5.5 Overall Mineralogy of Sample

From the mineralogies and weight distributions of the various separation products, the approximate overall mineralogical composition of the total sample can be calculated. This is as follows:

	Wt %	
Garnet	25	
Magnetite	25	
Quartz	20	
Fluorite	16	(from assay)
Amphibole	10	
Others	4	
	100	

'Others' includes biotite, chlorite, calcite, feldspar, vesuvianite, pyrite, chalcopyrite, ?pyrrhotite, arsenopyrite, hematite, goethite, cassiterite and scheelite.

6. OVERALL LIBERATION AND LOCKING CHARACTERISTICS OF FLUORITE TIN AND TUNGSTEN

The ore contains approximately 16% fluorite which is the mineral of principal interest at this stage of the investigation. From the sizing, separation, assay and optical data obtained in this work, the overall distribution of fluorite can be determined (Tables A-6 and A-7).

It can be seen from Table A-6 that fluorite liberation is less than 50% at particles sizes greater than 33-μm. The unliberated fluorite is approximately equally locked with magnetite and silicates.

In the minus 33 plus 17-μm material the liberation of fluorite is about 70% and grinding to pass approximately 30 μm will be needed to produce a high degree of liberation of fluorite.

The overall distribution of tin in the size fractions and the total sample is given in Tables A-8 and A-9. Approximately 45% of the tin in the ore is present in solid solution in garnet (0.06% Sn out of 0.13% Sn) and, of the 55% tin in cassiterite, only a very small amount is liberated at any size above 9 μm. There is thus little if any possibility of recovering a significant (e.g. >20%) proportion of the tin in the sample into a high grade tin concentrate by physical beneficiation.

The overall distribution of tungsten in the size fractions and the total sample are given in Tables A-11 and A-12. The tungsten is present as scheelite and it can be seen from Table A-11 that even in the plus 75-μm fraction approximately 50% of the scheelite is liberated, and that with