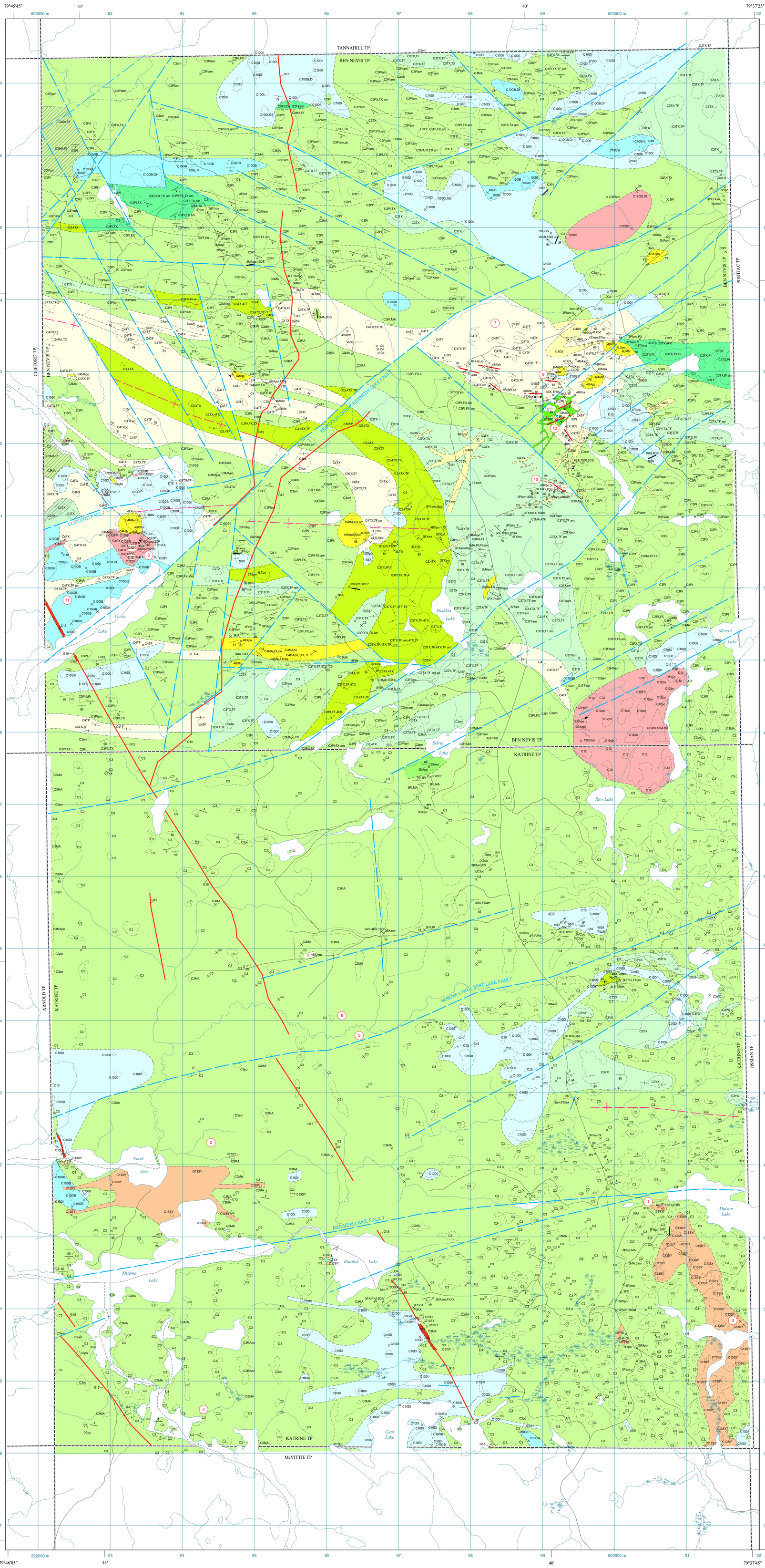


LEGEND[a,b,c]

PHANEROZOIC

CENOZOIC

QUATERNARY

PLEISTOCENE and RECENT

UNCONFORMITY

PRECAMBRIAN

PROTEROZOIC

15 **Diabase Dikes**

INTRUSIVE CONTACT

ARCHEAN

BLAKE RIVER GROUP

13 **Alkalic Intrusive Rocks:** Syenite

12 **Felsic to Intermediate Intrusive Rocks:** Granodiorite, feldspar porphyry, quartz-feldspar porphyry

10 **Mafic Intrusive Rocks**

- Diorite
- Gabbro, hornblende gabbro

INTRUSIVE CONTACT

4 **Felsic Metavolcanic Rocks**

- Rhyolitic to dacitic dikes
- Dominantly volcaniclastic rocks
- Felsic flows and massive rhyolites

3 **Intermediate Metavolcanic Rocks**

- Andesitic dikes
- Dominantly flows
- Volcaniclastic rocks
- Interbedded flows and volcaniclastic rocks
- Dacitic metavolcanic rocks
- Polymictic and interbedded intermediate and felsic volcaniclastic rocks

[a] The rock unit codes for this legend were designed for use with a database of geoscience information related to the Discover Abitibi Initiative. As a result, not all codes used in the database are shown in this legend.
[b] The letter "C" preceding a rock code denotes information compiled from previously published maps and reports.
[c] The letter "G" preceding a rock code denotes information interpreted from geophysical data.

EXPLANATION OF ROCK CODES

This map uses codes that are to be read from left to right.

① ③
3DAapAT
② ④

① The lithology code (3) identifies the main lithologic unit within a polygon or outcrop. Lithology codes correspond to units listed in LEGEND, above. The letters "C", "G" or "D" preceding a lithology code refer to, respectively, information compiled from previously published sources, information interpreted from geophysical data, and information derived from drill-hole logs.

② The primary rock type code (DA) identifies subdivisions of the main lithologic unit. Explanations of rock type codes are listed below under "Rock Type".

③ The texture code (ap) supplies additional information about the texture of the rock. Explanations of texture codes are listed below under "Textural Description".

④ The secondary rock type code (AT), where present, identifies a second, less abundant rock type within the polygon or outcrop. These codes are the same as those listed under "Rock Type".

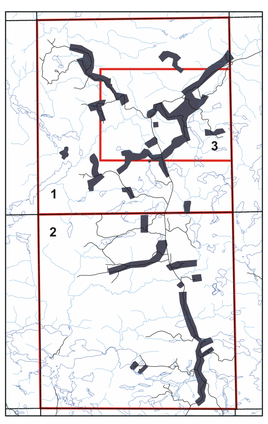
Using the legend and the explanations listed below, therefore, 3DAapAT indicates a polygon or outcrop of intermediate metavolcanic rock, composed primarily of aphyric dacite with subordinate ash tuff.

3DAapAT

Rock Type		Textural Description	
AG	Argillite	am	amygdaloidal
AK	Arkose	ap	aphyric
AP	Aplite	ax	alteration breccia
AT	Ash Tuff	bd	bedded
BK	Basaltic Komatiite	bx	brecciated
BT	Block Tuff	cb	cross bedded
BX	Breccia	cf	cooling fractures
CC	Carbonate	cg	coarse grained
CF	Carbonate-Fuchsite Schist	cl	clast supported
CG	Conglomerate	cu	cumulate
CH	Chert	cy	cyclic
CP	Clinopyroxenite	db	diabasic
CS	Chlorite Schist	ec	elongated clasts
CT	Cherty Tuff	ep	elongated pillows
CU	Cumulate	ey	eyes
DA	Dacite	fb	flow banding
DI	Diorite	fc	flattened clasts
DN	Dunite	fg	fine grained
DS	Dikes, Sills	fl	finely laminated
EX	Exhalite	fp	flattened pillows
FL	Flow	ft	fluidal texture
FP	Feldspar Porphyry	fx	fractured
FX	Flow Breccia	gp	glomeroporphyritic
GB	Gabbro	hu	hummocky cross-stratified
GD	Granodiorite	ib	intrusive breccia
GH	Hornblende Gabbro	ig	inverse grading
GL	Leucogabbro	lm	laminated
GM	Melanogabbro	mg	medium grained
GN	Gabbronorite	mm	monomictic
GP	Graphitic Phyllite	mx	matrix supported
GR	Granite	my	mylonite
GS	Graphitic Shale	ng	normal grading
GT	Graphitic Tuff	op	ophitic
GW	Greywacke	pg	pegmatitic
HY	Hyaloclastite	pj	polygonal joints
IF	Iron Formation	pm	polymictic
JA	Jasper	po	porphyritic
KI	Kimberlite	ps	polysutured
KO	Komatiite	re	reworked
LA	Litharenite	sc	schistose
LG	Leucogranite	sh	sheared
LM	Lamprophyre	sp	spherulitic
LS	Lapillistone	ss	soft-sediment deformation
LT	Lapilli Tuff	sx	spinifex
LX	Lobe and Microbreccia	tb	turbidite
MA	Massive	tc	trachytic
MD	Microdiorite	tf	tuffaceous
MU	Mudstone	tx	tectonic breccia
MZ	Monzonite	va	variolitic
NO	Norite	ve	vesicular
PD	Peridotite	vf	aphanitic
PG	Porphyritic Granite	xl	xenoliths
PI	Pillows		
PL	Parallel Laminated		
PP	Peperite		
PR	Pyroxenite		
PT	Crystal Tuff		
PX	Pillow Breccia		
PY	Pyroclastic Rock		
QD	Quartz Diorite		
QM	Quartz Monzonite		
QP	Quartz Porphyry		
QS	Quartz Syenite		
QZ	Quartzite		
RH	Rhyolite		
SE	Serpentinite		
SL	Sandstone-Siltstone		
SP	Spinifex		
SS	Sandstone		
ST	Siltstone		
SY	Syenite		
TA	Trachyandesite		
TB	Trachybasalt		
TC	Talc-Chlorite Schist		
TF	Tuff		
TN	Tonalite		
TR	Trachyte		
TS	Talc Schist		
TX	Tuff Breccia		
VB	Volcaniclastic Breccia		
VC	Volcaniclastic Rock		
VS	Volcaniclastic Sandstone		
VX	Volcanic Breccia		
WA	Wacke		
WT	Welded Tuff		
YX	Pyroclastic Breccia		
ZD	Monzodiorite		
ZG	Monzogabbro		
ZP	Quartz- Feldspar Porphyry		

PROPERTIES AND OCCURRENCES

1. Callighan (Au, Cu)
2. Norwood (Au, Pb, Zn)
3. Walsh-Katrine (Au, Cu, Pb)
4. Forward (Cu)
5. Lowe Katrine (Au, Cu)
6. Rivard (Cu)
7. Roche-North (Zn, Pb, Ag, Au)
8. Tremblay, A. (Au, Zn)
9. Roche-South (Zn)
10. Interprovincial-South (Zn, Pb, Cu)
11. Tremblay-West (Cu, Au)
12. Interprovincial-North (Zn, Pb, Au, Cu, Ag)



Transects mapped by author

See Sources of Information for explanation of numbers.

Ontario

Ontario Geological Survey

MAP P.3543–REVISED

PRECAMBRIAN GEOLOGY

BEN NEVIS AND KATRINE TOWNSHIPS

Scale 1:20 000

500 m 0 0.5 1 km

NTS Reference: 32 D/04, 05

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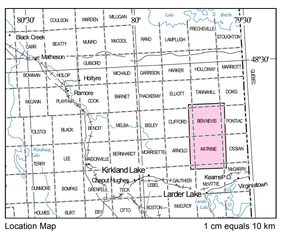

This geologic map represents one of the products of the Greenstone Architecture Project of the Discover Abitibi Initiative, which was designed to stimulate mineral exploration in the Ontario portion of the Abitibi greenstone belt and has components that range from geophysical surveying to deposit-scale mapping (*see* Ayer et al. 2003). This map presents results from the first year of the Base Metal Subproject 3 study, as summarized in Péloquin and Piercey 2003.

Cette carte géologique représente un des produits découlant du projet relatif à la ceinture de roches vertes architecturale, lequel s'inscrit dans le cadre de l'initiative *Découvrons l'Abitibi*, conçue pour stimuler l'exploration minérale dans la section ontarienne de la ceinture de roches vertes de l'Abitibi et constituée de diverses composantes, depuis les levés géophysiques jusqu'aux cartes à l'échelle du gisement (voir Ayer et al. 2003). Cette carte présente les résultats de la première année de l'étude portant sur le sous-projet 3 relatif aux métaux communs, résumée dans Péloquin et Piercey 2003.

Ayer, J.A., Thurston, P.C., Dubé, B., Fowler, A.D., Gibson, H.L., Hudak, G., Lafrance, B., Lesher, C.M., Piercey, S.J., Reed, L.E. and Thompson, P.H. 2003. Overview of the Discover Abitibi Greenstone Architecture project: subprojects, goals and results; *in* Summary of Field Work and Other Activities 2003, Ontario Geological Survey, Open File Report 6120, p.32-1 to 32-12.

Péloquin, A.S. and Piercey, S.J. 2003. Discover Abitibi, Base Metal Subproject 3. Geology and base metal mineralization in Ben Nevis, Katrine and Clifford townships; *in* Summary of Field Work and Other Activities 2003, Ontario Geological Survey, Open File Report 6120, p.41-1 to 41-8.

SYMBOLS

- Area of bedrock outcrop
- Small bedrock outcrop
- Lithologic contact, interpreted
- Lithologic contact, interpreted from geophysics
- Fault
- Lineament, interpreted from geophysics
- Shear
- Anticline
- Syncline
- Bedding; unsubdivided (trend only, magnitude of dip uncertain)
- Bedding; unsubdivided (inclined, vertical)
- Bedding; pillowed flows, facing direction unknown (trend only, inclined)
- Bedding; pillowed flows, facing direction known (magnitude of dip uncertain)
- Bedding; facing direction from grading (inclined, magnitude of dip uncertain, overturned)
- Bedding; facing direction from sedimentary structures other than grading and cross-bedding (overturned, magnitude of dip uncertain)
- Flow banding (inclined)
- Igneous contact (trend only, inclined, vertical)
- Foliation; unknown generation (trend only, magnitude of dip uncertain)
- Foliation; unknown generation (inclined, vertical)
- Foliation; second generation (trend only, inclined, vertical)
- Foliation; third generation (inclined)
- Displacement cleavage; unknown horizontal displacement (vertical)
- Joint (inclined)
- Brittle-ductile fault; unknown horizontal displacement (trend only, inclined)
- Brittle-ductile fault; dextral sense of displacement (inclined)
- Brittle-ductile fault; sinistral sense of displacement (inclined)
- Shear (trend only)
- Axial plane of kink fold; trend only (S-asymmetry, Z-asymmetry)
- Zone of contact metamorphism
- Roads, trails
- Township boundary
- Property, occurrence (keyed to list)

SOURCES OF INFORMATION

Base map information derived from the Ontario Land Information Warehouse, Land Information Ontario, Ontario Ministry of Natural Resources, scale 1:20 000. Universal Transverse Mercator (UTM) coordinates are in North American Datum 1983 (NAD 83), Zone 17.

Compiled geology from:
Jensen, L.S. 1975. Geology of Clifford and Ben Nevis townships, District of Cochrane; Ontario Geological Survey, Geoscience Report 132, 55p., accompanied by Map 2283, scale 1:31 680. (Survey area 1 on inset map.)

Hogg, W.A. 1964. Arnold and Katrine townships; Ontario Department of Mines, Geological Report 29, 13p., accompanied by Map 2061, scale 1:31 680. (Survey area 2 on inset map.)

Mines et Explorations Noranda Inc. (Jules Riopel, Géologue de projet) 1998. Rapport de forage 1998, Option Canagau (004), Canton Ben Nevis, District de Larder Lake, NTS 32D/05; unpublished company report, 25p., with maps. (Survey area 3 on inset map. Digital version supplied by Wallbridge Mining Limited.)

Assessment files, Resident Geologist's office, Kirkland Lake.

Mineral deposit information derived from the Mineral Deposit Inventory (MDI2), maintained by the Ontario Geological Survey, Resident Geologist Program.

Ontario Geological Survey 2003. Ontario airborne geophysical surveys, magnetic and electromagnetic data, grid and profile data, ASCII and Geosoft® formats, Kirkland Lake area; Ontario Geological Survey, Geophysical Data Set 1022.

Magnetic declination approximately 12°17'W at the centre of the map area in 2003.

CREDITS

Geology and compilation by A.S. Péloquin, Mineral Exploration Research Centre, Department of Earth Sciences, Laurentian University, Sudbury, Ontario, 2003, 2004.

Cartographic production by A. Evers.

Geologic mapping and research supported by the Discover Abitibi Initiative under contract awarded to the Mineral Exploration Research Centre (MERC), Laurentian University, Sudbury, Ontario.

Contract management, project management by Robert Calhoun, Project Manager, Discover Abitibi Initiative.

Overall project management by Timmins Economic Development Corporation.

FedNor Canada

Ontario Northern Ontario Heritage Fund / Fonds du patrimoine du Nord de l'Ontario

Discover Abitibi
A project of innovation, cooperation and revitalization

Découvrons l' Abitibi
Un projet d' innovation, de coopération et de renouvellement

Discover Abitibi Initiative
The Discover Abitibi Initiative is a regional, cluster economic development project based on geoscientific investigations of the western Abitibi greenstone belt. The initiative, centred on the Kirkland Lake and Timmins mining camps, will complete 19 projects developed and directed by the local stakeholders. FedNor, Northern Ontario Heritage Fund Corporation, municipalities and private sector investors have provided the funding for the initiative.

Initiative Découvrons l'Abitibi
L'initiative *Découvrons l'Abitibi* est un projet de développement économique régional dans une grappe d'industries, projet fondé sur des études géoscientifiques de la ceinture de roches vertes de l'Abitibi occidental. Cette initiative, centrée sur les zones minières de Kirkland Lake et de Timmins, mènera à bien 19 projets élaborés et dirigés par des intervenants locaux. FedNor, la Société de gestion du Fonds du patrimoine du Nord de l'Ontario, municipalités et des investisseurs du secteur privé ont fourni les fonds de cette initiative.

Timmins

KIRKLAND LAKE
THE RIGHT ENVIRONMENT

To enable the rapid dissemination of information, this map has not received a technical edit. Discrepancies may occur for which the Ontario Ministry of Northern Development and Mines does not assume liability. Users should verify critical information.

Issued 2005.

Information from this publication may be quoted if credit is given. It is recommended that reference to this map be made in the following form:

Péloquin, A.S. 2005. Precambrian geology of Ben Nevis and Katrine townships; Ontario Geological Survey, Preliminary Map P.3543–Revised, scale 1:20 000.