

NOTES TO ACCOMPANY SECTION D (Seismic profiles P1140, P1141, T8, T7 and P2185)

- Acquisition and processing**
- All seismic profiles along the section intersect at each of the physical splice points.
  - Residual diffractions attributed to under migration (low migration velocities) occur within and below the Bay Fiord Formation (Oer) near CDP 50, P2185.
- Seismic stratigraphic features**
- Overlapping reflections can be identified at the base of unit sC1c beneath CDP 190 on profile P1141. This is critical evidence indicating the presence of a sequence boundary at this level.
  - Overlapping reflections can be identified at the base of unit sC3 beneath CDP 270 on profile P1141. This is critical evidence indicating the presence of a sequence boundary at this level.
  - A good example of a topset reflector that becomes a sigmoidal reflector toward the south occurs in the Cape De Bray Formation (Dcs) interval near CDP 220, profile P1141. There are also many good examples of apparent topset truncation of oblique tangential clinoforms all along this line of section.
  - The southern shelf-slope break of the Blue Fiord Formation (Dbr) is believed to be located near CDP 67, profile T7. The slope facies reflections of the Blue Fiord are traceable from CDP 69 to about CDP 100.
  - Internal reflections in the Canyon Fiord Formation (Cfc) interval beneath CDP 250 to 400, profile P2185, have a divergent character with deeper reflections having steeper dips. These stratal attitudes are interpreted as having been generated by block rotation of sub-Canyon Fiord units on a south-dipping listric extensional fault active during Canyon Fiord deposition.
  - Strong, discontinuous internal reflections become increasingly prominent in unit sC2 north of CDP 70, profile T7.
  - Overlapping reflections above the Blue Fiord Formation (Dbr) (CDP 50 to 280, profile P2185) testify to a sequence boundary at this level.
  - Downlapping internal reflectors (CDP 50 to 100, P2185) mark a base-of-slope at the southern limit of unit OSC.
- Structural features**
- Up to 200 ms of residual velocity pull-up exists beneath the top of the Eleanor River Formation (Oer) interval below CDP 20, profile T8. However, there are also up to 300 ms of uplift of these units everywhere north of CDP 20. This uplift extends down at least to the sub-sC1 level.
  - Dramatic thickness variation in the Cape De Bray Formation (Dcs) interval is apparent between CDP 40 and 60, profile T8. This testifies to the importance of apparent ductile flow in the deformation mechanism of the Cape De Bray.
  - Dip separation on the fault beneath CDP 50, profile P2185, increases downward within unit sC2. This is considered evidence of growth faulting during deposition of this unit.
  - Uplift limit of the three extensional faults between CDP 50 and 150, profile P2185, occurs in the lower Bay Fiord (Obr1) interval. Thickness variation in Obr1 associated with fault termination could be caused by either syndepositional growth of the faults or (more likely) by postdepositional, synorogenic flow of evaporites.
  - Surface faults of uncertain attitude between CDP 200 and 250, profile P2185, presumably decrease their displacement downward and do not appear to offset the top of the Blue Fiord Formation (Dbr).
  - The north-dipping reflection assemblage at and below 5300 ms on profile P2185 represents the lower depth limit for the detachment surface that is linked to extensional faults and associated rotated blocks in the sC2 to sC10 interval.
  - An excellent example of the sub-Carboniferous angular unconformity occurs beneath the half-graben between CDP 250 and 350, profile P2185. The unconformity is also offset by at least one seismically imaged antithetic fault.
  - Weak reflections converging downward and to the north near 700 ms beneath CDP 425, profile P2185, are interpreted as being generated by the limb of a poorly imaged fold above the sub-Bay Fiord detachment.
  - Listric growth faults with up to 1050 ms of displacement occur beneath CDP 417 and 428, profile P2185. These faults apparently flatten southward into the sub-Bay Fiord detachment. This south-directed slip is presumably matched by an equivalent north-directed slip on deep-seated faults that display apparent growth within the lower Bay Fiord evaporites. Similar deep-seated young extension faults are interpreted within Spencer Range and Towson Point anticlinoria on Sections A, B and C.

**Depth conversion**

CPC:	3.7 km s <sup>-1</sup>
Dw:	3.6 km s <sup>-1</sup>
Dbr:	4.0-4.2 km s <sup>-1</sup>
Dcs:	3.9 km s <sup>-1</sup>
OSDCr:	4.6 km s <sup>-1</sup> (south)-5.5 km s <sup>-1</sup> (north)
Dbr, OSC, SDCr:	6.0 km s <sup>-1</sup> (south)-5.9 km s <sup>-1</sup> (north)
Otm, Oer:	6.4 km s <sup>-1</sup>
Oer1:	5.3 km s <sup>-1</sup>
sC1-Oer:	5.7 km s <sup>-1</sup>
below sC1:	6.2 km s <sup>-1</sup>

**Method of cross-section construction and restoration**

Bed length measurement and balancing of the contacts above Oer1, Otm, OSC and OSDCr between pairs of adjacent pin lines.

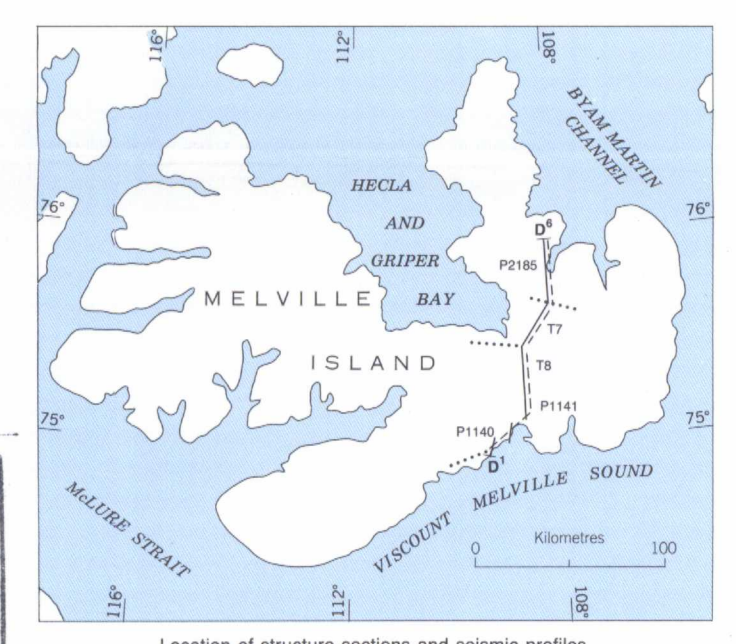
Bed length measurement and balancing of the contacts above sC1, sC2, sC3, sC4, and Oer between pairs of adjacent pin lines.

Bed length measurement of the contact above Dbr.

Area measurement and restoration of Oer1, Dcs, Dw, Dbr, Dcs and Dm between pairs of adjacent pin lines. This method assumes that horizontal shortening of units Oer1, Dcs-Dm is the same as that expressed by bed lengths of contacts above Oer1-OSDCr.

**Results**

Section length: 122.1 km  
 Postorogenic extension: 2.8 km  
 Pre-extension section length: 122.1 - 2.8 = 119.3 km  
 Bed length of Otm (this section): 135.1 km  
 Shortening of Otm (this section): 135.1 - 119.3 = 15.8 km (11.7%)  
 Estimated shortening in foreland\*: 3.5 km  
 Total shortening of Otm from foreland: 15.8 + 3.5 = 19.3 km (8.1%)  
 Bed length of Oer1 (this section): 125.8 km  
 Shortening of Oer1 (this section): 125.8 - 119.3 = 6.5 km (5.2%)  
 Estimated shortening in foreland\*: nil  
 Total shortening of Oer1 from foreland: 6.5 km  
 Deformed-state bed length of Dbr: 127.8 km  
 (includes 11.7 km existing prior to CFC deposition north of pin line 8)  
 Apparent shortening of Dbr (this section): 127.8 - 119.3 = 8.5 km (6.7%)  
 Estimated apparent shortening in foreland\*: 1.3 km  
 Total apparent shortening of Dbr (from foreland): 8.5 + 1.3 = 9.8 km (4.3%)  
 Range of assumed tectonic thickening of Dw-Dm (approximate): 2-9%  
 \*Foreland shortening is carried over to this section along the axial trace of Chevalier Bay Syncline from pin line 2 on Section G.



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