FELDSPAR TAILING EVALUATION

December 1968 Progress Report
Feldspar Tailings Report #2

Lab. Nos. Reported in Lab. Book No. 240 -

by
Robert D. Kauffman

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Introduction

The overall objective of this project is aimed at solving the tailing disposal problems of the three feldspar producers in the Spruce Pine, North Carolina area.

Legislation against stream pollution has necessitated that the three feldspar plants (International Minerals and Chemical Corporation, Feldspar Corporation, and Lawson-United Feldspar and Mineral Company) dispose of plant tailing (waste) without contaminating the streams. Thus under present conditions the three feldspar companies are continuously hauling their tailing away to nearby localities to be dumped. This has proved costly in itself, is marring the land, covering up potential mineral reserves and wasting the mineral values contained in the tailing.

In order to achieve the overall objective of the tailing program, to find a practical, profitable, consumer outlet for all or portions of the tailing, it was deemed necessary that the various tailing streams of three feldspar plants be characterized. Thus a sampling program was initiated in January 1968 in which the various tailing streams of the feldspar plants at Spruce Pine were sampled daily for ten consecutive days. This initial sampling program was followed in July 1968 by a weekly sampling program in which the various tailing streams were sampled over a ten-week period.

Samples

Daily samples of the various tailings of the three feldspar plants were collected over a ten-day period in January 1968. Those tailing streams sampled and the approximate daily tonnages are shown in Table A.

The samples were obtained by truck drivers of the three feldspar companies. That is, from each truck load of tailing hauled away, a shovel full of that particular material was placed in a drum designated for that day. Periodically Laboratory personnel went to Spruce Pine and cut out a representative portion from each daily sample for laboratory evaluation.

In July 1968 a second sampling program was initiated whereby weekly samples were obtained over a ten-week period. The procedure for obtaining the weekly samples was essentially the same as that used for obtaining the daily samples, except that at the end of each week the daily samples for that week were combined and a representative sample (± 50 pounds) was cut out for laboratory evaluation.

Those tailing streams sampled and the approximate daily tonnages, based on daily and weekly samples, are shown in Table A.

Table A

Tailing Rates

Company	Tailing Stream	Approximate TPD (Dry) Based on Daily Samples, Jan. '68	Approximate TPD (Dry) Based on Weekly Sam.July-Sept.'68
IMC	Filter Cake	129	126
	Coarse Tails	178	177
Feldspar Corp.	Filter Cake	250	231
	Coarse Tails	20	28.3
Lawson	Scraper Pile	235[1]	302[1]
Total		812	864.3

[1] This figure does not represent Lawson's total tails because the greater percentage of the fine material flows into Lawson's lower pond which is cleaned out once or twice a year.

From the daily and weekly samples, the following samples were made up in order that the tailing could be further evaluated.

1) A composite of the daily samples for each tailing stream

2) A composite of the weekly samples for each tailing stream

3) A composite of the daily composites - representing a composite of all tailing streams for the ten-day period

4) A composite of the weekly composites - representing a composite of all tailing streams for the ten-week period.

The various composite samples as shown above were evaluated in the same manner as the regular daily and weekly samples. All samples were composited in proportion to the tonnage produced. That is, a representative sample was cut out of each sample making up any particular composite, the weight of the sample being based on the tonnage of that particular tailing stream.

Procedure for Sample Evaluation

The various tailing samples from the three feldspar plants, as previously described, are evaluated in the following manner. This applies to daily samples (taken January 1968), weekly samples (taken July-September 1968), and composites.

1) Moisture Determination of the Head Sample.

2) Complete Screen Analysis of the Head Sample - Where the minus 400 mesh constitutes a high percentage of the total material, as in IMC and Feldspar Corporation filter cake, the sample is wet screened on 400 mesh. The plus 400 mesh and the minus 400 mesh material are then dried. A complete screen analysis is then carried out on the plus 400 mesh material. All minus 400 mesh material for any one sample is combined and the weight percentages for the various screen fractions are determined.

3) Complete Chemical Analysis of Head Sample - This includes the following analyses: Na_2O, K_2O, Fe_2O_3, Al_2O_3, SiO_2, CaO and I.L.

4) Flotation Evaluation - All of the tailing samples are evaluated by the flotation procedure, outlined in steps a-j below, with the exceptions shown at the end of this section. Also at the end of this section is the detailed data sheet for a typical flotation test; in this case, the flotation of the composite of the composites of weekly samples (see Table B).

a) The sample is screened wet on a 28 mesh screen.

b) The plus 28 mesh material is ground in a rod mill to minus 28 mesh (except for the mica). The plus 28 mesh mica is a potential product.

c) The minus 28 mesh material is deslimed at approximately 200 mesh. This minus 200 mesh fraction constitutes the primary slime.

d) The minus 28 plus 200 mesh material (flotation feed) is subjected to a high-solids scrub (70 percent) at 1000 rpm for five minutes.

e) The scrubbed material is again deslimed at 200 mesh, eliminating any secondary slimes created by scrubbing.

f) The minus 28 plus 200 mesh scrubbed and deslimed material is then subjected to a cationic float in a sulfuric acid circuit, whereby the mica is floated.

g) The mica float is screened at 80 mesh. The minus 80 mesh material would be considered waste and the plus 80 mesh material a potential mica product.

h) The cell discharge from the mica float is dewatered and conditioned with petroleum sulfonate in a sulfuric acid circuit. In this float the iron-bearing minerals, mostly garnet, float along with any remaining mica.

i) The cell discharge from the iron float is dewatered, subjected to a cationic float in an HF circuit, whereby the feldspar is floated away from the quartz. The feldspar and quartz are potential products.

j) The flotation products are dried and weighed. Samples for chemical analysis are cut out of the quartz and feldspar products. Samples are also cut out of the quartz and feldspar products for magnetic separation.

Exceptions to the above flotation procedure are the following:

a) IMC filter cake is deslimed at about 400 mesh instead of 200 mesh.

b) Quantities of reagents are varied when necessary to meet product specifications.

c) Some tailings are ground to minus 35 mesh rather than 28 mesh in order to assist in making grade.

d) Intensity of scrubbing is increased in some cases to assist in making grade.

5) Magnetic Separation of Quartz and Feldspar Products - Representative samples of the quartz and feldspar products are subjected to a dry, high intensity magnetic separation whereby those iron minerals remaining are removed. Thus the following samples are submitted for chemical analysis:

Product	Na_2O	K_2O	Fe_2O_3	Al_2O_3	SiO_2	CaO	I.L.
Feldspar	x	x	x	x	x	x	x
Quartz	x	x	x				
Nonmag Feld.	x	x	x				
Nonmag Qtz.	x	x	x				

NORTH CAROLINA STATE MINERALS RESEARCH LABORATORY

Flotation of Composite of Weekly Composites

ORE DRESSING TEST DATA

Sample No. T Test No. T-2

Engineer Robert D. Kauffman Date October 8, 1968

Object of Test Flotation of Composite of Weekly Composites

Product	Wt. %		Na_2O	K_2O	Fe_2O_3	Al_2O_3	SiO_2	CaO	I.L.		
Primary Slime	23.2										
Secondary "	4.0										
Total	27.2										
+28 Mesh Mica	0.6										
+80 Mesh Mica	3.3										
-80 Mesh Mica	2.4										
Total Mica	6.3										
Iron Float	2.1										
Spar Float	34.0		6.30	4.26	0.074	19.3	68.3	1.43	0.18		
Quartz Product	30.0		0.12	0.06	0.15						
Total	100.0										
Nonmag Spar			6.39	4.02	0.066						
Nonmag Qtz.			0.11	0.06	0.023						

Process Reagents lbs/Ton of Total Feed

Equipment	Time	% Solid	pH	rpm	H_2SO_4	M-70	F.O.	25-H	HF	Ar-T	NaOH
Grind +28 Mesh	2X0.5			53							
Scrub	5	68		1000							1.3
Mica Cond.	5	67	1.9	700	1.6		0.3	0.03		0.16	
Iron Cond.	5	72	2.5	700	0.3	0.5	0.3	0.06			
Spar Cond.	3	70	2.1	700				0.03	0.92	0.13	

Procedure

1. Screen on 28 Mesh
2. Grind +28 Mesh to -28 Mesh (except mica)
3. Deslime - 1 full bucket 1 time, 2 ½-full buckets 1 time each
4. Scrub
5. Deslime 2 ½-full buckets 1 time each
6. Mica float - good
7. Iron float - good
8. Spar float - good

Results

The following is a summation of the results of the data, as given in Appendixes A, B and C, on the tailing samples obtained from the three feldspar companies at Spruce Pine. Where possible, a comparison is made between the daily samples (taken January 1968) and the weekly samples (taken July-September 1968).

Lawson Tails

Screen Analyses - The data indicates that the daily samples are slightly coarser than the weekly samples, by about 4.0 percent at 200 mesh. The actual data for these screen analyses is shown in Appendix A.

Chemical Analyses of Head Samples - The difference between the head analysis of the daily and weekly is insignificant. This data is shown in Appendix B, Table 1.

Flotation Results - The data indicates that the flotation results of the calculated and actual composites of the daily and weekly samples are very close to being within the limits of the experimental error.

The data also indicates that an average of 44.7 percent of the daily samples constitutes the feldspar product while an average of 39.1 percent of the feed of the weekly samples is in the feldspar product. The quartz product constitutes an average of 28.5 percent of the feed of the daily samples and 33.8 percent of the feed of the weekly samples. The difference between the chemical analyses of the daily and weekly samples of the spar and quartz products is insignificant. The flotation tests carried out on Lawson tails showed there was no difficulty in obtaining feldspar of satisfactory grade. The data for the flotation tests carried out on Lawson tails is shown in Appendix C, Tables 1 and 2.

Feldspar Corporation Filter Cake

Screen Analyses - Data shows that the percent plus 200 mesh in the daily samples is greater than that in the weekly samples ($\pm$ 11 percent). This data is shown in Appendix A, Table 2.

Chemical Analyses of Head Samples - Data shows there is a difference in the head analyses of the daily and weekly samples. The average alkali of the weekly samples is about 0.8 percent greater than the daily samples. This data is shown in Appendix B, Table 2.

Flotation Results - The average percent slimes (minus 200 mesh) for the weekly samples is about ten percent greater than for the daily samples.

The average percent material in the feldspar float of the daily sample (35.6 percent) is about ten percent greater than that of the weekly samples (24.6 percent) while the percent material in the quartz product is approximately the same in the daily and weekly samples. The total alkali in the feldspar from the weekly samples is slightly higher than in the daily samples. Grade of the feldspar product was not difficult to obtain by flotation of the samples of Feldspar Corporation filter cake. The actual data for the flotation tests carried out on this material is shown in Appendix C, Tables 3 and 4.

Feldspar Corporation Coarse Tails

Screen Analyses - Data shows no difference between the screen analyses of the daily and weekly samples. This screen analysis data is shown in Appendix A, Table 3.

Chemical Analyses of Head Samples - Data shows no significant difference between the chemical analyses of the daily and weekly samples. This data is shown in Appendix B, Table 3.

Flotation Results - Flotation tests carried out on Feldspar Corporation coarse tails indicate the material contains a high percent of feldspar. Thus far, it has proven difficult to obtain grade on either the daily or weekly samples. This tailing product represents a small tonnage (about 20 tons per day). This flotation data is in Appendix C, Tables 5 and 6.

IMC Filter Cake

Screen Analyses - Data shows there is a wide variance in the individual screen analyses of both the daily and weekly samples. Thus based on this data, no definite conclusion can be assumed as to its significance. This data is reported in Appendix A, Table 4.

Chemical Analyses of Head Samples - Due to the difference in analysis between various daily samples (calculated composite and actual composite), any difference between daily and weekly samples could be attributed to experimental error. This data is reported in Appendix B, Table 4.

Flotation Results - Due to incomplete results, it is difficult to make a comparison between daily and weekly samples. Those results thus far compiled indicate that, for both the daily and weekly samples, the feldspar float product represents about 15 percent of the feed weight, while the quartz product constitutes about 9.5 percent of the total feed. The flotation of IMC filter cake is carried out on plus 400 mesh material. The minus 400 mesh slime constitutes about 70 percent of the total feed. This data is reported in Appendix C, Tables 7 and 8.

IMC Coarse Tails

Screen Analyses - Data indicates there is no significant difference between the screen analyses of the daily and weekly samples. This data is reported in Appendix A, Table 5.

Chemical Analyses of Head Samples - Data indicates the total alkali for the weekly samples averages slightly higher than that for the daily samples (± 0.9 percent). This data is reported in Appendix B, Table 5.

Flotation Results - Although data is not complete, it does indicate that approximately the same percentage of the feed of both the daily and weekly samples is floated in the feldspar float. The chemical analyses of the feldspar and quartz products of the daily and weekly samples is approximately the same. It has proven difficult to obtain grade in the feldspar product of IMC coarse tails. This data is reported in Appendix C, Tables 9 and 10.

Actual Composites of Daily and Weekly Composites

Screen Analyses - A comparative evaluation of data indicates there is no significant difference between the composite of all the daily tailings samples and the composite of all the weekly samples in the plus 200 mesh range of the screen analyses. In the minus 200 mesh material the weekly composite consists of coarser material than the daily composite. The actual results of the screen analyses of these two composites is shown in Appendix A, Table 6.

Chemical Analyses of Head Samples - Data shows there is little or no difference in the chemical analysis of the head sample of the daily and weekly composites. The actual results are shown in Appendix B, Table 6.

Flotation Results - By the use of normal sample preparation and flotation procedures, feldspar grade is obtainable without difficulty on both the daily and weekly composite samples. Results indicate any differences obtained by the flotation of these two products could be attributed to experimental error. The actual results of the flotation tests carried out on these two products is shown in Appendix C, Table 11.

Summation of Results

Table C shows, based on daily samples,[1] that 812 tons per day of tailing were produced by the three feldspar companies at Spruce Pine, North Carolina. From this material, it is estimated that 287 tons per day of feldspar and 222.1 tons per day of quartz could be recovered. If the above products were recovered by beneficiation, it is estimated that approximately 233.1 tons per day of slime would be produced.

Table C also shows, based on weekly samples,[2] that 864.3 tons per day of tailing were produced by the three feldspar companies. It is estimated from this material that 273.2 tons per day of feldspar and 244.4 tons per day of quartz could be recovered. If the above products were recovered by beneficiation, it is estimated that approximately 269.6 tons per day of slime would be produced.

Table C

Tailing and Product Rates

	Daily Samples (TPD)				Weekly Samples (TPD)			
	Tails	Spar	Quartz	Slime	Tails	Spar	Quartz	Slime
IMC Filter Cake	129	20.9	10.2	91.1	126	20.7	10.7	85.2
IMC Coarse Tails	178	59.4	91.3	11.4	177	65.5	75.5	18.4
	307	80.3	101.5	112.5	303	86.2	86.2	103.6
Feld.Corp.Filter Cake	250	89.0	49.7	86.5	231	56.8	45.3	106.7
Feld.Corp.Coarse Tail	20	12.7	4.0	0.9	28.3	12.1	10.8	3.2
	270	101.7	53.7	87.4	259.3	68.9	56.1	109.9
Lawson Tails	235	105.0	66.9	33.16	302	118.1	102.1	56.1
Total	812	287.0	222.1	233.1	864.3	273.2	244.4	269.6

Results of flotation tests show it is not difficult to obtain grade on the feldspar product (10.5 percent total alkali and 19.0 percent Al_2O_3) with IMC filter cake, Feldspar Corporation filter cake and Lawson tails. Thus far it has proved difficult to recover a feldspar product of satisfactory grade from IMC and Feldspar Corporation coarse tails. The latter product constitutes only small tonnage.

(1) Daily samples were taken in January 1968

(2) Weekly samples were taken from July-September 1968

Results of screen analyses and chemical analyses of head samples of the various tailing samples and composites of such indicate that in some instances there is a significant difference between the daily and weekly samples. This is true of Lawson tails, Feldspar Corporation filter cake and for the chemical analysis of IMC coarse tails. Due to the large experimental error of the screen analysis and chemical analysis of IMC filter cake, no definite conclusions can be drawn.

Table D gives an approximation of the reagent consumption and reagent cost per ton of feed* for the flotation of a sample of the composite of weekly composites.

Table D

Reagent Consumption and Cost

Reagent	Reagent Cost/lb	Consumption lbs/Ton	Cost/Ton
H_2SO_4	2.2 ¢	1.9	4.2 ¢
M-70	16.4	0.5	8.2
F.O.	1.5	0.6	0.9
25-H	25.0	0.12	2.9
HF	21.5	0.92	19.7
Armac-T	27.0	0.29	7.8
NaOH	5.5	1.3	7.1
			50.8 ¢

* This is not flotation feed but total feed which includes slimes and plus 28 mesh mica

Conclusions

The only conclusions that can be drawn from the data thus far correlated are as follows.

1) It has proved difficult in the laboratory to produce a good quality feldspar product from Feldspar Corporation coarse tails and IMC coarse tails.

2) Feldspar, quartz and mica products can be produced without much difficulty from samples of the other tailing streams.

3) It did not prove difficult to produce, by flotation, feldspar, quartz and mica products from composites of the daily composites and composites of the weekly composites.

4) Results show that in some instances there is a significant difference between the daily and weekly samples. This difference may be in the screen analysis, chemical analysis of the head sample and/ or flotation results.

5) The screen analyses of the calculated composite of the daily and weekly composite, in some instances showed the confidence limits (95 percent confidence) for certain screen fractions to be relatively high.

6) The calculated composites of the daily and weekly composite, for the chemical analyses of the head sample, show the confidence limits for some of the analyses to be relatively high.

7) The calculated composites of the daily and weekly composite, for results of flotation tests (where possible), show in some instances the confidence limits (95 percent) for the weight percent of some of the products to be relatively high. While the confidence limits for the analysis of the feldspar and quartz products are not significant.

Future Studies

The following recommendations for future work are based on the results and conclusions stated in this report.

1) Conduct a complete flotation evaluation with emphasis put on IMC coarse tails and the composites of the various tailing streams.

2) Carry out another sampling program, at the three feldspar plants of Spruce Pine, as follows:

   Over a period of five weeks, sample each of the five tailing streams at random once each week. This sampling should, if possible, be carried out by Laboratory personnel. As previously one shovel full per truck load would be taken and composited in a drum. At week's end a representative sample would be taken from the drum for laboratory evaluation. The above samples will be evaluated in the laboratory as previously. It should be emphasized that sufficient sample should be obtained from each tailing stream in order that numerous tests can be carried out and that portions of the sample can be used for making up composites.

3) In order to determine if the percent of each tails incorporated in a composite is a controlling factor for making feldspar grade, it would be beneficial to make up composites having various amounts of each tailing stream for evaluation.

APPENDIX -

EXPERIMENTAL DATA

The following tables, Appendixes A, B and C, are a summation of the data thus far accumulated on the various tailing streams of the feldspar companies located at Spruce Pine. Where data is incomplete all available data is given, as in the flotation of individual samples.

Appendix A - This is a summation of the screen analyses of the daily and weekly samples for each tailing stream.

Appendix B - This is a summation of the chemical analyses of the head samples of each tailing stream.

Appendix C - This is a summation of those flotation tests which made grade (feldspar) on samples from the various tailing streams and composites of such samples.

Appendix A -

Screen Analyses

Appendix A is a summation of the screen analyses of the daily and weekly samples for each tailing stream. The following tables are included in Appendix A:

Table 1 - Lawson Tails

Table 2 - Feldspar Corporation Filter Cake

Table 3 - Feldspar Corporation Coarse Tails

Table 4 - IMC Filter Cake

Table 5 - IMC Coarse Tails

Table 6 - Actual Composites of Daily and Weekly Composites

For each sample stream the following information is given in each of the tables; also, the confidence limits* were calculated for the calculated composites.

1) Calculated composite of daily samples

2) Actual composite of daily samples

3) Calculated composite of weekly samples

4) Actual composite of weekly samples

*Based on 95 percent confidence

Appendix A

Table 1

Screen Analyses -

Lawson Tails

Screen	Calc. Comp. Daily Samples $\bar{X}$	Calc. Comp. Daily Samples $\pm$ L	Actual Comp. Daily Samples	Calc. Comp. Weekly Samples $\bar{X}$	Calc. Comp. Weekly Samples $\pm$ L	Actual Comp. Weekly Samples
+20	4.19	0.899	4.2	3.06	1.06	3.2
-20+28	8.37	1.089	8.9	6.18	1.34	6.7
-28+35	11.23	1.966	11.5	9.09	0.834	9.3
-35+48	11.10	1.683	11.1	11.82	1.281	11.7
-48+65	10.20	0.506	11.0	11.38	1.284	11.1
-65+100	13.30	0.904	11.2	11.43	1.537	11.9
-100+150	12.40	0.997	13.8	12.23	2.070	9.5
-150+200	9.40	1.278	9.9	11.33	1.921	12.5
-200+270	6.30	1.135	5.6	6.75	0.746	5.4
-270+325	4.65	0.931	4.2	5.63	0.687	6.4
-325+400	2.65	0.731	1.6	3.11	0.490	2.6
-400	6.28	1.127	7.0	7.99	2.029	9.7

Appendix A

Table 2

Screen Analyses -

Feldspar Corporation Filter Cake

Screen	Calc. Comp. Daily Samples $\bar{X}$	Calc. Comp. Daily Samples $\pm L$	Actual Comp. Daily Samples	Calc. Comp. Weekly Samples $\bar{X}$	Calc. Comp. Weekly Samples $\pm L$	Actual Comp. Weekly Samples
+20			0.3	0.18	0.158	0.1
-20+28			1.6	0.78	0.171	0.7
-28+35	4.17	0.866	2.5	1.57	0.199	1.6
-35+48	3.89	0.802	4.0	2.73	0.312	2.7
-48+65	5.52	0.836	6.0	4.04	0.52	3.9
-65+100	9.46	0.637	9.9	6.93	0.445	6.8
-100+150	12.77	0.734	13.7	10.20	0.836	8.6
-150+200	13.26	0.7619	13.6	12.08	0.872	14.4
-200+270	9.37	0.7192	9.1	10.16	0.406	7.5
-270+325	8.77	1.49	8.6	11.29	1.42	12.9
-325+400	4.69	0.843	3.2	5.44	1.47	4.9
-400	28.08	2.43	27.5	34.6	3.10	35.9

Appendix A

Table 3

Screen Analyses -

Feldspar Corporation Coarse Tails

Screen	Calc. Comp. Daily Samples $\bar{X}$	Calc. Comp. Daily Samples $\pm L$	Actual Comp. Daily Samples	Calc. Comp. Weekly Samples $\bar{X}$	Calc. Comp. Weekly Samples $\pm L$	Actual Comp. Weekly Samples
+20	5.88	3.31	5.8	4.08	0.777	3.7
-20+28	24.24	3.39	24.5	18.46	1.84	18.8
-28+35	26.86	3.85	27.9	25.26	1.51	24.0
-35+48	18.80	1.90	18.0	21.20	1.19	22.0
-48+65	10.26	1.46	10.5	13.30	0.836	13.3
-65+100	6.68	1.69	5.8	8.25	1.04	8.5
-100+150	3.46	1.37	3.6	4.52	0.511	4.1
-150+200	1.66	0.74	1.8	2.18	0.384	2.8
-200+270	0.74	0.29	0.7	0.9	0.090	0.8
-270+325	0.40	0.26	0.5	0.7	0.129	0.8
-325+400	0.18	0.164	0.2	0.26	0.063	0.3
-400	0.56	0.423	0.7	0.84	0.160	0.9

Appendix A

Table 4

Screen Analyses - IMC Filter Cake

Screen	Calc. Comp. Daily Samples $\bar{X}$	Calc. Comp. Daily Samples $\pm L$	Actual Comp. Daily Samples	Calc. Comp. Weekly Samples $\bar{X}$	Calc. Comp. Weekly Samples $\pm L$	Actual Comp. Weekly Samples
+20						
-20+28			0.2	0.23	0.0752	0.3
-28+35			0.3	0.51	0.0737	0.6
-35+48			0.5	0.69	0.1607	0.7
-48+65	1.71	1.215	0.5	0.75	0.145	0.8
-65+100	1.10	0.396	0.8	1.12	0.1259	1.1
-100+150	1.81	1.119	1.5	1.77	0.3390	1.6
-150+200	3.28	0.730	4.2	3.85	0.524	4.0
-200+270	5.30	1.528	9.8	9.85	3.722	5.4
-270+325	12.80	1.728	15.1	14.16	3.460	12.8
-325+400	5.27	0.575	7.4	7.10	2.294	6.2
-400	68.74	4.986	59.7	59.97	8.07	66.5

Appendix A

Table 5

Screen Analyses -

IMC Coarse Tails

Screen	Calc. Comp. Daily Samples $\bar{X}$	Calc. Comp. Daily Samples ± L	Actual Comp. Daily Samples	Calc. Comp. Weekly Samples $\bar{X}$	Calc. Comp. Weekly Samples ± L	Actual Comp. Weekly Samples
+20	2.01	0.335	1.7	1.64	0.608	1.5
-20+28	11.43	2.58	12.4	10.36	1.114	10.5
-28+35	16.39	3.245	16.8	17.08	0.531	16.6
-35+48	13.87	1.87	14.1	14.93	1.21	15.3
-48+65	10.34	1.41	10.2	11.19	0.84	11.0
-65+100	10.38	1.44	9.5	10.61	0.504	10.9
-100+150	11.63	1.59	13.0	10.32	1.403	9.0
-150+200	9.99	1.76	10.6	9.55	1.082	11.1
-200+270	6.34	1.24	5.5	5.21	0.746	3.9
-270+325	4.51	0.949	3.4	4.39	0.583	5.2
-325+400	1.18	0.377	1.0	1.62	0.384	1.6
-400	1.91	0.479	1.8	3.10	0.469	3.4
			100.0			

Appendix A

Table 6

Screen Analyses -

Actual Composites of Daily and Weekly Composites

Screen	Actual Composite of[1] Daily Composites, % Weight	Actual Composite of[2] Weekly Composites, % Weight
+20	1.9	1.6
-20+28	6.9	6.0
-28+35	8.6	8.4
-35+48	9.2	9.6
-48+65	7.5	8.2
-65+100	9.9	10.9
-100+150	9.7	7.1
-150+200	13.5	12.9
-200+270	7.1	19.6
-270+325	9.4	7.8
-325+400	3.1	1.8
-400	13.2	6.1

(1) Weighted composite of all daily samples of all five tailing streams

(2) Weighted composite of all weekly samples of all five tailing streams

Appendix B -

Chemical Analyses

Appendix B is a summation of the chemical analyses (Na_2O, K_2O, Fe_2O_3, Al_2O_3, SiO_2, CaO, I.L.) of the head samples of the daily and weekly samples of the various tailing streams. The following tables are included in Appendix B:

Table 1 - Lawson Tails

Table 2 - Feldspar Corporation Filter Cake

Table 3 - Feldspar Corporation Coarse Tails

Table 4 - IMC Filter Cake

Table 5 - IMC Coarse Tails

Table 6 - Actual Composites of Daily and Weekly Composites

The following is given in each of the tables of Appendix B:

1) Calculated composite of daily samples

2) Actual composite of daily samples

3) Calculated composite of weekly samples

4) Actual composite of weekly samples

Where calculated composites were made the confidence limits were also calculated.

Appendix B

Table 1

Chemical Analyses of Head Samples -

Lawson Tails

Analysis	Calc. Comp. Daily Samples $\bar{X}$	Calc. Comp. Daily Samples $\pm L$	Actual Comp. Daily Samples 2/68	Actual Comp. Daily Samples 8/68	Calc. Comp. Weekly Samples $\bar{X}$	Calc. Comp. Weekly Samples $\pm L$	Actual Comp. Weekly Samples
Na_2O	3.55	0.924	3.25	3.30	3.69	0.400	3.61
K_2O	2.97	0.121	2.91	3.23	2.91	0.213	2.87
Fe_2O_3	0.735	0.048	0.71	0.67	0.61	0.092	0.61
Al_2O_3	13.93	0.843	14.5	15.0	13.47	0.634	13.4
SiO_2	75.75	1.211	76.6	76.3	77.77	1.184	78.2
CaO	1.02	0.075	0.90	1.12	1.02	0.093	0.83
I.L.	0.48	0.042	0.49	0.49	0.54	0.052	0.55

Appendix B

Tables 2 and 3

Table 2

Chemical Analyses of Feldspar Corporation Filter Cake

Analysis	Calc. Comp. Daily Samples $\bar{X}$	Calc. Comp. Daily Samples $\pm$ L	Actual Comp. Daily Samples 2/68	Actual Comp. Daily Samples 8/68	Calc. Comp. Weekly Samples $\bar{X}$	Calc. Comp. Weekly Samples $\pm$ L	Actual Comp. Weekly Samples
Na_2O	3.55	0.105	3.60	3.85	3.95	0.319	3.92
K_2O	3.11	0.193	3.11	3.42	3.52	0.109	3.49
Fe_2O_3	0.86	0.068	0.94	0.83	0.94	0.099	0.94
Al_2O_3	16.77	0.435	16.70	16.60	16.19	0.355	16.4
SiO_2	73.50	0.800	73.50	73.50	73.53	1.914	73.7
CaO	1.18	0.105	1.10	1.20	1.08	0.071	1.02
I.L.	0.57	0.105	0.63	0.61	0.66	0.014	0.66

Table 3

Chemical Analyses of Feldspar Corporation Coarse Tails

Analysis	Calc. Comp. Daily Samples $\bar{X}$	Calc. Comp. Daily Samples $\pm$ L	Actual Comp. Daily Samples 2/68	Actual Comp. Daily Samples 8/68	Calc. Comp. Weekly Samples $\bar{X}$	Calc. Comp. Weekly Samples $\pm$ L	Actual Comp. Weekly Samples
Na_2O	3.26	0.578	3.25	3.10	3.41	0.41	3.15
K_2O	2.21	0.436	2.33	2.36	2.56	0.28	2.26
Fe_2O_3	1.19	0.534	1.14	1.10	1.20	0.15	1.26
Al_2O_3	14.64	3.80	14.4	13.50	13.40	1.06	12.30
SiO_2	77.02	5.33	77.6	77.8	77.35	1.12	79.70
CaO	1.00	0.224	0.90	1.02	1.00	0.098	0.82
I.L.	0.40	0.071	0.52	0.51	0.51	0.111	0.47

Appendix B

Tables 4 and 5

Table 4

Chemical Analyses of IMC Filter Cake

Analysis	Calc. Comp. Daily Samples		Actual Comp. Daily Samples		Calc. Comp. Weekly Samples		Actual Comp. Weekly Samples
	$\bar{X}$	$\pm$ L	2/68	8/68	$\bar{X}$	$\pm$ L	
Na_2O	3.61	0.102	3.70	5.00	4.00	0.145	4.18
K_2O	3.84	0.017	3.92	4.22	4.21	0.075	4.29
Fe_2O_3	1.01	0.077	1.14	0.98	0.93	0.065	0.87
Al_2O_3	17.35	0.992	17.80	17.6	18.55	0.260	18.4
SiO_2	70.49	1.46	70.6	69.8	69.31	0.309	69.7
CaO	1.302	0.086	1.20	1.42	1.170	0.053	0.98
I.L.	1.013	0.084	1.28	1.09	1.63	0.210	1.62

Table 5

Chemical Analyses of IMC Coarse Tails

Analysis	Calc. Comp. Daily Samples		Actual Comp. Daily Samples		Calc. Comp. Weekly Samples		Actual Comp. Weekly Samples
	$\bar{X}$	$\pm$ L	2/68	8/68	$\bar{X}$	$\pm$ L	
Na_2O	2.51	0.268	2.64	2.48	2.895	0.344	2.98
K_2O	2.24	0.254	2.04	2.35	2.702	0.251	2.67
Fe_2O_3	0.65	0.652	0.64	0.62	0.664	0.078	0.66
Al_2O_3	11.03	1.543	11.2	10.4	11.46	1.112	11.50
SiO_2	82.33	2.23	82.5	82.7	80.98	1.775	81.70
CaO	0.74	0.085	0.50	0.80	0.718	0.104	0.64
I.L.	0.39	0.06	0.50	0.46	0.463	0.052	0.53

Appendix B

Table 6

Chemical Analyses -

Actual Composites of Daily and Weekly Composites

Analysis	Actual Composite of Daily Composites	Actual Composite of Weekly Composites
Na_2O	3.57	3.55
K_2O	3.03	3.05
Fe_2O_3	0.43	0.44
Al_2O_3	14.0	14.0
SiO_2	77.4	77.4
CaO	0.98	0.94
I.L.	0.58	0.60

Appendix C -

Flotation Data

Appendix C is a summation of the results of flotation tests carried out on daily and weekly samples for each tailing stream. Results are not given where feldspar flotation product did not meet grade. The confidence limits* are given where it was deemed practical. If only a few tests met grade, the confidence limits for that tailing stream were not calculated.

Table 1 - Lawson Tails

a) Calculated composite of flotation results on daily samples

b) Flotation results on actual composite of daily samples

Table 2 - Lawson Tails

a) Calculated composite of flotation results on weekly samples

b) Flotation results on actual composite of weekly samples

Table 3 - Feldspar Corporation Filter Cake

a) Calculated composite of flotation results on daily samples

b) Flotation results on actual composite of daily samples

Table 4 - Feldspar Corporation Filter Cake

a) Calculated composite of flotation results on weekly samples

b) Flotation results on actual composite of weekly samples

*Based on 95 percent confidence

Table 5 - Feldspar Corporation Coarse Tails

a) Calculated composite of flotation results on daily samples

b) Flotation results on actual composite of daily samples

Table 6 - Feldspar Corporation Coarse Tails

a) Calculated composite of flotation results on weekly samples

b) Flotation results on actual composite of weekly samples

Table 7 - IMC Filter Cake

a) Calculated composite of flotation results on daily samples

b) Flotation results on actual composite of daily samples

Table 8 - IMC Filter Cake

a) Calculated composite of flotation results on weekly samples

b) Flotation results on actual composite of weekly samples

Table 9 - IMC Coarse Tails

a) Calculated composite of flotation results on daily samples

b) Flotation results on actual composite of daily samples

Table 10 - IMC Coarse Tails

a) Calculated composite of flotation results on weekly samples

b) Flotation results on actual composite of weekly samples

Table 11 - Actual Composites of Daily and Weekly Composites

Appendix C

Table 1

Flotation Results - Lawson Tails

Daily Samples

a. Calculated Composite of Daily Samples

Product	Wt % $\bar{X}$	Wt % ± L		Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	11.8	2.19								
Secondary Slime	2.31	0.45								
+28 Mesh Mica	0.87	0.13								
+80 Mesh Mica	4.85	0.63								
-80 Mesh Mica	3.94	0.84								
Iron Float	3.09	0.69								
Spar Float	44.68	1.58	$\bar{X}$	6.52	3.97	0.057	19.51	68.45	1.55	0.17
			± L	0.075	0.305	0.002	0.31	0.54	0.002	0.02
Quartz Prod.	28.46	2.70	$\bar{X}$	0.075	0.046	0.014				

Above data based on ten out of ten samples

b. Actual Composite of Daily Samples

Product	Wt %	Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	12.3							
Secondary Slime	1.9							
+28 Mesh Mica	0.3							
+80 Mesh Mica	7.3							
-80 Mesh Mica	6.5							
Iron Float	1.7							
Spar Float	40.2	6.35	4.00	0.057	19.3	68.5	1.52	0.18
Quartz Prod.	29.8	0.05	0.03	0.015				

* Fe_2O_3 analysis after magnetic separation

Appendix C

Table 2

Flotation Results - Lawson Tails

Weekly Samples

a. Calculated Composite of Weekly Samples

Product	Wt. % $\bar{X}$	Wt. % $\pm$ L		Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	15.8	3.12								
Secondary Slime	2.77	0.65								
+28 Mesh Mica	0.34	0.18								
+80 Mesh Mica	3.5	0.66								
-80 Mesh Mica	2.6	0.93								
Iron Float	2.1	0.99								
Spar Float	39.1	3.41	$\bar{X}$	6.63	4.01	0.063	19.61	67.69	1.58	0.17
			$\pm$L	0.123	0.14	-	0.36	0.42	0.11	0.04
Quartz Prod.	33.8	4.07	$\bar{X}$	0.08	0.04	0.02				

Above data based on nine out of ten samples

b. Actual Composite of Weekly Samples

Product	Wt %	Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	15.3							
Secondary Slime	1.7							
+28 Mesh Mica	0.2							
+80 Mesh Mica	2.8							
-80 Mesh Mica	2.7							
Iron Float	2.3							
Spar Float	41.7	6.56	4.00	0.067	19.4	68.3	1.60	0.22
Quartz Prod.	33.3	0.06	0.03	0.010				

* Fe_2O_3 analysis after magnetic separation

Appendix C

Table 3

Flotation Results - Feldspar Corporation Filter Cake

Daily Samples

a. Calculated Composite of Daily Samples

Product	Wt % $\bar{X}$	Wt % $\pm L$		Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	31.16	3.46								
Secondary Slime	3.44	0.63								
+28 Mesh Mica	0.67	0.25								
+80 Mesh Mica	3.00	1.25								
-80 Mesh Mica	2.80	0.91								
Iron Float	3.54	1.12								
Spar Float	35.62	2.90	$\bar{X}$	6.80	3.84	0.06	20.08	67.33	1.60	0.19
			$\pm L$	0.15	0.27	-	0.46	0.63	0.016	0.04
Quartz Prod.	19.86	3.11	$\bar{X}$	0.07	0.26	0.02				

Above data based on eleven out of twelve samples

b. Actual Composite of Daily Samples

Product	Wt %	Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	31.5							
Secondary Slime	2.2							
+28 Mesh Mica	0.8							
+80 Mesh Mica	5.3							
-80 Mesh Mica	1.3							
Iron Float	1.5							
Spar Float	32.5	6.821	4.03	0.071	20.3	67.0	1.52	0.10
Quartz Prod.	24.9	0.30	0.17	0.036				

* Fe_2O_3 analysis after magnetic separation

Appendix C

Table 4

Flotation Results - Feldspar Corporation Filter Cake

Weekly Samples

a. Calculated Composite of Weekly Samples

Product	Wt % $\bar{X}$	Wt % $\pm L$		Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	42.2	3.13								
Secondary Slime	3.98	0.74								
+28 Mesh Mica	0.53	0.08								
+80 Mesh Mica	4.84	1.17								
-80 Mesh Mica	2.84	0.11								
Iron Float	1.41	0.34								
Spar Float	24.62	2.81	$\bar{X}$	6.43	4.40	0.09	19.82	67.53	1.36	0.24
			$\pm L$	0.15	0.19	0.002	0.57	0.82	0.013	0.007
Quartz Prod.	19.56	4.98	$\bar{X}$	0.49	0.18	0.040				

Above data based on nine out of ten samples

b. Actual Composite of Weekly Samples

Product	Wt %	Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	43.6							
Secondary Slime	3.9							
+28 Mesh Mica	0.6							
+80 Mesh Mica	5.6							
-80 Mesh Mica	5.6							
Iron Float	1.9							
Spar Float	21.8	6,40	4.34	0.050	19.2	68.3	1.26	1.00
Quartz Prod.	17.0	0.05	0.07	0.014				

* Fe_2O_3 analysis after magnetic separation

Appendix C

Table 5

Flotation Results - Feldspar Corporation Coarse Tails

Daily Samples

a. Calculated Composite of Daily Samples

Product	Wt % $\bar{X}$	Wt % $\pm$ L		Na_2O	K_2O	Fe_2O_3**	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	3.3	-								
Secondary Slime	1.3	-								
+28 Mesh Mica	1.6	-								
+80 Mesh Mica	3.2	-								
-80 Mesh Mica	0.8	-								
Iron Float	6.1	-								
Spar Float	63.4	-	$\bar{X}$	6.82	3.29	0.066	19.5	68.5	1.52	0.21
			$\pm$L							
Quartz Prod.	20.3		$\bar{X}$	0.26	0.11	0.021				

Note: The average results given here are based on two out of five samples. Analysis of other tests showed flotation products did not meet grade.

b. Actual Composite of Daily Samples*

Product	Wt %	Na_2O	K_2O	Fe_2O_3**	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	3.5							
Secondary Slime	1.0							
+28 Mesh Mica	0.4							
+80 Mesh Mica	1.3							
-80 Mesh Mica	1.0							
Iron Float	4.1							
Spar Float	39.1	6.75	3.62	0.073				
Quartz Prod.	49.6	1.44	0.71	0.036				

*Analysis incomplete

** Fe_2O_3 analysis after magnetic separation

Appendix C

Table 6

Flotation Results - Feldspar Corporation Coarse Tails

Weekly Samples

a. Calculated Composite of Weekly Samples

Product	Wt % $\bar{X}$	Wt % $\pm$ L		Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime										
Secondary Slime										
+28 Mesh Mica										
+80 Mesh Mica										
-80 Mesh Mica										
Iron Float										
Spar Float			$\bar{X}$							
			$\pm$L							
Quartz Prod.										

Note: Flotation results are not given here because it has not been possible thus far to make feldspar grade, (10.5 total alkali and/or 19 + % Al_2O_3).

b. Actual Composite of Weekly Samples

Product	Wt %	Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	6.5							
Secondary Slime	4.8							
+28 Mesh Mica	0.9							
+80 Mesh Mica	2.7							
-80 Mesh Mica	0.8							
Iron Float	3.2							
Spar Float	43.0	6.86	3.49	0.063	20.0	67.8	1.52	0.25
Quartz Prod.	38.1	0.18	0.06	0.049				

* Fe_2O_3 analysis after magnetic separation

Appendix C

Table 7

Flotation Results - IMC Filter Cake

Daily Samples

a. Calculated Composite of Daily Samples

Product	Wt % $\bar{X}$	Wt % $\pm L$		Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	57.68	2.56								
Secondary Slime	12.39	1.61								
+28 Mesh Mica	-	-								
+80 Mesh Mica	1.97	0.75								
-80 Mesh Mica	3.64	1.22								
Iron Float	0.60	0.46								
Spar Float	14.3	2.36	$\bar{X}$	6.12	5.27	0.085	20.4	65.69	1.46	0.29
			$\pm L$	0.18	0.17	-	0.04	0.603	0.08	0.20
Quartz Prod.	9.48	2.81	$\bar{X}$	1.10	0.80	0.047				
			$\pm L$	0.97	0.78	-				

Above data based on nine out of nine samples

b. Actual Composite of Daily Samples

Product	Wt %	Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	47.0							
Secondary Slime	17.2							
+28 Mesh Mica	0.1							
+80 Mesh Mica	5.4							
-80 Mesh Mica	1.3							
Iron Float	0.5							
Spar Float	18.9	6.54	5.04	0.048	20.5	66.1	1.48	0.16
Quartz Prod.	9.6	0.68	0.34	0.014				

* Fe_2O_3 analysis after magnetic separation

Appendix C

Table 8

Flotation Results - IMC Filter Cake

Weekly Samples

a. Calculated Composite of Weekly Samples

Product	Wt % $\bar{X}$	Wt % $\pm L$		Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	49.4	-								
Secondary Slime	18.7	-								
+28 Mesh Mica	0.1	-								
+80 Mesh Mica }	4.7	-								
-80 Mesh Mica }										
Iron Float	0.6	-								
Spar Float	15.4	-	$\bar{X}$	6.34	5.21	0.196	20.25	66.5	1.26	0.21
			$\pm L$							
Quartz Prod.	9.4	-	$\bar{X}$	1.20	0.80	0.037				

Note: The averages for both the weight % and chemical analysis are based on 6 samples out of 10. The remaining samples are either not completely analyzed or did not make grade.

b. Actual Composite of Weekly Samples

Product	Wt %	Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	59.9							
Secondary Slime	11.6							
+28 Mesh Mica	0.1							
+80 Mesh Mica }	6.2							
-80 Mesh Mica }								
Iron Float	1.6							
Spar Float	13.9	6.68	4.83	0.077	19.5	67.6	1.20	0.20
Quartz Prod.	6.7	0.30	0.15	0.015				

* Fe_2O_3 analysis after magnetic separation

Appendix C

Table 9

Flotation Results - IMC Coarse Tails

Daily Samples

a. Calculated Composite of Daily Samples

Product	Wt % $\bar{X}$	Wt % $\pm$ L		Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	5.8	-								
Secondary Slime	3.4	-								
+28 Mesh Mica	0.35	-								
+80 Mesh Mica	2.2	-								
-80 Mesh Mica	1.6	-								
Iron Float	1.25	-								
Spar Float	37.9	-	$\bar{X}$	6.39	4.41	0.011	19.85	67.15	1.38	0.19
			$\pm$L							
Quartz Prod.	47.5		$\bar{X}$	0.055	0.03	0.024				

Note: Results given here are based on the average of only 2 samples. Flotation products of other samples did not make grade.

b. Actual Composite of Daily Samples

Product		Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	5.9							
Secondary Slime	1.5							
+28 Mesh Mica	0.2							
+80 Mesh Mica	2.3							
-80 Mesh Mica	2.1							
Iron Float	2.4							
Spar Float	34.3	6.40	4.20	0.073	19.5	68.0	1.40	0.20
Quartz Prod.	51.3	0.11	0.07	0.014				

* Fe_2O_3 analysis after magnetic separation

Appendix C

Table 10

Flotation Results - IMC Coarse Tails

Weekly Samples

a. Calculated Composite of Weekly Samples

Product	Wt % $\bar{X}$	Wt % $\pm L$		Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	8.6	-								
Secondary Slime	1.8	-								
+28 Mesh Mica	0.16	-								
+80 Mesh Mica	4.54	-								
-80 Mesh Mica	2.70	-								
Iron Float	2.40	-								
Spar Float	37.0	-	$\bar{X}$	6.48	4.47	0.10	19.6	67.6	1.33	0.33
			$\pm L$							
Quartz Prod.	42.7	-	$\bar{X}$	0.18	0.08	0.025				

Note: The average results given here are based on only 4 samples. The results of the flotation tests on the other samples are either incomplete or did not make grade.

b. Actual Composite of Weekly Samples

Product	Wt %	Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	8.9							
Secondary Slime	1.5							
+28 Mesh Mica	0.3							
+80 Mesh Mica	3.1							
-80 Mesh Mica	2.1							
Iron Float	3.0							
Spar Float	36.6	6.25	4.33	0.054	18.9	68.7	1.28	0.16
Quartz Prod.	44.5	0.05	0.03	0.014				

* Fe_2O_3 analysis after magnetic separation

Appendix C

Table 11

Flotation Results - Composites of Composites

a. Actual Composite of Daily Composites

Product	Wt %	Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	22.7							
Secondary Slime	4.0							
+28 Mesh Mica	0.7							
+80 Mesh Mica	2.8							
-80 Mesh Mica	2.8							
Iron Float	2.5							
Spar Float	35.9	6.54	4.15	0.07	19.4	68.2	1.52	0.19
Quartz Prod.	28.6	0.05	0.03	0.022				

Note: Although 2 flotation tests were run on this material, the results of what is considered the best test are given.

b. Actual Composite of Weekly Composites

Product	Wt %	Na_2O	K_2O	Fe_2O_3*	Al_2O_3	SiO_2	CaO	I.L.
Primary Slime	23.2							
Secondary Slime	4.0							
+28 Mesh Mica	0.6							
+80 Mesh Mica	3.3							
-80 Mesh Mica	2.4							
Iron Float	2.1							
Spar Float	34.0	6.39	4.02	0.066	19.3	68.3	1.43	0.18
Quartz Prod.	30.0	0.11	0.06	0.023				

Note: Although 2 flotation tests were run on this material, the results of what is considered the best test are given.

* Fe_2O_3 analysis after magnetic separation