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NGU GEOCHRON: Database and analysis
package for Norwegian isotope geochronology

REPORT

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<p>Summary:</p> <p>Isotope geochronologic data analysis is an integral aspect of nearly every type of tectonic study. However, no regional compilation of Norwegian geochronologic data has been assembled since 1986 (Kullerud and co-workers for the Western Gneiss Region), despite the plethora of new, high-precision geochronologic data produced in the intervening 11 years. This report describes NGU GEOCHRON software, a new Windows-95/NT database and analysis package written to address these new developments in a rigorous and user-friendly format. The purpose of the program is to make available a database of all reliable, <u>public</u> isotopic age data from Norway, categorized according to particular geologic and geographic regions, rock types, isotopic methods and/or data authors, that can then be subjected to various forms of statistical analysis according to user-defined selection criteria. We describe the program setup and operation and the data sources for the software, in addition to providing some examples for application of isotope age data compilations and statistical analyses to address different sorts of tectonic questions.</p> <p>The precision of isotopic techniques and numerous new data in the literature demand a means for age-data access and analysis, especially within the context of our present understanding of the tectonic settings and tectonostratigraphy of Norwegian geology. This software package allows the user to re-evaluate old age data and to incorporate newer, high-precision ages and their geographic distributions for a variety research interests (provenance, rifting events, uplift/cooling events, crustal formation, faulting and extension, ore deposition, e.g.). Future expansion of the database will incorporate all isotopic age data from the Norwegian continental shelf, East Greenland, Svalbard and the UK.</p>			
Keywords: Geochronology		Isotopes	Database
Tectonics		Absolute ages	Norway
Statistics		Offshore	Onshore

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1. BACKGROUND AND PURPOSE

Recent advances in instrumentation and laboratory techniques for isotopic age dating have made possible inexpensive, numerous, and precise analyses of very small samples. Use of isotopic age data in various avenues of tectonic research has burgeoned in the last decade, in tandem with these technological advances. Thus, better knowledge of regional geology and tectonostratigraphy, in addition to new interest in combining on- and offshore age and thermochronologic information, have made isotopic age dating a virtually standard aspect of most types of tectonic research. However, despite the availability of numerous older data, and continued acquisition of new results, many pitfalls are encountered when attempting to interpret age data for a given region. These include: 1) mixing of data from different isotopic systems without proper statistical evaluation; 2) comparison of ages from different systems without knowledge of their relevance to mineral systems and rock evolution; 3) incomplete or lack of data sources and analytical documentation. All of these pitfalls can contribute to erroneous analysis of the ages of minerals, rocks, or geologic events, and have, in some cases, been propagated through the published literature.

In Norway, the only compilation and analysis of isotopic age data was produced by Kullerud et al. (1986) for the Western Gneiss Region (WGR). Since that publication, which incorporated data from the WGR through the end of 1985, 141 new age data have been published from this geologic province alone. At the time of this writing, 582 ages exist for all of Norway south of Trondheim, of which only 135 were published prior to 1986.

This combination of factors demands a new database compilation of isotopic ages for all of Norway. The NGU GEOCHRON software package is the product of this need. The package allows users to select, statistically analyze and interpret data published for the U-Pb, Sm-Nd, Rb-Sr, K-Ar, ^{40}Ar - ^{39}Ar , and fission track (FT) isotopic systems from rocks in Norway. As will be demonstrated in the subsequent description, various means exist by which to evaluate the reliability of these data, and enable the user to make a quantitative and qualitative evaluation of data.

The Geological Survey of Norway (NGU) is the appropriate medium for distribution of the software package; the complete software, as well as upgraded versions, will be publicly available on the NGU Web site (<http://www.ngu.no/geophysics>). The current version

incorporates c. 95% of all data from the southern half of Norway (that is, south of the Trøndelag area), but work in progress includes the remainder of Norway and Svalbard, with planned expansion onto the Norwegian continental shelf, East Greenland, and the UK.

The database and analysis package is designed to integrate a wide variety of applied and basic research needs. The two case studies presented in the final section include one for all of Western Norway (Precambrian through Mesozoic ages) and a second example from Late Palaeozoic and Mesozoic dikes in western Norway.

2. PROGRAM OVERVIEW

2.1 Installation

NGU GEOCHRON is installed by opening the SETUP.EXE file (if installed from disk or CD) or NGU97.EXE (if downloaded from WWW) and answering the series of questions in the pop-up windows appearing on the screen. Unless the user has a very specific requirement for the desktop, the default settings are recommended during installation.

2.2 Launching the database

Once installed, double-clicking on the NGU GEOCHRON icon opens the full database and data analysis program. The database palette appears as in Figure 1.

2.3 Program Components

The opening screen is composed of 4 parts, i.e. (1) Pull-down menus (*File, Set Query, Execute Query and Statistics*) over the blue database scrollbar, (2) Information section, (3) Method and Age section, and (4) Reference section. As a general rule, all click-boxes can be operated by the user, but text boxes cannot be edited permanently (note the checked box in upper right of palette: 'Read Only').

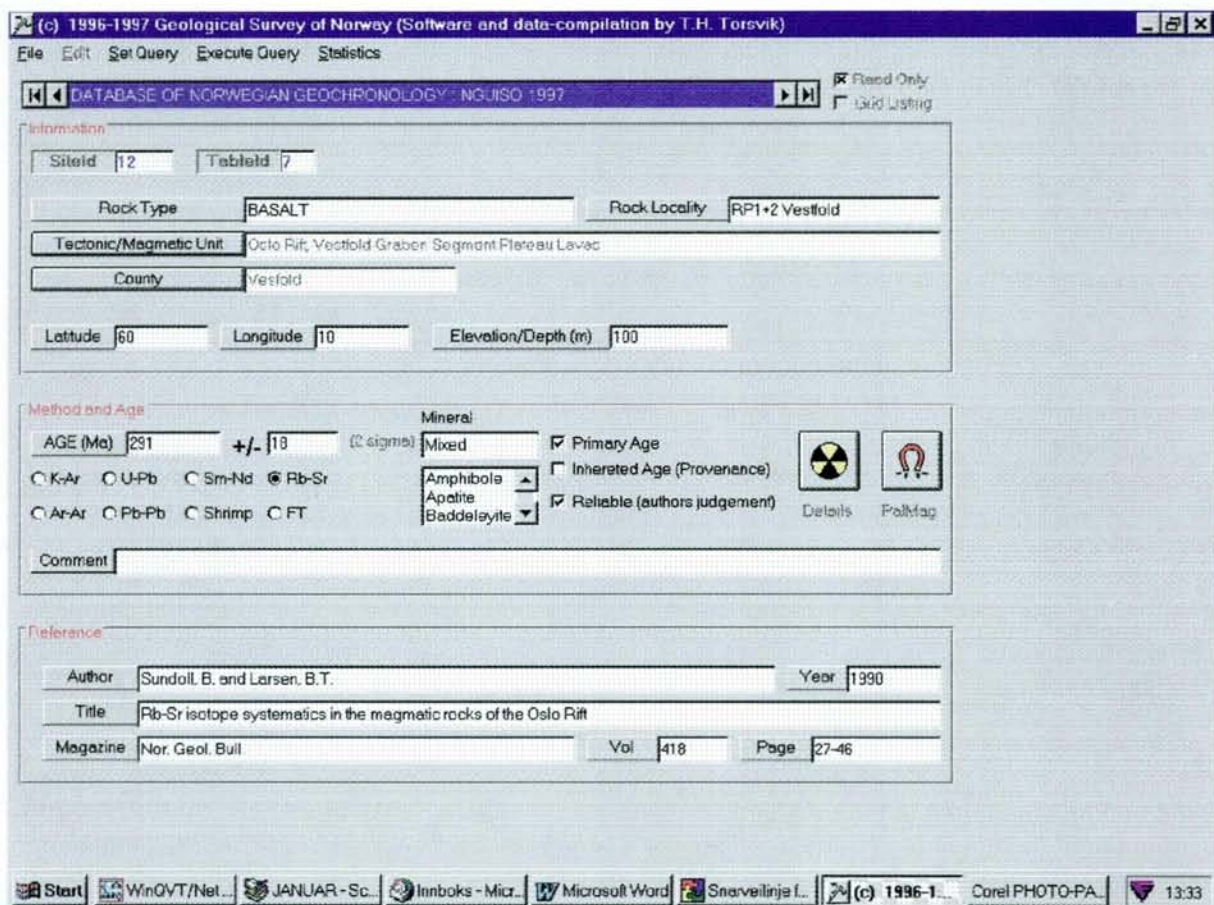


Figure 1. Opening screen upon launch of NGU GEOCHRON icon.

The following options are available in the opening screen:

OPTION	EFFECT
File	
Exit	End program session
Logon	Only used for operators with password to edit the database
Set Query	Activate the ' <i>Set Query</i> ' menu (2.3.1)
Execute Query	Execute queries set in ' <i>Set Query</i> ' and produce a table listing (2.3.2)
Statistics	Routine to calculate mean ages and statistics or to check that two ages are concordant at the 95% confidence level.
Database scrollbar	Display next or previous data-record. Click at left (right) to move to beginning (end) of data-base. This function will be affected by the ' <i>Set Query</i> ' parameters

2.3.1 Set Query

The '*Set Query*' menu is activated by a single click on the menu title. A second palette (see Fig. 2) called 'NGU GEOCHRON Queries' opens and overlies the main palette. Through

this 'Queries' section, the user sets and modifies a query for the purpose of retrieving the data of interest. Example queries and analyses are presented in Section 3 of this document, but a brief summary of the various database query functions is useful here:

A query can be specified according to any one or combination of criteria including *Author* (first author of publications used in database), *Tectonic/Magmatic Unit*, *County*, *Method*, *Age Filter*, *Publication Year*, *Data Reliability*, and *General Sorting*.

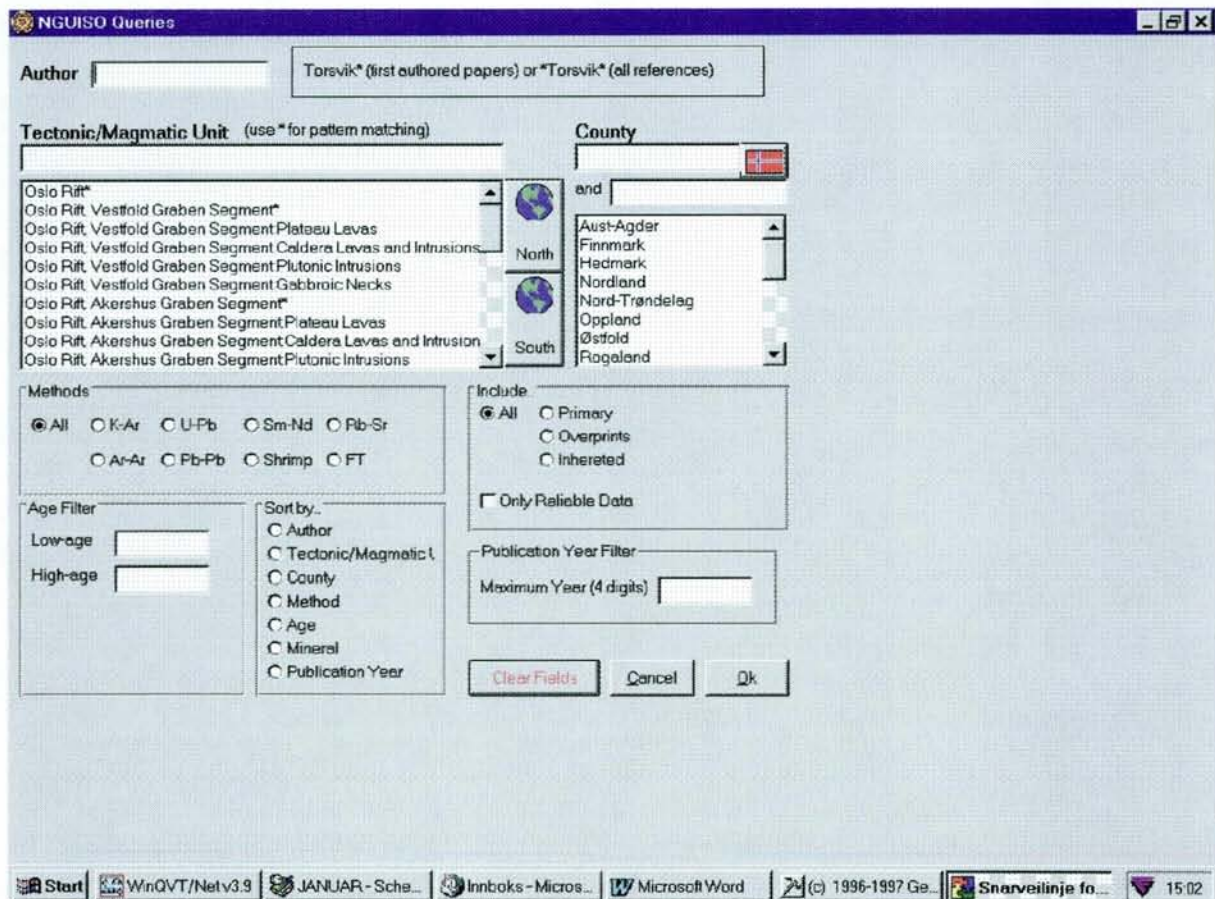


Figure 2. The 'Set Query' palette, acquired after clicking the 'Set Query' menu on the main palette (Fig. 1).

One or several of these criteria may be selected for any single search and all fields can be cleared for a new or revised search by clicking the red 'Clear Fields' button in the lower part of the palette. Short instructions for each query are given in Table 1 below. We note that the fields must be cleared completely before a new search is attempted (the text boxes do not automatically revert to a blank setting when a new search is launched).

Table 1 List of Query criteria and function in the database search

Selection criteria in Query palette	Criteria function in search
<i>Author query</i>	Type in author name (either first author e.g. Smith* or for all references, *Smith*)
<i>Tectonic/Magmatic unit</i>	Select according to geologic 'province' or rock type; Rock Province* will produce a pattern-matching search for all data from that province
<i>County/Geographic area</i>	User selects either 1) directly from the listed Norwegian counties, 2) from a manual input of the name of one or two Norwegian counties, or 3) from the maps obtained by clicking on one of the globes marked 'North' and 'South'. Performing the latter function produces a county-map for northern or southern Norway and the user can click directly on the county of interest to include in the search; (especially useful for those unfamiliar with Norway county names).
<i>Methods</i>	User clicks either 'All' to include all isotopic methods in the search, or one of the isotopic systems to narrow the search to a specific method; only one circle may be selected at a time.
<i>Age Filter</i>	User can manually specify an age range of interest for the search by typing an upper and lower age limit.
<i>'Include' (Data Reliability)</i>	User can specify what interpretation is given to the age in the original publication, i.e. whether the age represents a 'primary', 'overprint' or 'inherited' age according to the original author(s); the click box titled 'Only Reliable Data' (lower right on Query palette) includes only those data determined to be 'reliable', either by the NGU GEOCHRON database authors or the original authors
<i>Publication Year</i>	User can manually specify an age maximum for the search, i.e. the final year through which the search is conducted. Specifying 1988, for example, will include all data in the database from 1988 to the present.
<i>Sort By (General Sorting)</i>	Sorts the final results of the query. In addition to sorting by one of the above criteria, the user can sort by mineral, where

the resulting data table distinguishes mineral types used (mineral listings in Main Palette, see below). One of the click 'dots' for one of these categories must always be selected.

Once the user is satisfied with the specifications for the query, the 'OK' box in the lower right-hand corner is clicked and the screen returns to the Main Palette.

2.3.2. Execute Query

Click on the main palette command '*Execute Query*' and a search routine is performed. A Table Listing is produced on the screen (Fig. 3) that contains all entries in the database fulfilling the criteria of the query.

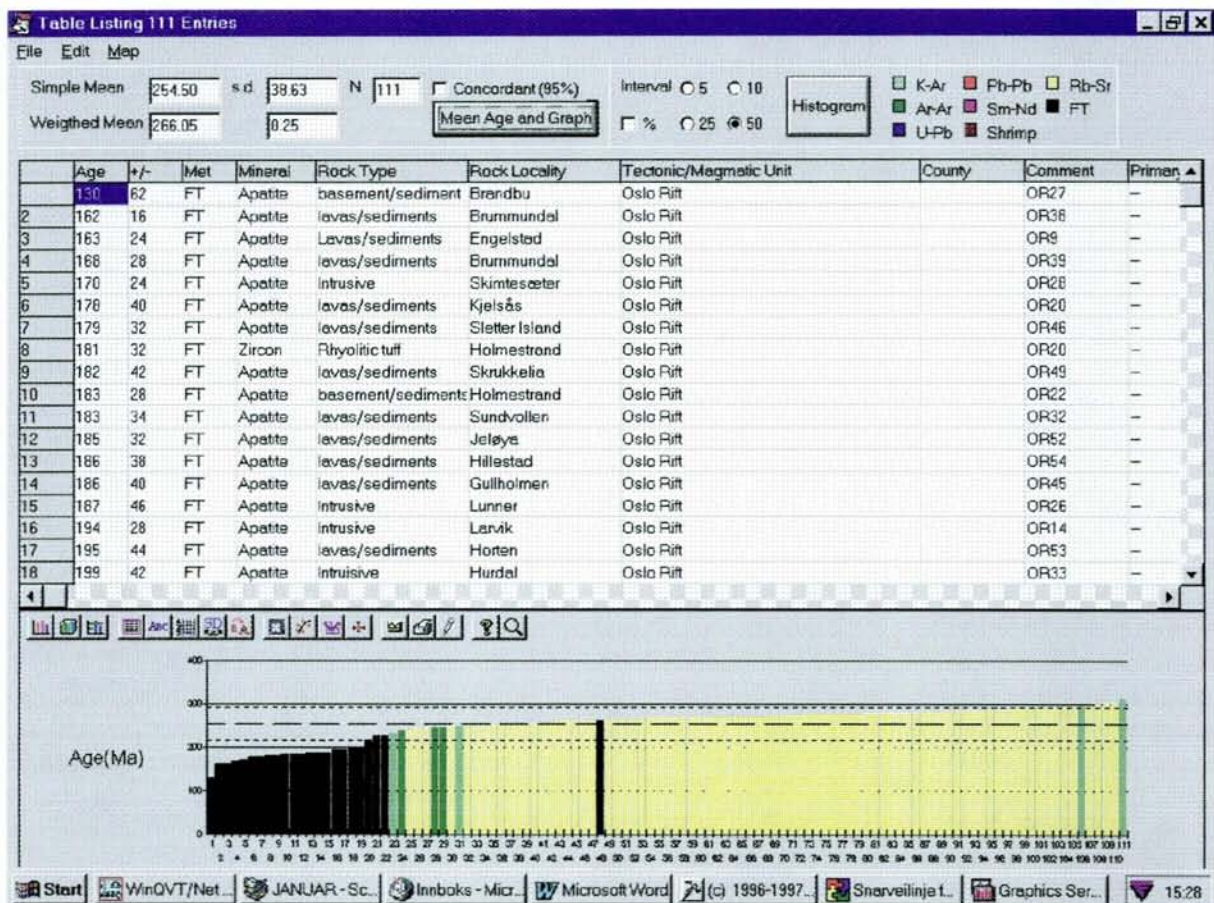


Figure 3. Table listing produced after the requested search (query) is executed.

The Table Listing is described in detail in Section 3 with the example searches. In essence, the table includes all information from each data-point (age) in the query, including error, method, rock/mineral, author, locality, and comments (see Figure 3); the standard scrollbar on the bottom of the Table allows the user to view the information as well as to move

(expand/reduce) the size of the table columns to view all of the information. A statistical analysis of the dataset can be performed easily by clicking one of the two available buttons on the table, either 'Mean age and graph' or 'Histogram' (Figure 3), both of which are described below and in Section 3. The graph in Figure 3 was produced by clicking on the 'Mean age and Graph' button. Note that the colors in the graph correspond to the Isotope Legend in the upper right-hand corner of the table (e.g. yellow represents Rb-Sr data in our example).

The Table Listing can additionally be edited—on-screen only—by deleting a row or rows (click the number of the row and then click on '*Delete row(s)*'). Under the menu command '*File*', the Table Listing can be printed directly (as seen on the screen) and/or exported as a 'text' file (.txt extension) or an 'Excel' file for later modification, changing of fonts, styles, etc. When the user is finished examining and/or exporting the data, the user returns to the Main Palette by dragging the pointer through the '*File*' menu to Exit.

The final menu item on the Table Listing is '*Map*'; clicking this heading produces a screen like that in Figure 4 (see full description below).

Options in 'Execute Query' are summarized below:

OPTION	EFFECT
File	
Export to text file	Export table listing to a text file (*.txt)
Export to EXCEL	Export table listing to an Excel file (*.xls)
Exit	Return to main screen
Delete row(s)	Delete selected row(s). Only in memory and affects graphs & prints
Map	Enter map option (see 2.2.3)
Mean Age and graph	Routine to display ages as color bars and calculate mean ages and statistics. Also checks if all ages are concordant at the 95% confidence level.
Histogram	Display a histogram for the tabulated age data. Select interval (5,10, 25 or 50 Ma age bins) and whether the vertical ages should be plotted as real observations or as percentages (%).
Print graph	In order to print the graph, click on the printer icon within the graph area. This will activate the graph system with subsequent set of instructions to follow on the screen for printout.
Save graph to file	Click on the printer icon within the graph area and select 'save to windows metafile' (*.wmf) or 'clipboard'. With either selection the graph can be imported to a drawing package for later modification.
	NOTE:

To access the graph system you can click on any of the icons in the graph view area

2.3.3 Map

The '**Map**' option is selected from Table Listing (2.3.2) and provides an elegant way for the user to view the data in real geographic coordinates, by isotopic method. More advanced users can glean palaeogeographic information from this sub-palette, via its (future) direct link to the GMAP Palaeogeographic Reconstruction software package (Torsvik and Smethurst, 1997).

To produce a simple map with a plot of the data from the Query, the user selects a map size (under pull-down bar, 'Scale'; usually 1500% is a fair size for a first attempt), and then a combination of features for the resulting map. Clicking the 'Norway' box produces a map of Norway, at the given scale. The buttons beneath Norway,

A = All	S = South	C = Central	N = North
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are the means by which to view directly those sections of the Norway map. The scale can then be adjusted accordingly and the button, 'redraw' must be clicked to change the screen presentation. Note that simply clicking 'Norway' will not draw a Norway map; the user must either click on A, S, C, or N, or on 'Redraw' to activate the new drawing. The Norway map also includes lineament drawings for the sub-sea structure of the northern North Sea. These, along with low-density coastlines from e.g. UK and Greenland, will be upgraded with more advanced vector files in future editions.

To plot data on the Norway map, the user clicks 'Sites' and then 'Redraw'; a drawing similar to Figure 4 is produced. The other land masses eventually to be included in the database are also available for plotting, although no data currently exist in the database for these regions (UK, Greenland, or Barents regions); the user must click one of these boxes to include that continent/landmass in the drawing. Again, 'Redraw' must be clicked each time the drawing is altered. Only those data in the literature for which a map and/or geographic coordinates were

published are presented on the map; lax reporting of data sites usually results in fewer 'Sites' listed for the map than the number of data listed in the preceding Table Listing.

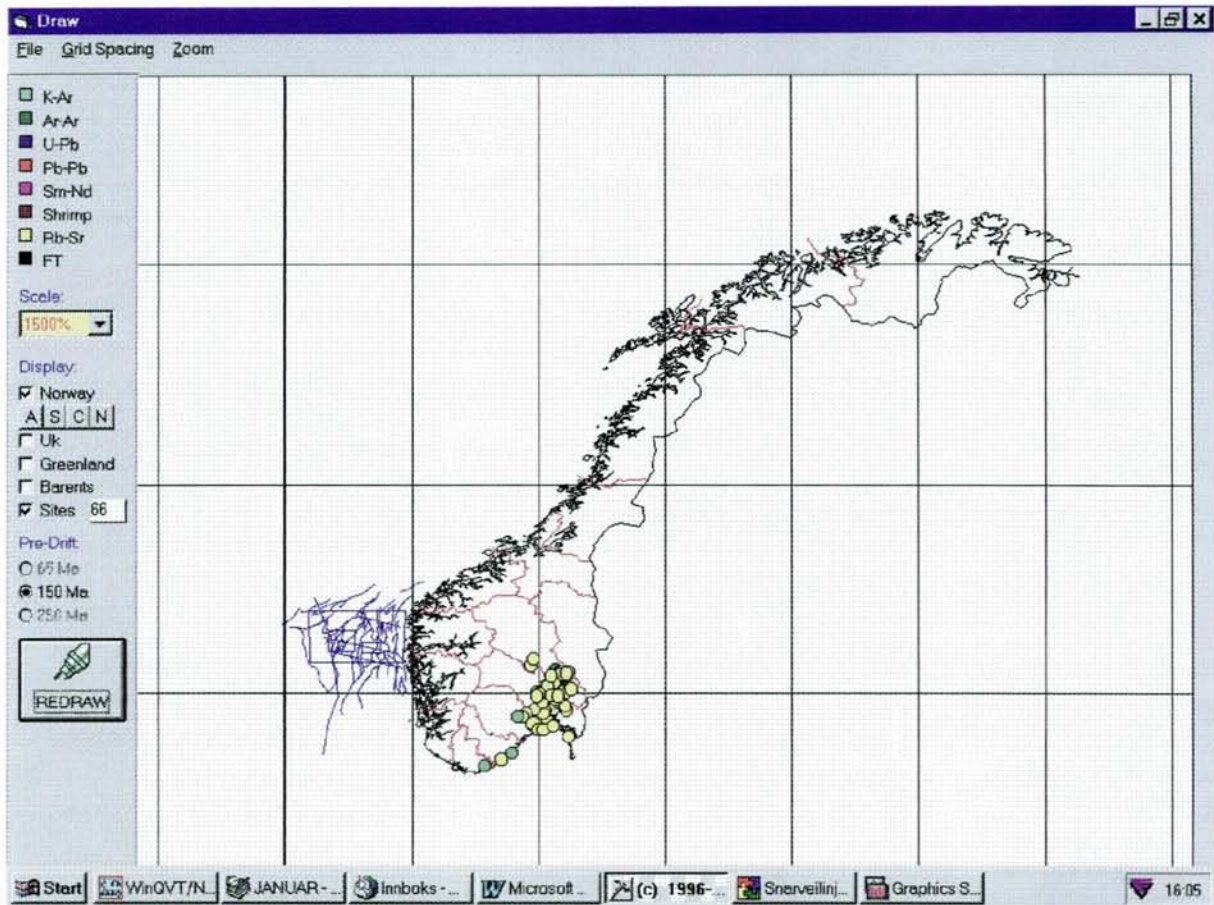


Figure 4. 'Map' function enables the user to view the data in the Table Listing in appropriate geographic coordinates.

For the purposes of palaeogeographic reconstructions, pre-drift configurations for 58, 150 and 265 Ma are available. The activation of this feature produces a map where the North Atlantic has been closed (rotation of Greenland with Eurasia fixed). Reconstruction parameters differ from the various periods, and are outlined and tabulated by Torsvik & Eide (1998).

The pull-down menus on the Map function ('File', 'Grid Spacing' and 'Zoom') allow the user to export the drawing, change the grid spacing and to 'zoom' to a particular map region by specifying latitude-longitude coordinates.

The Map function can be exited from the 'File' menu pulldown and the Main Palette is reached (for a new search) by pulling down to 'Exit' on the 'File' menu of the Table Listing.

Summary of options available in 'Map':

OPTION	EFFECT
File	
Save Picture	Save picture to a bitmap file
Print	Print picture
Printer Setup	Change printer or default parameters
Exit	Return to ' <i>Execute Query</i> ' table
Grid Spacing	Change latitude and longitude grid spacing
Zoom	Select projection zoom-center (enter latitude and longitude)
Scale	Set scale for map
Display	Select tick-boxes to draw Norway (A=all of Norway, S=South Norway, C=Central Norway and N=North Norway), UK, Greenland, Barents and isotopic sites
Pre-Drift	Select North Atlantic, reconstructed at 58, 150 and 265 Ma
Redraw	Draw a new map after changes have been made

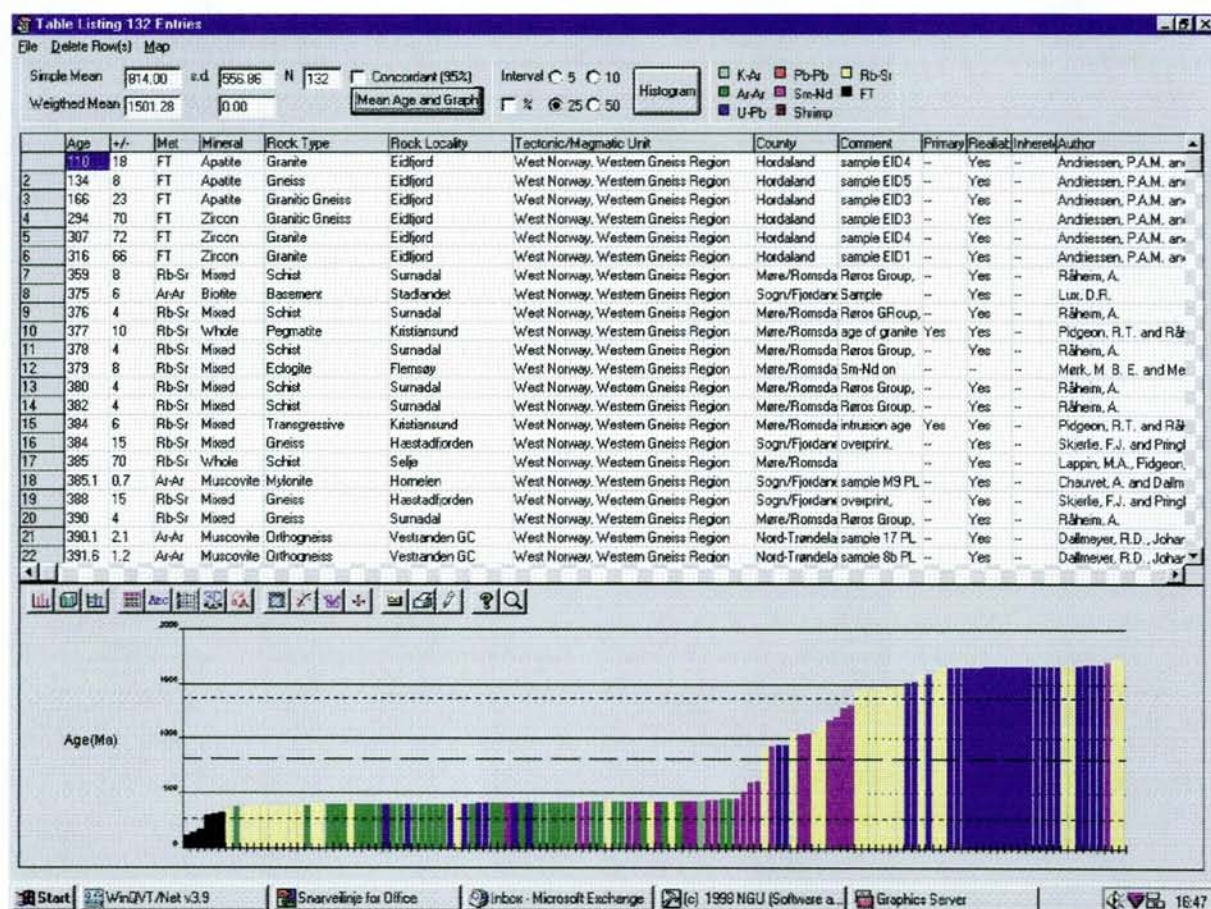
3. EXAMPLE APPLICATIONS

3.1 Western Gneiss Region

The first example is an analysis of isotopic ages from the Western Gneiss Region:

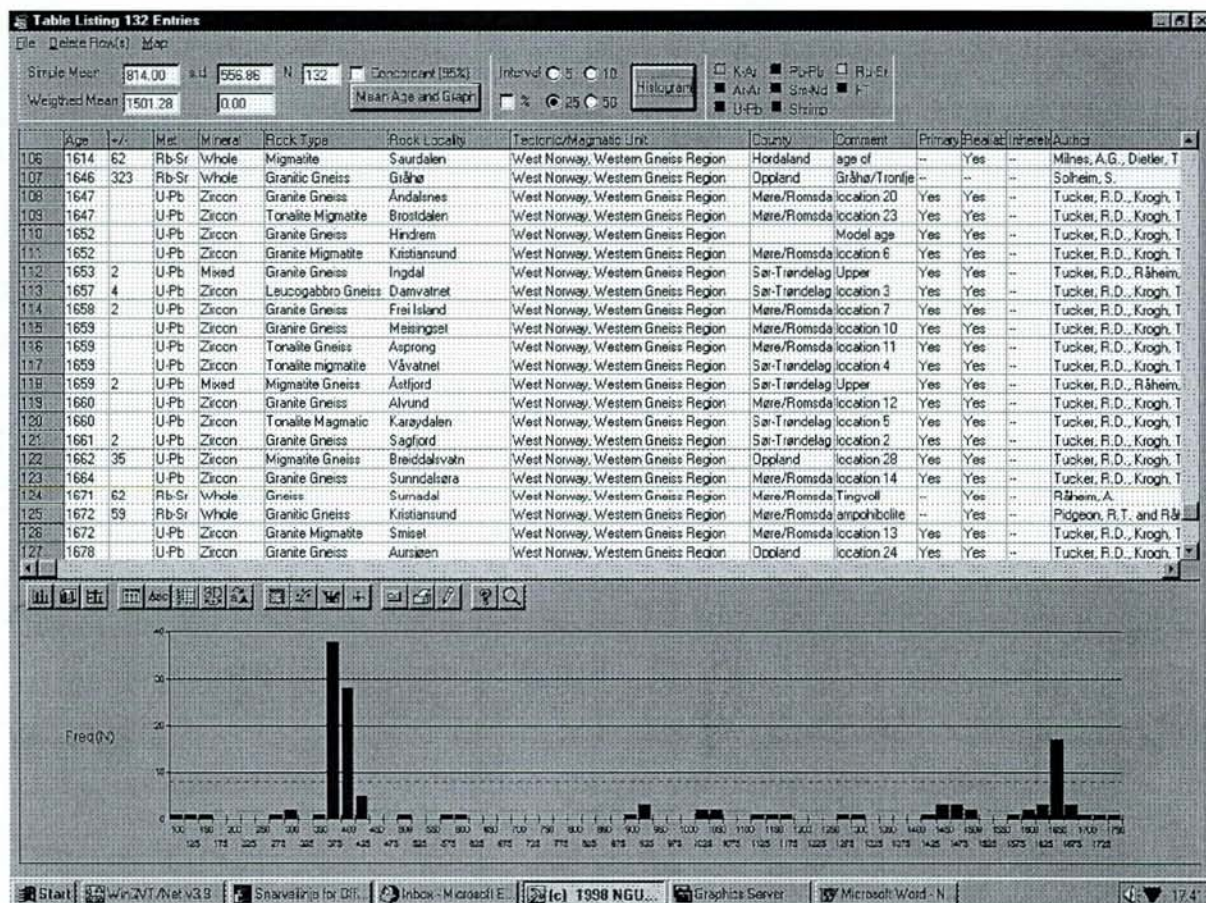
- Select 'Set Query' from the main and opening screen
- Select *Western Norway: Western Gneiss Region* as 'Tectonic/Magmatic Unit'
- Click on 'Age' in 'Sort by' box
- Click on 'OK' to return to main menu
- Select 'Execute Query' from the main and opening screen
- After the table listing of the data is visible, click 'Mean Age and Graph', and the screen will appear as in Fig. 5.

Figure 5 Listing of isotopic data from the Western Gneiss Region (sorted by age)



The color coding in Figure 5 is extremely useful in order to analyze age patterns. We notice immediately that Fission Track (black bars) show the youngest ages and represent young exhumation ages. In the Western Gneiss Region (WGR) we also notice a pronounced age plateau at around 395-400 Ma; these ages are mainly represented by ^{40}Ar - ^{39}Ar (dark green bars), lower-intercept U-Pb ages (blue bars) and Rb-Sr (yellow bars) data. The 395-400 Ma ages represent the dominant exhumation event in the WGR, following Scandian crustal thickening and eclogite formation (for which the most reliable ages lie between 400-450 Ma). The next clear plateau in the diagram is one at around 1650 Ma; these are mostly Svecofennian protolith ages, and are essentially identified only with the U-Pb method. Probably many 'mixing' ages, represented mainly by the Rb-Sr and Sm-Nd data, are found between the Svecofennian and Caledonian plateaus. The main population of age-data is also easily recognized by displaying the data in a histogram. Click on '25 Ma' interval and then 'Histogram' and Figure 6 will appear.

Figure 6 Same data as in figure 5 but displayed in a histogram.



In order to do an in-depth analysis of e.g. the WGR ages, the operator can change the '*Set Query*' parameters (e.g. display data on selected method, include only reliable data, or e.g. only include overprints or primary data). Alternatively, simply use the '*Delete row(s)*' option (remember to click on '*Mean Age and Graph*') in order to study various data-sets. A comprehensive analysis of WGR is detailed in Torsvik & Eide (1998) or Torsvik (1998).

3.2 Late Palaeozoic and Mesozoic dikes, western Norway

Problem: A number of alkaline dikes from the Sunnhordaland and Sotra areas in western Norway were dated by the K-Ar method in the middle-late 1970's and early 1980's (Færseth et al., 1976; Løvlie and Mitchell, 1982). These ages were somewhat equivocal because they spread over fairly large time span and appeared to indicate at least three magmatic pulses related to crustal extension on the developing eastern North Sea margin. The user desires to look at these older data and attempt to compare them to new ^{40}Ar - ^{39}Ar ages for dikes recently reported in the literature (Eide et al., 1998).

Steps:

- Select '*Set Query*' from the main and opening screen
- Scroll through '*Tectonic/Magmatic Unit*' to *West Norway*; click and highlight *West Norway, Late Palaeozoic-Mesozoic Dykes*
- When unsure whether or not ages other than K-Ar and ^{40}Ar - ^{39}Ar exist for these rocks, click 'All' under the '*Methods*' category
- When unsure of the age range spanned by the data, leave these categories blank
- To sort the data by age, click 'Age' under the '*Sort by*' category
- The query is set; click 'OK' to return to the Main Menu and input the search
- The Main Palette is now visible; select '*Execute Query*'
- ◆ After a few seconds, a table is produced listing 19 different data for the dikes
- ◆ To obtain a simple graph of the data click on the '*Mean age and Graph*' button to produce the figure shown in Figure 7:

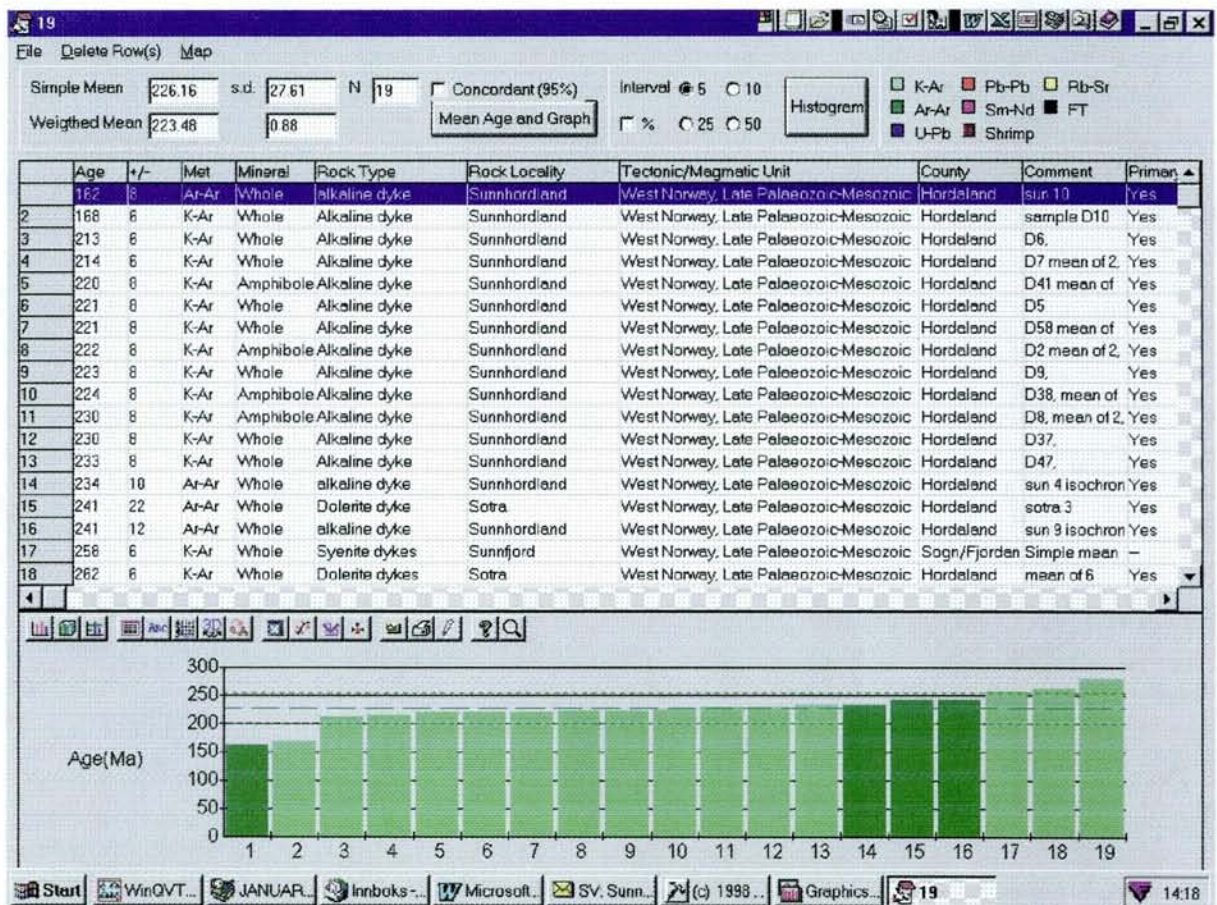


Figure 7. Simple graph of all age data from alkaline dikes in western Norway. Light green constitutes K-Ar ages (data sources from three different research groups, Færseth et al., 1976, Furnes et al., 1982 and Løvlie and Mitchell, 1982). Four dark green data are $^{40}\text{Ar}-^{39}\text{Ar}$ data from Eide et al. (1998).

A coarse visual analysis of these data indicates two very young ages (164-168 Ma), a large cluster of K-Ar ages in the 211-233 Ma range and then a group of higher ages including $^{40}\text{Ar}-^{39}\text{Ar}$ and K-Ar data from ca. 234 to 280 Ma. This analysis is borne out by the mean age of the data (226 Ma). Inspection of the same data with a histogram display is produced by clicking 'Histogram' and selecting a 5 m.y. bin interval (Figure 8).

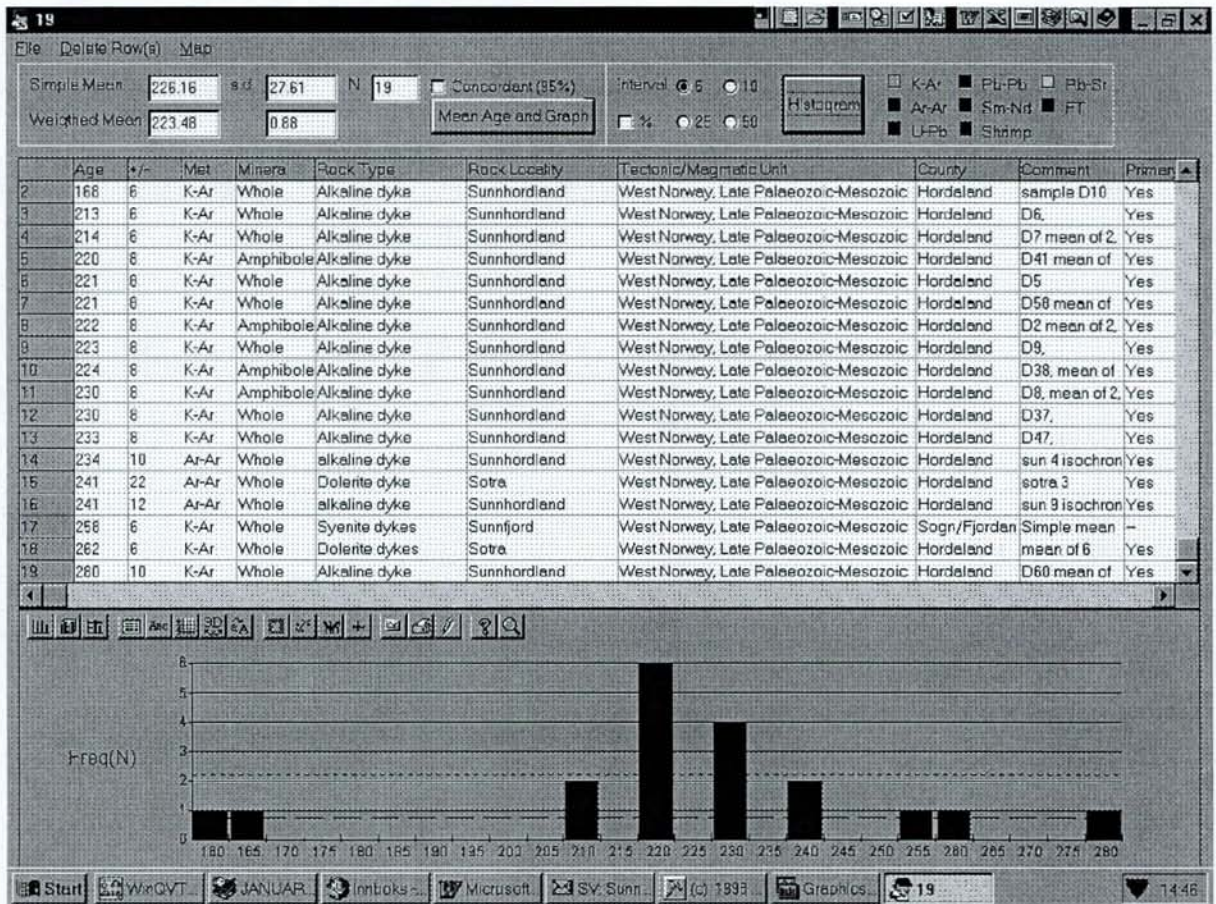


Figure 8. Histogram of the same western Norway dike data. Two age peaks occur in the 220 and 230 Ma bins.

The user can conduct a more detailed analysis of these data within the Table by selecting ‘Delete Rows’ (and clicking again on *Mean Age and Graph*). Visual display of the data in real coordinates can be obtained by clicking ‘Map’ and subsequently adding/deleting the land masses and/or specifying a particular pre-drift reconstruction. The probable importance of these data to development of the northern North Sea is evident in pre-drift reconstructions for both 150 and 265 Ma, where certain of these data appear to cluster. A caveat with this analysis of the data is that, upon investigation of the literature, the user will discover that the rocks dated by Eide et al. (1998) are, in fact, re-analyses of four of the older K-Ar samples. Eide et al. redated samples with K-Ar ages of 222 Ma, 262 Ma and 280 Ma and obtained new ^{40}Ar - ^{39}Ar ages of 234, 241 and 241 Ma. The Eide et al. study re-dated the 169 (K-Ar) Ma dike and yielded only a slight readjustment in that age to 164 Ma. Details of this study and interpretations of these new data can be found in Eide & Torsvik (1998) and Eide et al. (1998). The main points to derive from this simple analysis are: 1) the large spread in K-Ar ages for the dikes is most likely an artefact of some differential resetting of the Ar-systematics in dikes

intruded about 240 Ma; these artefacts are unresolvable within the K-Ar data but can be recovered with the ^{40}Ar - ^{39}Ar analyses; 2) the analyses of data via NGU GEOCHRON are very powerful and revealing, but do not supplant critical reading of the accompanying reference literature.

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APPENDIX: LISTING OF ISOTOPIC AGE DATA: SORTED BY AGE

Age	$\pm 2\sigma$	Method	Tectonic/Magmatic Unit	Author	Year
57.4	45.2	FT	South Norway, Fault Rocks	Grønlie, A., Harder, V. and Roberts, D.	1990
64.8	63.2	FT	South Norway, Fault Rocks	Grønlie, A., Harder, V. and Roberts, D.	1990
76.1	82.4	FT	South Norway, Fault Rocks	Grønlie, A., Harder, V. and Roberts, D.	1990
110	18	FT	West Norway, Western Gneiss Region	Andriessen, P.A.M. and Bos, A.	1986
128	32	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
129	28	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
130	62	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
134	8	FT	West Norway, Western Gneiss Region	Andriessen, P.A.M. and Bos, A.	1986
142	22	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
144	22	FT	South Norway, Fault Rocks	Grønlie, A., Naeser, C.W., Naeser, N.D., Mitchell, J.G., Sturt, B.A. and Ineson, P.R.	1994
148	2	Ar-Ar	Offshore	Ritchie, J.D., Swallow, J.L., Mitchell, J.G. and Morton, A.C.	1988
154	2	Ar-Ar	Offshore	Ritchie, J.D., Swallow, J.L., Mitchell, J.G. and Morton, A.C.	1988
158	8	K-Ar	Offshore	Ritchie, J.D., Swallow, J.L., Mitchell, J.G. and Morton, A.C.	1988
162	8	Ar-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Eide, E.A., Walderhaug, H., Torsvik, T.H. & Løvlie, R.	1998
162	16	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
163	24	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994

163	8	Ar-Ar	South Norway, Fault Rocks	Eide, E.A., Torsvik, T.H. and Andersen, T.B.	1997
166	23	FT	West Norway, Western Gneiss Region	Andriessen, P.A.M. and Bos, A.	1986
168	28	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
168	6	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Færseth, R.B., MacIntyre, R.M. and Naterstad, J.	1976
170	24	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
171	38	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
175	30	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
176	42	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
178	1.5	K-Ar	Offshore	Furnes, H., Elvsborg, A. & Malm, O.A.	1982
178	30	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
178	40	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
179	3	K-Ar	Offshore	Furnes, H., Elvsborg, A. & Malm, O.A.	1982
179	32	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
181	32	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
182	42	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
183	34	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
183	28	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
185	32	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
186	38	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994

186	40	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
187	46	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
189	20	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
190	34	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
191	70	U-Pb	West Norway, Caledonian Nappes:Ophiolites	Dunning, G.R. and Pedersen, R-B.	1988
194	28	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
195	34	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
195	44	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
196	28	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
197	52	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
199	42	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
200	40	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
204	50	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
206	14	K-Ar	South Norway, Fault Rocks	Grønlie, A., Naeser, C.W., Naeser, N.D., Mitchell, J.G., Sturt, B.A. and Ineson, P.R.	1994
208	46	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
209	36	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
213	6	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Færseth, R.B., MacIntyre, R.M. and Naterstad, J.	1976
214	6	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Færseth, R.B., MacIntyre, R.M. and Naterstad, J.	1976
217	50	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	

					1994
217	23	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
217	50	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
220	8	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Færseth, R.B., MacIntyre, R.M. and Naterstad, J.	1976
221	8	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Færseth, R.B., MacIntyre, R.M. and Naterstad, J.	1976
221	8	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Færseth, R.B., MacIntyre, R.M. and Naterstad, J.	1976
221	66	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
222	8	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Færseth, R.B., MacIntyre, R.M. and Naterstad, J.	1976
223	8	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Færseth, R.B., MacIntyre, R.M. and Naterstad, J.	1976
224	8	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Færseth, R.B., MacIntyre, R.M. and Naterstad, J.	1976
224	60	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
224	26	FT	South Norway, Fault Rocks	Grønlie, A., Naeser, C.W., Naeser, N.D., Mitchell, J.G., Sturt, B.A. and Ineson, P.R.	1994
225	8	K-Ar	South Norway, Fault Rocks	Grønlie, A., Naeser, C.W., Naeser, N.D., Mitchell, J.G., Sturt, B.A. and Ineson, P.R.	1994
228	44	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
228	40	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
229	26	FT	South Norway, Fault Rocks	Grønlie, A., Naeser, C.W., Naeser, N.D., Mitchell, J.G., Sturt, B.A. and Ineson, P.R.	1994
230	8	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Færseth, R.B., MacIntyre, R.M. and Naterstad, J.	1976
230	8	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Færseth, R.B., MacIntyre, R.M. and Naterstad, J.	1976

231	16	K-Ar	South Norway, Fault Rocks	Grønlie, A., Naeser, C.W., Naeser, N.D., Mitchell, J.G., Sturt, B.A. and Ineson, P.R.	1994
233	50	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
233	15	K-Ar	Oslo Rift, Related dykes and sills	Verschure, R.H., Majjer, C. & Andriessen, P.A.M.	1989
233	8	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Færseth, R.B., MacIntyre, R.M. and Naterstad, J.	1976
234	10	Ar-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Eide, E.A., Walderhaug, H., Torsvik, T.H. & Løvlie, R.	1998
235	54	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
235	39	FT	South Norway, Fault Rocks	Grønlie, A., Naeser, C.W., Naeser, N.D., Mitchell, J.G., Sturt, B.A. and Ineson, P.R.	1994
238	4	K-Ar	South Norway, Fault Rocks	Grønlie, A., Naeser, C.W., Naeser, N.D., Mitchell, J.G., Sturt, B.A. and Ineson, P.R.	1994
238	9	Ar-Ar	Oslo Rift, Related dykes and sills	Torsvik, T.H., Eide, E.A., Meert, J.G., Smethurst, M.A. & Walderhaug, H.J.	1998
239	40	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
239	44	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
241	22	Ar-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Eide, E.A., Walderhaug, H., Torsvik, T.H. & Løvlie, R.	1998
241	3	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T.	1990
241	12	Ar-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Eide, E.A., Walderhaug, H., Torsvik, T.H. & Løvlie, R.	1998
242	48	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
243	3	Rb-Sr	Oslo Rift, Akershus Graben Segment:Caldera Lavas and Intrusions	Sundvoll, B. and Larsen, B.T.	1990
243	46	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994

245	4	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T. 1990
246	9.2	Ar-Ar	Oslo Rift, Related dykes and sills	Torsvik, T.H., Eide, E.A., Meert, J.G., Smethurst, M.A. & Walderhaug, H.J. 1998
246	9.2	Ar-Ar	Oslo Rift, Related dykes and sills	Torsvik, T.H., Eide, E.A., Meert, J.G., Smethurst, M.A. & Walderhaug, H.J. 1998
247	68	U-Pb	West Norway, Caledonian Nappes:Ophiolites	Dunning, G.R. and Pedersen, R-B. 1988
247	48	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P. 1994
248	15	K-Ar	Oslo Rift, Related dykes and sills	Verschure, R.H., Majer, C. & Andriessen, P.A.M. 1989
248	4	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T. 1990
248	4	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Tuen, E. 1985
249	3	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B. and Larsen, B.T. 1993
249	6	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Tuen, E. 1985
251	2	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Rasmussen, E., Neuman E.-R., Andersen, T., Sundvoll, B, Fjerdingsstad, V. and Stabel, A. 1988
252	3	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Rasmussen, E., Neuman E.-R., Andersen, T., Sundvoll, B, Fjerdingsstad, V. and Stabel, A. 1988
252	3	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T. 1990
253	28	FT	South Norway, Fault Rocks	Grønlie, A., Naeser, C.W., Naeser, N.D., Mitchell, J.G., Sturt, B.A. and Ineson, P.R. 1994
253	20	K-Ar	South Norway, Fen Complex	Verschure, R.H., Majer, C., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A. and Verdurmen, E.A. Th 1983
253	10	Ar-Ar	South Norway, Fault Rocks	Eide, E.A., Torsvik, T.H. and Andersen, T.B. 1997

253	10	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T.	1990
254	8	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Tuen, E.	1985
255	4	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T.	1990
256	62	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
256	5	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T.	1990
256	6	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Tuen, E.	1985
258	6	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Furnes, H., Mitchell, J.G., Robins, B. and Skjerlie, F.J.	1982
260	8	K-Ar	South Norway, Fault Rocks	Færseth, R.B., MacIntyre, R.M. and Naterstad, J.	1976
262	6	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Løvlie, R. and Mitchell, J.G.	1982
262	3	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T.	1990
263	3	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Rasmussen, E., Neuman E.-R., Andersen, T., Sundvoll, B., Fjerdingsstad, V. and Stabel, A.	1988
263	5	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T.	1990
263	4	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T.	1990
264	13	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Tuen, E.	1985
264	60	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
265	11	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Gabbroic Necks	Neumann, E.-R., Larsen, B.T. and Sunvoll, B.	1985
266	5	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Caldera Lavas and Intrusions	Sundvoll, B. and Larsen, B.T.	1990
266	8	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T.	1990
266	6	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Gabbroic Necks	Neumann, E.-R., Larsen, B.T. and Sunvoll, B.	

				1985
267	4	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T. 1990
267	4	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Caldera Lavas and Intrusions	Sundvoll, B. and Larsen, B.T. 1990
267	3	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Tuen, E. 1985
268	3	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T. 1990
268	5	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Caldera Lavas and Intrusions	Rasmussen, E., Neuman E.-R., Andersen, T., Sundvoll, B, Fjerdingsstad, V. and Stabel, A. 1988
268	3	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Caldera Lavas and Intrusions	Rasmussen, E., Neuman E.-R., Andersen, T., Sundvoll, B, Fjerdingsstad, V. and Stabel, A. 1988
268	5	Rb-Sr	Oslo Rift, Akershus Graben Segment:Caldera Lavas and Intrusions	Sundvoll, B. and Larsen, B.T. 1990
268	5	Rb-Sr	Oslo Rift, Akershus Graben Segment:Caldera Lavas and Intrusions	Sundvoll, B. and Larsen, B.T. 1990
269	6	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Caldera Lavas and Intrusions	Sundvoll, B. and Larsen, B.T. 1990
270	4	Rb-Sr	Oslo Rift, Akershus Graben Segment:Caldera Lavas and Intrusions	Sundvoll, B. and Larsen, B.T. 1990
270	4	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T. 1990
271	2	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T. 1990
271	10	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B. and Larsen, B.T. 1993
271	3	Rb-Sr	Oslo Rift, Akershus Graben Segment:Caldera Lavas and Intrusions	Sundvoll, B. and Larsen, B.T. 1990
272	6	Rb-Sr	Oslo Rift, Akershus Graben Segment:Caldera Lavas and Intrusions	Sundvoll, B. and Larsen, B.T. 1990
272	7	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B. and Larsen, B.T. 1993
273	7	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B. and Larsen, B.T. 1993

273	4	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T.	1990
274	3	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Caldera Lavas and Intrusions	Sundvoll, B. and Larsen, B.T.	1990
274	6	Rb-Sr	Oslo Rift, Akershus Graben Segment:Caldera Lavas and Intrusions	Sundvoll, B. and Larsen, B.T.	1990
275	3	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B. and Larsen, B.T.	1993
275	4	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B. and Larsen, B.T.	1993
275	12	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B. and Larsen, B.T.	1993
276	6	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T.	1990
276	6	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T.	1990
276	6	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B. and Larsen, B.T.	1993
277	3	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plutonic Intrusions	Rasmussen, E., Neuman E.-R., Andersen, T., Sundvoll, B, Fjerdingsstad, V. and Stabel, A.	1988
278	8	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T.	1990
278	7	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plutonic Intrusions	Jacobsen, S.B. and Raade, G.	1975
278	5	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T.	1990
278	12	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T.	1990
278	5	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T.	1990
279	9	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T.	1990
280	7	Rb-Sr	Oslo Rift, Akershus Graben Segment:Caldera Lavas and Intrusions	Sundvoll, B. and Larsen, B.T.	1990
280	10	K-Ar	West Norway, Late Palaeozoic-Mesozoic Dykes	Færseth, R.B., MacIntyre, R.M. and Naterstad, J.	1976
281	11	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B. and Larsen, B.T.	

				1993
281	4	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plutonic Intrusions	Sundvoll, B. and Larsen, B.T. 1990
281	6	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T. 1990
283	8	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T. 1990
284	10	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T. 1990
284	7	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T. 1990
284	76	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P. 1994
285	7	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T. 1990
285	7	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B. and Larsen, B.T. 1993
288	4	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T. 1990
288	7	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T. 1990
288	9	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T. 1990
290	11	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B. and Larsen, B.T. 1993
290	4	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T. 1990
291	8	Rb-Sr	South Norway, Fault Rocks	Råheim., A. 1974
291	18	K-Ar	Oslo Rift, Vestfold Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T. 1990
291	8	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T. 1990
292	20	Rb-Sr	Oslo Rift, Akershus Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T. 1990
294	6	Rb-Sr	Oslo Rift, Vestfold Graben Segment:Plateau Lavas	Sundvoll, B. and Larsen, B.T. 1990

294	7	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B., Larsen, B.T. and Wandaas, B.	1992
294	70	FT	West Norway, Western Gneiss Region	Andriessen, P.A.M. and Bos, A.	1986
296	10	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B., Larsen, B.T. and Wandaas, B.	1992
296	10	K-Ar	Oslo Rift, Related dykes and sills	Løvie, R. & Mitchell, J.G.	1984
297	9	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B. and Larsen, B.T.	1993
300		Ar-Ar	South Norway, Fault Rocks	Eide, E.A., Torsvik, T.H. and Andersen, T.B.	1997
301	4	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B., Larsen, B.T. and Wandaas, B.	1992
303	9	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B., Larsen, B.T. and Wandaas, B.	1992
304	8	Rb-Sr	Oslo Rift, Related dykes and sills	Sundvoll, B., Larsen, B.T. and Wandaas, B.	1992
307	72	FT	West Norway, Western Gneiss Region	Andriessen, P.A.M. and Bos, A.	1986
310	85	U-Pb	South Norway, Gneiss Region: Rogaland Sector	Wielens, J.B.W., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A., Verdurmen, E.A.Th. and Verschure, R.H.	1980
313	20	K-Ar	Oslo Rift, Related dykes and sills	Verschure, R.H., Majjer, C., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A. and Verdurmen, E.A. Th	1983
316	66	FT	West Norway, Western Gneiss Region	Andriessen, P.A.M. and Bos, A.	1986
338	43	FT	South Norway, Fault Rocks	Grønlie, A., Naeser, C.W., Naeser, N.D., Mitchell, J.G., Sturt, B.A. and Ineson, P.R.	1994
346	7	Ar-Ar		Frost, R.T.C., Fitch, F.J. and Miller, J.	1981
350	40	U-Pb	South Norway, Gneiss Region: Rogaland Sector	Wielens, J.B.W., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A., Verdurmen, E.A.Th. and Verschure, R.H.	1980

359	8	Rb-Sr	West Norway, Western Gneiss Region	Råheim, A.	1977
365	160	U-Pb	South Norway, Gneiss Region: Rogaland Sector	Wielens, J.B.W., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A., Verdurmen, E.A.Th. and Verschure, R.H.	1980
375	6	Ar-Ar	West Norway, Western Gneiss Region	Lux, D.R.	1985
376	4	Rb-Sr	West Norway, Western Gneiss Region	Råheim, A.	1977
377	10	Rb-Sr	West Norway, Western Gneiss Region	Pidgeon, R.T. and Råheim., A.	1972
378	4	Rb-Sr	West Norway, Western Gneiss Region	Råheim, A.	1977
379	8	Rb-Sr	West Norway, Western Gneiss Region	Mørk, M. B. E. and Mearns, E.W.	1986
379	19.2	Ar-Ar	West Norway, Caledonian Nappes	Eide, E.A., Torsvik, T.H. and Andersen, T.B.	1997
380	26	Sm-Nd	West Norway, Caledonian Nappes	Furnes, H., Pedersen, R.B., Sundvoll, B., Tysseland, M. and Tymyr, O.	1989
380	4	Rb-Sr	West Norway, Western Gneiss Region	Råheim, A.	1977
382	4	Rb-Sr	West Norway, Western Gneiss Region	Råheim, A.	1977
382	11	U-Pb	West Norway, Caledonian Nappes	Northrup, C.J.	1997
384	6	Rb-Sr	West Norway, Western Gneiss Region	Pidgeon, R.T. and Råheim., A.	1972
384	15	Rb-Sr	West Norway, Western Gneiss Region	Skjerlie, F.J. and Pringle, I.R.	1978
385	70	Rb-Sr	West Norway, Western Gneiss Region	Lappin, M.A., Pidgeon, R.T. and van Breemen, O.	1979
385	8	K-Ar	West Norway, Caledonian Nappes	Cuthbert, S.J.	1991
385	0.7	Ar-Ar	West Norway, Western Gneiss Region	Chauvet, A. and Dallmeyer, R.D.	1992
386	20	Rb-Sr	West Norway, Caledonian Nappes	Scharer, U.	

					1980
388	15	Rb-Sr	West Norway, Western Gneiss Region	Skjerlie, F.J. and Pringle, I.R.	1978
390	11	Rb-Sr	West Norway, Caledonian Nappes	Scharer, U.	1980
390	29	Rb-Sr	West Norway, Caledonian Nappes	Furnes, H., Pedersen, R.B., Sundvoll, B., Tysseland, M. and Tymyr, O.	1989
390	4	Rb-Sr	West Norway, Western Gneiss Region	Råheim, A.	1977
390	2.1	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
392	2.1	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
392	1.2	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
392	21	Rb-Sr	West Norway, Western Gneiss Region	Solheim, S.	1980
393	1.5	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
393	0.7	Ar-Ar	West Norway, Western Gneiss Region	Chauvet, A. and Dallmeyer, R.D.	1992
393	1.2	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
393	3.2	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
394	4	U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Råheim, A., Krogh, T.E. and Corfu, F.	1987
395	3.5	Ar-Ar	West Norway, Western Gneiss Region	Chauvet, A. and Dallmeyer, R.D.	1992
395	2.2	Ar-Ar	West Norway, Western Gneiss Region	Boundy, T.M., Essene, E.J., Hall, C.M., Austreim, H. and Halliday, A.N.	1996
395	4	U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
395	6	U-Pb	West Norway, Caledonian Nappes	Scharer, U.	1980

395	1.9	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
395	1.3	Ar-Ar	West Norway, Western Gneiss Region	Chauvet, A. and Dallmeyer, R.D.	1992
395	0.8	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
396	2.4	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
396	2.4	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
396	2	Ar-Ar	West Norway, Caledonian Nappes	Northrup, C.J.	1997
396	8	Rb-Sr	West Norway, Western Gneiss Region	Solheim, S.	1980
396	5	U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Råheim, A., Krogh, T.E. and Corfu, F.	1987
396	2	U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
396	2.3	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
397	2	Ar-Ar	West Norway, Caledonian Nappes	Northrup, C.J.	1997
397	2	Ar-Ar	West Norway, Caledonian Nappes	Northrup, C.J.	1997
398	3	U-Pb	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
399	2	U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
399	0.8	Ar-Ar	West Norway, Western Gneiss Region	Chauvet, A. and Dallmeyer, R.D.	1992
399	0.7	Ar-Ar	West Norway, Western Gneiss Region	Chauvet, A. and Dallmeyer, R.D.	1992
400		U-Pb	West Norway, Western Gneiss Region	Pidgeon, R.T. and Råheim, A.	1972
400		U-Pb	West Norway, Western Gneiss Region	Lappin, M.A., Pidgeon, R.T. and van Breemen, O.	1979
400	16	Sm-Nd	West Norway, Western Gneiss Region	Mørk, M. B. E. and Mearns, E.W.	1986

400	2	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
402	1.8	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
403	1.1	Ar-Ar	West Norway, Western Gneiss Region	Chauvet, A. and Dallmeyer, R.D.	1992
403	0.7	Ar-Ar	West Norway, Western Gneiss Region	Chauvet, A. and Dallmeyer, R.D.	1992
404	1.1	Ar-Ar	West Norway, Western Gneiss Region	Chauvet, A. and Dallmeyer, R.D.	1992
406	3.4	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
407	1	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
407	24	Sm-Nd	West Norway, Western Gneiss Region	Griffinn, W. and Brueckner, H.	1985
408	8	Sm-Nd	West Norway, Western Gneiss Region	Mearns, E.W.	1986
408	3.4	Ar-Ar	West Norway, Caledonian Nappes	Boundy, T.M., Essene, E.J., Hall, C.M., Austreim, H. and Halliday, A.N.	1996
409	6	Ar-Ar	Offshore	Frost, R.T.C., Fitch, F.J. and Miller, J.	1981
409	2.7	Ar-Ar	West Norway, Western Gneiss Region	Boundy, T.M., Essene, E.J., Hall, C.M., Austreim, H. and Halliday, A.N.	1996
410	1	Ar-Ar	West Norway, Western Gneiss Region	Lux, D.R.	1985
410	3	Rb-Sr	West Norway, Caledonian Nappes	Wilks, W.J. and Cuthbert, S.J.	1994
410	90	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Wielens, J.B.W., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A., Verdurmen, E.A.Th. and Verschure, R.H.	1980
410	7	Rb-Sr	West Norway, Western Gneiss Region	Råheim, A.	1977
411	1.5	Ar-Ar	West Norway, Western Gneiss Region	Chauvet, A. and Dallmeyer, R.D.	1992

411	1	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
412	12	Sm-Nd	West Norway, Western Gneiss Region	Jamtveit, B., Carswell, D.A. and Mearns, E.W.	1991
412	47	Sm-Nd	West Norway, Western Gneiss Region	Mearns, E.W.	1986
414	2	Ar-Ar	Offshore	Frost, R.T.C., Fitch, F.J. and Miller, J.	1981
415	6.2	Ar-Ar	West Norway, Western Gneiss Region	Chauvet, A. and Dallmeyer, R.D.	1992
415	8	K-Ar	Offshore	Frost, R.T.C., Fitch, F.J. and Miller, J.	1981
415	2	U-Pb	West Norway, Caledonian Nappes	Northrup, C.J.	1997
415	21	U-Pb	West Norway, Caledonian Nappes	Scharer, U.	1980
416	28	Rb-Sr	West Norway, Western Gneiss Region	Råheim, A.	1977
418	4	K-Ar	Offshore	Frost, R.T.C., Fitch, F.J. and Miller, J.	1981
418	11	Sm-Nd	West Norway, Western Gneiss Region	Griffinn, W. and Brueckner, H.	1985
419	2.4	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C.	1992
420	4	Rb-Sr	West Norway, Western Gneiss Region	Råheim, A.	1977
421	0.8	Ar-Ar	West Norway, Western Gneiss Region	Chauvet, A. and Dallmeyer, R.D.	1992
423	8	K-Ar	West Norway, Western Gneiss Region	Cuthbert, S.J.	1991
423	30	Sm-Nd	West Norway, Western Gneiss Region	Griffinn, W. and Brueckner, H.	1985
423	8	K-Ar	West Norway, Caledonian Nappes	Cuthbert, S.J.	1991
423	12	Sm-Nd	West Norway, Western Gneiss Region	Griffinn, W. and Brueckner, H.	1985
429	2	U-Pb	West Norway, Caledonian Nappes	Northrup, C.J.	1997

429	0.9	Ar-Ar	West Norway, Caledonian Nappes	Boundy, T.M., Essene, E.J., Hall, C.M., Austreim, H. and Halliday, A.N. 1996
430	0.6	Ar-Ar	West Norway, Caledonian Nappes	Boundy, T.M., Essene, E.J., Hall, C.M., Austreim, H. and Halliday, A.N. 1996
430	7	U-Pb	West Norway, Caledonian Nappes	Nordgulen, Ø., Bickford, M.E., Nissen, A.L. & Wortman, G.L. 1993
430		K-Ar		Frost, R.T.C., Fitch, F.J. and Miller, J. 1981
432	0.5	U-Pb	West Norway, Caledonian Nappes	Northrup, C.J. 1997
432	2	U-Pb	West Norway, Caledonian Nappes	Northrup, C.J. 1997
432	6	Sm-Nd	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C. 1992
433	0.5	Ar-Ar	West Norway, Caledonian Nappes	Boundy, T.M., Essene, E.J., Hall, C.M., Austreim, H. and Halliday, A.N. 1996
435	10	U-Pb	West Norway, Caledonian Nappes	Nordgulen, Ø., Bickford, M.E., Nissen, A.L. & Wortman, G.L. 1993
436	4	Ar-Ar	Offshore	Frost, R.T.C., Fitch, F.J. and Miller, J. 1981
437	0.4	U-Pb	West Norway, Caledonian Nappes	Northrup, C.J. 1997
437	58	Sm-Nd	West Norway, Western Gneiss Region	Jamtveit, B., Carswell, D.A. and Mearns, E.W. 1991
437	1	U-Pb	West Norway, Caledonian Nappes	Northrup, C.J. 1997
437	4	U-Pb	West Norway, Caledonian Nappes	Nordgulen, Ø., Bickford, M.E., Nissen, A.L. & Wortman, G.L. 1993
440	2.4	Ar-Ar	West Norway, Western Gneiss Region	Dallmeyer, R.D., Johansson, L. and Møller, C. 1992
440	12	Sm-Nd	West Norway, Caledonian Nappes	Boundy, T.M., Mezger, K. and Essene, E.J. 1997
442	1	Ar-Ar	West Norway, Western Gneiss Region	Chauvet, A. and Dallmeyer, R.D. 1992
442	2	Ar-Ar		Frost, R.T.C., Fitch, F.J. and Miller, J.

				1981
443	7	U-Pb	West Norway, Caledonian Nappes	Nordgulen, Ø., Bickford, M.E., Nissen, A.L. & Wortman, G.L. 1993
443	10	K-Ar	Offshore	Frost, R.T.C., Fitch, F.J. and Miller, J. 1981
443	3	U-Pb	West Norway, Caledonian Nappes:Ophiolites	Dunning, G.R. and Pedersen, R-B. 1988
443	1.7	Ar-Ar	West Norway, Caledonian Nappes	Boundy, T.M., Hall, C.M., Essene, E.J. and Halliday, A.N. 1997
444		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Verschure, R.H., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Majjer, C., Priem, H.N.A. and Verdurmen, E.A.Th. 1980
444	1.9	Ar-Ar	West Norway, Caledonian Nappes	Boundy, T.M., Hall, C.M., Essene, E.J. and Halliday, A.N. 1997
446	3	Ar-Ar	West Norway, Caledonian Nappes	Andersen, T.B., Berry, H.N., Lux, D.R. and Andresen, A. 1997
447	20	Sm-Nd	West Norway, Western Gneiss Region	Griffinn, W. and Brueckner, H. 1985
447	7	U-Pb	West Norway, Caledonian Nappes	Nordgulen, Ø., Bickford, M.E., Nissen, A.L. & Wortman, G.L. 1993
448	4	Ar-Ar	West Norway, Caledonian Nappes	Andersen, T.B., Berry, H.N., Lux, D.R. and Andresen, A. 1997
448	4.2	Ar-Ar	West Norway, Caledonian Nappes	Boundy, T.M., Essene, E.J., Hall, C.M., Austreim, H. and Halliday, A.N. 1996
448	16	Ar-Ar	West Norway, Caledonian Nappes	Eide, E.A., Torsvik, T.H. and Andersen, T.B. 1997
448	6	Ar-Ar	Offshore	Frost, R.T.C., Fitch, F.J. and Miller, J. 1981
449	2	Ar-Ar	Offshore	Frost, R.T.C., Fitch, F.J. and Miller, J. 1981
449	2.2	Ar-Ar	West Norway, Caledonian Nappes	Andersen, T.B., Berry, H.N., Lux, D.R. and Andresen, A. 1997
450	10	U-Pb	West Norway, Caledonian Nappes	Boundy, T.M., Mezger, K. and Essene, E.J. 1997
451	1.1	Ar-Ar	West Norway, Caledonian Nappes	Boundy, T.M., Essene, E.J., Hall, C.M., Austreim, H. and Halliday, A.N. 1996

453	5	Ar-Ar	Offshore	Frost, R.T.C., Fitch, F.J. and Miller, J.	1981
453	2	Ar-Ar	Offshore	Frost, R.T.C., Fitch, F.J. and Miller, J.	1981
455	1.5	Ar-Ar	West Norway, Caledonian Nappes	Boundy, T.M., Essene, E.J., Hall, C.M., Austreim, H. and Halliday, A.N.	1996
460		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Verschure, R.H., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Majjer, C., Priem, H.N.A. and Verdurmen, E.A.Th.	1980
463	0.8	Ar-Ar	West Norway, Caledonian Nappes	Boundy, T.M., Essene, E.J., Hall, C.M., Austreim, H. and Halliday, A.N.	1996
468	60	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
469		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Verschure, R.H., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Majjer, C., Priem, H.N.A. and Verdurmen, E.A.Th.	1980
470	7	U-Pb	West Norway, Caledonian Nappes:Ophiolites	Dunning, G.R. and Pedersen, R-B.	1988
475	982	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
479	1	U-Pb	West Norway, Caledonian Nappes	Northrup, C.J.	1997
482	5	U-Pb	West Norway, Caledonian Nappes:Ophiolites	Dunning, G.R. and Pedersen, R-B.	1988
485	2	U-Pb	West Norway, Caledonian Nappes:Ophiolites	Dunning, G.R. and Pedersen, R-B.	1988
489	3	U-Pb	West Norway, Caledonian Nappes:Ophiolites	Dunning, G.R. and Pedersen, R-B.	1988
493	5	U-Pb	West Norway, Caledonian Nappes:Ophiolites	Dunning, G.R. and Pedersen, R-B.	1988
497	2	U-Pb	West Norway, Caledonian Nappes:Ophiolites	Dunning, G.R. and Pedersen, R-B.	1988
511	18	Sm-Nd	West Norway, Western Gneiss Region	Jamtveit, B., Carswell, D.A. and Mearns, E.W.	1991
523	20	K-Ar	South Norway, Fen Complex	Verschure, R.H., Majjer, C., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A. and Verdurmen, E.A. Th	

					1983
523	106	FT	Oslo Rift	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
540	14	Pb-Pb	South Norway, Fen Complex	Andersen, T. and Taylor, P.N.	1988
542	138	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
544	2.4	Ar-Ar	West Norway, Caledonian Nappes	Boundy, T.M., Hall, C.M., Essene, E.J. and Halliday, A.N.	1997
548	4.1	Ar-Ar	West Norway, Caledonian Nappes	Boundy, T.M., Hall, C.M., Essene, E.J. and Halliday, A.N.	1997
550	7	Rb-Sr	South Norway, Fen Complex	Andersen, T. and Sundvoll, B.	1987
557		K-Ar	South Norway, Gneiss Region: Rogaland Sector	Verschure, R.H., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Majer, C., Priem, H.N.A. and Verdurmen, E.A.Th.	1980
558	3.3	Ar-Ar	West Norway, Caledonian Nappes	Boundy, T.M., Hall, C.M., Essene, E.J. and Halliday, A.N.	1997
564	20	K-Ar	South Norway, Fen Complex	Verschure, R.H., Majer, C., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A. and Verdurmen, E.A. Th	1983
574	72	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P.	1994
578	28	Rb-Sr	South Norway, Fen Complex	Dahlgren, S.	1994
578	20	K-Ar	South Norway, Fen Complex	Verschure, R.H., Majer, C., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A. and Verdurmen, E.A. Th	1983
578	20	Ar-Ar	South Norway, Fen Complex	Meert, J.G., Torsvik, T.H., Eide, E..A. and Dahlgren, S.	1998
578	20	K-Ar	South Norway, Fen Complex	Verschure, R.H., Majer, C., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A. and Verdurmen, E.A. Th	1983
580	20	K-Ar	South Norway, Fen Complex	Verschure, R.H., Majer, C., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A. and Verdurmen, E.A. Th	1983
589	20	Ar-Ar	South Norway, Fen Complex	Meert, J.G., Torsvik, T.H., Eide, E..A. and Dahlgren, S.	1998

589	20	Ar-Ar	South Norway, Fen Complex	Meert, J.G., Torsvik, T.H., Eide, E.A. and Dahlgren, S. 1998
594	20	K-Ar	South Norway, Fen Complex	Verschure, R.H., Majer, C., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A. and Verdurmen, E.A. Th 1983
594	20	K-Ar	South Norway, Fen Complex	Verschure, R.H., Majer, C., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A. and Verdurmen, E.A. Th 1983
597	20	K-Ar	South Norway, Fen Complex	Verschure, R.H., Majer, C., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A. and Verdurmen, E.A. Th 1983
597	20	K-Ar	South Norway, Fen Complex	Verschure, R.H., Majer, C., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A. and Verdurmen, E.A. Th 1983
598	20	K-Ar	South Norway, Fen Complex	Verschure, R.H., Majer, C., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A. and Verdurmen, E.A. Th 1983
599	42	Sm-Nd	West Norway, Western Gneiss Region	Jamtveit, B., Carswell, D.A. and Mearns, E.W. 1991
601	20	K-Ar	South Norway, Fen Complex	Verschure, R.H., Majer, C., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A. and Verdurmen, E.A. Th 1983
608	170	Sm-Nd	West Norway, Western Gneiss Region	Griffinn, W. and Brueckner, H. 1985
611	110	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P. 1994
616	9	U-Pb	South Norway, Neoproterozoic Dykes	Bingen, B, Demaiffe, D. and van Breemen, O. 1997
627	128	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P. 1994
634	112	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P. 1994
644	30	Sm-Nd	South Norway, Neoproterozoic Dykes	Walderhaug, H.J., Torsvik, T.H. and Sundvoll, B. 1998
650	29	Rb-Sr	South Norway, Neoproterozoic Dykes	Walderhaug, H.J., Torsvik, T.H. and Sundvoll, B. 1998
651	80	Sm-Nd	South Norway, Neoproterozoic Dykes	Walderhaug, H.J., Torsvik, T.H. and Sundvoll, B. 1998

655	10	Rb-Sr	South Norway, Neoproterozoic Dykes	Walderhaug, H.J., Torsvik, T.H. and Sundvoll, B. 1998
657	98	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P. 1994
665	20	K-Ar	South Norway, Fen Complex	Verschure, R.H., Majer, C., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A. and Verdurmen, E.A. Th 1983
665	90	FT	South Norway	Rohrman, M., van der Beek, P. and Andriessen, P. 1994
718		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Verschure, R.H., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Majer, C., Priem, H.N.A. and Verdurmen, E.A.Th. 1980
803		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Verschure, R.H., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Majer, C., Priem, H.N.A. and Verdurmen, E.A.Th. 1980
815		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Verschure, R.H., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Majer, C., Priem, H.N.A. and Verdurmen, E.A.Th. 1980
820	36	Rb-Sr	South Norway, Neoproterozoic Dykes	Walderhaug, H.J., Torsvik, T.H. and Sundvoll, B. 1998
825		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Verschure, R.H., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Majer, C., Priem, H.N.A. and Verdurmen, E.A.Th. 1980
853		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Verstevee, A.J. 1975
854		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Verstevee, A.J. 1975
855	92	Sm-Nd	South Norway, Neoproterozoic Dykes	Walderhaug, H.J., Torsvik, T.H. and Sundvoll, B. 1998
855		Rb-Sr	South Norway, Gneiss Region:Rogaland Sector	Verschure, R.H., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Majer, C., Priem, H.N.A. and Verdurmen, E.A.Th. 1980
857	21	Rb-Sr	South Norway, Gneiss Region:Rogaland Sector	Pasteels, P., Demaiffe, D. and Michot, J. 1979
858		Rb-Sr	South Norway, Gneiss Region:Rogaland Sector	Verstevee, A.J. 1975
858		Rb-Sr	South Norway, Gneiss Region:Rogaland Sector	Verstevee, A.J. 1975

863		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Versteeve, A.J.	1975
864		Rb-Sr	South Norway, Gneiss Region:Rogaland Sector	Versteeve, A.J.	1975
865		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Verschure, R.H., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Majjer, C., Priem, H.N.A. and Verdurmen, E.A.Th.	1980
867		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Versteeve, A.J.	1975
867		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Versteeve, A.J.	1975
868		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Verschure, R.H., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Majjer, C., Priem, H.N.A. and Verdurmen, E.A.Th.	1980
871		Rb-Sr	South Norway, Gneiss Region:Rogaland Sector	Versteeve, A.J.	1975
871		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Verschure, R.H., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Majjer, C., Priem, H.N.A. and Verdurmen, E.A.Th.	1980
873		Rb-Sr	South Norway, Gneiss Region:Rogaland Sector	Versteeve, A.J.	1975
873		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Versteeve, A.J.	1975
877	18	U-Pb	West Norway, Caledonian Nappes	Scharer, U.	1980
878		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Versteeve, A.J.	1975
882		Rb-Sr	South Norway, Gneiss Region:Rogaland Sector	Versteeve, A.J.	1975
892	16	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
892	25	Rb-Sr	South Norway, Gneiss Region:Rogaland Sector	Pasteels, P., Demaiffe, D. and Michot, J.	1979
894		Rb-Sr	South Norway, Gneiss Region:Rogaland Sector	Versteeve, A.J.	1975
895		Rb-Sr	South Norway, Gneiss Region:Rogaland Sector	Versteeve, A.J.	1975
907	5.1	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	

					1996
909	16	U-Pb	West Norway, Caledonian Nappes	Scharer, U.	1980
911	14	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
915	3.6	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
915	4	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Scharer, U., Wilmart, E. and Duchesne, J.-C.	1996
915	2.2	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
916	1.8	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
916	41	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
917	1.9	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
917	14	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
917	2.2	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
918	1.8	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
919	2.4	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
919	3.9	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
919	5.7	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
919	4.4	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
920	4.2	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
920	3	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Scharer, U., Wilmart, E. and Duchesne, J.-C.	1996
921	32	Rb-Sr	West Norway, Western Gneiss Region	Milnes, A.G., Dietler, T.N. and Koestler, A.G.	1988

921	41	U-Pb	West Norway, Caledonian Nappes	Scharer, U.	1980
923	21	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
924	16	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
925	13	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
925	51	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
926	70	Sm-Nd	West Norway, Western Gneiss Region	Mørk, M. B. E. and Mearns, E.W.	1986
927	9	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
929	2	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Scharer, U., Wilmart, E. and Duchesne, J.-C.	1996
929	13	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
931	5	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Scharer, U., Wilmart, E. and Duchesne, J.-C.	1996
931	10	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Pasteels, P., Demaiffe, D. and Michot, J.	1979
932	3	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Scharer, U., Wilmart, E. and Duchesne, J.-C.	1996
932	3	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Scharer, U., Wilmart, E. and Duchesne, J.-C.	1996
936	5.3	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
940		K-Ar	South Norway, Gneiss Region:Rogaland Sector	Verstevee, A.J.	1975
942	4	U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
943	47	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. and van Breemen, O.	1996
943	5	U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
945	5	U-Pb	West Norway, Caledonian Nappes	Boundy, T.M., Mezger, K. and Essene, E.J.	1997

950	5	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Pasteels, P., Demaiffe, D. and Michot, J.	1979
987	99	U-Pb	South Norway, Gneiss Region:Telemark Sector	Bingen, B. & Van Breemen, O.	1997
1030	32	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Wielens, J.B.W., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A., Verdurmen, E.A.Th. and Verschure, R.H.	1980
1030	42	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Wielens, J.B.W., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A., Verdurmen, E.A.Th. and Verschure, R.H.	1980
1035	2.5	U-Pb	South Norway, Gneiss Region:Telemark Sector	Bingen, B. & Van Breemen, O.	1997
1035	94	Rb-Sr	West Norway, Western Gneiss Region	Solheim, S.	1980
1040	30	Sm-Nd	West Norway, Western Gneiss Region	Mearns, E.W.	1986
1045	27	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Wielens, J.B.W., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A., Verdurmen, E.A.Th. and Verschure, R.H.	1980
1045	13	Rb-Sr	South Norway, Gneiss Region:Bamble Sector	Kullerud, L. and Dahlgren S.H.	1993
1049	5	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. & Van Breemen, O.	1997
1051	5	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. & Van Breemen, O.	1997
1051	5	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. & Van Breemen, O.	1997
1051	3	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Bingen, B. & Van Breemen, O.	1997
1052	43	Sm-Nd	West Norway, Western Gneiss Region	Solheim, S.	1980
1055	70	Rb-Sr	West Norway, Western Gneiss Region	Solheim, S.	1980
1068	51	Sm-Nd	South Norway, Gneiss Region:Bamble Sector	Kullerud, L. and Dahlgren S.H.	1993

1070	27	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Wielens, J.B.W., Andriessen, P.A.M., Boelrijk, N.A.I.M., Hebeda, E.H., Priem, H.N.A., Verdurmen, E.A.Th. and Verschure, R.H.	1980
1073	28	Sm-Nd	South Norway, Gneiss Region:Bamble Sector	Kullerud, L. and Dahlgren S.H.	1993
1080	3	U-Pb	South Norway, Gneiss Region:Kongsberg Sector	Munz, I.A., Wayne, D. & Austreim, H.	1994
1081	6	Ar-Ar	South Norway, Gneiss Region:Bamble Sector	Cosca, M.A. and O'Nions R.K.	1994
1084	6	Ar-Ar	South Norway, Gneiss Region:Bamble Sector	Cosca, M.A. and O'Nions R.K.	1994
1086	6	Ar-Ar	South Norway, Gneiss Region:Bamble Sector	Cosca, M.A. and O'Nions R.K.	1994
1086	6	Ar-Ar	South Norway, Gneiss Region:Bamble Sector	Cosca, M.A. and O'Nions R.K.	1994
1087	6	Ar-Ar	South Norway, Gneiss Region:Bamble Sector	Cosca, M.A. and O'Nions R.K.	1994
1087	17	Sm-Nd	South Norway, Gneiss Region:Bamble Sector	Kullerud, L. and Dahlgren S.H.	1993
1087	6	Ar-Ar	South Norway, Gneiss Region:Bamble Sector	Cosca, M.A. and O'Nions R.K.	1994
1089	6	Ar-Ar	South Norway, Gneiss Region:Bamble Sector	Cosca, M.A. and O'Nions R.K.	1994
1091	6	Ar-Ar	South Norway, Gneiss Region:Bamble Sector	Cosca, M.A. and O'Nions R.K.	1994
1093	6	Ar-Ar	South Norway, Gneiss Region:Bamble Sector	Cosca, M.A. and O'Nions R.K.	1994
1098	7	Sm-Nd	South Norway, Gneiss Region:Bamble Sector	Kullerud, L. and Dahlgren S.H.	1993
1099	6	Ar-Ar	South Norway, Gneiss Region:Bamble Sector	Cosca, M.A. and O'Nions R.K.	1994
1099	6	Ar-Ar	South Norway, Gneiss Region:Bamble Sector	Cosca, M.A. and O'Nions R.K.	1994
1107	58	Sm-Nd	South Norway, Gneiss Region:Bamble Sector	Kullerud, L. and Dahlgren S.H.	1993
1110	140	Sm-Nd	South Norway, Gneiss Region:Bamble Sector	de Haas, G-J L.M., Verschure, R.H. and Majer, C.	1993

1112	6	Ar-Ar	South Norway, Gneiss Region:Bamble Sector	Cosca, M.A. and O'Nions R.K.	1994
1113	6	Ar-Ar	South Norway, Gneiss Region:Bamble Sector	Cosca, M.A. and O'Nions R.K.	1994
1129	302	Rb-Sr	West Norway, Western Gneiss Region	Solheim, S.	1980
1138	18	Rb-Sr	South Norway, Gneiss Region:Bamble Sector	Kullerud, L. and Dahlgren S.H.	1993
1153	39	Rb-Sr	South Norway, Gneiss Region:Rogaland Sector	Zhou, X.Q., Bingen, B., Demaiffe, D., Liegeois, J.-P., Hertogen, J., Weis, D. & Michot, J.	1995
1159	5	U-Pb	South Norway, Gneiss Region:Rogaland Sector	Zhou, X.Q., Bingen, B., Demaiffe, D., Liegeois, J.-P., Hertogen, J., Weis, D. & Michot, J.	1995
1163	14	Sm-Nd	West Norway, Western Gneiss Region	Jamtveit, B., Carswell, D.A. and Mearns, E.W.	1991
1166	41	U-Pb	South Norway, Gneiss Region:Telemark Sector	Bingen, B. & Van Breemen, O.	1997
1175	37	Sm-Nd	South Norway, Gneiss Region:Bamble Sector	Dahlgren, S.	1993
1190	37	Sm-Nd	South Norway, Gneiss Region:Telemark Sector	Menuge, J.F.	1985
1198	56	Sm-Nd	West Norway, Western Gneiss Region	Mørk, M. B. E. and Mearns, E.W.	1986
1252	26	U-Pb	West Norway, Caledonian Nappes	Scharer, U.	1980
1268	23	U-Pb	West Norway, Caledonian Nappes	Scharer, U.	1980
1289	48	Sm-Nd	West Norway, Western Gneiss Region	Mørk, M. B. E. and Mearns, E.W.	1986
1303	236	Sm-Nd	West Norway, Western Gneiss Region	Jamtveit, B., Carswell, D.A. and Mearns, E.W.	1991
1443	120	Rb-Sr	West Norway, Western Gneiss Region	Solheim, S.	1980
1455	97	Rb-Sr	West Norway, Western Gneiss Region	Solheim, S.	1980
1459	84	Rb-Sr	West Norway, Western Gneiss Region	Solheim, S.	1980

1468	103	Rb-Sr	West Norway, Western Gneiss Region	Solheim, S.	1980
1478	21.5	Rb-Sr	West Norway, Western Gneiss Region	Harvey, M.A.	1983
1479	63	Rb-Sr	West Norway, Western Gneiss Region	Abdel-Monem, A.A. and Bryhni, I.	1978
1489	116	Rb-Sr	West Norway, Western Gneiss Region	Solheim, S.	1980
1508		U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1520		U-Pb	West Norway, Western Gneiss Region	Lappin, M.A., Pidgeon, R.T. and van Breemen, O.	1979
1580	135	Rb-Sr	West Norway, Caledonian Nappes	Scharer, U.	1980
1591	73	Rb-Sr	West Norway, Western Gneiss Region	Skjerlie, F.J. and Pringle, I.R.	1978
1600		U-Pb	West Norway, Western Gneiss Region	Pidgeon, R.T. and Råheim, A.	1972
1604	23	U-Pb	West Norway, Caledonian Nappes	Scharer, U.	1980
1614	62	Rb-Sr	West Norway, Western Gneiss Region	Milnes, A.G., Dietler, T.N. and Koestler, A.G.	1988
1640	230	Sm-Nd	South Norway, Gneiss Region:Bamble Sector	de Haas, G-J L.M., Verschure, R.H. and Majer, C.	1993
1642	35	Rb-Sr	South Norway, Gneiss Region:Kongsberg Sector	Heim, M., Skjold, T. and Wolff, F.C.	1996
1646	323	Rb-Sr	West Norway, Western Gneiss Region	Solheim, S.	1980
1647		U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1647		U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1652		U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1652		U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1653	2	U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Råheim, A., Krogh, T.E. and Corfu, F.	1987

1657	4	U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1658	2	U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1659		U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1659		U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1659	2	U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Råheim, A., Krogh, T.E. and Corfu, F.	1987
1659		U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1660		U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1660		U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1661	2	U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1662	35	U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1664		U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1666	24	U-Pb	West Norway, Caledonian Nappes	Scharer, U.	1980
1671	62	Rb-Sr	West Norway, Western Gneiss Region	Råheim, A.	1977
1672		U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1672	59	Rb-Sr	West Norway, Western Gneiss Region	Pidgeon, R.T. and Råheim., A.	1972
1673	8	U-Pb	South Norway, Gneiss Region:Kongsberg Sector	Heim, M., Skjold, T. and Wolff, F.C.	1996
1678		U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1686	2	U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991
1686		U-Pb	West Norway, Western Gneiss Region	Tucker, R.D., Krogh, T.E. and Råheim, A.	1991

1694	20	U-Pb	West Norway, Caledonian Nappes	Scharer, U.	1980
1703	29	Sm-Nd	West Norway, Western Gneiss Region	Mearns, E.W.	1986
1734	106	Rb-Sr	West Norway, Western Gneiss Region	Solheim, S.	1980
1760	70	Rb-Sr	West Norway, Western Gneiss Region	Lappin, M.A., Pidgeon, R.T. and van Breemen, O.	1979
1770	190	Sm-Nd	South Norway, Gneiss Region:Bamble Sector	de Haas, G-J L.M., Verschure, R.H. and Majjer, C.	1993