



Metallurgy

FURTHER FLOTATION ASSESSMENTS

OF

QUEEN HILL COMPOSITES

FOR

STELLAR RESOURCES

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1. SUMMARY

A previous project (T0587) tested Queen Hill core composites. Assessments included analytical, mineralogical and flotation assessments for each and was based on a Renison style flowsheet. The table below summarises the key findings for each type. The current project (T0630) is focussed on improving the flotation response for both sulphide rejection and tin float concentrate grade and recovery. Results to date are presented below.

SUMMARY FROM T0587

Parameter		COMP 1	COMP 2
Head Grades	Sn (%)	1.00	0.93
	Fe (%)	25.1	29.6
	S (%)	15.5	23.1
Mineral Suite	Pyrite (%)	43.4	59.2
	Pyrrhotite (%)	0.2	4.3
	Iron Oxides (%)	18.9	13.4
	Quartz (%)	21.0	17.2
	Micas (%)	8.4	1.0
	Cassiterite (%)	1.9	1.3
	Sphalerite (%)	0.4	0.9
Heavy Liquid 2.95sg	Floats Mass (%)	17.9	8.8
	Sn Rec to Float (%)	1.2	0.6
Sulphide Concentrate	S Recovery (%)	78.4	93.0
	Sn Recovery (%)	15.4	18.1
Reground Sulphide Tail	Sn (%)	1.25	1.52
	S (%)	5.0	3.3
	Sn Dist >53um (%)	42	33
	Sn Lib >53um (%)	15	16
Slime Tail	Sn Dist (%)	1.3	1.9
Tin Float Feed	Sn Dist (%)	41.9	44.0
Tin Ro Conc	Sn Dist (%)	16.6	17.8
Tin Float Tail	Sn Dist (%)	25.3	26.2

FLOTATION TESTING

T0587 SULPHIDE FLOTATION

Sulphide float results are presented in the summary tables below. Sulphide rejection is quite acceptable at around 90% for most tests with less than 4% S in combined non-sulphide tails. Tin loss to concentrate is high, up to 35% of feed tin, when using PAX and without a depressant. A silicate depressant (sodium silicate) strongly reduces the loss of tin to the concentrate with losses reduced to around 15% of feed tin. Mineralogical assessment of sulphide concentrate indicates further gains can be made as a high proportion of the cassiterite is liberated in this product.

Assessment: Both composites behave in a similar manner in sulphide flotation. 14% of feed cassiterite remains in the sulphide concentrate, a high proportion of this cassiterite is free and potentially recoverable.

T0630 SULPHIDE FLOTATION

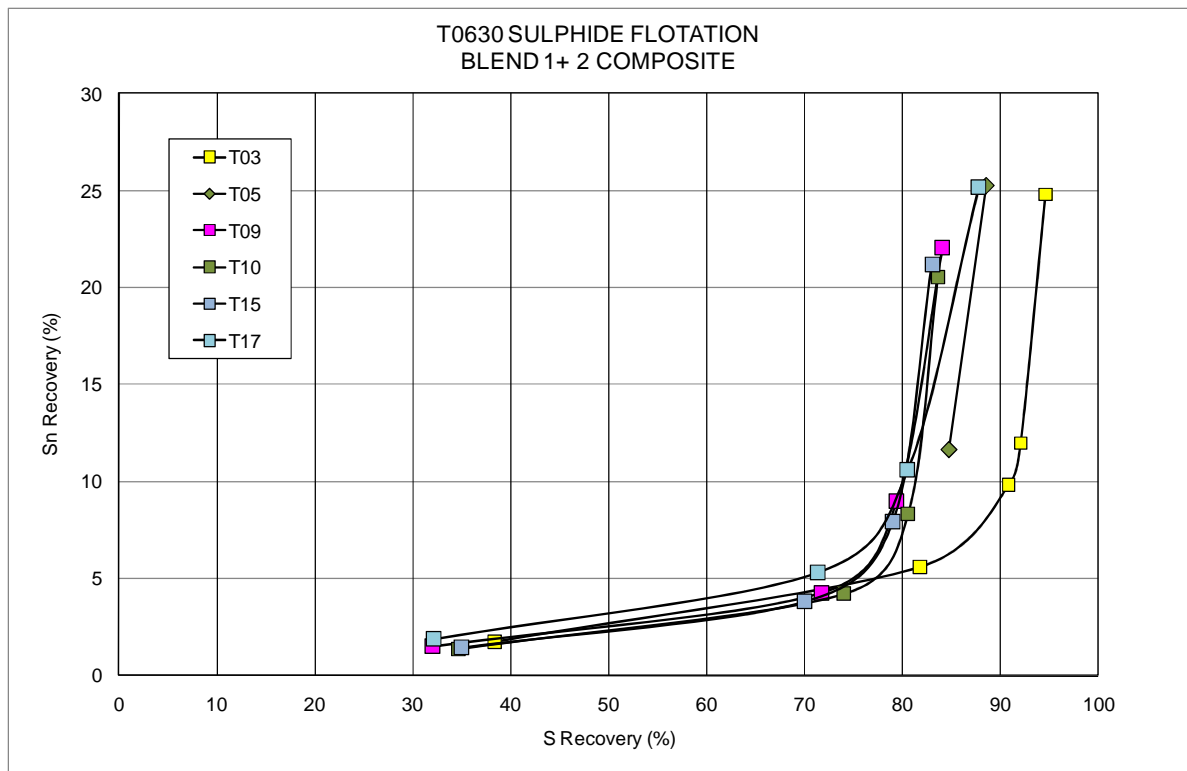
Flotation results are also presented in table 1 below (in bold). Results indicate that significant improvements can be made in the loss of tin in sulphide concentrate. These have been made by:

- Using a “weaker” xanthate collector (SEX rather than PAX)
- Using a guar depressant (Tall Bennett or Senmin)
- Regrinding sulphide rougher concentrate to a finer size.

Tin loss has been taken from the 15-20% recovery loss to a 7-12% recovery loss. Further assessments (sulphide floats are undertaken to generate tin flot feed) will be performed to test further improvement of tin loss.

TABLE 01: SULPHIDE FLOTATION ALL RO/REG/CL TESTS

TEST	REAGENTS						REG min	CONCENTRATE			
	PAX	SEX	H2SO4	Na Silicate	Guar 1	Guar 2		%Sn	Rec	%S	Rec
T03	155		350	400			7	0.64	19.7	40.2	82.8
T04	155		790	400			10	0.40	20.0	42.5	91.1
T07	156		406	507			14	0.52	13.7	43.1	76.5
T08	155		1390	506			18	0.31	14.3	44.3	87.2
T09	155		426	502			14	0.54	15.4	42.8	78.4
T10	172		1390	505			18	0.33	18.1	43.6	93.0
T03		220	1572		275		20	0.28	12.0	43.8	92.0
T05		186	1485		250		20	0.29	11.7	47.0	84.7
T09		206	1558			273	20	0.24	9.0	48.2	79.4
T10		213	1605			281	20	0.23	8.3	49.3	80.5
T15		215				284	20	0.22	7.6	51.5	77.8
T17		208	1569			275	20	0.27	10.6	43.3	80.5



TIN FLOTATION

Tin flotation results are summarised in the table below (current testing in bold).

TEST	H2SO4	SSF	SPA	OTHER	%Sn	Rec	%Fe	Rec
T12	717	386	615		4.33	37.2	33.5	19.6
T13	434	357	714		12.3	39.7	28.8	9.3
T04	863		1093		2.04	90.1	22.2	74.1
T06	673		898		3.05	68.7	23.3	40.7
T08	580		1029		2.37	84.0	23.9	70.3
T11	667		477	Edta to complex iron	3.96	42.7	23.3	18.2
T12	652		559	Edta to complex iron	1.57	12.8	24.7	14.6
T16	580		954	Ro/Cl	3.92	33.9	29.7	15.5
T18	580	92	1180	Ro/Cl				

Tin float results remain poor. Tin recovery can only be achieved at the expense of high iron recovery. Tests to reduce iron recovery have only been partially successful. Tests T16 and T18 have been performed to extend testing into cleaning. These do not appear to yield better performance. Work will continue along the following lines:

- Test with alternate iron depressants (ssf+depressant)
- Test with larger sulphide scavenger mass
- Test alternate collector (Tall Bennett tin collector type)