

Mineralogy of, and evidence for, fluid flow in fault gouges, Sydney region.

Robin Offler
Discipline of Earth Sciences
University of Newcastle
NSW 2308
robin.offler@newcastle.edu.au

David Och
SMEC Australia Pty Ltd
Level 5 118 Walker Street
North Sydney NSW 2060
David.Och@smec.com.au

David Phelan
SEM/X-Ray Unit
University of Newcastle
NSW 2308

Horst Zwingmann
CSIRO Petroleum
PO 1130 Bentley
WA 6102
Horst.Zwingmann@csiro.au

SUMMARY

X-ray diffraction studies of various fractions from gouges formed in NNE trending fault zones of the Sydney region reveal that illite, illite-smectite, kaolinite, quartz and dickite are present in varying proportions. SEM images of the clays in host sandstones and gouges show a variety of sizes and habits that reflect variations in fluid temperature, fluid/rock ratios and composition. Further, quartz exhibits overgrowths, etch pits of varying density, size, and shape. We believe the minerals present and features exhibited by them are the result of low temperature, hydrothermal fluids migrating through the fault zones during their formation.

Key words: fault gouge, mineralogy, etch pits, fluid flow