

Section 1 — Ore Dressing Investigations

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21. COMPOSITE SAMPLES FROM MOUNT CLEVELAND FOR VANNING TESTS

(See also Everard, G., this volume, pp. 128-133)

Split cores from diamond drilling operations at Mount Cleveland were received from Aberfoyle Tin Development Partnership for assay sample preparation. During the preparation of these assay samples, portions of the material were retained at relatively coarse sizes, generally at minus 10 mesh size.

Composite samples were made up from these coarsely ground samples on a footage basis for the following bores:—

Bores C9-12, C18, C23	Hall's Lode
Bores C14-16, C20	Henry's Lode
Bores C13, C17	Waterhole Lode

Composite samples from the Battery Lode (Bores C1-5) were obtained from the second portions of split core, which were forwarded for ore dressing investigations. These composites had been compounded by Aberfoyle Tin Development Partnership, and only required size reduction and removal of the sample.

As mentioned above, composite samples were made up on a footage basis, i.e., equal weights per foot of drill core sample. The only composite to show any deviation from this was sample C16/173-188, in which there was a slight deficit of material from samples C16/179 and C16/180.

The composite samples were all ground minus 52 mesh, and a vanning assay carried out on each composite by the standard method.

The vanning assay involves digestion of the sample with hydrochloric and nitric acids to decompose sulphides, iron oxides and carbonates. The residue is then panned (with intermediate grinding steps) to a high grade concentrate. This panning is much simplified by the chemical removal of a considerable portion of the heavy minerals present.

The head values quoted in the tabulation below are actual values determined on the composite sample ground minus 52 mesh. In some cases, this head value varies slightly from the head value as calculated from the various individual samples making up the composite, due to normal sampling and assaying variations.

All vannings were carried out in duplicate, and the results reported below are the mean of these duplicate results. In several cases where there was not reasonable agreement between the duplicate results (generally due to variation in grade of the vanned concentrate), a third vanning determination was carried out. As these vannings were carried out in duplicate, a considerable degree of reliance can be placed upon the results.

Lode	Bore and Composite No.	Assay Percent Sn		Percent Recovery of Tin in Vanning Concentrate
		Total	Vanning	
Battery—	C. 1/ 1- 2	0.79	0.47	59.7
	C. 1/ 5- 6	1.12	0.68	60.6
	C. 2/ 8- 15	0.60	0.25	41.4
	C. 3/ 16- 29	0.80	0.49	60.9
	C. 4/ 30- 40	0.57	0.27	46.6
Hall's—	C. 5/ 41- 66	0.96	0.59	61.7
	C. 9/ 71- 73	0.95	0.43	45.2
	C.10/ 75- 76	2.04	1.26	61.9
	C.10/ 77- 78	1.76	1.10	62.5
	C.10/ 79- 88	1.25	0.79	63.2
	C.11/ 89-119	1.30	0.95	72.6
	C.12/120-134	1.17	0.79	67.4
	C.12/135-143	1.00	0.59	58.9
	C.12/144-145	0.26	0.16	62.4
	C.12/146	2.91	2.45	84.3
	C.18/314-330	1.16	0.71	61.2
	C.23/334-351	0.72	0.53	73.0
Henry's—	C.14/239-244	0.77	0.54	70.3
	C.14/245-260	0.97	0.62	65.3
	C.15/167-171	3.10	1.93	62.1
	C.15/172	0.80	0.52	65.6
	C.16/173-188	0.80	0.49	61.2
	C.16/189-190	0.075	0.04	53.5
	C.16/191-193	1.02	0.75	73.2
	C.16/194-212	1.88	1.43	75.9
	C.16/213-214	0.57	0.35	60.6
	C.16/215-219	1.06	0.73	69.1
	C.20/270-278	1.01	0.78	77.1
	C.20/280	1.24	0.78	63.2
	C.20/281-284	0.58	0.37	64.5
	C.20/286-292	0.27	0.18	67.0
	C.20/297-311	0.98	0.70	71.7
Waterhole—	C.13/147	1.82	1.30	71.5
	C.13/148-153	0.79	0.58	73.0
	C.13/154-161	0.81	0.61	75.9
	C.17/221-235	0.87	0.49	56.0
Weighted average (footage basis)		1.00	0.66	66.1

Vanning recoveries approximate the recoveries that could be expected by gravity concentration under ideal conditions. It will be noted that there is considerable variation in the recoveries from samples of similar head values; it is therefore not safe to assume recoveries for untested samples.

The series below illustrates the point for a series of composites, each containing approximately 1 per cent tin.

Lode	Bore and Composite No.	Assay Percent Sn		Percent Recovery of Tin in Vanning Concentrate
		Total	Vanning	
Hall's—	C. 9/ 71- 73	0.95	0.43	45.2
	C.12/135-143	1.00	0.59	58.9
Battery—	C. 5/ 41- 66	0.96	0.59	61.7
	C.14/245-260	0.97	0.62	65.3
Henry's—	C.20/297-311	0.98	0.70	71.7
	C.16/191-193	1.02	0.75	73.2
	C.20/270-278	1.01	0.78	77.1

In this particular series it will be noted that from similar grade ores, the anticipated recoveries can vary from about 45 per cent to about 77 per cent of the tin. Differences in recovery would be due mainly to differences in association and grain size of the cassiterite.