



GOVERNMENT OF
NEWFOUNDLAND AND LABRADOR
Department of Mines and Energy
Geological Survey

MINERALIZED ALTERATION ZONE AND NEW DIMENSION-STONE SHOWINGS SOUTHWEST OF CORNER BROOK, WESTERN NEWFOUNDLAND

I. Knight
Regional Geology Section

OPEN FILE 12B/09/0470

St. John's, Newfoundland
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SUMMARY

During a 1:50 000 mapping survey of the Lower Paleozoic shelf sediments in the Harrys River map area, a broad mineralized alteration zone, and several new marble showings, were discovered. The mineralized alteration occurs in basal Cambrian metaclastic rocks deformed along with basement rocks in a complex duplex system, that forms the footwall to the Grand Lake Thrust. Float of rusty-weathering metasandstone and basement rocks, sampled north of Hare Hill in the vicinity of the Grand Lake Thrust, have also been analysed. The marble showings occur mostly in the southwest end of the Blue Pond Thrust Stack, but also include a number of showings at the southwest end of the North Brook Anticline.

REGIONAL GEOLOGY

The Harrys River map area (Figures 1 and 2, NTS map area 12B/09) is host to two belts of the Lower Paleozoic shelf sequence rocks in the Humber (tectonostratigraphic) Zone. In the western belt, Lower Cambrian to Middle Ordovician carbonate and lesser siliciclastic rocks occur in the North Brook Anticline (Williams, 1985), where they unconformably overlie Precambrian basement. The eastern belt is part of the Blue Pond Thrust Stack, a thin-skinned, imbricate, antiformal stack

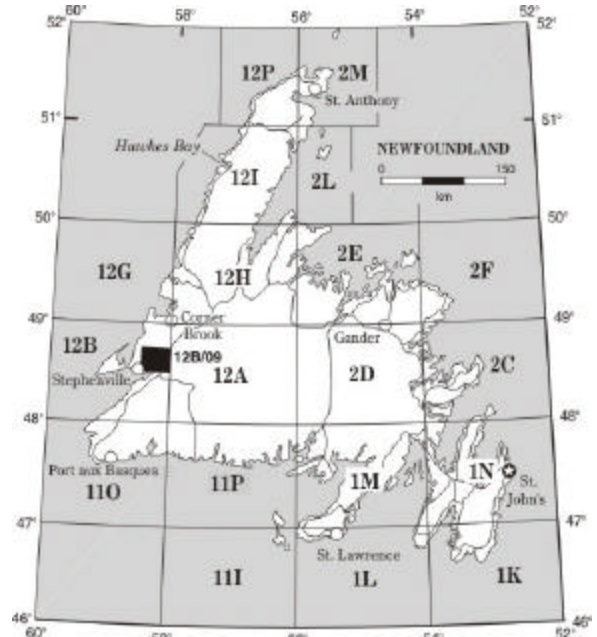


Figure 1. Index map of Newfoundland showing location of NTS map area 12B/09.

of polydeformed and low-grade metamorphosed carbonate shelf rocks (Knight, 1997). The North Brook Anticline is bounded by Paleozoic slate in the north and is unconformably overlain by flat-lying Carboniferous sediments in the south. The Blue Pond Thrust Stack is bounded in the east by the Grand Lake Thrust (*see* Williams and Cawood, 1989) and is truncated in the south by Carboniferous rocks. Several base metal (MVT) showings, hosted by calcite veins, have been found in the North Brook Anticline, and one showing is known in the Blue Pond Thrust Stack (Williams, 1985; *see* Pollock, 2000). A new galena-pyrite showing in a broad alteration zone has been found in a separate stream gorge near Williams' (1985) showing.

Local Setting of the Alteration Zone, Blue Pond Thrust Stack (Locality 3, Figure 2; NTS 12B/09, Zone 21, NAD 27, UTM 413099E/5385052N)

Metasandstone and quartz arenite of the Bradore Formation, and unconformably underlying Precambrian basement rocks of the Hare Hill complex, host a broad zone of veins, clots stringers and

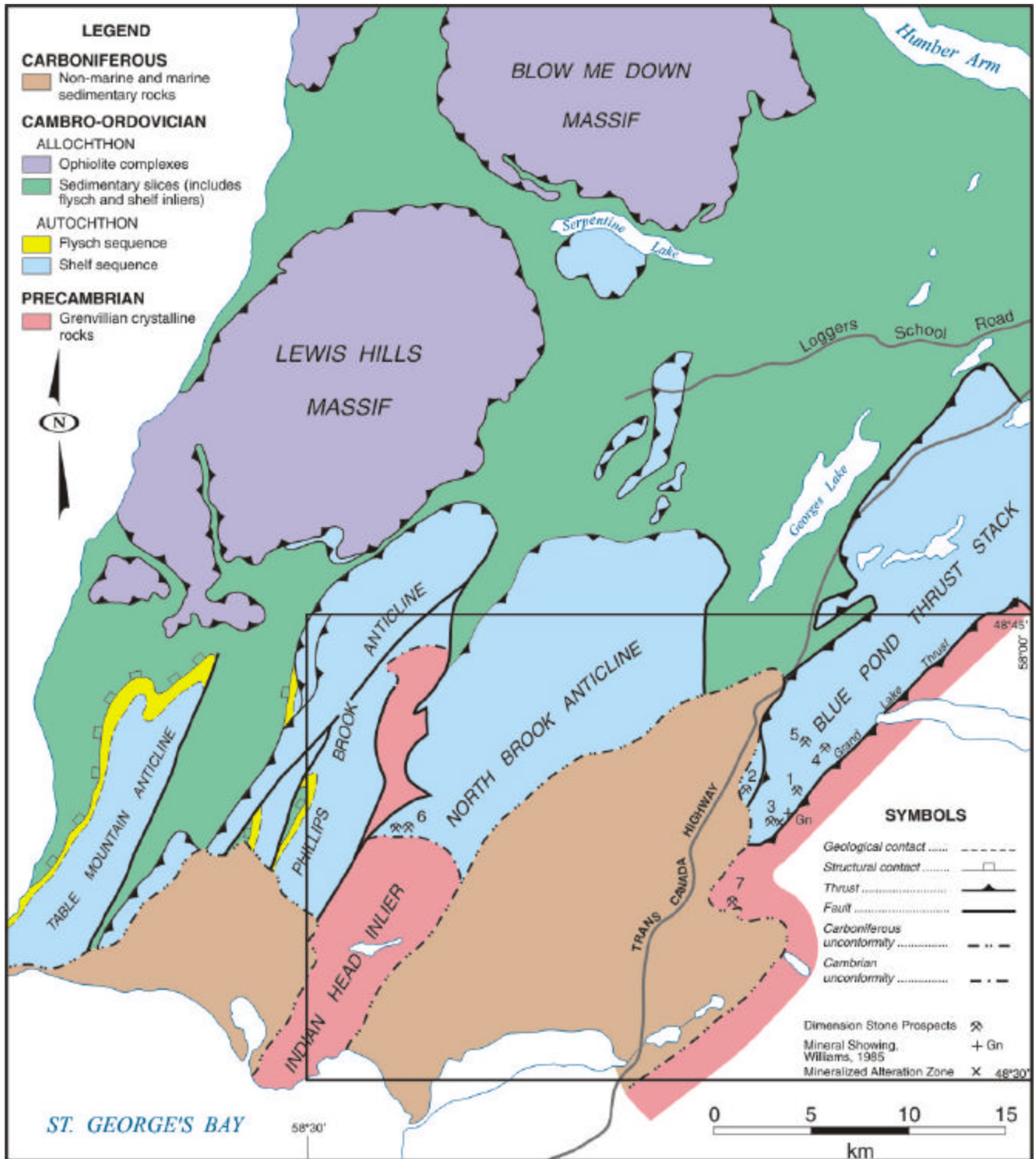


Figure 2. Simplified geological map of the main geological terranes of the Harrys River map area showing the North Brook Anticline and the Blue Pond Thrust Stack in their regional settings, and the approximate location of mineralized and dimension-stone showings (map modified after Williams and Cawood, 1989).

disseminations of galena and pyrite. The mineralized alteration zone can be traced through a number of horses of a footwall duplex below the Grand Lake roof thrust (Plate 1). A foliated and strongly deformed chloritic limestone (marble), the Devils Cove Member of the Forteau Formation, overlies the Bradore Formation in both the duplex and the footwall to the duplex where it is itself overlain by polydeformed phyllites of the Forteau Formation. Assays of seven grab samples from the alteration zone and from veins in both cover and basement rocks are listed in Table 1 and details of the showing and samples of rusty float from north of Hare Hill are listed in Appendix 1.

Base-metal and gold mineralization is also known in basement and overlying cover rocks of the Bradore Formation in the White Bay area (*see* Pollock, 2000; Pollock *et al.*, 2000). Recent reports of this area indicate gold associated with alteration zones cutting the overlying carbonate sequence in White Bay (Kermode Resources Ltd, 2002).

Dimension-stone Showings of the Blue Pond Thrust Stack (Localities 1 to 5, Figure 2)

The thrust stack is characterized by low-grade metamorphism of limestones and calcareous dolostones to fine-grained marbles. Several localities (*see* Appendix 2) include red, pink, blush, green, cream and white, clean and textured marbles (Plates 1 and 2). Rocks of the St. George and Table Head groups in the hangingwall and footwall of the Blue Pond Thrust Stack respectively, are characterized by grey venato marbles, some ornamented by red Carboniferous microfractures. The Devils Cove Limestone of the Grand Lake Thrust duplex is also an interesting white, pink to grey-green marble with strong planar to folded foliated fabrics. The area has good relief and all showings except the duplex marble lie along woods roads and are within a few kilometres of the Trans-Canada Highway.



Plate 1. Mineralized alteration zone in the Bradore Formation and the Devils Cove Member marble, Forteau Formation, Locality 3, figure 2; a - alteration zone; b - galena calcite vein in basement; c - floor thrust to duplex; d - bedded marble; e - folded foliated marble; f - fresh surface of white to pinkish marble.

Table 1. Geochemical analyses of grab samples from the mineralized alteration zone, in duplex, to the Grand Lake Thrust and pyritic float north of Hare Hill

Sample #	UTM		Map Sheet	Zone	NAD	Mo ppm	Cr ppm	P ppm	Zn ppm	Pb ppm	Co ppm	Ni ppm	Fe %	Mg %	Cd ppm	Ti ppm	V ppm	Be ppm
	Easting	Northing																
K-02-41C-1	413099	5385052	12B/09	21	27	0	17	494	22	10	15	10	3.60	0.37	0.1	3146	42	0.6
K-02-41C-2	413099	5385052	12B/09	21	27	1	22	1985	41	17	61	23	9.94	1.53	-0.2	7023	56	1.1
K-02-41C-3A	413099	5385052	12B/09	21	27	2	21	521	21	26	8	7	1.81	0.19	0.0	8262	59	1.1
K-02-41C-3B	413099	5385052	12B/09	21	27	2	25	534	29	24	7	13	2.60	0.31	0.0	8857	67	1.5
K-02-41C-4	413099	5385052	12B/09	21	27	0	14	150	11	4	3	7	2.79	0.12	-0.1	1954	45	0.5
K-02-41C-5	413099	5385052	12B/09	21	27	4	30	72	5521	37119	5	17	1.76	0.40	12.6	183	23	0.0
K-02-41C-6	413099	5385052	12B/09	21	27	4	3	53	14278	37945	7	14	4.88	0.26	40.9	97	19	-0.1
K-02-41C-7	413099	5385052	12B/09	21	27	3	14	76	10173	38358	6	18	2.23	0.32	23.5	153	22	0.0
K-02-54-1	417535	5389446	12B/09	21	27	2	32	541	164	40	31	140	9.36	1.68	1.0	2659	161	0.4
K-02-54-2	417535	5389446	12B/09	21	27	41	65	481	273	41	37	140	9.55	1.76	0.4	2710	170	0.4
K-02-54-3	417535	5389446	12B/09	21	27	6	35	243	56	18	4	20	3.17	0.63	0.0	2070	62	0.7
K-02-54-4A	417535	5389446	12B/09	21	27	6	19	644	1874	37	21	113	4.29	0.50	55.9	2447	72	0.5
K-02-54-4B	417535	5389446	12B/09	21	27	6	8	283	241	19	11	43	1.87	0.12	7.4	1695	34	0.7

Sample #	Ca %	Nb ppm	Cu ppm	Na %	Zr ppm	Dy ppm	Sc ppm	Y ppm	Al %	Mn ppm	Sr ppm	La ppm	Ce ppm	Ba ppm	Li ppm	K ppm	As ppm	Au ppb
K-02-41C-2	1.20	37	40	0.66	220	6.4	9.4	41	4.28	506	65	20	56	91	31.3	2.85	28	-5
K-02-41C-3A	4.10	37	20	0.68	387	8.8	9.2	59	6.53	508	101	47	85	256	12.6	5.50	7	-5
K-02-41C-3B	1.04	35	19	0.77	353	11.8	10.5	66	8.34	170	88	100	171	349	8.9	6.25	6	-5
K-02-41C-4	0.18	9	107	0.49	98	0.6	2.3	7	1.28	49	13	7	19	184	4.1	0.62	1	-5
K-02-41C-5	25.15	7	403	0.04	5	77.5	5.7	31.5	0.39	1853	87	300	598	42	8.2	0.18	7	-5
K-02-41C-6	25.84	9	250	0.02	7	71.4	1.6	309	0.18	2239	66	265	520	42	5.2	0.17	37	15
K-02-41C-7	25.18	6	717	0.30	7	76.4	4.3	318	0.69	1835	111	276	559	79	6.3	0.24	7	15
K-02-54-1	5.01	10	627	0.69	65	3.4	10.8	28	6.19	883	420	37	63	173	17.9	0.75	2	-1
K-02-54-2	2.45	15	333	1.62	97	2.0	9.8	23	5.36	750	205	18	41	232	23.3	1.66	3	-1
K-02-54-3	1.30	6	16	3.13	76	0.0	11.0	8	6.03	236	119	6	11	271	8.5	0.68	6	5
K-02-54-4A	0.63	6	75	5.51	67	1.5	17.0	17	6.46	176	38	8	22	27	4.0	0.10	8	5
K-02-54-4B	0.42	6	68	4.93	89	1.7	7.4	13	6.57	47	29	12	25	66	1.5	0.20	10	-5

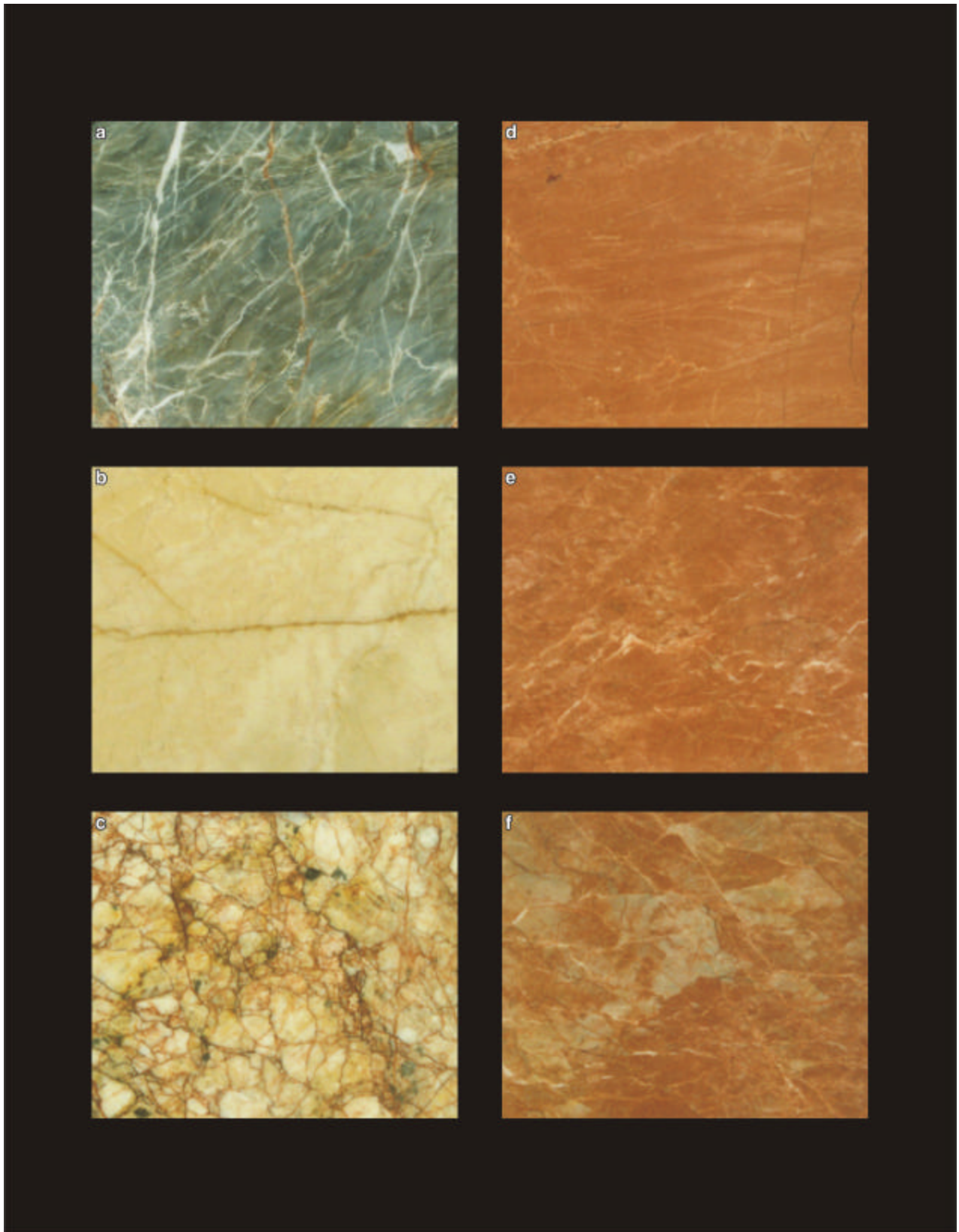


Plate 2. Marbles of the Blue Pond Thrust Stack shown on figure 2: a - grey marble locality 2; b and c - white marble locality 4; d,e and f - red marble locality 5.

**Dimension-stone in the North Brook Anticline near Crash Hill, Indian Head Range
(Locality 6, Figure 2; NTS 12B/09, Zone 21, NAD 27, 393245E 5385891N and 393574E
5386046N)**

An interesting dimension-stone prospect is hosted by the gently, north dipping, 15 to 20 m thick limestone, of the Devils Cove Member, Forteau Formation, Labrador Group, at the southwest end of the anticline. The limestone is exposed along a series of woods-roads north of Black Duck Siding. Here, nodular maroon, pink and green to grainy pink, white and red recrystallized limestones (Plate 3) are exposed in several block faults as the stratigraphy is traced around the fold. The limestones lie about 20 to 30 m above Precambrian basement of salmon-pink, banded to mylonitic granite gneiss, which is locally overprinted by green epidotic and chloritic alteration close to faults and the basal Cambrian unconformity. The altered basement granites may also provide an additional dimension-stone target.

**Pepper marble, Fleur de Lys Supergroup, Bottom Brook hills
(Locality 7, Figure 2; NTS 12B/09, Zone 21, NAD 27, UTM 412472E 5382829N to 412763E
5383024N)**

A narrow tectonized outlier of metasedimentary cover rocks lying within Precambrian basement of the internal domain of the Humber Zone in the hangingwall to the Grand Lake Thrust crops out along woods road near Bottom Brook (locality 7, Figure 2). It is host to pink, red and green, coarsely crystalline marble peppered by black spots (Plate 4). The marble, probably unconformably overlies Precambrian basement. It is rich in deformed pebbles and possibly sand-sized detrital grains (possibly reconstituted as new metamorphic minerals) derived from the basement that give the marble its peppered aspect. The black grains probably include dark green amphibole or pyroxene as well as amphibolitic, anorthositic and granitic pebbles that enhance the pink and lesser green marble with black spots and pebble patches, the latter showing resorbed margins in the marble matrix. The map of Currie and Van Berkel (1992) place

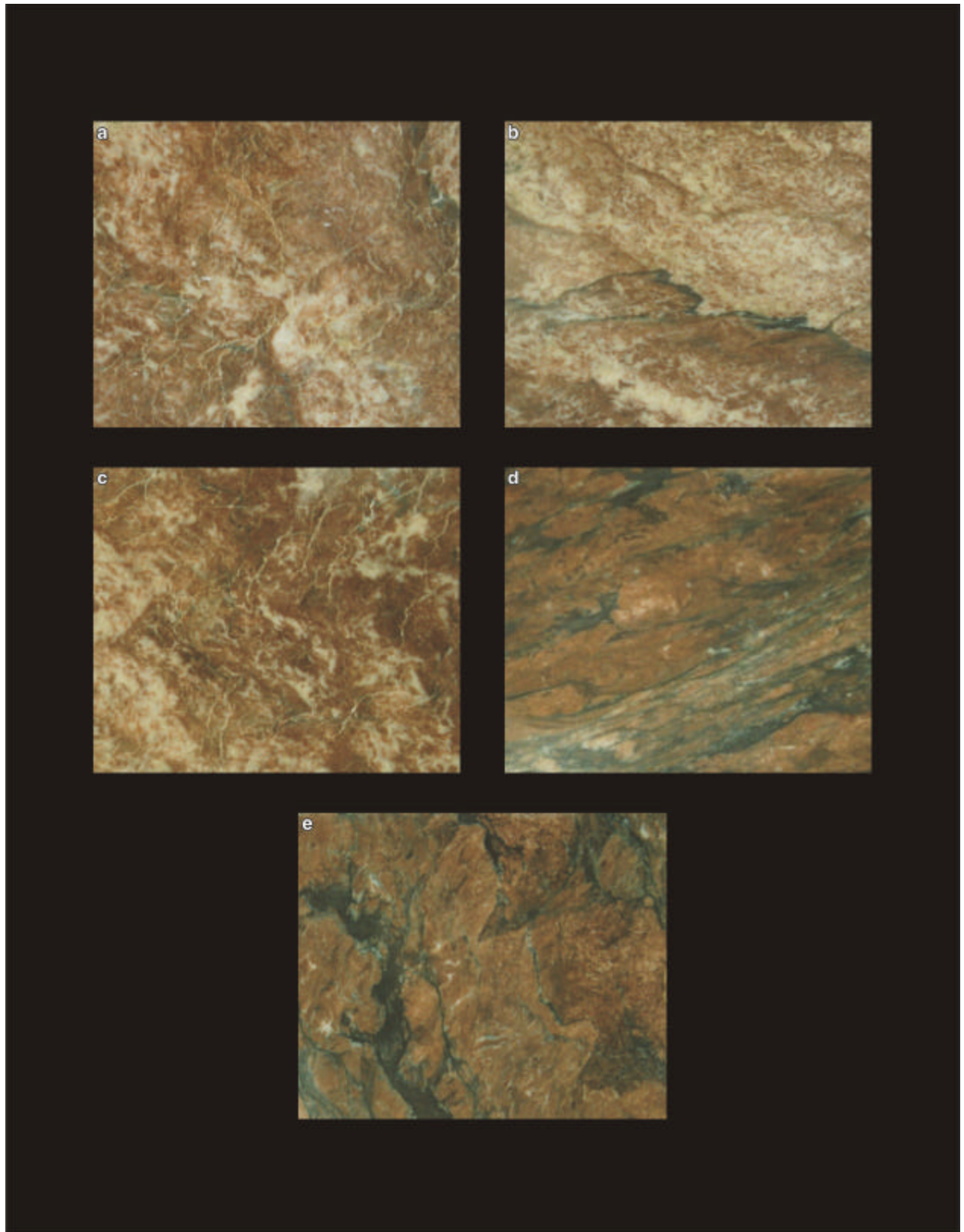


Plate 3. Grainy red, white and pink marble (a, b and c) and nodular maroon marble (d and e) of the Devils Cove Member, Forteau Formation, Crash Hill, Indian Head Range, locality 6, figure 2.

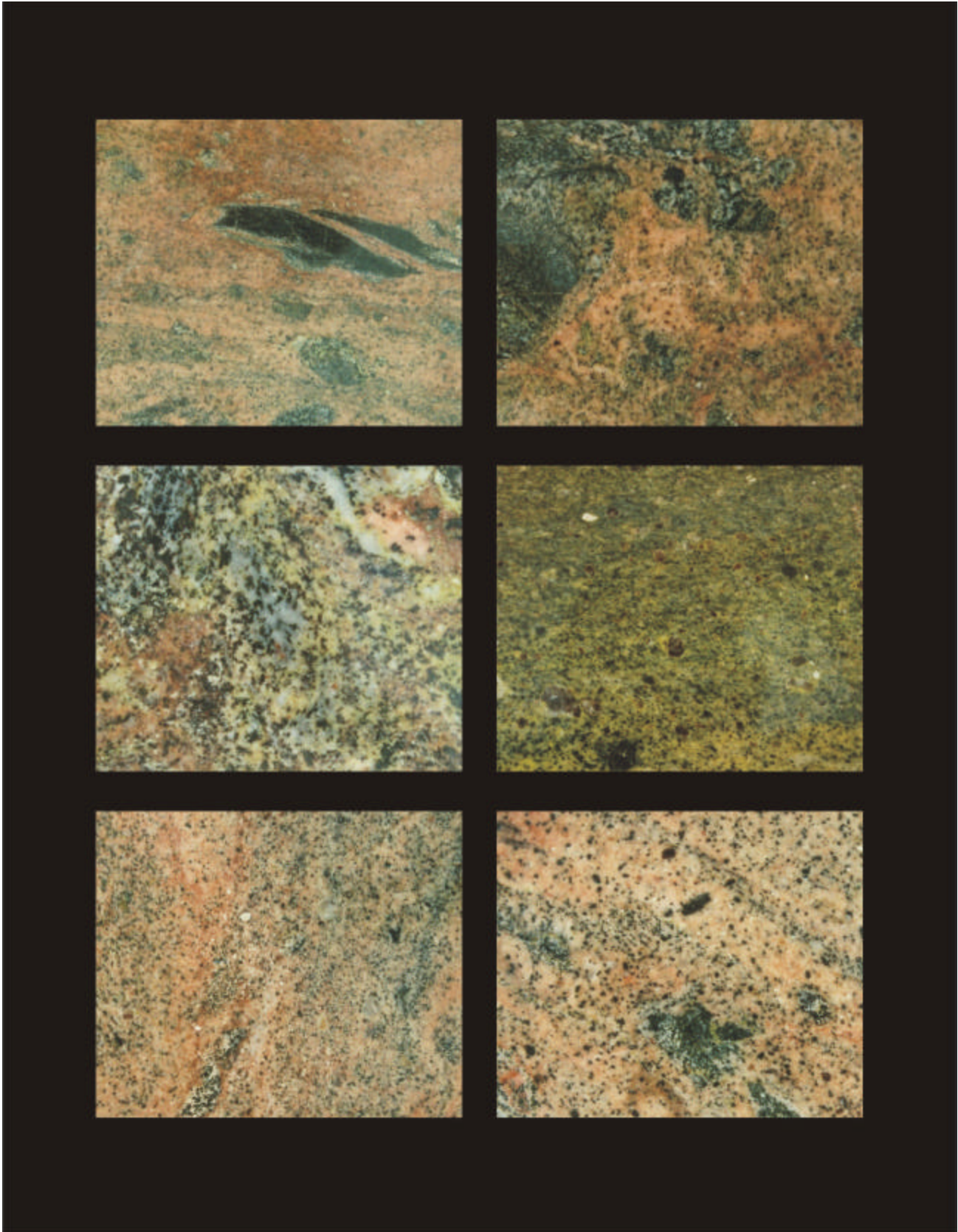


Plate 4. *Various pepper textured marbles of the Mount Musgrave Group, locality 7, figure 2.*

the unit in the Fleur de Lys Supergroup. Thus, it likely belongs to the South Brook Formation of the Mount Musgrave Group of Cawood and Van Gool (1994). It is possible that the unit, which is associated with quartz arenite psammites as well as grey pelites, is a correlative of the Devils Cove Member of the Labrador Group although it is of significantly higher metamorphic grade. The stratigraphic assignment suggests that similar marbles may be explored for in the Mount Musgrave Group of the Corner Brook area.

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APPENDIX 1

Details of location and geology of mineralized samples from the Blue Pond Thrust Stack

K-02-41C

Locality	Stream gorge, southwest of Hare Hill (same as marble showing 3, Blue Pond Thrust Stack)
UTM coordinates	12B/9, Zone 21, NAD 27, UTM 413099E 5385052N
Host Formation	Bradore Formation overlain by limestone of the Devils Cove Member, Forteau Formation, Labrador Group and resting unconformable upon Precambrian basement gneisses
Lithology	Bradore Formation quartz psammite/arenite Precambrian granitic gneiss with deformed mafic dykes and quartz-K- feldspar veins; Currie and Van Berkel (1988) show it as red amphibole leucogranite of Hare Hill Intrusion, possibly partly Silurian in age
Style of mineralization	Broad alteration zone with galena–pyrite–quartz–calcite veins, masses and disseminations in the Bradore Formation, calcite–galena–pyrite veins cutting basement

Sample Nos

K-02-41C-1	Broad alteration zone
K-02-41C-2	Broad alteration zone
K-02-41C-3A	Broad alteration zone
K-02-41C-3B	Broad alteration zone
K-02-41C-4	Broad alteration zone
K-02-41C-5	Main calcite–galena–pyrite mineralized zone
K-02-41C-6	Calcite–galena–pyrite vein cutting Bradore Formation
K-02-41C-7	Calcite–galena–pyrite vein, Grenvillian basement

K-02-54

Locality	North side of Hare Hill
UTM coordinates	12B/9, Zone 21, NAD 27, UTM 417535E 5389446N
Lithology	A) Boulder float of rusty-weathering melanocratic gneiss of Long Range origin B) Boulder float of quartz arenite psammite of Bradore Formation origin
Mineralization	Pyrite

Sample Nos

K-02-54-1	gneiss
K-02-54-2	gneiss
K-02-54-3	quartz psammite, Bradore Formation?
K-02-54-4A	quartz psammite, Bradore Formation?
K-02-54-4B	quartz psammite, Bradore Formation?

APPENDIX 2

Location and summary of marble showings in the Blue Pond Thrust Stack, south of Grand Lake

1) K-02-22B-22B1

Locality	Roadside outcrops along western side of ridge
UTM coordinates	12B/09, zone 21, NAD 27, 414891E 5388544N to 414854E 5388476N to 419910E 5388486N
Lithology	Yellow- to brown-weathering, calcareous to dolomitic marble, mostly pink having other tones of blush, yellowish and greenish hues. Generally, fairly massive, some joints, argillaceous and dolomite partings to thick beds. It is overlain by very fine grained cream dolostone marble. Prospect overlies a pale grey, highly fractured dolostone. White, thrombotic, dolomitic limestone marble occurs towards the northern part of the zone.
Thickness	estimated at about 30 to 40 m
Bedding attitude*	352°/33°E to 065°/45°SE (probably inverted)
Stratigraphic unit	Petit Jardin Formation, Port au Port Group

2) K-02-35D to 35D4 and K-02-39

Locality	Hillside east of Trout Brook
UTM coordinates	12B/09, zone 21, NAD 27, 412152E 5388278N to 411904E 5388150N, and 412296E 5388342N
Lithology	Grey-weathering, grey limestone having deformed sedimentary fabrics including burrows, fossils and dolomitic mottles, extensively ornamented by white calcite veins and by irregular red veinlets and microveins of red and yellow Carboniferous staining and sediment; some dolostone interbeds
Thickness	Unknown but may be of formation scale e.g., up to 100 m
Bedding attitude	Openly folded with bedding ranging from 225°/70°NW to 028°/65°SE to 235°/54°NW
Stratigraphic unit	Table Point Formation, Table Head Group
Structural setting	The grey veined (venato) Middle Ordovician marbles occur in the footwall to the Blue Pond Thrust; deformed Lower Ordovician St. George Group limestones occur in its hangingwall but are not listed here.

3) K-02-41B

Locality	Stream gorge (same locality as alteration zone, Table 1)
UTM coordinates	12B/09, zone 21, NAD 27, 413022E 5384969N
Lithology	Yellow-weathering, white, off-white, with pink, green, yellow and light grey variations, coarsely crystalline, foliated marble, folded fabrics, green chloritic folia, coarse calcite and quartz veins
Thickness	20 m +
Bedding attitude	250°/65°NW, footwall to Grand Lake Thrust footwall duplex, also involved in the duplex structure
Stratigraphic unit	Devils Cove Member, Forteau Formation, Labrador Group

4) K-02-42A/42A1

Locality	Hills overlooking west end of Grand Lake below Hare Hill
UTM coordinates	12B/09, zone 21, NAD 27, 416275E 5389878N to 416231E 5389925N
Lithology	Yellow-weathering, white to cream to yellow, finely crystalline, calcareous dolostone marble interbedded with greenish to yellow argillaceous dolostones, white limestone marble and grey dolostone, quartz veinlets pick out cleavage, zones or veins of white to off-white lumpy-textured marble with red veinlets
Thickness	Approximately 40 m
Bedding attitude	266°/62°N to 285°/52°N
Stratigraphic unit	Petit Jardin Formation to Berry Head Formation, Port au Port Group

Other potential localities

5) K-02-21E3

Locality	Roadside gravel pit
UTM coordinates	12B/09, zone 21, NAD 27, 414484E 5389087N
Lithology	Red and pink calcareous dolostone, white limestone marble with red stylolites and veinlets; broken outcrop only

* Bedding strike and dip readings notated here all refer to right hand rule of strike direction to dip