

7. CONVENTIONAL BENEFICIATION TESTWORK FOR PC1, PC2, SC1 AND SC2

The conventional treatment procedure used in this investigation consisted of bulk sulphide flotation followed by gravity recovery of tin. Concentrate products obtained in processing were assayed and mineralogically examined to study the treatment response and to establish the nature and mode of occurrence of tin minerals present. Initially, direct superpanning was carried out on the classified bulk sulphide flotation tailing products of the four composite samples to secure a set of superpanner concentrates for further examination. However, the initial superpanner concentrates obtained were very small in quantities and insufficient for conducting both the chemical and mineralogical analyses. Thus, tabling was introduced to treat larger samples followed by superpanning to up-grade the table rougher concentrates for further examination. Attempts were also made to produce a high grade tin concentrate from the combined table/superpanner concentrates produced from each of the composite samples.

7.1 Bulk Sulphide Flotation

7.1.1 Test Procedures and Results

Approximately 16 kg each of the four minus 1.70 mm (10 mesh BSS) composite head samples were stage ground to minus 401 μm (44 mesh BSS) at 60% solids and floated in a 40-litre Agitair cell at 30% solids. Sulphide concentrate and tailing fractions were produced from each of the four composites. The flotation conditions used and results obtained in each test are given in Appendix F. Chemical analyses of the sulphide concentrates, middlings and tailings produced are also presented in the same Appendix.

Mineralogical examinations were conducted on the four bulk sulphide flotation concentrates and the report is presented in Appendix G.

7.1.2 Discussion

Removal of sulphides by the bulk sulphide flotation process used for the four composite samples was poor as shown by the total sulphur analyses in the four tests. The adverse flotation behaviour could be due to either the very coarse grind size feed used (100% -401 μm) and/or sulphide minerals having undergone some degree of oxidation during processing. Use of a finer grind size feed would certainly improve the sulphide flotation performance as shown in the series of flotation tests conducted in the unconventional beneficiation testwork described