

British Columbia Geological Survey  
 Open File Map 2002-3  
 Sheet 1 of 3



# GEOLOGY OF THE ECSTALL GREENSTONE BELT BRITISH COLUMBIA

NTS 103H/10,11,12,13,14,15; 103I/03,04

Geology by Dani Aldrick, Chris Gallagher,  
 Pat Desjardins, Mary Dubravac and Brad Scott

Compilation by Dani Aldrick

Fieldwork 1999-2001 -- Maps Printed January, 2003

SCALE 1:50 000



QUATERNARY  
 PLEISTOCENE AND RECENT

Qal Gravel, sand, silt and clay

## INTRUSIVE ROCKS

- CENOZOIC TERTIARY PALEOCENE**  
*Quotton Pluton (56.8 ± 0.1 Ma; U-Pb zircon)*
- PQ Medium to coarse-grained, massive to foliated, locally strongly foliated tonalite to quartz diorite to diorite.
  - PQtN Hornblende ± biotite tonalite. Medium to coarse-grained, massive to foliated, locally strongly foliated.
  - PQqd Northern part of belt rocks quartz-rich, biotite ± garnet-bearing tonalite.
  - PQdr Quartz diorite. Medium to coarse-grained, massive to foliated, locally strongly foliated.
  - PQdi Diorite. Medium to coarse-grained, massive to foliated, locally strongly foliated.
- MESOZOIC CRETACEOUS LATE CRETACEOUS**  
*Ecstall Pluton (92.5 ± 1.0 Ma; U-Pb zircon)*
- LKE Epitaxial-biotite-hornblende diorite, quartz diorite to granodiorite. Moderately to strongly foliated within 500 metres of contact. Screens of mafic country rock are common.
  - LKEqd Epitaxial-biotite-hornblende granodiorite to tonalite.
  - LKEgd Epitaxial-biotite-hornblende granodiorite to tonalite.
  - LKEdr Medium to coarse-grained, massive to foliated.
  - LKEdrd Epitaxial-bearing diorite to quartz diorite. Medium to coarse-grained, massive to foliated.
  - LKEdrd Moderately to strongly foliated within 500 metres of contact. Screens of mafic country rock are common.

## LAYERED ROCKS

- PALEOZOIC DEVONIAN LATE DEVONIAN**  
*Davis Lake Gneiss (370.3 ± 0.8 Ma; U-Pb zircon)*
- LDgn Layered amphibolite-quartz diorite-granodiorite gneiss.
  - LDgn Medium grained. Well defined compositional layering. Fine-granular in part.
- DEVONIAN LATE DEVONIAN**  
*Prospect Hill Metasediments (~386 ± 0.7 Ma; U-Pb on detrital zircon)*
- LDs Undifferentiated or mixed metasedimentary units.
  - LDq Quartzite
  - LDst Metaslataste
  - LDm Marble
- DEVONIAN MIDDLE DEVONIAN**  
*Big Falls Metavolcanics (Big Falls Igneous Complex) (393.0 ± 1.2 Ma; U-Pb zircon)*
- MDvs Undifferentiated metavolcanic and metasedimentary units.
  - MDvtn Mafic metavolcanic rocks. MDvtp - pillow basalts.
  - MDvi Intermediate metavolcanic rocks.
  - MDvtFelsic metavolcanic rocks. Quartz-saturated schist ± pyrite.
  - MDst Undifferentiated or mixed metasedimentary rocks.
  - MDstl Metaslataste
  - MDq Quartzite
  - MDcg Conglomerate, granitoid pebbles and cobbles.
  - MDm Marble

## CRETACEOUS EARLY CRETACEOUS

- ACTIVE RIDGE Mafic Complex (115.2 ± 1.9 Ma; K-Ar hornblende)**
- EKA Two diorite stocks. One contains 3 hornblende plugs.
  - EKArd Diorite stock. Hornblende diorite. Medium grained, weakly to moderately foliated.
  - EKAhn Hornblende plugs. Plagioclase hornblende. Very coarse grained, massive to weakly foliated.

## MESOZOIC JURASSIC EARLY JURASSIC

- Foch Lake Pluton (191.7 ± 0.6 Ma; U-Pb zircon)**
- EJftn Titanite-epitaxial-biotite tonalite to granodiorite.
  - EJftn Medium grained, weakly to strongly foliated. Typically contains plagioclase phenocrysts.
- Johnston Lake Pluton (190.5 ± 1.2-0.9 Ma; U-Pb zircon)**
- EJvtN Epitaxial-biotite-hornblende tonalite.
  - EJvtN Medium grained, strongly lineated and weakly to strongly foliated. Augen textures developed locally.

## PALEOZOIC CARBONIFEROUS EARLY MISSISSIPPIAN

- Central Diorite Suite (236.6 ± 1.7-1.1 Ma; U-Pb zircon)**
- EMCdr Hornblende-biotite diorite. Medium grained, weakly to strongly foliated.
  - EMCdr Small elongate stocks, particularly abundant in the upper Ecstall River area.

## DEVONIAN MIDDLE DEVONIAN

- Big Falls Plutons (Big Falls Igneous Complex) (385.0 ± 2.3-2.7 Ma; U-Pb zircon)**
- MDB Undifferentiated. Three large elongate stocks, plus small pods and sills.
  - MDBtn Biotite-hornblende tonalite. Medium grained, weakly to strongly foliated.
  - MDBqd Quartz diorite. Medium grained, weakly to strongly foliated.

## MINERAL OCCURRENCES

MAP NO.	NAME	COMMODITY	MINFILE NO.
N1	Kwintsa Silimanite	silimanite, garnet	1031011
N2	Kwintsa	salt, clay	1031006
N3	Ralbovy	pyrite	
N4	Klata Lake	silimanite, garnet	1031220
N5	Stan	gossan (pyrite)	
N6	Saney	pyrite	
N7	Lochou	gossan (pyrite)	
N8	South Fork	pyrite	
N9	South Fork	pyrite	
N10	East Face	gossan (pyrite)	
N11	Scoka (Albes)	zinc, lead, silver, copper, gold	1031007
N12	Dallas	pyrite	
N13	Falls	pyrite	
N14	Croon	pyrite	
N15	Doglog	pyrite	
N16	Verlog	pyrite	
N17	Crest	pyrite	
N18	F-13	zinc, copper	1031077
N19	Mark	copper	
N20	West Marmot	gossan (pyrite)	
N21	Marmot	pyrite	

## CULTURAL SYMBOLS

- Logging Road
- Logging Camp
- VIA Railway. Schoena Line
- Yellowhead Highway No. 16

## GEOLOGIC SYMBOLS

- Geological boundary (defined)
- Geological boundary (assumed or compiled from references)
- Topographic treatment
- Fault (inferred)
- Station location
- Foliation (inclined, vertical)
- Axial trace of upright F<sub>1</sub> syncline
- Axial trace of upright F<sub>2</sub> syncline
- Axial trace of upright F<sub>3</sub> syncline (arrow indicates plunge)
- Axial trace of upright F<sub>3</sub> syncline (arrow indicates plunge)
- Mineral occurrence
- Stream Sediment Survey sample site

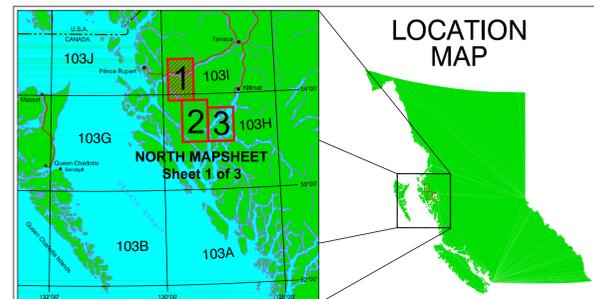
## SELECTED REFERENCES

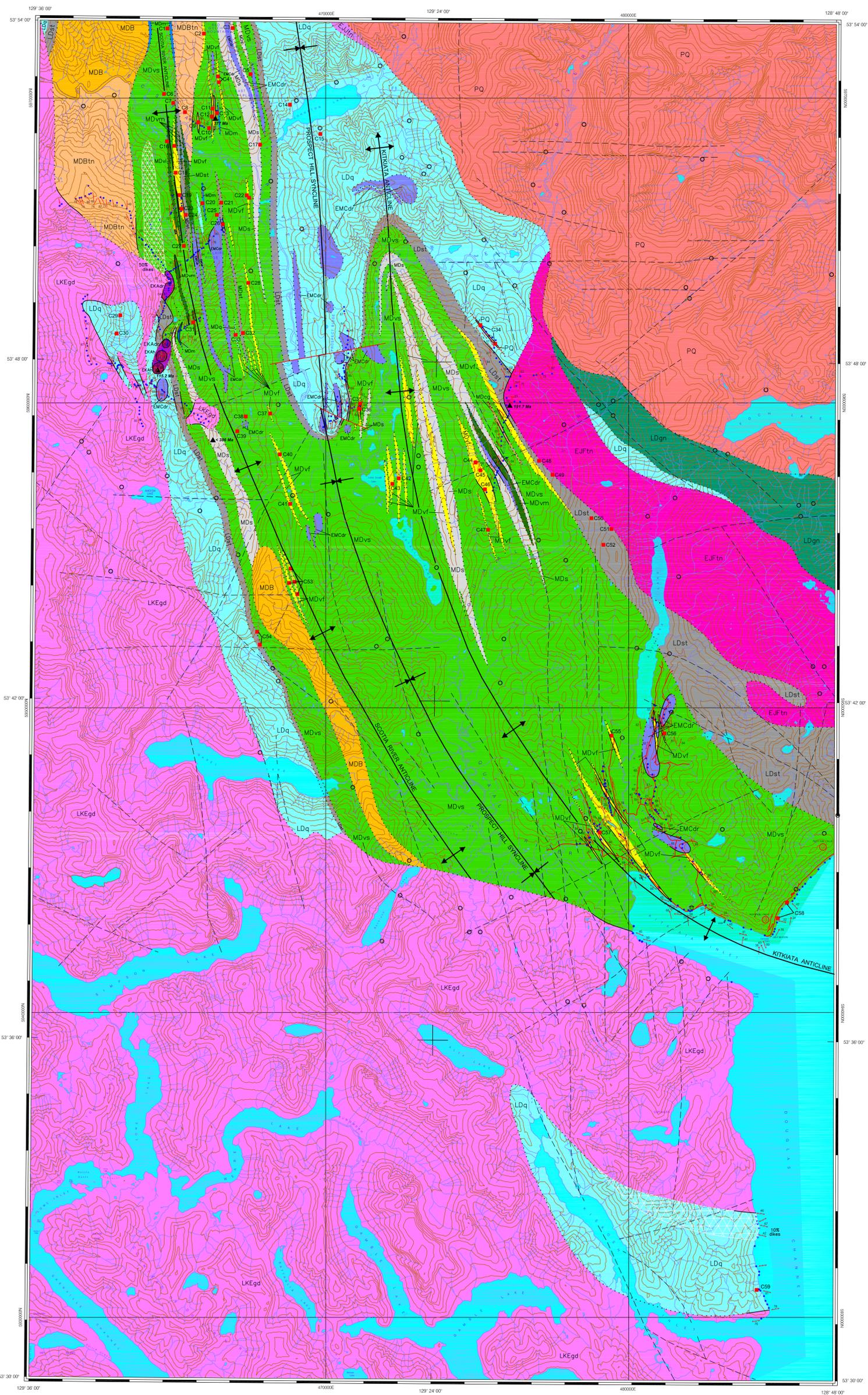
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- Gareau, S.A. (1991). Geology of the Scotia-Quaal metamorphic belt; unpublished Ph.D. thesis, Carleton University, 390p
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- Holyk, W., Padgham, W., Money, P. and Read, P. (1956). Geological map of the Ecstall River area; unpublished map for the Texas Gulf Sulphur Company, scale 1:126,720 (1 inch = 2 miles)

## ACKNOWLEDGMENTS

We have benefited from geological discussions with Arne Birkenland, Chris Graf and Peter Delancy. Previous mapping by Susie Gareau (1993, 1997) by Walter Holyk, Bill Padgham, Peter Money and Peter Read (1953, 1957, 1958) and geological teams from Noranda Ltd., Falconbridge Ltd., and Atna Resources Ltd. is incorporated.

Suggested Reference: Aldrick, D.J. (2002). Geology of the Ecstall Greenstone Belt, British Columbia; British Columbia Ministry of Energy and Mines, Open File 2002-3, Sheet 1, 1:50 000 scale.





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SCALE 1:50 000

QUATERNARY  
 PLEISTOCENE AND RECENT  
 Qgl Gravel, sand, silt and clay

### CENOZOIC

#### TERTIARY PALEOCENE

**Quotson Pluton (56.8 ± 0.1 Ma; U-Pb zircon)**

- PQ Medium to coarse-grained, massive to foliated, locally strongly foliated tonalite to quartz diorite to diorite.
- PQttn Hornblende ± biotite tonalite. Medium to coarse-grained, massive to foliated, locally strongly foliated.
- PQqd Quartz diorite. Medium to coarse-grained, massive to foliated, locally strongly foliated.
- PQdr Diorite. Medium to coarse-grained, massive to foliated, locally strongly foliated.

#### MESOZOIC CRETACEOUS

**Ecstall Pluton (93.5 ± 1.0 Ma; U-Pb zircon)**

- LKE Epitaxial-biotite-hornblende diorite, quartz diorite to granodiorite. Moderately to strongly foliated within 500 metres of contact. Screens of mafic country rock are common.
- LKEgd Epitaxial-biotite-hornblende granodiorite.
- LKEg Medium to coarse-grained, massive to foliated.
- LKEdr Epitaxial-bearing diorite to quartz diorite. Medium to coarse-grained, massive to foliated. Moderately to strongly foliated within 500 metres of contact. Screens of mafic country rock are common.

**Dike Swarm of Ecstall Pluton**

- 70% dike swarm
- 30% dike swarm
- 50% dike swarm
- 70% dike swarm

#### CRETACEOUS EARLY CRETACEOUS

**Altaire Ridge Mafic Complex (115.2 ± 1.9 Ma; K-Ar hornblende)**

- EKA Two diorite stocks. One contains 3 hornblende plugs.
- EKAdr Diorite stock. Hornblende diorite. Medium grained, weakly to strongly foliated. Fine grain spacing preserved.
- EKAH Hornblende plugs. Plagioclase hornblende. Very coarse grained, massive to weakly foliated.

#### MESOZOIC JURASSIC

**Fraser Lake Pluton (199.7 ± 0.6 Ma; U-Pb zircon)**

- EJFtn Thinly-spaced-biotite tonalite to granodiorite. Medium grained, weakly to strongly foliated. Typically contains plagioclase phenocrysts.

**Johnston Lake Pluton (190.5 ± 2.0 Ma; U-Pb zircon)**

- EJLtn Epitaxial-biotite-hornblende tonalite. Medium grained, strongly foliated and weakly to strongly foliated. Augen textures developed locally.

#### PALEOZOIC CARBONIFEROUS

##### EARLY MISSISSIPPIAN

**Central Diorite Suite (236.8 ± 17.7 ± 1.1 Ma; U-Pb zircon)**

- EMCdr Hornblende-biotite diorite. Medium grained, weakly to strongly foliated. Small elongate stocks, particularly abundant in the upper Ecstall River area.

#### DEVONIAN MIDDLE DEVONIAN

**Big Falls Plutons (Big Falls Igneous Complex) (385.0 ± 2.3 ± 7.7 Ma; U-Pb zircon)**

- MDB Undifferentiated. Three large elongate stocks, plus small pods and sills.
- MDBtn Biotite-hornblende tonalite. Medium grained, weakly to strongly foliated.
- MDBqd Quartz diorite. Medium grained, weakly to strongly foliated.

### LAYERED ROCKS

#### PALEOZOIC DEVONIAN LATE DEVONIAN

**Davis Lake Greens (170.3 ± 2.8 Ma; U-Pb zircon)**

- LDgn Layered amphibolite-quartz diorite-granodiorite gneiss. Medium grained. Well defined compositional layering.

#### DEVONIAN LATE DEVONIAN

**Prospect Hill Metasediments (<386-457-70 Ma; U-Pb on detrital zircon)**

- LDs Undifferentiated or mixed metasedimentary units.
- LDq Quartzite
- LDst Metastallstone
- LDm Marble

#### DEVONIAN MIDDLE DEVONIAN

**Big Falls Metavolcanics (Big Falls Igneous Complex) (385.0 ± 2.3 ± 7.7 Ma; U-Pb zircon)**

- MDvs Undifferentiated metavolcanic and metasedimentary units.
- MDvtr Mafic metavolcanic rocks. MDump - pillow basalts.
- MDvtr Intermediate metavolcanic rocks.
- MDvtr Felsic metavolcanic rocks. Quartz-sericite schist ± pyrite.
- MDs Undifferentiated or mixed metasedimentary rocks.
- MDst Metastallstone
- MDq Quartzite
- MDcg Conglomerate, granitoid pebbles and cobbles.
- MDm Marble

### MINERAL OCCURRENCES

MAP NO.	NAME	COMMODITY	MINFILE NO.
C1	West Ridge	pyrite	
C2	Ridge	pyrite	
C3	East Ridge	pyrite	
C4	Third Outcrop	copper, zinc, silver, gold, lead	103H 012
C5	East Plateau	copper, zinc, silver, gold	103H 050
C6	Swinnerton Creek	pyrite	
C7	East Swinnerton	pyrite	
C8	Wharf	pyrite	
C9	Red Bluff	pyrite	
C10	Trench	copper, zinc, silver	103H 051
C11	Ecstall - North Lens	copper, zinc, silver, gold, lead	103H 011
C12	Ecstall - South Lens	copper, zinc, silver, gold, lead	103H 011
C13	Five Foot Vein	copper, zinc, silver, gold	103H 011
C14	North Johnston Lake	pyrite	
C15	South Johnston Lake	pyrite	
C16	Slide Lake (2 sites)	pyrite	
C17	Mikway Creek	pyrite	
C18	Phoebes Creek	copper, zinc, silver, gold	103H 069
C19	Elaine Creek	copper, zinc, silver, gold	103H 053
C20	Canyon	zinc	
C21	North Mariposa	copper, zinc, silver	103H 052
C22	Cascade	pyrite	
C23	West Grid	copper, zinc, silver, gold	103H 053
C24	Sphalerite	zinc, copper, cadmium	103H 070
C25	West Mariposa	pyrite	103H 052
C26	South Mariposa	copper, zinc, silver	103H 052
C27	Thirteen Creek	copper, zinc, silver, gold	103H 054
C28	South Grid East	copper, zinc	103H 055
C29	Amber	copper, zinc, silver, lead	103H 071
C30	El Animo	copper, zinc, silver	103H 071
C31	Altair Ridge	pyrite	
C32	Balan Creek	pyrite	
C33	Holyk	anthophyllite	
C34	NTS (2 sites)	copper	
C35	Packack North Lens	copper, zinc, silver, gold, lead	103H 013
C36	Packack South Lens	copper, zinc, silver, gold, lead	103H 013
C37	Baby Bear	copper, zinc, silver	103H 056
C38	Paco Bear	copper, zinc, silver	103H 056
C39	Mama Bear	copper, zinc, silver	103H 056
C40	Panda	pyrite	
C41	Sockeye	zinc	
C42	East Rainbow	zinc, copper, gold	
C43	West Rainbow	zinc, copper, gold	
C44	Horsely	zinc, copper, lead, silver, gold	103H 014
C45	South Horsely	copper, zinc, lead, silver, gold	103H 014
C46	Steelhead	copper, zinc, silver	103H 036
C47	Pranha	copper	
C48	North Marlyn	pyrite	
C49	South Marlyn	pyrite	
C50	North Quaal	pyrite	
C51	East Quaal	pyrite	
C52	South Quaal	pyrite	
C53	Ravine (5 sites)	pyrite, pyrrhotite	
C54	Sirke (2 sites)	zinc, lead, silver	
C55	Kikiasa Lake	zinc, lead, silver	
C56	Bell	zinc, lead, silver	
C57	West Road	pyrite	
C58	Geopards Point	garnet	103H 064
C59	Baker Bay (Wakoon)	copper	103H 015

### CULTURAL SYMBOLS

- Logging Road
- Cabin

### GEOLOGIC SYMBOLS

- Geological boundary (defined)
- Geological boundary (assumed or compiled from references)
- Topographic lineament
- Fault
- Station location
- Foliation (indicated, vertical)
- Mineral lineation
- Axial trace of upright  $F_2$  anticline (arrow indicates plunge)
- Axial trace of upright  $F_2$  syncline (arrow indicates plunge)
- Mineral occurrence
- Gossan (rock, soil)
- Stream Sediment Survey sample site
- Geochronology sample site

### SELECTED REFERENCES

Aldrick, D.J. and Gallagher, C.S. (2000). Geology and mineral potential of the Ecstall VMS belt; B.C. Ministry of Energy and Mines, Geological Fieldwork 1999, Paper 2000-1, p. 249-265.

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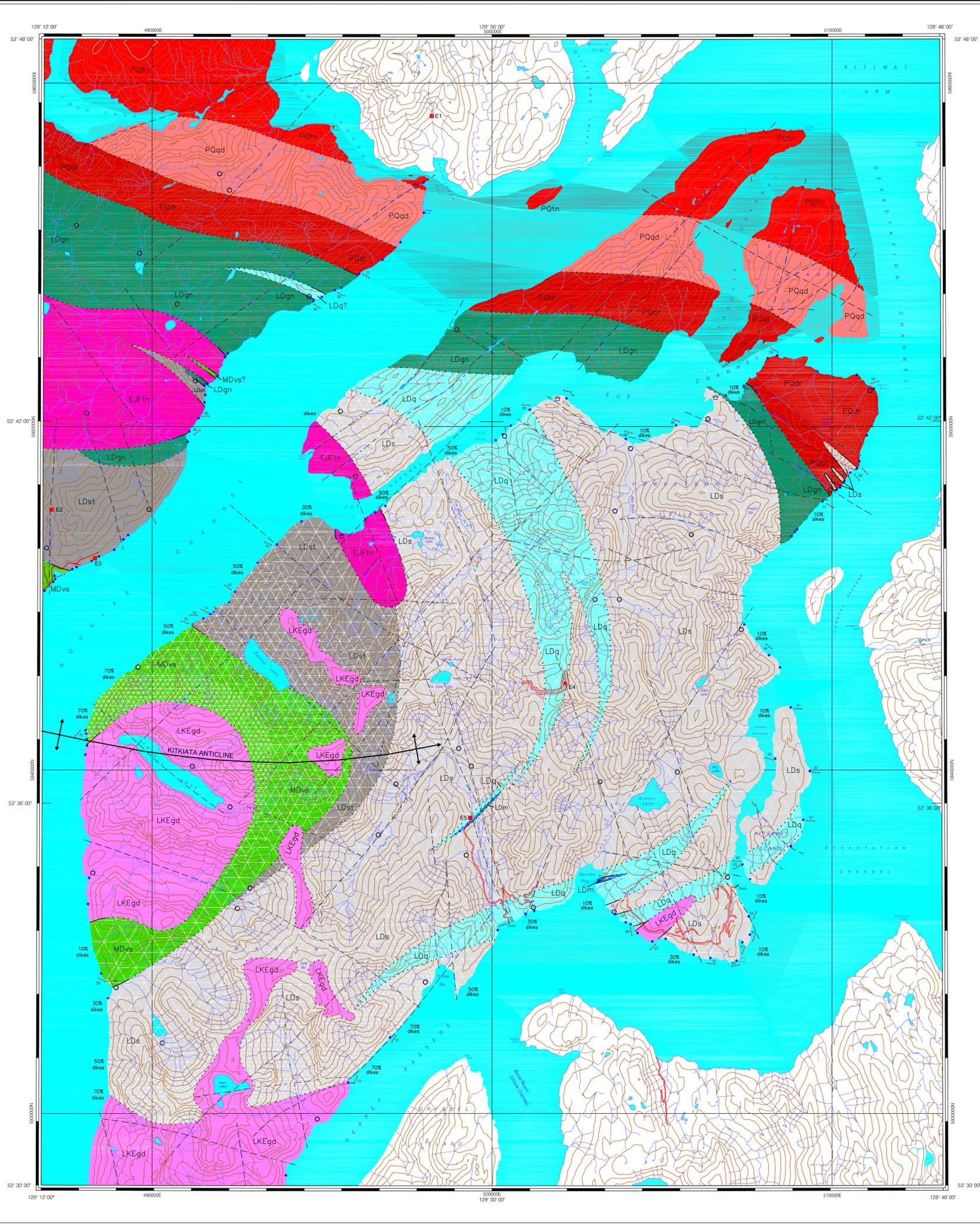
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### LOCATION MAP



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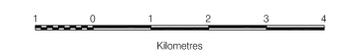
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**Felsic Dike Swarms (of Ecstall, Quooton or Foch Lake plutons)**  
 10% dike swarm  
 30% dike swarm  
 50% dike swarm  
 70% dike swarm

**EARLY CRETACEOUS**  
 Allaire Ridge Mafic Complex (115.2 ± 1.9 Ma; K-Ar hornblende)  
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**DEVONIAN MIDDLE DEVONIAN**  
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### QUATERNARY PLEISTOCENE AND CENT

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### LAYERED ROCKS

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**Prospect Hill Metasediments (<386 ± 167-70 Ma; U-Pb on detrital zircon)**  
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 LDq Quartzite  
 LDst Metasiltstone  
 LDm Marble

**MIDDLE DEVONIAN**  
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 MDvs Undifferentiated metavolcanic and metasedimentary units  
 MDvm Mafic metavolcanic rocks. MDvmp - pillow basalts.  
 MDvi Intermediate metavolcanic rocks.  
 MDvf Felsic metavolcanic rocks. Quartz-sericite schist +/- pyrite  
 MDs Undifferentiated or mixed metasedimentary rocks  
 MDst Metasiltstone  
 MDq Quartzite  
 MDcg Conglomerate, granitoid pebbles and cobbles  
 MDm Marble

### GEOLOGIC SYMBOLS

Geological boundary (defined) .....  
 Geological boundary (assumed or compiled from references) .....  
 Topographic lineament .....  
 Station location .....  
 Foliation (inclined, vertical) .....  
 Axial trace of upright F<sub>2</sub> anticline (arrow indicates plunge) .....  
 Mineral occurrence .....  
 Gossan .....  
 Stream Sediment Survey sample site .....

### CULTURAL SYMBOLS

Logging Road .....  
 Cabin .....

### MINERAL OCCURRENCES

MAP NO.	NAME	COMMODITY	MINFILE NO.
E1	Drumhomon	copper, silver, gold	103H 018
E2	Decare	zinc, lead	103H 016
E3	Abuzzi	copper, silver	103H 017
E4	Evelyn Lake	gossan (pyrite)	
E5	Dani (Cheenis Creek)	zinc, lead, copper, silver, gold	

### SELECTED REFERENCES

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