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Keywords: Geophysics, Rock unit, Borehole, Deformation zone, Fractures, Alteration.

Data in SKB's database can be changed for different reasons. Minor changes in SKB's database will not necessarily result in a revised report. Data revisions may also be presented as supplements, available at www.skb.se.

A pdf version of this document can be downloaded from www.skb.se.

Abstract

This report contains geological single-hole interpretation of the cored borehole KLX14A and the percussion borehole HLX43 at Laxemar. The interpretation combines the geological core mapping, interpreted geophysical logs and borehole radar measurements to identify rock units and possible deformation zones in the boreholes.

The geological single-hole interpretation shows that two rock units (RU1–RU2) occur in KLX14A. However, the borehole can be divided into three separate sections due to the repetition of RU1 (RU1a and RU1b). In general, borehole KLX14A is dominated by quartz monzodiorite (501036). Subordinate rock types comprise occurrences of fine-grained granite (511058), dolerite (501027), pegmatite (501061), fine-grained diorite-gabbro (505102) and granite (501058). Six possible deformation zones are identified in KLX14A (DZ1–DZ6).

Three rock units (RU1–RU3) occur in HLX43. However, the borehole can be divided into four separate sections due to the repetition of RU1 (RU1a and RU1b). The upper part of the borehole is dominated by a mixture of Ävrö granite (501044) and diorite/gabbro (501033) and a large section with dolerite (501027). The lower part of the borehole is dominated by Ävrö granite (501044). Subordinate rock types comprise occurrences of fine-grained granite (511058) and pegmatite (501061). One possible deformation zone is identified in HLX43 (DZ1).

Sammanfattning

Denna rapport behandlar geologisk enhålstolkning av kärnborrhålet KLX14A och hammarborrhålet HLX43 i Laxemar. Den geologiska enhålstolkningen syftar till att utifrån den geologiska karteringen, tolkade geofysiska loggar och borrhålsradarmätningar identifiera olika litologiska enheters fördelning i borrhålen samt möjliga deformationszoners läge och utbredning.

Den geologiska enhålstolkningen visar att KLX14A kan delas in i två litologiska enheter (RU1–RU2). Baserat på repetition av enheten RU1 (RU1a och RU1b) kan borrhålet delas in i tre sektioner. Generellt sett domineras borrhålet av kvartsmonzodiorit (501036). Finkornig granit (511058), diabas (501027), pegmatit (501061), finkornig diorit-gabbro (505102) och granit (511058) förekommer som underordnade bergarter. Sex möjliga deformationszoner har identifierats i KLX14A (DZ1–DZ6).

Tre litologiska enheter (RU1–RU3) förekommer i hammarborrhål HLX43. Baserat på repetition av enheten RU1 (RU1a och RU1b) kan borrhålet delas in i fyra sektioner. Den övre delen av borrhålet domineras av en blandning av Ävrögranit (501044) och diorit/gabbro (501033), och ett långt intervall med diabas (501027). Nedre delen av borrhålet domineras av Ävrögranit (501044). Finkornig granit (511058) och pegmatit (501061) förekommer som underordnade bergarter. En möjlig deformationszon har identifierats i HLX43 (DZ1).

Contents

1 Introduction

Much of the primary geological and geophysical borehole data stored in the SKB database SICADA need to be integrated and synthesized before they can be used for modeling in the 3D-CAD system Rock Visualization System (RVS). The end result of this procedure is a geological single-hole interpretation, which consists of integrated series of different loggings and accompanying descriptive documents (SKB MD 810.003 v.3.0, SKB internal controlling document).

This document reports the results gained by the geological single-hole interpretation of boreholes KLX14A and HLX43 at Laxemar (Figure 1-1), which is one of the activities performed within the site investigation at Oskarshamn. The work was carried out in accordance with activity plan AP PS 400-06-152. The controlling documents for performing this activity are listed in Table 1-1. Both activity plan and method description are SKB's internal controlling documents. Rock type nomenclature that has been used is shown in Table 1-2.

Original data from the reported activity are stored in the primary database Sicada, where they are traceable by the Activity Plan number (AP PS 400-06-152). Only data in SKB's databases are accepted for further interpretation and modelling. The data presented in this report are regarded as copies of the original data. Data in the databases may be revised, if needed. Such revisions will not necessarily result in a revision of the P-report, although the normal procedure is that major data revisions entail a revision of the P-report. Minor data revisions are normally presented as supplements, available at www.skb.se.

Table 1-1. Controlling documents for the performance of the activity.

Activity plan	Number	Version
Geologisk enhålstolkning av KLX14A och HLX43	AP PS 400-06-152	1.0
Method description	**Number**	**Version**
Metodbeskrivning för geologisk enhålstolkning	SKB MD 810.003	3.0

Table 1-2. Rock type nomenclature for the site investigation at Oskarshamn.

Rock type	Rock code	Rock description
Dolerite	501027	Dolerite
Fine-grained Götemar granite	531058	Granite, fine- to medium-grained, ("Götemar granite")
Coarse-grained Götemar granite	521058	Granite, coarse-grained, ("Götemar granite")
Fine-grained granite	511058	Granite, fine- to medium-grained
Pegmatite	501061	Pegmatite
Granite	501058	Granite, medium- to coarse-grained
Ävrö granite	501044	Granite to quartz monzodiorite, generally porphyritic
Quartz monzodiorite	501036	Quartz monzonite to monzodiorite, equigranular to weakly porphyritic
Diorite/gabbro	501033	Diorite to gabbro
Fine-grained dioritoid	501030	Intermediate magmatic rock
Fine-grained diorite-gabbro	505102	Mafic rock, fine-grained
Sulphide mineralization	509010	Sulphide mineralization
Sandstone	506007	Sandstone

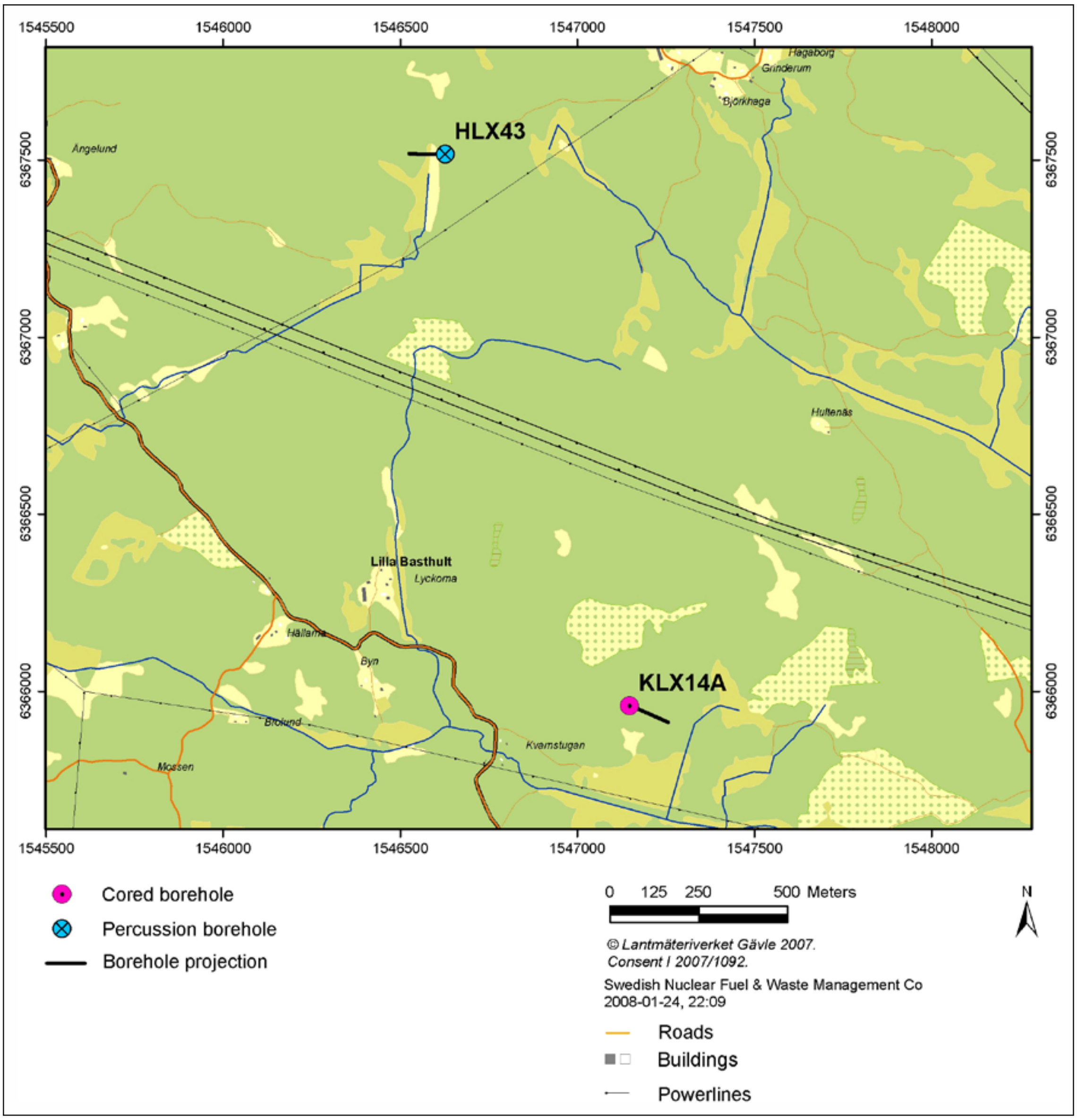

Figure 1-1. *Map showing the position of the cored borehole KLX14A and the percussion drilled borehole HLX43.*

2 Objective and scope

A geological single-hole interpretation is carried out in order to identify and to describe briefly the characteristics of major rock units and possible deformation zones within a borehole. The work involves an integrated interpretation of data from the geological mapping of the borehole (Boremap), different borehole geophysical logs and borehole radar data. The geological mapping of the cored boreholes involves a documentation of the character of the bedrock in the drill core. This work component is carried out in combination with an inspection of the oriented image of the borehole walls that is obtained with the help of the Borehole Image Processing System (BIPS). The geological mapping of the percussion boreholes focuses more attention on an integrated interpretation of the information from the geophysical logs and the BIPS images. For this reason, the results from the percussion borehole mapping are more uncertain. The interpretations of the borehole geophysical and radar logs are available when the single-hole interpretation is performed. The result from the geological single-hole interpretation is presented in a WellCad plot. The work reported here concerns stage 1 in the single-hole interpretation, as defined in the method description.

3 Data used for the geological single-hole interpretation

The following data have been used in the single-hole interpretation of boreholes KLX14A and HLX43.

- Boremap data (including BIPS and geological mapping data) /2, 3/.
- Generalized geophysical logs and their interpretation /4, 5/.
- Radar data and their interpretation /6, 7/.

As a basis for the geological single-hole interpretation a combined WellCad plot consisting of the above mentioned data sets were used. An example of a WellCad plot used during the geological single-hole interpretation is shown in Figure 3-1. The plot consists of nine main columns and several subordinate columns. These include nine main:

1: Length along the borehole

2: Boremap data
- 2.1: Rock type
- 2.2: Rock type < 1 m
- 2.3: Rock type structure
- 2.4: Rock structure intensity
- 2.5: Rock type texture
- 2.6: Rock type grain size
- 2.7: Structure orientation
- 2.8: Rock alteration
- 2.9: Rock alteration intensity
- 2.10: Crush

3: Generalized geophysical data
- 3.1: Silicate density
- 3.2: Magnetic susceptibility
- 3.3: Natural gamma radiation
- 3.4: Estimated fracture frequency

4: Unbroken fractures
- 4.1: Primary mineral
- 4.2: Secondary mineral
- 4.3: Third mineral
- 4.4: Fourth mineral
- 4.5: Alteration, dip direction

5: Broken fractures
- 5.1: Primary mineral
- 5.2: Secondary mineral
- 5.3: Third mineral
- 5.4: Fourth mineral

- 5.5: Aperture (mm)
- 5.6: Roughness
- 5.7: Surface
- 5.8: Slickenside
- 5.9: Alteration, dip direction

6: Crush zones

- 6.1: Piece (mm)
- 6.2: Sealed network
- 6.3: Core loss

7: Fracture frequency

- 7.1: Sealed fractures
- 7.2: Open fractures

8: BIPS

9: Length along the borehole

The geophysical logs are described below:

Magnetic susceptibility: The rock has been classified into sections of low, medium, high, and very high magnetic susceptibility. The susceptibility is strongly connected to the magnetite content in the different rock types.

Natural gamma radiation: The rock has been classified into sections of low, medium, and high natural gamma radiation. Low radiation may indicate mafic rock types and high radiation may indicate fine-grained granite or pegmatite.

Possible alteration: This parameter has not been used in the geological single-hole interpretation in the area.

Silicate density: This parameter indicates the density of the rock after subtraction of the magnetic component. It provides general information on the mineral composition of the rock types, and serves as a support during classification of rock types.

Estimated fracture frequency: This parameter provides an estimate of the fracture frequency along 5 m sections, calculated from short and long normal resistivity, SPR, P-wave velocity as well as focused resistivity 140 and 300. The estimated fracture frequency is based on a statistical connection after a comparison has been made between the geophysical logs and the mapped fracture frequency. The log provides an indication of sections with low and high fracture frequencies.

Close inspection of the borehole radar data was carried out during the interpretation process, especially during the identification of possible deformation zones. The occurrence and orientation of radar anomalies within the possible deformation zones are commented upon in the text that describes these zones.

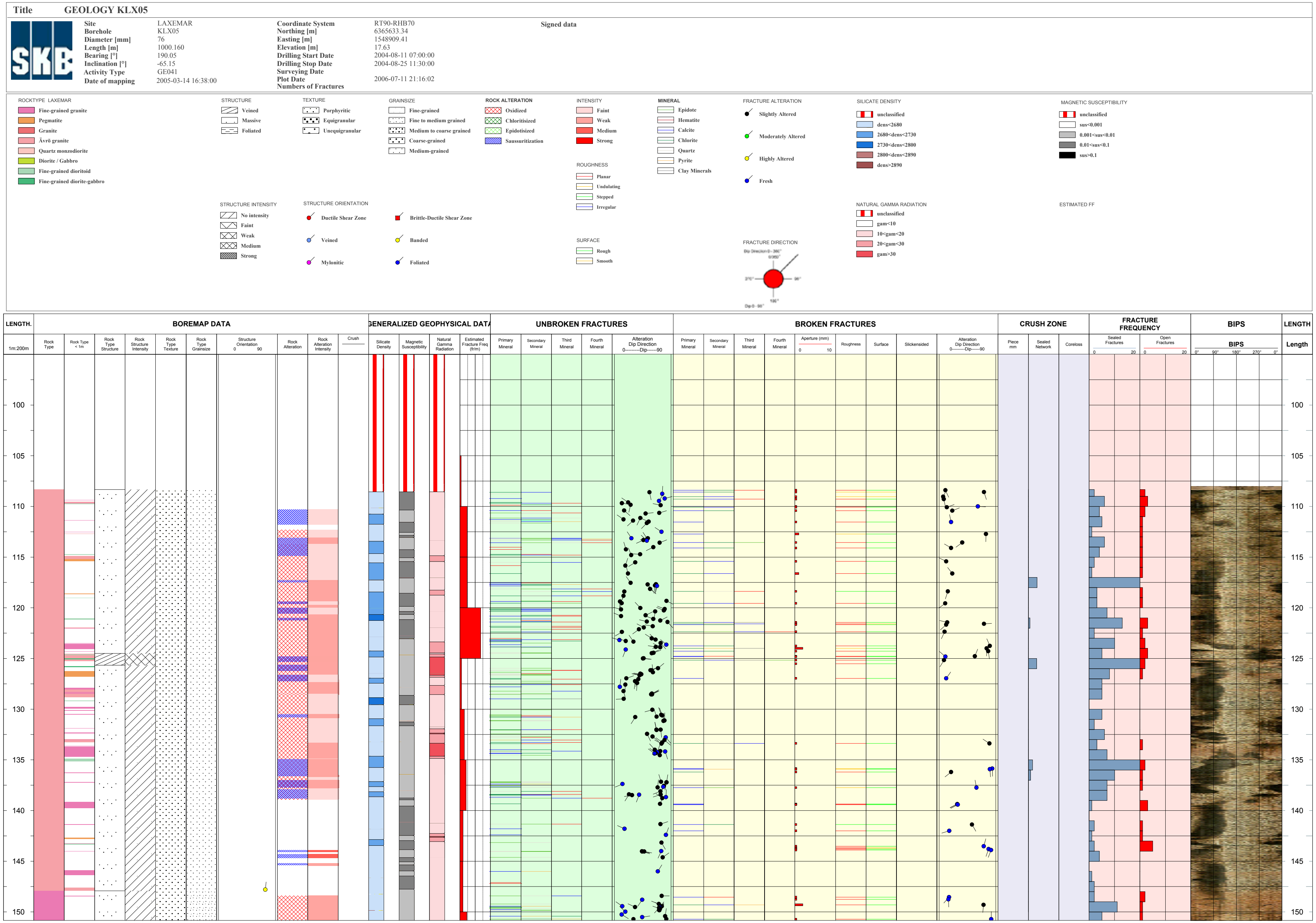

Figure 3-1. Example of WellCad plot (from borehole KLX05 in Laxemar) used as a basis for the single-hole interpretation.

4 Execution

4.1 General

The geological single-hole interpretation has been carried out by a group of geoscientists consisting of both geologists and geophysicists. All data to be used (see Chapter 3) are visualized side by side in a borehole document extracted from the software WellCad. The working procedure is summarized in Figure 4-1 and in the text below.

The first step in the working procedure is to study all types of data (rock type, rock alteration, silicate density, natural gamma radiation, etc) related to the character of the rock type and to merge sections of similar rock types, or sections where one rock type is very dominant, into rock units (minimum length of c. 5 m). Each rock unit is defined in terms of the borehole length interval and provided with a brief description for inclusion in the WellCad plot. This includes a brief description of the rock types affected by the possible deformation zone. The confidence in the interpretation of a rock unit is made on the following basis: 3 = high, 2 = medium and 1 = low.

The second step in the working procedure is to identify possible deformation zones by visual inspection of the results of the geological mapping (fracture frequency, fracture mineral, aperture, alteration, etc) in combination with the geophysical logging and radar data. The section of each identified possible deformation zone is defined in terms of the borehole length interval and provided with a brief description for inclusion in the WellCad plot. The confidence in the interpretation of a possible deformation zone is made on the following basis: 3 = high, 2 = medium and 1 = low.

Inspection of BIPS images is carried out whenever it is judged necessary during the working procedure. Furthermore, following definition of rock units and deformation zones, with their respective confidence estimates, the drill cores are inspected in order to check the selection of the boundaries between these geological entities. If judged necessary, the location of these boundaries is adjusted.

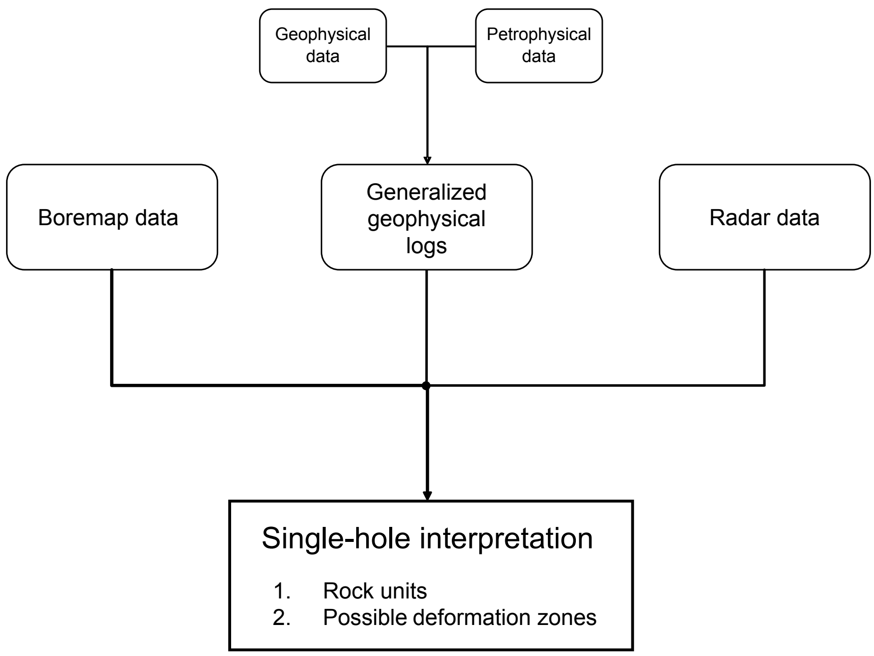

Figure 4-1. *Schematic block-scheme of single-hole interpretation.*

Possible deformation zones that are ductile or brittle in character have been identified primarily on the basis of occurrence of protomylonitic to mylonitic foliation and the frequency of fractures, respectively, according to the recommendations in /1/. Both the transitional parts and the core part have been included in each zone (Figures 4-2 to 4-4). The fracture/m values in Figure 4-4 may serve only as examples. The frequencies of open and sealed fractures have been assessed in the identification procedure, and the character of the zone has been described accordingly. Partly open fractures are included together with open fractures in the brief description of each zone. The presence of bedrock alteration, the occurrence and, locally, inferred orientation of radar reflectors, the resistivity, SPR, P-wave velocity, caliper and magnetic susceptibility logs have all assisted in the identification of primarily the brittle structures.

Since the frequency of fractures is of key importance for the definition of the possible deformation zones, a moving average plot for this parameter is shown for the cored borehole KLX14A (Figure 4-5). A 5 m window and 1 m steps have been used in the calculation procedure. The moving averages for open fractures alone, the total number of open fractures (open, partly open and crush), the sealed fractures alone, and the total number of sealed fractures (sealed and sealed fracture network) are shown in a diagram.

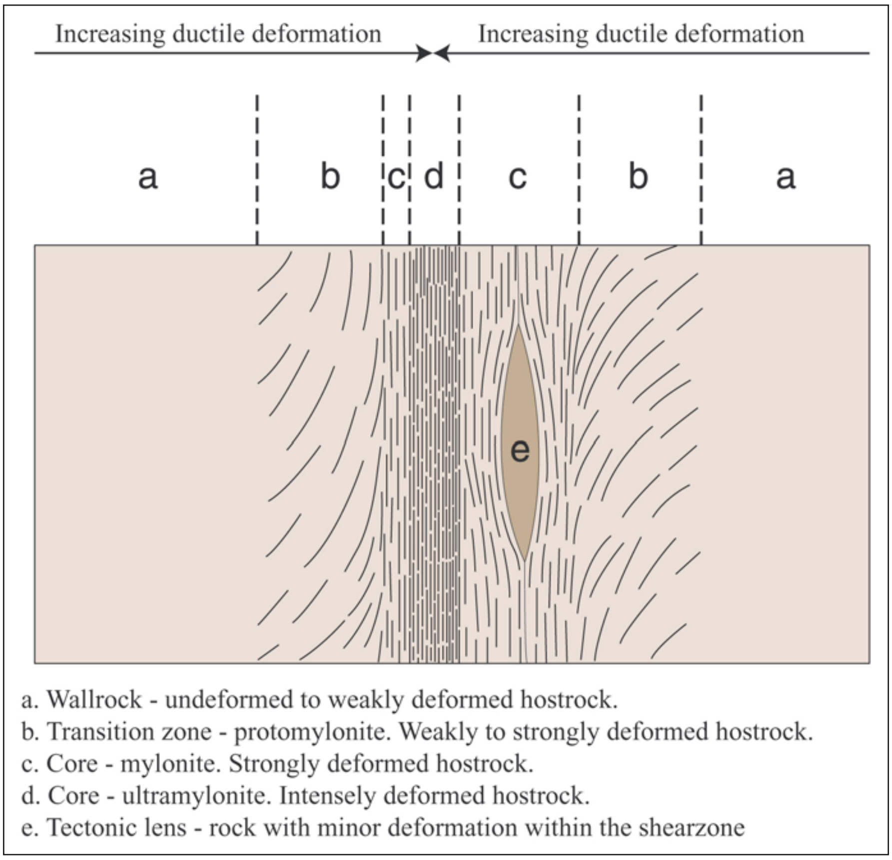

Figure 4-2. *Schematic example of a ductile shear zone. Homogeneous rock which is deformed under low- to medium-grade metamorphic conditions (after /1/).*

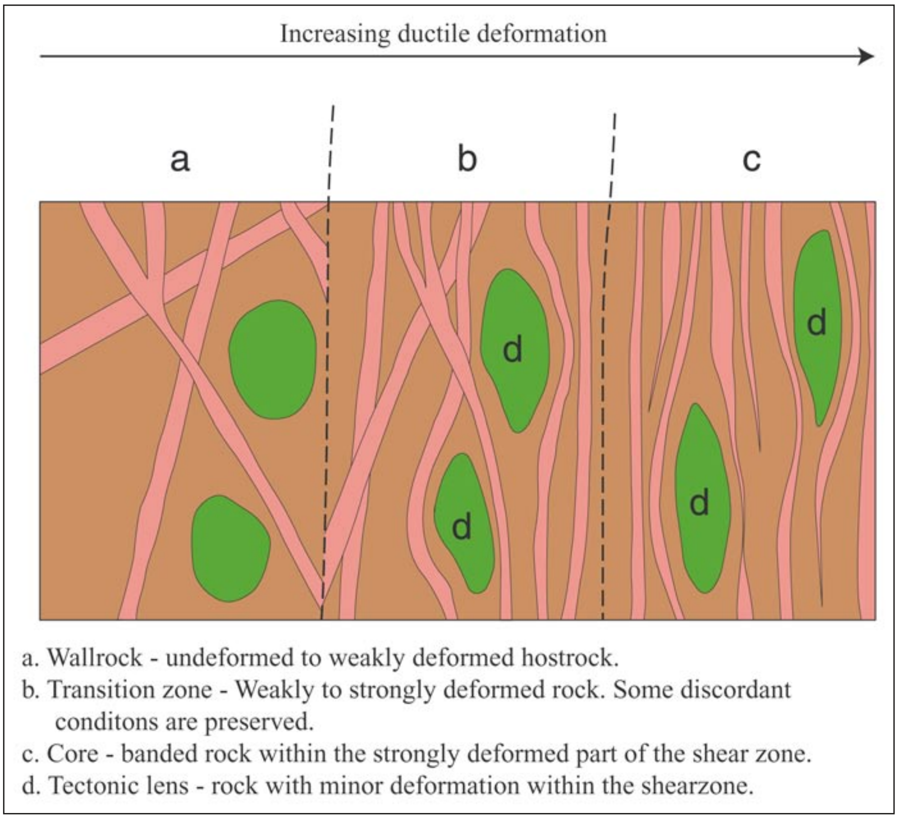

Figure 4-3. *Schematic example of a ductile shear zone. Heterogeneous rock which is deformed under low- to high-grade metamorphic conditions (after /1/).*

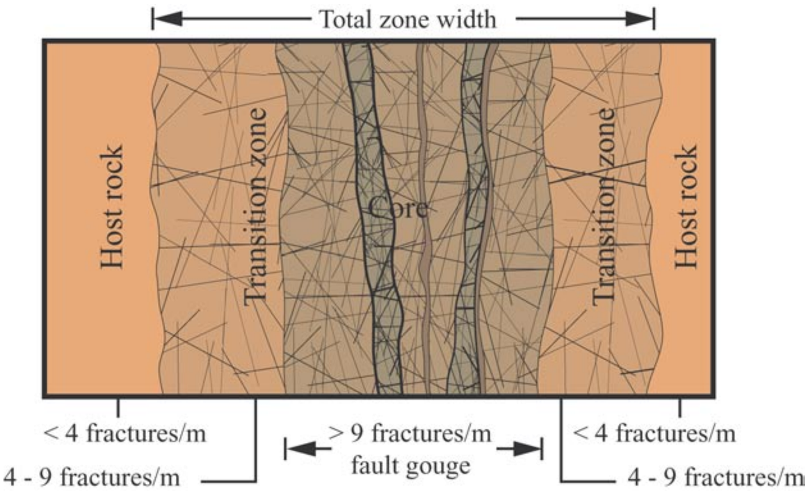

Figure 4-4. *Schematic example of a brittle deformation zone (after /1/).*

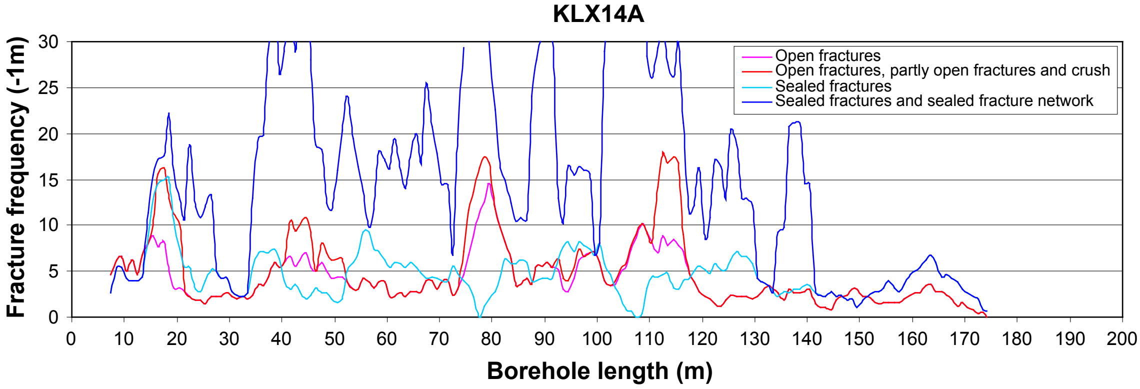

Figure 4-5. Fracture frequency plot for KLX14A. Moving average with a 5 m window and 1 m steps.

The occurrence and orientation of radar anomalies within these possible deformation zones are used during the identification of zones. Overview of the borehole radar measurement in KLX14A is shown in Figure 4-6 and for HLX43 in Figure 4-7. In some cases, alternative orientations for oriented radar reflectors are presented. One of the alternatives is considered to be correct, but due to uncertainty in the interpretation of radar data, a decision concerning which of the alternatives that represent the true orientation cannot be made.

Orientations from directional radar are presented as strike/dip using the right-hand-rule method, e.g. 040/80 corresponds to a strike of N40°E and a dip of 80° to the SE.

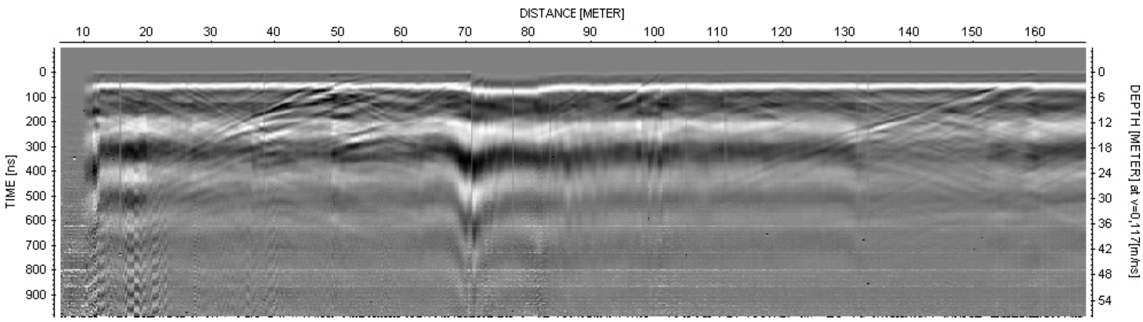

Figure 4-6. Overview (20 MHz data) of the borehole radar measurement in KLX14A.

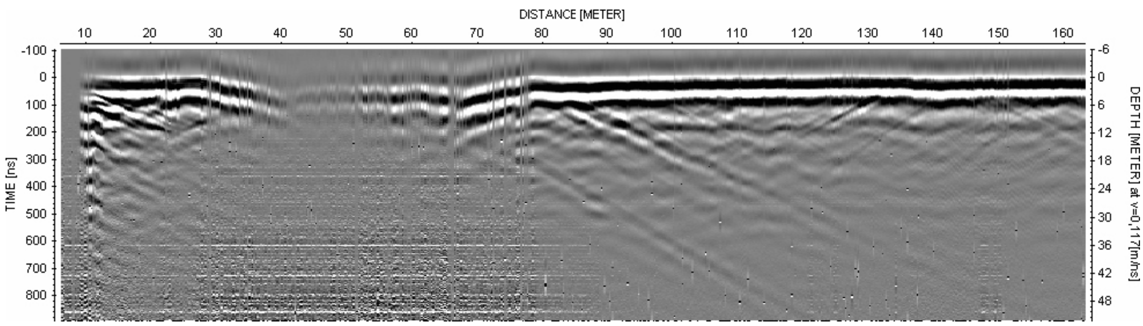

Figure 4-7. Overview (20 MHz data) of the borehole radar measurement in HLX43.

5 Results

The detailed result of the single-hole interpretation is presented as print-out from the software WellCad (Appendix 1 for KLX14A and Appendix 2 for HLX43).

5.1 KLX14A

Rock units

The borehole consists of two rock units (RU1 and RU2). Due to repetition of RU1 (RU1a and RU1b) the borehole can be divided into three sections.

4.00–69.23 m

RU1a: Totally dominated by quartz monzodiorite (501036). Subordinate rock types comprise fine-grained granite (511058), and sparse occurrences of fine-grained diorite-gabbro (505102), granite (501058) and pegmatite (501061). The section c. 51–53 m is faintly foliated. The quartz monzodiorite (501036) has a density in the range 2,750–2,800 kg/m^3. Confidence level = 3.

69.23–105.58 m

RU2: Totally dominated by quartz monzodiorite (501036). Subordinate rock types comprise fine-grained granite (511058), dolerite (501027), and very sparse occurrence of granite (501058). The quartz monzodiorite (501036) has a density in the range 2,750–2,800 kg/m^3. Confidence level = 3.

105.58–174.33 m

RU1b: Totally dominated by quartz monzodiorite (501036). Subordinate rock types comprise fine-grained granite (511058), particularly in the section c. 157.5–166 m, and very sparse occurrences of pegmatite (501061) and granite (501058). The section with fine-grained granite at c. 157.5–166 m is weakly foliated. The quartz monzodiorite (501036) has a density in the range 2,750–2,800 kg/m^3. Confidence level = 3.

Possible deformation zones

Six possible deformation zones have been recognised in KLX14A.

10.11–10.61 m

DZ1: Low-grade ductile shear zone associated with fine-grained diorite-gabbro (505102). Increased frequency of sealed fractures. Decreased magnetic susceptibility and resistivity (no sonic or caliper data available). Confidence level = 3.

17.83–18.30 m

DZ2: Brittle deformation zone characterized by increased frequency of open fractures, crush (0.35 m), faint red staining and slickenside. Decreased magnetic susceptibility and resistivity (no sonic or caliper data available). One radar reflector occurs at 17.9 m with the orientation 186/14. The reflector is prominent and can be observed to a distance of 20 m outside the borehole. The host rock is totally dominated by quartz monzodiorite (501036). Confidence level = 3.

42.07–43.35 m

DZ3: Brittle-ductile deformation zone characterized by increased frequency of open and sealed fractures and crush (0.3 m). Decreased magnetic susceptibility and resistivity, and slightly decreased P-wave velocity (no caliper data available). One non-oriented radar reflector occurs at 43.1 m with the angle 55° to borehole axis. The host rock is totally dominated by quartz monzodiorite (501036) with subordinate pegmatite (501061). Confidence level = 3.

74.67–125.35 m

DZ4: Inhomogeneous low-grade ductile shear zone overprinted by brittle deformation, characterized by locally increased frequency of open and sealed fractures, four minor core losses, eight crush zones, slickensides, marked increase in apertures, frequent breccias and mylonites. The zone covers the majority of RU2 and is associated with minor sections of dolerite. A c. 5 m wide mylonite occurs at the base of the zone. The upper part of the zone is faintly saussuritized. Throughout the zone there are narrow sections that exhibit weak to medium red staining and weak epidotization. The most intensely deformed sections (cores) are 74.67–82.20, 89.25–93.35, 102.95–119.50 and 125.05–125.35 m. There is a large decrease in resistivity, magnetic susceptibility and P-wave velocity along a major part of the section. There are also several distinct caliper anomalies. The most significant geophysical anomalies occur in the intervals c. 74.7–82.2 m, 92.0–93.5 m, 105.0–107.0 m and 112.5–115.5 m. There is a major decrease in fluid water resistivity at c. 88 m. One oriented and ten non-oriented radar reflectors occur within DZ4. The oriented reflector occurs at 75.8 m with the orientation 144/87. The reflector is strong and can be observed to a distance of 12 m outside the borehole. The non-oriented reflectors occur with angles from 38° and 84° to borehole axis. Low radar amplitude occurs in the intervals 73–80 m and 103–106 m. The host rock is dominated by quartz monzodiorite (501036). Subordinate rock types comprise dolerite (501027), fine-grained granite (511058), and sparse occurrences of pegmatite (501061) and granite (501058). Confidence level = 3.

138.10–138.90 m

DZ5: Brittle deformation zone characterized by increased frequency of sealed fractures and a moderate increase in open fractures, slickensides, weak red staining and epidotiztion. The section is characterized by decreased magnetic susceptibility, resistivity and P-wave velocity. The host rock is dominated by quartz monzodiorite with very sparse occurrence of fine-grained granite (511058). Confidence level = 3.

162.07–163.82 m

DZ6: Low-grade ductile shear zone associated with foliated fine-grained granite (511058). The section is characterized by decreased magnetic susceptibility and slightly decreased resistivity. Two non-oriented radar reflectors occur at 162.1 m and 164.9 m with the angle 30° and 36° to borehole axis, respectively. The reflectors are strong and constitute different parts of the same structure. They can be observed to a distance of 25 m outside the borehole. Low radar amplitude occurs in the interval 163–165 m, i.e. partly below DZ6. The host rock is dominated by quartz monzodiorite (501036). Confidence level = 3.

5.2 HLX43

Rock units

The borehole consists of three rock units (RU1 and RU3). Due to repetition of RU1 (RU1a and RU1b) the borehole can be divided into four sections.

6.06–32.48 m

RU1a: Mixture of Ävrö granite (501044) and diorite/gabbro (501033). Subordinate rock types comprise fine-grained granite (511058) and pegmatite (501061). The Ävrö granite (501044) has a density in the range 2,690–2,730 kg/m^3. Confidence level = 3.

32.48–73.84 m

RU2: Totally dominated by dolerite (501027). Confidence level = 3.

73.84–96.44 m

RU1b: Mixture of Ävrö granite (501044) and diorite/gabbro (501033). Subordinate rock type comprises pegmatite (501061). The Ävrö granite (501044) has a density in the range 2,690–2,730 kg/m^3. Confidence level = 3.

96.44–170.60 m

RU3: Totally dominated by Ävrö granite (501044). Subordinate rock types comprise fine-grained granite (511058), diorite/gabbro (501033) and pegmatite (501061). The Ävrö granite (501044) has a density in the range 2,690–2,730 kg/m^3. Confidence level = 3.

Possible deformation zones

One possible deformation zone has been recognised in HLX43.

32.3–81.7 m

DZ1: Brittle deformation zone characterized by strong increase in frequency of open fractures. The section c. 32–74 m is characterized by a major decrease in bulk resistivity (almost two orders of magnitude), several intervals with decreased P-wave velocity and numerous caliper anomalies. The geophysical data indicate strong brittle deformation. Eight non-oriented radar reflectors occur within DZ1. Two of them are very strong and prominent and occur at 50.3 m and 73.0 m with the angle 53° and 45° to borehole axis, respectively. Both reflectors can be observed to a distance of 54 m outside the borehole. The radar amplitude is low at the interval 32–73 m, which coincides with the fractured dolerite in the borehole. The host rock is dominated by dolerite (501027), in which the most intense deformation is concentrated. Subordinate rock types comprise Ävrö granite (501044) and diorite/gabbro (501033). Confidence level = 2.

6 Comments

The results from the geological single-hole interpretation of KLX14A and HLX43 are presented in a WellCad plot (Appendices 1–2). The WellCad plot consists of the following columns:

In data Boremap	1:	Depth (length along the borehole)
	2:	Rock type
	3:	Rock alteration
	4:	Frequency of sealed fractures
	5:	Frequency of open and partly open fractures
	6:	Crush zones
In data Geophysics	7:	Silicate density
	8:	Magnetic susceptibility
	9:	Natural gamma radiation
	10:	Estimated fracture frequency
Interpretations	11:	Description: Rock unit
	12:	Stereogram for sealed fractures in rock unit (blue symbols)
	13:	Stereogram for open and partly open fractures in rock unit (red symbols)
	14:	Description: Possible deformation zone
	15:	Stereogram for sealed fractures in possible deformation zone (blue symbols)
	16:	Stereogram for open and partly open fractures in possible deformation zone (red symbols)

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/5/ **Mattsson H, Keisu M, Thunehed H, 2007.** Interpretation of geophysical borehole measurements from KLX13A, KLX14A, KLX22A, KLX22B, KLX23A, KLX23B, KLX24A, KLX25A, KLX26A and KLX26B. SKB P-06-317, Svensk Kärnbränslehantering AB.

/6/ **Gustafsson J, Gustafsson C, 2006.** Oskarshamn site investigation. RAMAC, BIPS and deviation logging in boreholes KLX13A, KLX14A, KLX22A, KLX22B, KLX23A, KLX23B, KLX24A, KLX25A, KLX26A, KLX26B, HLX39 and HLX41. SKB P-06-260, Svensk Kärnbränslehantering AB.

/7/ **Gustafsson J, Gustafsson C, 2006.** Oskarshamn site investigation. RAMAC, BIPS and deviation logging in boreholes KLX17A and HLX43. SKB P-07-12, Svensk Kärnbränslehantering AB.

Geological single-hole interpretation of KLX14A

Title	SINGLE HOLE INTERPRETATION KLX14A					
Site	LAXEMAR	Inclination [°]	-49.95	Elevation [m.a.s.l.]	16.28	Signed data
Borehole	KLX14A	Date of mapping	2006-11-22 18:29:00	Drilling Start Date	2006-08-19 08:00:00	
Diameter [mm]	76	Coordinate System	RT90-RHB70	Drilling Stop Date	2006-09-04 15:22:00	
Length [m]	176.270	Northing [m]	6365958.87	Surveying Date		
Bearing [°]	111.95	Easting [m]	1547146.92	Plot Date	2007-10-14 22:03:05	

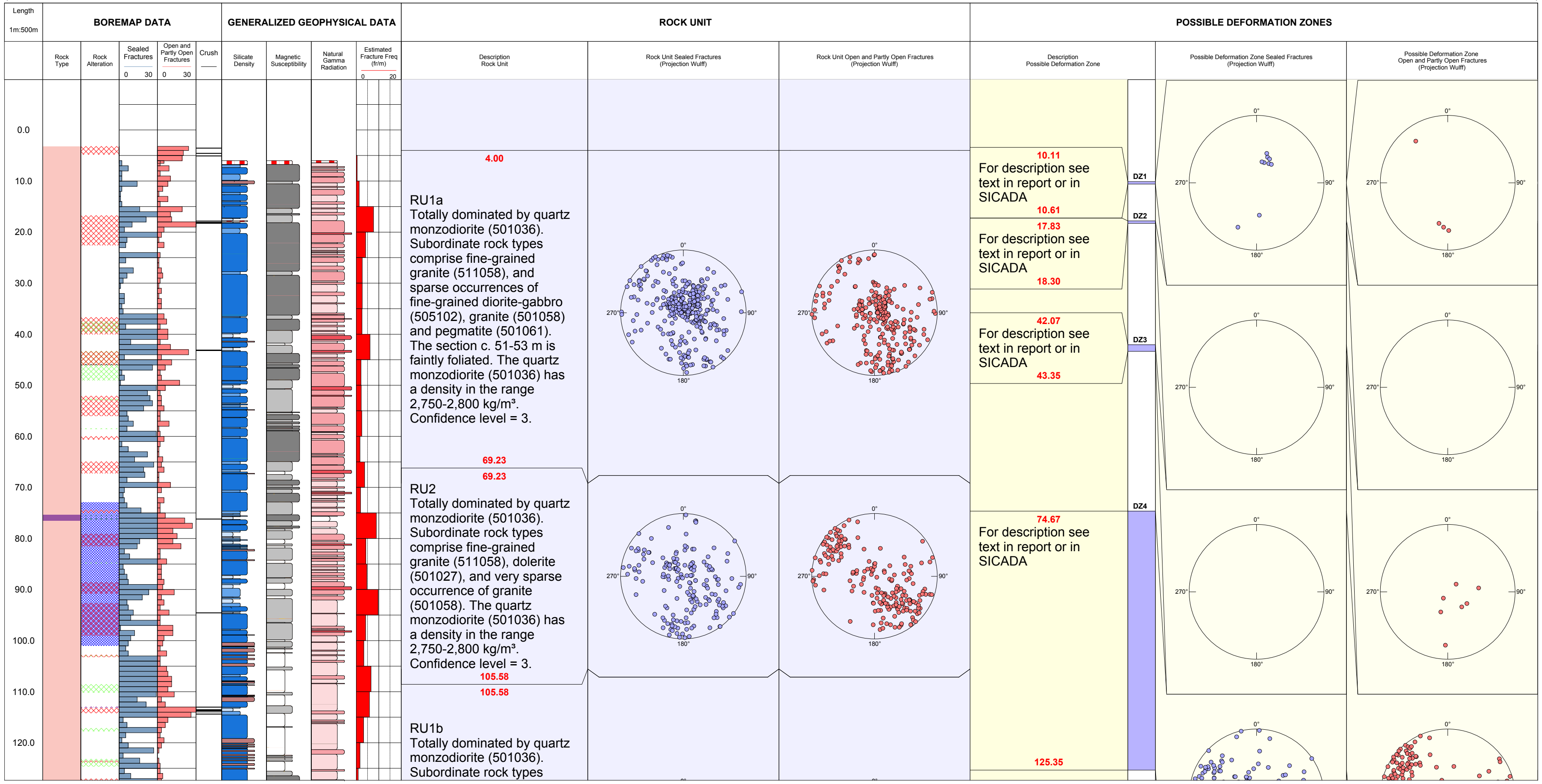
ROCKTYPE LAXEMAR
- Dolerite
- Fine-grained granite
- Quartz monzodiorite

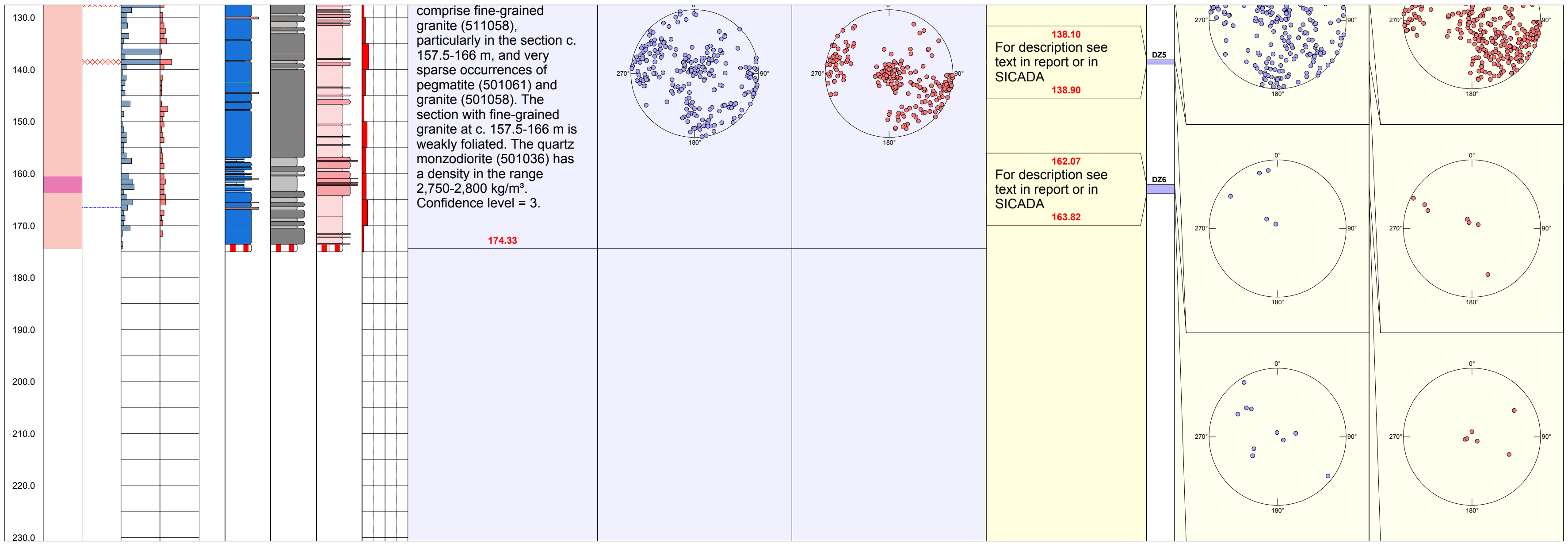
ROCK ALTERATION
- Oxidized
- Chloritisized
- Epidotisized
- Sericitisized
- Quartz dissolution
- Silicification
- Saussuritization

SILICATE DENSITY
- unclassified
- dens<2680
- 2680<dens<2730
- 2730<dens<2800
- 2800<dens<2890

SUSCEPTIBILITET
- unclassified
- sus<0.001
- 0.001<sus<0.01
- 0.01<sus<0.1

NATURAL GAMMA
- unclassified
- gam<10
- 10<gam<20
- 20<gam<30
- gam>30




130.0
140.0
150.0
160.0
170.0
180.0
190.0
200.0
210.0
220.0
230.0
comprise fine-grained granite (511058), particularly in the section c. 157.5-166 m, and very sparse occurrences of pegmatite (501061) and granite (501058). The section with fine-grained granite at c. 157.5-166 m is weakly foliated. The quartz monzodiorite (501036) has a density in the range 2,750-2,800 kg/m³. Confidence level = 3.
174.33
0°
90°
180°
270°
138.10
For description see text in report or in SICADA
138.90
162.07
For description see text in report or in SICADA
163.82
DZ5
DZ6

Geological single-hole interpretation of HLX43

Title	SINGLE HOLE INTERPRETATION HLX43					
Site	LAXEMAR	Inclination [°]	-50.50	Elevation [m.a.s.l.]	24.20	Signed data
Borehole	HLX43	Date of mapping	2006-12-05 08:49:00	Drilling Start Date	2006-10-19 15:00:00	
Diameter [mm]	140	Coordinate System	RT90-RHB70	Drilling Stop Date	2006-10-26 10:00:00	
Length [m]	170.600	Northing [m]	6367517.45	Surveying Date		
Bearing [°]	268.55	Easting [m]	1546626.60	Plot Date	2007-10-15 22:03:14	

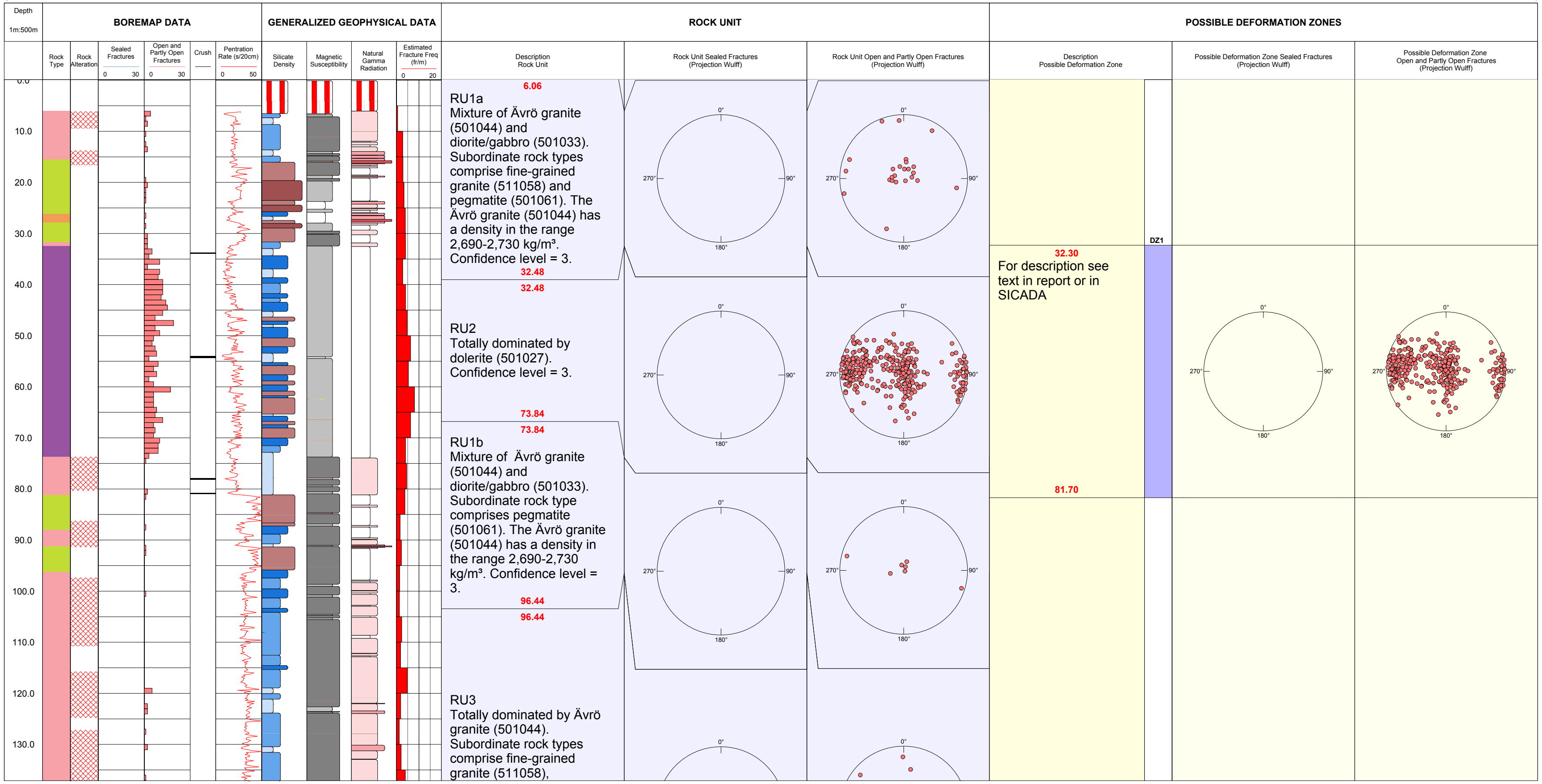
ROCKTYPE LAXEMAR
- Dolerite
- Pegmatite
- Ävrö granite
- Diorite / Gabbro

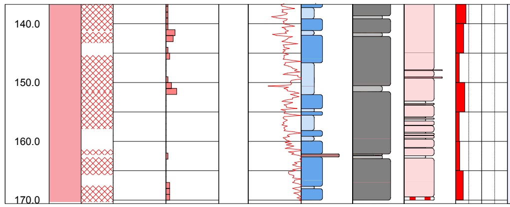
ROCK ALTERATION
- Oxidized

SILICATE DENSITY
- unclassified
- dens<2680
- 2680<dens<2730
- 2730<dens<2800
- 2800<dens<2890
- dens>2890

SUSCEPTIBILITET
- unclassified
- sus<0.001
- 0.001<sus<0.01
- 0.01<sus<0.1

NATURAL GAMMA
- unclassified
- gam<10
- 10<gam<20
- 20<gam<30
- gam>30





diorite/gabbro (501033)
and pegmatite (501061).
The Ävrö granite (501044)
has a density in the range
2,690-2,730 kg/m³.
Confidence level = 3.

170.60