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Oskarshamn site investigation

Boremap mapping of percussion boreholes HSH01-03

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March 2004

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Abstract

Many activities are performed within the site investigation at Simpevarp. In this report one of them is presented.

Three percussion drilled boreholes, HSH01, HSH02 and HSH03, were drilled for water supply for the core drilled boreholes KSH01A, KSH01B and KSH02. The percussion drilled boreholes were investigated with several logging methods, for example, conventional geophysical logging, borehole radar and TV-logging. This report comprises the interpretation of the BIPS-images from the TV-logging supported by the examination of the drill cuttings.

HSH01 and HSH03 are both drilled close to the core drilled borehole KSH01A. The boreholes are dominated by quartz-monzodiorite and granitic rocks. In HSH01 a fine-grained dioritoid was also observed. Sections relatively rich in open fractures occur in HSH01 at 25-51 m and 168-170 m depth and in HSH03 at 58.5-59.5 m and 65.0-79.0 m depth. In HSH03 a crushed section is observed at 68.6-70.5 m depth.

HSH02 is drilled close to the core drilled borehole KSH02. This borehole consists mainly of a fine-grained dioritoid with minor occurrences of granitic rocks. Sections relatively rich in open fractures occur in HSH02 at 80-90 m, 100-109 m and 126.5-144 m depth. No crushed sections were observed in the borehole.

Sammanfattning

Det är flera aktiviteter som utförs inom ramen för platsundersökningar på Simpevarp. I denna rapport är en av dessa presenterad.

Tre hammarborrade borrhål, HSH01, HSH02 och HSH03, borrades för att ge vatten till borrningen av de kärnborrade borrhålen KSH01A och KSH02. De hammarborrade borrhålen undersöktes med flera loggningsmetoder, bl.a. konventionell geofysisk loggning, borrhålsradar och TV-loggning. Denna rapport innefattar tolkningarna av BIPS-bilderna från TV-loggningarna med stöd av borrkaxundersökningar.

HSH01 och HSH03 är båda borrade nära kärnborrhålet KSH01A. De båda borrhålen domineras av kvarts-monzodiorit och granitiska bergarter. I HSH01 observerades även en finkornig dioritoid. Sektioner som är relativt rika på brutna sprickor återfinns i HSH01 vid 25-51 m och 168-170 m djup och i HSH03 vid 58.5-59.5 m och 65.0-79.0 m djup. I HSH03 observerades en krossad sektion vid 68.6-70.5 m djup.

HSH03 är borrat nära kärnborrhålet KSH02. HSH03 består främst av en finkornig dioritoid med underordnade granitiska bergarter. Sektioner som är relativt rika på brutna sprickor återfinns i HSH02 vid 80-90 m, 100-109 m och 126.5-144 m djup. Inga krossade partier observerades i borrhålet.

Contents

1 Introduction

This document reports the data gained by Boremap mapping of three percussion boreholes drilled within the site investigation at Simpevarp. The mapping was performed in accordance with activity plan AP PS 400-03-005 (SKB, internal document).

Three percussion drilled boreholes are investigated. Two of them, HSH01 and HSH03, are located nearby the 1000 m deep telescopic drilled borehole KSH01A /1/ and one, HSH02, is located nearby the 1000 m deep telescopic drilled borehole KSH02 (Figure 1-1). HSH01-03 were drilled for water supply to the core drilling.

The percussion drilled boreholes were after completion of drilling investigated with several logging methods, for example, conventional geophysical logging, borehole radar and TV-logging. The latter method implies logging with a colour TV-camera to produce images of the borehole wall, so called BIPS-images (Borehole Image Processing System). The method is described in SKB MD 222.006 (SKB, internal controlling document).

Mapping of percussion boreholes according to the Boremap method is based on the use of BIPS-images of the borehole wall, supported by the study of drill cuttings. Although the rock is crushed into fine-grained fractions, the mineralogical composition of the samples can still be studied. The combination of BIPS-images and samples of drill cuttings offers a reasonably efficient method for a continuous mapping of the geology along the borehole.

The BIPS-images also enable the study of the distribution of fractures along the borehole. Fracture characteristics like aperture, colour of fracture minerals etc are possible to study as well. Furthermore the orientation is documented, since the Boremap software calculates strike and dip of planar structures such as foliations, rock contacts and fractures. Important to keep in mind is that the mappings only represent the linear drill holes that intersect the rock body.

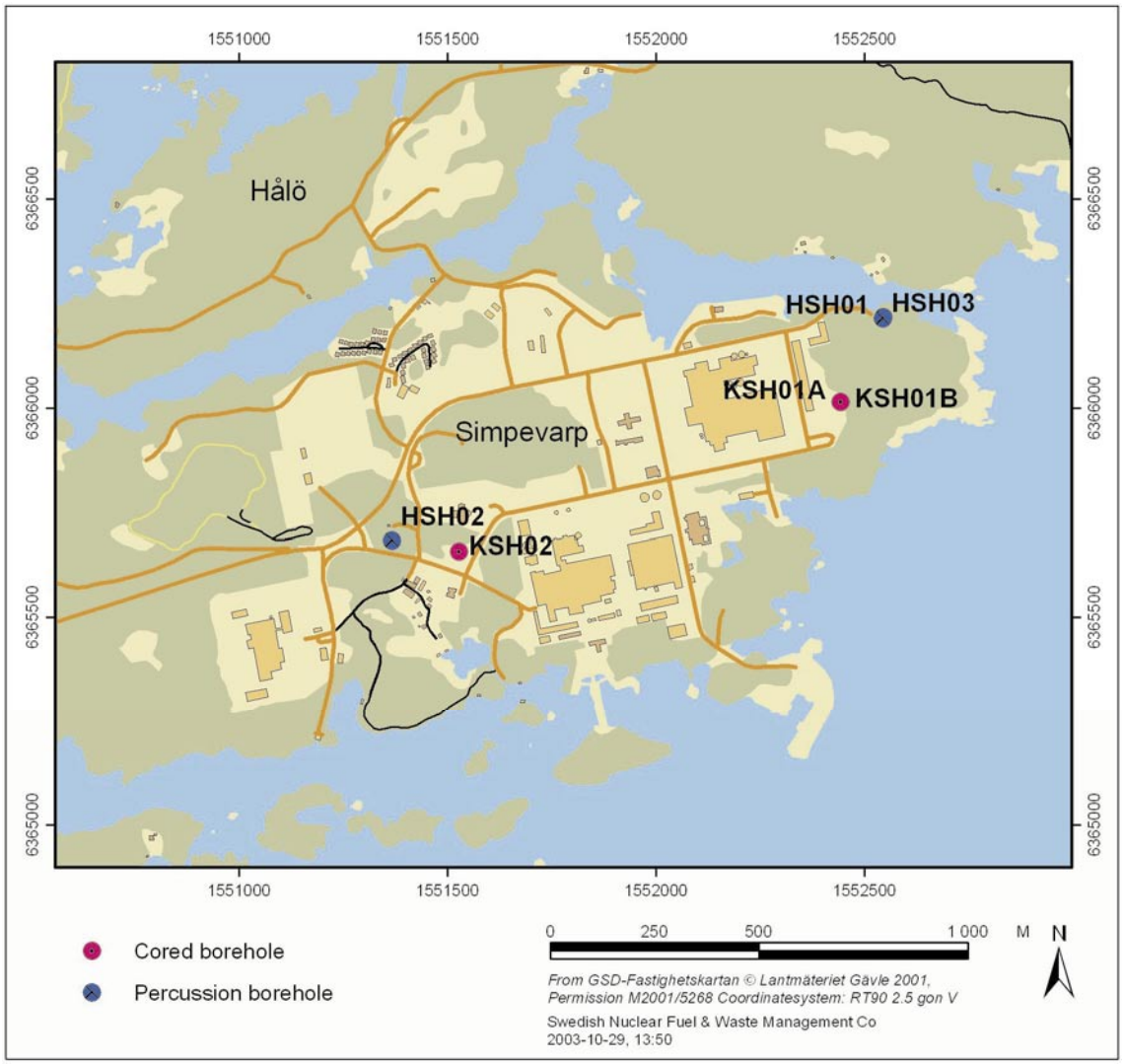


Figure 1-1. Locations of boreholes at Simpevarp, 2003.

2 Objective and scope

The aim of this activity was to document the occurrence and character of rock types, fractures, ductile structures and alterations in the bedrock penetrated by the three percussion drilled boreholes HSH01-03. Data were collected in order to obtain a foundation for a preliminary assessment of the bedrock conditions adjacent to the telescopic drilled boreholes KSH01A /1/ and KSH02 down to about 200 m.

3 Equipment

3.1 Description of Software

The Boremap mapping was performed with the latest updated version of the software Boremap 3.2. In the boremap software geological features such as rock type, rock occurrence, alterations, open or sealed fractures, crush zones, as well as other structural features can be mapped. The software calculates actual directions (strike and dip) of planar structures penetrated by the borehole. Data on inclination, bearing, and diameter of the borehole are used as in-data for the calculations (Table 3-1). The Boremap software is loaded with SKB's nomenclature for surface mapping at the Oskarshamn site investigation to enable correlation with the surface geology.

The results from the examination of drill cuttings were documented in an Excel database, while the stereographic projections were plotted in StereoNet. The schematic presentations of the boreholes were presented in WellCad, while the BIPS-images were printed with the software BIPS Image Print.

Table 3-1. Borehole data for HSH01-HSH03 (values from starting point).

ID-code	Northing	Easting	Borehole length (m)	BIPS-image interval (m, adjusted)	Bearing (degrees)	Inclination (degrees)	Depth to bedrock surface (m)
HSH01	6366218	1552546	200	12.0-196.65	4.4	-65.0	1.1
HSH02	6365683	1551368	200	12.0-180.9	185.7	-80.1	1.3
HSH03	6366214	1552545	201	12.0-196.9	218.9	-79.5	1.2

3.2 Other equipment

In the mapping of drill cuttings a stereo microscope was used as well as a daylight lamp, hydrochloric acid and an ordinary kitchen strainer.

3.3 BIPS-image quality

The quality of the BIPS-images varies. The BIPS-image from HSH01 is quite good to 162 m, but already from ca 70 m some clay particles has precipitated on the lower side of the borehole wall. At 162 m depth the borehole inclination has deviated so much that the inclination is less than 35^{o}. The effect of this is that the BIPS-camera has not always glided continuously down the borehole, but by stick slip motion. This clearly affects the quality of the BIPS-image negatively and many fractures were not detected because of this. The section 165.89-171.82 m has been mapped from another BIPS-image with slightly better quality.

BIPS-images from HSH02 and HSH03 are mostly of good quality, but they are of poorer quality towards the end of the boreholes due to suspensions in the borehole fluid. In HSH02 no observations could be made from 146.4 m downwards.

4 Execution

The Boremap mapping of the percussion drilled boreholes HSH01-03 was performed and documented according to activity plan AP PS 400-03-005 (SKB, internal document) referring to the SKB method description for Boremap mapping (SKB MD 143.006, Version 1.0, SKB, internal controlling document). The analytical procedures applied for examination of the drill cuttings followed a routine described below.

4.1 Examination of drill cuttings

The Boremap mapping of the percussion drilled boreholes HSH01-03 included examination of drill cuttings and mapping of BIPS-images in Boremap. The applied analytical procedures for examination of drill cuttings were simplified compared to what is outlined in the SKB method description for examination of drill cuttings, SKB MD 142.001 (SKB, internal controlling document). The method used for examination of drill cuttings from HSH01-HSH03 is outlined below.

Drill cutting samples had been collected during drilling with a frequency of one sample per metre. Three samples were stored together on top of each other in one litre semi-transparent plastic boxes. A representative, untreated sample of about 200 g from the three sample batch was examined by ocular inspection with respect to sample colour and grain size. The sample was thereafter sieved in water with an ordinary kitchen strainer. The colour of the washed sample was documented (in dry condition) and then the sample was examined under a stereo microscope with respect to rock type, mineralogy, grain size and possible alterations.

The accuracy of the examination might have been affected by contamination of the samples due to mixing of rock fragments from different levels of the borehole during the drilling. The estimation of the rock type ratio was very rough because of the sampling method and since it was difficult to separate different rock types of similar mineralogy. The effects of oxidation and possible silicification also complicated the ocular estimation.

All observations from the examination of drill cuttings were documented in an Excel database (Appendix 11). Together with the information obtained from the BIPS-image, these data were used for a lithological classification of the investigated borehole interval.

4.2 Preparations

Length adjustments of the BIPS-images were performed. Since it is well known that the measured length of the BIPS-images deviates approximately -0.5 m per 100 m of logging, the following length adjustments were made. The BIPS-images of HSH01 indicated an original length of 195.65 m and was adjusted to 196.65 m. The corresponding values for HSH02 were 180.0 m and 180.9 m and for HSH03 195.9 m and 196.9 m. The section 165.89-171.82 in HSH01 has been mapped from another BIPS-image that has slightly better quality than the first (both logged at the same time). This BIPS-image was length adjusted relatively to the first BIPS-image on the basis of geological features.

The total length of HSH01 and HSH02 were 200 m each, whereas HSH03 was 201 m long. The reason for the discrepancy between the total borehole length and the BIPS-image length is probably that some amount of drill cuttings has covered the bottom of the borehole. In the case of HSH02 the logging was probably interrupted because of the bad image quality.

Background data collected from SICADA prior to the Boremap mapping included:

- borehole diameter and total length (Appendix 8).
- deviation data (Appendix 9), except for HSH03 for which deviation data was missing.
- drilling penetration rate (Appendix 10).

Direction angles of the boreholes HSH01 and HSH02 were edited using the deviation data from the SKB SICADA database (Field Note: Simpevarp 32 and Simpevarp 33, respectively).

4.3 Execution of measurements

The available geological information is more limited for Boremap mapping of percussion drilled boreholes than of core drilled boreholes, when a continuous drill core can be directly compared with the BIPS-image of the borehole wall. During mapping of percussion boreholes, fractures can only be seen on the BIPS-images and rock samples are only available as crushed fragments. As solid rock samples are not accessible, certain assumptions and simplifications have to be made during the mapping. These assumptions and simplifications are described below.

4.3.1 Fractures

As fractures could only be seen in the BIPS-image they could not be confidently classified as rough, smooth or slickensided, nor could their mineralogy or alteration be confidently determined. Hence, the classifications of fracture minerals in the percussion drilled boreholes should be treated with caution. The following assumptions were made:

- The width of very thin fractures (<1 mm) were hard to measure accurately and was therefore, as a rule, interpreted as 1 mm thick or, if only vaguely observed, as 0.5 mm thick.
- Fractures only indicated by oxidized walls were mapped as sealed with 0.5 mm width.
- Fractures were assumed to be open if not clearly observed to be sealed. Therefore all very thin, vaguely observed fractures were mapped as possibly open, except for the ones only indicated by oxidation.
- Dark coloured fractures were interpreted to contain some chlorite, but the colouration may also be caused by shadows in the fracture walls or by different dark coloured minerals.
- White fracture fillings were mapped as quartz or calcite (impossible to separate in the BIPS-images), white fracture filling with greyish/greenish dots were mapped as quartz and epidote and all slightly greenish fracture fillings were mapped as X1.
- Pyrite, Fe-hydroxide, hematite, calcite, epidote, X1, X2 and X3 were observed in some of the drill cutting samples, but could not be correlated to specific structures in the BIPS-image.

4.3.2 Minerals

Unidentified minerals or mineral aggregates were mapped as:

X1 a light green to dark green aphanitic mineral assembly occurring in fractures, possibly consisting of quartz, feldspar and epidote.

X2 a dark red, transparent, very fine grained accessory mineral, possibly sphene.

X3 a bright orange, euhedral, very fine grained fracture mineral (rarely observed).

These were handed over for possible mineral analysis.

4.3.3 Rock colour

The rock colour documented in the Boremap mapping was classified from the observations of drill cuttings (dry samples), since colours in the BIPS-images appear somewhat modified and bleached. The documentation of colour of minor rock occurrences only observed in the BIPS-image is therefore likely to be less accurate.

4.3.4 Rock contacts

The orientation of irregular or diffuse rock contacts was difficult to observe and measure with the Boremap method, since only planar and discrete features can be accurately measured.

4.3.5 Lithologies

Lithological classifications of the rocks in HSH01-03 were usually difficult. A medium grained, equigranular, usually dark reddish grey, granitic rock poor in quartz was interpreted to belong to the quartz monzonite to monzodiorite series rocks. This rock type is referred to as quartz monzodiorite. Typical for this rock is that it usually contains biotite as well as amphibole, and that it is relatively rich in the accessory mineral X2.

A fine grained, rarely aphanitic, dark grey rock with no clear porphyritic texture was interpreted as a fine-grained dioritoid. The mineralogy differs slightly from the former rock type, since it has usually no visible amphibole and seems to contain less X2. It is possibly poorer in quartz than the former rock type and in some samples quartz seems to be missing.

In the drill cuttings the granites seemed to be easily distinguished because of their red colour and great quartz content, but the determinations were sometimes confusing when compared with the BIPS-images. Probably some of the rocks that were interpreted as granites (coded as 511058 or 501058) in the mapping of drill cuttings belong to the granite to quartz monzodiorite series rocks instead (i.e. Ävrö granites, coded as 501044), or are a result of silicification. When the granites seemed to be weakly porphyritic they were interpreted as 501044 instead of 511058 or 501058 in the Boremap mapping.

Classifications of thin bands, veins or segregates of felsic rocks were mainly based on the BIPS-images, since they were often difficult to recognize in the drill cutting samples.

When BIPS-images were not available, i.e. in the beginning of the boreholes, rock classification was based on the observations of drill cuttings only.

4.3.6 Alteration

The oxidation is usually clearly visible in the BIPS-images, while epidotization is hard to distinguish, although present. Therefore few observations of epidotization are made in the boremap mapping.

4.3.7 Grain size

Grain size was rarely possible to determine from the BIPS-images of HSH01-03. Therefore classifications of grain size for minor rock occurrences, which could not be observed in the drill cuttings, should not be taken as definite.

4.3.8 Deformational structures

Ductile and brittle ductile structures are frequent in the core from KSH01A /1/, but only few possible ductile structures are observed in HSH01-03. It can usually not be judged from the BIPS-images if structures sealed with X1 are mylonites or sealed fractures.

4.3.9 Supporting data

Data from the examination of drill-cuttings (Appendix 11) were used to support the classification of mineralogy and extent of secondary alteration observed in the BIPS image.

Drilling penetration rate was used as complementary data for the geological interpretation (Appendix 10). For example, major anomalies in drilling penetration rate correlated well with crush sections or densely fractured sections.

Observations of the BIPS-images were also compared with the drill core from borehole KSH01A /1/ (see Figure 1-1 for location). A report on the rocks of the Äspö Islands by Karl-Axel Kornfält and Hugo Wikman /2/ has been helpful when interpreting the lithologies.

4.4 Data handling

The Boremap mapping of HSH01-03 was performed on a local computer disk at Geosigma, Uppsala. Before every break (exceeding 15 minutes) a back-up file was saved on one of Geosigma's servers. Back-ups of the servers were made every twenty-four hours. After completion of each borehole, the database was submitted to SKB.

The mapping was quality checked by a routine in the Boremap software before it was archived and exported to the SKB SICADA database under Field Note Simpevarp 100.

The observations from the examination of drill cuttings from HSH01, HSH02 and HSH03 were archived in an Excel database. The data were subsequently exported to the SKB SICADA database and stored under Field Note Simpevarp 5, 7 and 8, respectively.

Data used for the production of WellCad images was taken from the SKB SICADA database. Only the data stored in the SKB SICADA database should be used for further interpretation.

5 Results

The geology of the three percussion drilled boreholes, HSH01-03 corresponds well with the geology in the telescopic drilled borehole KSH01A /1/. The results from the Boremap mapping are briefly described in Sections 5.1-5.3 below, and graphical presentations of the data are given in Appendices 1-6 (WellCad and BIPS-images). Equal area stereographic projections of poles to open and sealed fracture planes are shown in Appendix 7. The mappings of drill cuttings are to be found in Appendix 11. For description of lithologies see 4.3.5.

5.1 HSH01

Lithologies

The borehole consists mainly of quartz monzodiorite (61.6 %). It is equigranular, medium grained and dark reddish grey to dark red depending on the degree of oxidation. Traces of epidote are also usually present.

From approximately 93 m depth a fine grained dioritoid appears (20.4 %). This rock is usually dark grey to dark reddish grey, fine grained and poor in quartz.

Granitic, quartz rich rocks are observed throughout the borehole (18.0 %). It is not always clear whether these rocks rich in quartz are granites or belong to the rock series granites to quartz monzodiorites, or so called Ävrö granites. Granitic rocks rich in quartz occur at:

- 1.5- ca 8 m? (No BIPS-image available).
- 41.6-45.8 m.
- 104.4-108.6 m.
- 109.6-118.0 m.
- 120.8-133.9 m.

Fractures

In HSH01 the frequency of open fractures is calculated to 3.1 fractures/m from observations in the BIPS-image of the borehole (available from 12.0-196.65 m). If sealed fractures are included the fracture frequency is as high as 7.9 fractures/m. Sections with increased frequency of open fractures were observed between 35 and 51 m and between 168 and 170 m. A graph showing fracture frequency is shown in Appendix 4.

The orientations of fractures are shown in Appendix 7. Three open fracture sets were observed: one ENE-striking with moderate dip (60-70^{o}), one horizontal to sub-horizontal with varying strike (S-W) and one vertical NNE-striking set. The pattern is slightly different for mapped sealed fractures where two clear fracture sets were observed: one moderately dipping S-striking set and another moderately dipping ENE-striking set. Two less pronounced preferred orientations are vertical and strike ESE or NNE.

Two crushed sections belonging to the sub-horizontal fracture set were documented. They are not strictly crushed, but they are so rich in fractures that every single fracture was impossible to document. One of them is observed at 43.1-45.7 m (sub-horizontal, with very uncertain strike) and the other at 45.7-46.5 m (striking approximately 70/20).

5.2 HSH02

Lithologies

The borehole consists mainly of a dark grey to dark reddish grey, fine grained dioritoid (89.5 %). It is intruded by several millimetres thin and up to 4 m thick sections of granite and subordinate pegmatite (10.0 % together) that occur throughout the borehole. Possibly some Ävrö granites (0.5 %) were observed. Thicker sections of granite occur at:

- 27.2-29.2 m.
- 67.5-71.1 m.
- 91.8-92.8 m.
- 96.2-98.3 m.
- 108.1-109.8 m.

Fractures

The frequency of open fractures in HSH02 is calculated to 6.1 fractures/m from observations in the BIPS image of the borehole (possible to map between 12.0 and 146.4 m). If sealed fractures are included the fracture frequency is 8.9 fractures/m. The high amount of mapped open fractures is caused by the great amount of very thin fractures, which were mapped as possibly open since they were not obviously sealed. An increase in fracture frequency (open) was observed between 80 and 90 m, between 100 and 109 m and between 126.5 and 144 m. A graph showing fracture frequency is shown in Appendix 5.

The orientations of fractures are shown in Appendix 7. Three sets of open fractures are distinguished: one ESE-striking sub-horizontal set (10-20^{o} dip), one NNW-striking moderately dipping set (50-60^{o} dip) and one WSW-striking vertical set. A fourth possible fracture set is WNW-striking and vertical. The two dominating orientations of mapped sealed fractures are sub-horizontal S-striking and moderately dipping ENE-striking. Two other possible fracture sets are moderately dipping with NNW- or NW-strike.

No crushed sections were observed.

5.3 HSH03

Lithologies

The borehole consists mainly of quartz monzodiorite (58.2 %) as in HSH01. It is medium grained, dark reddish grey to dark red depending on the degree of oxidation. The fine grained dioritoid seems to be absent but some dark spots of other rock material can be observed (less than 0.01 %). This is interpreted to be a fine grained diorite-gabbro since some traces of very mafic material was observed during the mapping of drill cuttings.

As in HSH01 granitic, quartz rich rocks are observed throughout the borehole (41.8 %). The granite gets clearly deformed between 53.5 and 56.6 m showing a foliation of approximately 295/67°. The foliation can be traced to about 59.0 m, but it is disturbed by conspicuous marks in the section 56.6 - 59.0 m. Features in this section have not been documented in Boremap, since they are difficult to interpret.

Thicker sections with rocks rich in quartz (granites or Ävrö granite) occur at:

- 0.3-59.9 m.
- 84.0-87.1 m.
- 89.6-96.1 m.
- 153.8-165.0 m.
- 166.6-172.6 m.

Fractures

In HSH03 the frequency of open fractures is calculated to 1.9 fractures/m from observations in the BIPS image of the borehole (available from 12.0-196.9 m). If sealed fractures are included the fracture frequency is 4.6 fractures/m. An increase in the frequency of open fractures was observed between 58.5 and 59.5 m and between 65.0 and 79.0 m. The calculated fracture frequencies are somewhat underestimated, since several fractures at the end of the borehole were not possible to map due to bad BIPS-image quality. A graph showing fracture frequency is shown in Appendix 6.

The orientations of fractures are shown in Appendix 7. The dominating fracture set of open fractures is moderately dipping when striking SE and turning sub-horizontal to horizontal when striking S to SW. Two less pronounced vertical fracture sets are observed: one NE-striking and one WNW-striking. The mapped sealed fractures show two clearly distinguished preferred orientations: one moderately dipping (30-45°) SE striking set and one sub-horizontal (0-15° dip) S striking set.

Two sub-horizontal crushed sections were observed: one at 68.6-70.5 m striking roughly 100/30°, and one at 71.0-71.5 m striking 34/10°. The latter is not strictly a crushed section, but it is very densely fractured.

5.4 Discussion

5.4.1 The advantages of the Boremap method

From the described working procedures and the results in this report, it is apparent that the mapping of percussion drilled boreholes, with BIPS-images and the Boremap software, has made a great progress from earlier methods. For example, the following improvements have been made:

- Rock type and rock contacts can be determined with greater precision than before.
- Thin rock occurrences can be observed.
- Structures, of which fractures are most important, can be studied.

- The orientation of structures can be measured.
- The position of features (rock contacts, fractures etc) can be measured.
- The width of features can be measured; for instance the width of a crush zone as well as piece length.

5.4.2 The shortcomings of the Boremap method

The Boremap mapping of percussion drilled boreholes suffers from certain shortcomings compared to the corresponding method for core drilled boreholes. Some shortcomings are listed below:

- The mapping is dependent on good BIPS-images.
- Very thin, open fractures cannot be observed.
- Classification of thin fractures as open or sealed is problematic.
- The surface and alteration of open fractures cannot be studied.
- Minerals cannot be classified from the BIPS-images.
- The uncertain sampling depth and the sampling method of drill cuttings, limit the possibility to make judgements of the mineralogical composition of rocks continuously along the borehole.

Of all the shortcomings in the Boremap mapping, the problem with classification of thin fractures as open or sealed is the most serious. This problem is evident for HSH02. The mapped open fractures in the percussion drilled boreholes represent all fractures that are not obviously sealed (naturally open, drill induced and very thin sealed fractures), while the mapped open fractures in the core drilled boreholes has clearly cut the drill core (naturally open or opened during drilling or uptake). Therefore the open fractures from different borehole types cannot without exception be compared with each other. A better way of comparison is to compare the total fracture frequency.

5.4.3 Steps to improvement of the Boremap method

Since the Boremap mapping of percussion drilled boreholes is totally dependent on the BIPS-images, the quality of the images has to be good. Therefore,

- The boreholes have to be rinsed well.
- The suspensions must have precipitated before the logging takes place.
- The borehole inclination has to be steep in order to avoid stick-slip motions of the camera.
- A better resolution of the images, i.e. using BIP-IV with a resolution of 0.61/0.50 mm, would be preferable to the present resolution of 1.22/1.0 mm.

A better resolution of the BIPS-images would reduce the amount of fractures that cannot be determined as open or sealed. This is necessary for boreholes like HSH02. Still, a better BIPS resolution will not solve all the problems. For instance, colour contrasts are required to make observations. The dominating rocks in Simpevarp are very dark when wet (as in the boreholes) which make it difficult to observe fractures which are also dark or black.

To ensure the lithologies in the boreholes a few whole rock analysis are suggested. In order to overcome the present problems with very thin fractures (whether they are open or sealed) correlations with statistics from the core drilled borehole is suggested. Deviation for HSH03 must be measured in order to get right orientation data for the mapping.

The mapping clearly benefit from synchronous analysis of supporting data from the drilling, such as drilling penetration rate and observations of drill cores from the same drillsite. Geophysical data would also be helpful in interpreting the BIPS-images.

6 References

1) Ehrenborg, J. & Steiskal, V., 2003: Oskarshamn site investigation: Boremap mapping of core drilled boreholes KSH01A and KSH01B. In preparation.

2) Kornfält K.A. & Wikman H., 1988: The Rocks of the Äspö Island – Description to the detailed maps of solid rocks including maps of 3 uncovered trenches. SKB, Progress Report 25-88-12.

Appendix 1

BIPS-images of HSH01

Project name: Oskarshamn

Image file	**: c:\bips-b~1\hsh01\hsh01_~1\hsh011~1.bip**
BDT file	**: c:\bips-b~1\hsh01\hsh01_~1\hsh011~1.bdt**
Locality	**: Oskarshamn**
Bore hole number	**: HSH01**
Date	**: 03/03/23**
Time	**: 10:00:00**
Depth range	**: 11.000 - 195.675 m**
Azimuth	**: 4**
Inclination	**: -64**
Diameter	**: 140.0 mm**
Magnetic declination	**: 0.0**
Span	**: 4**
Scan interval	**: 0.25**
Scan direction	**: To bottom**
Scale	**: 1/25**
Aspect ratio	**: 90 %**
Pages	**: 10**
Color	**:**  **+0 +0 +0**

Project name: Oskarshamn
Bore hole No.: HSH01 **Azimuth: 4** **Inclination: -64**

Depth range: 11.000 - 31.000 m

(1 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH01 **Azimuth: 0** **Inclination: -61**

Depth range: 31.000 - 51.000 m

(2 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH01 **Azimuth: 355** **Inclination: -56**

Depth range: 51.000 - 71.000 m

(3 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH01 **Azimuth: 351** **Inclination: -53**

Depth range: 71.000 - 91.000 m

(4 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

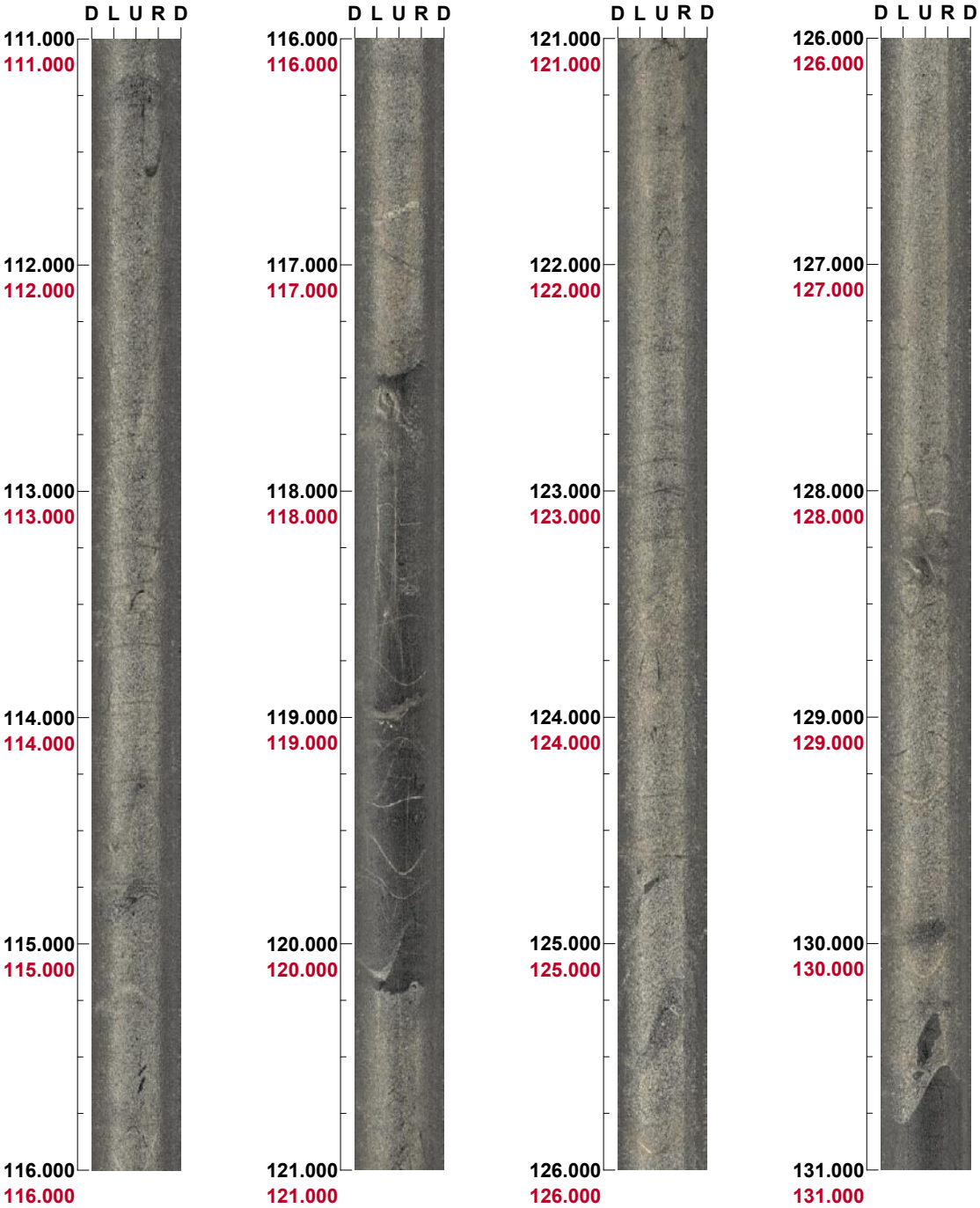
Project name: Oskarshamn
Bore hole No.: HSH01 **Azimuth: 347** **Inclination: -48**

Depth range: 91.000 - 111.000 m

(5 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH01 **Azimuth: 341** **Inclination: -43**

Depth range: 111.000 - 131.000 m



(6 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

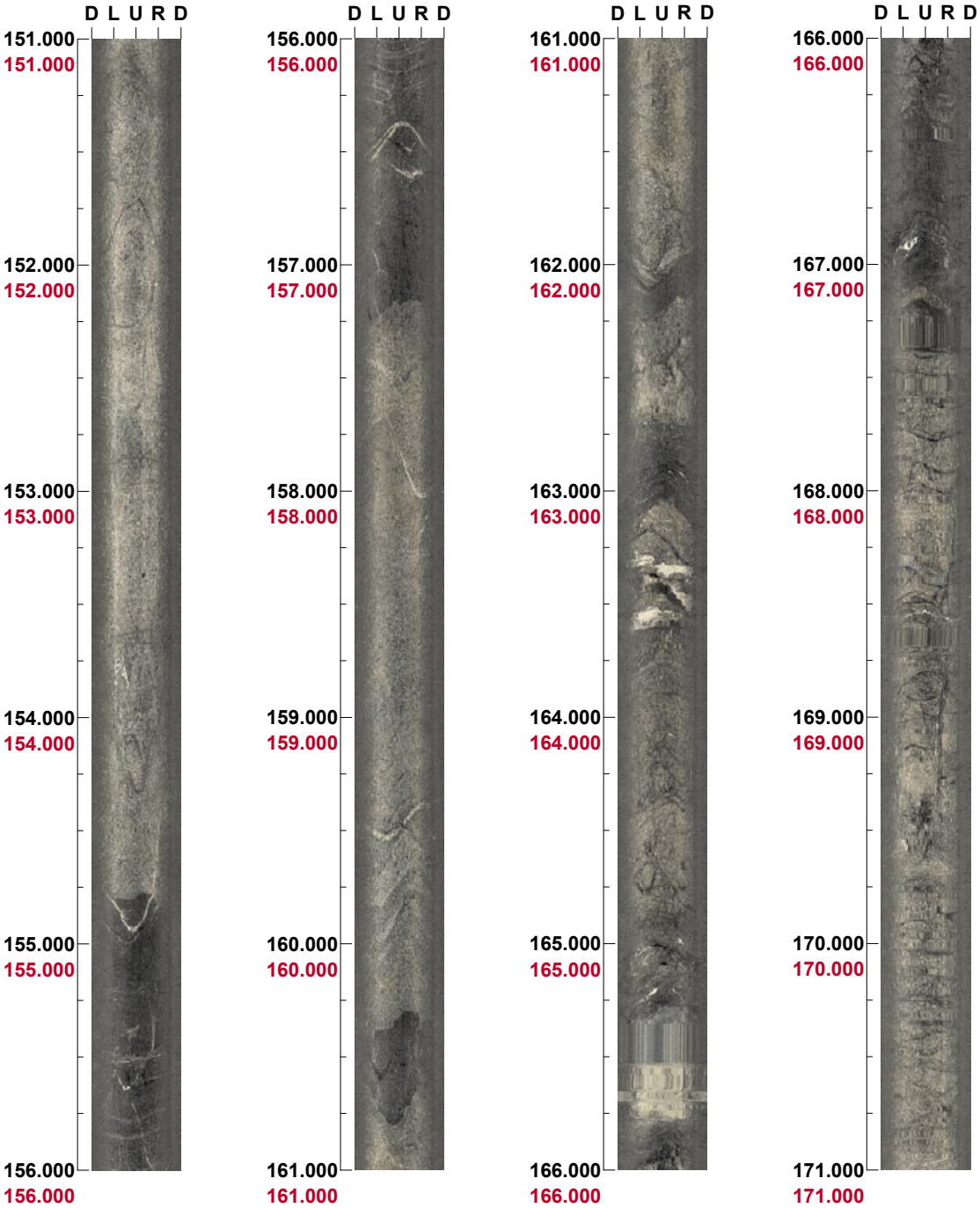
Project name: Oskarshamn
Bore hole No.: HSH01 **Azimuth: 338** **Inclination: -41**

Depth range: 131.000 - 151.000 m

(7 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH01 **Azimuth: 336** **Inclination: -37**

Depth range: 151.000 - 171.000 m



(8 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH01 **Azimuth: 335** **Inclination: -33**

Depth range: 171.000 - 191.000 m

(9 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH01 **Azimuth: 334** **Inclination: -31**

Depth range: 191.000 - 195.675 m

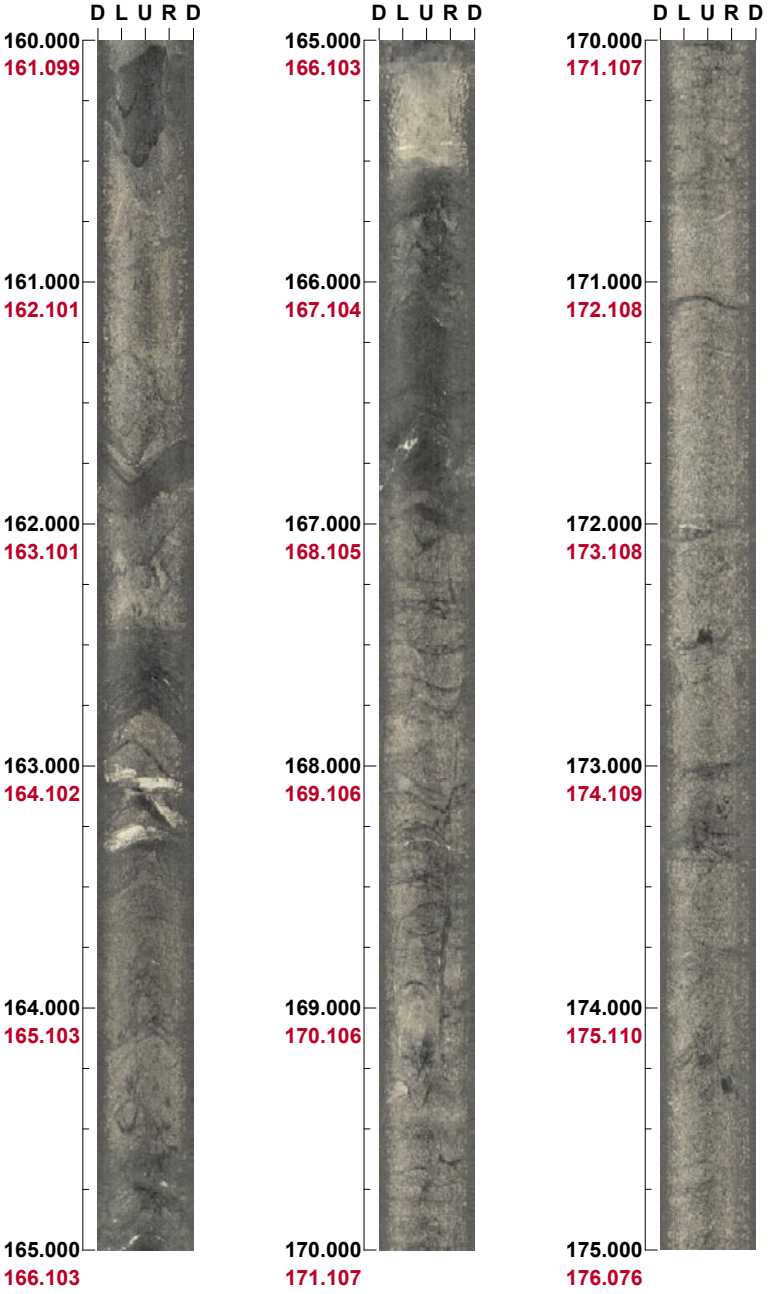
(10 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn

Image file	**: c:\bips-b~1\hsh01\hsh01_~1\hsh011~2.bip**
BDT file	**: c:\bips-b~1\hsh01\hsh01_~1\hsh011~2.bdt**
Locality	**: Oskarshamn**
Bore hole number	**: HSH01**
Date	**: 03/03/23**
Time	**: 12:03:00**
Depth range	**: 140.007 - 195.680 m**
Azimuth	**: 336**
Inclination	**: -39**
Diameter	**: 140.0 mm**
Magnetic declination	**: 0.0**
Span	**: 4**
Scan interval	**: 0.25**
Scan direction	**: To entrance**
Scale	**: 1/25**
Aspect ratio	**: 90 %**
Pages	**: 1**
Color	**:**  **+0 +0 +0**

Project name: Oskarshamn
Bore hole No.: HSH01 **Azimuth: 336** **Inclination: -35**

Depth range: 160.000 - 175.000 m



(1 / 1) **Scale: 1/25** **Aspect ratio: 90 %**

Appendix 2

BIPS-images of HSH02

Project name: Oskarshamn

Image file	**: c:\bips-b~1\hsh02\000.bip**
BDT file	**: c:\bips-b~1\hsh02\000.bdt**
Locality	**: Oskarshamn**
Bore hole number	**: HSH02**
Date	**: 02/09/16**
Time	**: 19:23:00**
Depth range	**: 11.000 - 179.993 m**
Azimuth	**: 185**
Inclination	**: -80**
Diameter	**: 140.0 mm**
Magnetic declination	**: 0.0**
Span	**: 4**
Scan interval	**: 0.25**
Scan direction	**: To bottom**
Scale	**: 1/25**
Aspect ratio	**: 90 %**
Pages	**: 9**
Color	**:**  **+0 +0 +0**

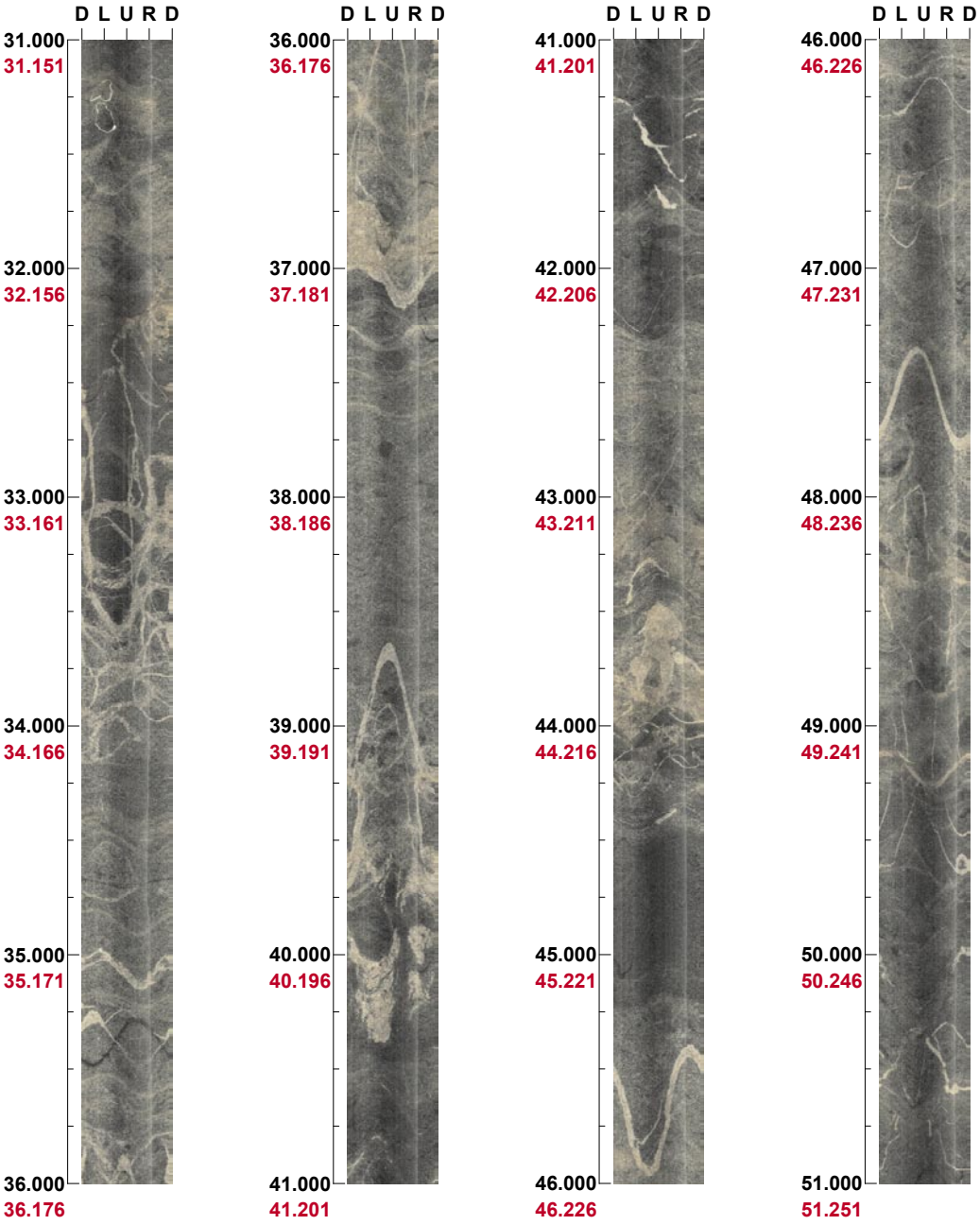
Project name: Oskarshamn
Bore hole No.: HSH02 **Azimuth: 185** **Inclination: -80**

Depth range: 11.000 - 31.000 m

(1 / 9) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH02 **Azimuth: 187** **Inclination: -80**

Depth range: 31.000 - 51.000 m



(2 / 9) **Scale: 1/25** **Aspect ratio: 90 %**

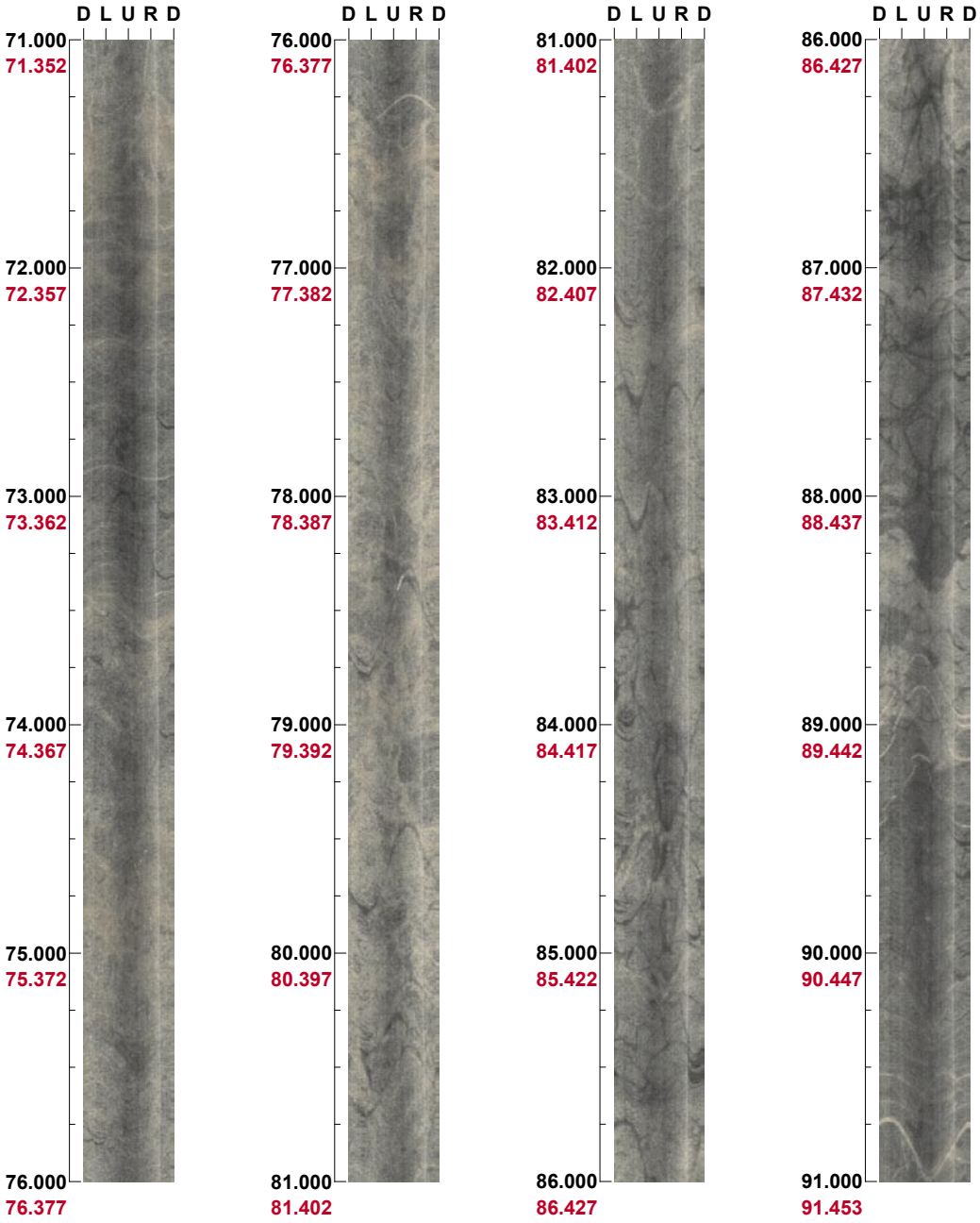
Project name: Oskarshamn
Bore hole No.: HSH02 **Azimuth: 198** **Inclination: -78**

Depth range: 51.000 - 71.000 m

(3 / 9) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH02 **Azimuth: 193** **Inclination: -75**

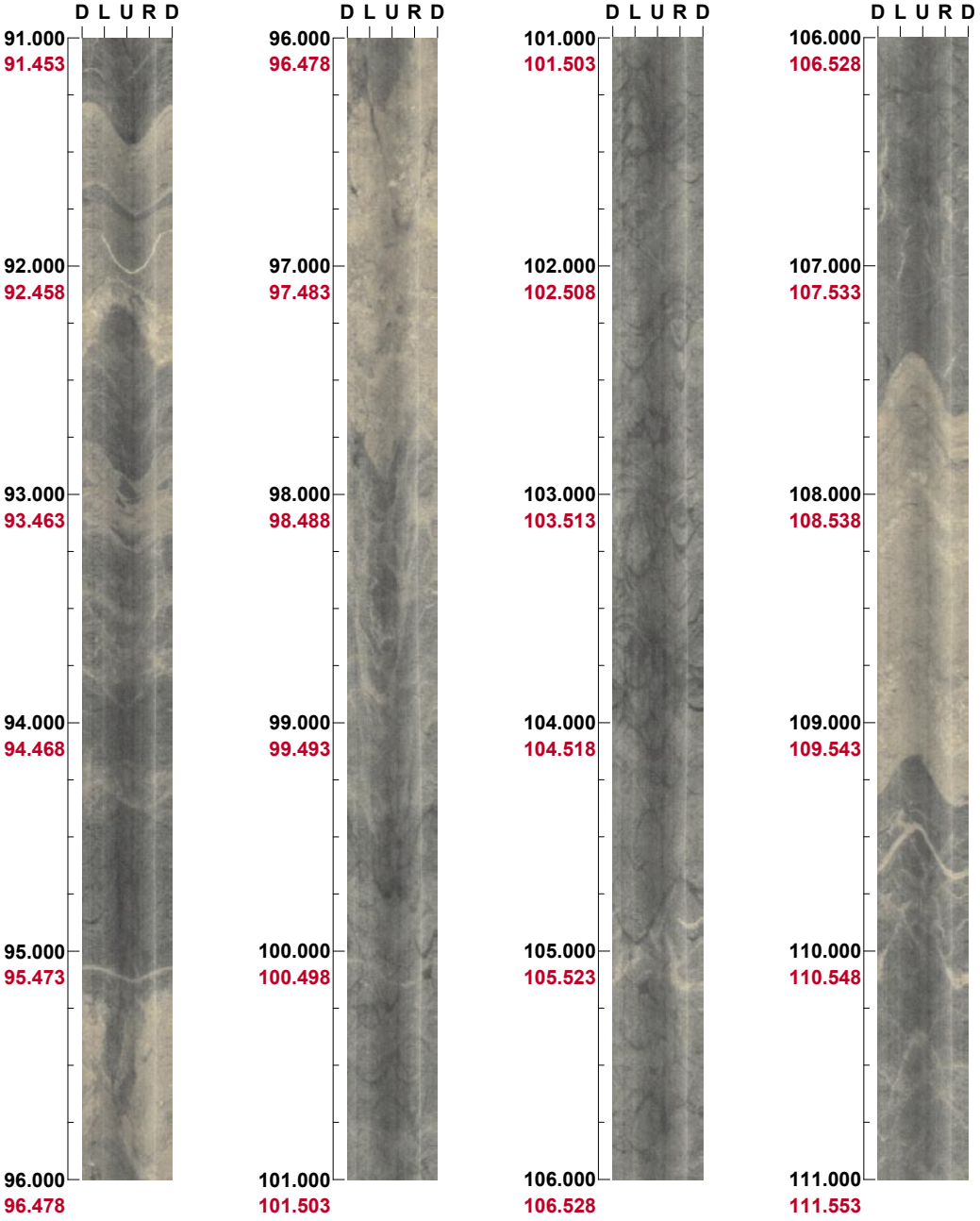
Depth range: 71.000 - 91.000 m



(4 / 9) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH02 **Azimuth: 181** **Inclination: -70**

Depth range: 91.000 - 111.000 m



(5 / 9) **Scale: 1/25** **Aspect ratio: 90 %**

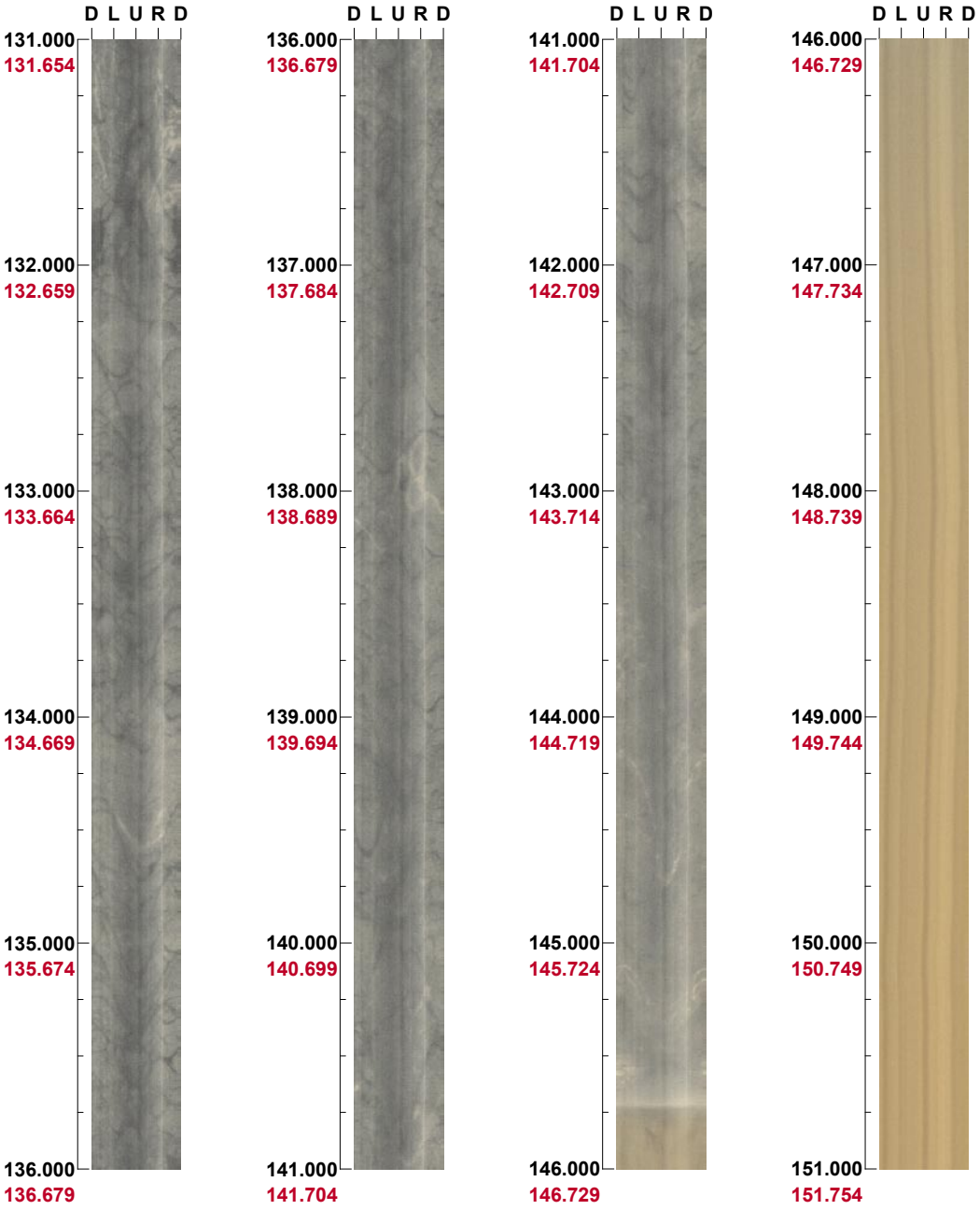
Project name: Oskarshamn
Bore hole No.: HSH02 **Azimuth: 178** **Inclination: -65**

Depth range: 111.000 - 131.000 m

(6 / 9) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH02 **Azimuth: 176** **Inclination: -63**

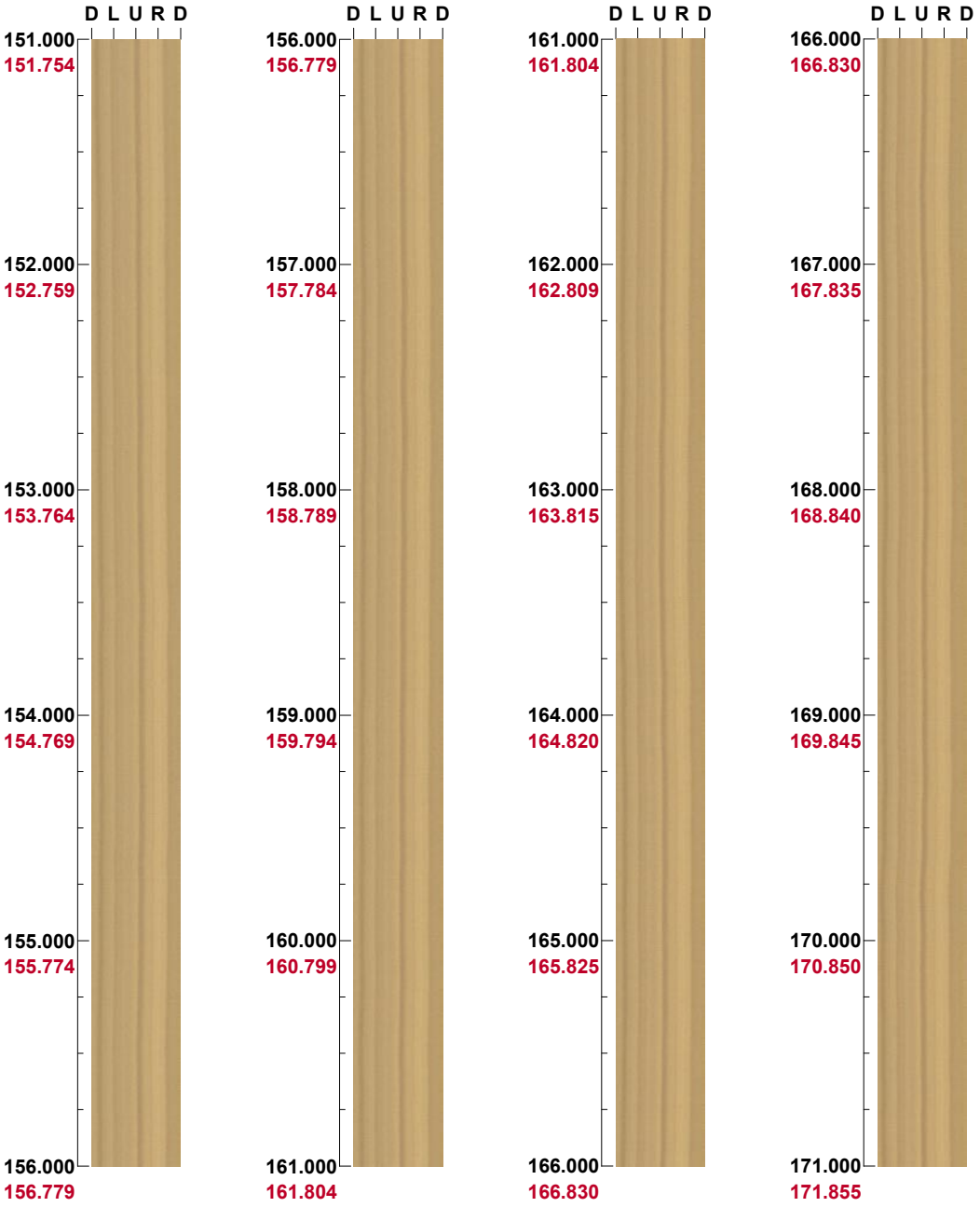
Depth range: 131.000 - 151.000 m



(7 / 9) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH02 **Azimuth: 174** **Inclination: -60**

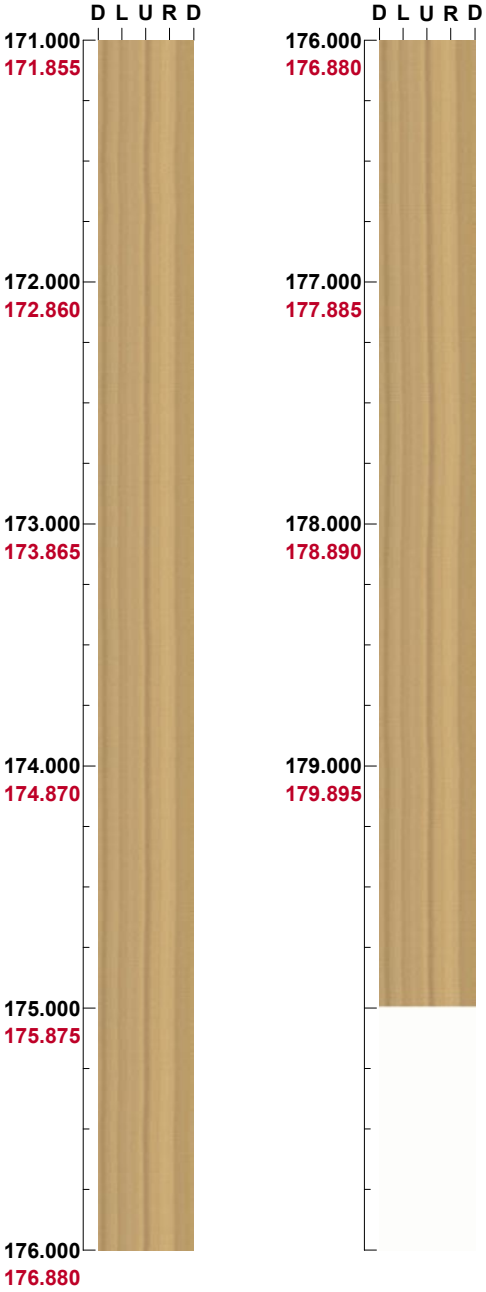
Depth range: 151.000 - 171.000 m



(8 / 9) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH02 **Azimuth: 172** **Inclination: -58**

Depth range: 171.000 - 179.993 m



(9 / 9) **Scale: 1/25** **Aspect ratio: 90 %**

Appendix 3

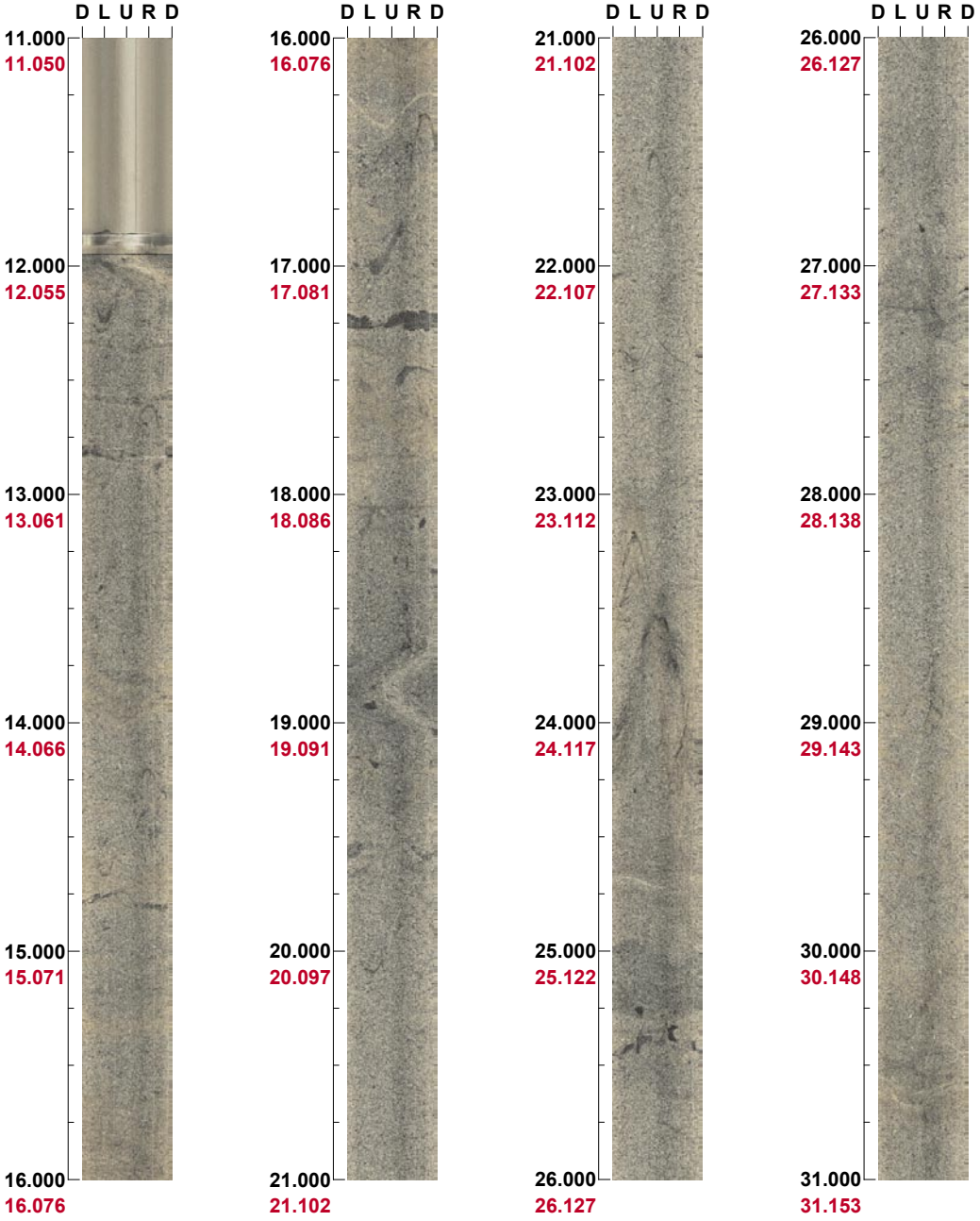
BIPS-images of HSH03

Project name: Oskarshamn

Image file	**: c:\bips-b~1\hsh03\hsh03.bip**
BDT file	**: c:\bips-b~1\hsh03\hsh03.bdt**
Locality	**: Oskarshamn**
Bore hole number	**: HSH03**
Date	**: 02/09/16**
Time	**: 10:35:00**
Depth range	**: 11.000 - 195.575 m**
Azimuth	**: 218**
Inclination	**: -79**
Diameter	**: 139.0 mm**
Magnetic declination	**: 0.0**
Span	**: 4**
Scan interval	**: 0.25**
Scan direction	**: To bottom**
Scale	**: 1/25**
Aspect ratio	**: 90 %**
Pages	**: 10**
Color	**:**  **+0 +0 +0**

Project name: Oskarshamn
Bore hole No.: HSH03 **Azimuth: 218** **Inclination: -79**

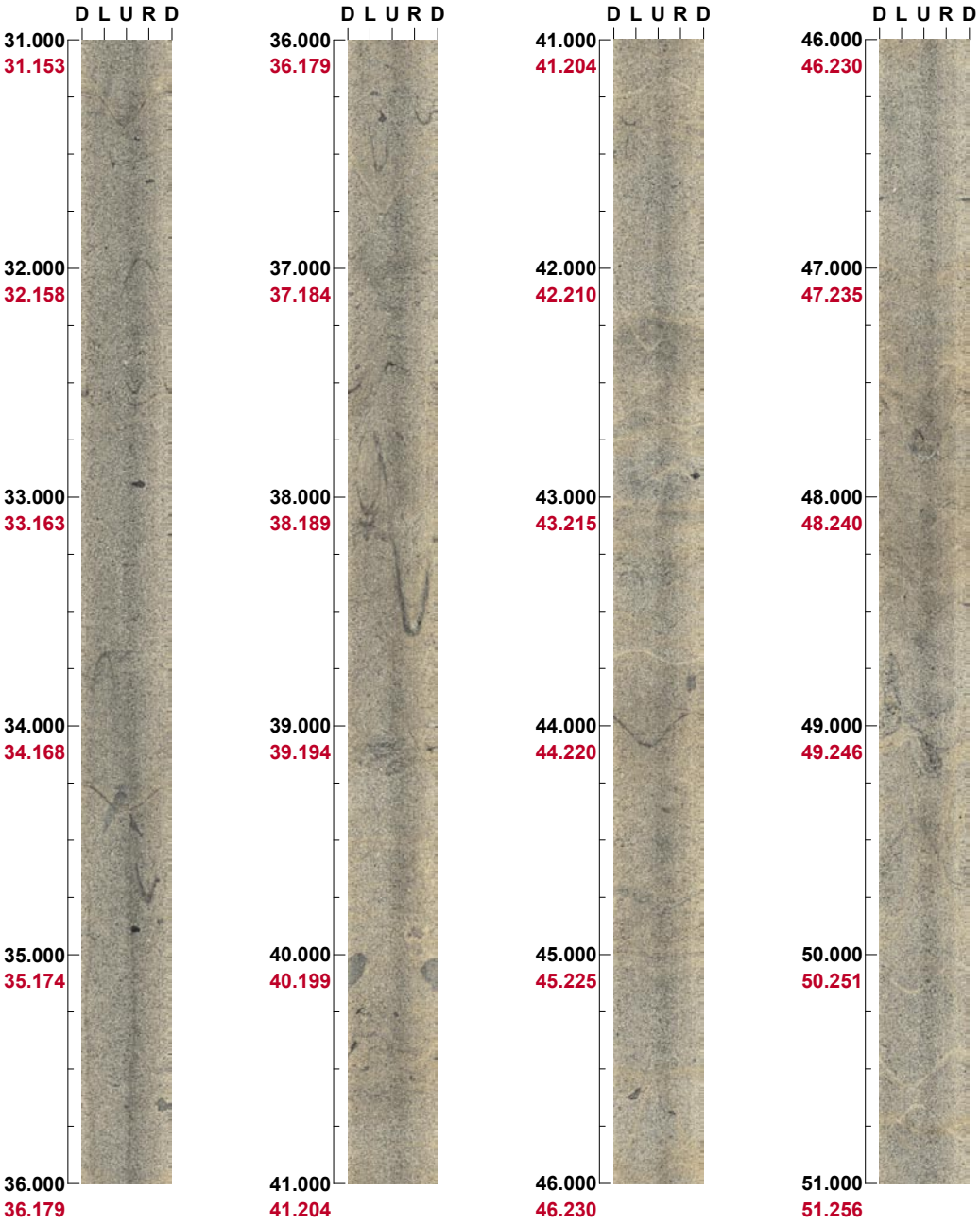
Depth range: 11.000 - 31.000 m



(1 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH03 **Azimuth: 218** **Inclination: -79**

Depth range: 31.000 - 51.000 m



(2 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH03 **Azimuth: 218** **Inclination: -79**

Depth range: 51.000 - 71.000 m

(3 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

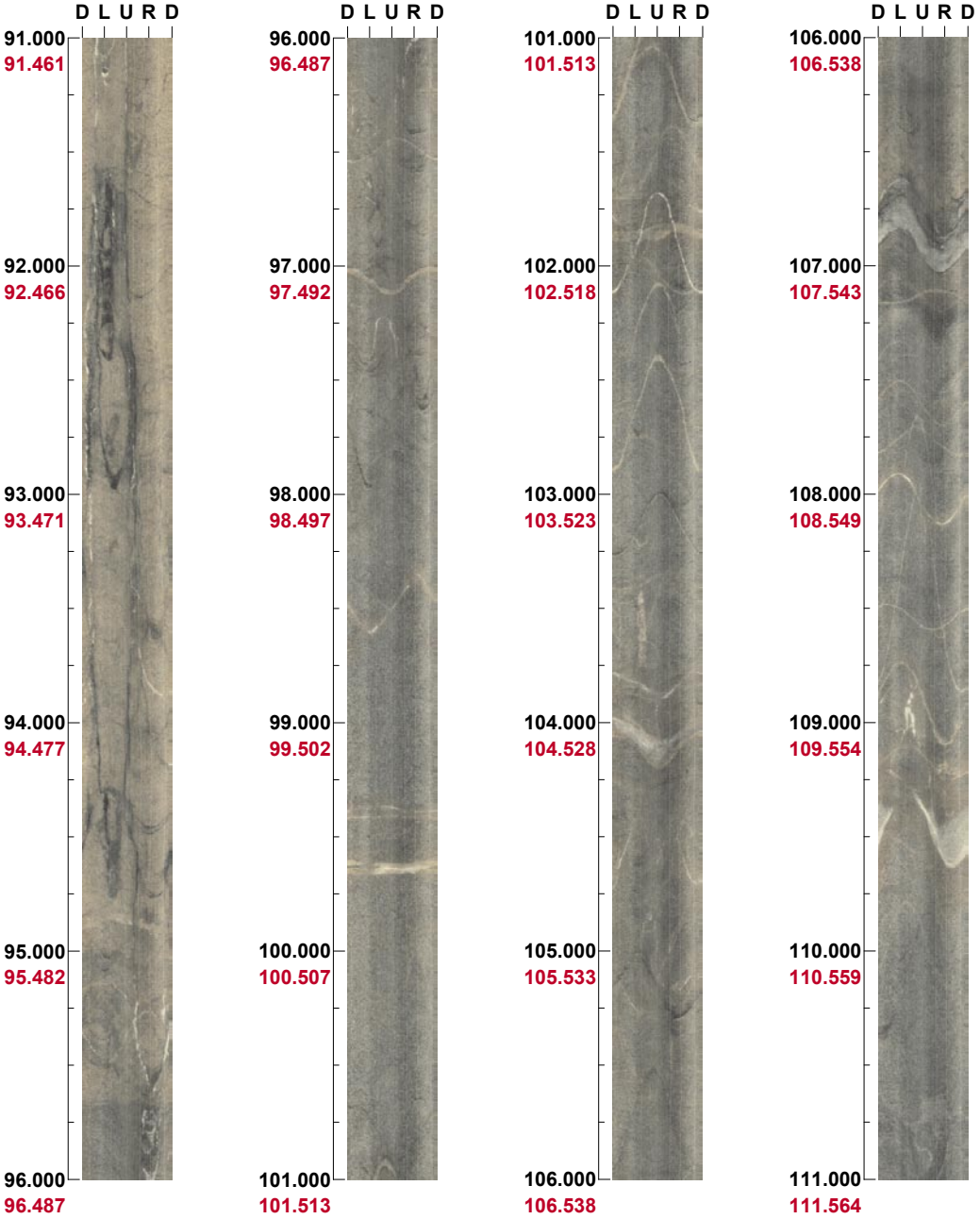
Project name: Oskarshamn
Bore hole No.: HSH03 **Azimuth: 218** **Inclination: -79**

Depth range: 71.000 - 91.000 m

(4 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH03 **Azimuth: 218** **Inclination: -79**

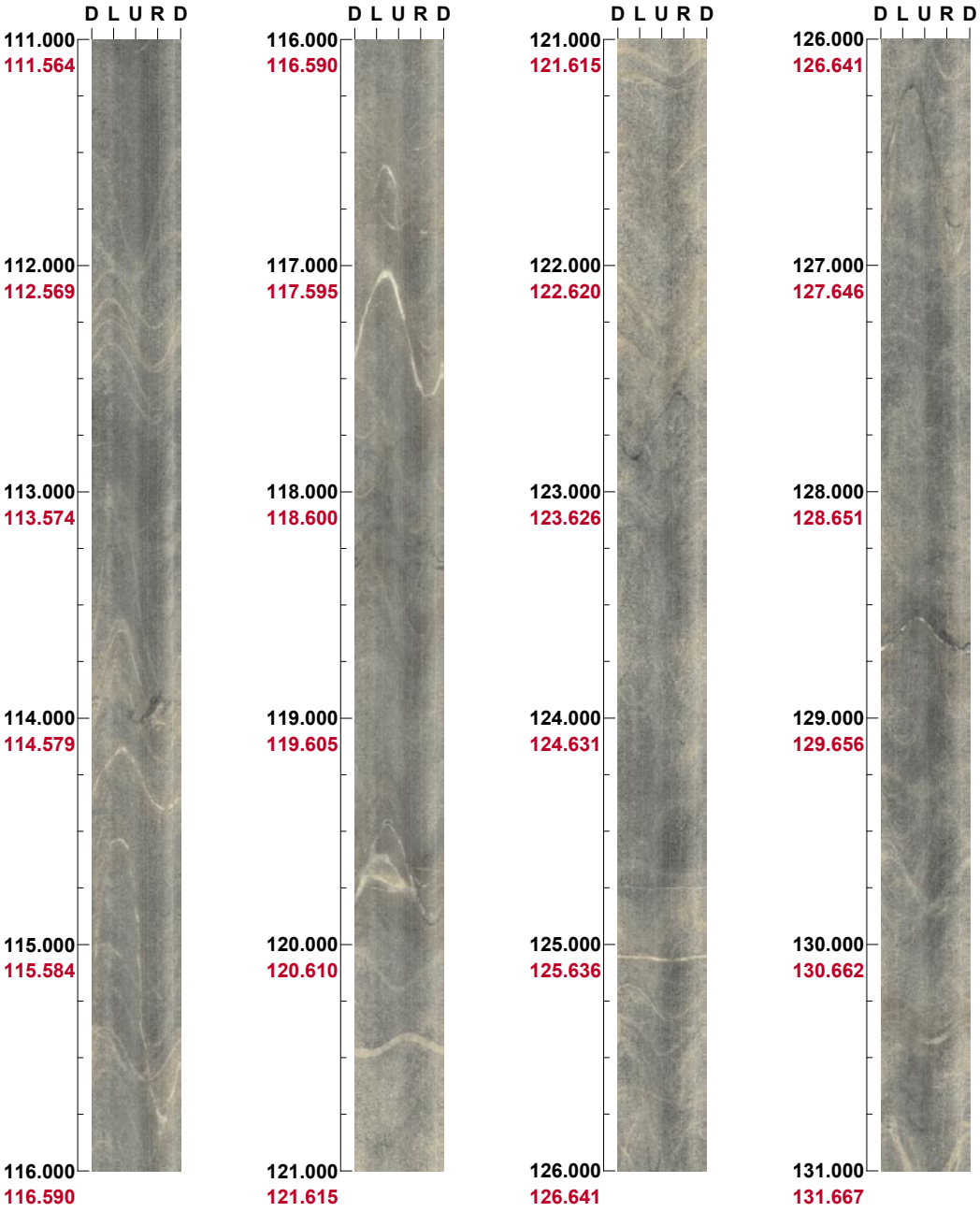
Depth range: 91.000 - 111.000 m



(5 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH03 **Azimuth: 218** **Inclination: -79**

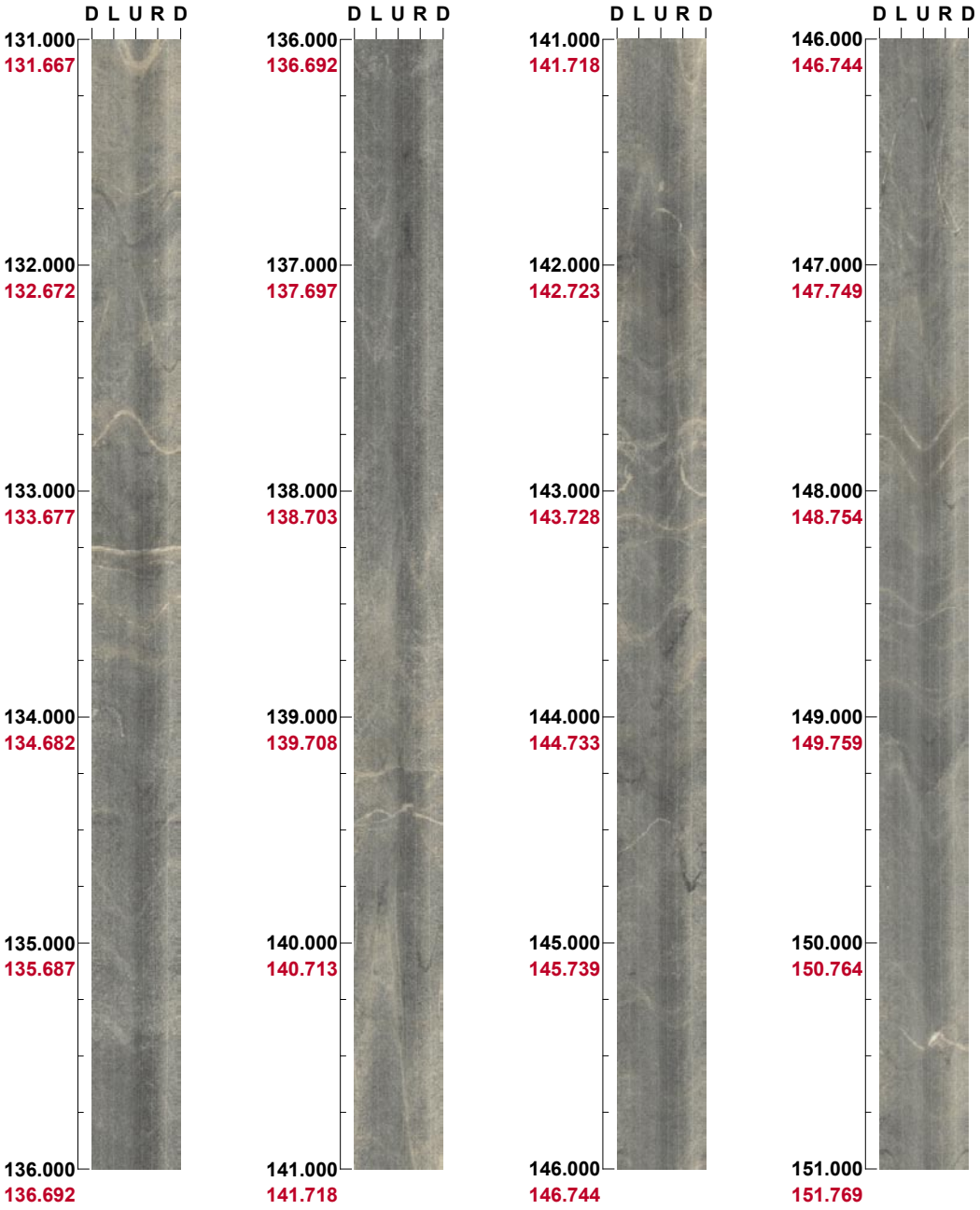
Depth range: 111.000 - 131.000 m



(6 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH03 **Azimuth: 218** **Inclination: -79**

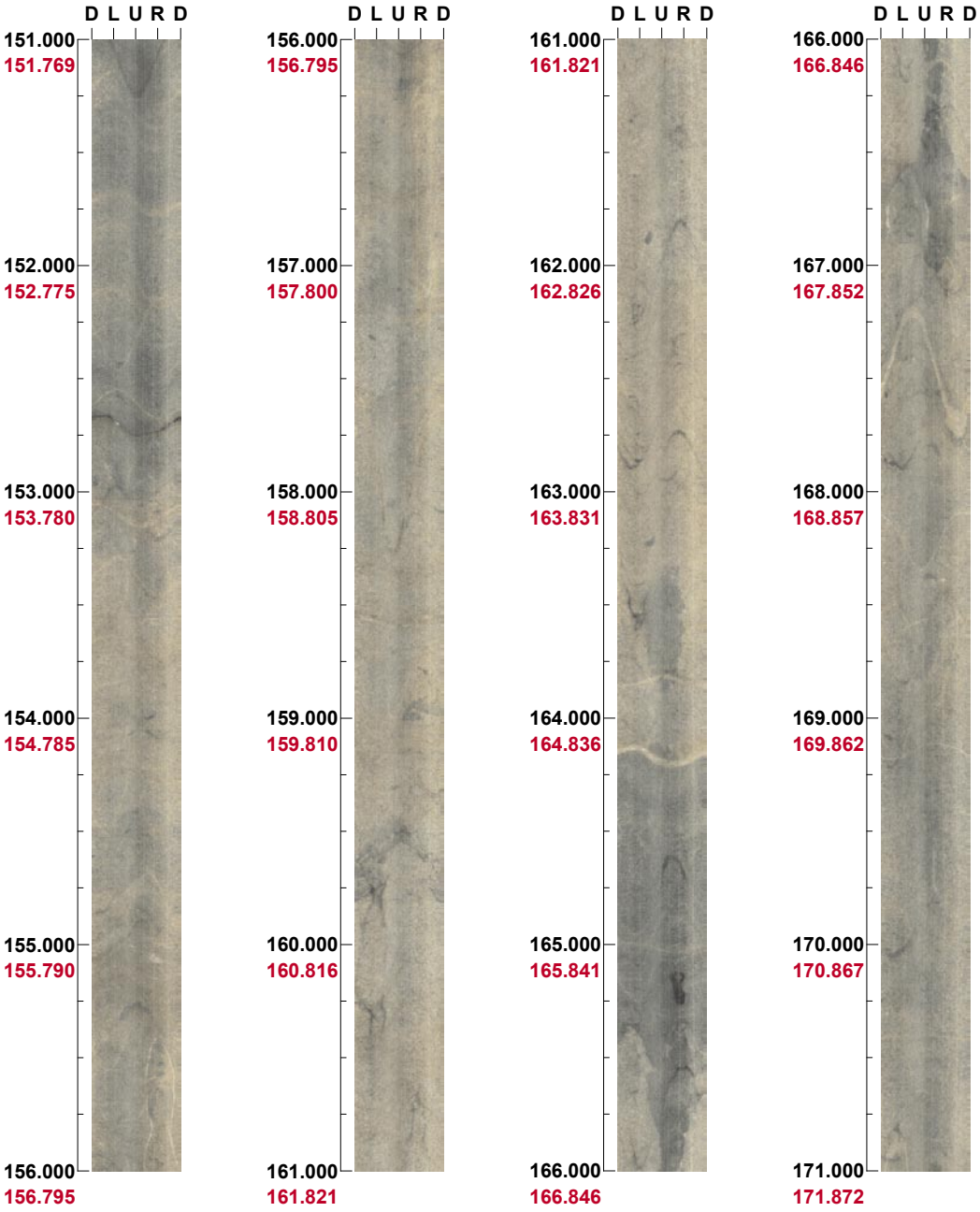
Depth range: 131.000 - 151.000 m



(7 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH03 **Azimuth: 218** **Inclination: -79**

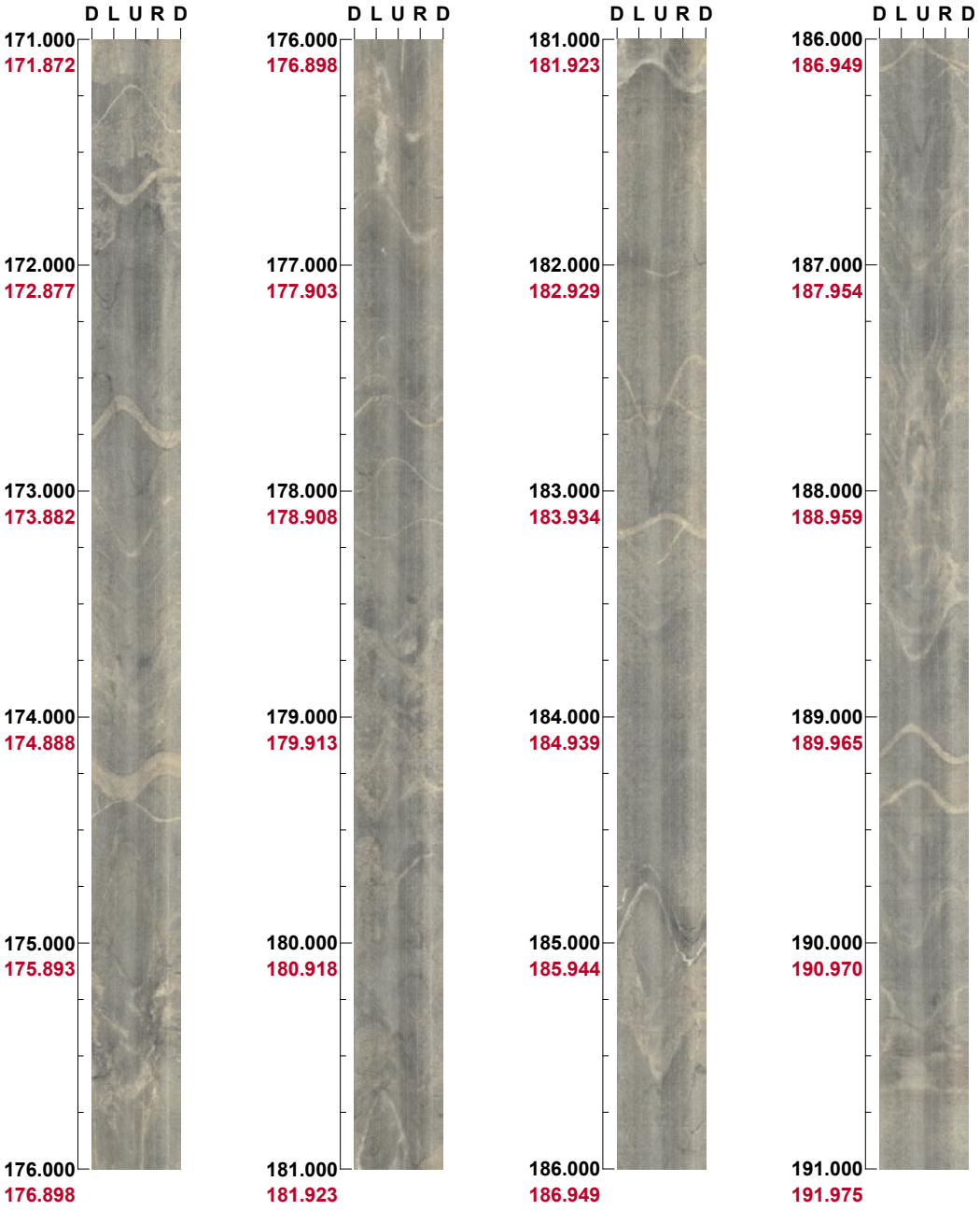
Depth range: 151.000 - 171.000 m



(8 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

Project name: Oskarshamn
Bore hole No.: HSH03 **Azimuth: 218** **Inclination: -79**

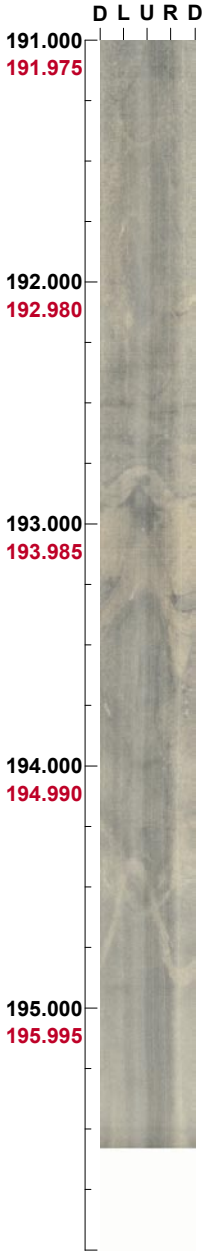
Depth range: 171.000 - 191.000 m



(9 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

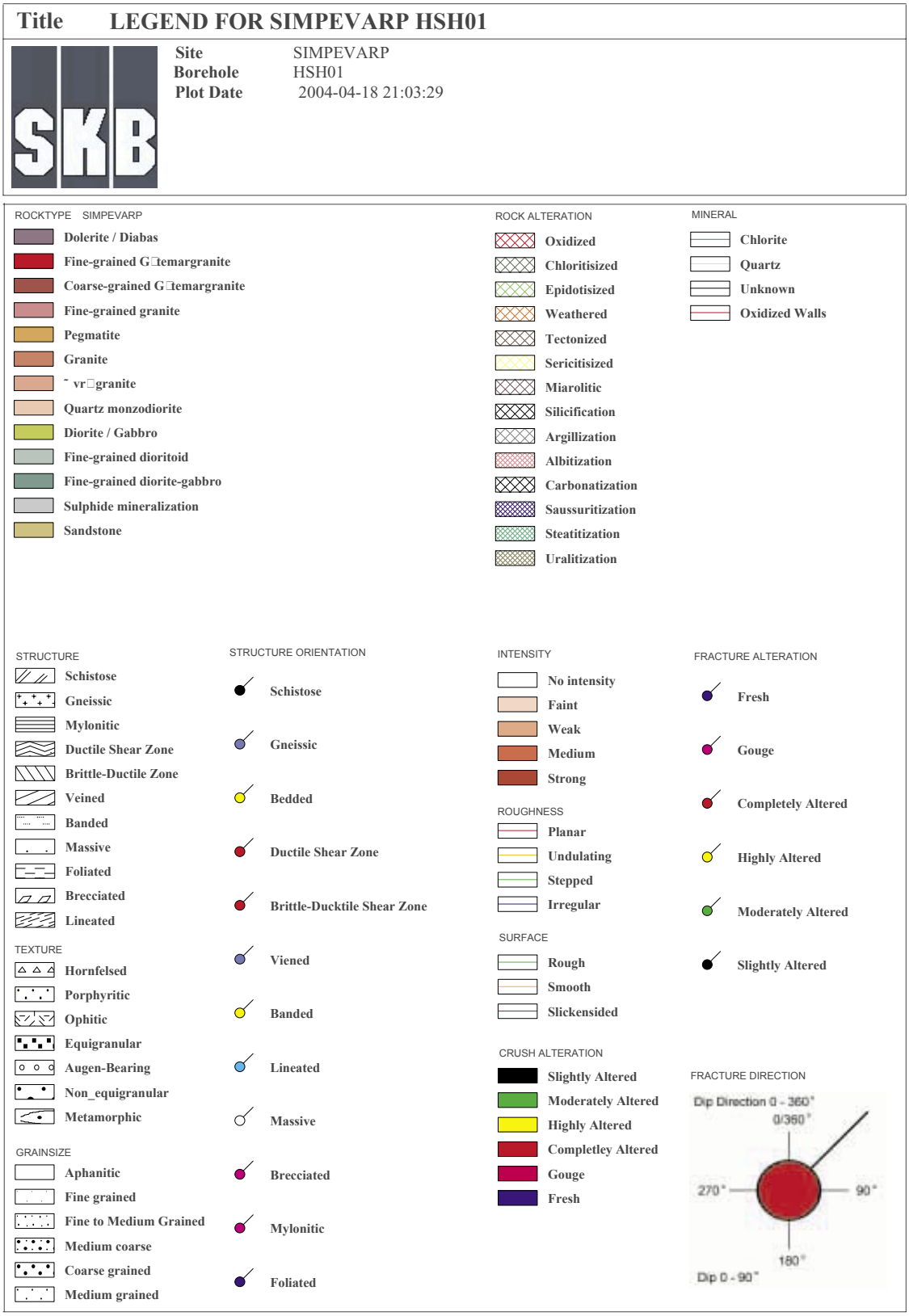
Project name: Oskarshamn
Bore hole No.: HSH03 **Azimuth: 218** **Inclination: -79**

Depth range: 191.000 - 195.575 m



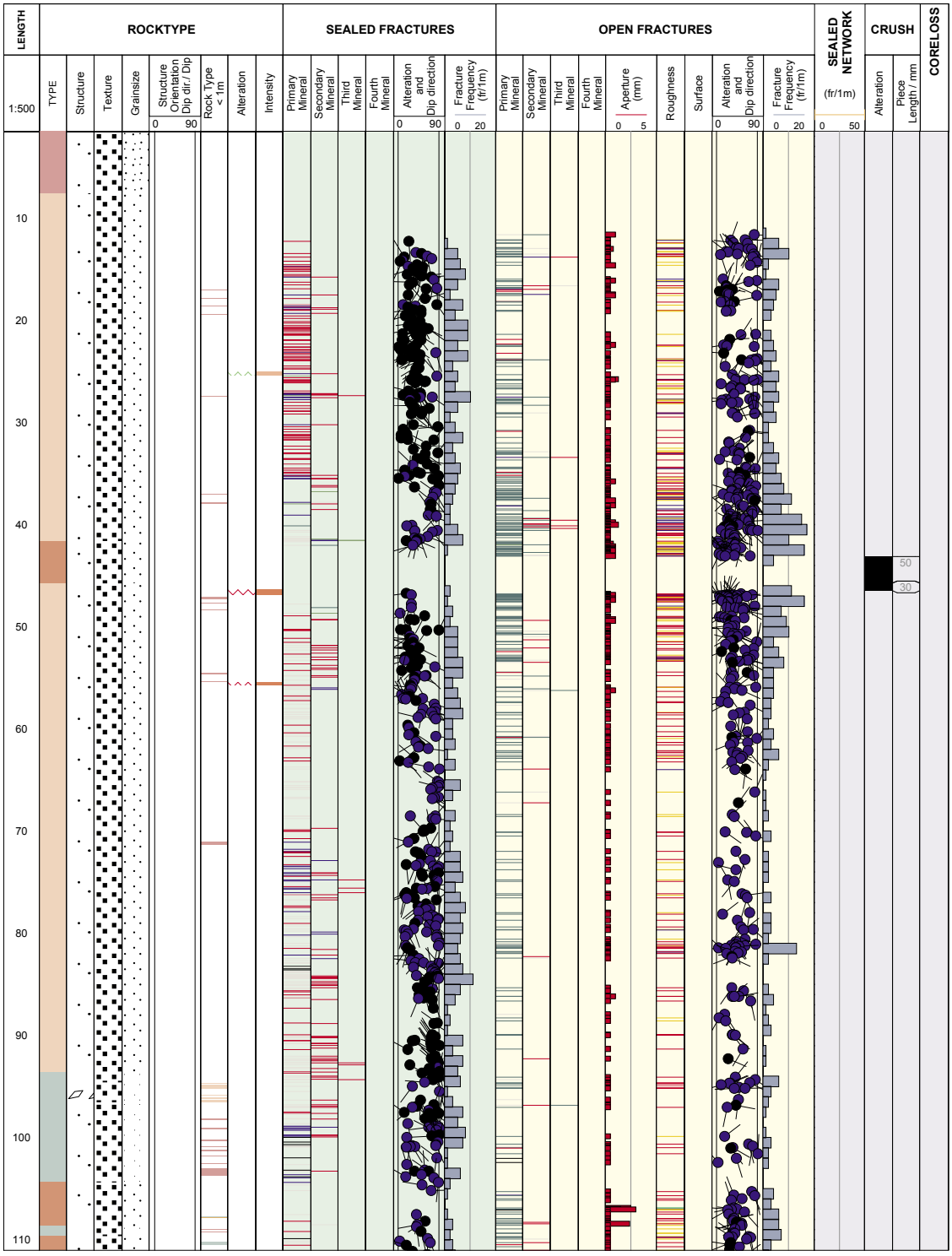
(10 / 10) **Scale: 1/25** **Aspect ratio: 90 %**

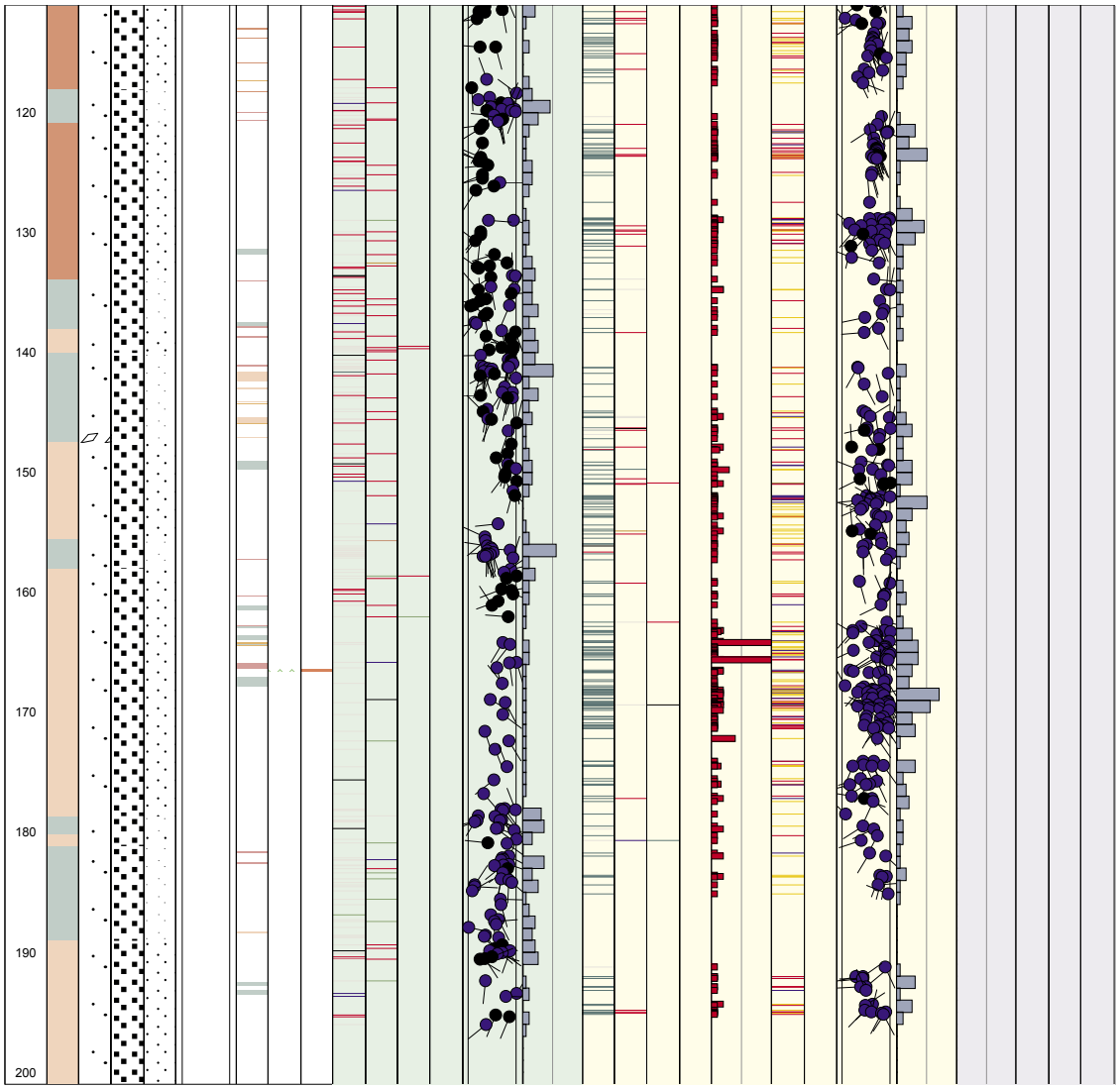
WellCad diagram of HSH01



Title

Site	SIMPEVARP	**Coordinate System**	RT90-RHB70
Borehole	HSH01	**Northing [m]**	6366217.77
Diameter [mm]	140	**Easting [m]**	1552545.72
Length [m]	200.000	**Elevation [m.a.s.l.]**	2.86
Bearing [°]	4.99	**Drilling Start Date**	2002-06-24 16:00:00
Inclination [°]	-69.98	**Drilling Stop Date**	2002-07-02 17:30:00
Date of mapping	2003-04-03 00:00:00	**Plot Date**	2004-06-09 21:04:59
Rocktype data from	p_rock_XXXXX	**Fracture data from**	p_fract_core

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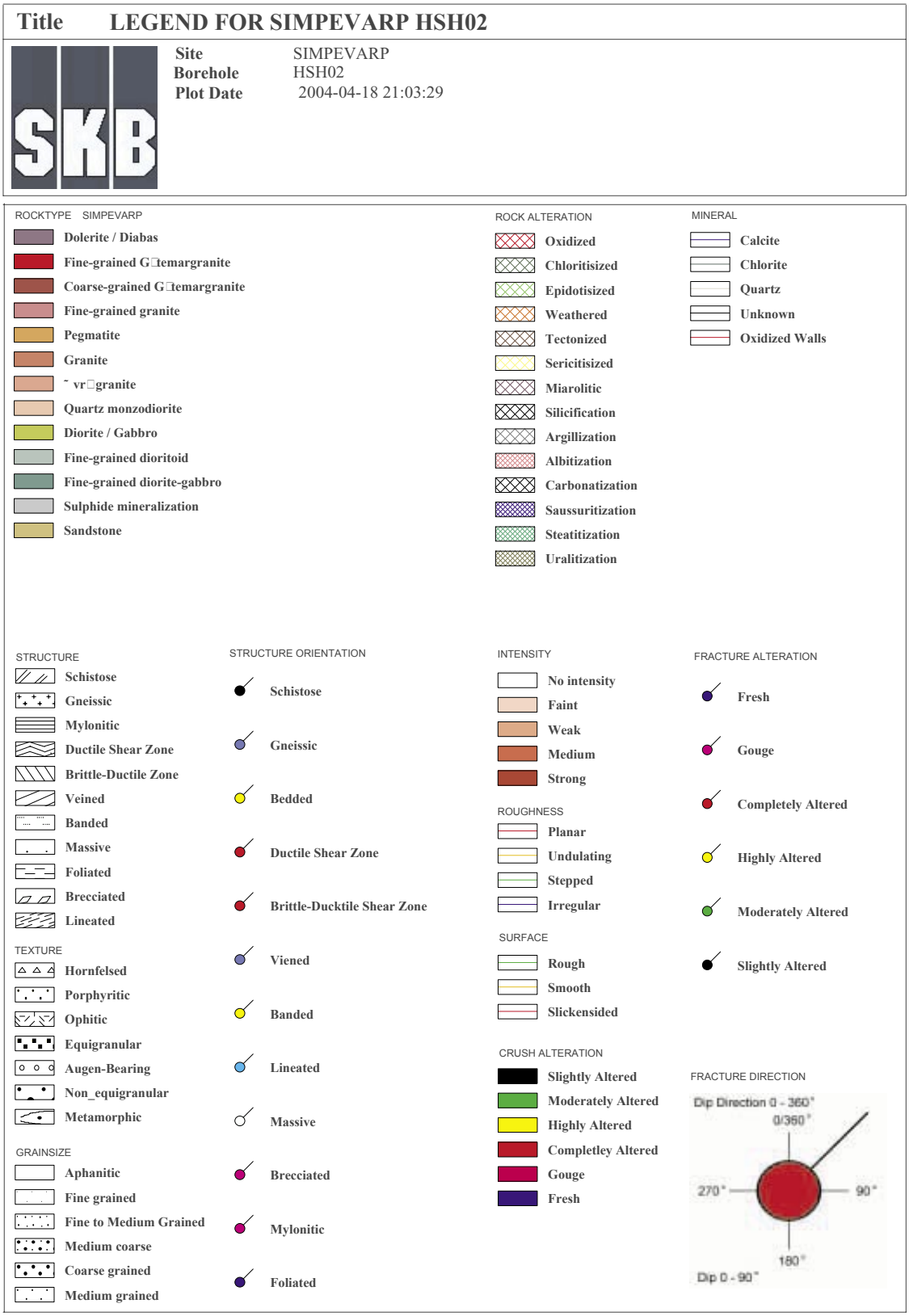
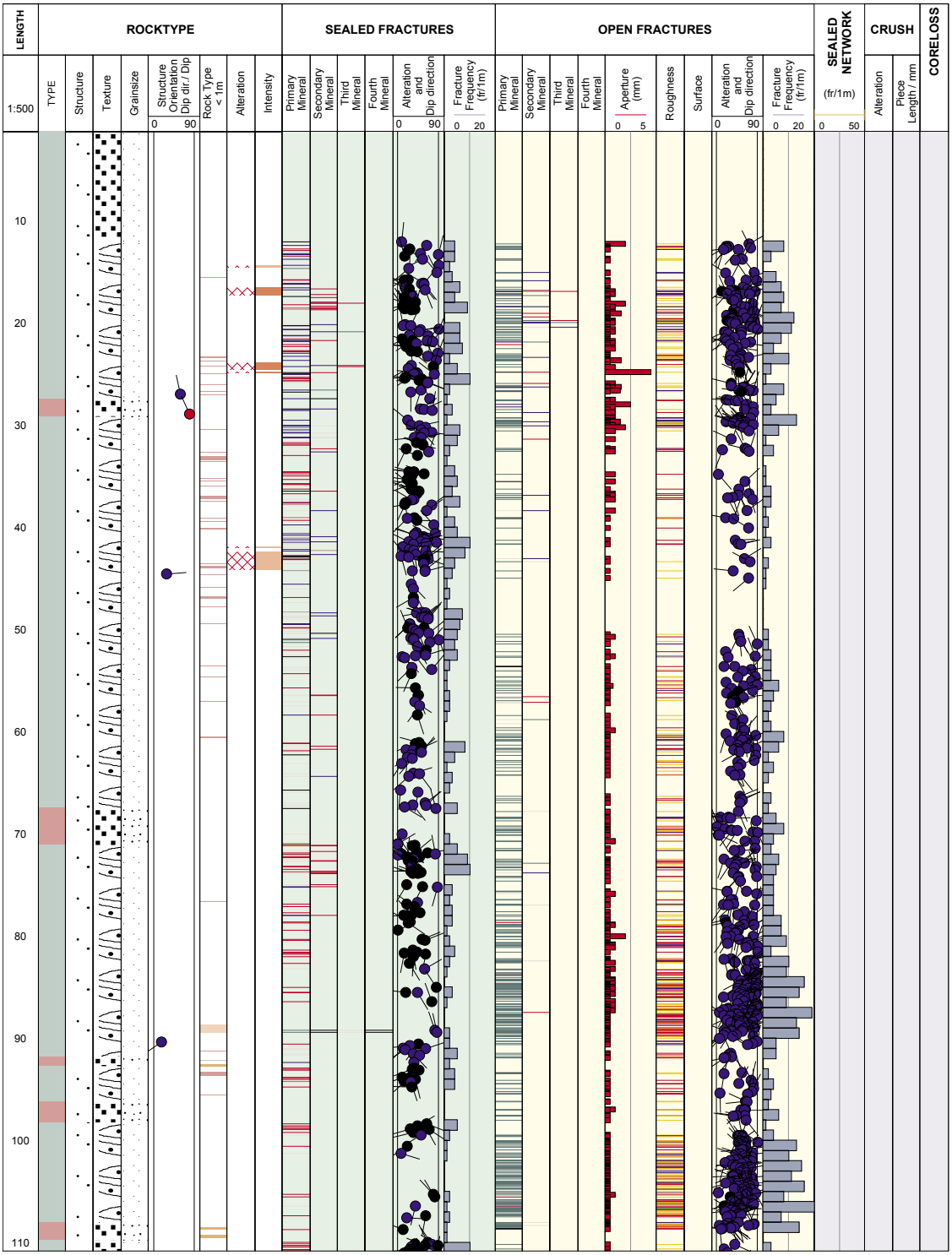
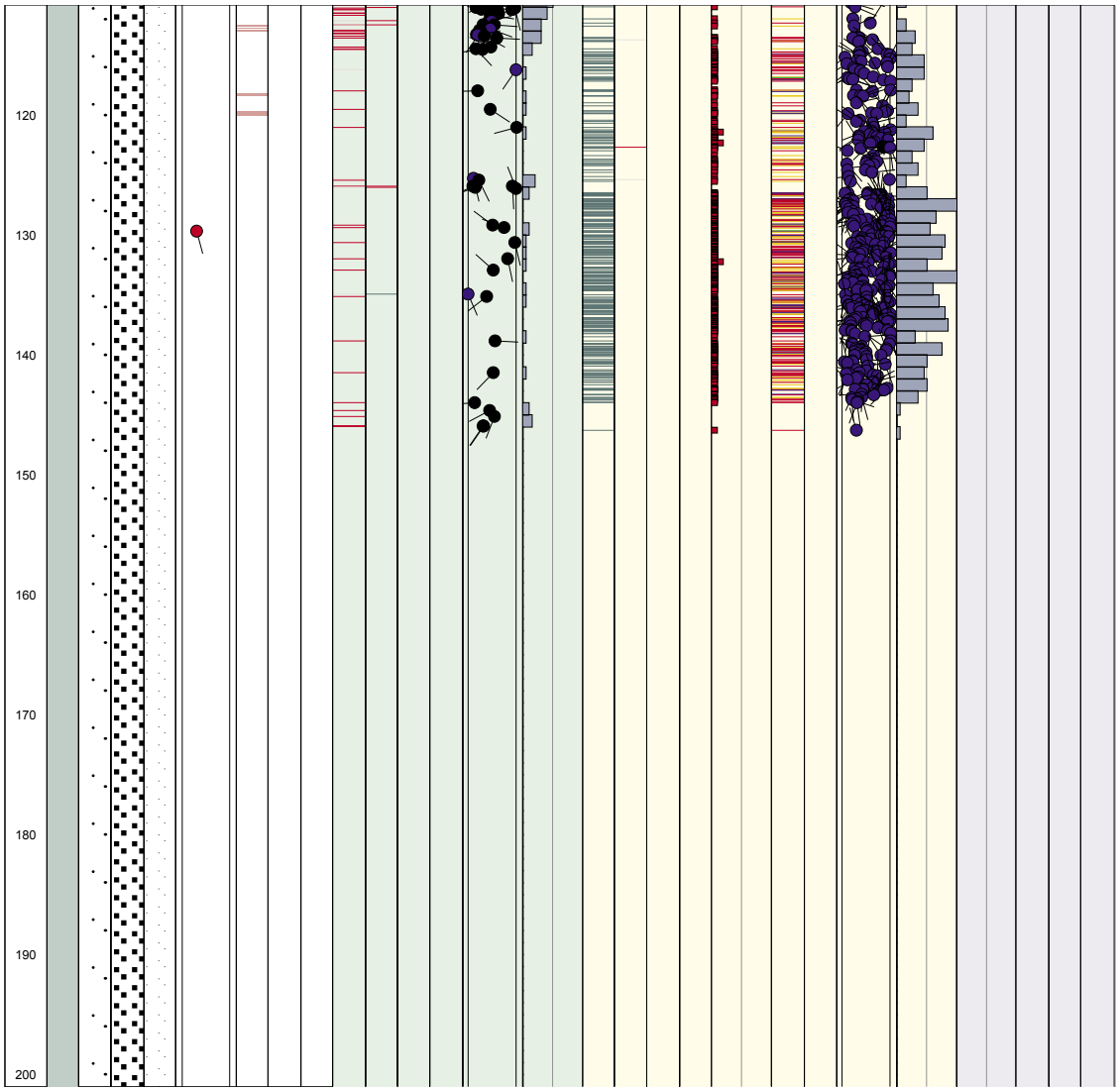
WellCad diagram of HSH02



Title

Site	SIMPEVARP	**Coordinate System**	RT90-RHB70
Borehole	HSH02	**Northing [m]**	6365682.90
Diameter [mm]	140	**Easting [m]**	1551368.34
Length [m]	200.000	**Elevation [m.a.s.l.]**	6.65
Bearing [°]	186.10	**Drilling Start Date**	2002-06-27 07:00:00
Inclination [°]	-80.08	**Drilling Stop Date**	2002-07-08 19:00:00
Date of mapping	2003-04-09 00:00:00	**Plot Date**	2004-06-09 21:04:59
Rocktype data from	p_rock_XXXXX	**Fracture data from**	p_fract_core

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WellCad diagram of HSH03

Title LEGEND FOR SIMPEVARP HSH03

Site SIMPEVARP
Borehole HSH03
Plot Date 2004-04-18 21:03:29

ROCKTYPE SIMPEVARP

- Dolerite / Diabas
- Fine-grained G□temargranite
- Coarse-grained G□temargranite
- Fine-grained granite
- Pegmatite
- Granite
- ˜ vr□granite
- Quartz monzodiorite
- Diorite / Gabbro
- Fine-grained dioritoid
- Fine-grained diorite-gabbro
- Sulphide mineralization
- Sandstone

ROCK ALTERATION

- Oxidized
- Chloritisized
- Epidotisized
- Weathered
- Tectonized
- Sericitisized
- Miarolitic
- Silicification
- Argillization
- Albitization
- Carbonatization
- Saussuritization
- Steatitization
- Uralitization

MINERAL

- Calcite
- Chlorite
- Quartz
- Unknown

STRUCTURE

- Schistose
- Gneissic
- Mylonitic
- Ductile Shear Zone
- Brittle-Ductile Zone
- Veined
- Banded
- Massive
- Foliated
- Brecciated
- Lineated

TEXTURE

- Hornfelsed
- Porphyritic
- Ophitic
- Equigranular
- Augen-Bearing
- Non_equigranular
- Metamorphic

GRAINSIZE

- Aphanitic
- Fine grained
- Fine to Medium Grained
- Medium coarse
- Coarse grained
- Medium grained

STRUCTURE ORIENTATION

- Schistose
- Gneissic
- Bedded
- Ductile Shear Zone
- Brittle-Ducktile Shear Zone
- Viened
- Banded
- Lineated
- Massive
- Brecciated
- Mylonitic
- Foliated

INTENSITY

- No intensity
- Faint
- Weak
- Medium
- Strong

ROUGHNESS

- Planar
- Undulating
- Stepped
- Irregular

SURFACE

- Rough
- Smooth
- Slickensided

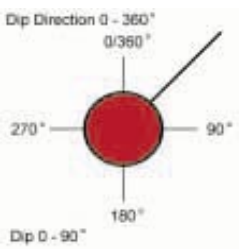
CRUSH ALTERATION

- Slightly Altered
- Moderately Altered
- Highly Altered
- Completley Altered
- Gouge
- Fresh

FRACTURE ALTERATION

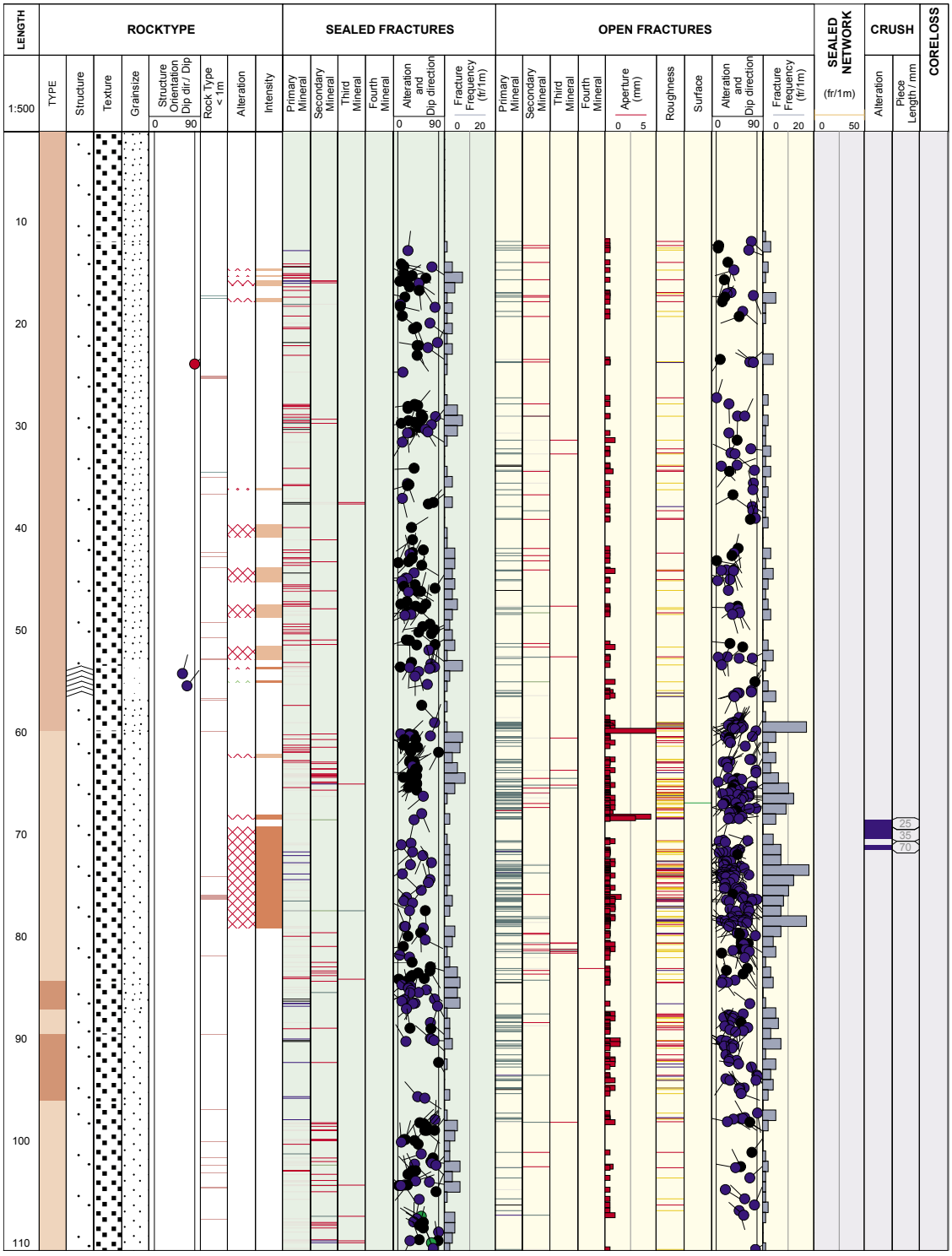
- Fresh
- Gouge
- Completely Altered
- Highly Altered
- Moderately Altered
- Slightly Altered

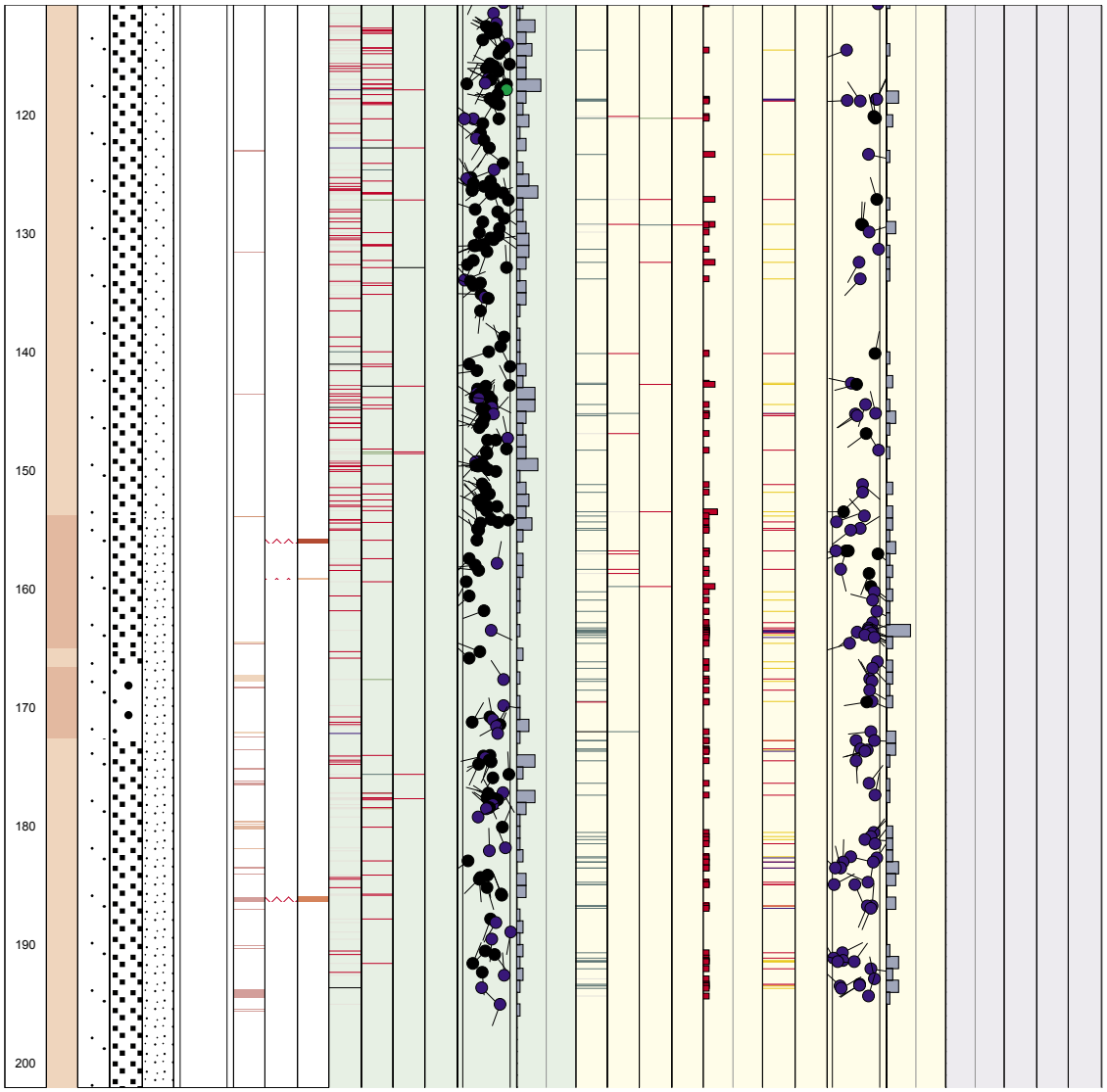
FRACTURE DIRECTION



Title

Site	SIMPEVARP	**Coordinate System**	RT90-RHB70
Borehole	HSH03	**Northing [m]**	6366213.95
Diameter [mm]	139	**Easting [m]**	1552544.53
Length [m]	201.000	**Elevation [m.a.s.l.]**	2.52
Bearing [°]	218.94	**Drilling Start Date**	2002-07-02 17:30:00
Inclination [°]	-79.48	**Drilling Stop Date**	2002-07-09 19:00:00
Date of mapping	2003-03-10 00:00:00	**Plot Date**	2004-06-09 21:04:59
Rocktype data from	p_rock_XXXXX	**Fracture data from**	p_fract_core

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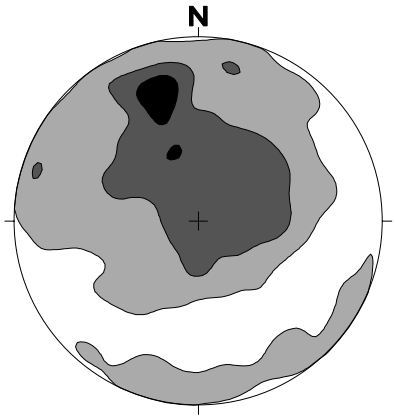
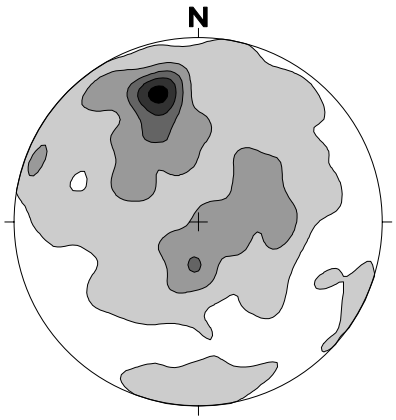
Appendix 7

Stereographic projections of open and sealed fractures, HSH01-03 (Lower hemisphere equal area, poles to planes)

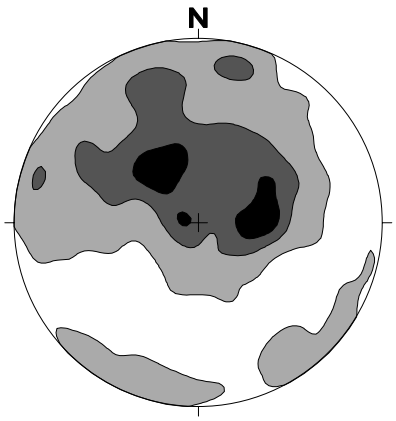
Lower hemisphere equal area projections of fracture data from HSH01



HSH01 – all fractures (n=1454)

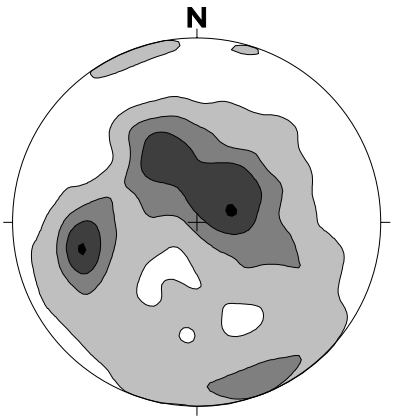


HSH01- open fractures (n=572)

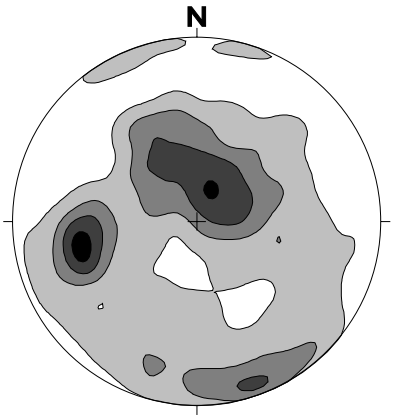


HSH01 – sealed fractures (n=712)

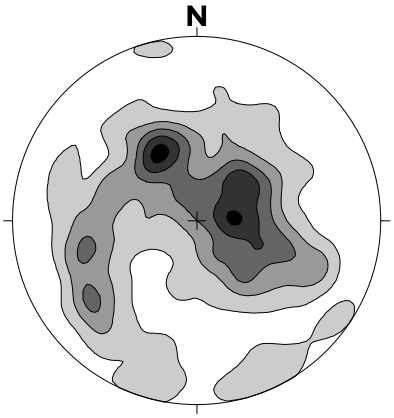
Lower hemisphere equal area projections of fracture data from HSH02



HSH02 – all fractures (n=1198)

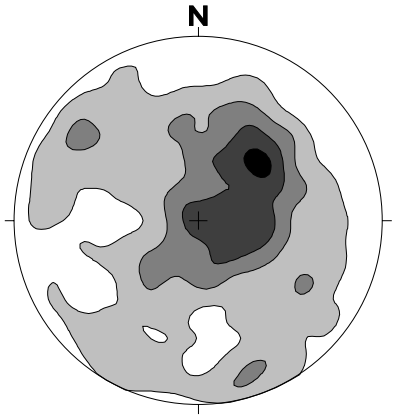


HSH02 – open fractures (n=824)

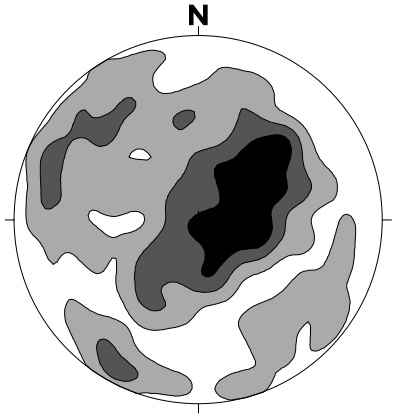


HSH02 – sealed fractures (n= 374)

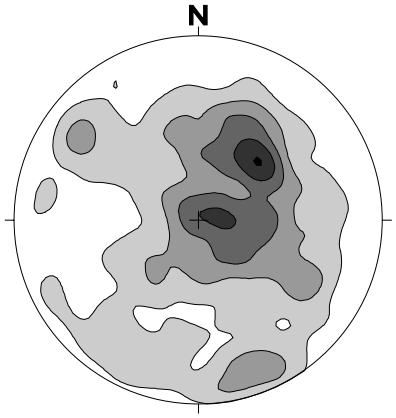
Lower hemisphere equal area projections of fracture data from HSH03



HSH03 – all fractures (n=843)



HSH03 – open fractures (n=357)



HSH03 – sealed fractures (n=486)

Appendix 8

In data: Borehole length and diameter, HSH01-03

Hole Diam T - Drilling: Borehole diameter

HSH01, 2002-06-24 16:00:00 - 2002-07-02 17:30:00 (0.000 - 200.000 m)

Sub Secup (m)	Sub Seclow (m)	Hole Diam (m)	Comment
0.000	1.500		
1.500	12.030	0.215	
12.030	200.000	0.140	Inner diameter of crown at 200 m!

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Hole Diam T - Drilling: Borehole diameter

HSH02, 2002-06-27 07:00:00 - 2002-07-08 19:00:00 (0.000 - 200.000 m)

Sub Secup (m)	Sub Seclow (m)	Hole Diam (m)	Comment
0.000	12.000	0.160	
12.000	12.030	0.148	
12.030	200.000	0.140	

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Hole Diam T - Drilling: Borehole diameter

HSH03, 2002-07-02 17:30:00 - 2002-07-09 19:00:00 (0.000 - 201.000 m)

Sub Secup (m)	Sub Seclow (m)	Hole Diam (m)	Comment
0.000	12.000	0.160	
12.000	12.030	0.148	
12.030	201.000	0.139	

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Appendix 9

In data: Deviation data for HSH01-02 (data for HSH03 is missing)

Magnetic Acc Dev T - Magnetic accelerometer deviation measurement

HSH01, 2002-12-14 08:30:00 - 2002-12-14 12:15:00 (0.000 - 200.000 m)

Bhlen (m)	Magnetic Bearing (degrees)	Dip (degrees)	Northing (m)	Easting (m)	Elevation (m)	Locala (m)	Localb (m)	Localc (m)
0.00	4.4	65.0						
3.00	3.9	64.8						
6.00	3.6	64.6						
9.00	3.1	64.3						
12.00	3.1	63.9						
15.00	2.6	63.3						
18.00	2.3	62.6						
21.00	1.6	61.8						
24.00	0.5	61.1						
27.00	359.5	60.5						
30.00	359.3	59.8						
33.00	359.1	58.9						
36.00	358.5	58.2						
39.00	357.8	57.7						
42.00	356.7	57.3						
45.00	356.0	56.7						
48.00	355.8	56.2						
51.00	355.1	55.5						
54.00	353.5	54.7						
57.00	352.2	54.0						
60.00	351.5	53.4						
63.00	351.1	52.7						
66.00	350.4	52.1						
69.00	349.3	51.6						
72.00	347.9	51.1						
75.00	347.7	50.4						
78.00	348.3	49.9						
81.00	348.6	49.4						
84.00	347.4	48.8						
87.00	346.1	48.1						
90.00	345.2	47.5						
93.00	343.9	46.9						
96.00	342.9	46.3						
99.00	342.2	45.7						
102.00	341.5	45.0						
105.00	340.9	44.3						
108.00	341.1	43.6						

Bhlen (m)	Magnetic Bearing (degrees)	Dip (degrees)	Northing (m)	Easting (m)	Elevation (m)	Locala (m)	Localb (m)	Localc (m)
111.00	340.8	43.0						
114.00	339.7	42.4						
117.00	338.7	41.8						
120.00	338.6	41.2						
123.00	339.1	40.7						
126.00	338.6	40.2						
129.00	336.9	39.8						
132.00	336.4	39.2						
135.00	337.2	38.7						
138.00	338.5	38.2						
141.00	338.4	37.7						
144.00	336.9	37.2						
147.00	336.5	36.7						
150.00	336.8	36.2						
153.00	336.5	35.7						
156.00	336.1	35.1						
159.00	336.2	34.6						
162.00	336.0	34.2						
165.00	335.6	33.9						
168.00	335.4	33.6						
171.00	335.0	33.1						
174.00	334.4	32.7						
177.00	334.6	32.3						
180.00	334.7	31.9						
183.00	333.3	31.5						
186.00	332.2	31.1						
189.00	332.3	30.7						
192.00	332.4	30.2						
195.00	332.2	29.8						
198.00	332.1	29.5						
200.00	332.1	29.3						

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Magnetic Acc Dev T - Magnetic accelerometer deviation measurement

HSH02, 2002-12-14 15:30:00 - 2002-12-14 17:20:00 (0.000 - 200.000 m)

Bhlen (m)	Magnetic Bearing (degrees)	Dip (degrees)	Northing (m)	Easting (m)	Elevation (m)	Locala (m)	Localb (m)	Localc (m)
0.00	185.7	80.1						
3.00	185.8	80.2						
6.00	185.6	80.3						
9.00	185.7	80.5						
12.00	185.8	80.4						
15.00	186.1	80.3						
18.00	186.2	80.3						
21.00	186.4	80.3						
24.00	187.0	80.2						
27.00	187.6	80.2						
30.00	188.6	80.5						
33.00	190.6	80.6						
36.00	193.0	80.5						
39.00	195.4	80.3						
42.00	197.2	80.0						
45.00	198.0	79.0						
48.00	198.4	78.4						
51.00	196.8	77.7						
54.00	195.2	77.0						
57.00	194.4	76.2						
60.00	193.8	75.5						
63.00	191.9	74.9						
66.00	189.7	74.3						
69.00	188.3	73.9						
72.00	187.3	73.3						
75.00	185.9	72.6						
78.00	184.0	72.1						
81.00	183.4	71.4						
84.00	181.8	70.7						
87.00	181.0	70.2						
90.00	180.6	69.8						
93.00	180.6	69.3						
96.00	180.4	68.5						
99.00	180.2	67.8						
102.00	180.2	67.4						
105.00	179.5	66.5						
108.00	178.9	65.9						
111.00	178.0	65.3						
114.00	177.2	64.7						
117.00	176.9	64.0						
120.00	176.6	63.6						
123.00	176.2	63.2						
126.00	176.2	62.4						
129.00	176.1	62.1						
132.00	176.2	61.6						
135.00	175.6	61.2						
138.00	174.7	60.9						

Bhlen (m)	Magnetic Bearing (degrees)	Dip (degrees)	Northing (m)	Easting (m)	Elevation (m)	Locala (m)	Localb (m)	Localc (m)
141.00	174.5	60.7						
144.00	174.0	60.3						
147.00	173.3	60.0						
150.00	173.0	59.8						
153.00	172.8	59.6						
156.00	172.8	59.3						
159.00	172.7	59.1						
162.00	172.7	59.1						
165.00	172.7	59.0						
168.00	172.6	58.7						
171.00	173.1	58.8						
174.00	173.3	58.9						
177.00	173.5	58.7						
180.00	173.6	58.7						
183.00	173.1	58.3						
186.00	172.6	57.9						
189.00	172.4	57.9						
192.00	172.1	57.7						
195.00	172.1	57.2						
198.00	172.0	57.1						
200.00	172.0	57.1						

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Appendix 10

In data: Drilling penetration rate, HSH01-03

Drillpen D T - Drill Penetration Log

HSH01, 2002-07-01 11:35:00 - 2002-07-02 13:35:00 (1.400 - 200.000 m)

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
1.40	17	0	0	
1.60	16	0	0	
1.80	17	0	0	
2.00	19	0	0	
2.20	16	0	0	
2.40	19	0	0	
2.60	22	0	0	
2.80	19	0	0	
3.00	21	0	0	
3.20	15	0	1	
3.40	19	0	0	
3.60	22	0	0	
3.80	22	0	0	
4.00	18	0	0	
4.20	19	0	0	
4.40	23	0	0	
4.60	18	0	0	
4.80	21	0	0	
5.00	21	0	0	
5.20	32	0	1	
5.40	42	0	1	
5.60	24	0	0	
5.80	20	0	0	
6.00	23	0	0	
6.20	23	0	0	
6.40	24	0	0	
6.60	18	0	1	
6.80	15	0	1	
7.00	17	0	0	
7.20	16	0	0	
7.40	22	0	0	
7.60	21	0	0	
7.80	21	0	0	
8.00	19	0	0	
8.20	21	0	0	
8.40	21	0	0	
8.60	19	0	0	
8.80	16	0	1	
9.00	12	0	1	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
9.20	15	0	1	
9.40	13	0	0	
9.60	31	0	0	
9.80	37	0	0	
10.00	35	0	0	
10.20	35	0	0	
10.40	33	0	0	
10.60	30	0	0	
10.80	22	0	0	
11.00	25	0	0	
11.20	28	0	0	
11.40	28	0	0	
11.60	34	0	0	
11.80	26	0	0	
12.00	13	0	0	
12.20	33	0	0	
12.40	25	0	0	
12.60	52	0	0	
12.80	58	0	0	
13.00	32	0	0	
13.20	19	0	0	
13.40	17	0	0	
13.60	13	0	0	
13.80	14	0	0	
14.00	22	0	0	
14.20	23	0	0	
14.40	20	0	0	
14.60	23	0	0	
14.80	23	0	0	
15.00	24	0	0	
15.20	24	0	0	
15.40	24	0	0	
15.60	22	0	0	
15.80	25	0	0	
16.00	19	0	0	
16.20	21	0	0	
16.40	21	0	0	
16.60	23	0	0	
16.80	21	0	0	
17.00	20	0	0	
17.20	19	0	0	
17.40	20	0	0	
17.60	18	0	0	
17.80	21	0	0	
18.00	16	0	0	
18.20	18	0	0	
18.40	17	0	0	
18.60	9	0	1	
18.80	11	0	1	
19.00	13	0	1	
19.20	14	0	1	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
19.40	18	0	0	
19.60	20	0	0	
19.80	24	0	0	
20.00	24	0	0	
20.20	25	0	0	
20.40	23	0	0	
20.60	24	0	0	
20.80	20	0	0	
21.00	23	0	0	
21.20	23	0	0	
21.40	22	0	0	
21.60	19	0	0	
21.80	23	0	0	
22.00	23	0	0	
22.20	23	0	0	
22.40	23	0	0	
22.60	20	0	0	
22.80	23	0	0	
23.00	24	0	0	
23.20	22	0	0	
23.40	20	0	0	
23.60	20	0	0	
23.80	20	0	0	
24.00	19	0	0	
24.20	20	0	0	
24.40	22	0	0	
24.60	23	0	0	
24.80	25	0	0	
25.00	25	0	0	
25.20	17	0	0	
25.40	12	0	0	
25.60	16	0	0	
25.80	16	0	0	
26.00	17	0	0	
26.20	24	0	0	
26.40	21	0	0	
26.60	25	0	0	
26.80	19	0	0	
27.00	25	0	0	
27.20	25	0	0	
27.40	22	0	0	
27.60	16	0	0	
27.80	21	0	0	
28.00	19	0	0	
28.20	14	0	0	
28.40	17	0	0	
28.60	22	0	0	
28.80	25	0	0	
29.00	27	0	0	
29.20	22	0	0	
29.40	23	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
29.60	18	0	0	
29.80	26	0	0	
30.00	27	0	0	
30.20	26	0	0	
30.40	24	0	0	
30.60	26	0	0	
30.80	25	0	0	
31.00	27	0	0	
31.20	23	0	0	
31.40	25	0	0	
31.60	22	0	0	
31.80	25	0	0	
32.00	21	0	0	
32.20	24	0	0	
32.40	23	0	0	
32.60	23	0	0	
32.80	19	0	0	
33.00	20	0	0	
33.20	22	0	0	
33.40	24	0	0	
33.60	21	0	0	
33.80	20	0	0	
34.00	26	0	0	
34.20	26	0	0	
34.40	26	0	0	
34.60	22	0	0	
34.80	23	0	0	
35.00	23	0	0	
35.20	14	0	1	
35.40	16	0	1	
35.60	16	0	1	
35.80	20	0	0	
36.00	18	0	0	
36.20	24	0	0	
36.40	21	0	0	
36.60	22	0	0	
36.80	15	0	0	
37.00	9	0	0	
37.20	13	0	0	
37.40	15	0	0	
37.60	16	0	0	
37.80	15	0	0	
38.00	8	0	0	
38.20	12	0	0	
38.40	15	0	0	
38.60	18	0	0	
38.80	19	0	0	
39.00	18	0	0	
39.20	18	0	0	
39.40	18	0	0	
39.60	15	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
39.80	14	0	0	
40.00	15	0	0	
40.20	14	0	0	
40.40	14	0	0	
40.60	13	0	0	
40.80	15	0	0	
41.00	16	0	0	
41.20	12	0	2	
41.40	6	0	2	
41.60	8	0	2	
41.80	9	0	1	
42.00	10	0	1	
42.20	11	0	1	
42.40	12	0	0	
42.60	11	0	0	
42.80	12	0	0	
43.00	13	0	0	
43.20	13	0	0	
43.40	13	0	0	
43.60	15	0	0	
43.80	14	0	0	
44.00	13	0	0	
44.20	13	0	0	
44.40	10	0	0	
44.60	10	0	0	
44.80	11	0	0	
45.00	9	0	0	
45.20	9	0	0	
45.40	11	0	0	
45.60	10	0	0	
45.80	10	0	0	
46.00	9	0	0	
46.20	9	0	0	
46.40	10	0	0	
46.60	9	0	0	
46.80	6	0	0	
47.00	8	0	0	
47.20	10	0	0	
47.40	14	0	0	
47.60	16	0	0	
47.80	15	0	0	
48.00	18	0	0	
48.20	18	0	0	
48.40	18	0	0	
48.60	19	0	0	
48.80	19	0	0	
49.00	20	0	0	
49.20	17	0	0	
49.40	20	0	0	
49.60	20	0	0	
49.80	23	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
50.00	18	0	0	
50.20	20	0	0	
50.40	19	0	0	
50.60	19	0	0	
50.80	18	0	0	
51.00	17	0	0	
51.20	21	0	0	
51.40	19	0	0	
51.60	19	0	0	
51.80	23	0	0	
52.00	24	0	0	
52.20	20	0	0	
52.40	21	0	0	
52.60	22	0	0	
52.80	23	0	0	
53.00	22	0	0	
53.20	20	0	0	
53.40	20	0	0	
53.60	19	0	0	
53.80	20	0	0	
54.00	20	0	0	
54.20	23	0	0	
54.40	20	0	0	
54.60	19	0	0	
54.80	16	0	0	
55.00	18	0	0	
55.20	18	0	0	
55.40	16	0	0	
55.60	14	0	0	
55.80	19	0	0	
56.00	18	0	0	
56.20	16	0	0	
56.40	20	0	0	
56.60	19	0	0	
56.80	21	0	0	
57.00	21	0	0	
57.20	21	0	0	
57.40	20	0	0	
57.60	20	0	0	
57.80	19	0	0	
58.00	15	0	0	
58.20	15	0	0	
58.40	14	0	0	
58.60	16	0	0	
58.80	17	0	0	
59.00	17	0	0	
59.20	17	0	0	
59.40	17	0	0	
59.60	18	0	0	
59.80	18	0	0	
60.00	15	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
60.20	20	0	0	
60.40	17	0	0	
60.60	14	0	0	
60.80	19	0	0	
61.00	20	0	0	
61.20	21	0	0	
61.40	21	0	0	
61.60	21	0	0	
61.80	21	0	0	
62.00	22	0	0	
62.20	19	0	0	
62.40	20	0	0	
62.60	18	0	0	
62.80	20	0	0	
63.00	19	0	0	
63.20	19	0	0	
63.40	19	0	0	
63.60	21	0	0	
63.80	21	0	0	
64.00	24	0	0	
64.20	18	0	0	
64.40	24	0	0	
64.60	22	0	0	
64.80	22	0	0	
65.00	23	0	0	
65.20	20	0	0	
65.40	18	0	0	
65.60	21	0	0	
65.80	19	0	0	
66.00	18	0	0	
66.20	19	0	0	
66.40	20	0	0	
66.60	20	0	0	
66.80	20	0	0	
67.00	23	0	0	
67.20	21	0	0	
67.40	21	0	0	
67.60	23	0	0	
67.80	21	0	0	
68.00	22	0	0	
68.20	23	0	0	
68.40	21	0	0	
68.60	17	0	0	
68.80	15	0	0	
69.00	17	0	0	
69.20	20	0	0	
69.40	20	0	0	
69.60	19	0	0	
69.80	20	0	0	
70.00	20	0	0	
70.20	19	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
70.40	14	0	0	
70.60	19	0	0	
70.80	19	0	0	
71.00	19	0	0	
71.20	18	0	0	
71.40	17	0	0	
71.60	17	0	0	
71.80	15	0	0	
72.00	14	0	0	
72.20	14	0	0	
72.40	16	0	0	
72.60	14	0	0	
72.80	14	0	0	
73.00	14	0	0	
73.20	17	0	0	
73.40	17	0	0	
73.60	15	0	0	
73.80	17	0	0	
74.00	19	0	0	
74.20	19	0	0	
74.40	17	0	0	
74.60	17	0	0	
74.80	16	0	0	
75.00	17	0	0	
75.20	17	0	0	
75.40	18	0	0	
75.60	14	0	0	
75.80	17	0	0	
76.00	21	0	0	
76.20	19	0	0	
76.40	19	0	0	
76.60	19	0	0	
76.80	15	0	0	
77.00	17	0	0	
77.20	19	0	0	
77.40	17	0	0	
77.60	17	0	0	
77.80	15	0	0	
78.00	16	0	0	
78.20	18	0	0	
78.40	18	0	0	
78.60	19	0	0	
78.80	21	0	0	
79.00	23	0	0	
79.20	21	0	0	
79.40	21	0	0	
79.60	20	0	0	
79.80	17	0	0	
80.00	18	0	0	
80.20	18	0	0	
80.40	18	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
80.60	20	0	0	
80.80	19	0	0	
81.00	19	0	0	
81.20	18	0	0	
81.40	17	0	0	
81.60	13	0	0	
81.80	17	0	0	
82.00	19	0	0	
82.20	14	0	0	
82.40	14	0	0	
82.60	15	0	0	
82.80	22	0	0	
83.00	25	0	0	
83.20	23	0	0	
83.40	25	0	0	
83.60	24	0	0	
83.80	20	0	0	
84.00	17	0	0	
84.20	23	0	0	
84.40	21	0	0	
84.60	20	0	0	
84.80	22	0	0	
85.00	27	0	0	
85.20	26	0	0	
85.40	25	0	0	
85.60	24	0	0	
85.80	25	0	0	
86.00	23	0	0	
86.20	25	0	0	
86.40	20	0	0	
86.60	22	0	0	
86.80	22	0	0	
87.00	20	0	0	
87.20	22	0	0	
87.40	15	0	0	
87.60	24	0	0	
87.80	26	0	0	
88.00	31	0	0	
88.20	24	0	0	
88.40	25	0	0	
88.60	28	0	0	
88.80	25	0	0	
89.00	23	0	0	
89.20	24	0	0	
89.40	24	0	0	
89.60	26	0	0	
89.80	23	0	0	
90.00	21	0	0	
90.20	23	0	0	
90.40	23	0	0	
90.60	23	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
90.80	24	0	0	
91.00	23	0	0	
91.20	21	0	0	
91.40	19	0	0	
91.60	18	0	0	
91.80	26	0	0	
92.00	21	0	0	
92.20	21	0	0	
92.40	22	0	0	
92.60	19	0	0	
92.80	20	0	0	
93.00	21	0	0	
93.20	22	0	0	
93.40	24	0	0	
93.60	21	0	0	
93.80	24	0	0	
94.00	31	0	0	
94.20	30	0	0	
94.40	28	0	0	
94.60	29	0	0	
94.80	18	0	0	
95.00	19	0	0	
95.20	15	0	0	
95.40	19	0	0	
95.60	20	0	0	
95.80	19	0	0	
96.00	20	0	0	
96.20	22	0	0	
96.40	22	0	0	
96.60	20	0	0	
96.80	22	0	0	
97.00	21	0	0	
97.20	21	0	0	
97.40	22	0	0	
97.60	23	0	0	
97.80	22	0	0	
98.00	22	0	0	
98.20	20	0	0	
98.40	18	0	0	
98.60	20	0	0	
98.80	21	0	0	
99.00	20	0	0	
99.20	19	0	0	
99.40	18	0	0	
99.60	18	0	0	
99.80	20	0	0	
100.00	22	0	0	
100.20	23	0	0	
100.40	22	0	0	
100.60	18	0	0	
100.80	20	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
101.00	20	0	0	
101.20	19	0	0	
101.40	19	0	0	
101.60	19	0	0	
101.80	19	0	0	
102.00	20	0	0	
102.20	22	0	0	
102.40	22	0	0	
102.60	21	0	0	
102.80	19	0	0	
103.00	17	0	0	
103.20	18	0	0	
103.40	19	0	0	
103.60	15	0	0	
103.80	16	0	0	
104.00	14	0	0	
104.20	16	0	0	
104.40	14	0	0	
104.60	17	0	0	
104.80	18	0	0	
105.00	19	0	0	
105.20	20	0	0	
105.40	20	0	0	
105.60	21	0	0	
105.80	20	0	0	
106.00	25	0	0	
106.20	25	0	0	
106.40	20	0	0	
106.60	18	0	0	
106.80	19	0	0	
107.00	13	0	1	
107.20	14	0	1	
107.40	15	0	1	
107.60	21	0	0	
107.80	20	0	0	
108.00	20	0	0	
108.20	20	0	0	
108.40	21	0	0	
108.60	19	0	0	
108.80	20	0	0	
109.00	24	0	1	
109.20	25	0	0	
109.40	25	0	0	
109.60	26	0	0	
109.80	16	0	0	
110.00	19	0	0	
110.20	24	0	0	
110.40	25	0	0	
110.60	24	0	0	
110.80	25	0	0	
111.00	21	0	1	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
111.20	22	0	0	
111.40	22	0	0	
111.60	21	0	0	
111.80	20	0	0	
112.00	22	0	0	
112.20	22	0	0	
112.40	21	0	0	
112.60	21	0	0	
112.80	20	0	0	
113.00	21	0	0	
113.20	21	0	0	
113.40	21	0	0	
113.60	19	0	0	
113.80	21	0	0	
114.00	18	0	0	
114.20	20	0	0	
114.40	21	0	0	
114.60	16	0	0	
114.80	20	0	0	
115.00	24	0	0	
115.20	22	0	0	
115.40	21	0	0	
115.60	21	0	0	
115.80	21	0	0	
116.00	24	0	0	
116.20	22	0	0	
116.40	22	0	0	
116.60	21	0	0	
116.80	20	0	0	
117.00	20	0	0	
117.20	22	0	0	
117.40	20	0	0	
117.60	20	0	0	
117.80	21	0	0	
118.00	22	0	0	
118.20	25	0	0	
118.40	30	0	0	
118.60	25	0	0	
118.80	26	0	0	
119.00	28	0	0	
119.20	27	0	0	
119.40	27	0	0	
119.60	28	0	0	
119.80	26	0	0	
120.00	25	0	0	
120.20	28	0	0	
120.40	30	0	0	
120.60	27	0	0	
120.80	30	0	0	
121.00	26	0	0	
121.20	23	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
121.40	21	0	0	
121.60	21	0	0	
121.80	20	0	0	
122.00	22	0	0	
122.20	21	0	0	
122.40	24	0	0	
122.60	23	0	0	
122.80	22	0	0	
123.00	23	0	0	
123.20	23	0	0	
123.40	25	0	0	
123.60	23	0	0	
123.80	24	0	0	
124.00	25	0	0	
124.20	26	0	0	
124.40	23	0	0	
124.60	24	0	0	
124.80	23	0	0	
125.00	24	0	0	
125.20	22	0	0	
125.40	20	0	0	
125.60	21	0	0	
125.80	22	0	0	
126.00	22	0	0	
126.20	24	0	0	
126.40	23	0	0	
126.60	24	0	0	
126.80	26	0	0	
127.00	28	0	0	
127.20	27	0	0	
127.40	26	0	0	
127.60	26	0	0	
127.80	24	0	0	
128.00	26	0	0	
128.20	24	0	0	
128.40	26	0	0	
128.60	25	0	0	
128.80	22	0	0	
129.00	14	0	1	
129.20	16	0	1	
129.40	23	0	0	
129.60	23	0	0	
129.80	24	0	0	
130.00	25	0	0	
130.20	25	0	0	
130.40	24	0	0	
130.60	24	0	0	
130.80	22	0	0	
131.00	23	0	0	
131.20	23	0	0	
131.40	26	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
131.60	32	0	0	
131.80	32	0	0	
132.00	27	0	0	
132.20	25	0	0	
132.40	23	0	0	
132.60	24	0	0	
132.80	26	0	0	
133.00	27	0	0	
133.20	26	0	0	
133.40	25	0	0	
133.60	25	0	0	
133.80	25	0	0	
134.00	31	0	0	
134.20	32	0	0	
134.40	36	0	0	
134.60	27	0	0	
134.80	31	0	0	
135.00	28	0	0	
135.20	34	0	0	
135.40	34	0	0	
135.60	36	0	0	
135.80	34	0	0	
136.00	32	0	0	
136.20	30	0	0	
136.40	31	0	0	
136.60	32	0	0	
136.80	29	0	0	
137.00	31	0	0	
137.20	30	0	0	
137.40	32	0	0	
137.60	15	0	1	
137.80	19	0	1	
138.00	29	0	0	
138.20	27	0	0	
138.40	29	0	0	
138.60	29	0	0	
138.80	29	0	0	
139.00	31	0	0	
139.20	28	0	0	
139.40	26	0	0	
139.60	25	0	0	
139.80	26	0	0	
140.00	25	0	0	
140.20	28	0	0	
140.40	35	0	0	
140.60	35	0	0	
140.80	35	0	0	
141.00	35	0	0	
141.20	30	0	0	
141.40	26	0	0	
141.60	29	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
141.80	30	0	0	
142.00	28	0	0	
142.20	25	0	0	
142.40	28	0	0	
142.60	28	0	0	
142.80	33	0	0	
143.00	36	0	0	
143.20	31	0	0	
143.40	37	0	0	
143.60	33	0	0	
143.80	24	0	0	
144.00	33	0	0	
144.20	32	0	0	
144.40	34	0	0	
144.60	36	0	0	
144.80	38	0	0	
145.00	38	0	0	
145.20	38	0	0	
145.40	36	0	0	
145.60	28	0	0	
145.80	26	0	0	
146.00	29	0	0	
146.20	32	0	0	
146.40	33	0	0	
146.60	33	0	0	
146.80	34	0	0	
147.00	35	0	0	
147.20	30	0	0	
147.40	31	0	0	
147.60	29	0	0	
147.80	31	0	0	
148.00	28	0	0	
148.20	25	0	0	
148.40	28	0	0	
148.60	22	0	0	
148.80	23	0	0	
149.00	27	0	0	
149.20	29	0	0	
149.40	36	0	0	
149.60	35	0	0	
149.80	31	0	0	
150.00	34	0	0	
150.20	30	0	0	
150.40	29	0	0	
150.60	26	0	0	
150.80	20	0	0	
151.00	23	0	0	
151.20	26	0	0	
151.40	24	0	0	
151.60	26	0	0	
151.80	25	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
152.00	21	0	0	
152.20	19	0	0	
152.40	22	0	0	
152.60	24	0	0	
152.80	22	0	0	
153.00	22	0	0	
153.20	23	0	0	
153.40	25	0	0	
153.60	24	0	0	
153.80	24	0	0	
154.00	26	0	0	
154.20	26	0	0	
154.40	22	0	0	
154.60	22	0	0	
154.80	21	0	0	
155.00	21	0	0	
155.20	22	0	0	
155.40	23	0	0	
155.60	24	0	0	
155.80	23	0	0	
156.00	29	0	0	
156.20	35	0	0	
156.40	32	0	0	
156.60	38	0	0	
156.80	40	0	0	
157.00	38	0	0	
157.20	36	0	0	
157.40	31	0	0	
157.60	28	0	0	
157.80	39	0	0	
158.00	37	0	0	
158.20	29	0	0	
158.40	28	0	0	
158.60	27	0	0	
158.80	25	0	0	
159.00	26	0	0	
159.20	29	0	0	
159.40	28	0	0	
159.60	28	0	0	
159.80	29	0	0	
160.00	25	0	0	
160.20	26	0	0	
160.40	25	0	0	
160.60	23	0	0	
160.80	23	0	0	
161.00	29	0	0	
161.20	28	0	0	
161.40	32	0	0	
161.60	36	0	0	
161.80	27	0	0	
162.00	25	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
162.20	28	0	0	
162.40	26	0	0	
162.60	26	0	0	
162.80	20	0	0	
163.00	20	0	0	
163.20	22	0	0	
163.40	20	0	0	
163.60	18	0	0	
163.80	14	0	0	
164.00	17	0	0	
164.20	21	0	0	
164.40	20	0	0	
164.60	20	0	0	
164.80	21	0	0	
165.00	24	0	0	
165.20	25	0	0	
165.40	24	0	0	
165.60	20	0	0	
165.80	15	0	0	
166.00	9	0	0	
166.20	11	0	0	
166.40	16	0	0	
166.60	20	0	0	
166.80	13	0	0	
167.00	21	0	0	
167.20	14	0	0	
167.40	12	0	0	
167.60	8	0	0	
167.80	9	0	0	
168.00	9	0	0	
168.20	15	0	0	
168.40	17	0	0	
168.60	18	0	0	
168.80	22	0	0	
169.00	26	0	0	
169.20	22	0	0	
169.40	19	0	0	
169.60	12	0	0	
169.80	17	0	0	
170.00	22	0	0	
170.20	25	0	0	
170.40	23	0	0	
170.60	28	0	0	
170.80	22	0	0	
171.00	24	0	0	
171.20	25	0	0	
171.40	23	0	0	
171.60	26	0	0	
171.80	28	0	0	
172.00	26	0	0	
172.20	24	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
172.40	25	0	0	
172.60	21	0	0	
172.80	25	0	0	
173.00	23	0	0	
173.20	27	0	0	
173.40	25	0	0	
173.60	23	0	0	
173.80	24	0	0	
174.00	22	0	0	
174.20	21	0	0	
174.40	25	0	0	
174.60	23	0	0	
174.80	23	0	0	
175.00	28	0	0	
175.20	26	0	0	
175.40	27	0	0	
175.60	26	0	0	
175.80	26	0	0	
176.00	24	0	0	
176.20	24	0	0	
176.40	27	0	0	
176.60	25	0	0	
176.80	29	0	0	
177.00	26	0	0	
177.20	25	0	0	
177.40	21	0	0	
177.60	23	0	0	
177.80	24	0	0	
178.00	25	0	0	
178.20	26	0	0	
178.40	28	0	0	
178.60	30	0	0	
178.80	32	0	0	
179.00	29	0	0	
179.20	36	0	0	
179.40	40	0	0	
179.60	37	0	0	
179.80	39	0	0	
180.00	32	0	0	
180.20	27	0	0	
180.40	24	0	0	
180.60	27	0	0	
180.80	28	0	0	
181.00	27	0	0	
181.20	27	0	0	
181.40	27	0	0	
181.60	25	0	0	
181.80	24	0	0	
182.00	26	0	0	
182.20	27	0	0	
182.40	29	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
182.60	27	0	0	
182.80	31	0	0	
183.00	38	0	0	
183.20	36	0	0	
183.40	43	0	0	
183.60	46	0	0	
183.80	41	0	0	
184.00	36	0	0	
184.20	42	0	0	
184.40	36	0	0	
184.60	43	0	0	
184.80	41	0	0	
185.00	38	0	0	
185.20	45	0	0	
185.40	53	0	0	
185.60	53	0	0	
185.80	50	0	0	
186.00	49	0	0	
186.20	48	0	0	
186.40	46	0	0	
186.60	51	0	0	
186.80	50	0	0	
187.00	48	0	0	
187.20	51	0	0	
187.40	48	0	0	
187.60	46	0	0	
187.80	49	0	0	
188.00	53	0	0	
188.20	76	0	0	
188.40	48	0	0	
188.60	56	0	0	
188.80	58	0	0	
189.00	54	0	0	
189.20	51	0	0	
189.40	57	0	0	
189.60	59	0	0	
189.80	49	0	0	
190.00	54	0	0	
190.20	28	0	0	
190.40	24	0	0	
190.60	28	0	0	
190.80	26	0	0	
191.00	26	0	0	
191.20	26	0	0	
191.40	27	0	0	
191.60	27	0	0	
191.80	25	0	0	
192.00	24	0	0	
192.20	23	0	0	
192.40	24	0	0	
192.60	22	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
192.80	22	0	0	
193.00	25	0	0	
193.20	22	0	0	
193.40	20	0	0	
193.60	25	0	0	
193.80	22	0	0	
194.00	13	0	0	
194.20	20	0	0	
194.40	23	0	0	
194.60	25	0	0	
194.80	25	0	0	
195.00	24	0	0	
195.20	26	0	0	
195.40	22	0	0	
195.60	23	0	0	
195.80	24	0	0	
196.00	23	0	0	
196.20	21	0	0	
196.40	20	0	0	
196.60	19	0	0	
196.80	22	0	0	
197.00	26	0	0	
197.20	24	0	0	
197.40	23	0	0	
197.60	24	0	0	
197.80	20	0	0	
198.00	24	0	0	
198.20	22	0	0	
198.40	26	0	0	
198.60	24	0	0	
198.80	26	0	0	
199.00	24	0	0	
199.20	24	0	0	
199.40	26	0	0	
199.60	25	0	0	
199.80	28	0	0	

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Drillpen D T - Drill Penetration Log

HSH02, 2002-06-27 11:31:00 - 2002-07-08 19:00:00 (3.400 - 200.000 m)

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
3.40	12	0	0	
3.60	17	0	0	
3.80	17	0	0	
4.00	17	0	0	
4.20	20	0	0	
4.40	18	0	0	
4.60	20	0	0	
4.80	21	0	0	
5.00	20	0	0	
5.20	16	0	0	
5.40	20	0	0	
5.60	23	0	0	
5.80	25	0	0	
6.00	23	0	0	
6.20	24	0	0	
6.40	22	0	0	
6.60	25	0	0	
6.80	31	0	0	
7.00	30	0	0	
7.20	29	0	0	
7.40	33	0	0	
7.60	36	0	0	
7.80	31	0	0	
8.00	31	0	0	
8.20	30	0	0	
8.40	25	0	0	
8.60	23	0	0	
8.80	23	0	0	
9.00	24	0	0	
9.20	31	0	0	
9.40	28	0	0	
9.60	26	0	0	
9.80	29	0	0	
10.00	32	0	0	
10.20	29	0	0	
10.40	31	0	0	
10.60	23	0	0	
10.80	28	0	0	
11.00	31	0	0	
11.20	32	0	0	
11.40	28	0	0	
11.60	24	0	0	
11.80	27	0	0	
12.00	13	0	0	
12.20	16	0	0	
12.40	19	0	0	
12.60	20	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
12.80	21	0	0	
13.00	22	0	0	
13.20	27	0	0	
13.40	24	0	0	
13.60	28	0	0	
13.80	21	0	0	
14.00	23	0	0	
14.20	23	0	0	
14.40	22	0	0	
14.60	19	0	0	
14.80	18	0	0	
15.00	22	0	0	
15.20	16	0	0	
15.40	17	0	0	
15.60	16	0	0	
15.80	17	0	0	
16.00	18	0	0	
16.20	17	0	0	
16.40	19	0	0	
16.60	12	0	1	
16.80	13	0	1	
17.00	13	0	1	
17.20	14	0	1	
17.40	18	0	0	
17.60	14	0	0	
17.80	17	0	0	
18.00	16	0	0	
18.20	14	0	0	
18.40	21	0	0	
18.60	19	0	0	
18.80	21	0	0	
19.00	20	0	0	
19.20	18	0	0	
19.40	22	0	0	
19.60	18	0	0	
19.80	16	0	0	
20.00	10	0	1	
20.20	13	0	1	
20.40	16	0	0	
20.60	11	0	1	
20.80	12	0	1	
21.00	14	0	0	
21.20	15	0	0	
21.40	15	0	0	
21.60	17	0	0	
21.80	17	0	0	
22.00	15	0	0	
22.20	13	0	0	
22.40	16	0	0	
22.60	15	0	0	
22.80	13	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
23.00	12	0	0	
23.20	9	0	0	
23.40	11	0	0	
23.60	14	0	0	
23.80	11	0	0	
24.00	13	0	0	
24.20	10	0	0	
24.40	10	0	0	
24.60	12	0	0	
24.80	20	0	0	
25.00	14	0	0	
25.20	16	0	0	
25.40	13	0	0	
25.60	18	0	0	
25.80	21	0	0	
26.00	20	0	0	
26.20	19	0	0	
26.40	16	0	0	
26.60	16	0	0	
26.80	16	0	0	
27.00	18	0	0	
27.20	19	0	0	
27.40	16	0	0	
27.60	12	0	1	
27.80	10	0	1	
28.00	15	0	0	
28.20	14	0	0	
28.40	16	0	0	
28.60	11	0	0	
28.80	13	0	0	
29.00	12	0	0	
29.20	15	0	0	
29.40	16	0	0	
29.60	15	0	0	
29.80	13	0	0	
30.00	18	0	0	
30.20	16	0	0	
30.40	18	0	0	
30.60	19	0	0	
30.80	21	0	0	
31.00	23	0	0	
31.20	25	0	0	
31.40	22	0	0	
31.60	24	0	0	
31.80	24	0	0	
32.00	26	0	0	
32.20	25	0	0	
32.40	20	0	0	
32.60	21	0	0	
32.80	23	0	0	
33.00	25	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
33.20	25	0	0	
33.40	23	0	0	
33.60	22	0	0	
33.80	21	0	0	
34.00	20	0	0	
34.20	22	0	0	
34.40	23	0	0	
34.60	24	0	0	
34.80	24	0	0	
35.00	23	0	0	
35.20	24	0	0	
35.40	23	0	0	
35.60	22	0	0	
35.80	23	0	0	
36.00	24	0	0	
36.20	25	0	0	
36.40	24	0	0	
36.60	22	0	0	
36.80	24	0	0	
37.00	20	0	0	
37.20	22	0	0	
37.40	21	0	0	
37.60	22	0	0	
37.80	23	0	0	
38.00	26	0	0	
38.20	23	0	0	
38.40	23	0	0	
38.60	23	0	0	
38.80	25	0	0	
39.00	23	0	0	
39.20	24	0	0	
39.40	22	0	0	
39.60	23	0	0	
39.80	23	0	0	
40.00	22	0	0	
40.20	26	0	0	
40.40	23	0	0	
40.60	21	0	0	
40.80	25	0	0	
41.00	26	0	0	
41.20	24	0	0	
41.40	24	0	0	
41.60	23	0	0	
41.80	23	0	0	
42.00	23	0	0	
42.20	23	0	0	
42.40	21	0	0	
42.60	23	0	0	
42.80	23	0	0	
43.00	21	0	0	
43.20	21	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
43.40	22	0	0	
43.60	20	0	0	
43.80	19	0	0	
44.00	19	0	0	
44.20	18	0	0	
44.40	19	0	0	
44.60	21	0	0	
44.80	23	0	0	
45.00	24	0	0	
45.20	28	0	0	
45.40	25	0	0	
45.60	23	0	0	
45.80	21	0	0	
46.00	23	0	0	
46.20	22	0	0	
46.40	24	0	0	
46.60	20	0	0	
46.80	24	0	0	
47.00	24	0	0	
47.20	24	0	0	
47.40	23	0	0	
47.60	24	0	0	
47.80	24	0	0	
48.00	23	0	0	
48.20	24	0	0	
48.40	23	0	0	
48.60	24	0	0	
48.80	24	0	0	
49.00	25	0	0	
49.20	26	0	0	
49.40	25	0	0	
49.60	21	0	0	
49.80	23	0	0	
50.00	28	0	0	
50.20	26	0	0	
50.40	21	0	0	
50.60	20	0	0	
50.80	20	0	0	
51.00	18	0	0	
51.20	25	0	0	
51.40	21	0	0	
51.60	26	0	0	
51.80	27	0	0	
52.00	28	0	0	
52.20	29	0	0	
52.40	26	0	0	
52.60	26	0	0	
52.80	25	0	0	
53.00	25	0	0	
53.20	26	0	0	
53.40	25	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
53.60	23	0	0	
53.80	19	0	0	
54.00	21	0	0	
54.20	22	0	0	
54.40	24	0	0	
54.60	23	0	0	
54.80	23	0	0	
55.00	25	0	0	
55.20	24	0	0	
55.40	24	0	0	
55.60	22	0	0	
55.80	21	0	0	
56.00	23	0	0	
56.20	22	0	0	
56.40	22	0	0	
56.60	23	0	0	
56.80	21	0	0	
57.00	22	0	0	
57.20	23	0	0	
57.40	24	0	0	
57.60	23	0	0	
57.80	25	0	0	
58.00	26	0	0	
58.20	25	0	0	
58.40	23	0	0	
58.60	20	0	0	
58.80	20	0	0	
59.00	23	0	0	
59.20	20	0	0	
59.40	20	0	0	
59.60	22	0	0	
59.80	22	0	0	
60.00	23	0	0	
60.20	25	0	0	
60.40	23	0	0	
60.60	21	0	0	
60.80	19	0	0	
61.00	22	0	0	
61.20	23	0	0	
61.40	24	0	0	
61.60	22	0	0	
61.80	22	0	0	
62.00	21	0	0	
62.20	21	0	0	
62.40	20	0	0	
62.60	21	0	0	
62.80	21	0	0	
63.00	18	0	0	
63.20	18	0	0	
63.40	18	0	0	
63.60	19	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
63.80	17	0	0	
64.00	19	0	0	
64.20	21	0	0	
64.40	19	0	0	
64.60	18	0	0	
64.80	18	0	0	
65.00	18	0	0	Coarse Mtrl.
65.20	19	0	0	
65.40	21	0	0	
65.60	23	0	0	
65.80	21	0	0	
66.00	19	0	0	
66.20	19	0	0	
66.40	23	0	0	
66.60	17	0	0	
66.80	19	0	0	
67.00	22	0	0	
67.20	22	0	0	
67.40	21	0	0	
67.60	26	0	0	
67.80	20	0	0	
68.00	23	0	0	
68.20	19	0	0	
68.40	20	0	0	
68.60	19	0	0	
68.80	18	0	0	
69.00	16	0	0	
69.20	19	0	0	
69.40	19	0	0	
69.60	19	0	0	
69.80	20	0	0	
70.00	22	0	0	
70.20	19	0	0	
70.40	19	0	0	
70.60	17	0	0	
70.80	14	0	0	
71.00	15	0	0	
71.20	17	0	0	
71.40	23	0	0	
71.60	24	0	0	
71.80	24	0	0	
72.00	22	0	0	
72.20	21	0	0	
72.40	24	0	0	
72.60	22	0	0	
72.80	28	0	0	
73.00	25	0	0	
73.20	27	0	0	
73.40	25	0	0	
73.60	24	0	0	
73.80	25	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
74.00	26	0	0	
74.20	24	0	0	
74.40	23	0	0	
74.60	24	0	0	
74.80	23	0	0	
75.00	22	0	0	
75.20	21	0	0	
75.40	20	0	0	
75.60	24	0	0	
75.80	24	0	0	
76.00	23	0	0	
76.20	24	0	0	
76.40	22	0	0	
76.60	22	0	0	
76.80	21	0	0	
77.00	22	0	0	
77.20	21	0	0	
77.40	23	0	0	
77.60	21	0	0	
77.80	21	0	0	
78.00	21	0	0	
78.20	22	0	0	
78.40	21	0	0	
78.60	21	0	0	
78.80	23	0	0	
79.00	22	0	0	
79.20	22	0	0	
79.40	22	0	0	
79.60	21	0	0	
79.80	20	0	0	
80.00	20	0	0	
80.20	18	0	0	
80.40	18	0	0	
80.60	17	0	0	
80.80	17	0	0	
81.00	16	0	0	
81.20	17	0	0	
81.40	19	0	0	
81.60	21	0	0	
81.80	22	0	0	
82.00	24	0	0	
82.20	25	0	0	
82.40	22	0	0	
82.60	20	0	0	
82.80	16	0	0	
83.00	21	0	0	
83.20	19	0	0	
83.40	18	0	0	
83.60	18	0	0	
83.80	17	0	0	
84.00	12	0	1	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
84.20	20	0	0	
84.40	18	0	0	
84.60	17	0	0	
84.80	19	0	0	
85.00	17	0	0	
85.20	18	0	0	
85.40	18	0	0	
85.60	19	0	0	
85.80	22	0	0	
86.00	22	0	0	
86.20	19	0	0	
86.40	21	0	0	
86.60	17	0	0	
86.80	15	0	0	
87.00	17	0	0	
87.20	16	0	0	
87.40	14	0	0	
87.60	18	0	0	
87.80	20	0	0	
88.00	22	0	0	Coarse Mtrl.
88.20	22	0	0	Coarse Mtrl.
88.40	16	0	0	Coarse Mtrl.
88.60	10	0	0	Coarse Mtrl.
88.80	11	0	0	Coarse Mtrl.
89.00	21	0	0	Coarse Mtrl.
89.20	22	0	0	Coarse Mtrl.
89.40	22	0	0	Coarse Mtrl.
89.60	16	0	0	Coarse Mtrl.
89.80	20	0	0	Coarse Mtrl.
90.00	11	0	0	
90.20	14	0	0	
90.40	18	0	0	
90.60	15	0	0	
90.80	18	0	0	
91.00	20	0	0	
91.20	29	0	0	
91.40	24	0	0	
91.60	24	0	0	
91.80	20	0	0	
92.00	18	0	0	
92.20	15	0	0	
92.40	17	0	0	
92.60	17	0	0	
92.80	20	0	0	
93.00	21	0	0	
93.20	20	0	0	
93.40	23	0	0	
93.60	21	0	0	
93.80	22	0	0	
94.00	26	0	0	
94.20	24	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
94.40	21	0	0	
94.60	24	0	0	
94.80	20	0	0	
95.00	22	0	0	
95.20	23	0	0	
95.40	25	0	0	
95.60	24	0	0	
95.80	23	0	0	
96.00	21	0	0	
96.20	20	0	0	
96.40	14	0	0	
96.60	19	0	0	
96.80	22	0	0	
97.00	16	0	0	
97.20	15	0	0	
97.40	13	0	0	
97.60	14	0	0	
97.80	14	0	0	
98.00	15	0	0	
98.20	15	0	0	
98.40	18	0	0	
98.60	22	0	0	
98.80	23	0	0	
99.00	23	0	0	
99.20	26	0	0	
99.40	23	0	0	
99.60	25	0	0	
99.80	25	0	0	
100.00	25	0	0	
100.20	22	0	0	
100.40	19	0	0	
100.60	22	0	0	
100.80	22	0	0	
101.00	21	0	0	
101.20	21	0	0	
101.40	21	0	0	
101.60	22	0	0	
101.80	21	0	0	
102.00	20	0	0	
102.20	16	0	0	
102.40	21	0	0	
102.60	22	0	0	
102.80	22	0	0	
103.00	20	0	0	
103.20	24	0	0	
103.40	21	0	0	
103.60	20	0	0	
103.80	18	0	0	
104.00	20	0	0	
104.20	20	0	0	
104.40	18	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
104.60	15	0	0	
104.80	20	0	0	
105.00	21	0	0	
105.20	23	0	0	
105.40	24	0	0	
105.60	20	0	0	
105.80	24	0	0	
106.00	24	0	0	
106.20	24	0	0	
106.40	22	0	0	
106.60	22	0	0	
106.80	22	0	0	
107.00	21	0	0	
107.20	22	0	0	
107.40	25	0	0	
107.60	23	0	0	
107.80	25	0	0	
108.00	25	0	0	
108.20	24	0	0	
108.40	23	0	0	
108.60	22	0	0	
108.80	19	0	0	
109.00	25	0	0	
109.20	25	0	0	
109.40	23	0	0	
109.60	17	0	0	
109.80	19	0	0	
110.00	19	0	0	
110.20	26	0	0	
110.40	26	0	0	
110.60	27	0	0	
110.80	25	0	0	
111.00	26	0	0	
111.20	27	0	0	
111.40	28	0	0	
111.60	26	0	0	
111.80	28	0	0	
112.00	33	0	0	
112.20	31	0	0	
112.40	26	0	0	
112.60	24	0	0	
112.80	27	0	0	
113.00	28	0	0	
113.20	26	0	0	
113.40	25	0	0	
113.60	31	0	0	
113.80	28	0	0	
114.00	25	0	0	
114.20	25	0	0	
114.40	26	0	0	
114.60	27	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
114.80	26	0	0	
115.00	28	0	0	
115.20	24	0	0	
115.40	24	0	0	
115.60	25	0	0	
115.80	25	0	0	
116.00	26	0	0	
116.20	25	0	0	
116.40	25	0	0	
116.60	24	0	0	
116.80	20	0	0	
117.00	18	0	0	
117.20	17	0	0	
117.40	17	0	0	
117.60	23	0	0	
117.80	26	0	0	
118.00	30	0	0	
118.20	25	0	0	
118.40	19	0	0	
118.60	16	0	0	
118.80	19	0	0	
119.00	25	0	0	
119.20	26	0	0	
119.40	27	0	0	
119.60	24	0	0	
119.80	26	0	0	
120.00	16	0	0	Q=4l/min (before dill start 7/5 8:20)
120.20	18	0	0	
120.40	23	0	0	
120.60	26	0	0	
120.80	28	0	0	
121.00	25	0	0	
121.20	30	0	0	
121.40	24	0	0	
121.60	17	0	0	
121.80	24	0	0	
122.00	25	0	0	
122.20	31	0	0	
122.40	27	0	0	
122.60	24	0	0	
122.80	25	0	0	
123.00	27	0	0	
123.20	27	0	0	
123.40	28	0	0	
123.60	28	0	0	
123.80	24	0	0	
124.00	25	0	0	
124.20	30	0	0	
124.40	31	0	0	
124.60	27	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
124.80	31	0	0	
125.00	28	0	0	
125.20	29	0	0	
125.40	27	0	0	
125.60	29	0	0	
125.80	27	0	0	
126.00	26	0	0	
126.20	28	0	0	
126.40	27	0	0	
126.60	27	0	0	
126.80	22	0	0	
127.00	24	0	0	
127.20	29	0	0	
127.40	27	0	0	
127.60	25	0	0	
127.80	24	0	0	
128.00	27	0	0	
128.20	33	0	0	
128.40	26	0	0	
128.60	23	0	0	
128.80	28	0	0	
129.00	27	0	0	
129.20	28	0	0	
129.40	33	0	0	
129.60	24	0	0	
129.80	23	0	0	
130.00	29	0	0	
130.20	25	0	0	
130.40	31	0	0	
130.60	27	0	0	
130.80	32	0	0	
131.00	35	0	0	
131.20	34	0	0	
131.40	28	0	0	
131.60	26	0	0	
131.80	29	0	0	
132.00	28	0	0	
132.20	35	0	0	
132.40	28	0	0	
132.60	27	0	0	
132.80	26	0	0	
133.00	26	0	0	
133.20	32	0	0	
133.40	28	0	0	
133.60	32	0	0	
133.80	29	0	0	
134.00	33	0	0	
134.20	24	0	0	
134.40	22	0	0	
134.60	22	0	0	
134.80	23	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
135.00	23	0	0	
135.20	22	0	0	
135.40	21	0	0	
135.60	19	0	0	
135.80	18	0	0	
136.00	21	0	0	
136.20	27	0	0	
136.40	26	0	0	
136.60	24	0	0	
136.80	20	0	0	
137.00	20	0	0	
137.20	21	0	0	
137.40	20	0	0	
137.60	20	0	0	
137.80	21	0	0	
138.00	26	0	0	
138.20	22	0	0	
138.40	31	0	0	
138.60	30	0	0	
138.80	25	0	0	
139.00	31	0	0	
139.20	35	0	0	
139.40	28	0	0	
139.60	26	0	0	
139.80	24	0	0	
140.00	24	0	0	
140.20	23	0	0	
140.40	29	0	0	
140.60	28	0	0	Changing hammer!
140.80	29	0	0	
141.00	29	0	0	
141.20	30	0	0	
141.40	28	0	0	
141.60	24	0	0	
141.80	18	0	0	
142.00	24	0	0	
142.20	33	0	0	
142.40	26	0	0	
142.60	24	0	0	
142.80	25	0	0	
143.00	27	0	0	
143.20	16	0	0	
143.40	21	0	0	
143.60	23	0	0	
143.80	21	0	0	
144.00	19	0	0	
144.20	23	0	0	
144.40	20	0	0	
144.60	20	0	0	
144.80	18	0	0	
145.00	20	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
145.20	22	0	0	
145.40	20	0	0	
145.60	18	0	0	
145.80	14	0	0	
146.00	13	0	0	
146.20	11	0	1	
146.40	8	0	1	
146.60	7	0	1	
146.80	7	0	1	
147.00	10	0	1	
147.20	13	0	0	
147.40	16	0	0	
147.60	20	0	0	
147.80	20	0	0	
148.00	23	0	0	
148.20	33	0	0	
148.40	31	0	0	
148.60	29	0	0	
148.80	24	0	0	
149.00	29	0	0	
149.20	28	0	0	
149.40	25	0	0	
149.60	26	0	0	
149.80	26	0	0	
150.00	27	0	0	
150.20	29	0	0	
150.40	35	0	0	
150.60	31	0	0	
150.80	29	0	0	
151.00	33	0	0	
151.20	31	0	0	
151.40	34	0	0	
151.60	31	0	0	
151.80	28	0	0	
152.00	29	0	0	
152.20	31	0	0	
152.40	27	0	0	
152.60	25	0	0	
152.80	24	0	0	
153.00	27	0	0	
153.20	31	0	0	
153.40	35	0	0	
153.60	32	0	0	
153.80	33	0	0	
154.00	31	0	0	
154.20	32	0	0	
154.40	31	0	0	
154.60	28	0	0	
154.80	22	0	0	
155.00	21	0	0	
155.20	24	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
155.40	27	0	0	
155.60	22	0	0	
155.80	22	0	0	
156.00	22	0	0	
156.20	25	0	0	
156.40	33	0	0	
156.60	25	0	0	
156.80	28	0	0	
157.00	26	0	0	
157.20	29	0	0	
157.40	27	0	0	
157.60	32	0	0	
157.80	23	0	0	
158.00	30	0	0	
158.20	25	0	0	
158.40	24	0	0	
158.60	27	0	0	
158.80	24	0	0	
159.00	23	0	0	
159.20	29	0	0	
159.40	32	0	0	
159.60	36	0	0	
159.80	35	0	0	
160.00	37	0	0	
160.20	38	0	0	
160.40	36	0	0	
160.60	30	0	0	
160.80	33	0	0	
161.00	33	0	0	
161.20	34	0	0	
161.40	32	0	0	
161.60	33	0	0	
161.80	30	0	0	
162.00	33	0	0	
162.20	32	0	0	
162.40	32	0	0	
162.60	33	0	0	
162.80	32	0	0	
163.00	34	0	0	
163.20	36	0	0	
163.40	39	0	0	
163.60	30	0	0	
163.80	30	0	0	
164.00	29	0	0	
164.20	39	0	0	
164.40	32	0	0	
164.60	33	0	0	
164.80	32	0	0	
165.00	30	0	0	
165.20	32	0	0	
165.40	33	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
165.60	33	0	0	
165.80	33	0	0	
166.00	34	0	0	
166.20	38	0	0	
166.40	34	0	0	
166.60	33	0	0	
166.80	34	0	0	
167.00	32	0	0	
167.20	37	0	0	
167.40	35	0	0	
167.60	38	0	0	
167.80	37	0	0	
168.00	42	0	0	
168.20	43	0	0	
168.40	48	0	0	
168.60	47	0	0	
168.80	35	0	0	
169.00	38	0	0	
169.20	44	0	0	
169.40	39	0	0	
169.60	49	0	0	
169.80	45	0	0	
170.00	44	0	0	
170.20	42	0	0	
170.40	35	0	0	
170.60	35	0	0	
170.80	37	0	0	
171.00	42	0	0	
171.20	42	0	0	
171.40	37	0	0	
171.60	36	0	0	
171.80	42	0	0	
172.00	42	0	0	
172.20	33	0	0	
172.40	30	0	0	
172.60	43	0	0	
172.80	44	0	0	
173.00	47	0	0	
173.20	51	0	0	
173.40	46	0	0	
173.60	57	0	0	
173.80	53	0	0	
174.00	57	0	0	
174.20	67	0	0	
174.40	72	0	0	
174.60	75	0	0	
174.80	73	0	0	
175.00	89	0	0	
175.20	58	0	0	
175.40	64	0	0	
175.60	72	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
175.80	91	0	0	
176.00	67	0	0	
176.20	75	0	0	
176.40	61	0	0	
176.60	59	0	0	
176.80	56	0	0	
177.00	65	0	0	
177.20	57	0	0	
177.40	54	0	0	
177.60	61	0	0	
177.80	63	0	0	
178.00	65	0	0	
178.20	45	0	0	Hole flushed!
178.40	22	0	0	
178.60	30	0	0	
178.80	31	0	0	
179.00	28	0	0	
179.20	27	0	0	
179.40	29	0	0	
179.60	31	0	0	
179.80	29	0	0	
180.00	29	0	0	
180.20	26	0	0	
180.40	31	0	0	
180.60	31	0	0	
180.80	31	0	0	
181.00	35	0	0	
181.20	38	0	0	
181.40	31	0	0	
181.60	34	0	0	
181.80	30	0	0	
182.00	32	0	0	
182.20	32	0	0	
182.40	29	0	0	
182.60	28	0	0	
182.80	27	0	0	
183.00	32	0	0	
183.20	28	0	0	
183.40	28	0	0	
183.60	27	0	0	
183.80	32	0	0	
184.00	40	0	0	
184.20	36	0	0	
184.40	31	0	0	
184.60	31	0	0	
184.80	33	0	0	
185.00	28	0	0	
185.20	24	0	0	
185.40	24	0	0	
185.60	22	0	0	
185.80	23	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
186.00	24	0	0	
186.20	28	0	0	
186.40	28	0	0	
186.60	23	0	0	
186.80	27	0	0	
187.00	33	0	0	
187.20	31	0	0	
187.40	24	0	0	
187.60	25	0	0	
187.80	33	0	0	
188.00	27	0	0	
188.20	27	0	0	
188.40	30	0	0	
188.60	38	0	0	
188.80	43	0	0	
189.00	43	0	0	
189.20	40	0	0	
189.40	44	0	0	
189.60	37	0	0	
189.80	36	0	0	
190.00	41	0	0	
190.20	37	0	0	
190.40	37	0	0	
190.60	35	0	0	
190.80	36	0	0	
191.00	26	0	0	
191.20	29	0	0	
191.40	26	0	0	
191.60	26	0	0	
191.80	24	0	0	
192.00	32	0	0	
192.20	31	0	0	
192.40	28	0	0	
192.60	24	0	0	
192.80	24	0	0	
193.00	28	0	0	
193.20	36	0	0	
193.40	34	0	0	
193.60	29	0	0	
193.80	29	0	0	
194.00	27	0	0	
194.20	39	0	0	
194.40	25	0	0	
194.60	31	0	0	
194.80	34	0	0	
195.00	34	0	0	
195.20	36	0	0	
195.40	34	0	0	
195.60	36	0	0	
195.80	37	0	0	
196.00	37	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
196.20	42	0	0	
196.40	31	0	0	
196.60	32	0	0	
196.80	36	0	0	
197.00	30	0	0	
197.20	33	0	0	
197.40	30	0	0	
197.60	28	0	0	
197.80	29	0	0	
198.00	30	0	0	
198.20	30	0	0	
198.40	23	0	0	
198.60	27	0	0	
198.80	38	0	0	
199.00	39	0	0	
199.20	44	0	0	
199.40	39	0	0	
199.60	42	0	0	
199.80	46	0	0	

Printout from SICADA 2004-01-09 14:49:05.

Drillpen D T - Drill Penetration Log

HSH03, 2002-07-02 17:30:00 - 2002-07-09 19:00:00 (0.000 - 201.000 m)

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
3.40	21	0	0	
3.60	20	0	0	
3.80	22	0	0	
4.00	24	0	0	
4.20	8	0	1	
4.40	16	0	0	
4.60	13	0	1	
4.80	8	0	1	
5.00	13	0	0	
5.20	14	0	0	
5.40	15	0	0	
5.60	19	0	0	
5.80	19	0	0	
6.00	19	0	0	
6.20	20	0	0	
6.40	21	0	0	
6.60	22	0	0	
6.80	19	0	0	
7.00	22	0	0	
7.20	21	0	0	
7.40	22	0	0	
7.60	21	0	0	
7.80	21	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
8.00	20	0	0	
8.20	16	0	0	
8.40	13	0	0	
8.60	16	0	0	
8.80	11	0	0	
9.00	12	0	0	
9.20	13	0	0	
9.40	15	0	0	
9.60	16	0	0	
9.80	14	0	0	
10.00	15	0	0	
10.20	14	0	0	
10.40	14	0	0	
10.60	14	0	0	
10.80	16	0	0	
11.00	18	0	0	
11.20	18	0	0	
11.40	19	0	0	
11.60	19	0	0	
11.80	19	0	0	
12.00	14	0	0	
12.20	19	0	0	
12.40	25	0	0	
12.60	22	0	0	
12.80	28	0	0	
13.00	30	0	0	
13.20	27	0	0	
13.40	25	0	0	
13.60	16	0	0	
13.80	19	0	0	
14.00	18	0	0	
14.20	18	0	0	
14.40	19	0	0	
14.60	19	0	0	
14.80	19	0	0	
15.00	19	0	0	
15.20	21	0	0	
15.40	21	0	0	
15.60	19	0	0	
15.80	20	0	0	
16.00	16	0	0	
16.20	17	0	0	
16.40	17	0	0	
16.60	23	0	0	
16.80	18	0	0	
17.00	20	0	0	
17.20	19	0	0	
17.40	20	0	0	
17.60	18	0	0	
17.80	17	0	0	
18.00	19	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
18.20	19	0	0	
18.40	15	0	0	
18.60	18	0	0	
18.80	18	0	0	
19.00	17	0	0	
19.20	19	0	0	
19.40	20	0	0	
19.60	18	0	0	
19.80	18	0	0	
20.00	17	0	0	
20.20	17	0	0	
20.40	18	0	0	
20.60	18	0	0	
20.80	19	0	0	
21.00	18	0	0	
21.20	19	0	0	
21.40	19	0	0	
21.60	19	0	0	
21.80	19	0	0	
22.00	19	0	0	
22.20	21	0	0	
22.40	20	0	0	
22.60	17	0	0	
22.80	17	0	0	
23.00	20	0	0	
23.20	18	0	0	
23.40	19	0	0	
23.60	18	0	0	
23.80	14	0	0	
24.00	15	0	0	
24.20	17	0	0	
24.40	17	0	0	
24.60	17	0	0	
24.80	18	0	0	
25.00	18	0	0	
25.20	20	0	0	
25.40	20	0	0	
25.60	17	0	0	
25.80	19	0	0	
26.00	19	0	0	
26.20	20	0	0	
26.40	19	0	0	
26.60	18	0	0	
26.80	19	0	0	
27.00	18	0	0	
27.20	21	0	0	
27.40	18	0	0	
27.60	18	0	0	
27.80	20	0	0	
28.00	19	0	0	
28.20	20	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
28.40	19	0	0	
28.60	19	0	0	
28.80	18	0	0	
29.00	20	0	0	
29.20	18	0	0	
29.40	19	0	0	
29.60	19	0	0	
29.80	20	0	0	
30.00	19	0	0	
30.20	20	0	0	
30.40	20	0	0	
30.60	20	0	0	
30.80	14	0	0	
31.00	15	0	0	
31.20	16	0	0	
31.40	16	0	0	
31.60	18	0	0	
31.80	17	0	0	
32.00	20	0	0	
32.20	18	0	0	
32.40	19	0	0	
32.60	18	0	0	
32.80	18	0	0	
33.00	19	0	0	
33.20	20	0	0	
33.40	21	0	0	
33.60	20	0	0	
33.80	20	0	0	
34.00	19	0	0	
34.20	19	0	0	
34.40	19	0	0	
34.60	17	0	0	
34.80	15	0	0	
35.00	18	0	0	
35.20	18	0	0	
35.40	17	0	0	
35.60	17	0	0	
35.80	17	0	0	
36.00	18	0	0	
36.20	19	0	0	
36.40	18	0	0	
36.60	18	0	0	
36.80	21	0	0	
37.00	19	0	0	
37.20	21	0	0	
37.40	19	0	0	
37.60	20	0	0	
37.80	16	0	0	
38.00	18	0	0	
38.20	17	0	0	
38.40	14	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
38.60	14	0	0	
38.80	17	0	0	
39.00	20	0	0	
39.20	22	0	0	
39.40	18	0	0	
39.60	20	0	0	
39.80	20	0	0	
40.00	21	0	0	
40.20	25	0	0	
40.40	21	0	0	
40.60	18	0	0	
40.80	19	0	0	
41.00	19	0	0	
41.20	21	0	0	
41.40	20	0	0	
41.60	20	0	0	
41.80	18	0	0	
42.00	19	0	0	
42.20	20	0	0	
42.40	20	0	0	
42.60	18	0	0	
42.80	22	0	0	
43.00	21	0	0	
43.20	23	0	0	
43.40	23	0	0	
43.60	21	0	0	
43.80	20	0	0	
44.00	21	0	0	
44.20	20	0	0	
44.40	17	0	0	
44.60	19	0	0	
44.80	19	0	0	
45.00	19	0	0	
45.20	19	0	0	
45.40	18	0	0	
45.60	20	0	0	
45.80	22	0	0	
46.00	22	0	0	
46.20	21	0	0	
46.40	22	0	0	
46.60	21	0	0	
46.80	22	0	0	
47.00	22	0	0	
47.20	22	0	0	
47.40	21	0	0	
47.60	21	0	0	
47.80	20	0	0	
48.00	20	0	0	
48.20	20	0	0	
48.40	19	0	0	
48.60	19	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
48.80	21	0	0	
49.00	21	0	0	
49.20	22	0	0	
49.40	21	0	0	
49.60	21	0	0	
49.80	20	0	0	
50.00	20	0	0	
50.20	22	0	0	
50.40	38	0	1	
50.60	48	0	1	
50.80	21	0	0	
51.00	21	0	0	
51.20	22	0	0	
51.40	21	0	0	
51.60	18	0	0	
51.80	20	0	0	
52.00	19	0	0	
52.20	18	0	0	
52.40	18	0	0	
52.60	22	0	0	
52.80	17	0	0	
53.00	18	0	0	
53.20	21	0	0	
53.40	21	0	0	
53.60	18	0	0	
53.80	17	0	0	
54.00	18	0	0	
54.20	18	0	0	
54.40	17	0	0	
54.60	16	0	0	
54.80	15	0	0	
55.00	15	0	0	
55.20	8	0	1	
55.40	10	0	1	
55.60	15	0	0	
55.80	18	0	0	
56.00	14	0	0	
56.20	12	0	0	
56.40	12	0	0	
56.60	15	0	0	
56.80	17	0	0	
57.00	17	0	0	
57.20	18	0	0	
57.40	17	0	0	
57.60	17	0	0	
57.80	20	0	0	
58.00	20	0	0	
58.20	21	0	0	
58.40	21	0	0	
58.60	21	0	0	
58.80	18	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
59.00	17	0	0	
59.20	19	0	0	
59.40	21	0	0	
59.60	15	0	1	
59.80	17	0	1	Water 24L/min.
60.00	13	0	1	
60.20	18	0	0	
60.40	20	0	0	
60.60	26	0	0	
60.80	25	0	0	
61.00	23	0	0	
61.20	25	0	0	
61.40	26	0	0	
61.60	28	0	0	
61.80	28	0	0	
62.00	29	0	0	
62.20	29	0	0	
62.40	26	0	0	
62.60	26	0	0	
62.80	22	0	0	
63.00	25	0	0	
63.20	98	0	1	Något hårdare material!
63.40	135	0	1	Något hårdare material!
63.60	92	0	1	Något hårdare material!
63.80	23	0	0	
64.00	24	0	0	
64.20	24	0	0	
64.40	23	0	0	
64.60	23	0	0	
64.80	17	0	0	
65.00	19	0	0	
65.20	23	0	0	
65.40	17	0	0	
65.60	19	0	0	
65.80	22	0	0	
66.00	21	0	0	
66.20	15	0	0	
66.40	18	0	0	
66.60	13	0	1	
66.80	11	0	1	
67.00	14	0	1	
67.20	16	0	0	
67.40	15	0	0	
67.60	12	0	0	
67.80	19	0	0	
68.00	19	0	0	
68.20	19	0	0	
68.40	12	0	3	
68.60	11	0	3	
68.80	10	0	3	
69.00	10	0	3	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
69.20	8	0	3	
69.40	9	0	3	
69.60	8	0	3	
69.80	6	0	3	
70.00	7	0	3	
70.20	7	0	3	
70.40	9	0	3	
70.60	9	0	3	
70.80	9	0	3	
71.00	12	0	3	
71.20	11	0	3	
71.40	10	0	3	
71.60	10	0	3	
71.80	12	0	3	
72.00	9	0	3	
72.20	9	0	3	
72.40	10	0	3	
72.60	15	0	0	
72.80	14	0	0	
73.00	20	0	0	
73.20	20	0	0	
73.40	16	0	0	
73.60	14	0	0	
73.80	14	0	0	
74.00	12	0	0	
74.20	16	0	0	
74.40	18	0	0	
74.60	16	0	0	
74.80	17	0	0	
75.00	17	0	0	
75.20	17	0	0	
75.40	19	0	0	
75.60	14	0	0	
75.80	14	0	0	
76.00	19	0	0	
76.20	23	0	0	
76.40	21	0	0	
76.60	18	0	0	
76.80	23	0	0	
77.00	21	0	0	
77.20	20	0	0	
77.40	14	0	0	
77.60	18	0	0	
77.80	19	0	0	
78.00	23	0	0	
78.20	20	0	0	
78.40	17	0	0	
78.60	18	0	0	
78.80	17	0	0	
79.00	19	0	0	
79.20	23	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
79.40	23	0	0	
79.60	22	0	0	
79.80	21	0	0	
80.00	20	0	0	
80.20	26	0	0	
80.40	26	0	0	
80.60	24	0	0	
80.80	21	0	0	
81.00	19	0	0	
81.20	24	0	0	
81.40	24	0	0	
81.60	18	0	0	
81.80	21	0	0	
82.00	24	0	0	
82.20	24	0	0	
82.40	24	0	0	
82.60	22	0	0	
82.80	27	0	0	
83.00	22	0	0	
83.20	22	0	0	
83.40	19	0	0	
83.60	21	0	0	
83.80	21	0	0	
84.00	22	0	0	
84.20	23	0	0	
84.40	21	0	0	
84.60	22	0	0	
84.80	22	0	0	
85.00	23	0	0	
85.20	24	0	0	
85.40	20	0	0	
85.60	19	0	0	
85.80	21	0	0	
86.00	20	0	0	
86.20	22	0	0	
86.40	21	0	0	
86.60	21	0	0	
86.80	21	0	0	
87.00	21	0	0	
87.20	22	0	0	
87.40	23	0	0	
87.60	21	0	0	
87.80	13	0	0	
88.00	16	0	0	
88.20	19	0	0	
88.40	24	0	0	
88.60	25	0	0	
88.80	20	0	0	
89.00	20	0	0	
89.20	21	0	0	
89.40	19	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
89.60	20	0	0	
89.80	20	0	0	
90.00	20	0	0	
90.20	16	0	0	
90.40	14	0	0	
90.60	13	0	1	
90.80	12	0	1	
91.00	16	0	0	
91.20	20	0	0	
91.40	16	0	0	
91.60	15	0	0	
91.80	18	0	0	
92.00	17	0	0	
92.20	15	0	0	
92.40	17	0	0	
92.60	15	0	0	
92.80	13	0	0	
93.00	13	0	0	
93.20	14	0	0	
93.40	17	0	0	
93.60	17	0	0	
93.80	16	0	0	
94.00	16	0	0	
94.20	16	0	0	
94.40	14	0	0	
94.60	14	0	0	
94.80	13	0	0	
95.00	18	0	0	
95.20	19	0	0	
95.40	19	0	0	
95.60	20	0	0	
95.80	19	0	0	
96.00	18	0	0	
96.20	21	0	0	
96.40	21	0	0	
96.60	22	0	0	
96.80	23	0	0	
97.00	24	0	0	
97.20	25	0	0	
97.40	23	0	0	
97.60	16	0	0	
97.80	17	0	0	
98.00	17	0	0	
98.20	18	0	0	
98.40	18	0	0	
98.60	20	0	0	
98.80	22	0	0	
99.00	27	0	0	
99.20	26	0	0	
99.40	26	0	0	
99.60	26	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
99.80	26	0	0	
100.00	27	0	0	
100.20	25	0	0	
100.40	25	0	0	
100.60	26	0	0	
100.80	25	0	0	
101.00	25	0	0	
101.20	26	0	0	
101.40	26	0	0	
101.60	24	0	0	
101.80	22	0	0	
102.00	21	0	0	
102.20	23	0	0	
102.40	23	0	0	
102.60	20	0	0	
102.80	22	0	0	
103.00	29	0	0	
103.20	28	0	0	
103.40	28	0	0	
103.60	24	0	0	
103.80	25	0	0	
104.00	28	0	0	
104.20	28	0	0	
104.40	28	0	0	
104.60	23	0	0	
104.80	23	0	0	
105.00	122	0	1	Något hårdare material!
105.20	248	0	1	Något hårdare material!
105.40	302	0	1	Något hårdare material!
105.60	40	0	0	
105.80	22	0	0	
106.00	21	0	0	
106.20	20	0	0	
106.40	24	0	0	
106.60	25	0	0	
106.80	26	0	0	
107.00	19	0	0	
107.20	19	0	0	
107.40	12	0	0	
107.60	17	0	0	
107.80	139	0	1	
108.00	26	0	0	
108.20	33	0	0	
108.40	32	0	0	
108.60	30	0	0	
108.80	28	0	0	
109.00	30	0	0	
109.20	31	0	0	
109.40	35	0	0	
109.60	32	0	0	
109.80	28	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
110.00	25	0	0	
110.20	24	0	0	
110.40	24	0	0	
110.60	26	0	0	
110.80	28	0	0	
111.00	28	0	0	
111.20	28	0	0	
111.40	33	0	0	
111.60	33	0	0	
111.80	32	0	0	
112.00	33	0	0	
112.20	36	0	0	
112.40	36	0	0	
112.60	34	0	0	
112.80	30	0	0	
113.00	31	0	0	
113.20	31	0	0	
113.40	33	0	0	
113.60	34	0	0	
113.80	33	0	0	
114.00	33	0	0	
114.20	30	0	0	
114.40	29	0	0	
114.60	27	0	0	
114.80	26	0	0	
115.00	26	0	0	
115.20	27	0	0	
115.40	35	0	0	
115.60	33	0	0	
115.80	32	0	0	
116.00	27	0	0	
116.20	30	0	0	
116.40	31	0	0	
116.60	30	0	0	
116.80	31	0	0	
117.00	30	0	0	
117.20	29	0	0	
117.40	29	0	0	
117.60	27	0	0	
117.80	27	0	0	
118.00	29	0	0	
118.20	32	0	0	
118.40	32	0	0	
118.60	30	0	0	
118.80	33	0	0	
119.00	29	0	0	
119.20	29	0	0	
119.40	27	0	0	
119.60	29	0	0	
119.80	30	0	0	
120.00	31	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
120.20	30	0	0	
120.40	25	0	0	
120.60	25	0	0	
120.80	27	0	0	
121.00	32	0	0	
121.20	37	0	0	
121.40	38	0	0	
121.60	38	0	0	
121.80	36	0	0	
122.00	32	0	0	
122.20	32	0	0	
122.40	32	0	0	
122.60	30	0	0	
122.80	29	0	0	
123.00	30	0	0	
123.20	31	0	0	
123.40	30	0	0	
123.60	31	0	0	
123.80	31	0	0	
124.00	31	0	0	
124.20	32	0	0	
124.40	37	0	0	
124.60	32	0	0	
124.80	34	0	0	
125.00	35	0	0	
125.20	35	0	0	
125.40	35	0	0	
125.60	34	0	0	
125.80	36	0	0	
126.00	33	0	0	
126.20	33	0	0	
126.40	32	0	0	
126.60	30	0	0	
126.80	29	0	0	
127.00	31	0	0	
127.20	33	0	0	
127.40	36	0	0	
127.60	36	0	0	
127.80	35	0	0	
128.00	34	0	0	
128.20	35	0	0	
128.40	35	0	0	
128.60	36	0	0	
128.80	36	0	0	
129.00	34	0	0	
129.20	36	0	0	
129.40	33	0	0	
129.60	19	0	0	
129.80	25	0	0	
130.00	28	0	0	
130.20	36	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
130.40	42	0	0	
130.60	38	0	0	
130.80	37	0	0	
131.00	33	0	0	
131.20	33	0	0	
131.40	31	0	0	
131.60	28	0	0	
131.80	30	0	0	
132.00	30	0	0	
132.20	30	0	0	
132.40	35	0	0	
132.60	33	0	0	
132.80	27	0	0	
133.00	30	0	0	
133.20	42	0	0	
133.40	38	0	0	
133.60	37	0	0	
133.80	29	0	0	
134.00	28	0	0	
134.20	24	0	0	
134.40	29	0	0	
134.60	29	0	0	
134.80	29	0	0	
135.00	31	0	0	
135.20	31	0	0	
135.40	31	0	0	
135.60	31	0	0	
135.80	31	0	0	
136.00	31	0	0	
136.20	41	0	0	
136.40	42	0	0	
136.60	37	0	0	
136.80	37	0	0	
137.00	37	0	0	
137.20	34	0	0	
137.40	34	0	0	
137.60	32	0	0	
137.80	33	0	0	
138.00	32	0	0	
138.20	32	0	0	
138.40	33	0	0	
138.60	32	0	0	
138.80	32	0	0	
139.00	34	0	0	
139.20	33	0	0	
139.40	36	0	0	
139.60	35	0	0	
139.80	35	0	0	
140.00	36	0	0	
140.20	34	0	0	
140.40	30	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
140.60	31	0	0	
140.80	30	0	0	
141.00	33	0	0	
141.20	33	0	0	
141.40	31	0	0	
141.60	31	0	0	
141.80	31	0	0	
142.00	32	0	0	
142.20	39	0	0	
142.40	38	0	0	
142.60	33	0	0	
142.80	32	0	0	
143.00	25	0	0	
143.20	25	0	0	
143.40	27	0	0	
143.60	30	0	0	
143.80	29	0	0	
144.00	30	0	0	
144.20	29	0	0	
144.40	28	0	0	
144.60	26	0	0	
144.80	27	0	0	
145.00	30	0	0	
145.20	30	0	0	
145.40	28	0	0	
145.60	26	0	0	
145.80	28	0	0	
146.00	28	0	0	
146.20	30	0	0	
146.40	30	0	0	
146.60	29	0	0	
146.80	29	0	0	
147.00	29	0	0	
147.20	28	0	0	
147.40	27	0	0	
147.60	27	0	0	
147.80	26	0	0	
148.00	29	0	0	
148.20	31	0	0	
148.40	31	0	0	
148.60	32	0	0	
148.80	26	0	0	
149.00	26	0	0	
149.20	34	0	0	
149.40	33	0	0	
149.60	35	0	0	
149.80	37	0	0	
150.00	37	0	0	
150.20	38	0	0	
150.40	38	0	0	
150.60	35	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
150.80	34	0	0	
151.00	36	0	0	
151.20	38	0	0	
151.40	42	0	0	
151.60	37	0	0	
151.80	38	0	0	
152.00	31	0	0	
152.20	25	0	0	
152.40	30	0	0	
152.60	30	0	0	
152.80	30	0	0	
153.00	31	0	0	
153.20	30	0	0	
153.40	30	0	0	
153.60	35	0	0	
153.80	25	0	0	
154.00	33	0	0	
154.20	32	0	0	
154.40	32	0	0	
154.60	34	0	0	
154.80	30	0	0	
155.00	25	0	0	
155.20	27	0	0	
155.40	29	0	0	
155.60	27	0	0	
155.80	27	0	0	
156.00	28	0	0	
156.20	26	0	0	
156.40	26	0	0	
156.60	30	0	0	
156.80	30	0	0	
157.00	28	0	0	
157.20	27	0	0	
157.40	30	0	0	
157.60	33	0	0	
157.80	32	0	0	
158.00	30	0	0	
158.20	28	0	0	
158.40	27	0	0	
158.60	24	0	0	
158.80	26	0	0	
159.00	26	0	0	
159.20	26	0	0	
159.40	27	0	0	
159.60	27	0	0	
159.80	25	0	0	
160.00	26	0	0	
160.20	27	0	0	
160.40	33	0	0	
160.60	30	0	0	
160.80	26	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
161.00	24	0	0	
161.20	20	0	0	
161.40	22	0	0	
161.60	22	0	0	
161.80	23	0	0	
162.00	24	0	0	
162.20	23	0	0	
162.40	23	0	0	
162.60	23	0	0	
162.80	24	0	0	
163.00	23	0	0	
163.20	23	0	0	
163.40	28	0	0	
163.60	28	0	0	
163.80	25	0	0	
164.00	28	0	0	
164.20	27	0	0	
164.40	27	0	0	
164.60	29	0	0	
164.80	33	0	0	
165.00	32	0	0	
165.20	29	0	0	
165.40	35	0	0	
165.60	36	0	0	
165.80	35	0	0	
166.00	36	0	0	
166.20	41	0	0	
166.40	44	0	0	
166.60	40	0	0	
166.80	37	0	0	
167.00	32	0	0	
167.20	29	0	0	
167.40	29	0	0	
167.60	27	0	0	
167.80	31	0	0	
168.00	26	0	0	
168.20	26	0	0	
168.40	25	0	0	
168.60	26	0	0	
168.80	25	0	0	
169.00	27	0	0	
169.20	29	0	0	
169.40	30	0	0	
169.60	33	0	0	
169.80	29	0	0	
170.00	25	0	0	
170.20	23	0	0	
170.40	24	0	0	
170.60	26	0	0	
170.80	26	0	0	
171.00	24	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
171.20	22	0	0	
171.40	21	0	0	
171.60	24	0	0	
171.80	26	0	0	
172.00	23	0	0	
172.20	28	0	0	
172.40	36	0	0	
172.60	29	0	0	
172.80	31	0	0	
173.00	28	0	0	
173.20	30	0	0	
173.40	36	0	0	
173.60	34	0	0	
173.80	28	0	0	
174.00	25	0	0	
174.20	28	0	0	
174.40	28	0	0	
174.60	32	0	0	
174.80	30	0	0	
175.00	29	0	0	
175.20	30	0	0	
175.40	37	0	0	
175.60	37	0	0	
175.80	34	0	0	
176.00	28	0	0	
176.20	26	0	0	
176.40	27	0	0	
176.60	23	0	0	
176.80	22	0	0	
177.00	26	0	0	
177.20	26	0	0	
177.40	25	0	0	
177.60	26	0	0	
177.80	24	0	0	
178.00	25	0	0	
178.20	27	0	0	
178.40	40	0	0	
178.60	40	0	0	
178.80	34	0	0	
179.00	32	0	0	
179.20	32	0	0	
179.40	33	0	0	
179.60	34	0	0	
179.80	32	0	0	
180.00	32	0	0	
180.20	27	0	0	
180.40	25	0	0	
180.60	28	0	0	
180.80	32	0	0	
181.00	31	0	0	
181.20	32	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
181.40	40	0	0	
181.60	32	0	0	
181.80	26	0	0	
182.00	25	0	0	
182.20	23	0	0	
182.40	26	0	0	
182.60	24	0	0	
182.80	26	0	0	
183.00	30	0	0	
183.20	29	0	0	
183.40	24	0	0	
183.60	33	0	0	
183.80	32	0	0	
184.00	29	0	0	
184.20	34	0	0	
184.40	35	0	0	
184.60	35	0	0	
184.80	36	0	0	
185.00	32	0	0	
185.20	30	0	0	
185.40	32	0	0	
185.60	32	0	0	
185.80	32	0	0	
186.00	26	0	0	
186.20	25	0	0	
186.40	25	0	0	
186.60	28	0	0	
186.80	29	0	0	
187.00	33	0	0	
187.20	35	0	0	
187.40	36	0	0	
187.60	40	0	0	
187.80	37	0	0	
188.00	35	0	0	
188.20	32	0	0	
188.40	34	0	0	
188.60	32	0	0	
188.80	32	0	0	
189.00	31	0	0	
189.20	32	0	0	
189.40	31	0	0	
189.60	34	0	0	
189.80	31	0	0	
190.00	32	0	0	
190.20	36	0	0	
190.40	38	0	0	
190.60	39	0	0	
190.80	38	0	0	
191.00	38	0	0	
191.20	38	0	0	
191.40	38	0	0	

Bhlen (m)	Pen Time (s)	Water	Fracture	Comment
191.60	33	0	0	
191.80	28	0	0	
192.00	27	0	0	
192.20	30	0	0	
192.40	26	0	0	
192.60	28	0	0	
192.80	29	0	0	
193.00	31	0	0	
193.20	30	0	0	
193.40	31	0	0	
193.60	32	0	0	
193.80	30	0	0	
194.00	28	0	0	
194.20	28	0	0	
194.40	22	0	0	
194.60	23	0	0	
194.80	29	0	0	
195.00	32	0	0	
195.20	30	0	0	
195.40	32	0	0	
195.60	32	0	0	
195.80	28	0	0	
196.00	28	0	0	
196.20	33	0	0	
196.40	38	0	0	
196.60	38	0	0	
196.80	39	0	0	
197.00	40	0	0	
197.20	39	0	0	
197.40	39	0	0	
197.60	39	0	0	
197.80	35	0	0	
198.00	33	0	0	
198.20	31	0	0	
198.40	26	0	0	
198.60	36	0	0	
198.80	33	0	0	
199.00	31	0	0	
199.20	36	0	0	
199.40	36	0	0	
199.60	34	0	0	
199.80	30	0	0	
200.00	29	0	0	
200.20	24	0	0	
200.40	32	0	0	
200.60	36	0	0	
200.80	36	0	0	Ca. 45L/min.

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Appendix 11

Mapping of drill cuttings, HSH01-03

Drill cuttings

Date: 2003-04-03 Sign.: Christin Nordman

			Untreated drill cuttings sample				Washed and sieved drill cuttings sample												
Hole	from	to	Lightn.	Chrom.	Hue	Grainsize	Lightn.	Chrom.	Hue	Grainsize	Rock type A	Rock type B	Min-1	Min-2	Min-3	Min-4	Min-5	Distr.	Kommentar
HSH01	**1.5**	4.75	100; Light	0;	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine grained granite		36; Quartz	32; Potash Feldspar	49; Plagioclase	33; Chlorite	16; Epidote	100; 100 %	poor in dark minerals
HSH01	4.75	7.75	100; Light	0;	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine grained granite		36; Quartz	32; Potash Feldspar	49; Plagioclase	10; Biotite	33; Chlorite	100; 100 %	poor in dark minerals, also a yellowish mineral
HSH01	7.75	10.75	200; Dark	0;	5; Green	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine grained granite	32; Potash Feldspar	49; Plagioclase	10; Biotite	10; Biotite	36; Quartz	90; 90/10	7.75-8.75m granite, traces of orange-coloured mineral. Altered.
HSH01	10.75	12	0;	10; Pinkish	5; Green	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)	511058; Fine grained granite	32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	16; Epidote	90; 90/10	pyrite, traces of epidote. possibly also some prehnite sealed fractures
HSH01	12	13	200; Dark	80; Greyish	5; Green	6; Fine-to medium grained	100; Light	40; Brownish	8; Grey	1; Aphanitic (grains not visible with naked eye)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)	32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	30; Calcite	60; 60/40	Seems to be an acid volcanic rock: Aphanitic, light brownish grey with 0.5mm aggregates of quartz and biotite. Seems otherwise to be feldspar-rich with biotite. NO SIGNS OF THIS ROCK IN THE BIPS-IMAGES! Traces of fine-medium grained granite. Traces of bright dark orange coloured idiomorphic (?) crystals with metallic lustre (alteration product from pyrite???)
HSH01	13	16	200; Dark	50; Greenish	8; Grey	6; Fine-to medium grained	200; Dark	50; Greenish	8; Grey	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	16; Epidote	100; 100 %	traces of chlorite and epidote and oxidized sulphide. Possibly traces of granite.
HSH01	16	19	200; Dark	10; Pinkish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	50; Greenish	8; Grey	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)	501058; Granite	32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	90; 90/10	rust - open fracture. Traces of epidote
HSH01	19	22	200; Dark	50; Greenish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	20; Reddish	8; Grey	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)	501058; Granite	32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	90; 90/10	Traces of epidote, pyrite, chlorite (as alteration product from biotite). Fresh rock
HSH01	22	25	200; Dark	80; Greyish	5; Green	9; Medium-grained (1-5 mm)	200; Dark	50; Greenish	8; Grey	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	Traces of epidote, pyrite, chlorite (as alteration product from biotite). Fresh rock
HSH01	25	28	0;	80; Greyish	2; Red	9; Medium-grained (1-5 mm)	200; Dark	50; Greenish	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	27-28 red, otherwise like sample above.Traces of pyrite,calcite, epidote <1mm wide sealed fracture with fine grained epidote and ? Light green.
HSH01	28	31	200; Dark	50; Greenish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	50; Greenish	8; Grey	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of epidote, pyrite, Fe-hydroxide, transparent dark red mineral
HSH01	31	34	200; Dark	10; Pinkish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	10; Pinkish	8; Grey	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of epidote, pyrite, transparent dark red mineral =X2
HSH01	34	37	0;	80; Greyish	2; Red	9; Medium-grained (1-5 mm)	200; Dark	0;	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of epidote, calcite, transparent dark red mineral.
HSH01	37	40	0;	80; Greyish	2; Red	6; Fine-to medium grained	200; Dark	0;	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	chlorite as alteration procuct from biotite, epidote, also epidote fragements in greenish feldsparrich (or prehnite, =X1) sealed fracture?
HSH01	40	43	0;	80; Greyish	2; Red	8; Medium to coarse grained	0;	0;	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)	501058; Granite	32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	60; 60/40	epidote, X1, chlorite as alteration procuct from biotite
HSH01	43	46	0;	0;	2; Red	9; Medium-grained (1-5 mm)	0;	0;	2; Red	9; Medium-grained (1-5 mm)	501058; Granite	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)	32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	11091; X1	90; 90/10	X1, poorer in dark minerals, relatively rich in quartz (more granitic?). sealed fracture with finegrained to aphanitic minerals of epidote, hematite and black mineral
HSH01	46	49	0;	50; Greenish	2; Red	9; Medium-grained (1-5 mm)	200; Dark	0;	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	33; Chlorite	100; 100 %	chlorite as alteration procuct from biotite
HSH01	49	52	0;	0;	2; Red	6; Fine-to medium grained	200; Dark	50; Greenish	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	10; Biotite	100; 100 %	calcite, also white quarts sealed fractures (aphanitic to very fine grain size, with some dark minerals)
HSH01	52	55	0;	10; Pinkish	2; Red	9; Medium-grained (1-5 mm)	200; Dark	50; Greenish	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	somewhat poorer in dark minerals, traces of epidote.
HSH01	55	58	0;	50; Greenish	2; Red	6; Fine-to medium grained	200; Dark	0;	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of pyrite, epidote, calcite. Calcite as sealed fracture together with very fine grained quartz. Amph > biot
HSH01	58	61	0;	50; Greenish	2; Red	6; Fine-to medium grained	200; Dark	0;	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of pyrite and epidote. Rich in amphibole, biotite subordinated (if present)
HSH01	61	64	0;	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	0;	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of pyrite, X1.a fragment with almost aphanitic quarts with euhedral feldspar crystals and biotite. Amph > biotite
HSH01	64	67	0;	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	0;	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of pyrite, Rich in amphibole, biotite subordinate (if present?)
HSH01	67	70	0;	10; Pinkish	8; Grey	6; Fine-to medium grained	0;	20; Reddish	8; Grey	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of epidote, pyrite, calcite
HSH01	70	73	0;	0;	2; Red	6; Fine-to medium grained	200; Dark	0;	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of calcite
HSH01	73	76	0;	80; Greyish	2; Red	6; Fine-to medium grained	200; Dark	50; Greenish	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	chlorite as alteration product from amphibole and biotite
HSH01	76	79	0;	80; Greyish	2; Red	6; Fine-to medium grained	200; Dark	50; Greenish	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	
HSH01	79	82	200; Dark	20; Reddish	5; Green	6; Fine-to medium grained	200; Dark	0;	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	81-82 m dark. 79-81m more red. Traces of pyrite, epidote, chlorite (on possible fracture plane). The white sealed fractures seem to be quartz with some epidote.
HSH01	82	85	0;	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	30; Calcite	100; 100 %	traces of calcite and pyrite
HSH01	85	88	200; Dark	0;	5; Green	6; Fine-to medium grained	200; Dark	10; Pinkish	8; Grey	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of dark red transparent mineral
HSH01	88	91	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	200; Dark	80; Greyish	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	greenish grey 88-90m, The white sealed fractures are probably filled with quartz- Traces of dark red transparent mineral.

Drill cuttings							Date: 2003-04-03		Sign.:	Christin Nordman											
			Untreated drill cuttings sample				Washed and sieved drill cuttings sample														
Hole	from	to	Lightn.	Chrom.	Hue	Grainsize	Lightn.	Chrom.	Hue	Grainsize	Rock type A	Rock type B	Min-1	Min-2	Min-3	Min-4	Min-5	Distr.	Kommentar
HSH01	91	94	0;	10; Pinkish	8; Grey	6; Fine-to medium grained	200; Dark	80; Greyish	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (¯ sp□diorite, tonalite)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	3; Amphibole	90; 90/10	91-92m greenish red. Epidote,traces of pyrite, very fine grained epidote + feldspar + quartz
HSH01	94	97	0;	50; Greenish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501036; Quartz monzodiorite (¯ sp□diorite, tonalite)	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	3; Amphibole	60; 60/40	94-95m more reddish. Traces of pyrite, epidote, chlorite. Quartz up to 0.5mm crystals
HSH01	97	100	0;	0;	2; Red	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	dark greyish green 97-99m.
HSH01	100	103	0;	10; Pinkish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	some mediumgrained quartz-feldspar aggregates occur
HSH01	103	106	100; Light	80; Greyish	2; Red	6; Fine-to medium grained	100; Light	0;	2; Red	9; Medium-grained (1-5 mm)	501058; Granite	501036; Quartz monzodiorite (¯ sp□diorite, tonalite)	32; Potash Feldspar	49; Plagiodase	36; Quartz	10; Biotite	3; Amphibole	90; 90/10	traces of epidote, calcite, hematite on possible fracture plane
HSH01	106	109	100; Light	80; Greyish	2; Red	2; Fine-grained (<1 mm)	0;	20; Reddish	8; Grey	9; Medium-grained (1-5 mm)	501058; Granite	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	32; Potash Feldspar	49; Plagiodase	36; Quartz	10; Biotite	33; Chlorite	90; 90/10	chlorite as alteration produc from biotite. Epidote, dark red transparent mineral (sample)
HSH01	109	112	0;	20; Reddish	8; Grey	8; Medium to coarse grained	100; Light	20; Reddish	8; Grey	6; Fine-to medium grained	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501058; Granite	32; Potash Feldspar	49; Plagiodase	36; Quartz	3; Amphibole	10; Biotite	60; 60/40	traces of epidote, calcite, transparent dark red mineral.
HSH01	112	115	100; Light	10; Pinkish	8; Grey	6; Fine-to medium grained	100; Light	20; Reddish	8; Grey	9; Medium-grained (1-5 mm)	501058; Granite	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	32; Potash Feldspar	49; Plagiodase	36; Quartz	10; Biotite	3; Amphibole	90; 90/10	traces of epidote and light greenish fine grained fracture filling
HSH01	115	118	100; Light	10; Pinkish	8; Grey	6; Fine-to medium grained	100; Light	80; Greyish	2; Red	9; Medium-grained (1-5 mm)	501058; Granite	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	32; Potash Feldspar	49; Plagiodase	36; Quartz	3; Amphibole	10; Biotite	90; 90/11	traces of dark red transparent mineral (sample), calcite together with orange coloured euhedral mineral (sample), greenish afanitic fracture mineralaggregates
HSH01	118	121	0;	80; Greyish	5; Green	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501058; Granite	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	16; Epidote	90; 90/10	traces of prehnite (? In sealed fracture), epidote, orange coloured fracture mineral (sample), transparent dark red mineral
HSH01	121	124	0;	0;	2; Red	6; Fine-to medium grained	0;	0;	2; Red	9; Medium-grained (1-5 mm)	501058; Granite		32; Potash Feldspar	49; Plagiodase	36; Quartz	10; Biotite	11091; X1	100; 100 %	traces of green very fine grained mineral aggregate, dark red transparent mineral
HSH01	124	127	0;	0;	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	9; Medium-grained (1-5 mm)	501058; Granite		32; Potash Feldspar	49; Plagiodase	36; Quartz	10; Biotite	16; Epidote	100; 100 %	traces of epidote, dark red transparent mineral =X2
HSH01	127	130	0;	0;	2; Red	6; Fine-to medium grained	0;	0;	2; Red	9; Medium-grained (1-5 mm)	501058; Granite		32; Potash Feldspar	49; Plagiodase	36; Quartz	10; Biotite	16; Epidote		traces of prehnite (?), epidote
HSH01	130	133	0;	0;	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	9; Medium-grained (1-5 mm)	501058; Granite	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	32; Potash Feldspar	49; Plagiodase	36; Quartz	10; Biotite	3; Amphibole	80; 80/20	X1,epidote
HSH01	133	136	0;	80; Greyish	2; Red	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501058; Granite	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	3; Amphibole	90; 90/10	traces of X2, epidote, fragment of medium grained granite
HSH01	136	139	0;	20; Reddish	8; Grey	8; Medium to coarse grained	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of calcite, epidote, X1, pyrite, X2
HSH01	139	142	0;	80; Greyish	2; Red	6; Fine-to medium grained	200; Dark	0;	2; Red	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501036; Quartz monzodiorite (¯ sp□diorite, tonalite)	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	16; Epidote	50; 50/50	traces of pyrite, epidote, calcite.
HSH01	142	145	0;	80; Greyish	2; Red	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501036; Quartz monzodiorite (¯ sp□diorite, tonalite)	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	3; Amphibole	90; 90/10	traces of pyrite, epidote, calcite.
HSH01	145	148	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501036; Quartz monzodiorite (¯ sp□diorite, tonalite)	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	16; Epidote	80; 80/20	traces of epidote, X2, X1, biotite
HSH01	148	151	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501036; Quartz monzodiorite (¯ sp□diorite, tonalite)	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	3; Amphibole	70; 70/30	traces of epidote, pyrite, X1,
HSH01	151	154	0;	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (¯ sp□diorite, tonalite)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	3; Amphibole	70; 70/30	traces of X2, epidote, calcite,in BIPS-images no volcanite (delayed cuttings?)
HSH01	154	157	100; Light	10; Pinkish	8; Grey	6; Fine-to medium grained	100; Light	20; Reddish	8; Grey	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (¯ sp□diorite, tonalite)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	3; Amphibole	80; 80/20	traces of epidote.
HSH01	157	160	0;	10; Pinkish	8; Grey	6; Fine-to medium grained	0;	20; Reddish	8; Grey	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (¯ sp□diorite, tonalite)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	16; Epidote	70; 70/30	traces of purple red aphanitic probably fracture material, in BIPS-images no volcanite (delayed cuttings)
HSH01	160	163	0;	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501036; Quartz monzodiorite (¯ sp□diorite, tonalite)	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	3; Amphibole	60; 60/40	traces of epidote, chlorite, X1, calcite
HSH01	163	166	0;	20; Reddish	8; Grey	6; Fine-to medium grained	0;	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501036; Quartz monzodiorite (¯ sp□diorite, tonalite)	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	16; Epidote	50; 50/50	traces of epidote, calcite, finegrained hematite rich aggregates,
HSH01	166	169	0;	80; Greyish	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (¯ sp□diorite, tonalite)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	16; Epidote	80; 80/20	4mm big quartz, probably fracture material, X1, pyrite
HSH01	169	172	0;	80; Greyish	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (¯ sp□diorite, tonalite)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	32; Potash Feldspar	49; Plagiodase	10; Biotite	36; Quartz	16; Epidote	90; 90/10	relatively much epidote (also mixed with white mineral), X1, calcite, contamination of volcanite.

Drill cuttings

Date: 2003-04-03 Sign.: Christin Nordman

Hole	from	to	Untreated drill cuttings sample Lightn.	Chrom.	Hue	Grainsize	Washed and sieved drill cuttings sample Lightn.	Chrom.	Hue	Grainsize	Rock type A	Rock type B	Min-1	Min-2	Min-3	Min-4	Min-5	Distr.	Kommentar
HSH01	172	175	0;	0;	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	90; 90/10	relatively much epidote, traces of prehnite (?), X1 (here light pistage green or light green, epidote with white feldspar and quartz? Very fine grained)
HSH01	175	178	0;	50; Greenish	2; Red	9; Medium-grained (1-5 mm)	0;	80; Greyish	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	90; 90/10	relatively much epidote, calcite, rich in very fine grained fracture material (pistage green, light green, dark green and light grey) Volcanite in Bips image (delayed cuttings)
HSH01	178	181	0;	50; Greenish	2; Red	9; Medium-grained (1-5 mm)	0;	80; Greyish	2; Red	9; Medium-grained (1-5 mm)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)		32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	80; 80/20	relatively much epidote, rich in very fine grained fracture material (pistage green, light green) Volcanite in Bips image (delayed cuttings)
HSH01	181	184	0;	0;	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	16; Epidote	70; 70/30	rich in very fine grained fracture material (pistage green, light green), chlorite on fracture plane.
HSH01	184	187	0;	0;	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	50; 50/50	rich in very fine grained fracture material (pistage green, light green),calcite, quartz as possible fracture material
HSH01	187	190	0;	0;	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	50; 50/50	traces of calcite and epidote
HSH01	190	193	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)	32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	16; Epidote	80; 80/20	traces of pyrite, possible sphene (X2),
HSH01	193	196	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)	32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz	3; Amphibole	70; 70/30	traces of calcite,epidote, X1,
HSH01	196	200	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501036; Quartz monzodiorite (˜ sp□diorite, tonalite)	32; Potash Feldspar	49; Plagioclase	10; Biotite	36; Quartz		90; 90/10	traces of X2, epidote. Rock ratio very uncertain.

Drill cuttings

Date: 2003-04-10 Sign.: Christin Nordman

Hole	from	to	Untreated drill cuttings sample Lightn.	Chrom.	Hue	Grainsize	Washed and sieved drill cuttings sample Lightn.	Chrom.	Hue	Grainsize	Rock type A	Rock type B	Min-1	Min-2	Min-3	Min-4	Min-5	Distr.	Kommentar
HSH02	**1.3**	- 3.4	0;	0;	4; Brown	6; Fine-to medium grained	0;	40; Brownish	2; Red	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	16; Epidote	30; Calcite	100; 100 %	moraine? Or contamination of moraine. No visible quartz?
HSH02	3.4	- 6.4	200; Dark	0;	8; Grey	8; Medium to coarse grained	0;	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	33; Chlorite	100; 100 %	traces of epidote. Contamination of moraine?
HSH02	6.4	- 9.4	200; Dark	0;	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	100; 100 %	traces of epidote, calcite, X1 (light green aphanitic to finegrained aggregate, possibly of epidote, feldspar and quartz)
HSH02	9.4	- 12.4	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	100; 100 %	X1 of various colour shades
HSH02	12.4	- 16	200; Dark	0;	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	30; Calcite	100; 100 %	only traces of calcite
HSH02	16	- 19	200; Dark	50; Greenish	2; Red	9; Medium-grained (1-5 mm)	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (~ sp□ diorite, tonalite)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	90; 90/10	X1- probably prehnite. Biotite seems chlorite altered in the oxidized parts. The oxidized parts seem to be very poor in quartz. Traces of rust
HSH02	19	- 22	200; Dark	0;	2; Red	9; Medium-grained (1-5 mm)	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (~ sp□ diorite, tonalite)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	30; Calcite	90; 90/10	traces of yellowish mineral, X1, rust. Uncertain rock type, could be only altered volcanite?
HSH02	22	- 25	200; Dark	0;	2; Red	9; Medium-grained (1-5 mm)	200; Dark	0;	2; Red	2; Fine-grained (<1 mm)	501036; Quartz monzodiorite (~ sp□ diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	33; Chlorite	100; 100 %	traces of pyrite, 5mm quartz grain (from fracture filling?), chlorite as alteration procuct from biotite. Uncertain rock type, could be only altered volcanite???
HSH02	25	- 28	200; Dark	0;	2; Red	9; Medium-grained (1-5 mm)	200; Dark	80; Greyish	2; Red	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	70; 70/30	25-26m dark grey/black, traces of X1
HSH02	28	- 31	200; Dark	20; Reddish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	80; Greyish	2; Red	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		90; 90/10	aphanitic very greenish black fracture material (sealed)
HSH02	31	- 34	200; Dark	20; Reddish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	80; Greyish	2; Red	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	80; 80/20	
HSH02	34	- 37	200; Dark	50; Greenish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	90; 90/10	traces of X2, pyrite, epidote, calcite
HSH02	37	- 40	200; Dark	10; Pinkish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	30; Calcite	90; 90/10	traces of X2
HSH02	40	- 43	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	16; Epidote	100; 100 %	traces of calcite, 5mm big quartz-grain (from sealed fracture?)
HSH02	43	- 46	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		90; 90/10	
HSH02	46	- 49	200; Dark	10; Pinkish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	70; 70/30	very little epidote, calcite, pyrite
HSH02	49	- 52	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		90; 90/10	traces of rust
HSH02	52	- 55	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501058; Granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	60; 60/40	53-54m red (granite), traces of epidote, calcite together with epidote as fracture material
HSH02	55	- 58	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501058; Granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	90; 90/10	
HSH02	58	- 61	200; Dark	0;	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	6; Fine-to medium grained	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		90; 90/10	traces of pyrite, calcite, X2
HSH02	61	- 64	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite			100; 100 %	any quartz?
HSH02	64	- 67	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite			100; 100 %	any quartz? Traces of rust, X3, X1
HSH02	67	- 70	0;	50; Greenish	2; Red	9; Medium-grained (1-5 mm)	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite		80; 80/20	67-68 black as above traces of epidote and calcite. Fresh rock
HSH02	70	- 73	0;	20; Reddish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	16; Epidote	90; 90/10	70-72m dark red. Probable fracture material of chlorite, epidote and quartz. (X!)
HSH02	73	- 76	200; Dark	0;	2; Red	9; Medium-grained (1-5 mm)	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (~ sp□ diorite, tonalite)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		70; 70/30	74-75m black/dark grey
HSH02	76	- 79	200; Dark	10; Pinkish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (~ sp□ diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	50; Pyrite	80; 80/20	traces of X1

Drill cuttings

Date: 2003-04-10 Sign.: Christin Nordman

			Untreated drill cuttings sample				Washed and sieved drill cuttings sample												
Hole	from	to	Lightn.	Chrom.	Hue	Grainsize	Lightn.	Chrom.	Hue	Grainsize	Rock type A	Rock type B	Min-1	Min-2	Min-3	Min-4	Min-5	Distr.	Kommentar
HSH02	79	82	200; Dark	0;	8; Grey	6; Fine-to medium grained	200; Dark	10; Pinkish	8; Grey	6; Fine-to medium grained	511058; Fine-grained granite	501036; Quartz monzodiorite (˜ sp□ diorite, tonalite)	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	50; Pyrite	70; 70/30	traces of calcite
HSH02	82	85	200; Dark	50; Greenish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		70; 70/30	granite light pinkish grey
HSH02	85	88	200; Dark	50; Greenish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501036; Quartz monzodiorite (˜ sp□ diorite, tonalite)	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		60; 60/40	possibly also some granite
HSH02	88	91	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	30; Calcite	100; 100 %	almost aphanitic, traces of X1 and granite. In BIPS-image light coloured rock - delayed cuttings?
HSH02	91	94	0;	0;	9; Black	9; Medium-grained (1-5 mm)	200; Dark	80; Greyish	2; Red	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501036; Quartz monzodiorite (˜ sp□ diorite, tonalite)	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		50; 50/50	red and black, 501036 fine- to medium grained. Also some granite, fine-medium grained.
HSH02	94	97	0;	50; Greenish	2; Red	9; Medium-grained (1-5 mm)	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501036; Quartz monzodiorite (˜ sp□ diorite, tonalite)	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	70; 70/30	94-96 m black.
HSH02	97	100	0;	10; Pinkish	8; Grey	8; Medium to coarse grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (˜ sp□ diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	100; 100 %	BIPS-images unclear - porphyritic or not? Traces of calcite
HSH02	100	103	0;	0;	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		100; 100 %	100-101m dark grey. Traces of coarse grained granite
HSH02	103	106	200; Dark	50; Greenish	8; Grey	8; Medium to coarse grained	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		100; 100 %	weathered surfaces indicate open fracture, small rusty minerals.
HSH02	106	109	200; Dark	50; Greenish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	50; 50/50	108-109m dark red, one grain seem to be a part of a shear zone
HSH02	109	112	0;	0;	2; Red	9; Medium-grained (1-5 mm)	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	50; 50/50	110-112m dark grey. Volacanite fine to medium grained.
HSH02	112	115	0;	0;	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		100; 100 %	some parts with fine-medium grain size
HSH02	115	118	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		100; 100 %	
HSH02	118	121	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501058; Granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	50; Pyrite	90; 90/10	
HSH02	121	124	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	501058; Granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		90; 90/10	
HSH02	124	127	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		100; 100 %	
HSH02	127	130	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		90; 90/10	
HSH02	130	133	0;	0;	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		90; 90/10	
HSH02	133	136	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		100; 100 %	
HSH02	136	139	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		100; 100 %	traces of rust, fine-medium grained granite
HSH02	139	142	0;	50; Greenish	9; Black	8; Medium to coarse grained	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		100; 100 %	traces of rusty mineral
HSH02	142	145	0;	0;	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		100; 100 %	some parts oxidated
HSH02	145	148	200; Dark	20; Reddish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	2; Red	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	30; Calcite	100; 100 %	traces of X1 and epidote
HSH02	148	151	200; Dark	20; Reddish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	30; Calcite	100; 100 %	
HSH02	151	154	200; Dark	50; Greenish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	100; 100 %	traces of calcite
HSH02	154	157	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	90; 90/10	
HSH02	157	160	200; Dark	50; Greenish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	33; Chlorite	90; 90/10	only traces of chlorite

Drill cuttings

Date: 2003-04-10 Sign.: Christin Nordman

Hole	from	to	Untreated drill cuttings sample Lightn.	Chrom.	Hue	Grainsize	Washed and sieved drill cuttings sample Lightn.	Chrom.	Hue	Grainsize	Rock type A	Rock type B	Min-1	Min-2	Min-3	Min-4	Min-5	Distr.	Kommentar
HSH02	160	163	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	16; Epidote	100; 100 %	planes with chlorite and calcite
HSH02	163	166	0;	10; Pinkish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	16; Epidote	80; 80/20	
HSH02	166	169	0;	0;	9; Black	8; Medium to coarse grained	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		100; 100 %	
HSH02	169	172	0;	10; Pinkish	9; Black	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	16; Epidote	80; 80/20	
HSH02	172	175	0;	50; Greenish	9; Black	6; Fine-to medium grained	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	16; Epidote	90; 90/10	
HSH02	175	178	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	16; Epidote	90; 90/10	
HSH02	178	181	200; Dark	50; Greenish	8; Grey	6; Fine-to medium grained	200; Dark	50; Greenish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	30; Calcite	80; 80/20	
HSH02	181	184	200; Dark	50; Greenish	8; Grey	6; Fine-to medium grained	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	16; Epidote	80; 80/20	
HSH02	184	187	200; Dark	50; Greenish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	90; 90/10	traces of calcite, epidote
HSH02	187	190	200; Dark	50; Greenish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	100; 100 %	traces of granite.
HSH02	190	193	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz		100; 100 %	
HSH02	193	196	0;	50; Greenish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	0;	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	90; 90/10	traces of epidote and X1
HSH02	196	199	0;	10; Pinkish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	16; Epidote	70; 70/30	
HSH02	199	200	0;	10; Pinkish	9; Black	9; Medium-grained (1-5 mm)	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	60; 60/40	traces of epidote, X1

Drill cuttings

Date: 2003-04-11 Sign.: Christin Nordman

Hole	from	to	Untreated drill cuttings sample Lightn.	Chrom.	Hue	Grainsize	Washed and sieved drill cuttings sample Lightn.	Chrom.	Hue	Grainsize	Rock type A	Rock type B	Min-1	Min-2	Min-3	Min-4	Min-5	Distr.	Kommentar
HSH03	**0.3**	3.4	100; Light	0;	4; Brown	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite		100; 100 %	traces of epidote
HSH03	3.4	6.4	0;	0;	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	11091; X1	100; 100 %	traces of X1 (aphanitic to fine-grained epidote, quartz-feldspar aggregate or prehnite?)
HSH03	6.4	9.4	0;	0;	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite		100; 100 %	
HSH03	9.4	12	0;	80; Greyish	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	33; Chlorite	100; 100 %	biotite seems slightly chlorite altered.
HSH03	12	16	100; Light	10; Pinkish	8; Grey	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	33; Chlorite	100; 100 %	traces of epidote, biotite seems slightly chlorite altered.
HSH03	16	19	100; Light	10; Pinkish	8; Grey	6; Fine-to medium grained	0;	80; Greyish	2; Red	6; Fine-to medium grained	511058; Fine-grained granite	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	33; Chlorite	90; 90/10	traces of epidote, biotite seems slightly chlorite altered.
HSH03	19	22	100; Light	10; Pinkish	8; Grey	6; Fine-to medium grained	100; Light	80; Greyish	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite		100; 100 %	
HSH03	22	25	0;	80; Greyish	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	16; Epidote	100; 100 %	only traces of epidote
HSH03	25	28	100; Light	10; Pinkish	8; Grey	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite		100; 100 %	
HSH03	28	31	0;	80; Greyish	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	11091; X1	100; 100 %	
HSH03	31	34	100; Light	80; Greyish	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite		100; 100 %	traces of epidote (1 grain)
HSH03	34	37	100; Light	0;	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite	505102; Fine-grained diorite-gabbro (Greenstone)	49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	16; Epidote	90; 90/10	traces of rust, epidote in xenolith (?, dark, finegrained, with visible biotite and epidote) Rock type 2 uncertain.
HSH03	37	40	100; Light	0;	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	16; Epidote	100; 100 %	traces of epidote, X2 (dark red transparent mineral),
HSH03	40	43	100; Light	80; Greyish	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	16; Epidote	100; 100 %	traces of epidote
HSH03	43	46	100; Light	80; Greyish	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	16; Epidote	100; 100 %	traces of epidote
HSH03	46	49	0;	0;	2; Red	6; Fine-to medium grained	200; Dark	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	16; Epidote	100; 100 %	greyish 46-47m, oxidized, X1 (fracture material)
HSH03	49	52	100; Light	80; Greyish	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	33; Chlorite	100; 100 %	chlorite as alteration product from biotite
HSH03	52	55	0;	0;	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite		100; 100 %	schistose in BIPS-images! Traces of epidote, fine grain size dominates
HSH03	55	58	0;	0;	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	30; Calcite	100; 100 %	traces of calcite, rusty mineral,
HSH03	58	61	0;	80; Greyish	2; Red	6; Fine-to medium grained	0;	50; Greenish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	50; Pyrite	90; 90/10	traces of calcite,
HSH03	61	64	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	50; Pyrite	100; 100 %	traces of pyrite
HSH03	64	67	200; Dark	20; Reddish	8; Grey	9; Medium-grained (1-5 mm)	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	100; 100 %	biotite partly chlorite altered.
HSH03	67	70	200; Dark	0;	2; Red	9; Medium-grained (1-5 mm)	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	33; Chlorite	100; 100 %	epidote, X1, red aphanitic grains
HSH03	70	73	200; Dark	0;	2; Red	6; Fine-to medium grained	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	33; Chlorite	100; 100 %	traces of X1,
HSH03	73	76	200; Dark	0;	2; Red	6; Fine-to medium grained	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	33; Chlorite	100; 100 %	traces of X1, calcite, rust, qz-rich "vein" with wallrock material,
HSH03	76	79	200; Dark	0;	2; Red	6; Fine-to medium grained	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	100; 100 %	traces of epidote
HSH03	79	82	200; Dark	0;	2; Red	6; Fine-to medium grained	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	90; 90/10	traces of epidote
HSH03	82	85	200; Dark	0;	2; Red	8; Medium to coarse grained	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	33; Chlorite	80; 80/20	traces of calcite,X1, epidote
HSH03	85	88	200; Dark	0;	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite	501036; Quartz monzodiorite (Äspö diorite, tonalite)	49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	33; Chlorite	90; 90/10	traces of calcite,X1, epidote
HSH03	88	91	200; Dark	0;	2; Red	6; Fine-to medium grained	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	33; Chlorite	90; 90/10	traces of calcite,X1, epidote
HSH03	91	94	200; Dark	50; Greenish	2; Red	9; Medium-grained (1-5 mm)	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	90; 90/10	epidote, calcite, chlorite, also grey aphanitic vein material
HSH03	94	97	200; Dark	80; Greyish	2; Red	9; Medium-grained (1-5 mm)	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	100; 100 %	traces of calcite, fine-medium grained, granite, biotite partly chlorite altered.
HSH03	97	100	200; Dark	80; Greyish	2; Red	9; Medium-grained (1-5 mm)	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of X1, calcite, pyrite,
HSH03	100	103	200; Dark	50; Greenish	2; Red	6; Fine-to medium grained	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	3; Amphibole	90; 90/10	traces of calcite
HSH03	103	106	200; Dark	50; Greenish	2; Red	6; Fine-to medium grained	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	105-106m fresher rock, traces of pyrite, X1, chlorite, calcite
HSH03	106	109	200; Dark	50; Greenish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of X1, pyrite, calcite, also white quarts in sealed fractures.
HSH03	109	112	200; Dark	50; Greenish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	Traces of pyrite, calcite, X1, epidote. 110-111m somewhat reddish.
HSH03	112	115	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of X2, calcite, epidote

Drill cuttings

Date: 2003-04-11 Sign.: Christin Nordman

Hole	from	-	to	Untreated drill cuttings sample Lightn.	Chrom.	Hue	Grainsize	Washed and sieved drill cuttings sample Lightn.	Chrom.	Hue	Grainsize	Rock type A	Rock type B	Min-1	Min-2	Min-3	Min-4	Min-5	Distr.	Kommentar
HSH03	115	-	118	0;	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	100; 100 %	traces of X1, X2, calcite. 117-118m red
HSH03	118	-	121	200; Dark	50; Greenish	2; Red	6; Fine-to medium grained	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	16; Epidote	100; 100 %	quartz-feldspar + epidote rich aphanitic aggregates, X1, also pure quarts in bigger grains (4mm), traces of calcite. Sealed vein with X1 and purer epidote that seems sheared. epidote and quartz material also possibly sheared.
HSH03	121	-	124	200; Dark	10; Pinkish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	511058; Fine-grained granite	501036; Quartz monzodiorite (Äspö diorite, tonalite)	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	16; Epidote	70; 70/30	traces of epidote, calcite, pyrite, X1. Rock type ratio very uncertain
HSH03	124	-	127	200; Dark	10; Pinkish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	511058; Fine-grained granite	501036; Quartz monzodiorite (Äspö diorite, tonalite)	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	16; Epidote	90; 90/10	Traces of X2, pyrite, calcite. Rock type ratio very uncertain
HSH03	127	-	130	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	501030; Fine-grained dioritoid (Metavolcanite, volcanite)	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	16; Epidote	90; 90/10	traces of X1, epidote, pyrite. Volcanite uncertain
HSH03	130	-	133	200; Dark	10; Pinkish	8; Grey	6; Fine-to medium grained	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	16; Epidote	100; 100 %	traces of pyrite, epidote, calcite
HSH03	133	-	136	200; Dark	10; Pinkish	8; Grey	6; Fine-to medium grained	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	11091; X1	100; 100 %	traces of pyrite, calcite, epidote, rusty mineral,
HSH03	136	-	139	200; Dark	0;	8; Grey	6; Fine-to medium grained	200; Dark	0;	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	traces of calcite, pyrite, X2
HSH03	139	-	142	200; Dark	10; Pinkish	8; Grey	6; Fine-to medium grained	200; Dark	0;	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	3; Amphibole	90; 90/10	traces of X2,pyrite, epidote
HSH03	142	-	145	200; Dark	10; Pinkish	8; Grey	6; Fine-to medium grained	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	3; Amphibole	70; 70/30	traces of X2, pyrite Rock type ratio very uncertain
HSH03	145	-	148	200; Dark	0;	8; Grey	6; Fine-to medium grained	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	Traces of calcite, X1, X2. possibly also granite. Very fine drill cuttings.
HSH03	148	-	151	200; Dark	0;	8; Grey	6; Fine-to medium grained	200; Dark	0;	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	Traces of epidote, calcite, X1, X2
HSH03	151	-	154	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	3; Amphibole	100; 100 %	Traces of epidote, calcite, X2
HSH03	154	-	157	0;	0;	2; Red	6; Fine-to medium grained	200; Dark	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	10; Biotite	36; Quartz	33; Chlorite	100; 100 %	Traces of pyrite, epidote, X1, chlorite as alteration product from biotite
HSH03	157	-	160	0;	0;	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite	501036; Quartz monzodiorite (Äspö diorite, tonalite)	49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	33; Chlorite	80; 80/20	Traces of epidote, X1, chlorite as alteration product from biotite
HSH03	160	-	163	0;	0;	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	511058; Fine-grained granite		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	16; Epidote	100; 100 %	Traces of calcite
HSH03	163	-	166	0;	80; Greyish	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	6; Fine-to medium grained	511058; Fine-grained granite	505102; Fine-grained diorite-gabbro (Greenstone)	49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	3; Amphibole	70; 70/30	Probably also some 501036. Traces of calcite and epidote
HSH03	166	-	169	0;	80; Greyish	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	16; Epidote	100; 100 %	X1, relatively much epidote, traces of pyrite
HSH03	169	-	172	0;	80; Greyish	2; Red	6; Fine-to medium grained	0;	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite		50; 50/50	Rock type ratio very uncertain
HSH03	172	-	175	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	16; Epidote	90; 90/10	Fine grain size dominates. traces of calcite, epidote, X2,
HSH03	175	-	178	200; Dark	0;	2; Red	6; Fine-to medium grained	0;	0;	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	11091; X1	100; 100 %	traces of pyrite, epidote
HSH03	178	-	181	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	3; Amphibole	100; 100 %	traces of pyrite,epidote. Possibly traces of granite?
HSH03	181	-	184	200; Dark	50; Greenish	2; Red	6; Fine-to medium grained	200; Dark	50; Greenish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	3; Amphibole	100; 100 %	Relatively rich in epidote and X1, also quartz from fracture material? Traces of pyrite
HSH03	184	-	187	200; Dark	50; Greenish	2; Red	6; Fine-to medium grained	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	11091; X1	90; 90/10	Relatively rich in epidote and X1 (also dark green and bluish green) Traces of pyrite
HSH03	187	-	190	200; Dark	10; Pinkish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	11091; X1	60; 60/40	Traces of pyrite, Rock type ratio very uncertain
HSH03	190	-	193	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)		49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	16; Epidote	100; 100 %	Traces of epidote, X1, pyrite
HSH03	193	-	196	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	80; Greyish	2; Red	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	3; Amphibole	90; 90/10	Traces of pyrite, X1 (sheared/mylonitic?)
HSH03	196	-	199	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	3; Amphibole	90; 90/10	Traces of pyrite, calcite, X1.
HSH03	199	-	201	200; Dark	20; Reddish	8; Grey	2; Fine-grained (<1 mm)	200; Dark	20; Reddish	8; Grey	6; Fine-to medium grained	501036; Quartz monzodiorite (Äspö diorite, tonalite)	511058; Fine-grained granite	49; Plagioclase	32; Potash Feldspar	36; Quartz	10; Biotite	3; Amphibole	50; 50/50	Traces of X1, X2. Hematite-rich 1mm thin vein