnesium. As ions were measured in the 23-month sample, the drop seen for conductivity in the 24-month sample (caused by dilution with rainwater) is not seen in the figures below.

Sulphate concentrations are the most important indicator on pyrite oxidation before there is a pH drop and increased with time in all treatments. Concentrations were not so different between the two treatments, but the greater rate of increase in the freshwater (DF) containers indicates greater oxidation rates. The higher concentration in the starting water of the salt water treatment compared to the starting water of the fresh water treatment as well as high evaporation causing loss of water from DF_2 will have affected the concentrations we see. Rate of increase in the coming years is important to see which treatments give greater pyrite oxidation. Note that sea water contains high concentrations of sulphate and if seawater was used to set up the experiments the concentrations would be quite different.

The sulphate concentrations were lower than measured in the VAS containers (alum shale exposed to rain and drying periods, ch. 3.1). The amount of water that has been in contact with the shale in the VAS containers can be estimated to 725 mm from registered rain (Appendix D), while for the DF and DS containers the volume depends on how much water has been lost and replaced in the containers, and this is unknown. A rough estimate of the total water would be 1500L for the two years (as a lot was lost during transport to NOAH).

Fluoride increased with time and nitrate seemed to decrease. The concentrations of both ions were low. Sodium, calcium, magnesium and potassium concentrations all increased with time. For sodium, the large concentration increase in the DS containers was unexpected as alum shale don't normally contribute this much sodium but could be caused by e.g. evaporation. Evaporation would affect other measured elements and ions as well.

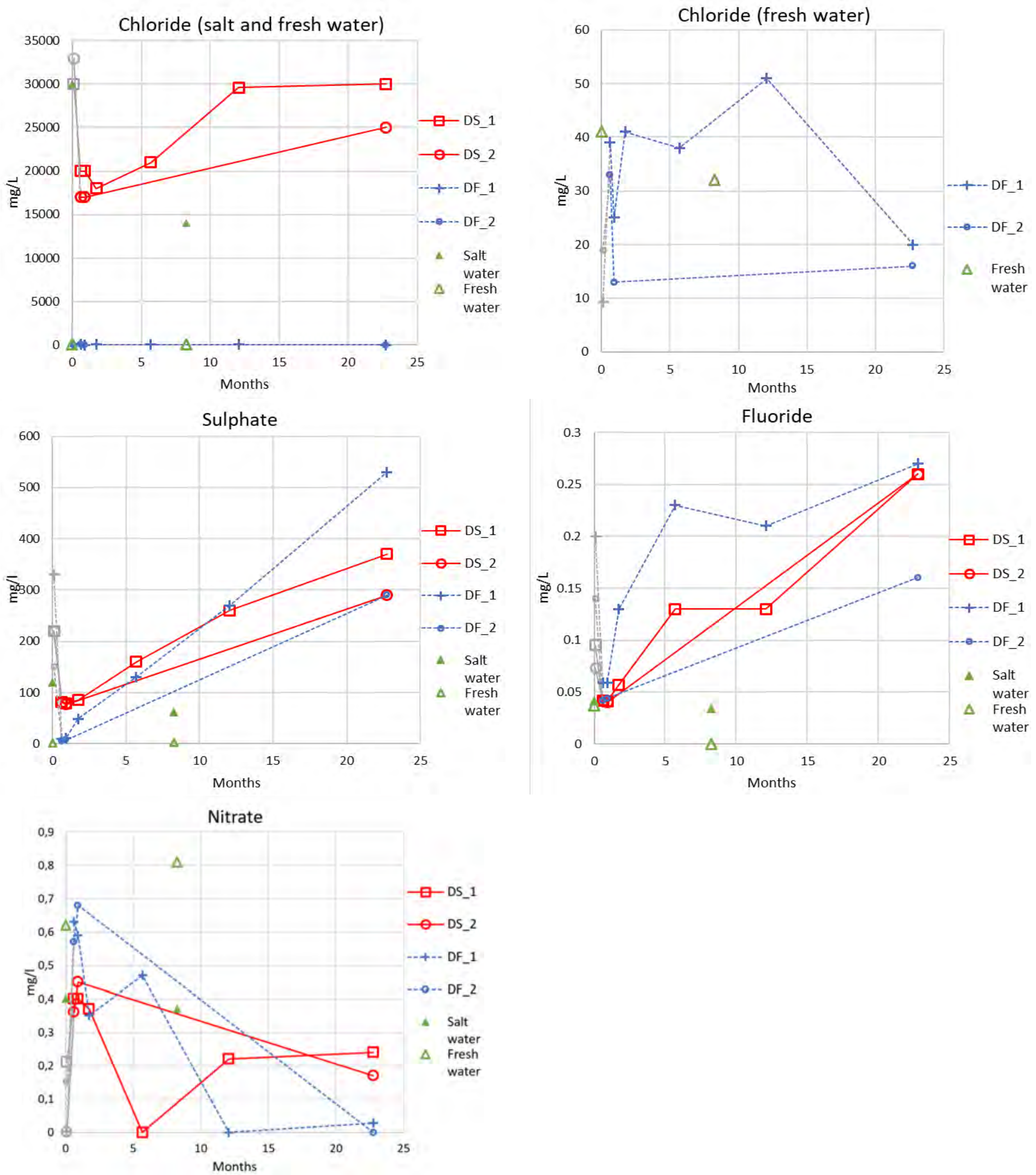

Figure 31 Main anions except nitrogen compounds for the first 24 months in the containers investigating alum shale stored in salt water (DS) and fresh water (DF). Green triangles represent measurements made of the water used to start the experiment and added later to refill the containers. Note that the figures for chloride in both containers and only fresh water have different y-axis for readability.

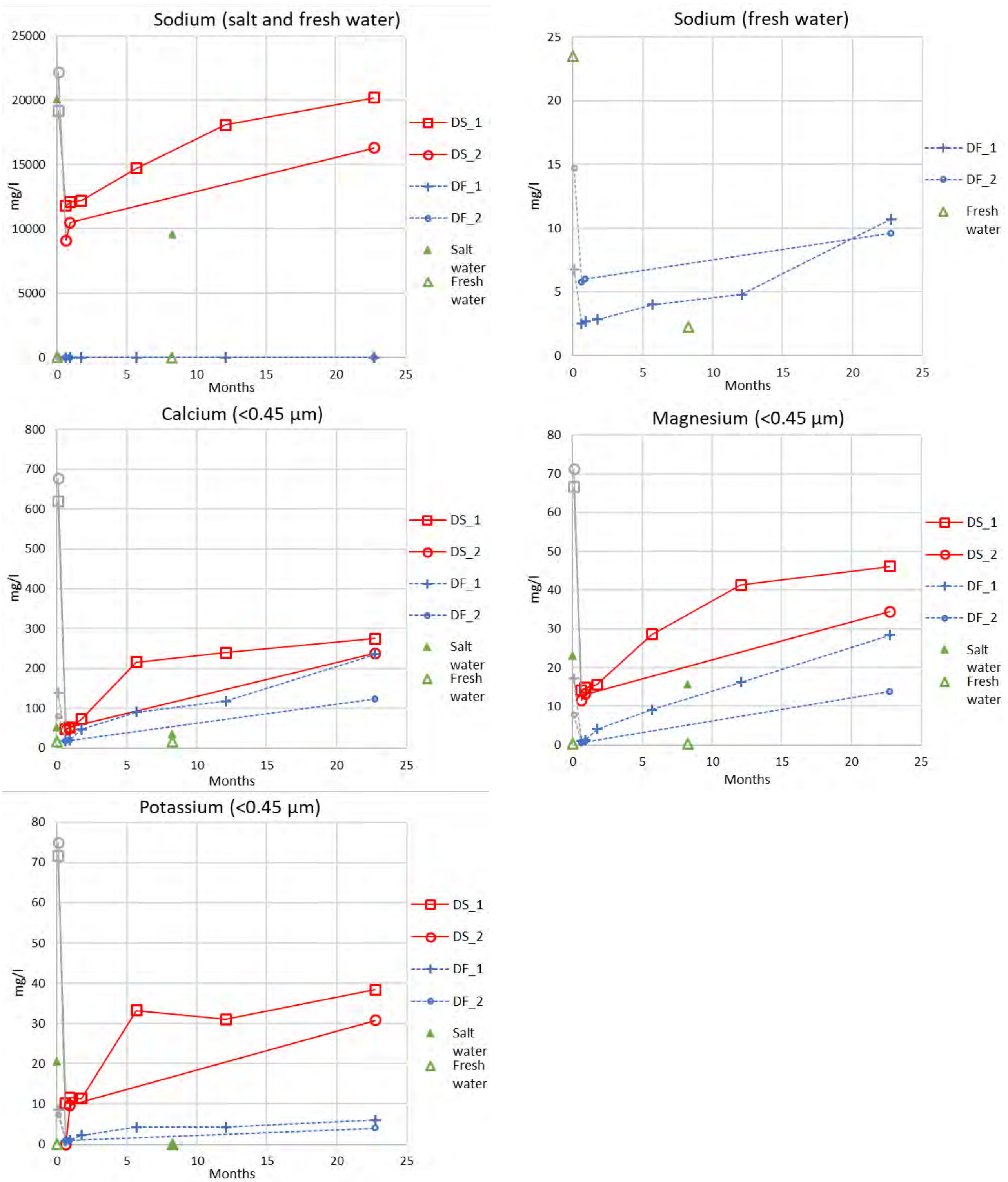

Figure 32 Main cations for the first 24 months in the containers investigating alum shale stored in salt water (DS) and fresh water (DF). Green triangles represent measurements made of the water used to start the experiment and added later to refill the containers.

3.2.3 Element leaching with time

Concentrations of iron and aluminium were varying and not very high (Figure 33). The drop in aluminium concentrations at 17 months was caused by a high detection limit (20 µg/L).

Silicon was only measured once in the DS containers and results were below detections limits, thus results are not presented. Phosphorus concentrations are not presented for 2022 as different analysis methods (IC and ICP-MS) have been used and the data seem to not be comparable. New evaluation of the data should be done after more analyses in 2023.

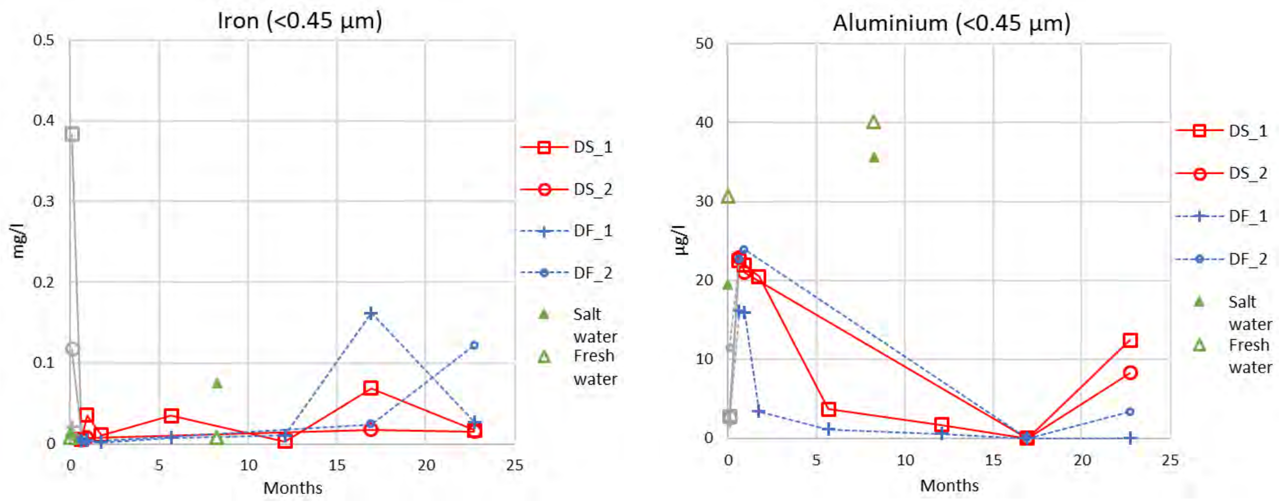

Figure 33 Leaching of iron and aluminium for the first 24 months in the containers investigating alum shale stored in salt water (DS) and fresh water (DF). Green triangles represent measurements made of the water used to start the experiment and added later to refill the containers.

For nickel, cadmium, cobalt, barium, molybdenum and uranium there were higher concentrations in the saltwater treatment (DS) than in the freshwater treatment (DF) (Figure 34, Figure 35 and Figure 36). No elements seemed to be present in higher concentrations in the freshwater than the salt water.

The VAS containers have the same shale as in the DF and DS containers but are not submerged in water but exposed to air and rain. Concentrations of zinc, nickel, cadmium, and cobalt in the water-filled containers were varying, but several times lower than what was seen in the last samples of the VAS containers (ch. 3.1.3). Manganese concentrations were about half of what was seen in the VAS leachates. Note that comparison of concentrations between VAS and DF/DS containers is complicated by different water volumes that have been in contact with the shale. Nevertheless, the trend of increasing concentrations seen for so many elements in the VAS treatment is not seen for that many elements for the DF/DS treatments. This was also expected, as pyrite oxidation is expected to be slower when the alum shale is submerged in water due to slower oxygen diffusion.

Concentrations of lead were somewhat higher in the DF and DS compared to VAS. Barium and uranium concentrations were similar in VAS and DF, but higher in DS.

After two years, molybdenum concentrations were similar in the DS and VAS treatments, but a higher concentration of molybdenum was seen in the leachate in the beginning of the VAS experiment. The molybdenum concentrations in the leachate of the DF treatment were comparably low.

Strontium was only measured in the saltwater treatment due to a mistake when ordering the analysis.

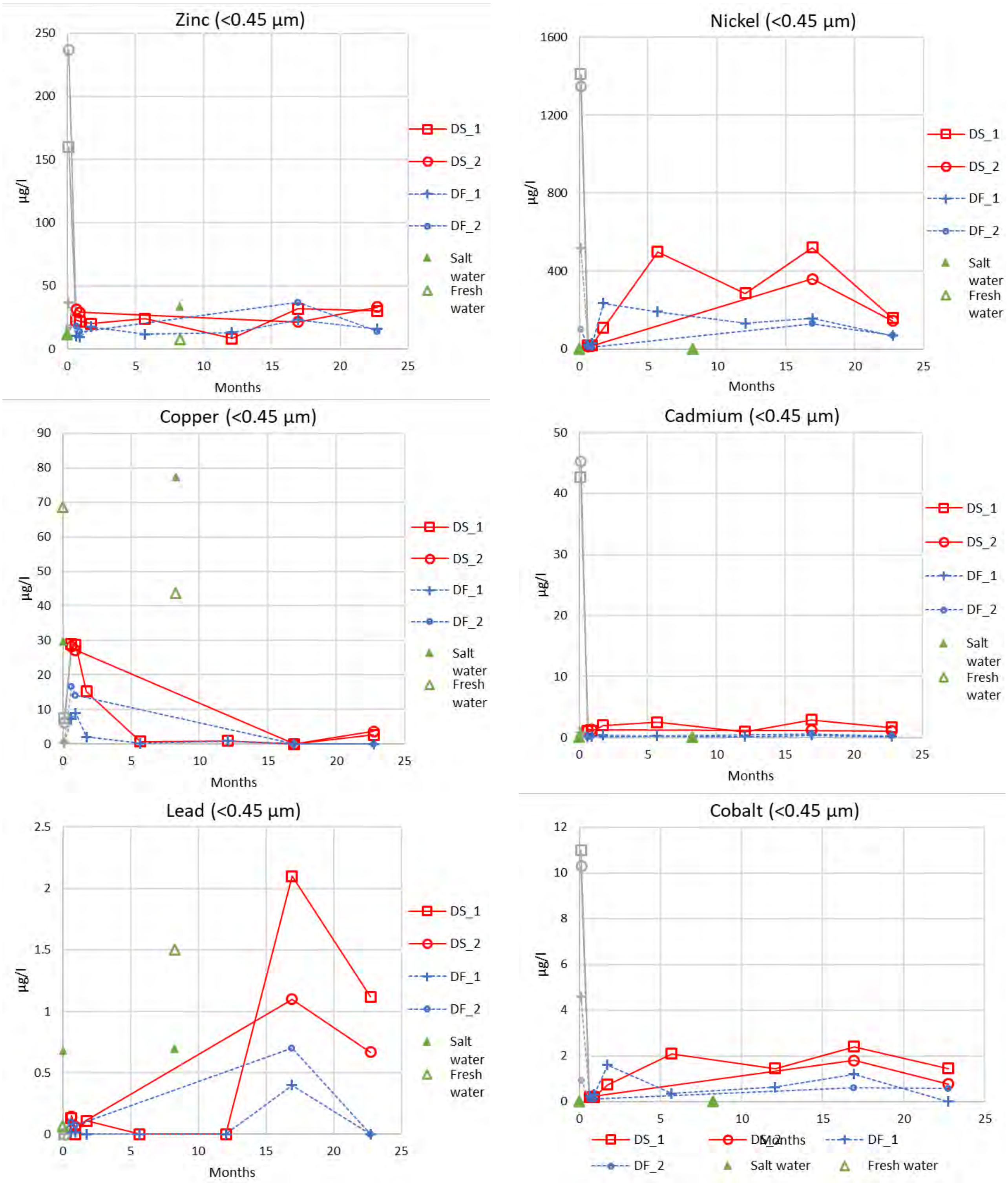

Figure 34 Leaching of zinc, nickel, copper, cadmium, lead and cobalt for the first 24 months in the containers investigating alum shale stored in salt water (DS) and fresh water (DF). Green triangles represent measurements made of the water used to start the experiment and added later to refill the containers.

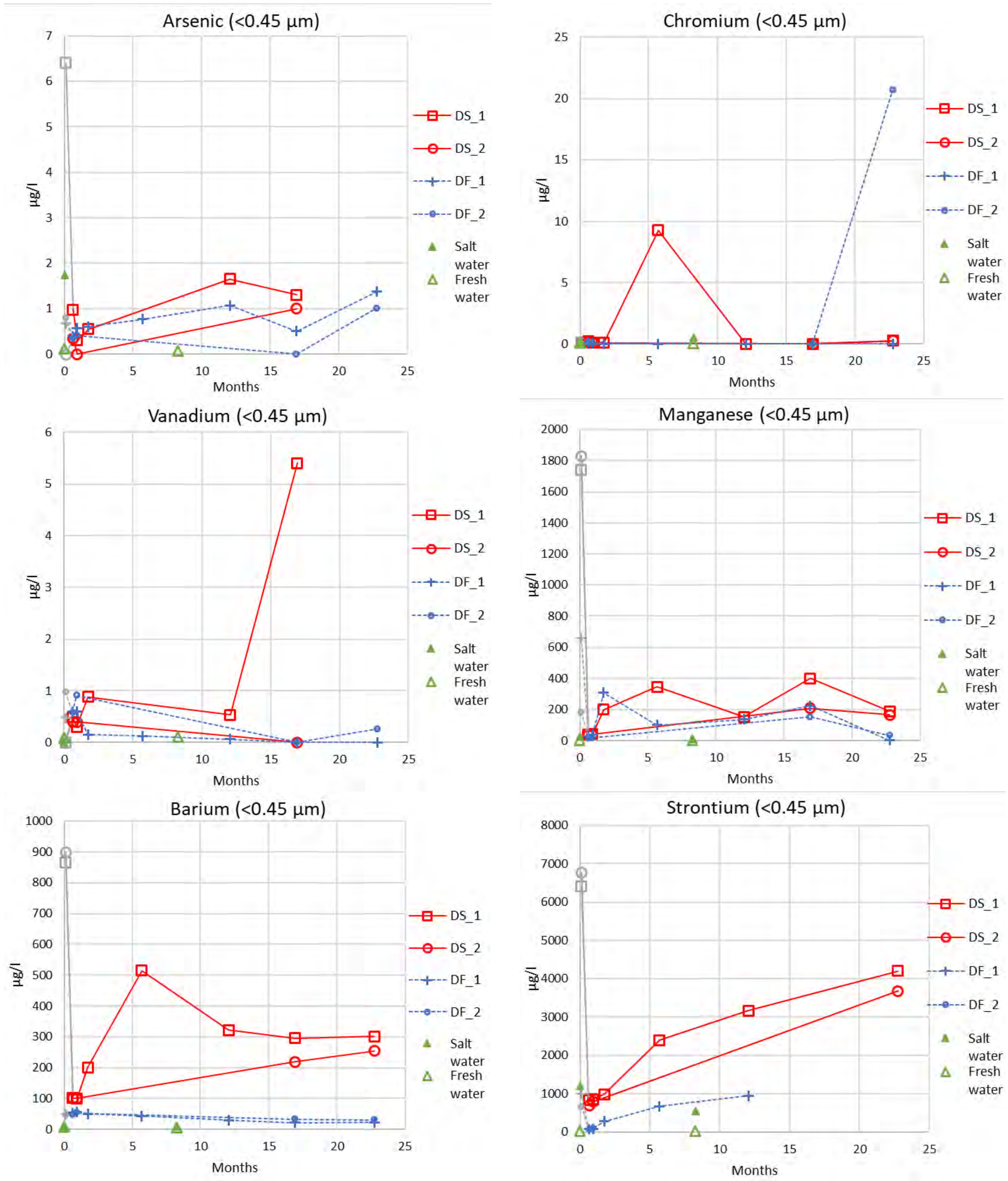

Figure 35 Leaching of arsenic, chromium, vanadium, manganese, barium and strontium for the first 24 months in the containers investigating alum shale stored in salt water (DS) and fresh water (DF). Green triangles represent measurements made of the water used to start the experiment and added later to refill the containers.

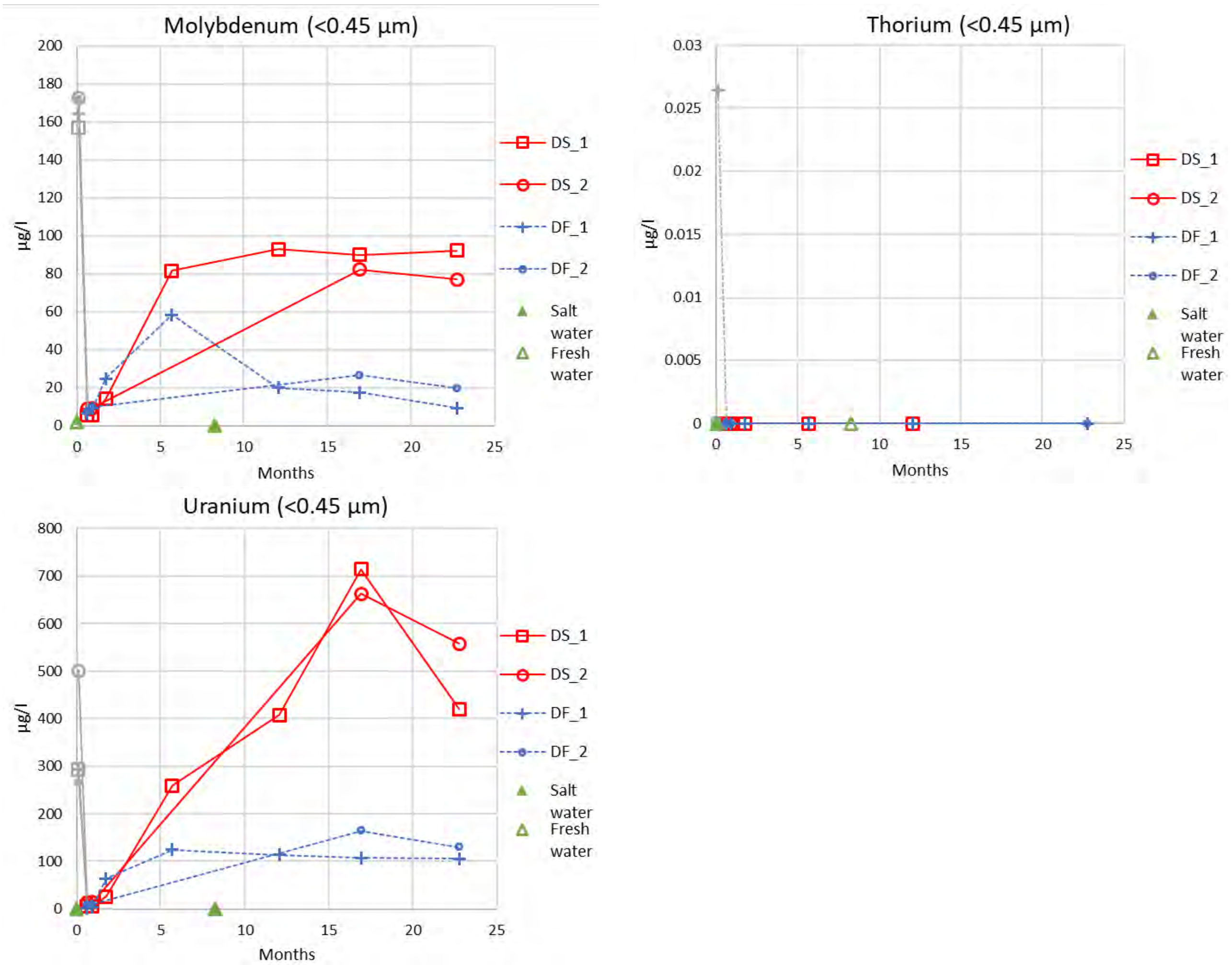

Figure 36 Leaching of molybdenum, thorium and uranium for the first 24 months in the containers investigating alum shale stored in salt water (DS) and fresh water (DF). Green triangles represent measurements made of the water used to start the experiment and added later to refill the containers.

3.3 Leachate quality for SVV containers

3.3.1 pH, conductivity, redox, alkalinity, TOC, SS

The pH in the AT1 and AT2 containers (alum shale from tunnel) was similar in 2022 as measurements in 2020 and 2021, except one outlier (Figure 37). The pH of the G2 container reduced to below 3, and this is likely the cause of the very high concentrations seen for several elements in the coming chapter. The A3 container, with shale from a road cut, showed the same seasonal variation as in 2021, with lower pH in the summer. This is likely caused by the temperature dependence of the sulphide oxidation reactions and means that pH drops may have happened also in the years before NGI restarted measurements, i.e. any time between 2 and 6 years. pH in leachate from the A1 container, with larger pieces of the same alum shale as used in the A3 container, dropped below 6 and down to about 4.5 for the first time in September 2022, illustrating the effect of larger grain size. All containers seem to have a certain variation of pH with season, but the effect is largest for A3 (and possibly A1). Note that as the AT containers were started 8 months later than containers A1, A3 and G2, and therefore the summer/autumn drops are in different parts of the graph.

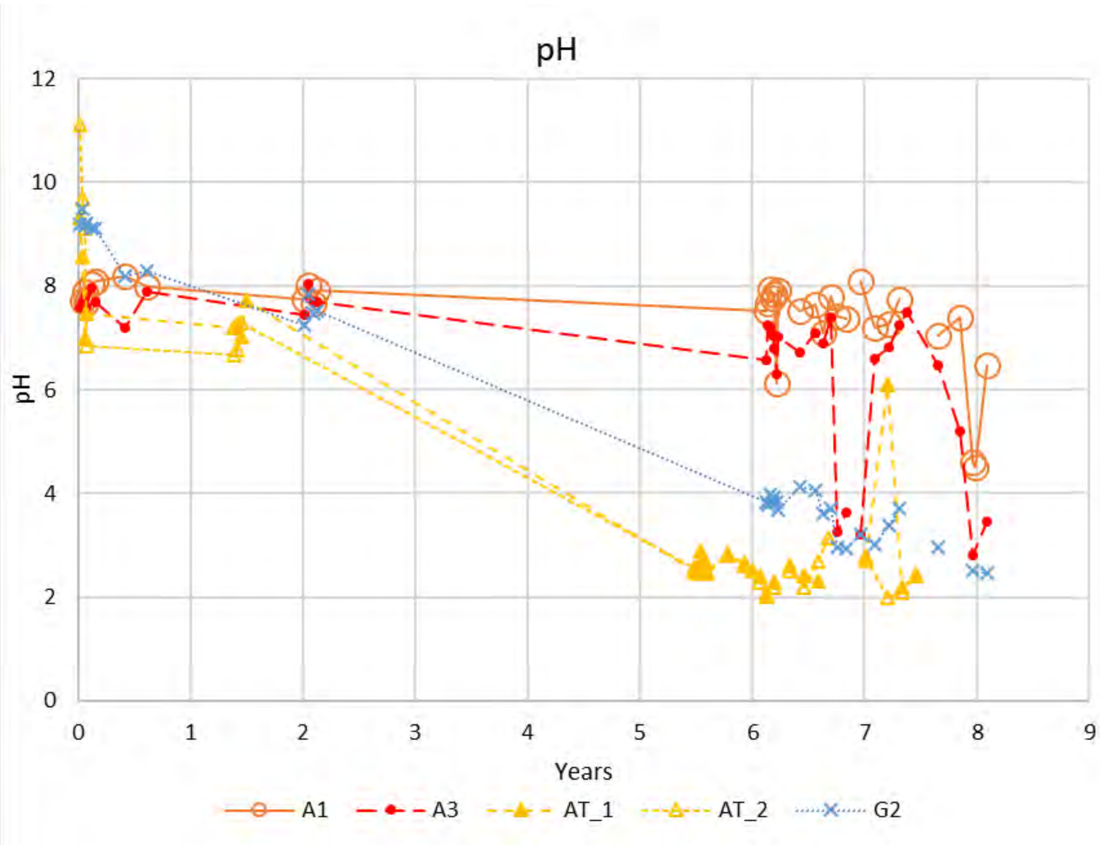

Figure 37 pH measurements with time for the SVV containers.

Conductivity in all the containers is higher in summer/autumn (Figure 38), also reflecting the increased reaction rates with higher temperature in the summer. Note that as the AT containers were started 8 months later than containers A1, A3 and G2, and therefore the summer/autumn peak are in different parts of the graph.

The A3 samples with low pH had similar pH to G2 samples taken at the same time, but the conductivity in the leachate from G2 was much greater.

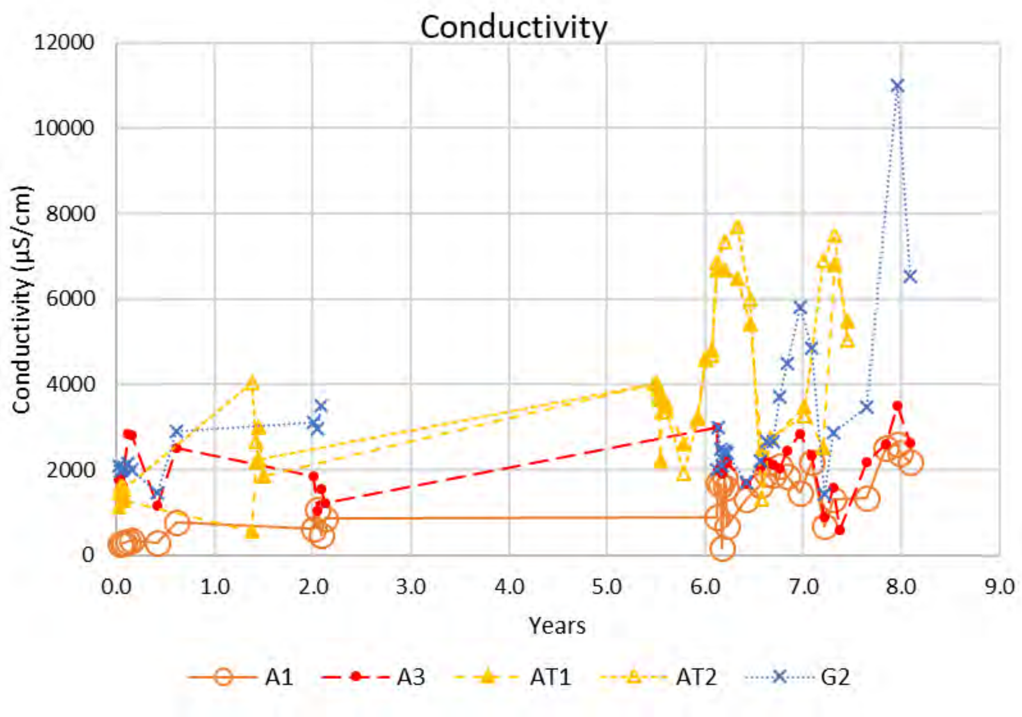

Figure 38 Conductivity with time in the SVV containers.

Alkalinity is only measured down to pH 4.5 and has been set to zero in samples with lower pH (Figure 39). TOC and suspended solids were only measured in one sample from A1 in 2022, as the other containers had no water when samples were sent to ALS 22.09.22 (Table 3).

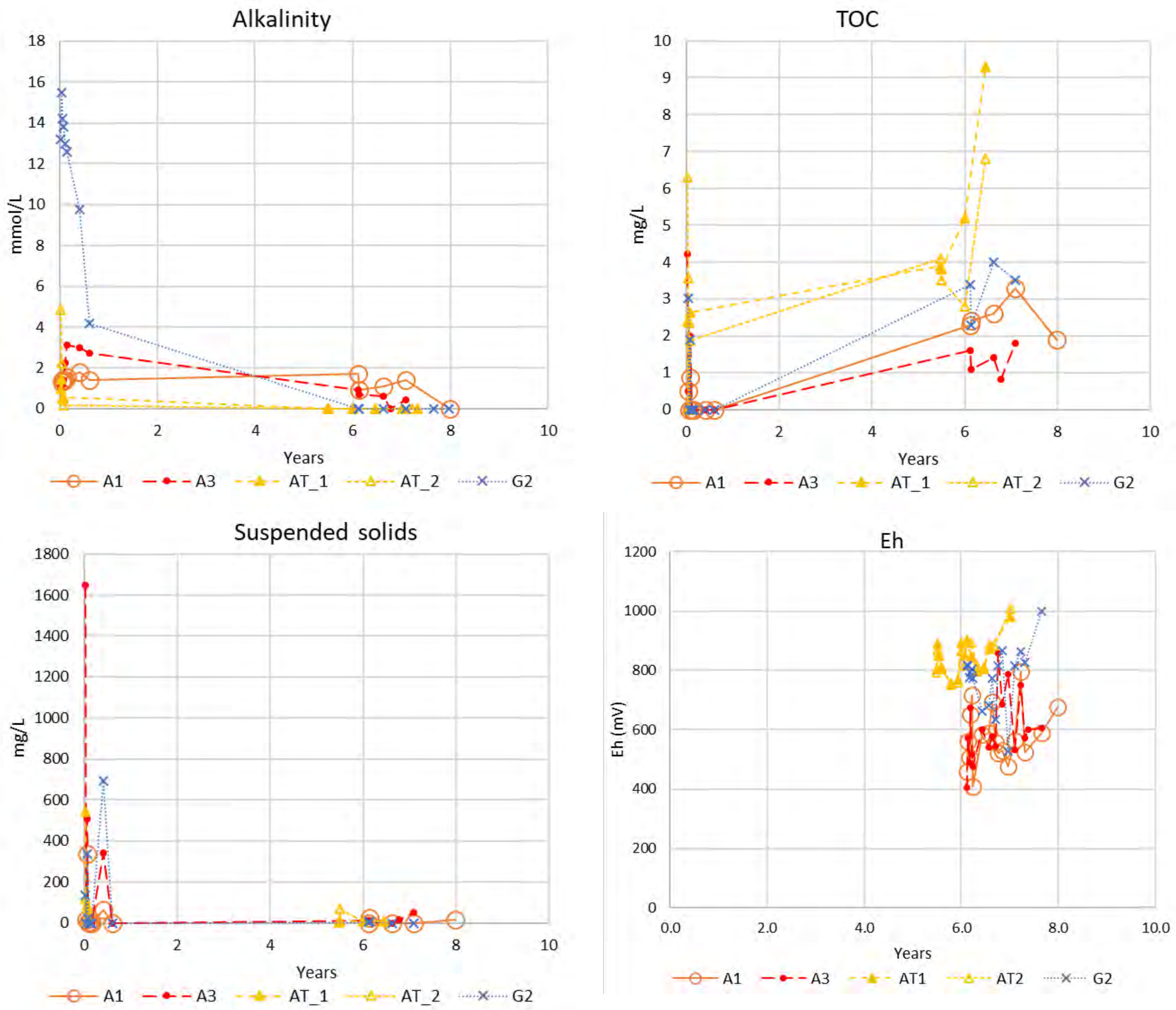

Figure 39 Alkalinity, TOC, E_h and suspended solids (SS) in the five containers from SVV. Note that the master students (2016 measurements) did not measure alkalinity, TOC and SS.

3.3.2 Main anions and cations

Sulphate was lowest in leachate from the A1 container (700-2000 mg/L in 2022) and somewhat higher in A3 (1000-2000 mg/L). AT containers have previously had the highest sulphate leachate concentrations and are still high with 2000-7000 mg/L but is surpassed by the last G2 leachate sample at 20 000 mg/L. Nitrate is above detection limit only in one sample from the A1 container. Chloride seem to have increased some in 2022, and fluoride has increased in all containers except A1.

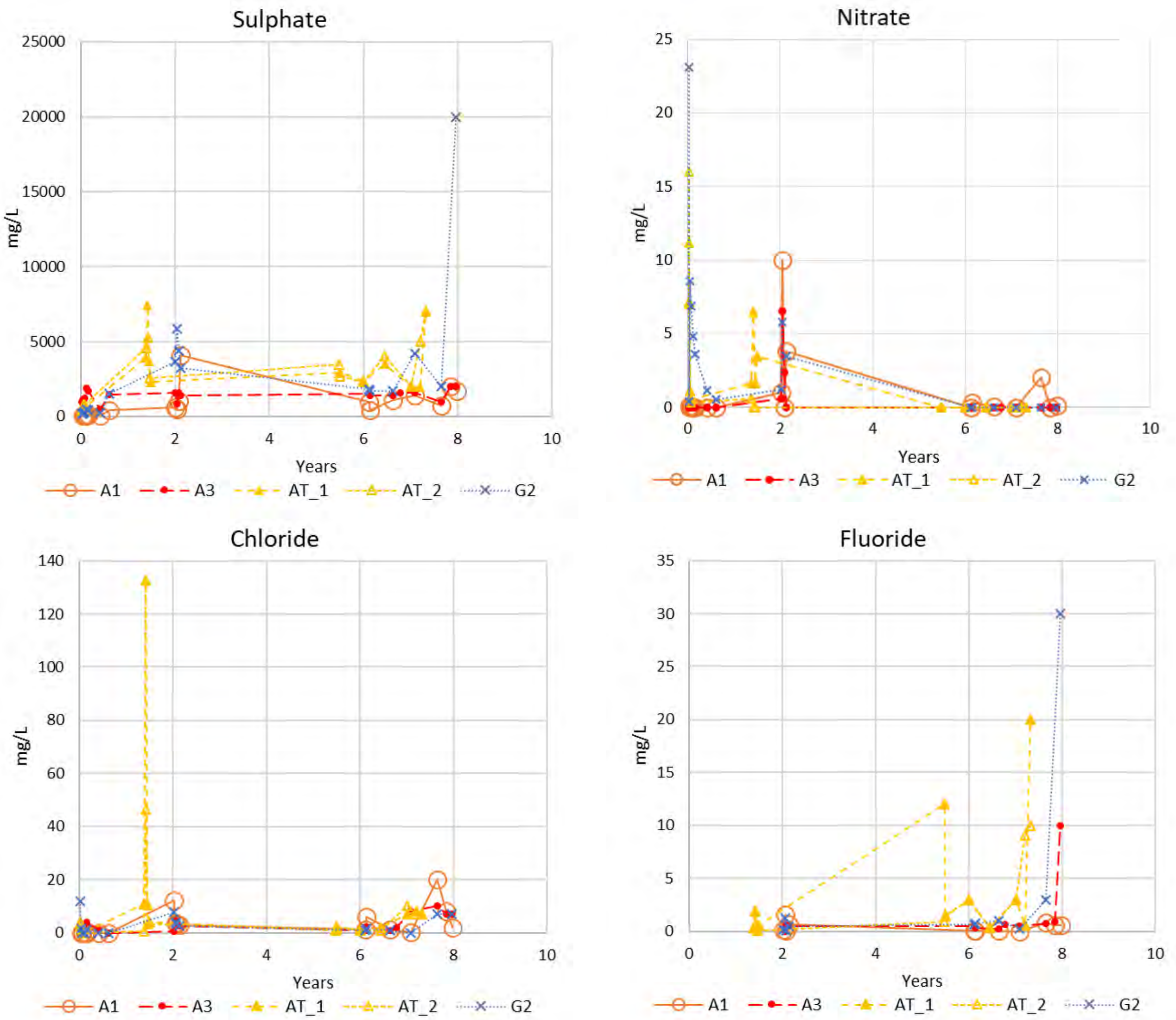

Figure 40 Concentrations of anions measured in leachate from the SVV containers. Fluoride was not measured in the first part of the experiment.

For the major cations, there was only one measurement for A1 in 2022 (Figure 41), and none for the other containers as there was no water in the cans when samples were sent to ALS 22.09.22. Calcium leaching from A1 continued the increasing trend from earlier years, likely reflecting carbonates dissolving to neutralize acid. Magnesium concentrations more than doubled, while potassium concentrations were similar to previous years. Sodium concentrations increased from 3-4 mg/l in 2021 to 28 mg/L in 2022, which is similar to what was seen in VAS containers, mixed and clean masses (Figure 24). As chloride also increased in the SVV containers, sea-salt deposition is not an unlikely explanation.

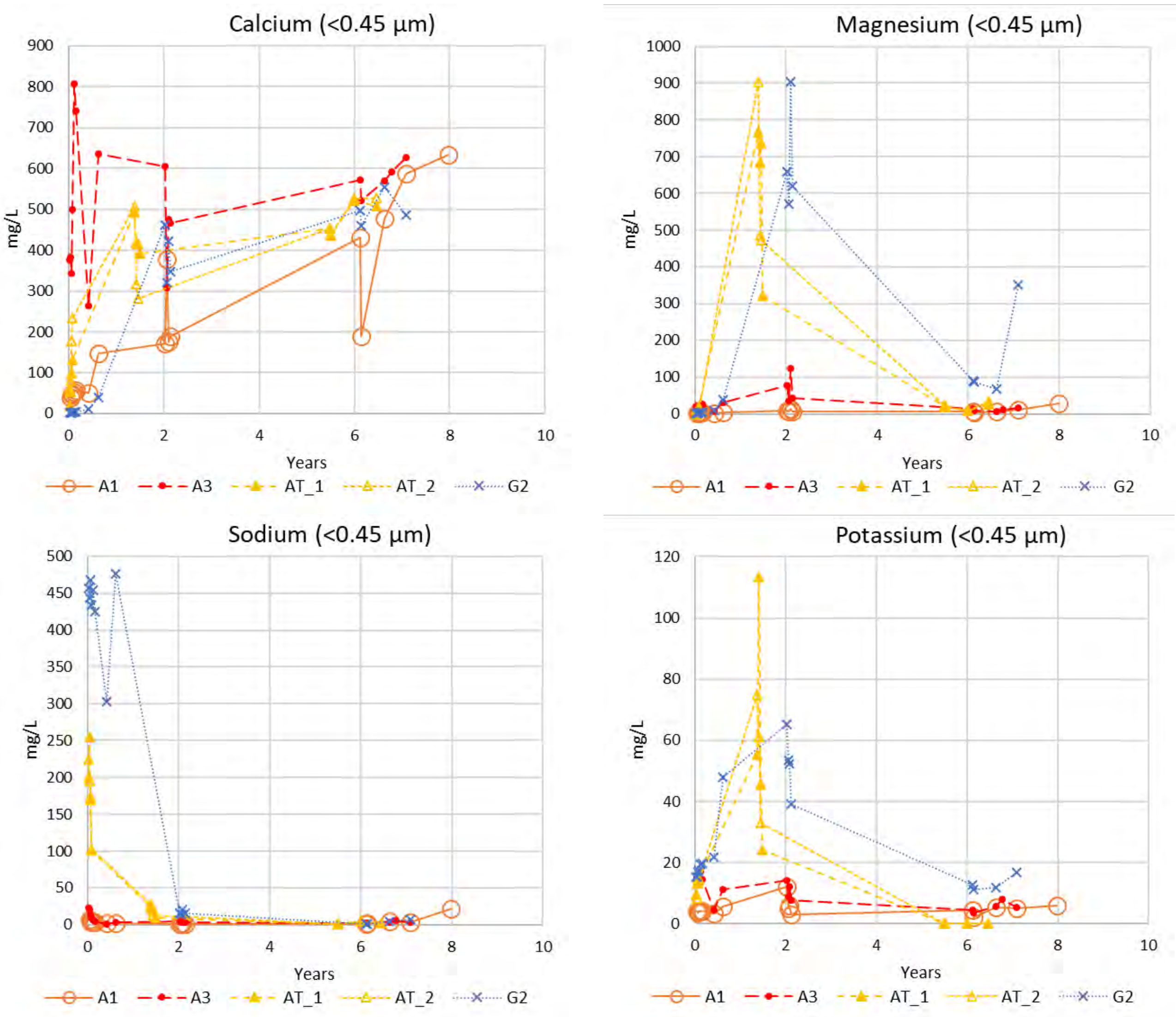

Figure 41 Major cations (measured by ICP-MS) with time in the five SVV containers.

3.3.3 Element leaching with time

Due to an error when ordering analysis, no measurements were done for strontium or silicon in 2022. Phosphorus concentrations are not presented for 2022 as different analysis methods (IC and ICP-MS) have been used and the data seem to not be comparable. New evaluation of the data should be done after more analyses in 2023.

Concentrations of iron and aluminium (Figure 42) are highest in leachate from the AT1, AT2 and G2 containers, with continuously low pH. The peak seen for G2 for conductivity and sulphate concentrations at eight years is also recognized in the concentrations of aluminium and iron. Concentrations are also increasing in the A3 sample, with 220 mg/L iron and 31 700 µg/L aluminium in the last sample. For the A1 leachate, concentrations of aluminium (587 µg/L in the last sample) and iron (0.174 mg/L in the last sample) are about 100 times higher than in 2021.

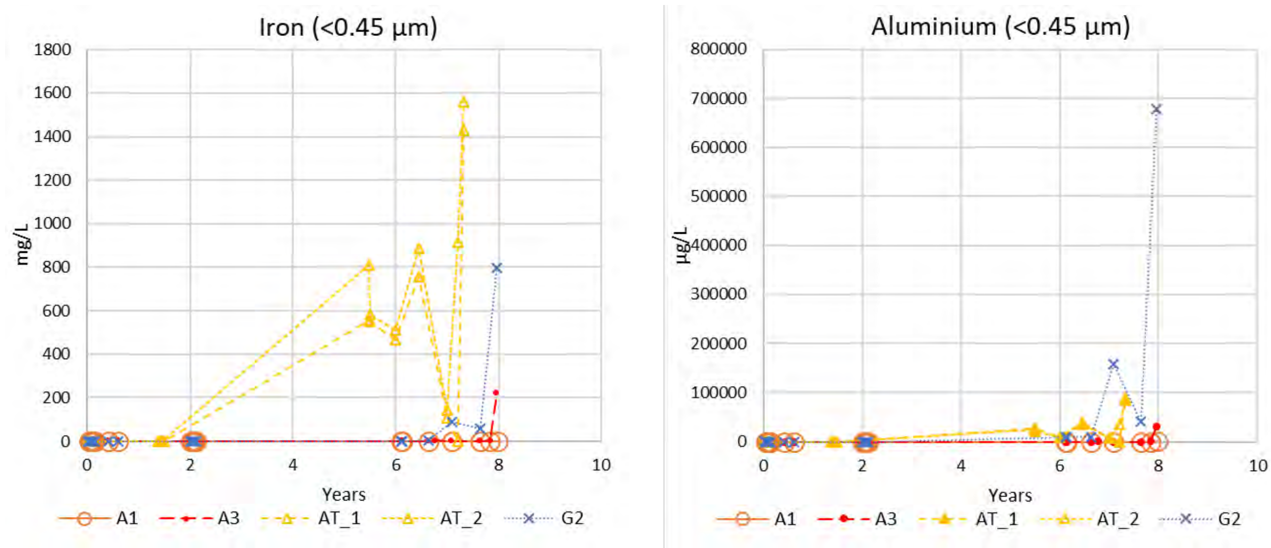

Figure 42 Leaching of iron and aluminium with time in the five containers from SVV. Phosphorus and silicon were not measured in 2016 (~1.5 and ~2 y samples)

Concentrations of zinc, nickel, copper, cadmium, lead, cobalt and manganese all had a similar increase in the leachate from G2 (figure 43 and figure 44). Looking more closely, one can see that also A3 and A1 concentrations are increasing for these elements, up to several orders of magnitudes. Note that the wrong concentrations were used for G2 leachate in the manganese figure in the report for 2021 (NGI, 2023) and the figure here looks different.

Arsenic leaching pattern (figure 44) is similar to what is seen for iron, which may mean that arsenic is released from arsenopyrite. Vanadium and chromium leaching patterns are somewhat similar to arsenic.

Barium concentrations seem to have stabilised around 20 µg/L for all containers. Molybdenum concentrations are low compared to the beginning of the experiment and the available parts of the element may have been washed out quickly.

Thorium has only been measured in one sample from A1 in 2022 as there was no water in the cans for the other containers for the sampling 22.09.2022 when samples were sent to ALS for analysis. Leaching of uranium seem to be increasing in all containers except A1.

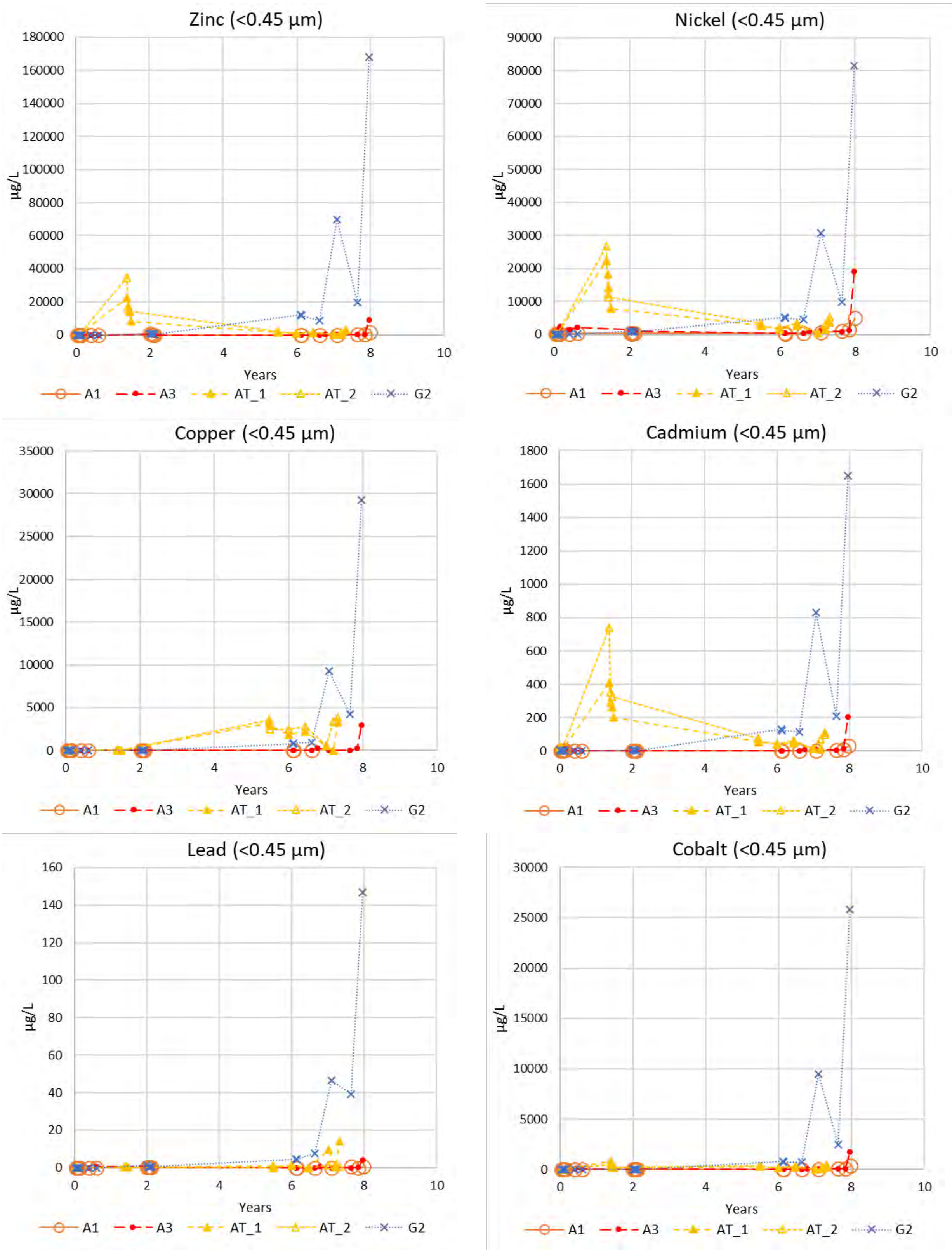

Figure 43 Leachate concentrations of zinc, nickel, copper, cadmium, lead and cobalt with time for the five SVV containers.

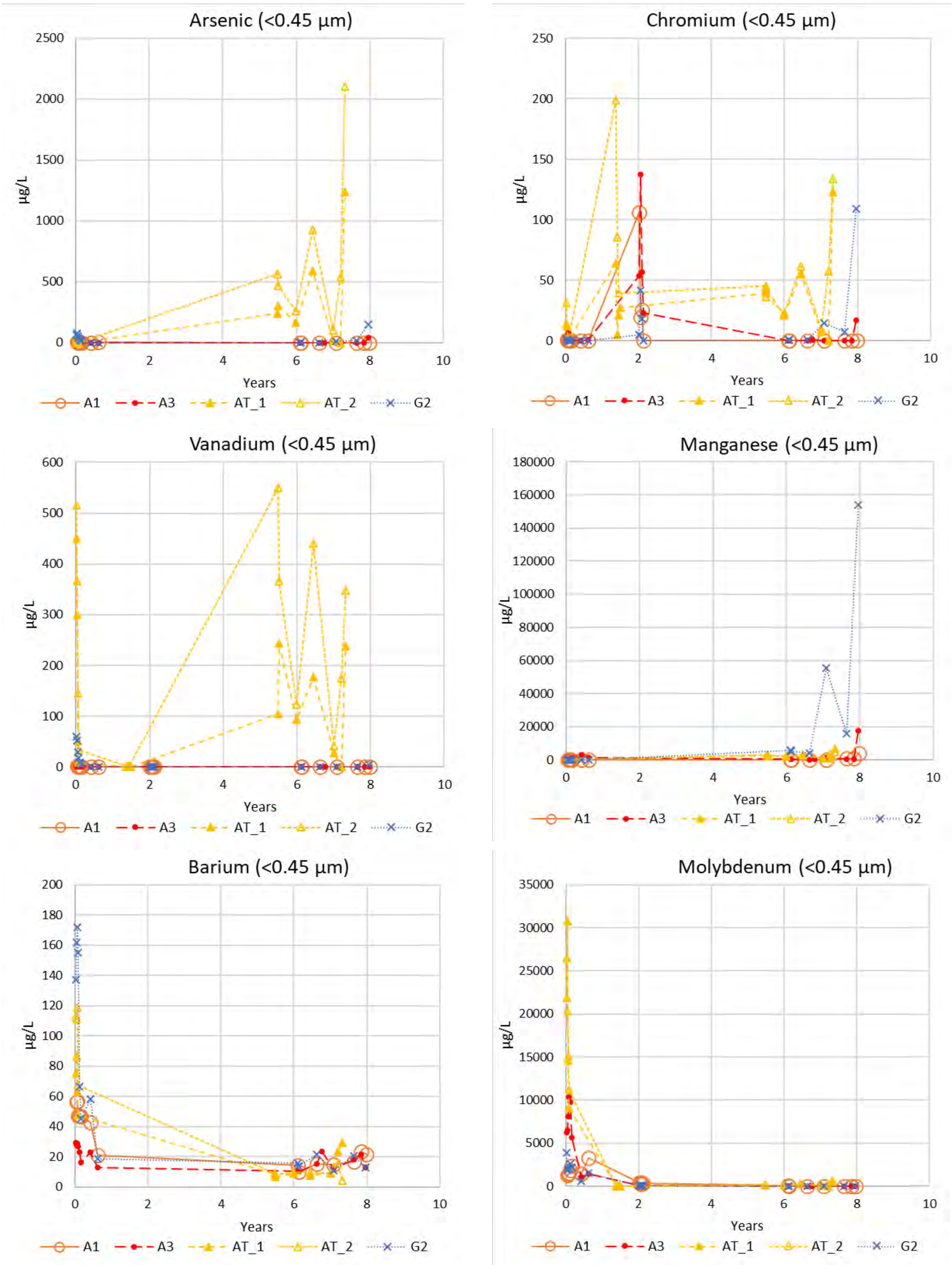

Figure 44 Leachate concentrations of arsenic, chromium, vanadium, manganese, barium and molybdenum with time for the five SVV containers.

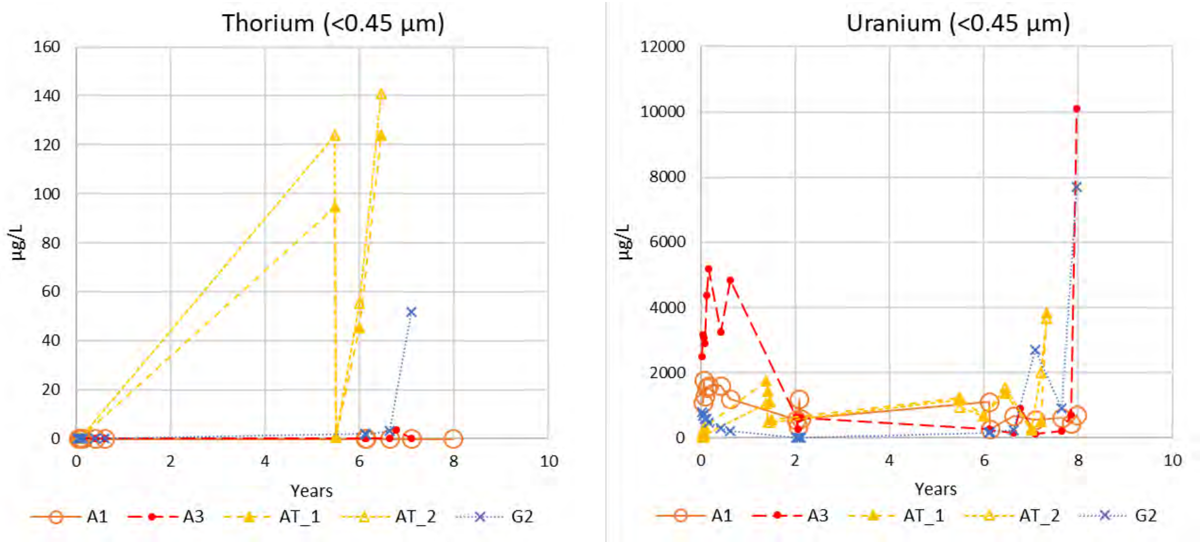

Figure 45 Leachate concentrations of thorium and uranium with time for the five SVV containers.

3.4 Leachate quality for containers G4H and unknown

Due to uncertainties in storage conditions at Gran (Figure 2) for G4H and uncertain identity of the other container (G5H/A4H/A5H) it was decided to discard these two. Field parameters from the period they were sampled in 2021 and 2022 are presented in Table 4 and Table 5. Other parameters are gathered in Appendix C. See also Appendix B for triangular diagrams used to try to identify the rock masses in the unknown container.

Table 4 Field parameters measured by NGI and NOAH for container G4H.

Date	År	Conductivity (µS/cm)	pH	Eh (mV)
01/11/2021	7.1	2410	5.9	739
17/12/2021	7.2	1316	7.77	748
20/01/2022	7.3	551	8.03	587
11/02/2022	7.4	887	7.87	484
23/05/2022	7.6	2490	7.11	667
03/08/2022	7.8	4200	6.5	-
15/09/2022	8.0	3600	7.6	-
01/11/2022	8.1	3000	7.18	-

Table 5 Field parameter measured by NGI and NOAH for unknown container (G5H/A4H/A5H).

Date	År	Conductivity (µS/cm)	pH	Eh (mV)
		µS/cm		mV
01/11/2021	7.1	2160	6.2	691
17/12/2021	7.2	999	7.6	727
20/01/2022	7.3	1003	7.95	568
11/02/2022	7.4	1645	8.07	460
23/05/2022	7.6	2530	7.2	666
03/08/2022	7.8	3700	6.8	-
01/11/2022	8.1	2470	6.35	-

4 References

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Appendix A

PHOTOS CONTAINER EXPERIMENTS ROCK MASSES

Contents

A1 Photos from field work 01.11.2022

A1.1 NGI containers: pure alum shale, mixed masses and clean masses

A1.1.1 VAS_1: Pure alum shale (100% alum shale, 0% rhomb porphyry)

A1.1.2 VAS_2: Pure alum shale (100% alum shale, 0% rhomb porphyry)

A1.1.3 B5_1: 5 % alum shale, 95% rhomb porphyry

A1.1.4 B5_2: 5 % alum shale, 95% rhomb porphyry

A1.1.5 B10_1: 10 % alum shale, 90% rhomb porphyry

A1.1.6 B10_2: 10 % alum shale, 90% rhomb porphyry

A1.1.7 B20_1: 20 % alum shale, 80% rhomb porphyry

A1.1.8 B20_2: 20 % alum shale, 80% rhomb porphyry

A1.1.9 RM_1: 0 % alum shale, 100% rhomb porphyry

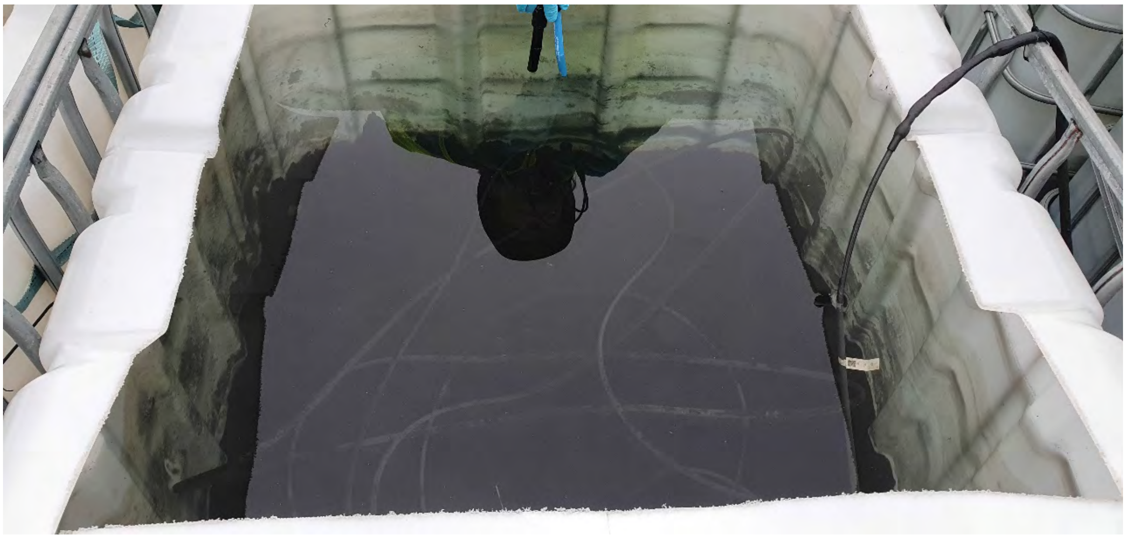
A1.1.10 RM_2: 0 % alum shale, 100% rhomb porphyry

A1.2 NGI containers: salt water and fresh water storage

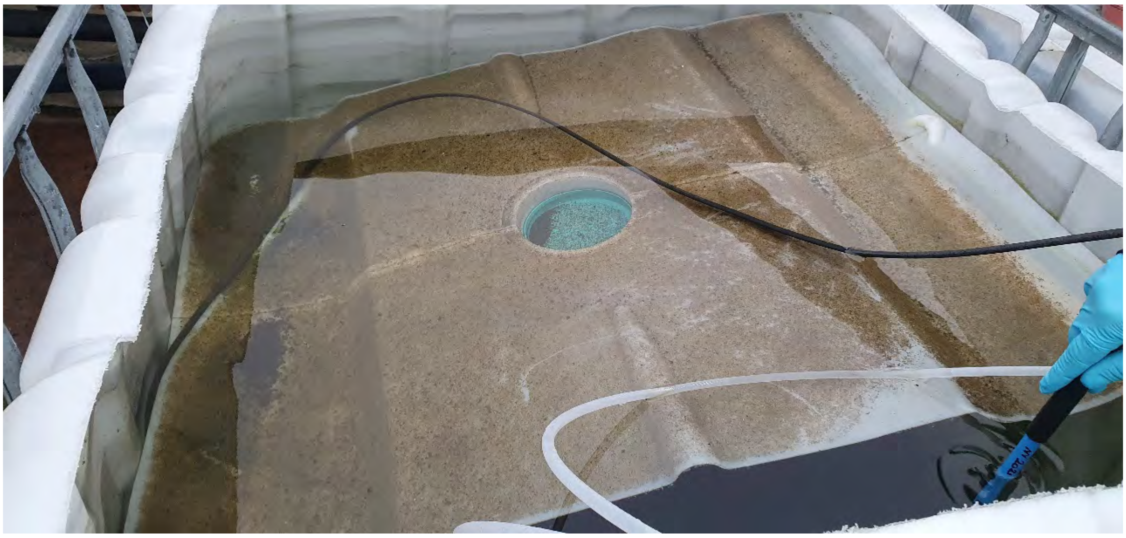
A1.2.1 DF_1: Fresh water, 100% alum shale

A1.2.2 DF_2: Fresh water, 100% alum shale

A1.2.3 DS_1: Salt water, 100% alum shale



A1.2.4 DS_2: Salt water, 100% alum shale



A1.3 SVV containers

A1.3.1 A1: Alum shale from road cut, big pieces

A1.3.2 A3: Alum shale from road cut

G2: Galgeberg shale from road cut

A1.3.3 AT1: Alum shale from tunnel

A1.3.4 AT2: Alum shale from tunnel

A1.3.5 G4H: Galgeberg shale mixed with Huk limestone

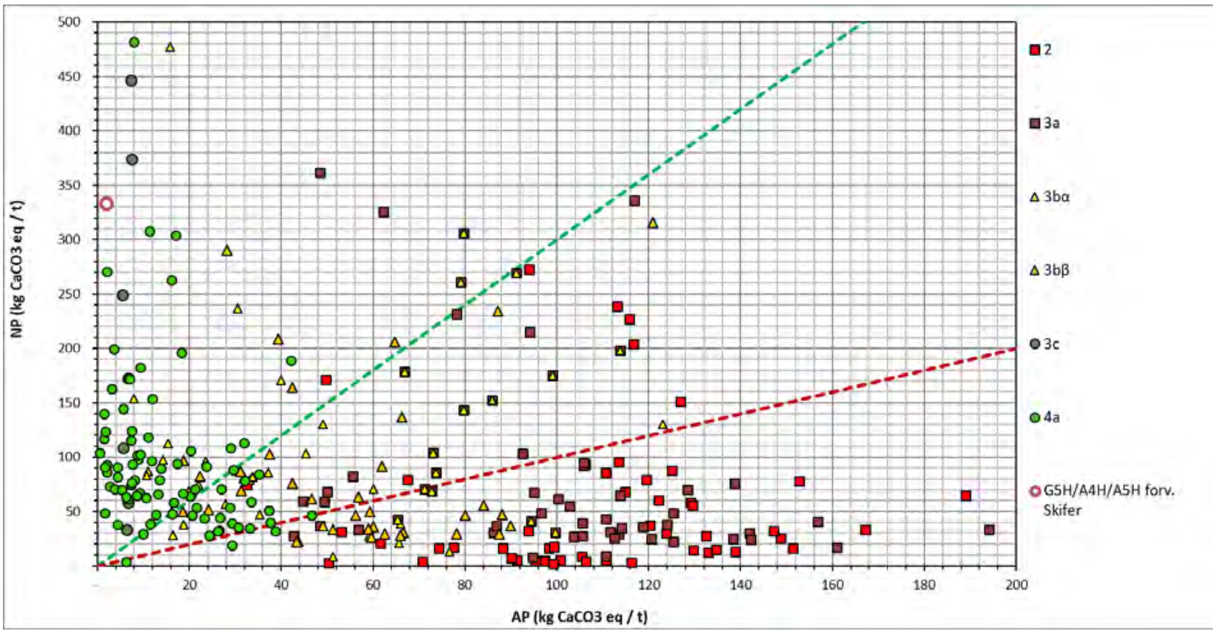
A1.3.6 Unknown: black shale mixed with Huk limestone (G5H/A4H/A5H)

Appendix B

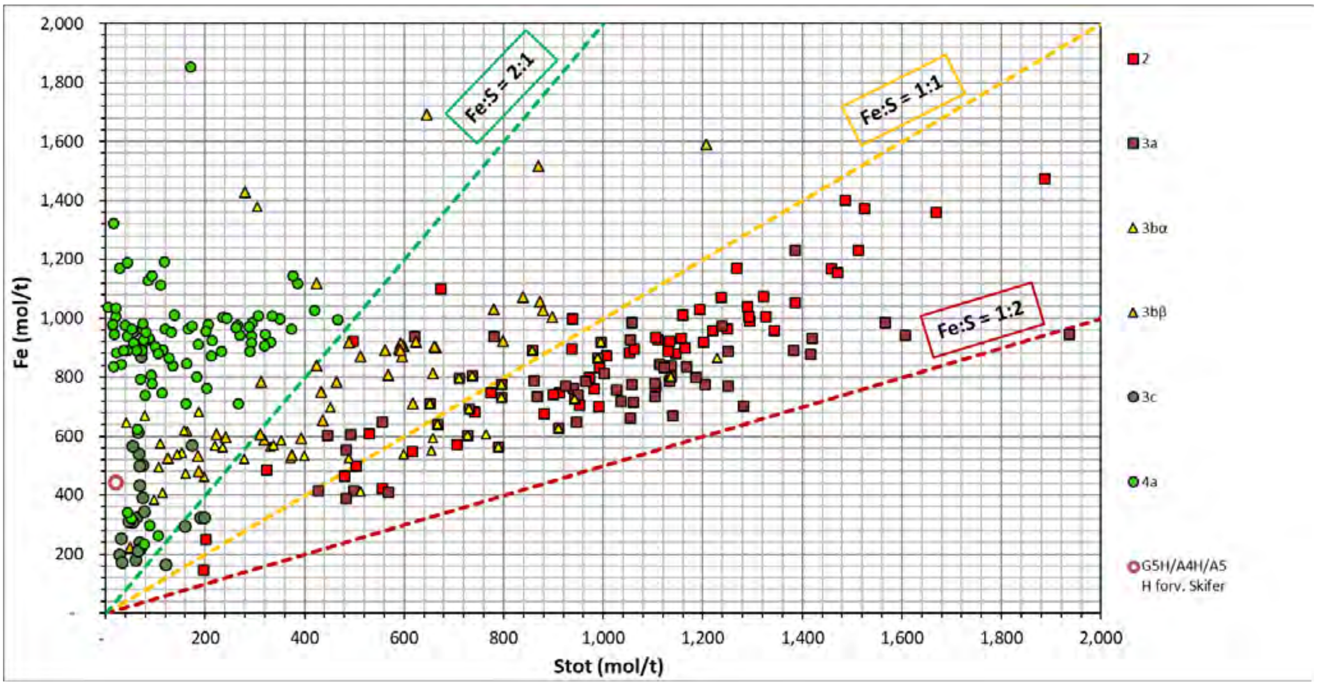
TRIANGULAR DIAGRAMS FOR UKNOWN CONTAINER (BLACK SHALE MIXED WITH HUK LIMESTONE (G5H/A4H/A5H))

Contents

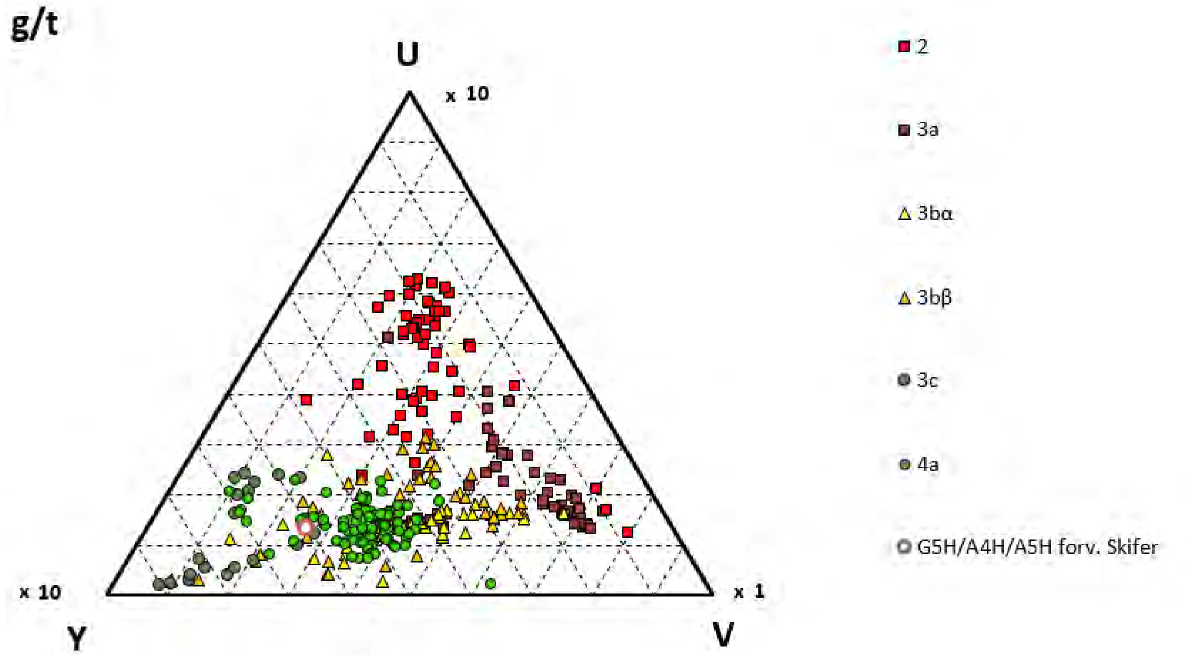
B1 AP:NP diagram

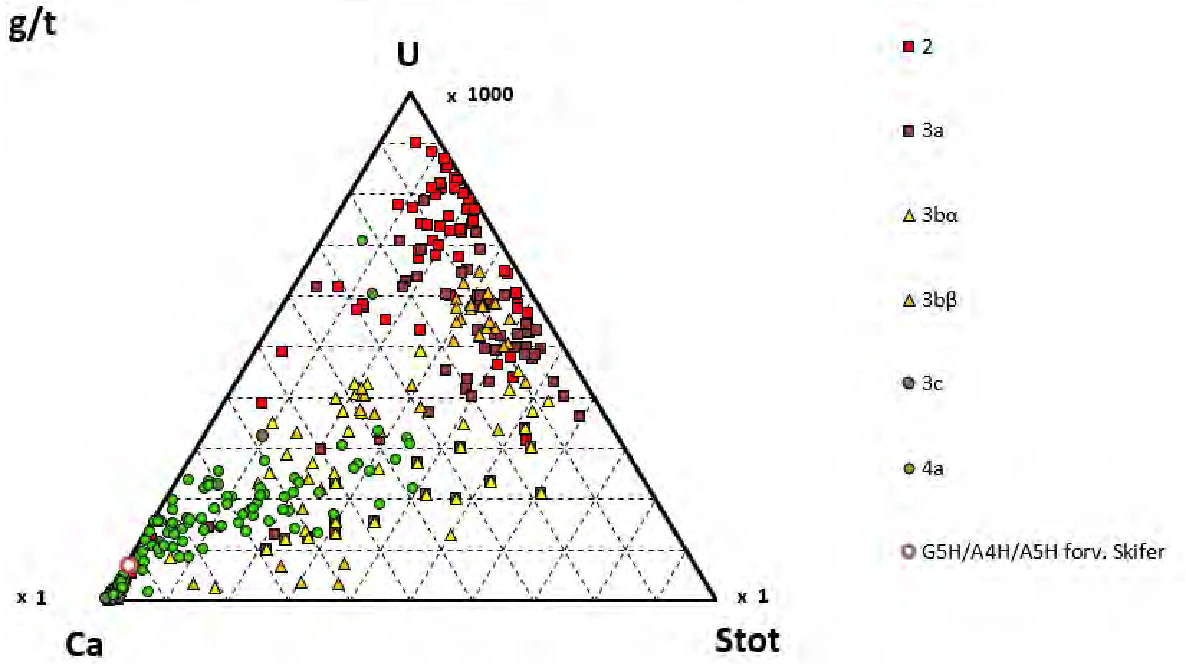


B2 Fe:S diagram

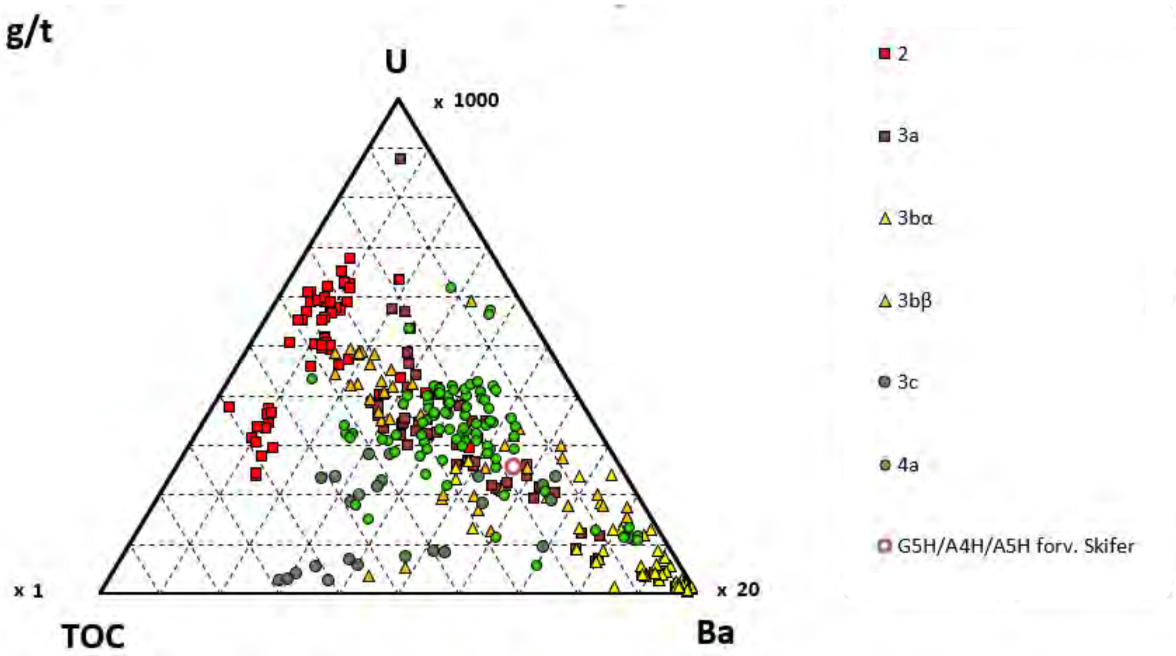


B3 Triangular diagrams

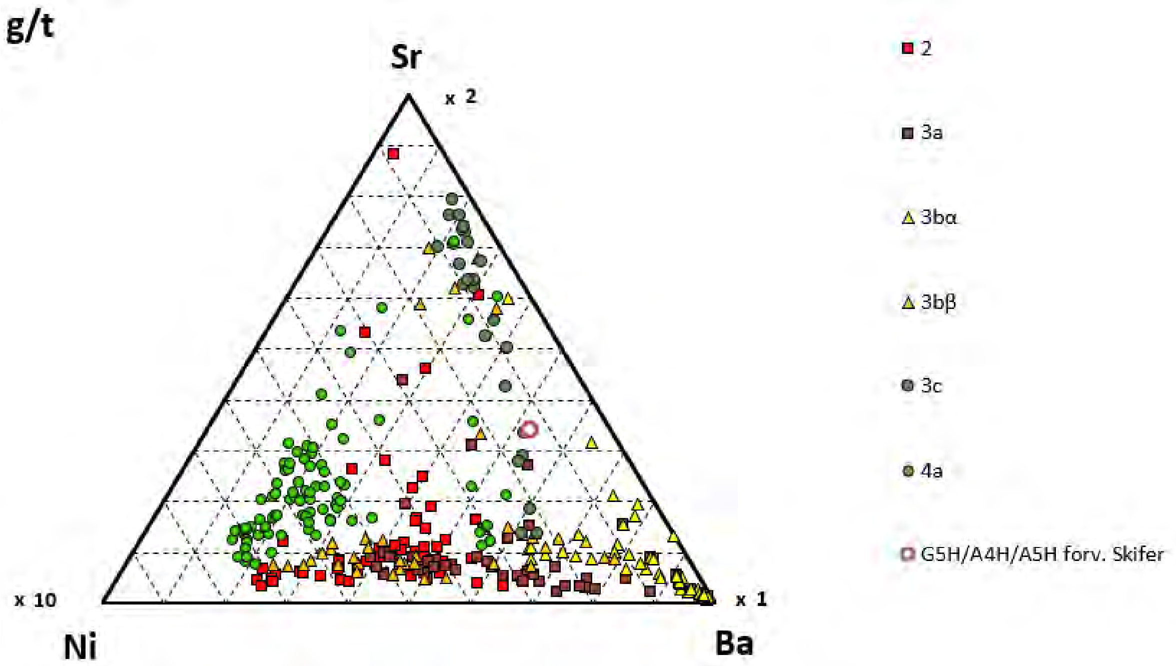




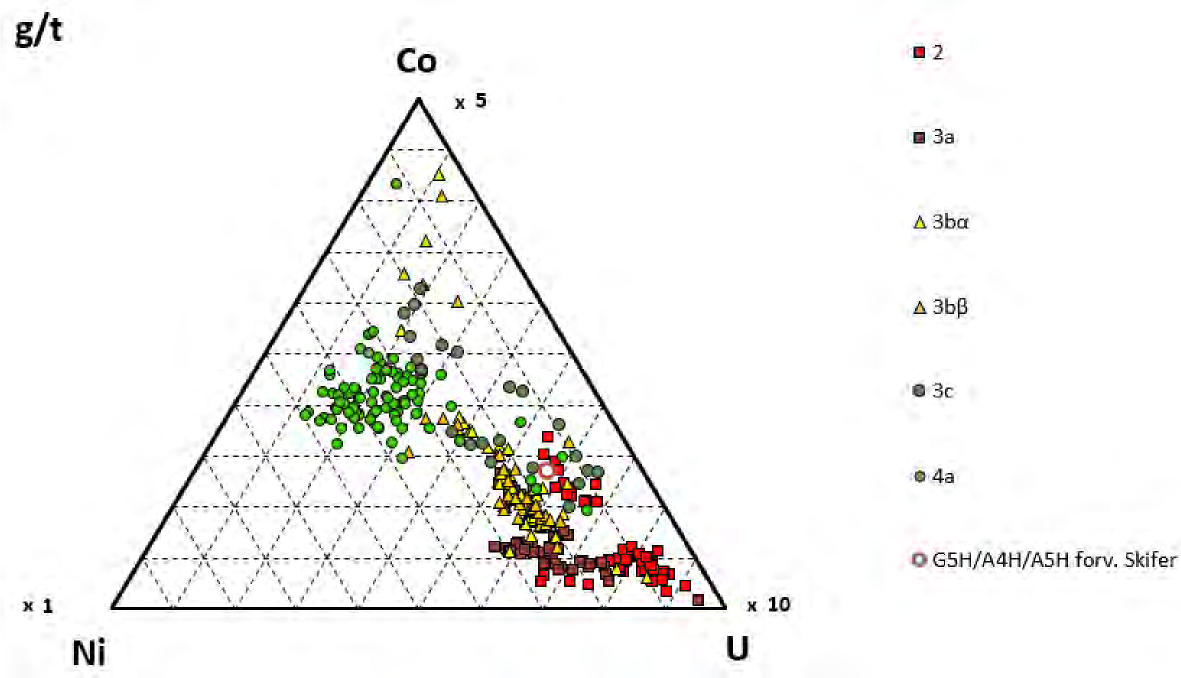
B3.1 Diagrams suggested by Pabst et al. (2017) to separate 3bα and 3bβ from other horizons of black mudrock



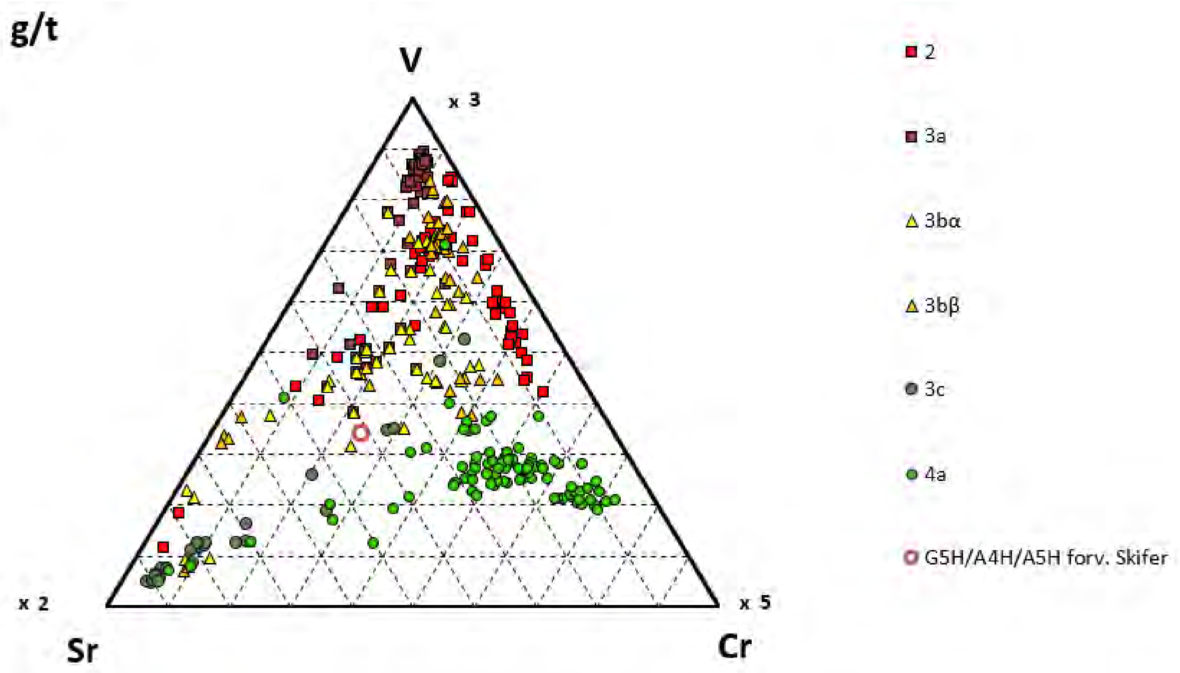
Result: 3a/3bβ/4a



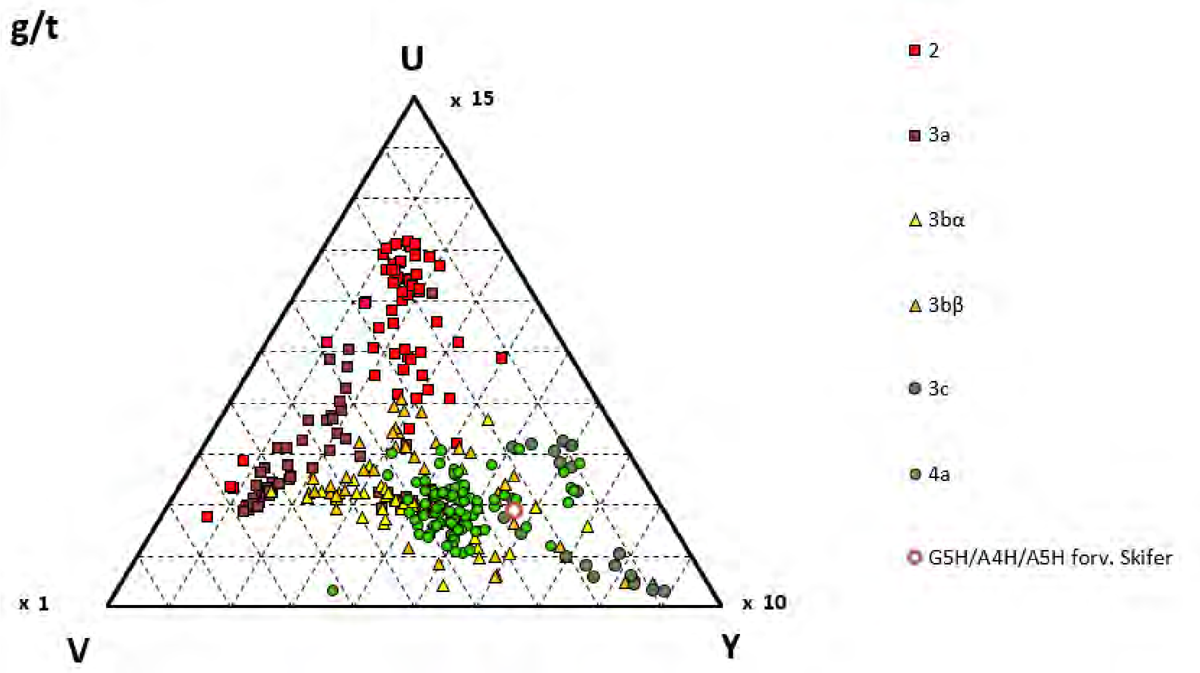
Result:?

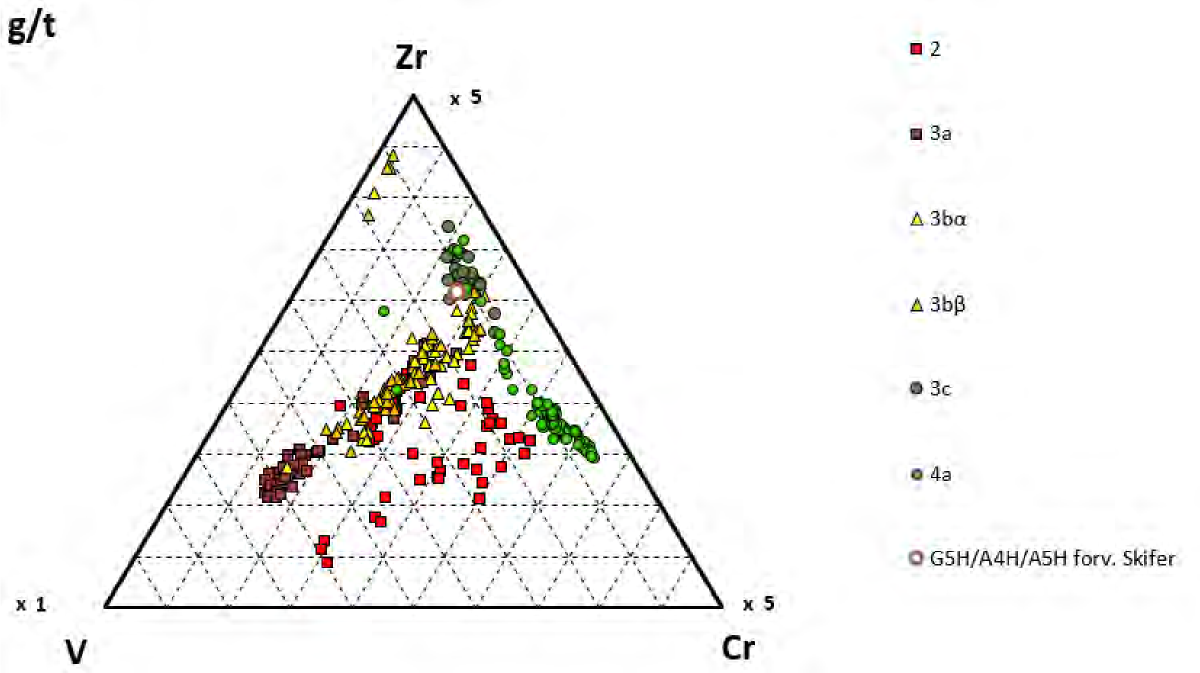

g/t
Co
x 5
x 1
x 10
Ni
U
2
3a
3bα
3bβ
3c
4a
G5H/A4H/A5H forv. Skifer

Result: 2/3c

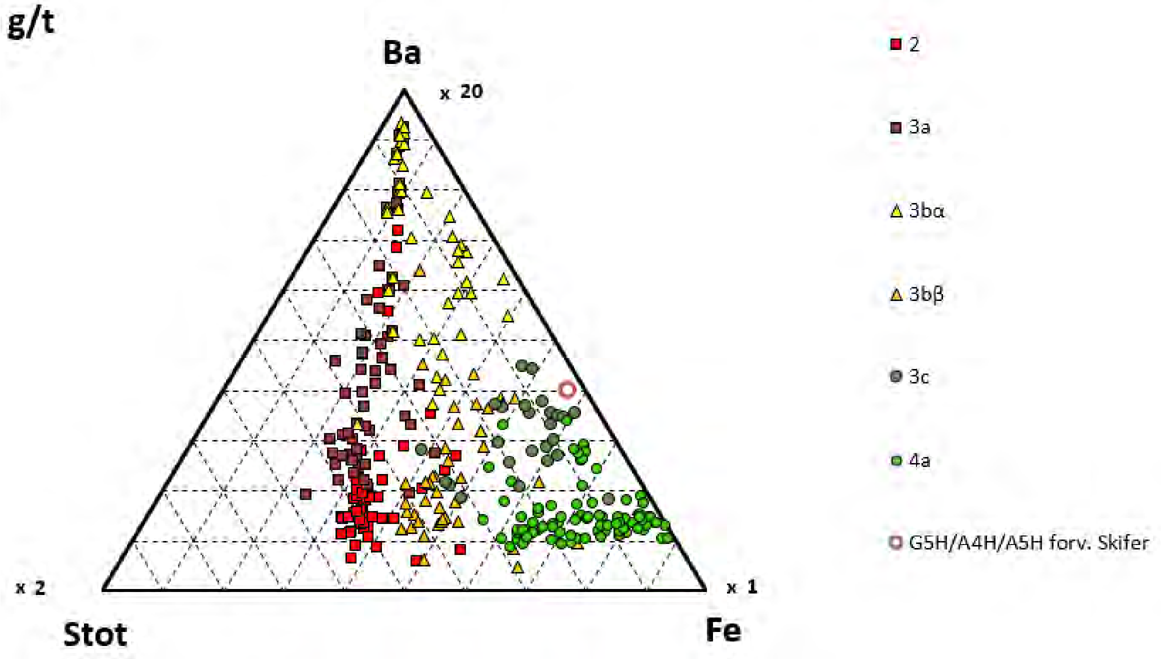

g/t
V
x 3
x 2
x 5
Sr
Cr
2
3a
3bα
3bβ
3c
4a
G5H/A4H/A5H forv. Skifer

B3.2 Triangular diagrams suggested by Pabst et al. (2017) to identify horizon 3a, 3c and 4a

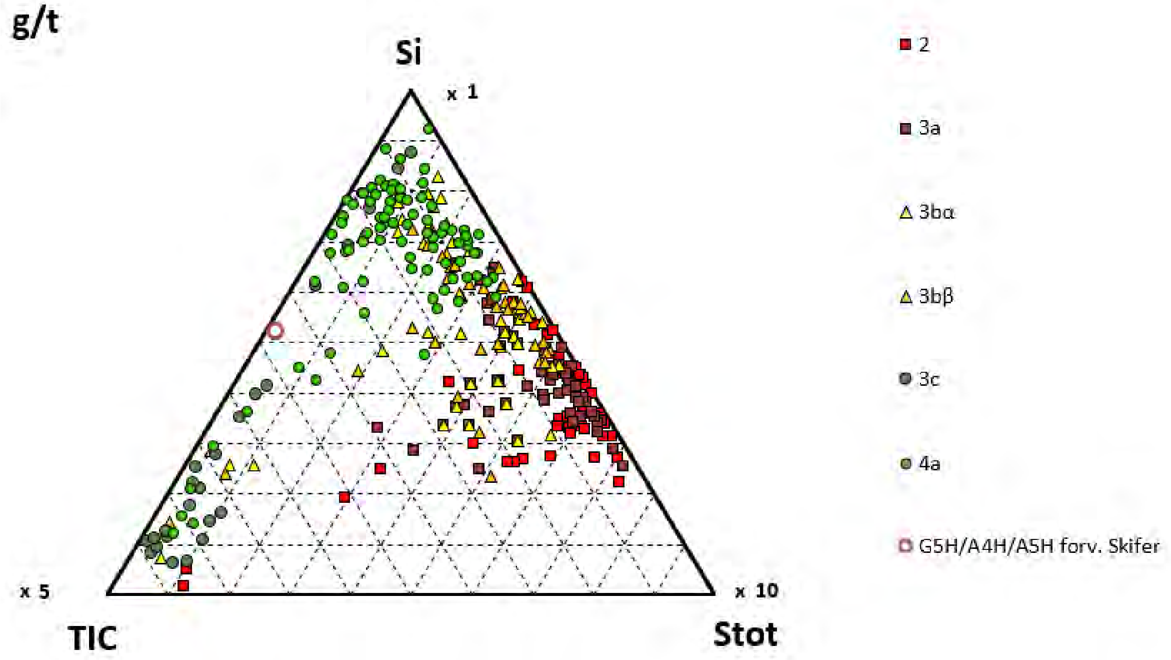




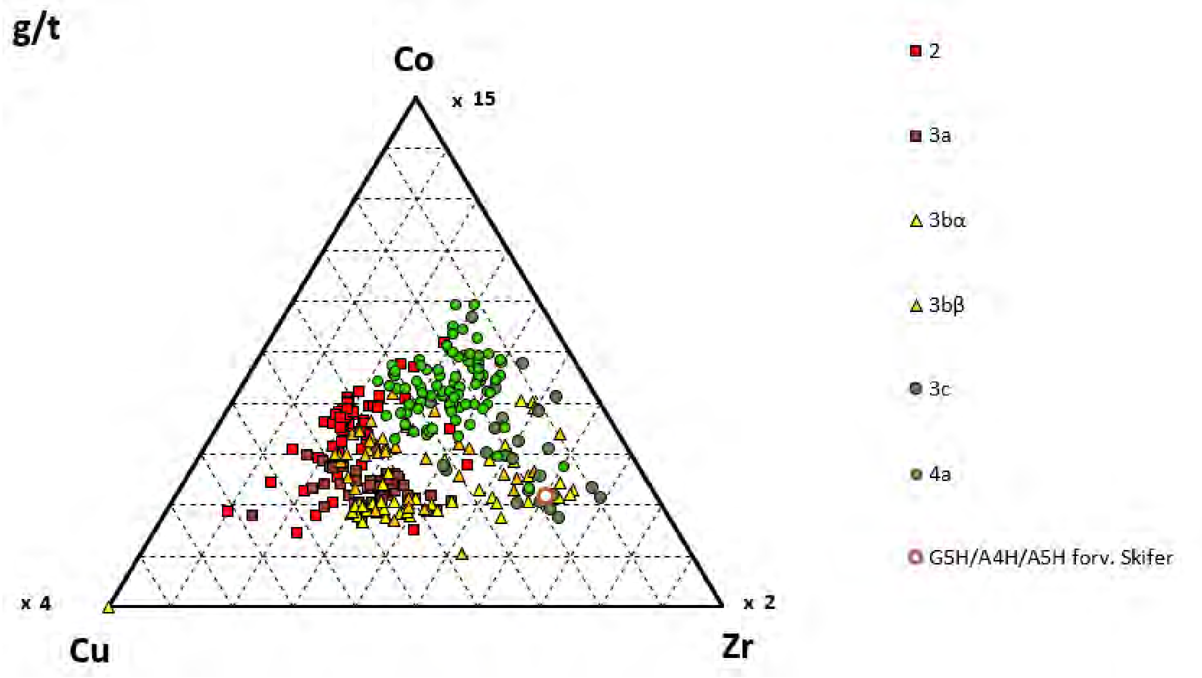
Result: 3c



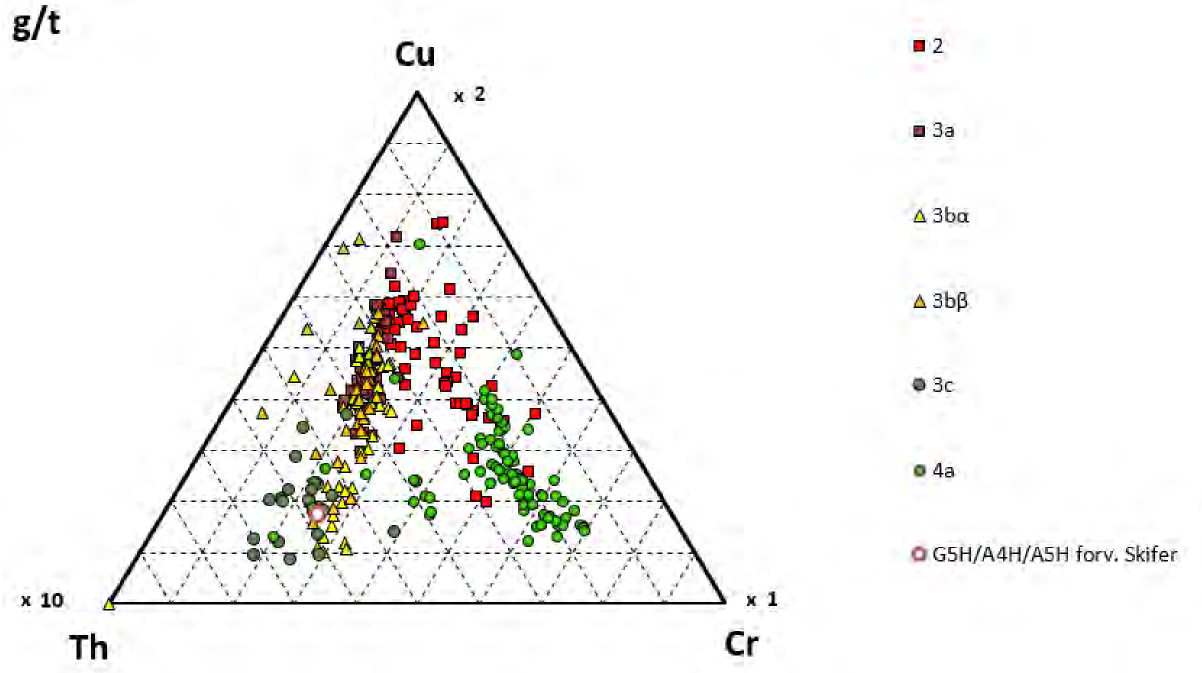
Result: 3c



Result: 3c/4a



Result: 3c/3bα/3bβ



Result: 3c/3bα/3bβ

Appendix C

LEACHATE RESULTS FOR GH4 AND UKNOWN CONTAINER (BLACK SHALE MIXED WITH HUK LIMESTONE (G5H/A4H/A5H))

X_REFERANSENR	SAMPLE_NUMBE	TEXT_ID	DESCRIPT	SAMPLED_DATE	COMMON_NAM	NAME	FORMATTED_ENTRY	DISPLAY_STRING	REPORTED_NAME
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Zn	412	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Zn	169	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Zn	691	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	V	<5	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	V	<5	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	V	<5	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	U	7,2	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	U	17,7	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	U	5,8	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Tl	0,1	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Tl	0,4	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Tl	0,3	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	IC	SO4	3000	mg/L	ISO 10304
22-028	123649	O-7536	G4H	03.08.2022 00:00	IC	SO4	3000	mg/L	ISO 10304
22-028	122531	O-7401	G4H	23.05.2022 00:00	IC	SO4	2000	mg/L	ISO 10304
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Sn	<10	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Sn	<10	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Sn	<10	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Se	<6	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Se	16,9	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Se	16	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Sb	<1	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Sb	<1	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Sb	<1	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	EKSTERN_FLY	Redokspotensial		mV	DIN 38404-C5
22-028	123649	O-7536	G4H	03.08.2022 00:00	EKSTERN_FLY	Redoksp	555	mV	DIN 38404-C5
22-028	122531	O-7401	G4H	23.05.2022 00:00	EKSTERN_FLY	Redoksp	459	mV	DIN 38404-C5
22-028	124624	O-7945	G4H	15.09.2022 00:00	IC	PO4	<0,3	mg/L	ISO 10304
22-028	123649	O-7536	G4H	03.08.2022 00:00	IC	PO4	<0,3	mg/L	ISO 10304
22-028	122531	O-7401	G4H	23.05.2022 00:00	IC	PO4	<0,3	mg/L	ISO 10304
22-028	124624	O-7945	G4H	15.09.2022 00:00	BENKANALYSI	pH	7,6	-	NS-EN ISO 10523
22-028	123649	O-7536	G4H	03.08.2022 00:00	BENKANALYSI	pH	6,5	-	NS-EN ISO 10523

X_REFERANSENR	SAMPLE_NUMBE	TEXT_ID	DESCRIPT	SAMPLED_DATE	COMMON_NAM	NAME	FORMATTED_ENTRY	DISPLAY_STRING	REPORTED_NAME
22-028	122531	O-7401	G4H	23.05.2022 00:00	BENKANALYSI	pH	7,1	-	NS-EN ISO 10523
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Pb	<0,2	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Pb	0,2	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Pb	0,6	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	IC	NO3	<0,1	mg/L	ISO 10304
22-028	123649	O-7536	G4H	03.08.2022 00:00	IC	NO3	<0,1	mg/L	ISO 10304
22-028	122531	O-7401	G4H	23.05.2022 00:00	IC	NO3	2	mg/L	ISO 10304
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Ni	696	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Ni	826	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Ni	989	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Mo	4,2	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Mo	6,8	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Mo	8,8	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Mn	1320	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Mn	2260	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Mn	1310	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	BENKANALYSI	Kondukt	3,6	mS/cm	Intern metode, elektrode
22-028	123649	O-7536	G4H	03.08.2022 00:00	BENKANALYSI	Kondukt	4,2	mS/cm	Intern metode, elektrode
22-028	122531	O-7401	G4H	23.05.2022 00:00	BENKANALYSI	Kondukt	2,5	mS/cm	Intern metode, elektrode
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Fe	168	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Fe	202	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Fe	351	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	IC	F	4	mg/L	ISO 10304
22-028	123649	O-7536	G4H	03.08.2022 00:00	IC	F	0,7	mg/L	ISO 10304
22-028	122531	O-7401	G4H	23.05.2022 00:00	IC	F	0,6	mg/L	ISO 10304
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Cu	<4	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Cu	<4	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Cu	9,5	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Cr	<3	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Cr	<3	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Cr	<3	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Co	49,8	µg/L	NS-EN ISO 17294-2 (ICP-MS)
X_REFERANSENR	SAMPLE_NUMBE	TEXT_ID	DESCRIPT	SAMPLED_DATE	COMMON_NAM	NAME	FORMATTED_ENTRY	DISPLAY_STRING	REPORTED_NAME

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22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Co	96,5	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	IC	Cl	7	mg/L	ISO 10304
22-028	123649	O-7536	G4H	03.08.2022 00:00	IC	Cl	8	mg/L	ISO 10304
22-028	122531	O-7401	G4H	23.05.2022 00:00	IC	Cl	10	mg/L	ISO 10304
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Cd	9	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Cd	5,4	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Cd	14,8	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	IC	Br	<0,3	mg/L	ISO 10304
22-028	123649	O-7536	G4H	03.08.2022 00:00	IC	Br	<0,3	mg/L	ISO 10304
22-028	122531	O-7401	G4H	23.05.2022 00:00	IC	Br	<0,3	mg/L	ISO 10304
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Ba	13,1	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Ba	25,4	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Ba	16,4	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	As	0,7	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	As	0,7	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	As	<0,5	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	124624	O-7945	G4H	15.09.2022 00:00	ICP	Al	233	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123649	O-7536	G4H	03.08.2022 00:00	ICP	Al	<20	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122531	O-7401	G4H	23.05.2022 00:00	ICP	Al	48,9	µg/L	NS-EN ISO 17294-2 (ICP-MS)
G5H/A4H/A5H, ukjent kontainer									
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Zn	480	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Zn	1420	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	V	<5	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	V	<5	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	U	5,6	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	U	6,9	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Tl	0,5	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Tl	0,3	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	IC	SO4	3000	mg/L	ISO 10304
22-028	122532	O-7402	G5H	23.05.2022 00:00	IC	SO4	2000	mg/L	ISO 10304
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Sn	<10	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Sn	<10	µg/L	NS-EN ISO 17294-2 (ICP-MS)

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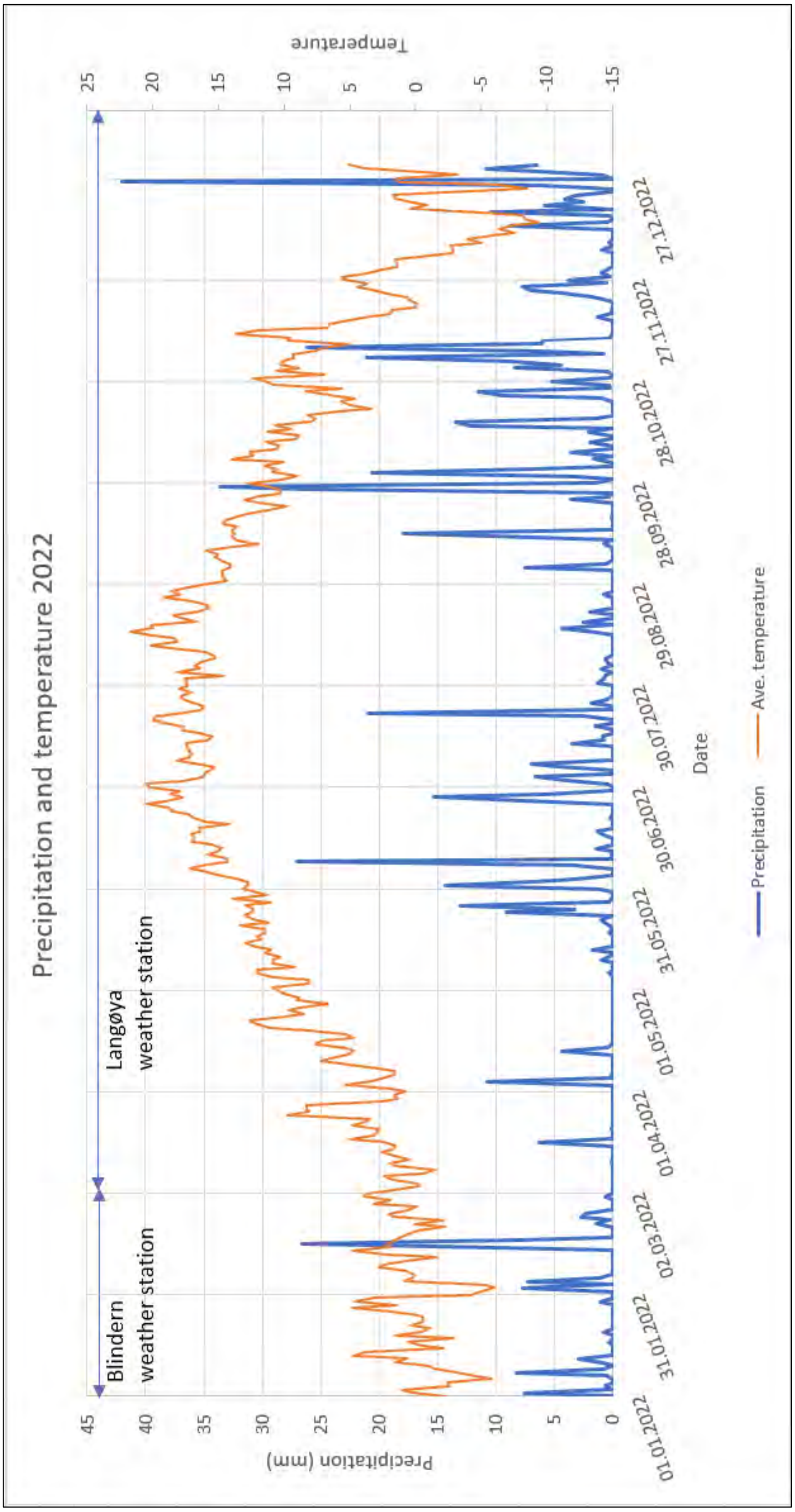
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Se	17,6	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Se	21,6	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Sb	<1	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Sb	<1	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	EKSTERN_FLY	Redoksp	520,2	mV	DIN 38404-C5
22-028	122532	O-7402	G5H	23.05.2022 00:00	EKSTERN_FLY	Redoksp	458	mV	DIN 38404-C5
22-028	123637	O-7524	G5H	03.08.2022 00:00	IC	PO4	<0,3	mg/L	ISO 10304
22-028	122532	O-7402	G5H	23.05.2022 00:00	IC	PO4	<0,3	mg/L	ISO 10304
22-028	123637	O-7524	G5H	03.08.2022 00:00	BENKANALYSI	pH	6,8	-	NS-EN ISO 10523
22-028	122532	O-7402	G5H	23.05.2022 00:00	BENKANALYSI	pH	7,2	-	NS-EN ISO 10523
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Pb	0,2	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Pb	0,2	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	IC	NO3	<0,1	mg/L	ISO 10304
22-028	122532	O-7402	G5H	23.05.2022 00:00	IC	NO3	2	mg/L	ISO 10304
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Ni	1350	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Ni	1430	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Mo	2,4	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Mo	4,3	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Mn	4110	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Mn	1880	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	BENKANALYSI	Kondukt	3,7	mS/cm	Intern metode, elektrode
22-028	122532	O-7402	G5H	23.05.2022 00:00	BENKANALYSI	Kondukt	2,5	mS/cm	Intern metode, elektrode
22-028	124625	O-7946	G5H	15.09.2022 00:00	DOKUMENTA	Kommer	Prøve ble ikke tatt ut	-	Kommentarer
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Fe	78,9	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Fe	675	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	IC	F	0,7	mg/L	ISO 10304
22-028	122532	O-7402	G5H	23.05.2022 00:00	IC	F	0,6	mg/L	ISO 10304
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Cu	<4	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Cu	6	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Cr	<3	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Cr	<3	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Co	128	µg/L	NS-EN ISO 17294-2 (ICP-MS)

X_REFERANSENR	SAMPLE_NUMBE	TEXT_ID	DESCRIPT	SAMPLED_DATE	COMMON_NAM	NAME	FORMATTED_ENTRY	DISPLAY_STRING	REPORTED_NAME
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Co	178	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	IC	Cl	8	mg/L	ISO 10304
22-028	122532	O-7402	G5H	23.05.2022 00:00	IC	Cl	10	mg/L	ISO 10304
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Cd	23,8	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Cd	31,8	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	IC	Br	<0,3	mg/L	ISO 10304
22-028	122532	O-7402	G5H	23.05.2022 00:00	IC	Br	<0,3	mg/L	ISO 10304
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Ba	22	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Ba	17	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	As	0,5	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	As	<0,5	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	123637	O-7524	G5H	03.08.2022 00:00	ICP	Al	<20	µg/L	NS-EN ISO 17294-2 (ICP-MS)
22-028	122532	O-7402	G5H	23.05.2022 00:00	ICP	Al	35,9	µg/L	NS-EN ISO 17294-2 (ICP-MS)

Appendix D

PRECIPITATION DATA


Precipitation and temperature 2022
Blindern weather station
Langøya weather station
Precipitation (mm)
Temperature
Date
Precipitation
Ave. temperature
01.01.2022
31.01.2022
02.03.2022
01.04.2022
01.05.2022
31.05.2022
30.06.2022
30.07.2022
29.08.2022
28.09.2022
28.10.2022
27.11.2022
27.12.2022

Appendix E

LEACHATE REPORTS

Contents

DS_1

X_REFERANSENR	SAMPLED_DATE		TEXT_ID	SAMPLE_NUMBER	NAME	FORMATTED_ENTRY	DISPLAY_STRING	REPORTED_NAME	ANALYSIS
22-023	29.03.22	DS_1	O-7325	121733	Konduktivitet	100	mS/cm	Intern metode, elektrode	KOND_L
22-023	29.03.22	DS_1	O-7325	121733	pH	7,8	-	NS-EN ISO 10523	PH_L
22-023	29.03.22	DS_1	O-7325	121733	Al	<20	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	As	1,3	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Ba	295	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Cd	2,9	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Co	2,4	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Cr	<3	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Cu	<4	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Fe	69,1	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Mn	400	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Mo	89,9	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Ni	521	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Pb	2,1	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Sb	12,2	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Se	6,1	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Sn	<10	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Tl	0,6	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	U	714	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	V	5,4	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_1	O-7325	121733	Zn	31,7	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4

DS_2

X_REFERANSENR	SAMPLED_DATE		TEXT_ID	SAMPLE_NUMBER	NAME	FORMATTED_ENTRY	DISPLAY_STRING	REPORTED_NAME	ANALYSIS
22-023	29.03.22	DS_2	O-7326	121734	Konduktivitet	61	mS/cm	Intern metode, elektrode	KOND_L
22-023	29.03.22	DS_2	O-7326	121734	pH	8	-	NS-EN ISO 10523	PH_L
22-023	29.03.22	DS_2	O-7326	121734	Al	<20	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	As	1	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Ba	219	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Cd	1,2	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Co	1,8	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Cr	<3	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Cu	<4	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Fe	17,4	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Mn	209	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Mo	82,3	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Ni	360	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Pb	1,1	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Sb	14,4	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Se	<6	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Sn	<10	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Tl	0,3	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	U	663	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	V	<5	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DS_2	O-7326	121734	Zn	21,3	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Konduktivitet	0,97	mS/cm	Intern metode, elektrode	KOND_L

DF_1

X_REFERANSENR	SAMPLED_DATE		TEXT_ID	SAMPLE_NUMBER	NAME	FORMATTED_ENTRY	DISPLAY_STRING	REPORTED_NAME	ANALYSIS
22-023	29.03.22	DF_1	O-7327	121735	pH	8	-	NS-EN ISO 10523	PH_L
22-023	29.03.22	DF_1	O-7327	121735	Al	<20	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	As	0,5	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Ba	21,2	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Cd	0,4	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Co	1,2	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Cr	<3	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Cu	<4	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Fe	162	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Mn	223	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Mo	17,4	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Ni	156	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Pb	0,4	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Sb	<1	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Se	<6	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Sn	<10	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Tl	0,1	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	U	107	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	V	<5	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_1	O-7327	121735	Zn	23,1	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4

DF_2

X_REFERANSENR	SAMPLED_DATE		TEXT_ID	SAMPLE_NUMBER	NAME	FORMATTED_ENTRY	DISPLAY_STRING	REPORTED_NAME	ANALYSIS
22-023	29.03.22	DF_2	O-7328	121736	Konduktivitet	0,62	mS/cm	Intern metode, elektrode	KOND_L
22-023	29.03.22	DF_2	O-7328	121736	pH	8,1	-	NS-EN ISO 10523	PH_L
22-023	29.03.22	DF_2	O-7328	121736	Al	<20	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	As	<0,5	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Ba	32,4	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Cd	0,6	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Co	0,6	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Cr	<3	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Cu	<4	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Fe	24,4	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Mn	151	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Mo	26,7	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Ni	130	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Pb	0,7	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Sb	1,9	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Se	<6	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Sn	<10	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Tl	0,1	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	U	164	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	V	<5	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4
22-023	29.03.22	DF_2	O-7328	121736	Zn	36,7	µg/L	NS-EN ISO 17294-2 (ICP-MS)	MET_ICP-MS_HMI4

Dette analysesertifikatet erstatter tidligere sertifikat med samme nummer

ANALYSERAPPORT

Ordrenummer	: **NO2219273**	Side	: 1 av 31
Endring	: **2**		
Kunde	: **NGI**	Prosjekt	: SP Under Oslo WP1
Kontakt	: Arne Pettersen	Prosjektnummer	: 20200436
Adresse	: Boks 3930 Ullevål Stadion 806 Oslo Norge	Prøvetaker	: ----
		Sted	: ----
		Dato prøvemottak	: 2022-09-27 07:25
Epost	: ap@ngi.no	Analysedato	: 2022-09-27
Telefon	: 22023117	Dokumentdato	: 2023-07-13 15:48
COC nummer	: ----	Antall prøver mottatt	: 30
Tilbuds- nummer	: OF220658	Antall prøver til analyse	: 30

Om rapporten

Forklaring til resultatene er gitt på slutten av rapporten.
Denne rapporten erstatter enhver foreløpig rapport med denne referansen. Resultater gjelder innleverte prøver slik de var ved innleveringstidspunktet. Alle sider på rapporten har blitt kontrollert og godkjent før utsendelse.

Denne rapporten får kun gjengis i sin helhet, om ikke utførende laboratorium på forhånd har skriftlig godkjent annet. Resultater gjelder bare de analyserte prøvene.

Hvis prøvetakingstidspunktet ikke er angitt, prøvetakingstidspunktet vil bli default 00:00 på prøvetakingsdatoen. Hvis datoen ikke er angitt, blir default dato satt til dato for prøvemottak angitt i klammer uten tidspunkt.

Kommentarer

Tidssensitive parametere analyseres uakkreditert da tiden fra prøvetaking overstiger analysens krav
Ny rapport grunnet original feilkalkulering av NO3-verdi. Merk at verdien av NO3-nitrogen er den samme.

Underskrivere	*Posisjon*
Torgeir Rødsand	DAGLIG LEDER

NORSK AKKREDITERING TEST 125

Analyseresultater

Submatriks: **ELUAT**

			Kundes prøvenavn	**VAS_1**				
			Prøvenummer lab	*NO2219273001*				
			Kundes prøvetakingsdato	*2022-09-22 00:00*				
Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Anioner								
Klorid (Cl-)	**3**	± 0.30	mg/L	1	2022-09-27	W-CL-DA	NO	a
Fluorid (F-)	**0.90**	± 0.14	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**2200**	± 330.00	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**290**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	**0.93**	± 0.14	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**7.4**	± 0.20	-	0.1	2022-09-27	W-PH-PCT	NO	a
Temperatur	**21**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	**11**	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat-N (NO3-N)	<0.006	----	mg/L	0.006	2022-09-27	W-NO3N-DA-CALC	NO	*
Nitrat som NO3	<0.027	----	mg/L	0.027	2022-09-27	W-NO3N-DA-CALC	NO	*
Fosfat-P	<0.0040	----	mg/L	0.0040	2022-09-28	W-PO4-FIA	NO	*
Fosfat (PO4)	<0.0120	----	mg/L	0.0120	2022-09-28	W-PO4-FIA	NO	*
Andre analyser								
Redokspotensial	**330**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**11**	± 1.53	mg/L	0.10	2022-09-27	W-TOC-IR	NO	a

Submatriks: **ELUAT**

	Kundes prøvenavn	VAS_2						
	Prøvenummer lab	NO2219273002						
	Kundes prøvetakingsdato	2022-09-22 00:00						
Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Anioner								
Klorid (Cl-)	**2**	± 0.30	mg/L	1	2022-09-27	W-CL-DA	NO	a
Fluorid (F-)	**1.3**	± 0.20	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**2300**	± 345.00	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**304**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	**0.77**	± 0.12	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**7.5**	----	-	0.1	2022-09-27	W-PH-PCT	NO	*
Temperatur	**20**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	**15**	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat-N (NO3-N)	<0.006	----	mg/L	0.006	2022-09-27	W-NO3N-DA-CALC	NO	*
Nitrat som NO3	<0.027	----	mg/L	0.027	2022-09-27	W-NO3N-DA-CALC	NO	*
Fosfat-P	<0.0040	----	mg/L	0.0040	2022-09-28	W-PO4-FIA	NO	*
Fosfat (PO4)	<0.0120	----	mg/L	0.0120	2022-09-28	W-PO4-FIA	NO	*
Andre analyser								
Redokspotensial	**321**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**4.9**	± 0.69	mg/L	0.10	2022-09-27	W-TOC-IR	NO	a

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Submatriks: **ELUAT**

				Kundes prøvenavn	B5_1			
				Prøvenummer lab	NO2219273003			
				Kundes prøvetakingsdato	2022-09-22 00:00			
Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Anioner								
Klorid (Cl-)	**11**	± 1.00	mg/L	1	2022-09-27	W-CL-DA	NO	a
Fluorid (F-)	**5.7**	± 0.86	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**600**	± 90.00	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**115**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	**0.16**	± 0.05	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**7.6**	----	-	0.1	2022-09-27	W-PH-PCT	NO	*
Temperatur	**20**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	**8.0**	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat-N (NO3-N)	**3.14**	----	mg/L	0.006	2022-09-27	W-NO3N-DA-CALC	NO	*
Nitrat som NO3	**13.9**	----	mg/L	0.027	2022-09-27	W-NO3N-DA-CALC	NO	*
Fosfat-P	<0.0040	----	mg/L	0.0040	2022-09-28	W-PO4-FIA	NO	*
Fosfat (PO4)	<0.0120	----	mg/L	0.0120	2022-09-28	W-PO4-FIA	NO	*
Andre analyser								
Redokspotensial	**330**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**4.0**	± 0.56	mg/L	0.10	2022-09-27	W-TOC-IR	NO	a

Submatriks: **ELUAT**

	Kundes prøvenavn	**B5_2**
	Prøvenummer lab	*NO2219273004*
	Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Anioner								
Klorid (Cl-)	**12**	± 1.00	mg/L	1	2022-09-27	W-CL-DA	NO	a
Fluorid (F-)	**8.0**	± 1.20	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**520**	± 78.00	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**110**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	**0.82**	± 0.12	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**7.6**	----	-	0.1	2022-09-27	W-PH-PCT	NO	*
Temperatur	**21**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	**26**	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat-N (NO3-N)	**5.01**	----	mg/L	0.006	2022-09-27	W-NO3N-DA-CALC	NO	*
Nitrat som NO3	**22.2**	----	mg/L	0.027	2022-09-27	W-NO3N-DA-CALC	NO	*
Fosfat-P	<0.0040	----	mg/L	0.0040	2022-09-28	W-PO4-FIA	NO	*
Fosfat (PO4)	<0.0120	----	mg/L	0.0120	2022-09-28	W-PO4-FIA	NO	*
Andre analyser								
Redokspotensial	**341**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**5.4**	± 0.77	mg/L	0.10	2022-09-27	W-TOC-IR	NO	a

Submatriks: **ELUAT**

Kundes prøvenavn	**B10_1**
Prøvenummer lab	*NO2219273005*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Anioner								
Klorid (Cl-)	**7**	± 0.70	mg/L	1	2022-09-27	W-CL-DA	NO	a
Fluorid (F-)	**2.9**	± 0.44	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**1100**	± 165.00	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**175**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	**0.37**	± 0.06	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**7.0**	----	-	0.1	2022-09-27	W-PH-PCT	NO	*
Temperatur	**22**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	**14**	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat-N (NO3-N)	**1.35**	----	mg/L	0.006	2022-09-27	W-NO3N-DA-CALC	NO	*
Nitrat som NO3	**5.97**	----	mg/L	0.027	2022-09-27	W-NO3N-DA-CALC	NO	*
Fosfat-P	<0.0040	----	mg/L	0.0040	2022-09-28	W-PO4-FIA	NO	*
Fosfat (PO4)	<0.0120	----	mg/L	0.0120	2022-09-28	W-PO4-FIA	NO	*
Andre analyser								
Redokspotensial	**341**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**9.7**	± 1.36	mg/L	0.10	2022-09-27	W-TOC-IR	NO	a

Submatriks: **ELUAT**

	Kundes prøvenavn	B10_2
	Prøvenummer lab	NO2219273006
	Kundes prøvetakingsdato	2022-09-22 00:00

Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Anioner								
Klorid (Cl-)	**8**	± 0.80	mg/L	1	2022-09-27	W-CL-DA	NO	a
Fluorid (F-)	**4.1**	± 0.62	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**650**	± 97.50	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**129**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	**0.54**	± 0.08	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**7.0**	----	-	0.1	2022-09-27	W-PH-PCT	NO	*
Temperatur	**21**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	<5	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat-N (NO3-N)	**1.77**	----	mg/L	0.006	2022-09-27	W-NO3N-DA-CALC	NO	*
Nitrat som NO3	**7.84**	----	mg/L	0.027	2022-09-27	W-NO3N-DA-CALC	NO	*
Fosfat-P	**0.0065**	----	mg/L	0.0040	2022-09-28	W-PO4-FIA	NO	*
Fosfat (PO4)	**0.019**	----	mg/L	0.0120	2022-09-28	W-PO4-FIA	NO	*
Andre analyser								
Redokspotensial	**331**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**16**	± 2.28	mg/L	0.10	2022-09-27	W-TOC-IR	NO	a

Submatriks: **ELUAT**

	Kundes prøvenavn	B20_1
	Prøvenummer lab	NO2219273007
	Kundes prøvetakingsdato	2022-09-22 00:00

Parameter	Resultat	MU	Enhet	LOR	Analysedato	Metode	Utf. lab	Acc.Key
Anioner								
Klorid (Cl-)	**7**	± 0.70	mg/L	1	2022-09-27	W-CL-DA	NO	a
Fluorid (F-)	**1.8**	± 0.27	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**1500**	± 225.00	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**213**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	**0.56**	± 0.08	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**7.2**	----	-	0.1	2022-09-27	W-PH-PCT	NO	*
Temperatur	**21**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	**6.0**	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat-N (NO3-N)	**0.542**	----	mg/L	0.006	2022-09-27	W-NO3N-DA-CALC	NO	*
Nitrat som NO3	**2.40**	----	mg/L	0.027	2022-09-27	W-NO3N-DA-CALC	NO	*
Fosfat-P	**0.0052**	----	mg/L	0.0040	2022-09-28	W-PO4-FIA	NO	*
Fosfat (PO4)	**0.016**	----	mg/L	0.0120	2022-09-28	W-PO4-FIA	NO	*
Andre analyser								
Redokspotensial	**331**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**9.4**	± 1.33	mg/L	0.10	2022-09-27	W-TOC-IR	NO	a

Submatriks: **ELUAT**

				Kundes prøvenavn	**B20_2**			
				Prøvenummer lab	*NO2219273008*			
				Kundes prøvetakingsdato	*2022-09-22 00:00*			
Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Anioner								
Klorid (Cl-)	**7**	± 0.70	mg/L	1	2022-09-27	W-CL-DA	NO	a
Fluorid (F-)	**1.9**	± 0.29	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**1400**	± 210.00	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**203**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	**0.67**	± 0.10	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**7.4**	----	-	0.1	2022-09-27	W-PH-PCT	NO	*
Temperatur	**21**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	<5	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat-N (NO3-N)	**0.844**	----	mg/L	0.006	2022-09-27	W-NO3N-DA-CALC	NO	*
Nitrat som NO3	**3.74**	----	mg/L	0.027	2022-09-27	W-NO3N-DA-CALC	NO	*
Fosfat-P	**0.0047**	----	mg/L	0.0040	2022-09-28	W-PO4-FIA	NO	*
Fosfat (PO4)	**0.014**	----	mg/L	0.0120	2022-09-28	W-PO4-FIA	NO	*
Andre analyser								
Redokspotensial	**331**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**5.5**	± 0.78	mg/L	0.10	2022-09-27	W-TOC-IR	NO	a

Submatriks: **ELUAT**

			Kundes prøvenavn	**RM_1**				
			Prøvenummer lab	*NO2219273009*				
			Kundes prøvetakingsdato	*2022-09-22 00:00*				
Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Anioner								
Klorid (Cl-)	**10**	± 1.00	mg/L	1	2022-09-27	W-CL-DA	NO	a
Fluorid (F-)	**10**	± 1.50	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**56**	± 8.40	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**34.3**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	**1.0**	± 0.15	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**7.7**	----	-	0.1	2022-09-27	W-PH-PCT	NO	*
Temperatur	**21**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	**7.0**	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat-N (NO3-N)	**7.01**	----	mg/L	0.006	2022-09-27	W-NO3N-DA-CALC	NO	*
Nitrat som NO3	**31.0**	----	mg/L	0.027	2022-09-27	W-NO3N-DA-CALC	NO	*
Fosfat-P	**0.0075**	----	mg/L	0.0040	2022-09-28	W-PO4-FIA	NO	*
Fosfat (PO4)	**0.022**	----	mg/L	0.0120	2022-09-28	W-PO4-FIA	NO	*
Andre analyser								
Redokspotensial	**307**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**13**	± 1.84	mg/L	0.10	2022-09-27	W-TOC-IR	NO	a

Submatriks: **ELUAT**

Kundes prøvenavn	**RM_2**
Prøvenummer lab	*NO2219273010*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	Resultat	MU	Enhet	LOR	Analysedato	Metode	Utf. lab	Acc.Key
Anioner								
Klorid (Cl-)	**10**	± 0.90	mg/L	1	2022-09-27	W-CL-DA	NO	a
Fluorid (F-)	**9.7**	± 1.46	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**36**	± 5.40	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**31.5**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	**1.2**	± 0.18	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**7.7**	----	-	0.1	2022-09-27	W-PH-PCT	NO	*
Temperatur	**21**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	**5.0**	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat-N (NO3-N)	**5.48**	----	mg/L	0.006	2022-09-27	W-NO3N-DA-CALC	NO	*
Nitrat som NO3	**24.3**	----	mg/L	0.027	2022-09-27	W-NO3N-DA-CALC	NO	*
Fosfat-P	**0.0049**	----	mg/L	0.0040	2022-09-28	W-PO4-FIA	NO	*
Fosfat (PO4)	**0.015**	----	mg/L	0.0120	2022-09-28	W-PO4-FIA	NO	*
Andre analyser								
Redokspotensial	**305**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**15**	± 2.09	mg/L	0.10	2022-09-27	W-TOC-IR	NO	a

Submatriks: **SJØVANN**

Kundes prøvenavn	**DS_1**
Prøvenummer lab	*NO2219273011*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	Resultat	MU	Enhet	LOR	Analysedato	Metode	Utf. lab	Acc.Key
Anioner								
Klorid (Cl-)	**30000**	± 4500.00	mg/L	0.5	2022-09-29	W-CL (7125.10)	DK	a ulev
Fluorid (F-)	**0.26**	± 0.10	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**370**	± 55.50	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**7380**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	**1.7**	± 0.26	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**7.7**	----	-	0.1	2022-09-27	W-PH-PCT	NO	*
Temperatur	**23**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	**76**	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat	**0.24**	± 0.04	mg/L	0.01	2022-09-27	W-NO3-SW-mg/L (6092.09)	DK	a ulev
Fosfat (ortofosfat)	**11**	± 30.00	µg/L	3	2022-10-10	W-PO43-µg/L (6613.40)	DK	a ulev
Andre analyser								
Redokspotensial	**311**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**5.5**	----	mg/L	0.10	2022-09-27	W-TOC-IR	NO	*

Submatriks: **SJØVANN**

Kundes prøvenavn	**DS_2**
Prøvenummer lab	*NO2219273012*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	Resultat	MU	Enhet	LOR	Analysedato	Metode	Utf. lab	Acc.Key
Anioner								
Klorid (Cl-)	**25000**	± 3750.00	mg/L	0.5	2022-09-30	W-CL (7125.10)	DK	a ulev
Fluorid (F-)	**0.26**	± 0.10	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**290**	± 43.50	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**6060**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	**2.3**	± 0.35	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**7.9**	----	-	0.1	2022-09-27	W-PH-PCT	NO	*
Temperatur	**22**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	**32**	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat	**0.17**	± 0.04	mg/L	0.01	2022-09-27	W-NO3-SW-mg/L (6092.09)	DK	a ulev
Fosfat (ortofosfat)	<2.0	----	µg/L	3	2022-10-10	W-PO43-µg/L (6613.40)	DK	a ulev
Andre analyser								
Redokspotensial	**306**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**5.0**	----	mg/L	0.10	2022-09-27	W-TOC-IR	NO	*

Submatriks: **ELUAT**

Kundes prøvenavn	**DF_1**
Prøvenummer lab	*NO2219273013*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	Resultat	MU	Enhet	LOR	Analysedato	Metode	Utf. lab	Acc.Key
Anioner								
Klorid (Cl-)	**20**	± 2.00	mg/L	1	2022-09-27	W-CL-DA	NO	a
Fluorid (F-)	**0.27**	± 0.10	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**530**	± 79.50	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**116**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	**2.1**	± 0.32	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**8.0**	----	-	0.1	2022-09-27	W-PH-PCT	NO	*
Temperatur	**22**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	<5	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat-N (NO3-N)	**0.006**	----	mg/L	0.006	2022-09-27	W-NO3N-DA-CALC	NO	*
Nitrat som NO3	**0.028**	----	mg/L	0.027	2022-09-27	W-NO3N-DA-CALC	NO	*
Fosfat-P	**0.0049**	----	mg/L	0.0040	2022-09-28	W-PO4-FIA	NO	*
Fosfat (PO4)	**0.015**	----	mg/L	0.0120	2022-09-28	W-PO4-FIA	NO	*
Andre analyser								
Redokspotensial	**341**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**3.0**	± 0.42	mg/L	0.10	2022-09-27	W-TOC-IR	NO	a

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Submatriks: **ELUAT**

	Kundes prøvenavn	DF_2
	Prøvenummer lab	NO2219273014
	Kundes prøvetakingsdato	2022-09-22 00:00

Parameter	Resultat	MU	Enhet	LOR	Analysedato	Metode	Utf. lab	Acc.Key
Anioner								
Klorid (Cl-)	**16**	± 2.00	mg/L	1	2022-09-27	W-CL-DA	NO	a
Fluorid (F-)	**0.16**	± 0.10	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**290**	± 43.50	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**68.3**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	**1.7**	± 0.26	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**8.1**	----	-	0.1	2022-09-27	W-PH-PCT	NO	*
Temperatur	**22**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	<5	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat-N (NO3-N)	<0.006	----	mg/L	0.006	2022-09-27	W-NO3N-DA-CALC	NO	*
Nitrat som NO3	<0.027	----	mg/L	0.027	2022-09-27	W-NO3N-DA-CALC	NO	*
Fosfat-P	**0.0047**	----	mg/L	0.0040	2022-09-28	W-PO4-FIA	NO	*
Fosfat (PO4)	**0.014**	----	mg/L	0.0120	2022-09-28	W-PO4-FIA	NO	*
Andre analyser								
Redokspotensial	**340**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**2.8**	± 0.40	mg/L	0.10	2022-09-27	W-TOC-IR	NO	a

Submatriks: **ELUAT**

	Kundes prøvenavn	A1
	Prøvenummer lab	NO2219273015
	Kundes prøvetakingsdato	2022-09-22 00:00

Parameter	Resultat	MU	Enhet	LOR	Analysedato	Metode	Utf. lab	Acc.Key
Anioner								
Klorid (Cl-)	**2**	± 0.30	mg/L	1	2022-09-27	W-CL-DA	NO	a
Fluorid (F-)	**0.58**	± 0.10	mg/L	0.03	2022-09-27	W-F (6110.00)	DK	a ulev
Sulfat (SO4)	**1700**	± 255.00	mg/L	0.5	2022-09-29	W-SO4 (6211.10)	DK	a ulev
Fysikalsk								
Ledningsevne (konduktivitet)	**239**	----	mS/m	0.100	2022-09-27	W-CON-PCT	NO	*
Alkalinitet pH 4.5	<0.050	----	mmol/L	0.05	2022-09-29	W-ALKAL (7150.30)	DK	a ulev
pH-verdi	**4.5**	----	-	0.1	2022-09-27	W-PH-PCT	NO	*
Temperatur	**21**	----	°C	1	2022-09-27	W-PH-PCT	NO	*
Suspendert stoff	**14**	----	mg/L	5	2022-09-27	W-TSS-GR	NO	*
Næringsstoffer								
Nitrat-N (NO3-N)	**0.028**	----	mg/L	0.006	2022-09-27	W-NO3N-DA-CALC	NO	*
Nitrat som NO3	**0.126**	----	mg/L	0.027	2022-09-27	W-NO3N-DA-CALC	NO	*
Fosfat-P	**0.018**	----	mg/L	0.0040	2022-09-28	W-PO4-FIA	NO	*
Fosfat (PO4)	**0.055**	----	mg/L	0.0120	2022-09-28	W-PO4-FIA	NO	*
Andre analyser								
Redokspotensial	**470**	----	mV	-	2022-10-04	W-REDOKSPOT-GBA	GB	a ulev
Totalt organisk karbon (TOC)	**1.9**	± 0.27	mg/L	0.10	2022-09-27	W-TOC-IR	NO	a

Submatriks: **ELUAT**

Kundes prøvenavn	**VAS_1**
Prøvenummer lab	*NO2219273016*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Prøve pre-preparering								
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*
Oppløste elementer/metaller								
U (Uran)	**85.4**	± 8.50	µg/L	0.001	2022-09-30	W-SFMS-5D	LE	a ulev
Th (Thorium)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D-5%	LE	a ulev
S (Svovel)	**751**	± 75.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Al (Aluminium)	**45.3**	± 7.10	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev
As (Arsen)	**0.739**	± 0.14	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Ba (Barium)	**14.9**	± 1.50	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Ca (Kalsium)	**545**	± 55.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Cd (Kadmium)	**27.4**	± 2.70	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Co (Kobolt)	**21.0**	± 2.10	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Cr (Krom)	<0.5	----	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Cu (Kopper)	**1.33**	± 0.23	µg/L	1.0	2022-09-30	W-SFMS-5D	LE	a ulev
Fe (Jern)	<0.004	----	mg/L	0.0040	2022-09-30	W-SFMS-5D	LE	a ulev
Hg (Kvikksølv)	<0.02	----	µg/L	0.02	2022-09-30	W-AFS-17V3a	LE	a ulev
K (Kalium)	**20.5**	± 2.10	mg/L	0.5	2022-09-30	W-AES-1B	LE	a ulev
Mg (Magnesium)	**183**	± 18.00	mg/L	0.09	2022-09-30	W-AES-1B	LE	a ulev
Mn (Mangan)	**510**	± 51.00	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Mo (Molybden)	**128**	± 13.00	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Na (Natrium)	**30.9**	± 3.10	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Ni (Nikkel)	**1260**	± 126.00	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Pb (Bly)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
V (Vanadium)	**0.231**	± 0.04	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Zn (Sink)	**1100**	± 110.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev

Submatriks: **ELUAT**

Kundes prøvenavn	**VAS_2**
Prøvenummer lab	*NO2219273017*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Prøve pre-preparering								
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*
Oppløste elementer/metaller								
U (Uran)	**105**	± 11.00	µg/L	0.001	2022-09-30	W-SFMS-5D	LE	a ulev
Th (Thorium)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D-5%	LE	a ulev
S (Svovel)	**820**	± 82.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Al (Aluminium)	**25.2**	± 6.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev
As (Arsen)	**1.03**	± 0.15	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Ba (Barium)	**16.8**	± 1.70	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Ca (Kalsium)	**592**	± 59.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Cd (Kadmium)	**54.6**	± 5.50	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Co (Kobolt)	**52.6**	± 5.30	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Cr (Krom)	<0.5	----	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Cu (Kopper)	**1.48**	± 0.24	µg/L	1.0	2022-09-30	W-SFMS-5D	LE	a ulev
Fe (Jern)	**0.00917**	± 0.00459	mg/L	0.0040	2022-09-30	W-SFMS-5D	LE	a ulev
Hg (Kvikksølv)	<0.02	----	µg/L	0.02	2022-09-30	W-AFS-17V3a	LE	a ulev
K (Kalium)	**27.7**	± 2.80	mg/L	0.5	2022-09-30	W-AES-1B	LE	a ulev
Mg (Magnesium)	**196**	± 20.00	mg/L	0.09	2022-09-30	W-AES-1B	LE	a ulev
Mn (Mangan)	**463**	± 46.00	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Mo (Molybden)	**69.6**	± 7.00	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Na (Natrium)	**25.4**	± 2.50	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Ni (Nikkel)	**2160**	± 216.00	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Pb (Bly)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
V (Vanadium)	**0.0579**	± 0.03	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Zn (Sink)	**1520**	± 152.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev

Submatriks: **ELUAT**

Kundes prøvenavn	**B5_1**
Prøvenummer lab	*NO2219273018*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Prøve pre-preparering								
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*
Oppløste elementer/metaller								
U (Uran)	**46.0**	± 4.60	µg/L	0.001	2022-09-30	W-SFMS-5D	LE	a ulev
Th (Thorium)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D-5%	LE	a ulev
S (Svovel)	**215**	± 22.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Al (Aluminium)	**97.9**	± 11.20	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev
As (Arsen)	**1.45**	± 0.19	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Ba (Barium)	**42.4**	± 4.20	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Ca (Kalsium)	**245**	± 25.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Cd (Kadmium)	**1.34**	± 0.14	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Co (Kobolt)	**1.01**	± 0.14	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Cr (Krom)	<0.5	----	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Cu (Kopper)	**1.84**	± 0.26	µg/L	1.0	2022-09-30	W-SFMS-5D	LE	a ulev
Fe (Jern)	<0.004	----	mg/L	0.0040	2022-09-30	W-SFMS-5D	LE	a ulev
Hg (Kvikksølv)	<0.02	----	µg/L	0.02	2022-09-30	W-AFS-17V3a	LE	a ulev
K (Kalium)	**5.62**	± 0.56	mg/L	0.5	2022-09-30	W-AES-1B	LE	a ulev
Mg (Magnesium)	**15.1**	± 1.50	mg/L	0.09	2022-09-30	W-AES-1B	LE	a ulev
Mn (Mangan)	**12.6**	± 1.40	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Mo (Molybden)	**88.7**	± 8.90	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Na (Natrium)	**26.0**	± 2.60	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Ni (Nikkel)	**52.2**	± 5.20	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Pb (Bly)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
V (Vanadium)	**0.600**	± 0.07	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Zn (Sink)	**17.4**	± 2.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev

Submatriks: **ELUAT**

Kundes prøvenavn	**B5_2**
Prøvenummer lab	*NO2219273019*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Prøve pre-preparering								
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*
Oppløste elementer/metaller								
U (Uran)	**52.7**	± 5.30	µg/L	0.001	2022-09-30	W-SFMS-5D	LE	a ulev
Th (Thorium)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D-5%	LE	a ulev
S (Svovel)	**190**	± 19.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Al (Aluminium)	**142**	± 15.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev
As (Arsen)	**1.89**	± 0.22	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Ba (Barium)	**33.8**	± 3.40	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Ca (Kalsium)	**221**	± 22.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Cd (Kadmium)	**6.97**	± 0.70	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Co (Kobolt)	**4.97**	± 0.51	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Cr (Krom)	<0.5	----	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Cu (Kopper)	**3.55**	± 0.40	µg/L	1.0	2022-09-30	W-SFMS-5D	LE	a ulev
Fe (Jern)	**0.00760**	± 0.00456	mg/L	0.0040	2022-09-30	W-SFMS-5D	LE	a ulev
Hg (Kvikksølv)	<0.02	----	µg/L	0.02	2022-09-30	W-AFS-17V3a	LE	a ulev
K (Kalium)	**5.47**	± 0.55	mg/L	0.5	2022-09-30	W-AES-1B	LE	a ulev
Mg (Magnesium)	**13.5**	± 1.40	mg/L	0.09	2022-09-30	W-AES-1B	LE	a ulev
Mn (Mangan)	**122**	± 12.00	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Mo (Molybden)	**90.8**	± 9.10	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Na (Natrium)	**27.6**	± 2.80	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Ni (Nikkel)	**165**	± 17.00	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Pb (Bly)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
V (Vanadium)	**0.447**	± 0.06	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Zn (Sink)	**126**	± 13.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev

Submatriks: **ELUAT**

Kundes prøvenavn	**B10_1**
Prøvenummer lab	*NO2219273020*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Prøve pre-preparering								
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*
Oppløste elementer/metaller								
U (Uran)	**185**	± 19.00	µg/L	0.001	2022-09-30	W-SFMS-5D	LE	a ulev
Th (Thorium)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D-5%	LE	a ulev
S (Svovel)	**392**	± 39.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Al (Aluminium)	**86.2**	± 10.20	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev
As (Arsen)	**0.671**	± 0.13	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Ba (Barium)	**30.3**	± 3.00	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Ca (Kalsium)	**391**	± 39.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Cd (Kadmium)	**179**	± 18.00	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Co (Kobolt)	**150**	± 15.00	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Cr (Krom)	<0.5	----	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Cu (Kopper)	**45.7**	± 4.60	µg/L	1.0	2022-09-30	W-SFMS-5D	LE	a ulev
Fe (Jern)	<0.004	----	mg/L	0.0040	2022-09-30	W-SFMS-5D	LE	a ulev
Hg (Kvikksølv)	<0.02	----	µg/L	0.02	2022-09-30	W-AFS-17V3a	LE	a ulev
K (Kalium)	**8.94**	± 0.89	mg/L	0.5	2022-09-30	W-AES-1B	LE	a ulev
Mg (Magnesium)	**35.4**	± 3.50	mg/L	0.09	2022-09-30	W-AES-1B	LE	a ulev
Mn (Mangan)	**2860**	± 286.00	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Mo (Molybden)	**31.0**	± 3.10	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Na (Natrium)	**27.1**	± 2.70	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Ni (Nikkel)	**3460**	± 346.00	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Pb (Bly)	**0.338**	± 0.09	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
V (Vanadium)	**0.0884**	± 0.03	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Zn (Sink)	**5480**	± 548.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev

Submatriks: **ELUAT**

	Kundes prøvenavn	B10_2
	Prøvenummer lab	NO2219273021
	Kundes prøvetakingsdato	2022-09-22 00:00

Parameter	Resultat	MU	Enhet	LOR	Analysedato	Metode	Utf. lab	Acc.Key
Prøve pre-preparering								
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*
Oppløste elementer/metaller								
U (Uran)	**63.2**	± 6.30	µg/L	0.001	2022-09-30	W-SFMS-5D	LE	a ulev
Th (Thorium)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D-5%	LE	a ulev
S (Svovel)	**262**	± 26.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Al (Aluminium)	**233**	± 24.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev
As (Arsen)	**0.687**	± 0.13	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Ba (Barium)	**24.5**	± 2.50	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Ca (Kalsium)	**280**	± 28.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Cd (Kadmium)	**39.4**	± 3.90	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Co (Kobolt)	**30.0**	± 3.00	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Cr (Krom)	<0.5	----	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Cu (Kopper)	**5.88**	± 0.62	µg/L	1.0	2022-09-30	W-SFMS-5D	LE	a ulev
Fe (Jern)	**0.0249**	± 0.0051	mg/L	0.0040	2022-09-30	W-SFMS-5D	LE	a ulev
Hg (Kvikksølv)	<0.02	----	µg/L	0.02	2022-09-30	W-AFS-17V3a	LE	a ulev
K (Kalium)	**6.46**	± 0.65	mg/L	0.5	2022-09-30	W-AES-1B	LE	a ulev
Mg (Magnesium)	**21.8**	± 2.20	mg/L	0.09	2022-09-30	W-AES-1B	LE	a ulev
Mn (Mangan)	**686**	± 69.00	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Mo (Molybden)	**31.1**	± 3.10	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Na (Natrium)	**23.7**	± 2.40	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Ni (Nikkel)	**1130**	± 113.00	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Pb (Bly)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
V (Vanadium)	<0.05	----	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Zn (Sink)	**1100**	± 110.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev

Submatriks: **ELUAT**

			Kundes prøvenavn	**B20_1**				
			Prøvenummer lab	*NO2219273022*				
			Kundes prøvetakingsdato	*2022-09-22 00:00*				
Parameter	**Resultat**	*MU*	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Prøve pre-preparering								
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*
Oppløste elementer/metaller								
U (Uran)	**139**	± 14.00	µg/L	0.001	2022-09-30	W-SFMS-5D	LE	a ulev
Th (Thorium)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D-5%	LE	a ulev
S (Svovel)	**537**	± 54.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Al (Aluminium)	**39.0**	± 6.70	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev
As (Arsen)	<0.5	----	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Ba (Barium)	**23.0**	± 2.30	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Ca (Kalsium)	**509**	± 51.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Cd (Kadmium)	**90.8**	± 9.10	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Co (Kobolt)	**53.5**	± 5.40	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Cr (Krom)	<0.5	----	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Cu (Kopper)	**6.35**	± 0.66	µg/L	1.0	2022-09-30	W-SFMS-5D	LE	a ulev
Fe (Jern)	**0.0198**	± 0.0049	mg/L	0.0040	2022-09-30	W-SFMS-5D	LE	a ulev
Hg (Kvikksølv)	<0.02	----	µg/L	0.02	2022-09-30	W-AFS-17V3a	LE	a ulev
K (Kalium)	**12.5**	± 1.30	mg/L	0.5	2022-09-30	W-AES-1B	LE	a ulev
Mg (Magnesium)	**61.2**	± 6.10	mg/L	0.09	2022-09-30	W-AES-1B	LE	a ulev
Mn (Mangan)	**866**	± 87.00	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Mo (Molybden)	**78.2**	± 7.80	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Na (Natrium)	**18.2**	± 1.80	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Ni (Nikkel)	**1800**	± 180.00	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Pb (Bly)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
V (Vanadium)	**0.0679**	± 0.03	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Zn (Sink)	**2540**	± 254.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev

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Ordrenummer	: NO2219273 Endring 2
Kunde	: NGI

Submatriks: **ELUAT**

Kundes prøvenavn	**B20_2**
Prøvenummer lab	*NO2219273023*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	**Resultat**	*MU*	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Prøve pre-preparering								
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*
Oppløste elementer/metaller								
U (Uran)	**80.5**	± 8.10	µg/L	0.001	2022-09-30	W-SFMS-5D	LE	a ulev
Th (Thorium)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D-5%	LE	a ulev
S (Svovel)	**487**	± 49.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Al (Aluminium)	**25.9**	± 6.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev
As (Arsen)	<0.5	----	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Ba (Barium)	**25.7**	± 2.60	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Ca (Kalsium)	**478**	± 48.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Cd (Kadmium)	**42.8**	± 4.30	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Co (Kobolt)	**39.9**	± 4.00	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Cr (Krom)	<0.5	----	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Cu (Kopper)	**1.92**	± 0.26	µg/L	1.0	2022-09-30	W-SFMS-5D	LE	a ulev
Fe (Jern)	<0.004	----	mg/L	0.0040	2022-09-30	W-SFMS-5D	LE	a ulev
Hg (Kvikksølv)	<0.02	----	µg/L	0.02	2022-09-30	W-AFS-17V3a	LE	a ulev
K (Kalium)	**12.6**	± 1.30	mg/L	0.5	2022-09-30	W-AES-1B	LE	a ulev
Mg (Magnesium)	**56.8**	± 5.70	mg/L	0.09	2022-09-30	W-AES-1B	LE	a ulev
Mn (Mangan)	**647**	± 65.00	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Mo (Molybden)	**85.5**	± 8.60	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Na (Natrium)	**19.6**	± 2.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Ni (Nikkel)	**1470**	± 147.00	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Pb (Bly)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
V (Vanadium)	**0.0655**	± 0.03	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Zn (Sink)	**951**	± 95.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev

Submatriks: **ELUAT**

Kundes prøvenavn	**RM_1**
Prøvenummer lab	*NO2219273024*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Prøve pre-preparering								
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*
Oppløste elementer/metaller								
U (Uran)	**3.56**	± 0.36	µg/L	0.001	2022-09-30	W-SFMS-5D	LE	a ulev
Th (Thorium)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D-5%	LE	a ulev
S (Svovel)	**18.5**	± 1.90	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Al (Aluminium)	**120**	± 13.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev
As (Arsen)	**1.70**	± 0.21	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Ba (Barium)	**53.5**	± 5.40	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Ca (Kalsium)	**46.3**	± 4.60	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Cd (Kadmium)	<0.05	----	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Co (Kobolt)	**0.394**	± 0.11	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Cr (Krom)	**1.18**	± 0.19	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Cu (Kopper)	**1.83**	± 0.26	µg/L	1.0	2022-09-30	W-SFMS-5D	LE	a ulev
Fe (Jern)	**0.0191**	± 0.0049	mg/L	0.0040	2022-09-30	W-SFMS-5D	LE	a ulev
Hg (Kvikksølv)	<0.02	----	µg/L	0.02	2022-09-30	W-AFS-17V3a	LE	a ulev
K (Kalium)	**2.67**	± 0.27	mg/L	0.5	2022-09-30	W-AES-1B	LE	a ulev
Mg (Magnesium)	**3.36**	± 0.34	mg/L	0.09	2022-09-30	W-AES-1B	LE	a ulev
Mn (Mangan)	**1.95**	± 0.54	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Mo (Molybden)	**95.0**	± 9.50	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Na (Natrium)	**19.2**	± 1.90	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Ni (Nikkel)	**1.04**	± 0.32	µg/L	0.50	2022-10-04	W-SFMS-5D	LE	a ulev
Pb (Bly)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
V (Vanadium)	**0.576**	± 0.07	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Zn (Sink)	<2	----	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev

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Ordrenummer : NO2219273 Endring 2
Kunde : NGI

Submatriks: **ELUAT**

Kundes prøvenavn	**RM_2**
Prøvenummer lab	*NO2219273025*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Prøve pre-preparering								
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*
Oppløste elementer/metaller								
U (Uran)	**3.36**	± 0.34	µg/L	0.001	2022-09-30	W-SFMS-5D	LE	a ulev
Th (Thorium)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D-5%	LE	a ulev
S (Svovel)	**13.2**	± 1.30	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Al (Aluminium)	**103**	± 12.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev
As (Arsen)	**1.48**	± 0.19	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Ba (Barium)	**46.4**	± 4.60	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Ca (Kalsium)	**44.1**	± 4.40	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Cd (Kadmium)	<0.05	----	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Co (Kobolt)	**1.06**	± 0.15	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Cr (Krom)	**47.1**	± 4.70	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Cu (Kopper)	**4.63**	± 0.50	µg/L	1.0	2022-09-30	W-SFMS-5D	LE	a ulev
Fe (Jern)	**0.228**	± 0.02	mg/L	0.0040	2022-09-30	W-SFMS-5D	LE	a ulev
Hg (Kvikksølv)	<0.02	----	µg/L	0.02	2022-09-30	W-AFS-17V3a	LE	a ulev
K (Kalium)	**2.30**	± 0.23	mg/L	0.5	2022-09-30	W-AES-1B	LE	a ulev
Mg (Magnesium)	**3.07**	± 0.31	mg/L	0.09	2022-09-30	W-AES-1B	LE	a ulev
Mn (Mangan)	**4.78**	± 0.69	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Mo (Molybden)	**80.0**	± 8.00	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Na (Natrium)	**17.4**	± 1.70	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Ni (Nikkel)	**24.0**	± 2.40	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Pb (Bly)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
V (Vanadium)	**0.934**	± 0.10	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Zn (Sink)	<2	----	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev

Submatriks: **SJØVANN**					*Kundes prøvenavn*	**DS_1**			
					Prøvenummer lab	*NO2219273026*			
					Kundes prøvetakingsdato	*2022-09-22 00:00*			
Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*	
Prøve pre-preparering									
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev	
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*	
Oppløste elementer/metaller									
U (Uran)	**420**	± 42.00	µg/L	0.001	2022-09-30	W-SFMS-5C	LE	a ulev	
S (Svovel)	**110**	± 11.00	mg/L	0.2	2022-09-30	W-AES-1A	LE	a ulev	
Al (Aluminium)	**12.4**	± 1.40	µg/L	0.70	2022-09-30	W-SFMS-5C	LE	a ulev	
Ba (Barium)	**301**	± 38.00	µg/L	0.10	2022-09-30	W-SFMS-5C	LE	a ulev	
Ca (Kalsium)	**275**	± 28.00	mg/L	0.1	2022-09-30	W-AES-1A	LE	a ulev	
Cd (Kadmium)	**1.65**	± 0.20	µg/L	0.050	2022-09-30	W-SFMS-5C	LE	a ulev	
Co (Kobolt)	**1.45**	± 0.16	µg/L	0.050	2022-09-30	W-SFMS-5C	LE	a ulev	
Cr (Krom)	**0.276**	± 0.06	µg/L	0.10	2022-09-30	W-SFMS-5C	LE	a ulev	
Cu (Kopper)	**2.63**	± 0.32	µg/L	0.50	2022-09-30	W-SFMS-5C	LE	a ulev	
Fe (Jern)	**0.0171**	± 0.0018	mg/L	0.0040	2022-09-30	W-SFMS-5C	LE	a ulev	
Hg (Kvikksølv)	<0.002	----	µg/L	0.002	2022-09-30	W-AFS-17V2	LE	a ulev	
K (Kalium)	**38.4**	± 3.80	mg/L	0.4	2022-09-30	W-AES-1A	LE	a ulev	
Mg (Magnesium)	**46.1**	± 4.60	mg/L	0.09	2022-09-30	W-AES-1A	LE	a ulev	
Mn (Mangan)	**188**	± 20.00	µg/L	0.10	2022-09-30	W-SFMS-5C	LE	a ulev	
Mo (Molybden)	**92.2**	± 9.40	µg/L	0.10	2022-09-30	W-SFMS-5C	LE	a ulev	
Na (Natrium)	**20200**	± 2020.00	mg/L	0.1	2022-09-30	W-AES-1A	LE	a ulev	
Ni (Nikkel)	**158**	± 17.00	µg/L	0.50	2022-09-30	W-SFMS-5C	LE	a ulev	
P (Fosfor)	<40	----	µg/L	40	2022-09-30	W-SFMS-5C	LE	a ulev	
Pb (Bly)	**1.12**	± 0.11	µg/L	0.30	2022-09-30	W-SFMS-5C	LE	a ulev	
Si (Silisium)	<2	----	mg/L	0.03	2022-09-30	W-AES-1A	LE	a ulev	
Sr (Strontium)	**4200**	± 420.00	µg/L	2	2022-09-30	W-AES-1A	LE	a ulev	
Zn (Sink)	**30.1**	± 3.90	µg/L	2.0	2022-09-30	W-SFMS-5C	LE	a ulev	

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Submatriks: **SJØVANN**

	Kundes prøvenavn	**DS_2**
	Prøvenummer lab	*NO2219273027*
	Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Prøve pre-preparering								
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*
Oppløste elementer/metaller								
U (Uran)	**558**	± 56.00	µg/L	0.001	2022-09-30	W-SFMS-5C	LE	a ulev
S (Svovel)	**92.4**	± 9.20	mg/L	0.2	2022-09-30	W-AES-1A	LE	a ulev
Al (Aluminium)	**8.29**	± 0.96	µg/L	0.70	2022-09-30	W-SFMS-5C	LE	a ulev
Ba (Barium)	**254**	± 32.00	µg/L	0.10	2022-09-30	W-SFMS-5C	LE	a ulev
Ca (Kalsium)	**238**	± 24.00	mg/L	0.1	2022-09-30	W-AES-1A	LE	a ulev
Cd (Kadmium)	**1.08**	± 0.13	µg/L	0.050	2022-09-30	W-SFMS-5C	LE	a ulev
Co (Kobolt)	**0.766**	± 0.09	µg/L	0.050	2022-09-30	W-SFMS-5C	LE	a ulev
Cr (Krom)	**0.278**	± 0.06	µg/L	0.10	2022-09-30	W-SFMS-5C	LE	a ulev
Cu (Kopper)	**3.66**	± 0.44	µg/L	0.50	2022-09-30	W-SFMS-5C	LE	a ulev
Fe (Jern)	**0.0155**	± 0.0017	mg/L	0.0040	2022-09-30	W-SFMS-5C	LE	a ulev
Hg (Kvikksølv)	**0.00231**	± 0.00045	µg/L	0.002	2022-09-30	W-AFS-17V2	LE	a ulev
K (Kalium)	**30.8**	± 3.10	mg/L	0.4	2022-09-30	W-AES-1A	LE	a ulev
Mg (Magnesium)	**34.4**	± 3.40	mg/L	0.09	2022-09-30	W-AES-1A	LE	a ulev
Mn (Mangan)	**166**	± 18.00	µg/L	0.10	2022-09-30	W-SFMS-5C	LE	a ulev
Mo (Molybden)	**77.0**	± 7.90	µg/L	0.10	2022-09-30	W-SFMS-5C	LE	a ulev
Na (Natrium)	**16300**	± 1630.00	mg/L	0.1	2022-09-30	W-AES-1A	LE	a ulev
Ni (Nikkel)	**145**	± 16.00	µg/L	0.50	2022-09-30	W-SFMS-5C	LE	a ulev
P (Fosfor)	<40	----	µg/L	40	2022-09-30	W-SFMS-5C	LE	a ulev
Pb (Bly)	**0.670**	± 0.07	µg/L	0.30	2022-09-30	W-SFMS-5C	LE	a ulev
Si (Silisium)	<0.6	----	mg/L	0.03	2022-09-30	W-AES-1A	LE	a ulev
Sr (Strontium)	**3680**	± 368.00	µg/L	2	2022-09-30	W-AES-1A	LE	a ulev
Zn (Sink)	**33.3**	± 4.30	µg/L	2.0	2022-09-30	W-SFMS-5C	LE	a ulev

Submatriks: **ELUAT**

Kundes prøvenavn	**DF_1**
Prøvenummer lab	*NO2219273028*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Prøve pre-preparering								
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*
Oppløste elementer/metaller								
U (Uran)	**106**	± 11.00	µg/L	0.001	2022-09-30	W-SFMS-5D	LE	a ulev
Th (Thorium)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D-5%	LE	a ulev
S (Svovel)	**202**	± 20.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Al (Aluminium)	<2	----	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev
As (Arsen)	**1.37**	± 0.18	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Ba (Barium)	**22.2**	± 2.20	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Ca (Kalsium)	**235**	± 24.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Cd (Kadmium)	**0.120**	± 0.04	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Co (Kobolt)	<0.05	----	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Cr (Krom)	<0.5	----	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Cu (Kopper)	<1	----	µg/L	1.0	2022-09-30	W-SFMS-5D	LE	a ulev
Fe (Jern)	**0.0271**	± 0.0053	mg/L	0.0040	2022-09-30	W-SFMS-5D	LE	a ulev
Hg (Kvikksølv)	<0.02	----	µg/L	0.02	2022-09-30	W-AFS-17V3a	LE	a ulev
K (Kalium)	**6.02**	± 0.60	mg/L	0.5	2022-09-30	W-AES-1B	LE	a ulev
Mg (Magnesium)	**28.4**	± 2.80	mg/L	0.09	2022-09-30	W-AES-1B	LE	a ulev
Mn (Mangan)	**0.623**	± 0.51	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Mo (Molybden)	**9.36**	± 1.00	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Na (Natrium)	**10.7**	± 1.10	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Ni (Nikkel)	**67.6**	± 6.80	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Pb (Bly)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
V (Vanadium)	<0.05	----	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Zn (Sink)	**15.7**	± 1.80	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev

Submatriks: **ELUAT**

Kundes prøvenavn	**DF_2**
Prøvenummer lab	*NO2219273029*
Kundes prøvetakingsdato	*2022-09-22 00:00*

Parameter	**Resultat**	MU	*Enhet*	*LOR*	*Analysedato*	*Metode*	*Utf. lab*	*Acc.Key*
Prøve pre-preparering								
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*
Oppløste elementer/metaller								
U (Uran)	**130**	± 13.00	µg/L	0.001	2022-09-30	W-SFMS-5D	LE	a ulev
Th (Thorium)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D-5%	LE	a ulev
S (Svovel)	**94.2**	± 9.40	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Al (Aluminium)	**3.34**	± 5.45	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev
As (Arsen)	**1.01**	± 0.15	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Ba (Barium)	**30.4**	± 3.00	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Ca (Kalsium)	**123**	± 12.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Cd (Kadmium)	**0.252**	± 0.04	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Co (Kobolt)	**0.565**	± 0.11	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Cr (Krom)	**20.7**	± 2.10	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Cu (Kopper)	<1	----	µg/L	1.0	2022-09-30	W-SFMS-5D	LE	a ulev
Fe (Jern)	**0.122**	± 0.01	mg/L	0.0040	2022-09-30	W-SFMS-5D	LE	a ulev
Hg (Kvikksølv)	<0.02	----	µg/L	0.02	2022-09-30	W-AFS-17V3a	LE	a ulev
K (Kalium)	**4.03**	± 0.40	mg/L	0.5	2022-09-30	W-AES-1B	LE	a ulev
Mg (Magnesium)	**13.8**	± 1.40	mg/L	0.09	2022-09-30	W-AES-1B	LE	a ulev
Mn (Mangan)	**33.8**	± 3.40	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Mo (Molybden)	**19.8**	± 2.00	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Na (Natrium)	**9.61**	± 0.96	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Ni (Nikkel)	**69.3**	± 6.90	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Pb (Bly)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
V (Vanadium)	**0.258**	± 0.04	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Zn (Sink)	**14.0**	± 1.70	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev

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Submatriks: **ELUAT**

	Kundes prøvenavn	A1
	Prøvenummer lab	NO2219273030
	Kundes prøvetakingsdato	2022-09-22 00:00

Parameter	Resultat	MU	Enhet	LOR	Analysedato	Metode	Utf. lab	Acc.Key
Prøve pre-preparering								
Filtrering	**Ja**	----	-	-	2022-09-29	W-PP-filt	LE	a ulev
Stabilisering	**Ja**	----	-	-	2022-09-29	W-PPV-S	LE	*
Oppløste elementer/metaller								
U (Uran)	**694**	± 69.00	µg/L	0.001	2022-09-30	W-SFMS-5D	LE	a ulev
Th (Thorium)	<0.2	----	µg/L	0.20	2022-09-30	W-SFMS-5D-5%	LE	a ulev
S (Svovel)	**611**	± 61.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Al (Aluminium)	**587**	± 59.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev
As (Arsen)	<0.5	----	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Ba (Barium)	**21.6**	± 2.20	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Ca (Kalsium)	**634**	± 63.00	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Cd (Kadmium)	**31.2**	± 3.10	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Co (Kobolt)	**358**	± 36.00	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Cr (Krom)	<0.5	----	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Cu (Kopper)	**175**	± 18.00	µg/L	1.0	2022-09-30	W-SFMS-5D	LE	a ulev
Fe (Jern)	**0.174**	± 0.02	mg/L	0.0040	2022-09-30	W-SFMS-5D	LE	a ulev
Hg (Kvikksølv)	<0.02	----	µg/L	0.02	2022-09-30	W-AFS-17V3a	LE	a ulev
K (Kalium)	**6.01**	± 0.60	mg/L	0.5	2022-09-30	W-AES-1B	LE	a ulev
Mg (Magnesium)	**28.2**	± 2.80	mg/L	0.09	2022-09-30	W-AES-1B	LE	a ulev
Mn (Mangan)	**4080**	± 408.00	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
Mo (Molybden)	<0.5	----	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Na (Natrium)	**21.8**	± 2.20	mg/L	0.2	2022-09-30	W-AES-1B	LE	a ulev
Ni (Nikkel)	**5000**	± 500.00	µg/L	0.50	2022-09-30	W-SFMS-5D	LE	a ulev
Pb (Bly)	**0.523**	± 0.09	µg/L	0.20	2022-09-30	W-SFMS-5D	LE	a ulev
V (Vanadium)	<0.05	----	µg/L	0.050	2022-09-30	W-SFMS-5D	LE	a ulev
Zn (Sink)	**1660**	± 166.00	µg/L	2.0	2022-09-30	W-SFMS-5D	LE	a ulev

Dette er slutten av analyseresultatdelen av analysesertifikatet

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Kort oppsummering av metoder

Analysemetoder	*Metodebeskrivelser*
W-AES-1A	Bestemmelse av metaller i ferskvann, bassengvann og drikkevann ved ICP-AES iht SS-EN ISO 11885:2009 og US EPA Method 200.7:1994. Prøvene er surgjort med 1ml høyren salpetersyre per 100 ml prøve før analyse, dersom prøven ikke er surgjort ved ankomst lab. Ingen oppslutning.
W-AES-1B	Bestemmelse av metaller i avløpsvann ved ICP-AES iht SS-EN ISO 11885:2009 og US EPA Method 200.7:1994. Prøvene er surgjort med 1ml høyren salpetersyre per 100 ml i forkant av analyse. Dette gjelder ikke allerede surgjorte prøver. Ingen oppslutning.
W-AFS-17V2	Bestemmelse av kvikksølv (Hg) i vann ved AFS iht SS-EN ISO 17852:2008. Prøvene er surgjort med 1ml høyren salpetersyre per 100ml prøve før analyse. Dette gjelder ikke prøver som allerede er surgjort ved ankomst lab. Ingen oppslutning.
W-AFS-17V3a	Bestemmelse av kvikksølv (Hg) i avløpsvann ved AFS iht SS-EN ISO 17852:2008. Prøvene er surgjort med 1ml høyren salpetersyre pr 100ml prøve i forkant av analyse. Dette gjelder ikke prøver som allerede er surgjort. Ingen oppslutning.
W-PP-filt	Filtrering (SE-SOP-0259, SS-EN ISO 5667-3:2018)
*W-PPV-S	Stabilisering med H202 før analyse av svovel W-AES-1A (SE-SOP-0259).
W-SFMS-5C	Bestemmelse av metaller i sjøvann ved ICP-SFMS iht SS-EN ISO 17294-2:2016 og US EPA Method 200.8:1994. Prøvene er surgjort med 1ml høyren salpetersyre per 100ml før analyse. Dette gjelder ikke prøver som allerede er surgjort ved ankomst lab. Ingen oppslutning.
W-SFMS-5D	Bestemmelse av metaller i urent vann ved ICP-SFMS iht SS-EN ISO 17294-2:2016 og US EPA Method 200.8:1994. Prøvene er surgjort med 1ml høyren salpetersyre per 100ml før analyse. Dette gjelder ikke prøver som allerede er surgjort ved ankomst lab. Ingen oppslutning.
W-SFMS-5D-5%	Bestemmelse av metaller i urent vann ved ICP-SFMS iht SS-EN ISO 17294-2:2016 og US EPA Method 200.8:1994. Prøvene er surgjort med 5ml høyren salpetersyre per 100ml før analyse. Dette gjelder ikke prøver som allerede er surgjort ved ankomst lab. Ingen oppslutning.
W-ALKAL (7150.30)	Bestemmelse av alkalinitet i vann ved potensiometrisk titrering. Metode: DS/EN ISO 9963-1:1994. Realtiv måleusikkerhet: 15%.
W-CL (7125.10)	Klorid i vann ved spektrofotometri. Metode: DS/ISO 15923:2013 Måleusikkerhet: 15%
W-F (6110.00)	Bestemmelse av fluorid i vann. Metode: DS 218:1975,MOD Måleusikkerhet: 15%
W-NO3-SW-mg/L (6092.09)	Nitrat i saltvann, rapportert i mg/L. Metode: DS 223:1991. Automatisert bestemmelse. Måleusikkerhet: 15%
W-PO43-µg/L (6613.40)	Ortofosfat/Fosfat i saltvann, rapportert i µg/L. Metode: DS/ISO 15923-1:2013. Relativ måleusikkerhet: 15%
W-SO4 (6211.10)	Fotometrisk bestemmelse av Sulfat (SO42-) i vann. Metode: DS/ISO 15923:2013 Måleusikkerhet: 15%
W-CL-DA	Discrete analyzer, fotometrisk deteksjon iht ISO 15923-1
W-CON-PCT	Bestemmelse av konduktivitet (ledningsevne) i rentvann, sjøvann og avløpsvann ihht. NS ISO 7888.
W-NO3N-DA-CALC	Discrete analyzer, fotometrisk deteksjon iht ISO 15923-1. Beregnede verdier basert på andre analyser.
W-PH-PCT	Bestemmelse av pH i rentvann, bassengvann og avløpsvann ihht. NS-EN ISO 10523:2012. Sjøvann basert på NS-EN ISO 10523.
*W-PO4-FIA	Bestemmelse av totalfosfor og ortofosfat i rentvann og avløpsvann med spektrofotometer basert på NS-EN ISO 6878.
W-TOC-IR	Bestemmelse av total organisk karbon, løst organisk karbon, organisk karbon, uorganisk karbon, og ikke flyktige karbonforbindelser med IR ihht NS-EN 1484.
W-TSS-GR	Bestemmelse av suspendert stoff i rentvann, sjøvann, badebassengvann og avløpsvann ihht. NS 4733
W-REDOKSPOT-GBA	Redokspotensial i vann ved redokstitrering, metode: DIN 38404-C6

Noter: **LOR** = Rapporteringsgrenser representerer standard rapporteringsgrenser for de respektive parameterne for hver metode. Merk at rapporteringsgrensen kan bli påvirket av f.eks nødvendig fortynning grunnet matriksinterferens eller ved for lite prøvemateriale

MU = Måleusikkerhet

a = A etter utøvende laboratorium angir akkreditert analyse gjort av ALS Laboratory Norway AS

a ulev = A ulev etter utøvende laboratorium angir akkreditert analyse gjort av underleverandør

***** = Stjerne før resultat angir ikke-akkreditert analyse.

< betyr mindre enn

> betyr mer enn

n.a. – ikke aktuelt

n.d. – Ikke påvist

Måleusikkerhet:

Måleusikkerhet skal være tilgjengelig for akkrediterte metoder. For visse analyser der dette ikke oppgis i rapporten, vil dette oppgis ved henvendelse til laboratoriet.

Måleusikkerheten angis som en utvidet måleusikkerhet (etter definisjon i "Evaluation of measurement data - Guide to the expression of uncertainty in measurement", JCGM 100:2008 Corrected version 2010) beregnet med en dekningsfaktor på 2 noe som gir et konfidensinterval på om lag 95%.

Måleusikkerhet fra underleverandører angis ofte som en utvidet usikkerhet beregnet med dekningsfaktor 2. For ytterligere informasjon, kontakt laboratoriet.

Utførende lab

	Utførende lab
DK	*Analysene er utført av:* ALS Denmark A/S, Bakkegårdsvej 406A Humlebæk
GB	*Analysene er utført av:* GBA Pinneberg, Flensburger Strasse 15 Pinneberg Tyskland
LE	*Analysene er utført av:* ALS Scandinavia AB Luleå, Aurorum 10 Luleå Sverige 977 75
NO	*Analysene er utført av:* ALS Laboratory Group avd. Oslo, Drammensveien 264 Oslo Norge 0283

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