APPENDIX 1

Background data to accompany Woodsworth submission

This project will add significantly to our knowledge of the western Coast Plutonic Complex, the eastern part of the Queen Charlotte Basin, and how the two relate. It is the only project in this proposal to deal with the east edge of Queen Charlotte Basin.

Cameron (in press) suggested that the most important source of oil in the Queen Charlotte Basin is the Lower Jurassic rocks of Wrangellia. However, the northeastern limit of Wrangellia in this region is controversial. Yorath and Chase (1981) placed the boundary between Wrangell and Alexander terranes along the southeast extension of the Rennell Sound Fault. If this suggestion is correct, then much of northern Queen Charlotte Basin and Dixon Entrance may be unpromising for oil exploration.

An alternative model, implied by the data of Roddick (1970) and one K-Ar date, is that the pillow basalts on Bonilla Island in eastern Hecate Strait are correlative with the Upper Triassic Karmutsen Formation characteristic of Wrangellia. If this suggestion is correct, then the Wrangellia-Alexander boundary must be shifted at least 80 km further north, and at least a further 15,000 km^2 of Queen Charlotte Basin may contain Lower Jurassic Wrangellian strata.

Woodsworth and Orchard (1985) showed that rocks in northeastern Hecate Strait and Dixon Entrance are underlain by strata of the Alexander Terrane. They postulated that the Coast Plutonic Complex east of Hecate Strait is also underlain by Alexander Terrane and that the entire region was favorable for volcanogenic massive sulphide and precious metal deposits. This suggestion implies that the boundary between Wrangell and Alexander terranes may well run along the west sides of Banks and Porcher Islands. This project is designed to test these conflicting hypotheses and to place constraints on the location of the important (from both mineral and oil exploration viewpoints) boundary between Wrangellia and Alexander Terrane. This problem can be approached through careful sampling and chemical analyses of basalts on Bonilla and Gurd islands and comparison with basalts on Queen Charlotte Islands.

The project will also examine the structural evolution of the eastern margin of the Queen Charlotte Basin. Most of the northwest-trending channels east of Hecate Strait are presumed to follow regionally important faults. Evidence for such faults consists of the presence of mylonite and augen gneiss along the shores of the channels. However, the nature, age and sense of motion on these faults is completely unknown. An understanding of the structure of the east side of Hecate Strait would place constraints on the evolution and geometry of the Queen Charlotte Basin and would aid in interpreting the economically important Au deposits on Banks and Porcher islands. This problem can be approached by detailed field studies in selected areas, and by

radiometric dating of deformed and undeformed plutons. These methods have proven successful in outlining the structural evolution of the eastern margin of the Coast Plutonic Complex.

The third problem to be addressed is the uplift and thermal history of the eastern Queen Charlotte Basin and western Coast Plutonic Complex. Given the ages and depths of emplacement of the plutons in the region (determined from radiometric and metamorphic studies), and the structure of the region (addressed by the second phase of this project), uplift end thermal histories can be derived that are required to understand the thermal history of the basin.