Newfoundland Labrador

Natural Resources

LEGEND

Order of listing of units under each heading does not necessarily correspond to relative stratigraphic age. (Descriptive notes outlining the characteristics of each of the map units are released available with this open file map; the Open File number is the same)

MINOR INTRUSIONS OF MESOPROTEROZOIC AGE
(may include rocks that pre-date and postdate the Nain Plutonic Suite)

- dgb; dp — Olivine gabbro and diabase; dp: feldsparphyric dykes
- dg — Granitic dykes; includes aplitic and pegmatitic varieties of several ages
- dgp — Olivine-bearing pegmatitic gabbroic or dioritic dykes
- dfd — Dioritic dykes, includes oxide- and pyroxene-rich dykes
- dc — Undeformed to strongly deformed composite basic–silicic dykes
- dgl — Black and dark-grey granular gabbronoritic (ferrodioritic?) dykes, locally biotite- and hornblende-bearing
- MKm — Kaiktusuak dykes: Massive, slightly porphyritic, fayalite+augite monzonite
- Mgbn — Leucogabbronoritic sheet

IGNEOUS ROCKS OF MESOPROTEROZOIC AGE: THE NAIN PLUTONIC SUITE
(may include some older rocks)

GRANITIC ROCKS

- MSgr — Coarse fayalite+augite-bearing monzonite and quartz monzonite
- MBlfmz — Massive to foliated, fayalite-bearing monzonite and quartz monzonite within the Barth Island composite intrusion
- MLfmz — Massive to strongly foliated, locally layered, fayalite-bearing, porphyritic monzonite, quartz monzonite and syenite peripheral to the Mount Lister intrusion; locally mingled with oxide-apatite gabbronorite

DIORITIC ROCKS

- Mfd — Coarse, buff- to brown-weathering, oxide-rich gabbronoritic rock
- Mlfd — Layered to massive, buff- to brown-weathering, oxide-rich, gabbronoritic rock
- Moxf — Rusty, locally oxide(magnetite)-rich ferrodiorite
- MSKld — Satorsoakulluk dykes: Granular brown-weathering ferrodiorite
- MAfd — Akpaume? intrusion: Granular brown-weathering ferrodiorite dyke
- Mxfd — Granular brown-weathering ferrodiorite
- MSfd — Sachem Bay intrusion: Massive to diffusely layered ferrodiorite and related hybrid rocks
- MBlfd — Massive to layered ferrodiorite and related hybrid rocks within the Barth Island composite intrusion

TROCTOLITIC ROCKS

- Mclt — Coarse leucotroctolite
- MTlt — Tessiuyarsuk intrusion: Leucotroctolite, troctolite, and olivine-bearing leuconoritic rocks
- Mlt; Mltb — Mlt: Leucotroctolite, troctolite, and orthopyroxene-bearing troctolitic rocks; Mltb: Reddish-brown troctolite of the western part of the body
- MPMlt — Port Manvers Run intrusion: Dark-grey to black leucotroctolite
- MTlr — Tikkiraluk Hill intrusion: Brown-weathering troctolite and olivine gabbro
- MBlt — Pale grey-green to reddish-brown troctolite and olivine gabbro of the Barth Island composite intrusion

ANORTHOSITIC ROCKS

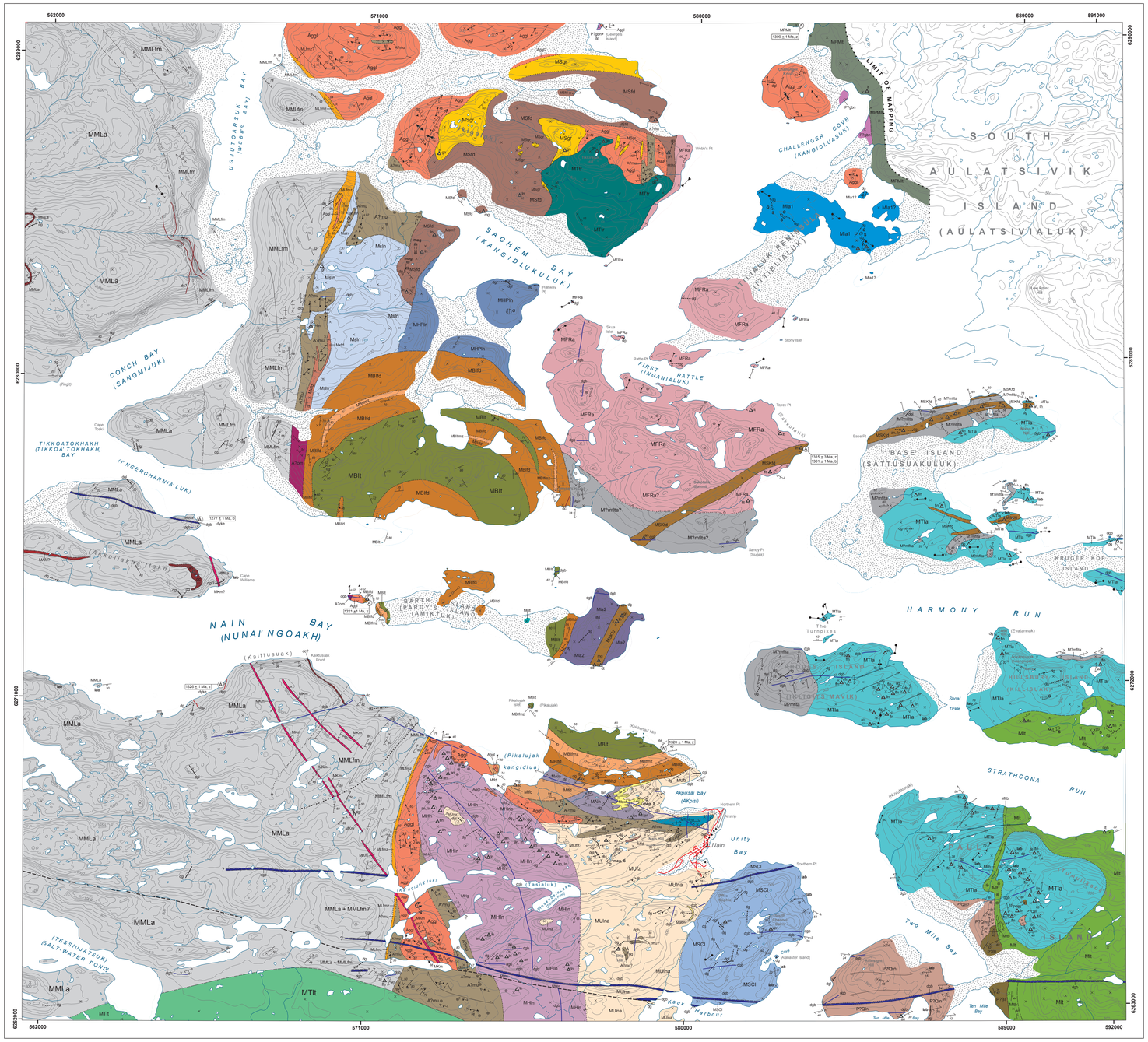
- Mla2 — Massive, white- to pale-grey-weathering anorthosite, leuconorite, and leucogabbro
- Mla1 — Massive white- to pale-grey-weathering anorthosite and leuconorite
- MHPln — Halfway Point intrusion: Mottled to clotted-textured leuconorite
- Msln — Seriate-textured leuconorite
- MTla — The Turnpikes intrusion(s): Massive, grey-weathering, locally olivine-bearing, leuconorite and anorthosite
- MFRa — First Rattle intrusion: Massive grey-weathering anorthosite and leuconorite, locally olivine bearing
- MHln; MHg; MHno — Hosenbein Lake intrusion: MHln: Brownish-weathering leuconorite and grey-weathering clotted- to seriate-textured leuconorite and leucogabbro; MHg: Massive olivine gabbro; MHlno: Oxide-rich rocks of the northern part intrusion
- MSCl — South Channel Cairn intrusion: Massive to layered leucogabbro, leuconorite and anorthosite
- MAln — Akpiksai Bay intrusion: Massive to weakly foliated leuconorite to anorthosite, having a fairly uniform distribution to the orthopyroxene
- M?mnla — Massive to weakly layered, locally foliated, white (recrystallized) and mauve to grey (non-recrystallized) anorthosite and leuconorite
- MMLa; MMLfm — Mount Lister intrusion: MMLa: Pegmatoidal anorthosite and leuconorite; MMLfm: Foliated leuconoritic and anorthositic eastern margin of the intrusion
- MUlna; MUfz — Unity Bay intrusion: MUlna: Medium to coarse-grained leuconorite, leucogabbro and anorthosite; MUlfz: Foliated leuconoritic and anorthositic northern zone of the intrusion
- M?mflta — Foliated to massive leuconorite, olivine-bearing leuconorite, leucotroctolite and anorthosite

IGNEOUS ROCKS OF PROBABLE PALEOPROTEROZOIC AGE

- P?Qln — Quarry intrusion: Foliated, grey to brownish-grey leuconorite and anorthosite
- P?Bl — The Bridges intrusion: Well-layered, commonly olivine-bearing rocks: gabbronorite, anorthosite, pyroxenite
- P?gbn — Metagabbronorite
- dlm — Foliated lamprophyre dyke

MAFIC, ULTRAMAFIC, AND FELSIC ROCKS OF ASSUMED ARCHEAN AGE

- Aggl — Migmatitic, granulite-facies, quartzofeldspathic gneisses; dispersed mafic, ultramafic and metasedimentary rafts
- A?om — Layered, olivine-bearing mafic rocks and olivine-free, mesocratic, leuconoritic and anorthositic rocks
- A?mu — Layered ultramafic, mafic, mesocratic and pale-weathering leucogabbronoritic to anorthositic rocks; minor quartzofeldspathic gneiss



SYMBOLS

- Observation and/or note station
- Selected data stations compiled from other sources
- Geological contact (defined, approximate, transitional, assumed, questionable)
- Gneissic layering (inclined, vertical, dip unknown)
- Igneous layering (inclined, vertical, dip unknown)
- Foliation, both metamorphic and igneous (inclined, vertical, dip unknown)
- Unspecified foliation and layering compiled from other sources (actual dip given; dip >45°; dip <45°; vertical)
- Layering and foliation parallel in plutonic rocks (inclined, vertical, dip unknown)
- Elongation orientation of mafic enclaves in granitic rocks
- Elongation orientation of pyroxene concentrations (inclined, dip unknown)
- Preferred orientation of plagioclase megacrysts (inclined, vertical, dip unknown)
- Lineation trend and plunge
- Plunge of small-fold; S, M, indicates down-plunge symmetry
- General form-lines of foliation trend
- Lineaments
- Antiform, synform, overturned antiform
- Fault (approximate, assumed)
- Gossan zone (see NOTES below)
- Sulphide(s), ilmenite(ilm) and magnetite(mag) showings and prospects (see NOTES below) — S, ilm, mag
- Labradorite occurrence (see NOTES below) — lab
- Age determination site (see NOTES below) — 1308 ± 2 Ma
- Minor units in gneisses (see NOTES below)
- Inclusions in plutonic rocks (see NOTES below)
- Areas having Quaternary cover and few or no outcrops

NOTES

The gneissic layering in the Archean(?) ultramafic-mafic-anorthositic sequence (Unit A?mu) refers to compositional variations that are primary in origin, as well as those generated by deformational transposition.

Foliation symbols displayed on the map encompass fabrics of penetrative origin caused by solid-state structural modification of metamorphic rocks (e.g., axial plane fabrics to folds in the gneisses), those solid-state fabrics within the igneous rocks that are produced by post-magmatic modification of igneous textures (e.g., the recrystallization and elongation of feldspar and orthopyroxene in the margin of the Mount Lister intrusion), those that are presumably produced by pre-full-solidification compaction (e.g., flattening of mafic enclaves in the granitic rocks), and those that are produced by magmatic processes (e.g., orientation of feldspar trains in ferrodiorite).

The contact between the Unity Bay intrusion and the Hosenbein Lake intrusion, southwest of Nain, is a broad zone of megabreccia within which individual outcrops on each side of the border as portrayed on the map may include one unit in excess of the other (e.g., numerous blocks of Unity Bay intrusion within a host of Hosenbein Lake leuconorite or numerous dykes of Hosenbein Lake leuconorite transecting Unity Bay rock).

Some symbols for field station locations, especially those used to illustrate the distribution of the gneisses (Unit A?mu) on the eastern side of the gentle north–south valley east of Conch Bay, may not be accurately located. This is because most of the aerial photographs (approx. 1:70 000-scale) used for the field work during the helicopter-supported reconnaissance work show a snow-covered landscape; consequently, the ground stations portrayed on the map from areas of particular heavy snow cover may, in some cases, be misplaced by several hundred metres.

Areas underlain by the Mount Lister intrusion in the upland region, north of Conch Bay and south of Nain Bay, have not been systematically traversed, the data points are based largely on helicopter reconnaissance. Similarly, the inland region between First Rattle and Sandy Point has been mapped only through limited observation using helicopter reconnaissance.

The northern part of the Barth Island intrusion has been compiled mainly from a thesis by Kathleen Mulhern, completed as part of the requirements for a M.Sc. degree at Syracuse University, New York, in 1974, and on file with the Geological Survey (GSNL File # 14C/12/13). Additional layering orientations were derived from a map compiled by D.J. Butler for Voisey's Bay Nickel Company and Archean Resources Limited (GSNL File # LAB/1161).

The extent of the troctolitic dyke and some abutting rocks on Paul Island, northeast of Two Mile Bay, is based partly on a map by R. Miller completed in 1996 and contained in a report from NDT Ventures Limited on file with the Geological Survey (GSNL File # 14C/12/129).

The following key applies to the inclusions in plutonic rocks:
an = undivided anorthositic rocks; ln = leuconorite (locally containing olivine); ltt = leucotroctolite (locally containing orthopyroxene); fln = foliated leuconorite; ftt = foliated leucotroctolite; lan = layered anorthosite and leuconorite (including rafts derived from the gneisses); gn = gneissic rocks of various types; mg = mafic granulite; dt = diatremic breccia; od = oxide-rich dioritic rocks; B = The Bridges-type layered rocks

The following key applies to selected minor units in gneisses:
Q = quartzite; cs = calc-silicate rocks; pg = pelitic and semipelitic rocks; an = anorthositic rocks

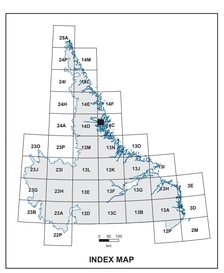
Sulphide and oxide mineralization in the area have several modes of occurrence and several hosts. The salient features of each are:
1. The 'Valley Zone', west of Akpiksai Bay – named and investigated by NDT Ventures Limited, comprises sulphides and magnetite within brown, oxide-rich ferrodiorite. The gossanous rocks are associated with a stockwork of such diorite. The extent of rusty rocks here can give an erroneous impression of the magnetite(+/-sulphides) distribution. The mineralized dykes and veins form subhorizontal intrusions atop the anorthosite, creating large surface gossans but having limited vertical continuity to the mineralization. Additionally, magnetite(-sulphides) oxidation locally generates broad, rusty veneers across the proximal, otherwise barren, anorthosite.
2. The 'Unity Zone', on the ridge to the west of Nain – named and investigated by NDT Ventures Limited, comprises sulphide minerals in a couple of differing settings. The east prospect, exemplified by a gossan zone in the cliff directly behind Nain, comprises pyrrhotite veins that crosscut a mafic to ultramafic 'granulite', part of the layered rock sequence of Nain ridge. Rusty oxide(magnetite)-rich, sulphide-bearing meladioritic (gabbronoritic) dykes occur on the ridge above the gossan, and the pyrrhotite veins in the granulitic rock may be related to these. The west prospect comprises brown pyroxenite dykes that intrude, and contain numerous blocks of, the Unity Bay anorthosite and leuconorite. These dykes are not as noticeably enriched in magnetite as those of the east zone, and may represent a different dyke emplacement episode.
3. Gossan zones located on the central Itliliuk Peninsula are hosted by pale grey to white leuconorite and anorthosite. The rusty zones are developed over networks of sulphide veinlets that penetrate along silicate grain boundaries and crosscut silicate crystals. Mineralized parts of outcrops locally have abrupt contacts with unmineralized host, but whether the sulphide-bearing parts are rafts or indigenous products of trapped sulphide magma has not been determined. Assays of grab samples returned less than 0.5% Ni and Cu.
4. Gossan zones located along the southern part of Hillsbury Island are hosted by grey, locally olivine-bearing, leuconorite. Only the easternmost one shown on the map has been examined, the freshest samples comprising minor amounts of intergrain sulphides. The locations of other gossans demarcated on the island were plotted from distant observation, and not examined on the ground. Assays from the examined zone returned very low values of base metals (<100 ppm).
5. Magnetite is widespread in the ferrodioritic rocks of the Nain area, and the differing aeromagnetic signature of some rock units can be used to define their extent. This is very well illustrated, for example, by the Barth Island ferrodiorite and the Satorsoakulluk dyke. The magnetite has a variety of modes in the largest intrusions, from scattered granules between silicate minerals to irregular streaks and poorly defined layers. It is the main component in some of the narrow dykes on the ridge west of Nain (see 1 and 2 above). The magnetite-rich zones shown on the map in ferrodiorite south of Sachem Bay were outlined and investigated by Kennow Resources in 1995 (see map by S. Watters and D. Cole on file with the Geological Survey; GSNL File # 14C/12(134)); these showings have not been examined by the compiler.
6. The ilmenite occurrence on the Nain Bay shoreline southwest of Kaiktusuak Point was documented by British Newfoundland Corporation in 1953, and investigated by that company in 1955. It was not visited by the compiler. The mineralization comprises ilmenite (+/- magnetite) and subordinate hypersthene as irregular, metre-scale lenses within coarse-grained, grey anorthosite assigned here to the Mount Lister intrusion. Ilmenite and hypersthene are commonly associated minerals elsewhere in this intrusion, and ilmenite occurs in pegmatitic, olivine+biotite+/-hornblende-bearing leucogabbroic dykes that crosscut it. TiO_2 and Fe (total) contents of 41.45% and 37.75%, respectively, were reported from an analysis of a sample of 'massive ore' from the shoreline occurrence (see GSNL File # NFLD/0119).

Labradorite schiller to plagioclase is a widespread attribute of the anorthositic intrusions. Particularly noteworthy occurrences include: i) deep-blue shades within pegmatoidal anorthosite of the Mount Lister intrusion along the cliffs of inner Nain Bay, ii) yellowish-green shades in medium-grained leuconorite of The Turnpikes intrusion along Shoal Tickle and on the largest island east of Base Island, and iii) pale blue to blue-green shades in medium-grained leuconorite assigned to the South Channel Cairn intrusion between Southern Point and Kauk Harbour.

Isotopic ages determined by M.A. Hamilton, Geological Survey of Canada (GSC), Ottawa, using U-Pb data from zircon (z) and/or baddeleyite (b). The ages shown on the map include those derived from mineral samples collected during the field work by the compiler as well as those supplied by M.A. Hamilton based on independent work undertaken with R.F. Emslie (GSC).

NOTE ABOUT THE GEOGRAPHIC NAMES

The official and unofficial names for geographic features that are embedded within the digital topographic base-map used for this geological compilation have been, in some cases, amended to include the local names for these same features. In addition, names have been included for features that otherwise have no name on the base map but are, nevertheless, used by the Inuit and non-Inuit residents of Nain. The Inuktitut names for many of the geographic features have been contributed by Mr. Willson Jararuse of the Nunatsiavut Government, Nain, and the spellings of these follow the current (2014) "Labrador dialect" orthography. Inuktitut names not supplied by Mr. Jararuse have been gleaned from the comprehensive "List of Labrador Eskimo Place Names" by E. P. Wheeler II (Bulletin 131, National Museum of Canada, Ottawa, 1953), and map users are encouraged to consult that publication for additional nomenclature information. It should be noted that Wheeler's orthography follows that recommended by the Royal Geographic Society, and his names differ in spelling form from those supplied by Mr. Jararuse. It should also be noted that some features are referred to by more than two names (e.g., Amiktuk or Barth Island or Pardy's Island; Tasialuk or Trousers Pond or Hosenbein Lake). The amendments to existing names and the added new names are indicated as follows: the Inuktitut ones are enclosed by parentheses, e.g., (Amiktuk; Tikkoâ' tôkhakh), whereas the non-Inuit ones are enclosed by square brackets, e.g., [Mt. Sophie; George's Island]. The stratigraphic names assigned to the geological units in the map legend, however, use base-map-embedded geographic identifiers and spellings (e.g., Barth Island intrusion) and otherwise extant nomenclature (e.g., Hosenbein Lake intrusion; Satorsoakulluk dykes) to preserve continuity with previously published regional geological terminology.



INDEX MAP

Geology compiled by B. Ryan, based on field work in 1990, 1991, 1999 and 2000. Additional information has been gleaned from published and unpublished sources, including manuscript maps of E.P. Wheeler II from 1970 and exploration company assessment reports from the 1990s, on file at the Geological Survey Division, Department of Natural Resources, Government of Newfoundland and Labrador.

GIS/digital cartography by A. Paltanavage and K. Morgan.

Base map in digital format published by Geomatics Canada, Earth Sciences Sector, Natural Resources Canada, Ottawa.

Approximate magnetic declination, 2013, at centre of map 24°04.2' west, decreasing 16.8' annually.

Elevations in feet above mean sea level. Contour interval 100 feet.

Universal Transverse Mercator (UTM) projection Zone 20.

North American Datum (NAD) 1927.

Open File 14C/12/0154 (includes separate descriptive notes)
This map supercedes Map 2001-10, Open File 14C/12/0136.

Copies of this map may be obtained from the Geoscience Publications and Information Section, Geological Survey, Department of Natural Resources, Government of Newfoundland and Labrador, P.O. Box 8700, St. John's, NL, Canada, A1B 4J6.

Department Website: http://www.nr.gov.nl.ca/nr
Geological Survey Website: http://www.nr.gov.nl.ca/nr/mines/Geoscience/

This map is subject to revision and modification.

PUBLISHED 2015.

MAP 2015-08

GEOLOGICAL SURVEY NEWFOUNDLAND AND LABRADOR 1864

GEOLOGICAL MAP OF THE NAIN AREA (NTS 14C/12)

Scale 1: 50 000

0 1 2 3 4 5
Kilometres

Recommended Citation
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Descriptive notes, outlining the characteristics of each of the map units are available as a separate document (Open File 14C/12/0154).