

8. CONCLUSIONS

The Stage II beneficiation study of Mt Bischoff tin ores gave the following findings:

- (a) Porphyry composites PC1 and PC2 were considerably different from the sulphide composites SC1 and SC2 both in head grade and mineralogical composition.
- (b) Intimate association of cassiterite with sulphides and non-opaque gangue existed in varying degree in all composite samples. SC1 was the worst case observed followed by PC1 and PC2. The best cassiterite liberation characteristics occurred in SC2 which had greater than 50% liberation in the -1.70 +0.25 mm size fraction.
- (c) The unconventional 'front-end' tin flotation treatment was applicable to all four composite samples. A general ten-fold concentration was obtained in the tin rougher flotation concentrates with high recoveries. The tin rougher flotation recovery would largely depend on the reduction of tin losses in the sulphide pre-float and in the talc pre-float in the case of SC2. Tin collectors PTAA and SPA gave the best overall flotation performance in which a correlation of flotation time/collector dosage/feed grind size (both deslimed and undeslimed) was established. The coarser feed grind size of 100% -150 μm gave similar flotation test results compared to those obtained for the finer feed grind size of 100% -75 μm . The results of limited testwork conducted with other tin collectors CA540 and S-3903 were not as promising and further study would be required to evaluate fully their flotation performance. Concentration by gravity methods was shown to be an effective means of up-grading the tin flotation rougher concentrate.
- (d) The problem of mineral locking between cassiterite and other minerals present was revealed in the study of the conventional tin treatment of the four composite samples. Test results showed that an initial finer feed grind (probably around 150 μm) would be required