Structural Geology of the Triangle Zone at Langford Creek, Southwestern Alberta

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Outcrop and drillhole data within the Langford Creek study area were digitized from Geological Survey of Canada maps and field data, and entered into the computer program TRIPOD. Statistical analysis of outcrops with cylindrically folded domains was conducted to determine fold axes. Outcrops and drillholes within each domain were projected axially onto cross sections using TRIPOD. Seismic data were used to complete three balanced cross sections from these data.

The basal detachment beneath some of the study area lies within the Mississippian Exshaw Formation; elsewhere it is in the Jurassic Fernie Formation. Strata above the upper detachment are cut by a series of foreland verging thrusts that flatten in an upper detachment situated in the Upper Cretaceous Bearpaw Formation. Strata above this detachment lie in the west limb of the Alberta syncline. The balanced cross-sections provide evidence for a major lateral ramp affecting strata beneath the upper detachment and connecting flats in the Exshaw and Fernie Formations. This structure is responsible for a 5° to 15° southerly plunge of folds at the surface. Displacement associated with foreland verging thrusts below the upper detachment in part continues into the foreland to be dissipated by layer parallel shortening in units above the upper detachment, and in part is transferred to the surface along hinterland verging thrusts.