

*PILOT PLANT TEST WORK
RESOLUTION COPPER PROJECT*

RIO TINTO

KM4420

December 19, 2014

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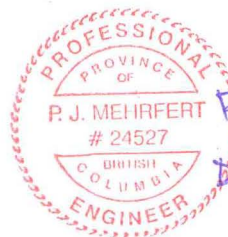


Cameron Bruin, EIT
Project Metallurgist



Peter Mehrfert, P. Eng.
Manager - Operations

December 19, 2014
KM4420



Dec. 19, 2014

Report Distribution:
Andrew Luke, Resolution Copper, Arizona, USA

1.0 Introduction

Rio Tinto is evaluating the Resolution Copper deposit located in Arizona. The main element of interest for this project is copper, with a secondary value in molybdenum.

Mr. Andrew Luke, Metallurgical Engineer for Resolution Copper, requested a proposal to complete pilot plant testing on sample from the deposit. A proposal was sent via email on July 31, 2014. Approval was given to proceed with the test program and test work commenced upon receipt of the sample.

The principle objectives of this project as defined by Mr. Luke were to:

- Construct a composite and assess the chemical and mineralogical characteristics of the sample.
- Conduct limited metallurgical laboratory test work to confirm the performance for two flowsheets, namely a bulk circuit and selective circuit.
- Prepare pilot plant feed material, and operate a pilot plant to evaluate continuous metallurgical performance of both flowsheets.
- Produce pilot plant bulk concentrates for subsequent copper-molybdenum separation testing.
- Produce pilot plant flotation products for testing by other vendors.
- Produce pilot plant products for environmental testing.

A shipment, comprised of 12 wooden crates, was received at ALS Metallurgy Kamloops on September 11, 2014. From this material, a Lab Composite and a Pilot Composite, totaling approximately 4.8 tonnes, were constructed by combining the samples received, as per client instructions. Details on samples received and composite construction can be located in Appendix I.

The metallurgical program began in mid-September 2014 and the pilot plant campaign took place between October 27 and November 5, 2014. Mr. Andrew Luke and Mr. Rich Heig were onsite for the majority of the piloting campaign. We would like to acknowledge both of them for their technical input and guidance during the program. Following the test work, preparation of this technical report commenced.

The following technical brief summarizes only the key points of the program. All of the test data generated by this program can be reviewed in a series of appendices attached to this brief. The appendices are arranged as follows:

Appendix I - Sample Origin

Appendix II - Flotation Test Data

Appendix III - Particle Sizing Data

Appendix IV - Special Data

Appendix V - Mineralogical Data

Appendix VI - Pilot Plant Data

2.0 Ore Characterization

There are several inherent characteristics of an ore that will predispose the process design required to extract and concentrate minerals of value. The mineral and chemical content dictate the configuration of the flotation process required. The mineral fragmentation characteristics determine the primary grinding requirements to permit a physical separation of the minerals ahead of flotation. These characteristics are discussed in the following subsections.

2.1 Chemical and Mineral Content

The chemical composition of the Lab Composite was determined using standard analytical techniques. The resulting data is summarized in Table 1. Full chemical composition data can be found in Appendix IV. Copper assayed at about 2.1 percent, and molybdenum was measured at 0.038 percent.

The mineral content of the composite was determined by conducting a Particle Mineral Analysis (PMA) using QEMSCAN at a nominal 159 μ m K₈₀. A summary of the mineral content data from the analysis is presented in Table 2. Chalcopyrite was the main copper mineral observed, at about 2.8 percent of the sample. Secondary copper minerals were also present, and accounted for almost half the copper content in the sample.

Significant pyrite content was measured, at about 7.6 percent of the mass. Selective conditions against pyrite would be required to produce a high grade copper concentrate. As well, pyrite and other sulphides in the tailings may cause acid rock drainage. Special processing to mitigate acid rock drainage would likely be necessary if this is a concern.

Talc measured about 0.2 percent of the mass, and could pose dilution problems in concentrates as talc is naturally hydrophobic.

TABLE 1
HEAD ASSAY SUMMARY DATA
Metallurgical Lab Composite

Sample	Assay – percent					
	Cu	Fe	Fe(t)	Mo	S(t)	S(s)
Lab Composite	2.06	6.3	6.4	0.038	6.31	6.22

Note: Detailed head assay data is located in Appendix IV.

TABLE 2
MINERAL COMPOSITION

Minerals	Content (percent)	Copper Distribution (percent)
Chalcopyrite	2.77	51.6
Bornite	0.47	16.0
Chalcocite	0.63	26.6
Covellite	0.11	3.8
Enargite/Tennantite	0.02	0.6
Native Copper/Cuprite	0.02	1.4
Molybdenite	0.03	-
Sphalerite	0.06	-
Pyrite	7.63	-
Quartz	44.1	-
Micas	34.4	-
Feldspars	3.25	-
Chlorite	0.65	-
Talc	0.21	-
Fluorite	0.08	-
Other	5.52	-
Total	100	100

Note: Detailed mineralogical data is located in Appendix V.

2.2 Mineral Fragmentation

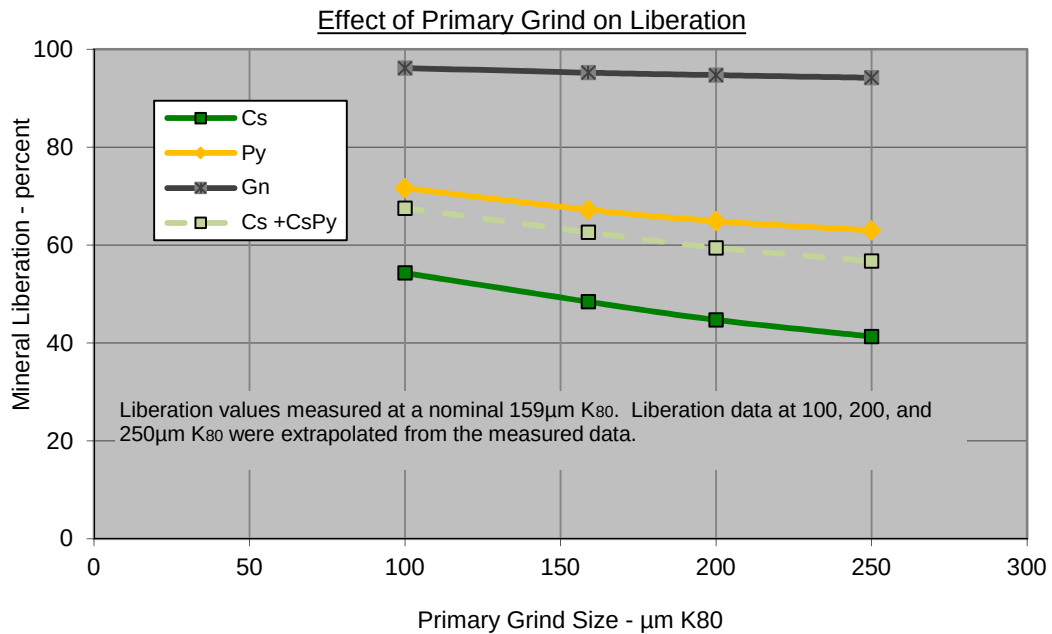
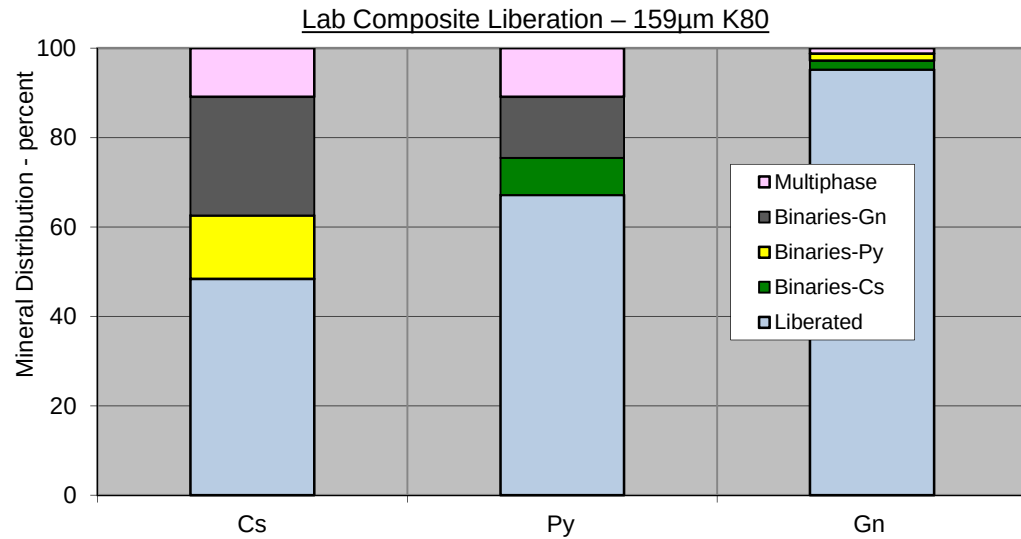
The Particle Mineral Analysis (PMA) liberation data for the Lab Composite was obtained at a primary grind sizing of about 159 μ m K₈₀. The analysis was conducted on four size fractions and provided quantitative fragmentation data for the main sulphide minerals as well as non-sulphide gangue. The data generated from these analyses is presented in Figure 1.

Copper sulphide liberation for the Lab Composite measured about 48 percent when measured in two dimensions, which would be considered slightly low for good rougher circuit recovery. Typically, liberation values of about 50 to 55 percent are targeted in the primary grind for good sulphide rougher circuit performance. Unliberated copper sulphides were mainly associated with non-sulphide gangue and pyrite at about 27 and 14 percent of the copper, respectively.

Pyrite was about 67 percent liberated in the feed. This liberation is very favorable, and may provide reasonable opportunity to have a selective rougher circuit. Copper sulphides could theoretically be recovered without recovering all the pyrite into the same product.

When considering a bulk circuit, liberated copper sulphide plus copper sulphide locked with pyrite could be considered together. In this light, copper liberation would be excellent and a coarser primary grind of around 250 μ m K₈₀ may be possible while maintaining copper performance. However, the quality and efficient recovery of binary and multiphase sulphides with gangue would need to be considered due to acid rock drainage concerns of the tailings.

FIGURE 1
MINERAL LIBERATION



Notes: a) Cs - Copper Sulphides; Gn-Non-Sulphide Gangue Minerals; Py-Pyrite
 b) Cs + CsPy includes Liberated copper sulphides, and copper sulphides in binary with pyrite.
 c) Detailed mineralogical data is located in Appendix V.

3.0 Metallurgical Testing

Laboratory flotation tests were performed prior to pilot plant operation in order to confirm metallurgical response of the sample to the developed flowsheets. Rougher, cleaner and locked cycle tests were conducted to establish final conditions to be used in pilot plant operation. Both the selective and bulk flowsheets were carried throughout the project. The following subsections describe the flowsheets and test results.

3.1 The Flowsheets

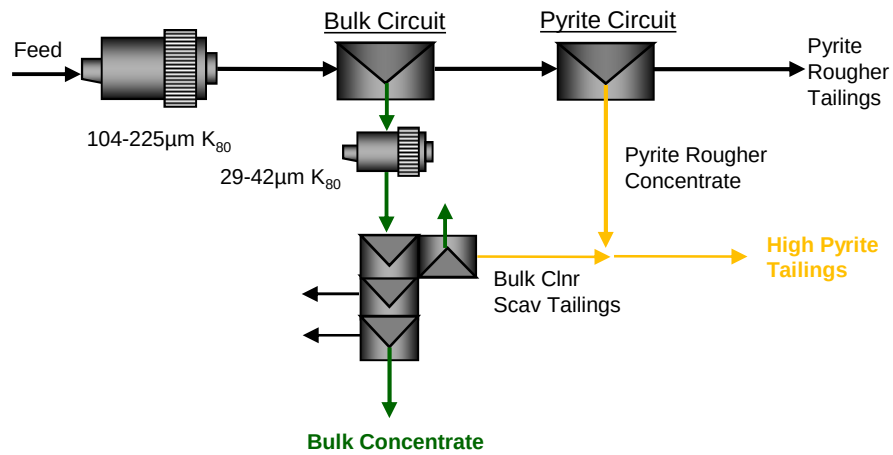
The flowsheets used in this test program are presented in Figure 2. For the selective flowsheet, Cytec Aero 8989 promoter was used as the copper collector in the bulk circuit. Fuel oil was used to assist with molybdenum flotation. Lime was added to both the primary grind and regrind to modulate the pH to provide more selective conditions against pyrite. SIPX, and in one test PAX, was used in the pyrite circuit, to recover sulphide material from the tailings to minimize acid rock drainage potential. The bulk flowsheet used SIPX in the roughers and cleaners. Fuel oil was also used to assist with molybdenum flotation. Lime was added only in the cleaners, to reject pyrite out the cleaner tailings.

The selective circuit, although slightly more intricate and expensive from a reagent perspective, provides benefits in regrinding requirements, as well as cleaning simplicity, with less pyrite and mass reporting to the bulk cleaners. The use of a weaker collector may also reduce pyrite flotation from residual collector in the cleaner.

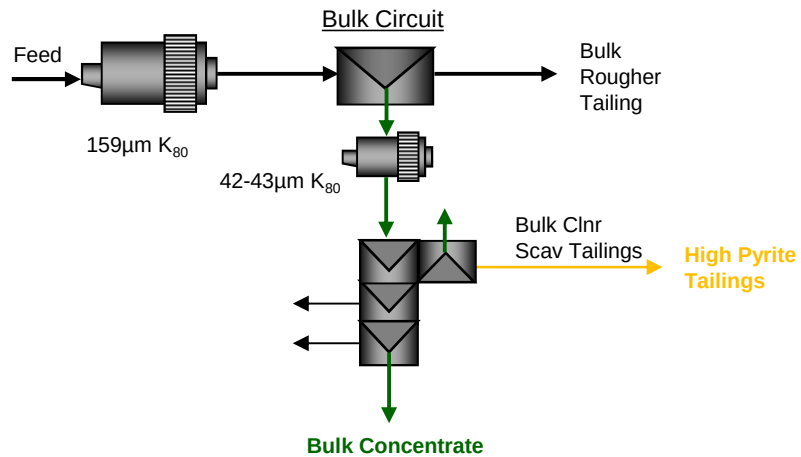
The segregation of the pyrite flotation allows for less restraint when pulling the pyrite concentrate to achieve low sulphide content in the rougher tailings. The most important consideration for the selective circuit is finding and operating at the point where copper recovery does not drop, while selectivity over pyrite remains beneficial.

FIGURE 2
FLWSHEETS USED IN THE TEST PROGRAM

Selective Flowsheet



Bulk Flowsheet

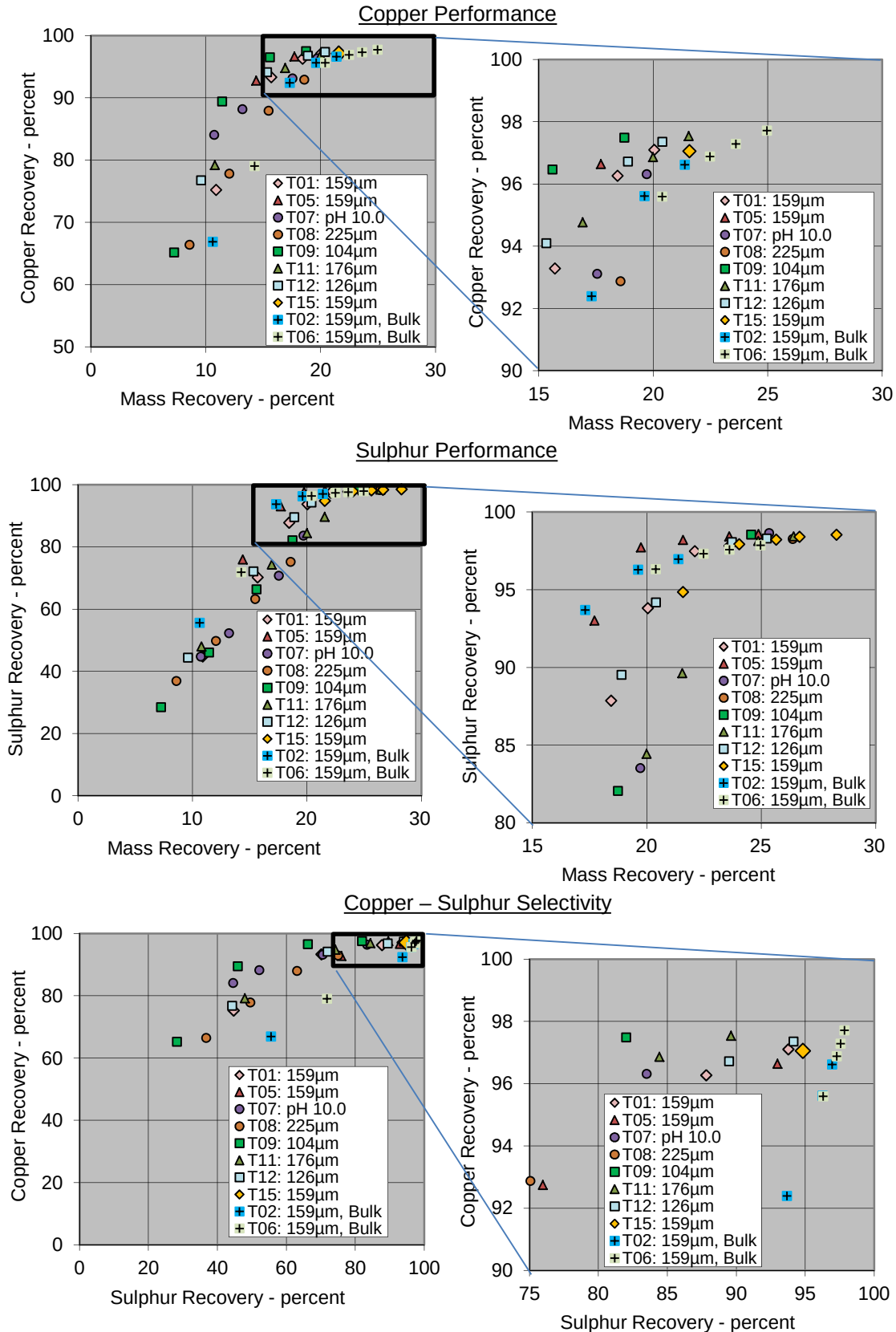


3.2 Rougher Test Results

Kinetic rougher flotation tests using the selective and bulk flowsheets were completed on the composite. The rougher flotation test data is summarized and presented in Figure 3 and the following comments provide a summary of the data:

- For the selective flowsheet, the bulk roughers recovered from 93 to 98 percent of the copper, at mass recoveries from about 18 to 22 percent. Sulphur recovery ranged from 75 to 95 percent.
- For the bulk flowsheet, the bulk roughers recovered from 97 to 98 percent of the both copper and sulphur, at mass recoveries of about 21 to 25 percent.
- A grind series on the selective circuit indicated improved copper kinetics for the finest grind, at 104 μ m K₈₀, and poorer kinetics at 225 μ m K₈₀ as might be expected. Intermediate grinds, from 126 to 176 μ m K₈₀ showed little change in performance. Sulphur kinetics were relatively unchanged at all grind sizes, indicating the improvement in copper performance may be related to increased liberation of copper sulphides from non-sulphide gangue, as opposed to pyrite.
- Total sulphur grades in the final rougher tailings assayed between 0.11 and 0.16 percent for the selective flowsheet, and between 0.16 and 0.22 percent for the bulk flowsheet. It proved difficult to recover the remaining sulphur. Optical microscopic examination of the tails indicated the sulphur occurred as small inclusions in gangue, and very finely liberated particles. Over-aggressive conditions to improve sulphur recovery may cause negative implications in the cleaner, specifically for the bulk flowsheet.

FIGURE 3
ROUGHER FLOTATION TEST RESULTS – ALL FLOWSHEETS



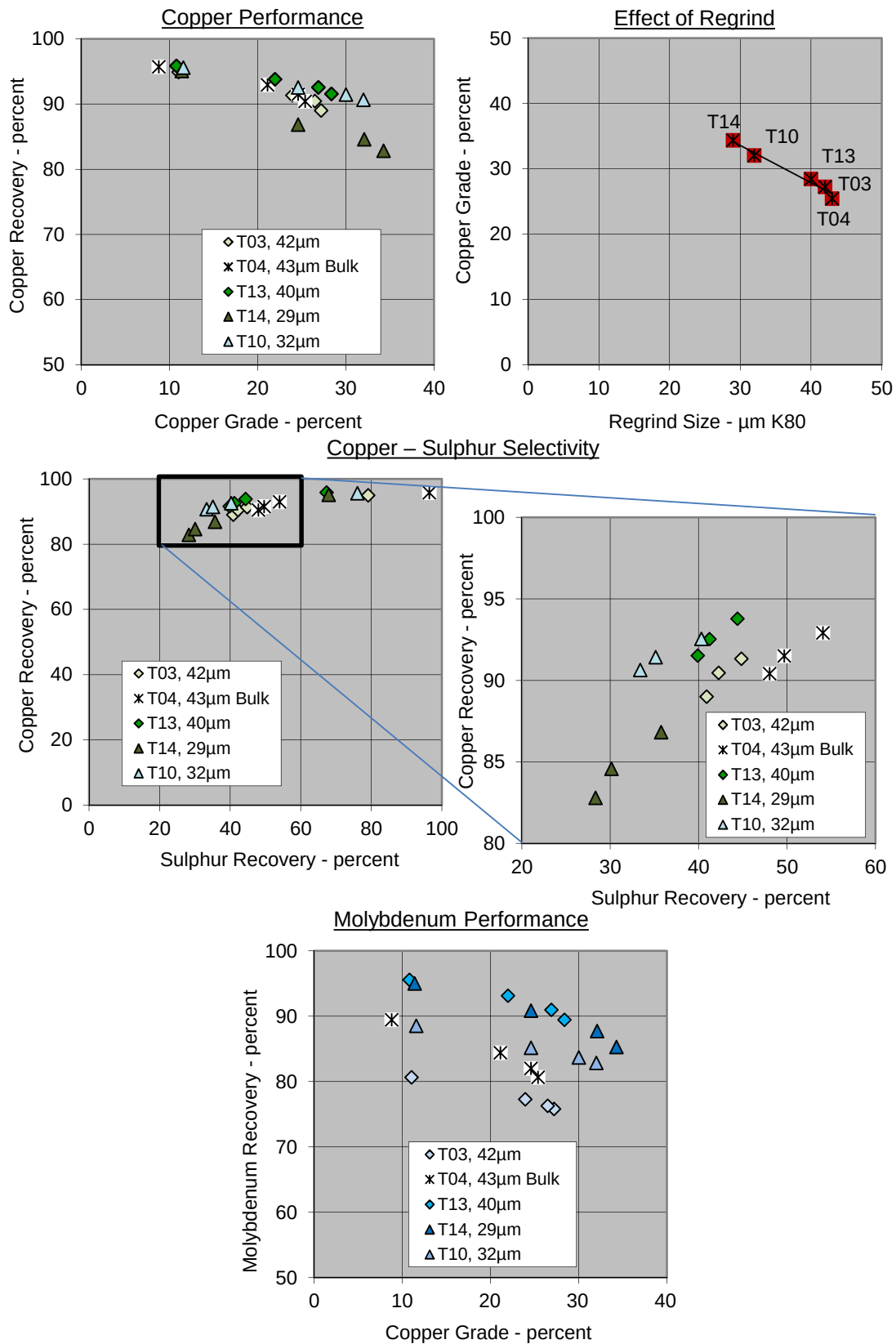
Notes: a) All Tests except T02 and T06 utilized the selective flowsheet. The pyrite rougher data has been removed from analysis for simplicity, except for sulphur performance.
b) Detailed test results and conditions are located in Appendix II.

3.3 Cleaner Test Results

Laboratory open circuit batch cleaner tests were performed with the Lab Composite to provide metallurgical performance using selective and bulk flowsheet conditions. The cleaner flotation test data is summarized and presented in Figure 4. The following comments provide a summary of the data:

- Final bulk concentrate copper grades ranged from 25 to 34 percent at recoveries of about 83 to 92 percent. This analysis, including the figures, does not include the cleaner scavenger concentrate. Recovery would be expected to increase with the recirculation of this stream and other intermediate tails.
- Between the bulk and selective flowsheets, no significant change was observed in the grade recovery curve of copper; however, copper selectivity over sulphur was slightly compromised in the one bulk flowsheet cleaner conducted. In closed circuit, this effect would likely be magnified, with increased pyrite, along with xanthate collector recirculated.
- A trend of final bulk concentrate grade and regrind discharge sizing was observed. Care must be taken with this analysis as the range of regrind size is not very wide, and recovery is not included in the relationship. However, it does provide some indication that final concentrate grade is largely dependent on regrind size.
- Molybdenum performance was most notably affected by rougher recoveries. Final molybdenum recoveries to the bulk concentrate ranged from 76 to 89 percent, at grades of 0.41 to 0.64 percent.

FIGURE 4
CLEANER FLOTATION TEST RESULTS



Notes: a) All tests except T04 utilize the selective circuit.

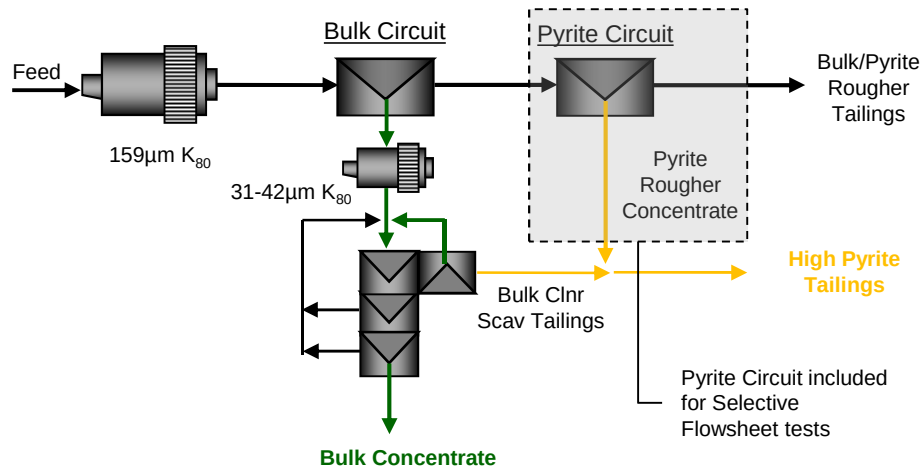
b) Detailed test results and conditions can be located in Appendix II.

3.4 Locked Cycle Test Results

Locked cycle tests were performed using both flowsheets to provide an estimation of performance under closed circuit conditions and what might be expected in the pilot plant. Test flowsheet, conditions, and a summary of locked cycle test results are shown in Figure 5. The following points may be of interest when reviewing the data:

- As expected, the bulk flowsheet proved more difficult to produce a high grade final concentrate. The first locked cycle test, with conditions taken from open circuit cleaner testing, resulted in a final concentrate of about 22 percent copper at a recovery of about 94 percent. A second test on the bulk flowsheet, with reduced cleaner time and collector showed a slight improvement in grade, to 24 percent copper, without affecting copper recovery.
- The selective flowsheet initially produced a concentrate at a copper grade of about 26 percent and a recovery of about 92 percent. A second locked cycle, at a finer regrind sizing of 31 μ m K₈₀ significantly improved grade, to almost 34 percent copper, while dropping recovery to 91 percent.
- Molybdenum recovery was 86 percent for both selective flowsheet locked cycle tests, and 86 to 88 percent for the two bulk flowsheet tests.
- Sulphur recovery to the bulk concentrate was significantly lower in the selective flowsheet tests than the bulk flowsheet tests. Again, the balance between copper selectivity in the roughers and overall performance is of great importance.

FIGURE 5
LOCKED CYCLE FLOTATION TESTS



Locked Cycle Test Conditions

Bulk Circuit						Selective Circuit						
Stage	Time min	pH	Reagent Dosage - g/tonne			Stage	Time min	pH	Reagent Dosage - g/tonne			
			Lime	Fuel Oil	SIPX				Lime	Fuel Oil	8989	SIPX
Primary Grind	12	7.5-7.6	-	10	-	Primary Grind	12	8.4-8.8	100-125	10	-	-
Bulk Roughers	12	7.4-7.6	-	-	16	Bulk Roughers	7	9.0	25	-	8	-
Bulk Regrind	18	11.0	300-400	10	-	Bulk Regrind	12 - 30	10.9-11.0	100-125	10	-	-
Bulk Cleaners	7-12	11.0	√	-	2.5 - 4	Bulk Cleaners	15 - 16	11.0	200-250	-	4 - 5	-
Bulk Cleaner Scav	2	11.0	√	10	1 - 2	Bulk Cleaner Scav	2	11.0	√	10	2 - 3	-
						Pyrite Roughers	6-8	8.6-8.8	-	-	-	25

Locked Cycle Test Results

Product	Mass - percent	Assay - percent				Distribution - percent			
		Cu	Mo	Fe	S	Cu	Mo	Fe	S
<u>T16: Bulk Circuit</u>									
Bulk Ro Tail	76.9	0.09	0.004	1.3	0.21	3	7	17	3
Bulk Clnr Scav Tail	14.4	0.37	0.012	15.1	17.0	3	5	38	41
Bulk 3rd Clnr Con	8.7	21.7	0.395	30.1	39.5	94	88	45	57
<u>T18: Bulk Circuit, Reduced Cleaner Collector</u>									
Bulk Ro Tail	78.2	0.08	0.004	1.3	0.19	3	8	17	3
Bulk Clnr Scav Tail	13.8	0.47	0.016	17.0	18.5	3	6	40	44
Bulk 3rd Clnr Con	8.0	24.0	0.381	31.3	38.8	94	86	43	54
<u>T17: Selective Circuit, Regrind</u>									
Pyrite Ro Tail	74.6	0.05	0.004	1.1	0.2	2	7	15	2
Pyrite Ro Con	6.0	1.15	0.018	10.8	12.3	3	3	12	12
Bulk Clnr Scav Tail	12.0	0.39	0.012	16.5	20.2	2	4	37	40
Bulk 3rd Clnr Con	7.3	25.9	0.428	26.1	38.7	92	86	36	46
<u>T19: Selective Circuit, Regrind</u>									
Pyrite Ro Tail	74.7	0.04	0.003	1.1	0.14	1	6	14	2
Pyrite Ro Con	6.9	0.68	0.011	16.6	20.2	2	2	20	22
Bulk Clnr Scav Tail	12.6	0.87	0.018	18.9	23.2	5	6	41	45
Bulk 3rd Clnr Con	5.8	33.5	0.562	23.8	34.6	91	86	24	31

Note: Detailed test conditions and results can be located in Appendix II.

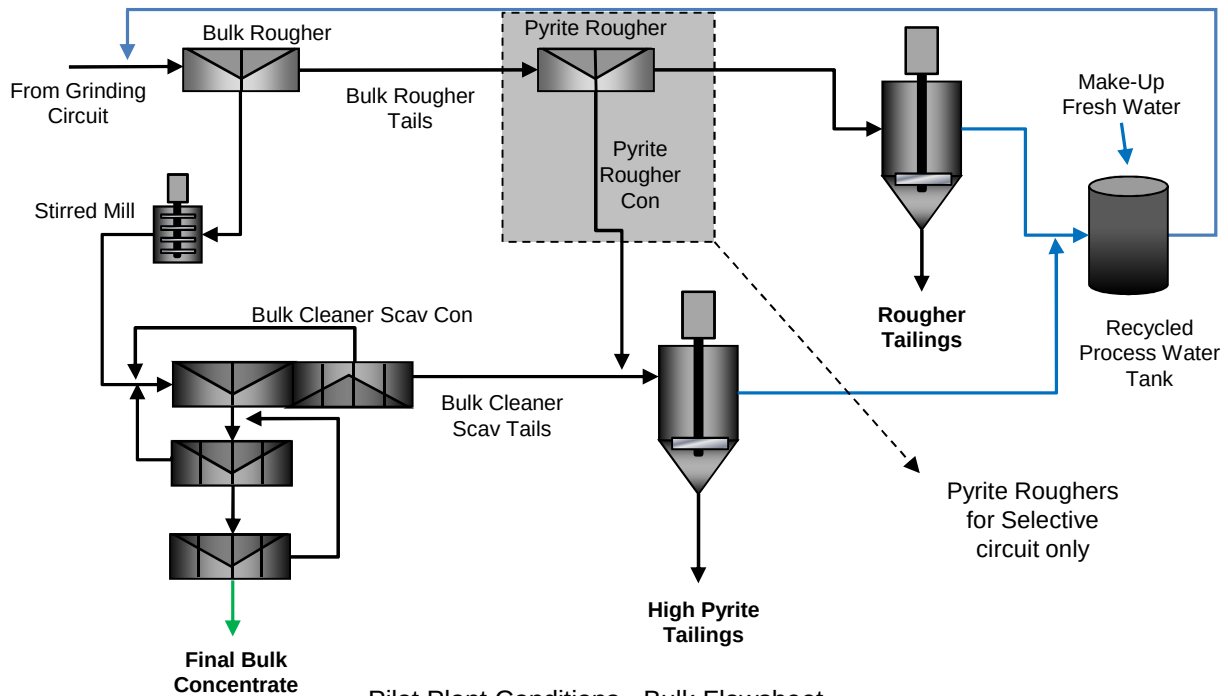
4.0 Pilot Plant Overview

The pilot plant configuration was designed to produce a high grade bulk concentrate for both flowsheets. The pilot plant operated over 8 days, designated P1 to P8, with 5 operating days for the bulk flowsheet, and 3 operating days for the selective flowsheet. A primary grind sizing targeting 160 μ m K₈₀ was utilized. A schematic of the process flowsheets and conditions for the flowsheets are displayed in Figure 6.

Feed to the primary rod mill was ground in closed circuit with a vibrating screen. A two-litre vertical stirred mill was used to achieve targeted regrind sizings.

To monitor the performance of the process, spot samples for sizing and assay were completed with rapid turnaround. Overall performance was based on period surveys, with up to 2 surveys per day, denoted as WSA (Window Survey A) or WSB (Window Survey B). Details of the time period that each Window represents is denoted in the pilot plant operating sheets in Appendix VI. Sampling protocol involved cutting process streams, typically every 30 minutes for 2 hours, across the window survey period, generating representative of the survey period performance.

Bulk circuit cleaning included three stages of cleaning, using mechanical cleaner cells.



Pilot Plant Conditions - Bulk Flowsheet

Sample	Stage	pH	Reagent Addition - g/tonne			
			Lime	SIPX	Fuel Oil	MIBC
Bulk Flow sheet P1- P5	Primary Grind	7.5-7.8	-	-	9-15	-
	Bulk Rougher	7.7-7.9	-	16-17	-	42-124
	Bulk Regrind	11.5-11.8	432-630	-	9-10	-
	Bulk Cleaners	10.6-11.5	40-109	2.0-2.6	-	9-43
	Bulk Cleaner Scav	10.7-11.3	-	1	-	-

Pilot Plant Conditions - Selective Flowsheet

Sample	Stage	pH	Reagent Addition - g/tonne				
			Lime	8989	Fuel Oil	MBC	SIPX
Selective Flow sheet P6-P8	Primary Grind	9.7-10.8	211-345	-	19-21	-	-
	Bulk Rougher	8.7-9.3	-	11-14	-	119-202	-
	Bulk Regrind	11.5-11.6	200-272	-	9-10	-	-
	Bulk Cleaners	10.7-11.2	35-101	3-4	-	27-65	-
	Bulk Cleaner Scav	10.7-11.1	-	1-2	-	-	-
	Pyrite Rougher	-	-	-	-	0-51	7-10

Pilot Plant Equipment

Stage	Bulk Flowsheet Equipment	Selective Flowsheet Equipment
Primary Grinding	24" Rod Mill	24" Rod Mill
Bulk Primary Grinding	Vibrating screen (500µm)	Vibrating screen (400µm)
Bulk Roughers	6 x 18L Cells	4 x 18L Cells
Pyrite Roughers	-	4 x 18L Cells
Bulk Regrind	1 x 2L Stirred Mill	1 x 2L Stirred Mill
Bulk 1st Cleaner	2 x 18L Cells	2 x 18L Cells
Bulk Cleaner Scav	8 x 2L Cells	8 x 2L Cells
Bulk 2nd Cleaner	7 - 8 x 2L Cells	4 - 5 x 2L Cells
Bulk 3rd Cleaner	4 x 2L Cells	3 - 4 x 2L Cells

Notes: a) Reagent additions are the range of daily averages.
b) Detailed test conditions and results can be located in Appendix VI.

4.1 Primary Grinding

Feed to the primary rod mill was ground in closed circuit with a screen. The performance of the grinding circuit is shown in Figure 7. The graphs show the chronological survey sample sizings for the bulk rougher feed.

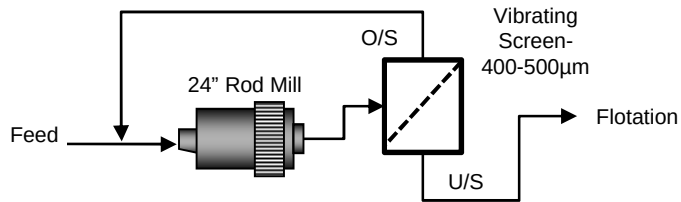
The feed rate averaged about 70 kilograms per hour over the 8 operating days. The primary grind sizing averaged about 168 μ m K₈₀ from survey samples, while operational quick sizings averaged about 157 μ m K₈₀. About 4 tonnes of sample was processed over the course of the run.

The table at the bottom of Figure 7 displays the grinding circuit feed rate and operational particle sizing data for the pilot runs.

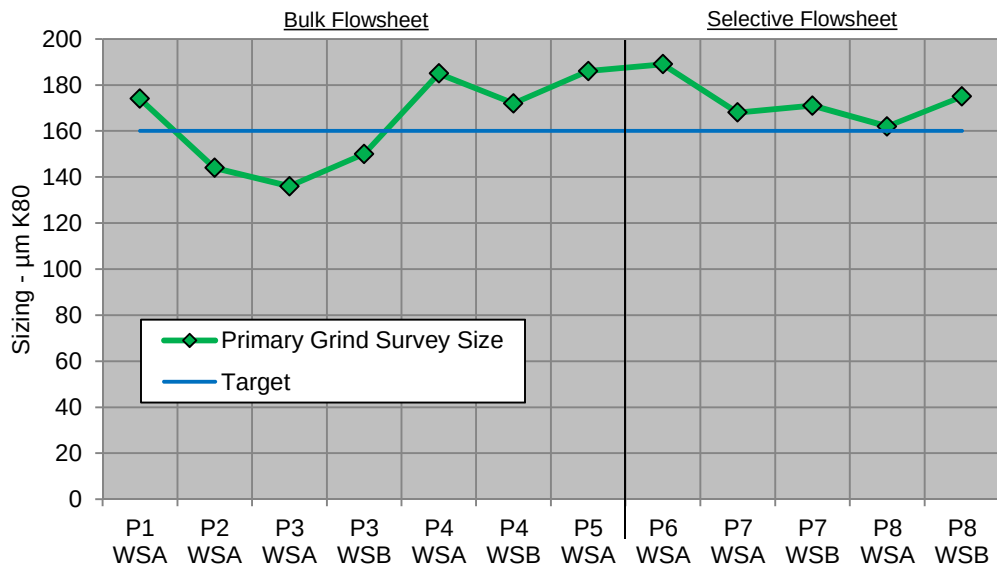
As part of mineralogy analysis on pilot plant products, the flotation feed from the P8 WSB survey was submitted for PMA, at a nominal 172 μ m K₈₀. As expected, the results were very similar to the mineralogical analysis conducted on the Lab Composite feed. Further analysis can be seen Section 5.1.

FIGURE 7
SUMMARY OF PILOT PLANT PRIMARY GRINDING

Grinding Circuit



Primary Grind Measurements – Survey Sizings



Operating Feed Rate and Sizes

Run Day	Run Time Hours	Feed kg	Feed Rate kg/hour	Feed Rate Range - kg/hr	Float Feed Size Range - µm K80
P1	7.5	541	72.1	67-82	159-186
P2	4.8	318	66.3	62-74	138-160
P3	8.1	563	69.4	62-85	122-147
P4	8.1	567	70.0	59-89	151-181
P5	4.5	305	67.7	59-75	166-182
P6	7.1	516	72.6	60-77	152-178
P7	8.2	542	66.1	64-78	127-174
P8	8.0	554	69.2	66-75	142-171

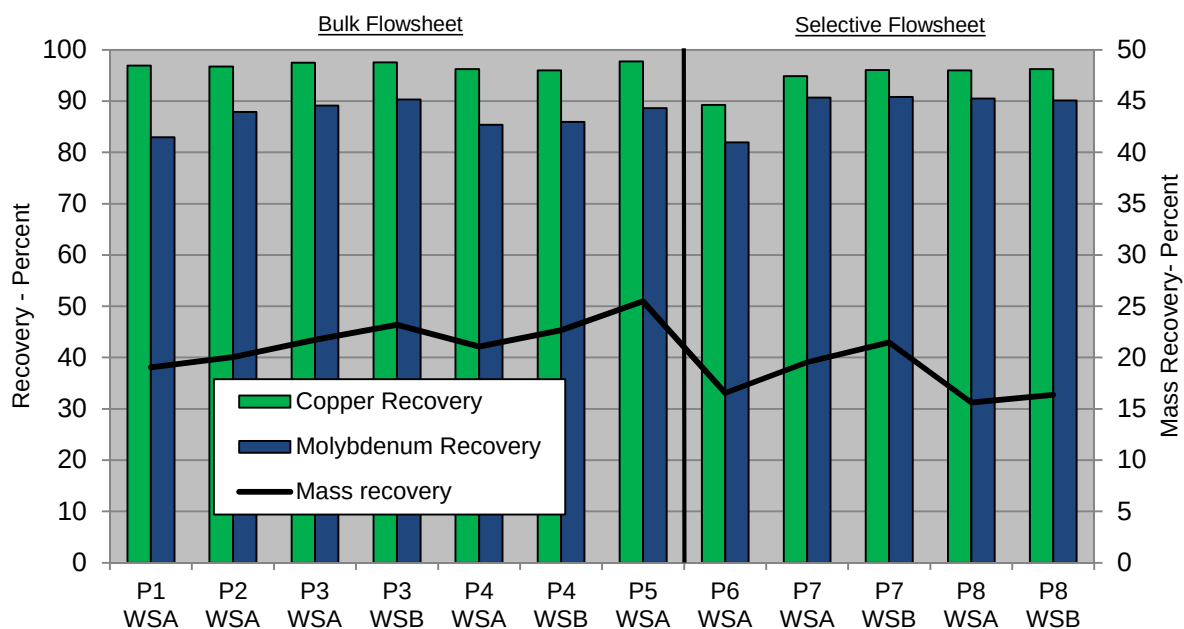
Note: Detailed grinding data is provided in Appendix VI. Sizings are located in Appendix III.

4.2 Rougher Flotation Performance

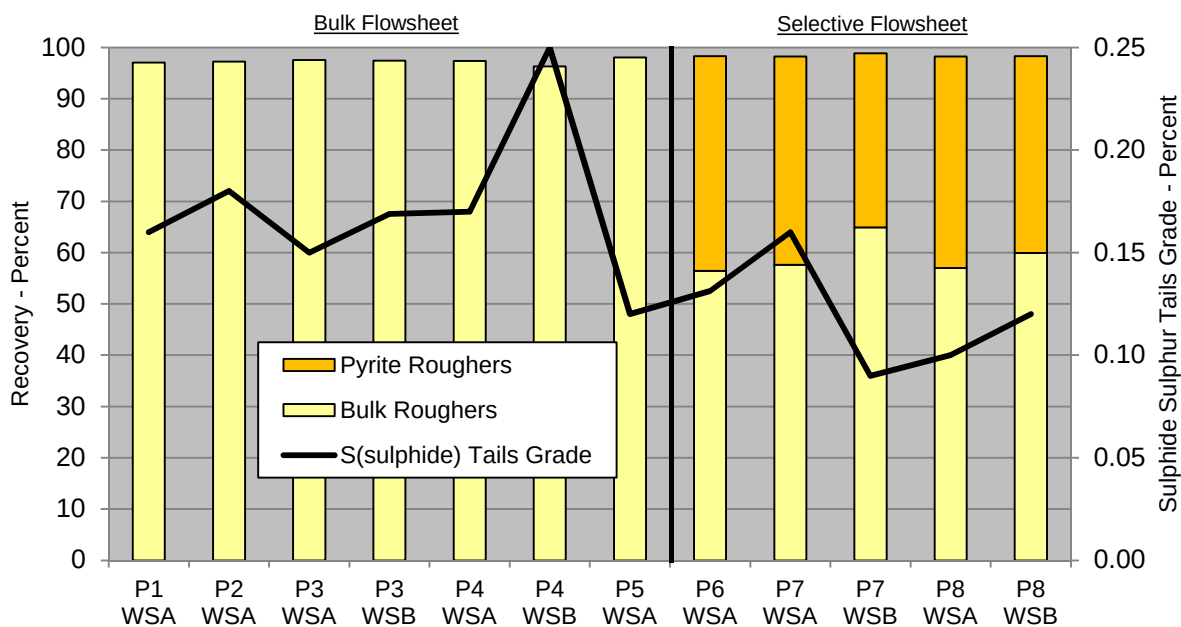
The chronological rougher circuit flotation performance is displayed in Figure 8. The following points are of interest when reviewing the data:

- For the bulk flowsheet, copper and sulphur were both 96 to 98 percent recovered to the rougher concentrate. Mass recoveries ranged from 19 to 26 percent. This was similar to that measured in the laboratory tests. Sulphide sulphur assays of the rougher tailings measured between 0.12 and 0.25 percent.
- For the selective flowsheet, the bulk roughers recovered a consistent 95 to 96 percent of the copper, excluding P6, the start-up day on the new flowsheet, at 16 to 22 percent mass recovery. This was again similar to that measured in the laboratory tests. Sulphur recovery in the bulk rougher varied from 56 to 65 percent, which was lower than testing in the lab, indicating better copper selectivity. Operationally, the selective circuit was much more forgiving, and it was relatively easy to obtain a selective operating point for the roughers, perhaps more so than in the lab.
- The pyrite circuit of the selective flowsheet performed well, recovering almost all the remaining sulphur, resulting in sulphide sulphur grades of about 0.09 to 0.16 percent, slightly better than with the bulk flowsheet.
- Molybdenum recovery was between 85 and 90 percent, and 90 to 91 percent for the bulk and selective flowsheets, respectively disregarding the first operating day of each flowsheet.

FIGURE 8
PILOT PLANT ROUGHERS
Bulk Rougher Performance



Rougher Sulphur Performance



Note: Detailed pilot plant results are provided in Appendix VI.

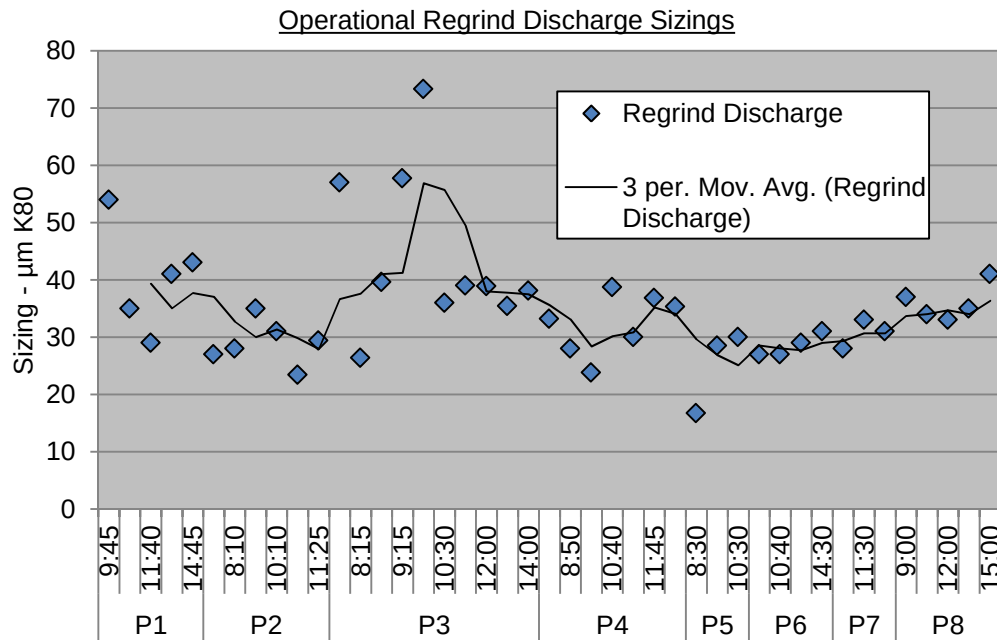
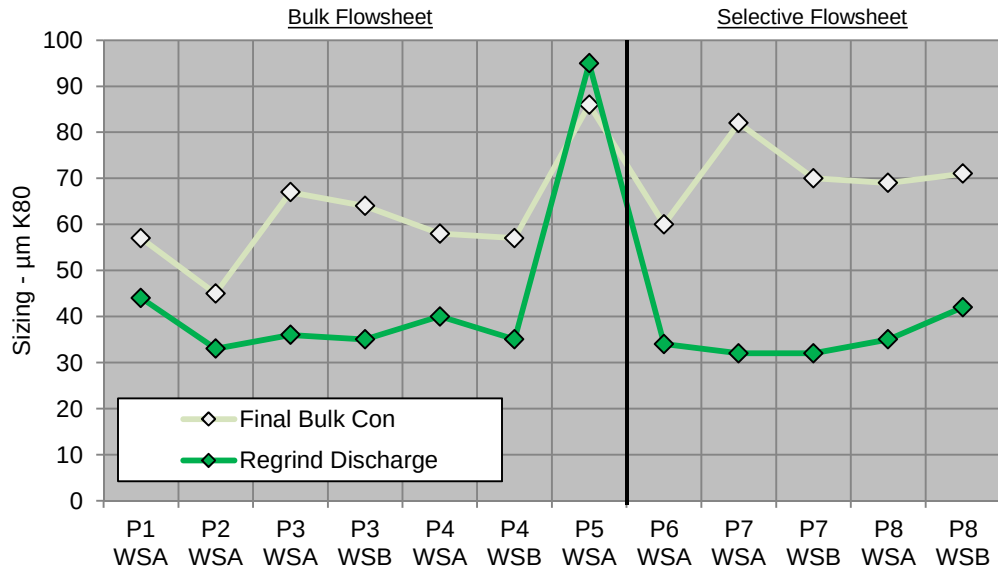
4.3 Regrind and Concentrate Sizings

A two litre stirred mill was used to achieve the regrind target size. A chronological graph of regrind discharge and concentrate sizings are shown for both the bulk and selective circuits in Figure 9. The following points may be of interest:

- The target bulk regrind discharge sizing for the bulk flowsheet was about 40 μ m K₈₀. The actual bulk regrind discharge sizing varied from between 33 to 44 μ m K₈₀, which was close to the target, except for P5, which was 95 μ m K₈₀.
- The target regrind sizing for the selective flowsheet bulk regrind discharge was about 30 to 40 μ m K₈₀. Survey regrind discharge sizings ranged from 32 to 42 μ m K₈₀.
- It was immediately evident that upon switching to the selective flowsheet after P5, regrinding was much easier to control. Significantly less pyrite in the rougher concentrate was helpful from a regrinding and operational perspective.
- Pyrite, a relatively hard mineral, can influence regrind discharge sizings and regrind energy requirements. Specifically for the bulk flowsheet, excess energy is unnecessarily applied to regrind liberated pyrite to achieve a target size distribution.
- Final concentrate sizings, although coarser than regrind discharge, generally trended relative to regrind discharge sizings; however, a slight shift to a coarser size is evident on the selective flowsheet. This reinforces the concept of pyrite influencing regrind requirements. With less pyrite, specifically in coarse fractions, regrinding energy can be more appropriately applied.

FIGURE 9
PILOT PLANT REGRINDING

Window Survey Sizings



- Notes: a) Detailed pilot plant results are provided in Appendix VI.
 b) The coarse regrind discharge sizing on P5 may be related to re-suspension of excessive coarse particles as sanding issues were addressed in the rougher circuit.

4.4 Overall Metallurgical Performance

Overall metallurgical performance of the pilot plant is shown in Figure 10.

Using the bulk flowsheet, the pilot plant produced a bulk concentrate between 20 and 30 percent copper, at recoveries of 84 to 95 percent copper. The best bulk circuit performance was measured on P4 where between the two surveys, a copper concentrate grading about 27 percent and recovering about 93.5 percent of the copper was produced. However, these surveys, specifically P4 WSB, correspond with a high sulphide grade left in the rougher tailings 0.17 and 0.25 for WSA and WSB, respectively.

Operation during P5 highlighted some of the issues with a bulk flowsheet, as pyrite flotation was uncontrollable. It is unclear on the exact reason for the poor performance, although a very coarse regrind discharge and collector dosage in the cleaning circuit are suspect.

Some sanding of coarse particles, likely pyrite, was noticed in the first rougher bank, most noticeably on P5. For the remaining days, a slightly smaller vibrating screen was used in the grinding circuit to reduce the top size of flotation feed. It is undetermined if this had an effect on metallurgical performance.

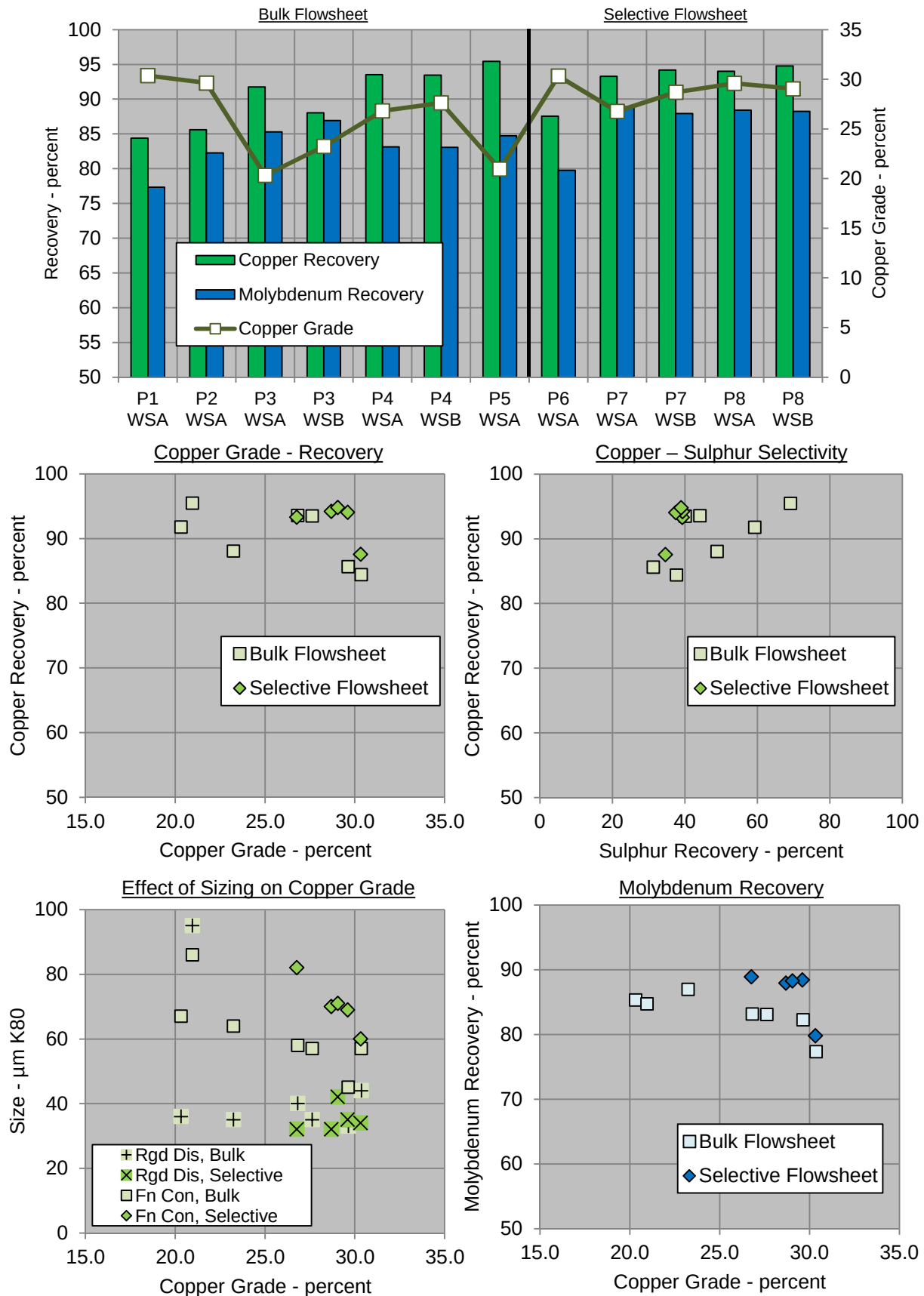
For the selective flowsheet, disregarding P6, the first day of operation, 94 percent of the copper in the pilot plant feed was recovered to the bulk concentrate, grading 28.5 percent, on average. Molybdenum was about 88 percent recovered.

While near similar grade recovery performance may be possible for the bulk flowsheet, as indicated by P4 operation, operationally the selective circuit is a more robust design, and easier to control. Regrinding energy can be more appropriately applied, and the pyrite rougher circuit allows for better control of sulphur content in the rougher tails.

FIGURE 10

SUMMARY OF OVERALL PLANT PERFORMANCE

Copper Performance



5.0 Mineralogical Analysis on Pilot Plant Exit Products

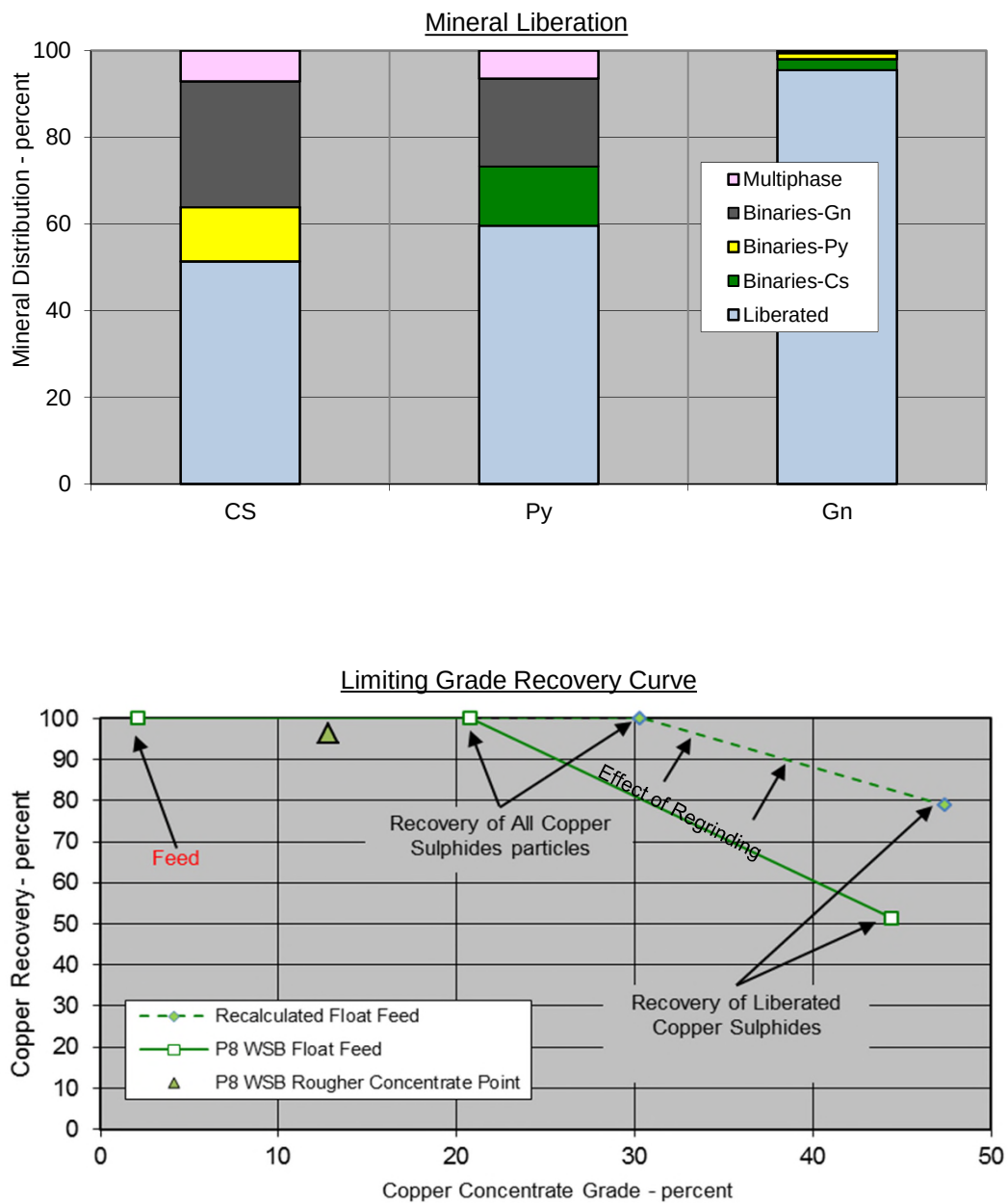
Survey samples from P4 WSA and P8 WSB, representing bulk and selective flowsheets, respectively were submitted for Particle Mineral Analyses using QEMSCAN. The following subsections relate to the results of the various streams.

5.1 P8 Flotation Feed

A sample of the flotation feed for P8 was subject to mineralogical analysis. A summary of the data is displayed in Figure 11. The following points may be of interest:

- The P8 flotation feed sample was very similar to the Lab Composite analysis, as in Section 2.0 Ore Characterization. The sizing was 172 μ m K₈₀, slightly coarser than the Lab Composite at 159 μ m K₈₀.
- Copper sulphide liberation was 51 percent, and pyrite liberation was 60 percent. At these values, adequate rougher recovery and separation would be expected.
- Regrinding is required to produce a high grade copper concentrate at high recovery. The limiting grade recovery curve for the feed, and the recalculated feed based on the exit products, is shown in Figure 12. The difference between these two curves is the effect regrinding the rougher concentrate had on the sample.

FIGURE 11
P8 WSB FLOTATION FEED MINERALOGY



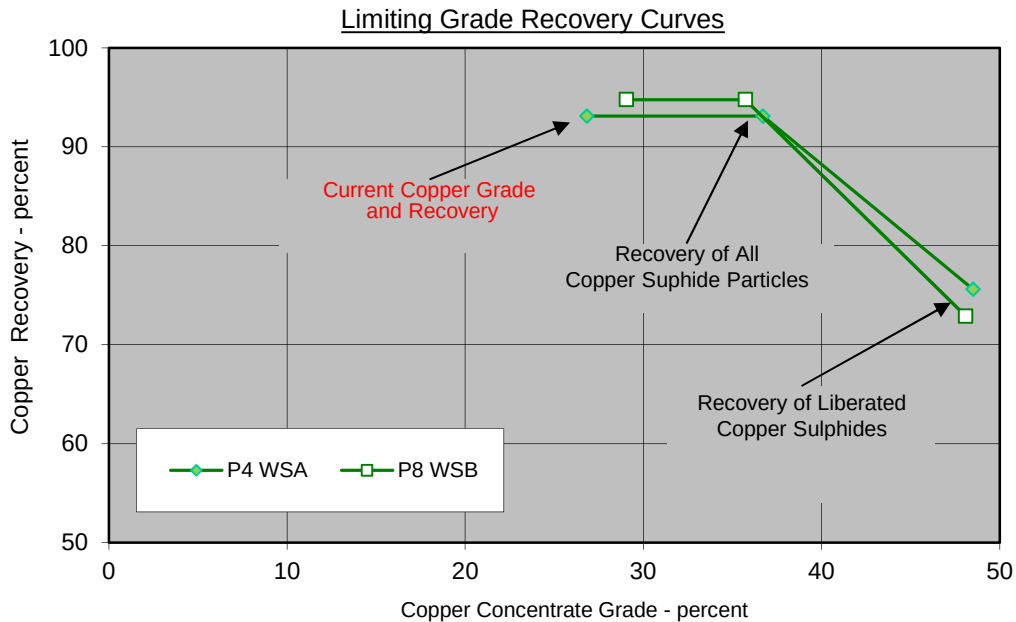
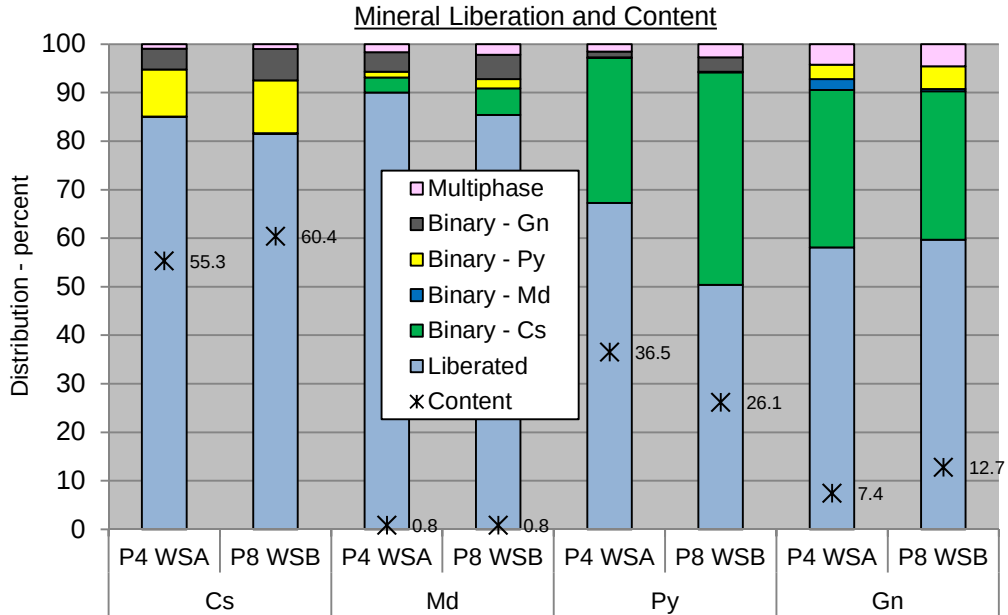
Notes: a) Cs-copper sulphides, Gn-Non-sulphide gangue minerals; Py-pyrite.
 b) Detailed mineralogical data is located in Appendix V.

5.2 Quality of the Bulk Concentrates

Particle Mineral Analyses using QEMSCAN were conducted on bulk concentrates from operation during both the bulk and selective flowsheets. Specifically, P4 WSA represented the bulk flowsheet and P8 WSB represented the selective flowsheet. A summary of the results is found in Figure 12. Photomicrographs of the concentrates are appended. The following points are of interest when reviewing the data:

- The most noticeable difference between the concentrate samples was the pyrite content and liberation. The concentrate produced, using the bulk flowsheet, contained significantly more pyrite, at about 37 percent, than the selective flowsheet, at about 26 percent. About 67 percent of the pyrite was liberated in P4 concentrate, and 50 percent was liberated in the P8 concentrate, as measured in 2 dimensions. The high liberation of pyrite in the bulk flowsheet concentrate indicates the troubles of rejecting pyrite after recovery to a bulk rougher concentrate. More selective conditions against pyrite would be needed to reject liberated pyrite.
- Copper sulphides were similarly liberated, at about 85 and 82 percent for P4 and P8, respectively. The majority of the remaining copper sulphides were locked in binary particles with pyrite. Further regrinding would be required to reject pyrite without losing copper recovery. From photomicrograph observations, many copper sulphide-pyrite binaries contain only a small amount of copper sulphide, or are intricately locked with pyrite. Extensive regrind would be required to adequately liberate these particles, and may not be economic.

FIGURE 12
BULK CONCENTRATE MINERALOGY



Notes: a) Cs-copper sulphides; Gn-non-sulphide gangue minerals; Py-pyrite; Md-molybdenum.
 b) P4 represents the bulk flowsheet operation, while P8 represents the selective flowsheet operation.
 c) Detailed mineralogical data is located in Appendix V.

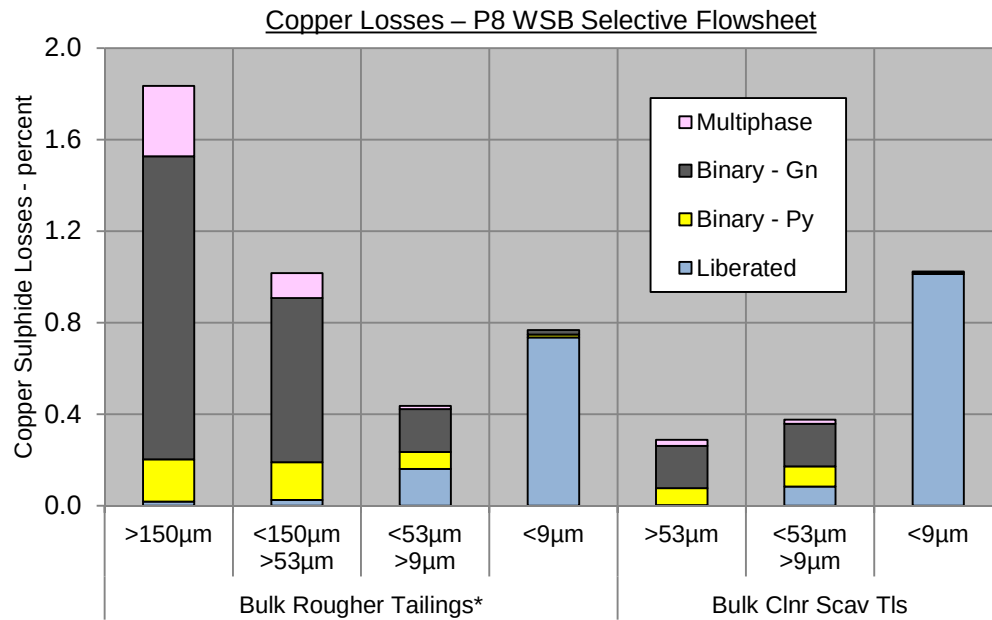
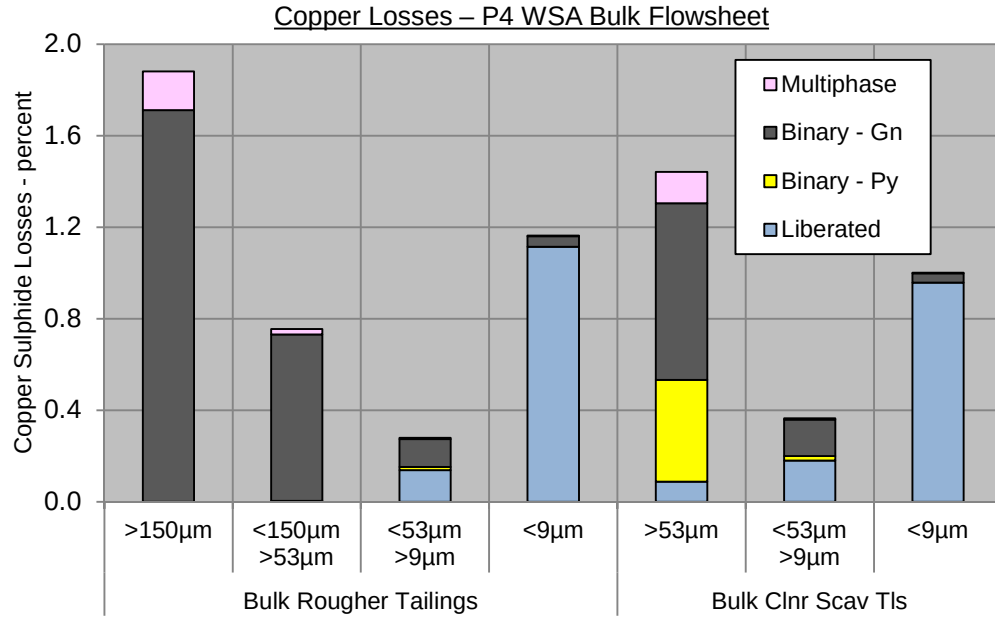
5.3 Copper Losses

Particle Mineral Analyses using QEMSCAN were conducted on tailings from both the bulk and selective flowsheets. Specifically, P4 WSA represented the bulk flowsheet and P8 WSB represented the selective flowsheet. A summary of the results is found in Figure 13. The following points are of interest when reviewing the data:

- Copper losses using both flowsheets were typical of a flotation circuit; losses were mainly through coarse unliberated copper sulphides, and fine liberated copper sulphides.
- The bulk rougher tailings data for P8 WSB is recombined from both the pyrite rougher concentrate and pyrite rougher tailings. A higher copper sulphide association with pyrite was observed under the selective flowsheet as the selective conditions limited the recovery of pyrite in the bulk rougher.
- The increase in losses that were seen in the selective circuit roughers were offset by reduced losses in the cleaners, as significantly lower amounts of coarse copper losses were observed in the bulk cleaner scavenger tailings. This was also seen in assays by size conducted on the cleaner scavenger tailings from P2, where copper losses occurred extensively in the coarse fraction. Detailed assay by size data can be found in Appendix IV*.

* Regrinding was conducted in open circuit, with ceramic media stirred mills. It is unclear how regrinding in closed circuit may affect performance.

FIGURE 13
PILOT PLANT TAILINGS MINERALOGY



Notes: a) * Bulk Rougher Tailings losses for the selective flowsheet includes both pyrite rougher concentrate and pyrite rougher tailings.

b) Cs-copper sulphides; Gn-non-sulphide gangue minerals; Py-pyrite.

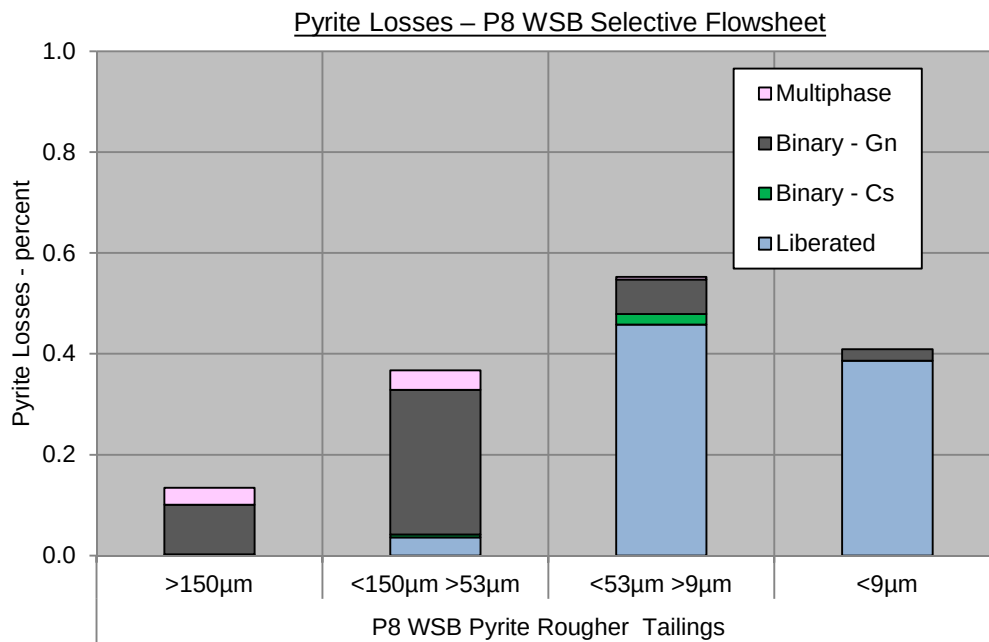
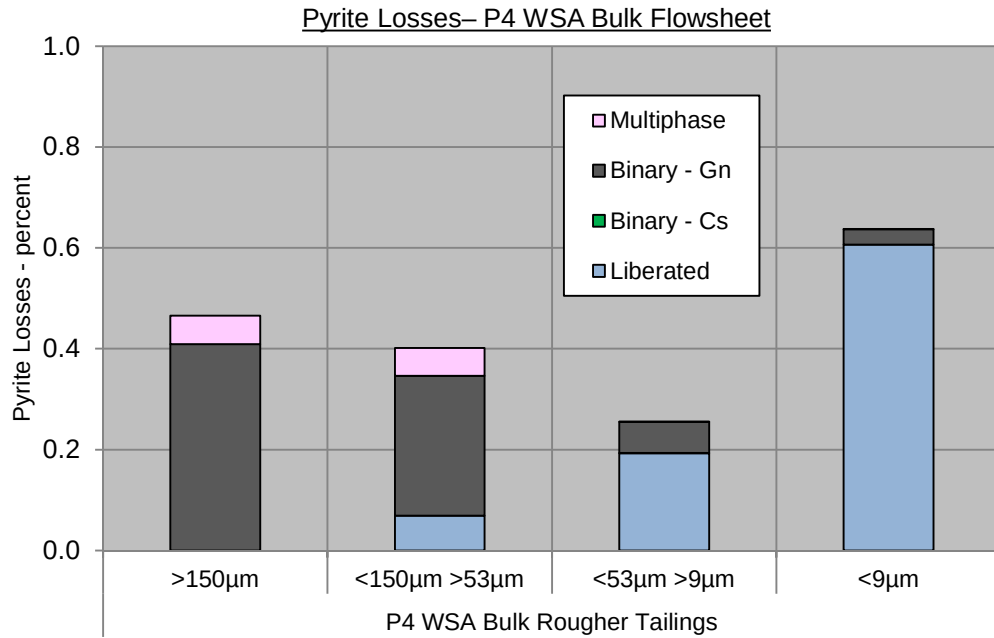
c) Detailed mineralogical data is located in Appendix V.

5.4 Pyrite Losses

Pyrite losses were also measured from analysis of the tailings samples, as potential acid rock drainage could be a concern in the rougher tailings. A summary of the results is found in Figure 14. The following points are of interest when reviewing the data:

- The selective flowsheet reduced coarse pyrite containing particle losses to the pyrite rougher tailings, likely due to aggressive conditions applied in the pyrite roughers.
- The bulk rougher tailings for the bulk flowsheet had slightly higher coarse losses, due to the inability to employ as aggressive conditions as was possibly in the pyrite circuit. Cleaner circuit considerations had to be taken into account during operation of the bulk flowsheet.
- The main pyrite losses using both flowsheets occurred as finely liberated pyrite. Increased flotation times may be required to recover more of the fine pyrite.

FIGURE 14
PILOT PLANT PYRITE LOSSES MINERALOGY



Notes: a) Cs-copper sulphides; Gn-non-sulphide gangue minerals; Py-pyrite.
 b) Detailed mineralogical data is located in Appendix V.

6.0 Copper-Molybdenum Separation

Bulk concentrates produced from the pilot plant operation were subjected to copper-molybdenum separation testing in the laboratory. Specifically, concentrates produced on P2 WSA, P4 WSA, and P6 were used for testing throughout the test program. A summary of results is presented in Figure 15. Photomicrographs of Test 21 concentrate are appended.

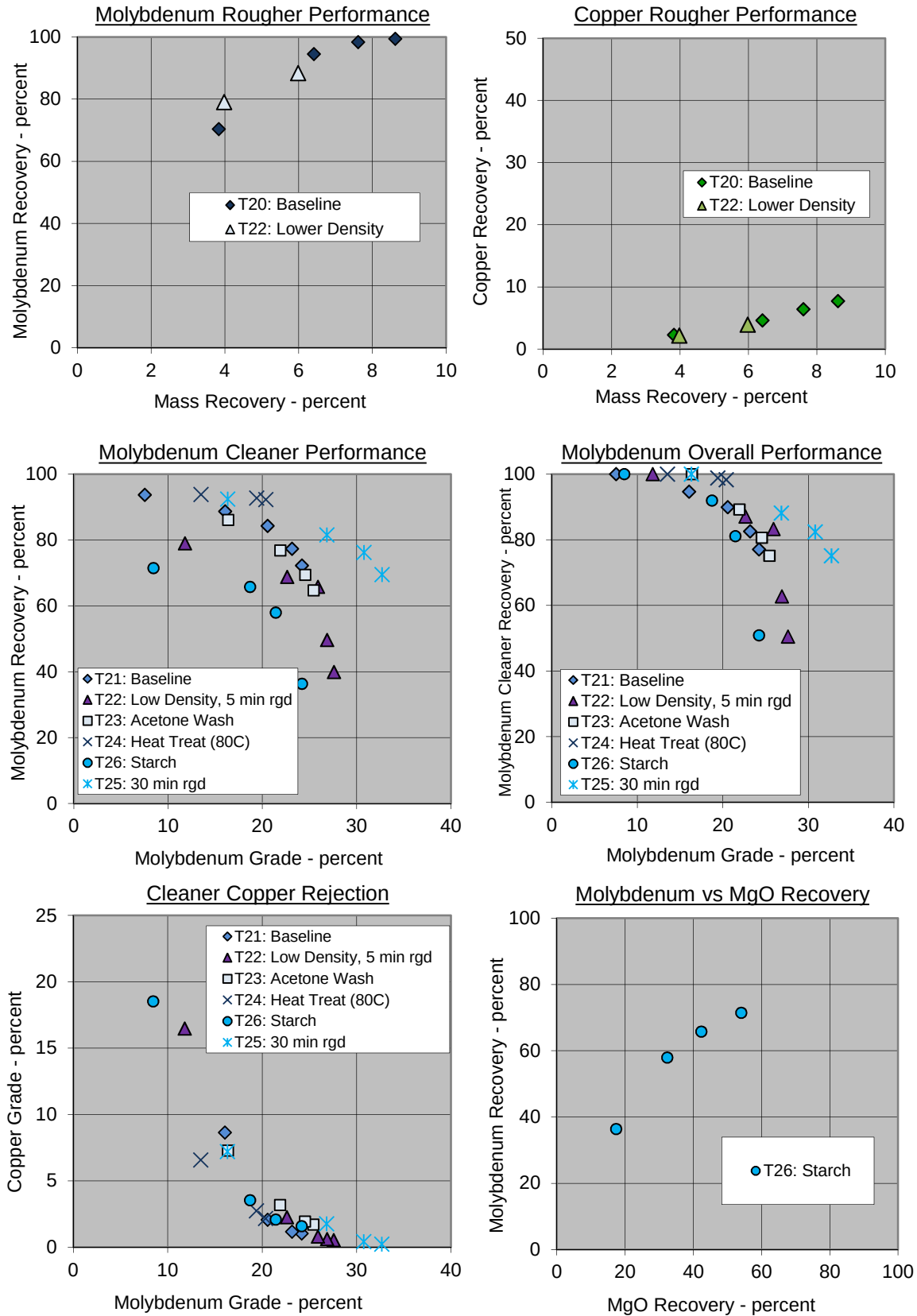
Preliminary flotation testing indicated it was difficult to produce a final high grade molybdenum concentrate. However, copper and pyrite were not the main diluents in the concentrate, as copper rejection was excellent.

It was suspected that non-sulphide gangue was floating, either from natural hydrophobicity, excess collector, entrainment, or interlocking with molybdenum. A number of methods were investigated to remove the non-sulphide gangue from the concentrate, including floating at a lower density, performing an acetone wash on the rougher concentrate, heat treating to about 80 degrees Celsius to volatilize collector, increased regrinding energy, and starch addition. None of the methods were greatly successful.

The most successful test utilized 30 minutes of regrinding. This resulted in a molybdenum concentrate grading 33 percent molybdenum at a recovery from the bulk concentrate of only 69 percent. This indicates regrinding is benefiting flotation; however, interlocking is not the main issue.

A locked cycle test was conducted to target a concentrate grade of about 25 percent molybdenum. The flowsheet and summary of results can be located in Figure 17, appended. The test recovered about 87 percent of the molybdenum from the bulk concentrate at a grade of about 24 percent. The copper grade in the molybdenum concentrate was about 1.1 percent.

FIGURE 15
COPPER MOLYBDENUM FLOTATION TEST RESULTS



Note: Detailed test results and conditions can be located in Appendix II.

6.0 Copper-Molybdenum Separation (cont)

A Bulk Mineral Analysis using the QEMSCAN was conducted on the molybdenum concentrate from Test 22 to confirm the mineral species of the diluent gangue. A summary of the mineral composition is shown in Table 3.

TABLE 3
MINERAL COMPOSITION OF T22 MOLYBDENUM CONCENTRATE

Minerals	Mineral Content (percent)
Copper Sulphides	1.2
Molybdenite	49.1
Pyrite	0.4
Quartz	3.4
Talc	37.9
Other	8.0

Note: Detailed mineralogy can be located in Appendix V.

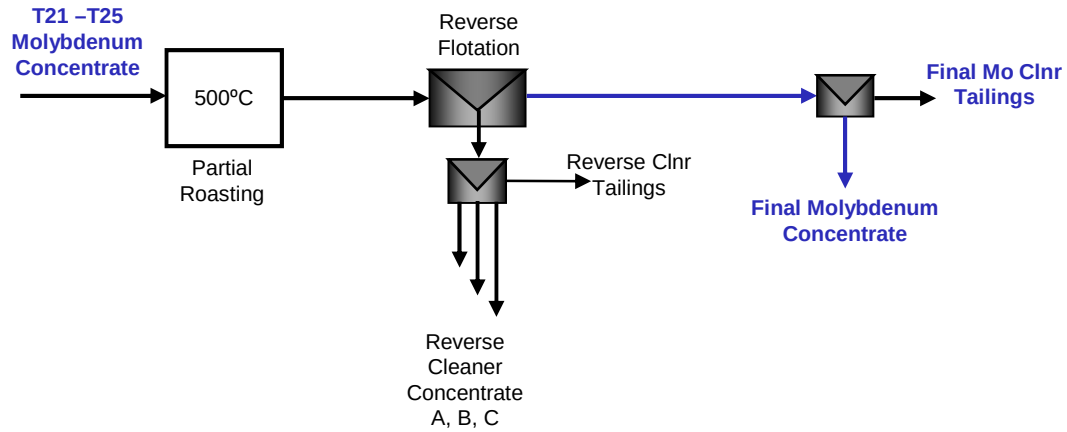
As suspected, talc, a naturally hydrophobic mineral composed a significant portion of the concentrate. Although the talc content in the original composite is relatively low at about 0.2 percent, due to the low mass recovery of the molybdenum concentrate relative to the flotation feed, the talc composition is magnified.

A reverse flotation flowsheet, including a partial roasting stage to oxidize molybdenite, was trialed on molybdenum concentrate from Tests 21 to 25. A flowsheet and summary of results is presented in Figure 16.

The test showed good promise for creating a high grade molybdenum concentrate. The tailings from reverse flotation graded 46 percent molybdenum at a recovery of about 87 percent, while the concentrate recovered about 92 percent of the MgO, an indication of talc. Additional testing, including closed circuit operation on the entire molybdenum circuit is required to establish overall performance.

FIGURE 16
MOLYBDENUM REVERSE FLOTATION RESULTS

Flowsheet



Conditions

Stage	Time min	pH	Eh - mV	Reagents - g/tonne*				
				H ₂ SO ₄	Soda Ash	NaHS	Fuel Oil	MIBC
Roasting	30	-	-	-	-	-	-	-
Reverse Rougher	4	3.0	218	9000	-	-	-	231
Reverse Cleaners	3	3.0	222-228	10000	-	-	-	561
Final Mo Cleaner	3	10.0	-475	-	37000	963	308	231

Note: *Dosages are with respect to the test feed of 130 g of molybdenum concentrate from Test 21- Test 25.

Test Results - Summary

Product	Mass percent	Assay - percent					Distribution - percent				
		Cu	Mo	Fe	S	MgO	Cu	Mo	Fe	S	MgO
Fn Mo Clnr Con	17.4	0.70	51.1	1.0	35.9	1.1	10	39	6	39	2
Fn Mo Clnr TI	26.0	2.28	42.4	3.0	30.3	2.8	46	48	28	49	6
Reverse Con 1A	25.2	0.73	1.59	2.8	1.02	23.0	14	2	26	2	46
Reverse Con 1B	16.7	0.71	3.26	2.6	2.26	22.1	9	2	16	2	29
Reverse Con 1C	6.4	1.29	8.17	3.7	5.70	18.1	7	2	9	2	9
Reverse Clnr Tail	8.2	2.17	18.9	5.3	12.5	12.4	14	7	16	6	8

Notes: a) Detailed test results can be located in Appendix II.

b) Electrochemical potential (Eh) was measured using a Ag/AgCl Pt Electrode. Results are unadjusted against SHE.

7.0 Concentrate Quality

A suite of minor element analyses were conducted on the concentrates produced from the pilot plant test work and copper molybdenum separation. Bulk concentrates produced from the bulk and selective flowsheets were analyzed. The following observations, summarized in Table 4, should be used as a guide to assess concentrate marketability:

- Fluorine measured 560 to 730 ppm in the bulk concentrates. At these levels, penalties may occur.
- Arsenic measured between 291 and 430 ppm in the bulk concentrates, which is below typical penalty levels. The arsenic is likely associated tennantite, a secondary copper mineral.
- Mercury was undetectable in the bulk concentrates, assaying <1 ppm.
- The molybdenite concentrate contained a rather significant amount of Rhenium, at 375 ppm. Additional credits may be paid for rhenium content.
- Further concentrate marketability advice should be sought.

TABLE 4
MINOR ELEMENTS IN THE BULK AND MOLYBDENUM CONCENTRATES

Element	Symbol	Units	KM4420-P4 Bulk Final Con WSA	KM4420-P5 Bulk Final Con WSA	KM4420-P8 Bulk Final Con WSB	KM4420-28 Moly Con IV & V
Aluminum	Al	%	0.33	0.34	0.54	0.49
Antimony	Sb	ppm	4.3	3.3	4.4	0.8
Arsenic	As	ppm	378	291	430	35
Bismuth	Bi	ppm	87.3	65.2	96.4	13.4
Cadmium	Cd	ppm	13.7	11.8	14.7	<0.2
Calcium	Ca	%	0.1	0.08	0.12	0.58
Cobalt	Co	ppm	147	197	126	18
Copper	Cu	%	26.9	21.0	29.5	1.12
Fluorine	F	ppm	600	560	730	-
Iron	Fe	%	27.6	31.9	26.4	3.15
Lead	Pb	ppm	101	95	116	51
Magnesium	Mg	%	0.3	0.25	0.35	8.23
Manganese	Mn	ppm	30	30	50	320
Mercury	Hg	ppm	<1	<1	<1	-
Molybdenum	Mo	%	0.517	0.406	0.511	22.6
Nickel	Ni	ppm	100	126	87	30
Phosphorus	P	ppm	200	200	300	200
Rhenium	Re	ppm	8.71	6.99	8.95	375
Selenium	Se	ppm	200	220	200	230
Silver	Ag	ppm	43.1	32.8	45.7	11.2
Sulphur	S	%	36.8	39.5	33.9	16.8
Tellurium	Te	ppm	15.3	22.1	18.4	24.6
Zinc	Zn	ppm	2940	2800	3600	700

Notes: a) Detailed results can be found in Appendix V.

b) Copper and Sulphur assays conducted at ALS Metallurgy Kamloops. All other assay conducted by ALS Geochemistry, North Vancouver

c) P4 and P5 represent bulk flowsheet operation; P8 represents selective circuit operation.

8.0 Conclusions and Recommendations

Rio Tinto is in the process of developing the Resolution Copper deposit, to operate as a block caving mining operation. A pilot plant test program was conducted to assess the metallurgical performance of two flowsheet types in continuous operation, and to generate concentrate and tailings.

One sample shipment was received, which was composited into a Lab Composite, and Pilot Plant Feed composite, of similar composition. The Lab Composite measured about 2.1 percent copper, and about 0.04 percent molybdenum.

Limited bench scale flotation testing was completed to establish preliminary results and conditions for pilot plant operation for both a bulk flowsheet and a selective flowsheet. Bench scale testing indicated the bulk flowsheet had difficulties in producing a high grade final concentrate, due to the high pyrite recovery necessary, and aggressive conditions associated with the pyrite recovery. The selective flowsheet was much easier to control in the cleaner circuits, and a high grade concentrate was easier to produce.

Pilot plant testing was conducted over a period of 8 operating days; P1-P5 were used for bulk flowsheet operation, and P6-P8 were operated under a selective flowsheet schematic. Pilot plant operation mirrored what was observed in the lab, with the bulk flowsheet proving difficult to produce a high grade bulk concentrate at high recoveries, while the selective circuit was much easier from an operating perspective. Overall average copper and molybdenum performance for selected run days is summarized in Table 5.

Using the bulk flowsheet, an average of about 92 percent of the feed copper and 85 percent of the molybdenum was recovered to the bulk concentrate grading about 24.5 percent copper and 0.48 percent molybdenum. Using the selective flowsheet, an average of about 94 percent of the feed copper and 88 percent of the

molybdenum was recovered to the bulk concentrate grading about 28.5 percent copper and 0.52 percent molybdenum.

TABLE 5
OVERALL PILOT PLANT RESULTS

Flowsheet	Run Days	Assay - percent			Recovery - percent		
		Cu	Mo	S	Cu	Mo	S
Bulk	P3-P4	24.5	0.477	37.8	92	85	48
Selective	P7-P8	28.5	0.516	35.4	94	88	39

Notes: a) Only select rundays have been included to provide most representative operation performance.
b) Detailed pilot plant data is located in Appendix VI.

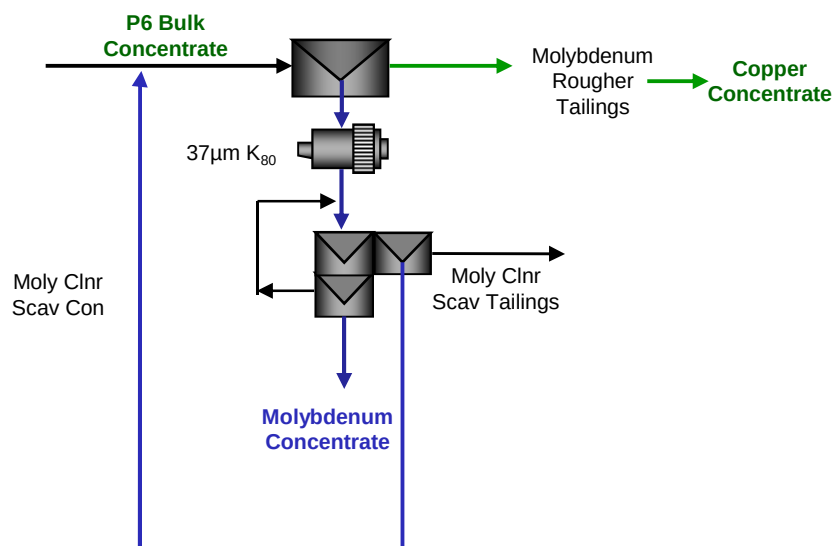
Copper-molybdenum separation was conducted on bulk concentrate produced from the pilot plant. Initial testing proved difficult to produce a high grade molybdenum concentrate. A Bulk Mineral Analysis of molybdenum concentrate indicated talc, a naturally hydrophobic gangue mineral, was diluting the concentrate. Locked cycle testing, to produce a low grade molybdenum concentrate, resulted in about 87 percent recovery of the molybdenum from the bulk concentrate at a grade of about 24 percent molybdenum.

An alternative processing option, with partial oxidation of the molybdenum concentrate at 500°C, followed by a reverse flotation, was also investigated. This showed good potential in producing a high grade molybdenum concentrate, with a concentrate grade of 46 percent molybdenum. Locked cycle testing is required with this flowsheet to determine overall recovery and grade.

Bulk and molybdenum concentrates contained low levels of most deleterious elements, including mercury, arsenic, antimony, cadmium, and selenium. Fluorine; however, was slightly high at about 500 to 700 ppm in the bulk concentrate, and penalties for fluorine may occur. A careful review of concentrate marketability with an expert in concentrate sales is recommended.

FIGURE 17
COPPER MOLYBDENUM SEPARATION LCT RESULTS

Flowsheet



Conditions

Stage	pH	Eh - mV	Reagents - g/tonne	
			NaHS	MIBC
Moly Roughers	11.4	-490	2100	-
Regrind	9.0	-82	-	-
Cleaners	10.4-10.5	-460 to -475	613	-
Cleaner Scav	10.4	-460	-	4

Test Results - Summary

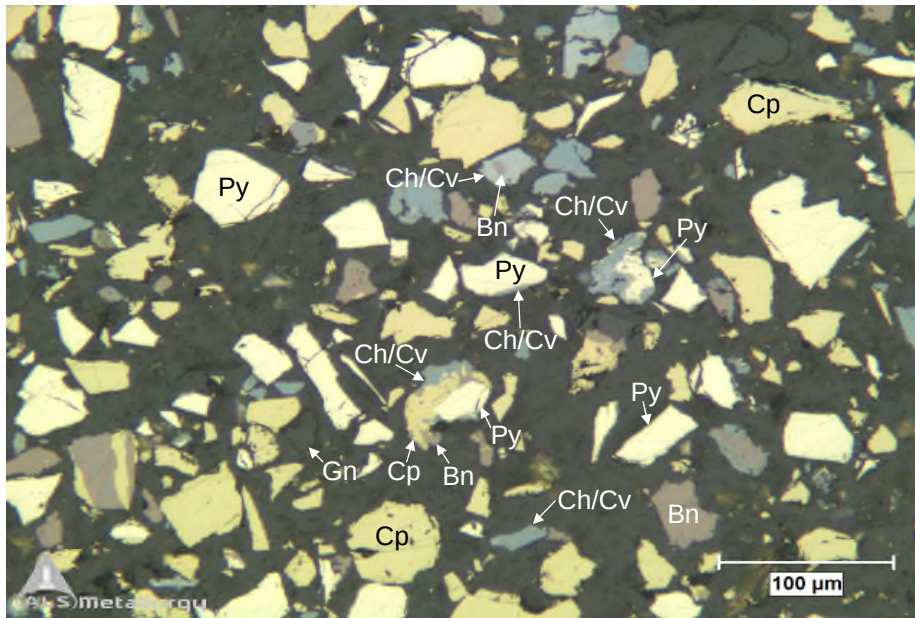
Product	Mass - percent	Assay - percent				Distribution - percent			
		Cu	Mo	Fe	S	Cu	Mo	Fe	S
Feed - P6 Bulk Con	100.0	29.0	0.576	24.6	34.7	100.0	100.0	100.0	100.0
Moly Ro Tail	93.6	29.9	0.029	25.3	35.5	96.3	4.7	96.3	95.7
Moly Clnr Scav Tail	4.3	24.1	1.17	19.8	26.1	3.6	8.8	3.5	3.3
Moly 2rd Clnr Con	2.1	1.12	23.7	2.4	16.8	0.1	86.5	0.2	1.0

Notes: a) Detailed test results can be located in Appendix II.

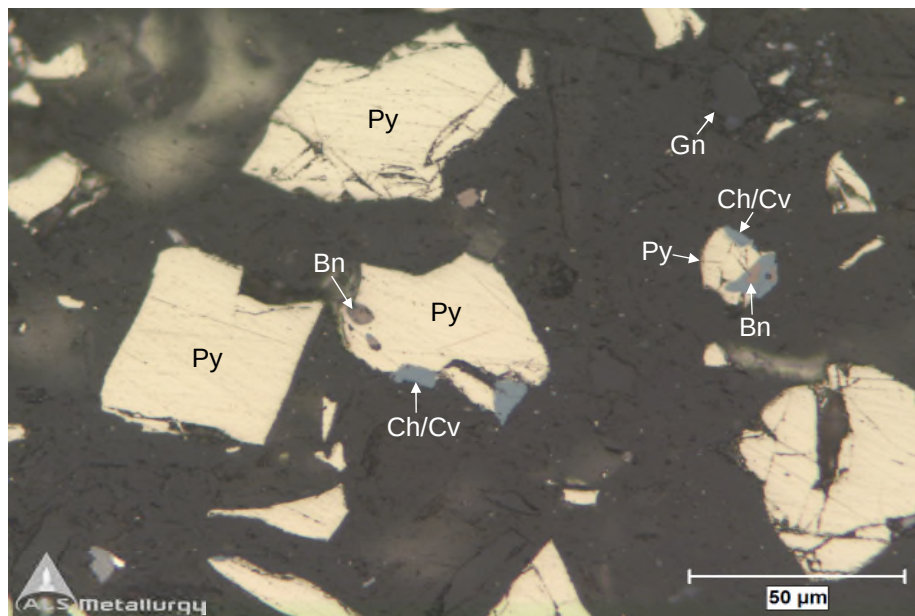
b) Electrochemical potential (Eh) was measured using a Ag/AgCl Pt Electrode. Results are unadjusted against SHE.

PHOTOMICROGRAPH 1
RESOLUTION COPPER DEPOSIT
KM4420

Test 17 Bulk Concentrate IV



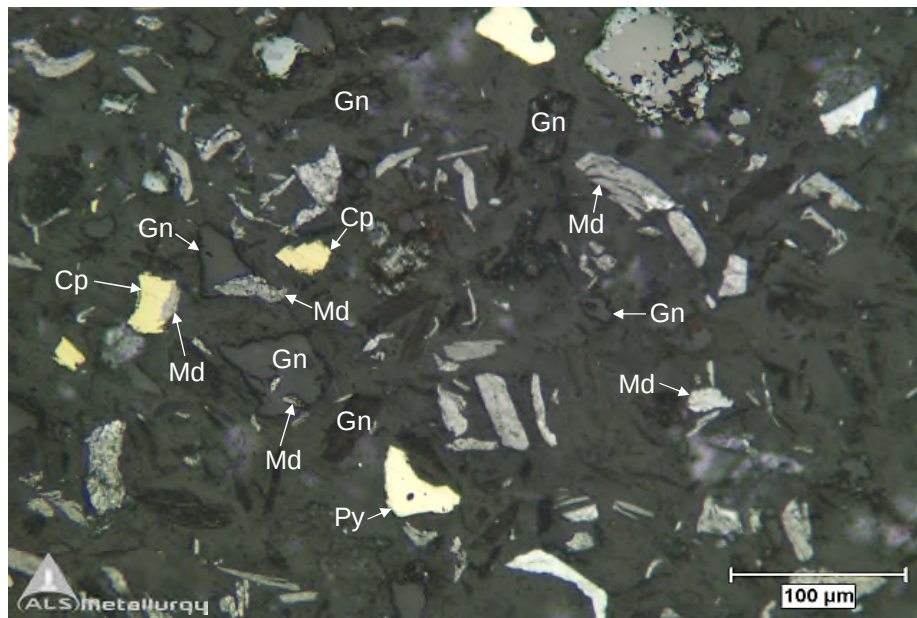
Test 17 Bulk Cleaner Scavenger Tailing IV



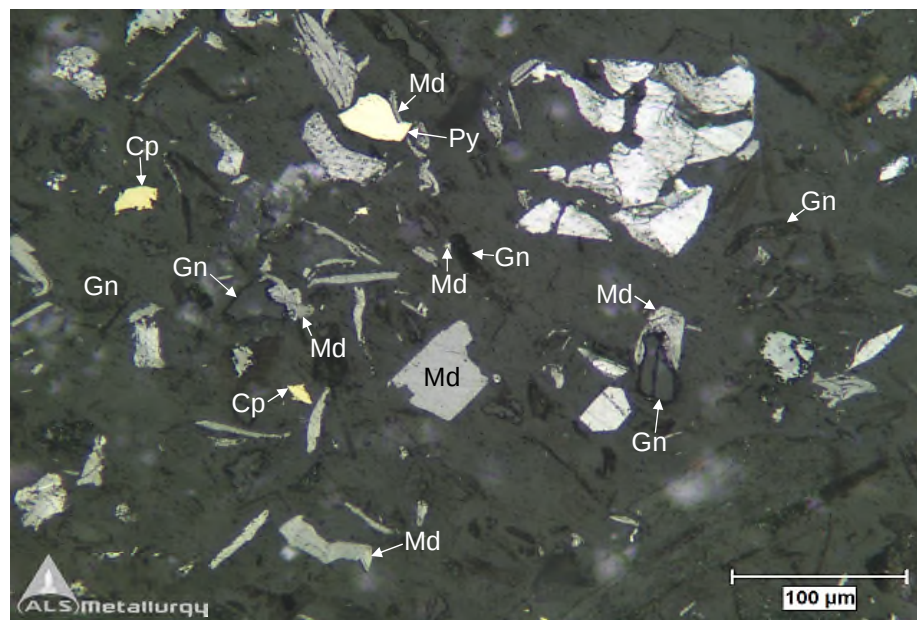
*Cp-Chalcopyrite, Bn-Bornite, Ch/Cv-Chalcocite/Covellite, Py-Pyrite, Gn-Gangue.

PHOTOMICROGRAPH 2
RESOLUTION COPPER DEPARTMENT – MOLYBDENITE CONCENTRATE
Test 21 KM4420

Unsize



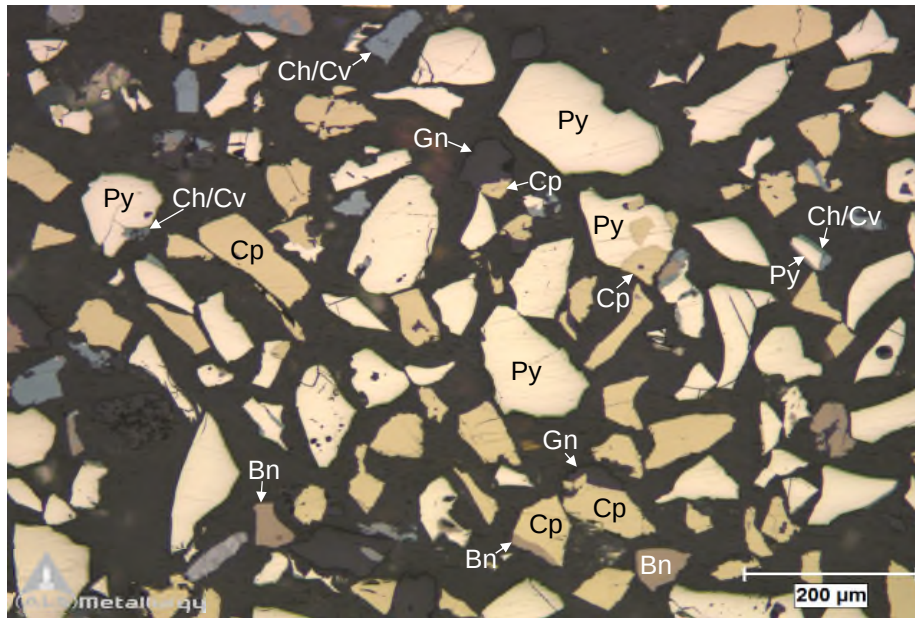
Unsize



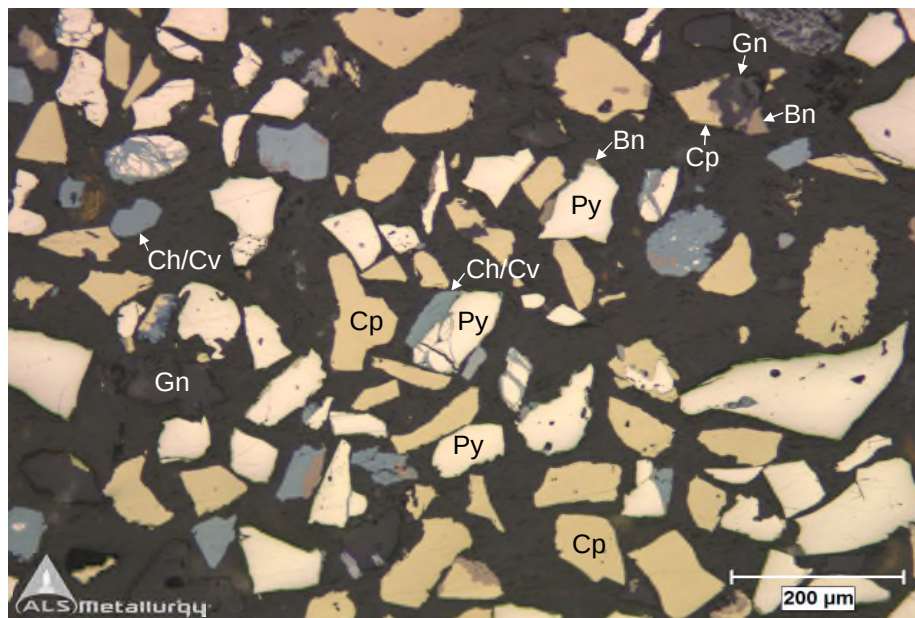
*Cp-Chalcopyrite, Md-Molybdenite, Py-Pyrite, Gn-Gangue.

PHOTOMICROGRAPH 3
RESOLUTION COPPER DEPOSIT
KM4420

P4 Bulk Final Concentrate, >53µm



P8 Bulk Final Concentrate, >53µm



*Cp-Chalcopyrite, Bn-Bornite, Ch/Cv-Chalcocite/Covellite, Py-Pyrite, Gn-Gangue.

APPENDIX I – KM4420

SAMPLE ORIGIN

1.0 Sample Origin

One shipment was received at ALS Metallurgy Kamloops on September 11, 2014, consisting of twelve wooden totes containing about 4,816 kilograms of sample in total. Samples were received as HQ/NQ ¼ core.

The mass and identification of each sample received is presented in Table I-1, appended. Samples were reported to be from the Resolution Copper deposit, located near the city of Superior about 100 kilometers east of Phoenix in the state of Arizona.

Material from all crates was coarsely crushed and homogenized. Approximately 100 kilograms was split from the sample for metallurgical bench testing, which was crushed to minus 6 mesh and rotary split into 2 kilograms charges. This sample was called the Lab Composite. Representative head cuts were taken from the Lab Composite witness sample and assayed for the elements of interest. All metallurgical test charges were sealed in plastic bags under nitrogen and stored at -10°C. The remaining bulk sample was crushed to minus 6 mesh, homogenized, and placed into totes for pilot plant feed; this was called the Pilot Plant Feed.

Average head assay data for the Lab Composite is provided in Table I-2.

TABLE I-2
HEAD ASSAY SUMMARY DATA – METALLURGICAL LAB COMPOSITE

Sample	Assay – percent					
	Cu	Fe	Fe(t)	Mo	S(t)	S(s)
Lab Composite	2.06	6.3	6.4	0.038	6.31	6.22

Note: Detailed head assay data is located in Appendix IV.

Various samples were shipped during the course of the project. A summary of the shipments can be found in Table I-3.

TABLE I-3
SAMPLES SHIPPED OUT FOR VENDOR TESTING

Date	Test	Product	Sample Form	Mass - kg		Sent To
				Total	Dry Est	
October 17, 2014	T17	Pyrite Ro Tails II & III	Filter Cake	-	2	SGS Minerals
November 7, 2014	P3	Bulk Ro Tails	Filter Cake	-	2	
November 7, 2014	P4	Bulk Ro Tails	Filter Cake	-	2	
November 7, 2014	P6	Pyrite Ro Tails	Filter Cake	-	2	
November 7, 2014	P7	Pyrite Ro Tails	Filter Cake	-	2	
November 7, 2014	P8	Pyrite Ro Tails	Filter Cake	-	2	
November 13, 2014	P3	Bulk Clnr Scav Tails	Filter Cake	-	2	
November 13, 2014	P4	Bulk Clnr Scav Tails	Filter Cake	-	2	
November 13, 2014	P6	High Pyrite Tails	Filter Cake	-	4	
November 13, 2014	P7	High Pyrite Tails	Filter Cake	-	2	
November 13, 2014	P8	High Pyrite Tails	Filter Cake	-	2	
November 3, 2014	P1-P5	Process Water	Water	-	-	ALS Environmental
November 4, 2014	P5-P7	Process Water	Water	-	-	
November 6, 2014	P7-P8	Process Water	Water	-	-	
November 10, 2014	P8	Process Water	Water	40	-	Pockcock Industrial
November 10, 2014	P8	Bulk Final Con	Slurry	45	15	
November 10, 2014	P8	High Pyrite Tails	Slurry	61	15	
November 10, 2014	P8	Pyrite Ro Tails	Slurry	40	15	
November 25, 2014	-	High Pyrite Tails	Dry	5	5	Resolution Copper Mining
November 25, 2014	-	Pyrite Ro Tailings	Dry	5	5	
November 25, 2014	T28	Molybdenum Ro Tail I-V	Dry	4	4	
November 26, 2014	P6	Bulk Final Con WSA	Filter Cake	-	1	FLSmidth- Dawson Metallurgical Lab
November 26, 2014	P7	Bulk Final Con Startup	Filter Cake	-	13	
November 26, 2014	P7	Bulk Final Con WSA	Filter Cake	-	13	
November 26, 2014	P7	Bulk Final Con WSB	Filter Cake	-	12	
November 26, 2014	P8	Bulk Final Con WSA	Filter Cake	-	9	
November 26, 2014	P8	Bulk Final Con WSB	Filter Cake	-	4	

TABLE I-1
SAMPLE MASS AND IDENTIFICATION

Hole/Interval ID	Bag	Mass (kg)
RES-005L 1643.48-1717.32	Bag 1	10.3
	Bag 2	10.1
	Bag 3	10.6
	Bag 4	9.7
	Bag 5	9.3
	Bag 6	11.7
RES-005L 1717.32-1770.32	Bag 1	8.1
	Bag 2	10.7
	Bag 3	11.1
	Bag 4	10.0
RES-005L 1771.22-1823.67	Bag 1	12.5
	Bag 2	11.9
	Bag 3	7.0
	Bag 4	9.0
RES-005L 1823.67-1884.81	Bag 1	11.2
	Bag 2	10.8
	Bag 3	12.7
	Bag 4	12.0
	Bag 5	5.5
RES-005L 1884.81-1932.81	Bag 1	8.5
	Bag 2	10.8
	Bag 3	5.4
	Bag 4	5.1
RES-005L 1932.81-1983.05	Bag 1	7.3
	Bag 2	9.0
	Bag 3	8.1
	Bag 4	6.5
	Bag 5	6.4
RES-005L 1983.05-2025.05	Bag 1	10.9
	Bag 2	11.4
	Bag 3	6.7
RES-005L 2028.00-2077.87	Bag 1	11.7
	Bag 2	13.3
	Bag 3	11.4
RES-009G 1744.46-1804.46	Bag 1	19.5
	Bag 2	20.8
	Bag 3	17.7
	Bag 4	16.8
	Bag 5	17.3
	Bag 6	18.6

TABLE I-1
SAMPLE MASS AND IDENTIFICATION

Hole/Interval ID	Bag	Mass (kg)
RES-009G 1804.46-1859.26	Bag 1	18.1
	Bag2	20.3
	Bag 3	19.9
	Bag 4	20.5
	Bag 5	20.5
	Bag 6	4.5
RES-009G 1859.26-1910.25	Bag 1	16.5
	Bag 2	21.2
	Bag 3	19.3
	Bag 4	20.8
	Bag 5	22.4
RES-009G 1910.25-1965.25	Bag 1	19.6
	Bag 2	20.9
	Bag 3	18.3
	Bag 4	14.0
RES-013F 1782.20-1824.20	Bag 1	14.3
	Bag 2	11.6
	Bag 3	13.3
	Bag 4	12.2
	Bag 5	8.9
	Bag 6	9.2
RES-013F 1824.20-1879.20	Bag 1	6.5
	Bag 2	12.8
	Bag 3	3.5
	Bag 4	8.7
	Bag 5	3.8
	Bag 6	7.4
	Bag 7	5.8
	Bag 8	7.9
RES-013F 1879.20-1930.40	Bag 1	5.1
	Bag 2	5.1
	Bag 3	8.7
	Bag 4	7.0
	Bag 5	8.7
RES-013F 1930.40-1980.25	Bag 1	8.8
	Bag 2	10.4
	Bag 3	5.7
	Bag 4	8.8
	Bag 5	6.7

TABLE I-1
SAMPLE MASS AND IDENTIFICATION

Hole/Interval ID	Bag	Mass (kg)
RES-013F 1980.25-2040.00	Bag 1	12.0
	Bag 2	13.6
	Bag 3	15.6
RES-013F 2041.52-2098.60	Bag 1	12.6
	Bag 2	12.2
	Bag 3	8.9
RES-017M 1469.84-1562.41	Bag 1	12.9
	Bag 2	15.4
	Bag 3	13.8
	Bag 4	14.8
	Bag 5	13.2
	Bag 6	17.0
	Bag 7	12.4
	Bag 8	16.0
	Bag 9	11.7
	Bag 10	10.2
	Bag 11	10.6
RES-017M 1562.41-1641.2	Bag 1	10.5
	Bag 2	12.9
	Bag 3	12.2
	Bag 4	14.4
	Bag 5	14.2
	Bag 6	16.1
	Bag 7	12.0
	Bag 8	14.4
	Bag 9	10.7
RES-017M 1641.20-1733.00	Bag 1	10.6
	Bag 2	15.0
	Bag 3	8.5
	Bag 4	12.3
	Bag 5	10.7
	Bag 6	11.2
	Bag 7	12.9
	Bag 8	12.6
	Bag 9	10.6
	Bag 10	14.0
	Bag 11	12.0
	Bag 12	15.2
	Bag 13	4.2

TABLE I-1
SAMPLE MASS AND IDENTIFICATION

Hole/Interval ID	Bag	Mass (kg)
RES-017M 1733.00-1830.92	Bag 1	14.8
	Bag 2	20.6
	Bag 3	17.0
	Bag 4	20.3
	Bag 5	17.6
	Bag 6	22.1
	Bag 7	18.8
	Bag 8	22.9
RES-017M 1830.92-1939.39	Bag 1	15.5
	Bag 2	16.3
	Bag 3	12.2
	Bag 4	14.3
	Bag 5	11.5
	Bag 6	14.9
	Bag 7	11.9
	Bag 8	16.3
	Bag 9	15.3
	Bag 10	18.9
	Bag 11	20.6
RES-017M 1939.39-2068.75	Bag 1	12.7
	Bag 2	13.0
	Bag 3	16.4
	Bag 4	17.0
	Bag 5	15.3
	Bag 6	19.7
	Bag 7	16.9
	Bag 8	18.5
	Bag 9	14.3
	Bag 10	17.9
	Bag 11	15.3
	Bag 12	18.4
	Bag 13	9.9
RES-025B 1522.33-1589.56	Bag 1	17.9
	Bag 2	13.3
	Bag 3	17.4
	Bag 4	14.5
	Bag 5	12.7
	Bag 6	11.3
RES-025B 1589.56-1636.30	Bag 1	13.3
	Bag 2	16.7
	Bag 3	16.6

TABLE I-1
SAMPLE MASS AND IDENTIFICATION

Hole/Interval ID	Bag	Mass (kg)
RES-025B 1636.30-1683.75	Bag 1	15.1
	Bag 2	18.8
	Bag 3	18.7
RES-025B 1683.75-1718.60	Bag 1	15.0
	Bag 2	14.8
	Bag 3	9.5
RES-025B 1718.60-1751.79	Bag 1	18.0
	Bag 2	15.9
RES-025B 1751.79-1798.13	Bag 1	17.4
	Bag 2	18.2
	Bag 3	14.1
RES-025B 1798.13-1866.90	Bag 1	16.5
	Bag 2	17.9
	Bag 3	17.1
	Bag 4	18.9
RES-025B 1866.90-1907.91	Bag 1	12.8
	Bag 2	13.6
	Bag 3	13.9
RES-025B 1907.91-1939.70	Bag 1	14.5
	Bag 2	9.9
	Bag 3	7.8
RES-025B 1939.70-1984.33	Bag 1	12.9
	Bag 2	13.3
	Bag 3	13.3
	Bag 4	3.7
RES-025E 1601.70-1733.00	Bag 1	10.8
	Bag 2	13.8
	Bag 3	14.1
	Bag 4	12.5
	Bag 5	13.5
	Bag 6	15.8
	Bag 7	13.0
	Bag 8	11.5
	Bag 9	20.3
RES-025E 1733.00-1831.20	Bag 1	18.9
	Bag 2	20.1
	Bag 3	18.6
	Bag 4	15.1
	Bag 5	13.4
	Bag 6	6.7

TABLE I-1
SAMPLE MASS AND IDENTIFICATION

Hole/Interval ID	Bag	Mass (kg)
RES-025E 1831.20-1924.66	Bag 1	14.8
	Bag 2	14.2
	Bag 3	12.8
	Bag 4	12.8
	Bag 5	18.0
	Bag 6	7.7
RES-025E 1924.66-2001.01	Bag 1	14.2
	Bag 2	16.1
	Bag 3	17.2
	Bag 4	15.2
	Bag 5	13.7
RES-025E 2001.01-2125.01	Bag 1	12.0
	Bag 2	13.4
	Bag 3	11.2
	Bag 4	13.7
	Bag 5	14.1
	Bag 6	13.0
	Bag 7	11.5
	Bag 8	12.6
	Bag 9	14.1
RES-027D 1794.10-1878.00	Bag 1	13.3
	Bag 2	14.0
	Bag 3	13.4
	Bag 4	15.7
	Bag 5	12.8
	Bag 6	14.6
	Bag 7	12.9
	Bag 8	12.7
	Bag 9	12.2
	Bag 10	13.7
	Bag 11	15.6
	Bag 12	16.0

TABLE I-1
SAMPLE MASS AND IDENTIFICATION

Hole/Interval ID	Bag	Mass (kg)
RES-027D 1878.00-1998.47	Bag 1	15.4
	Bag 2	15.6
	Bag 3	16.3
	Bag 4	17.1
	Bag 5	16.9
	Bag 6	19.2
	Bag 7	16.9
	Bag 8	17.4
	Bag 9	17.4
	Bag 10	16.7
	Bag 11	15.6
	Bag 12	15.7
	Bag 13	16.8
	Bag 14	15.9
	Bag 15	12.2
	Bag 16	9.9
RES-027D 1998.47-2083.50	Bag 1	15.5
	Bag 2	14.9
	Bag 3	15.1
	Bag 4	11.7
	Bag 5	14.7
	Bag 6	12.4
	Bag 7	6.1
RES-028B 1563.21-1577.07	Bag 1	15.9
RES-028B 1577.07-1617.30	Bag 1	14.5
	Bag 2	12.6
	Bag 3	12.9
RES-028B 1617.30-1659.50	Bag 1	15.1
	Bag 2	14.8
	Bag 3	12.7
RES-028B 1659.50-1714.65	Bag 1	14.9
	Bag 2	14.4
	Bag 3	14.0
	Bag 4	14.5
RES-028B 1714.65-1761.56	Bag 1	15.7
	Bag 2	15.7
	Bag 3	15.9
RES-028B 1761.56-1787.86	Bag 1	13.7
	Bag 2	13.6

TABLE I-1
SAMPLE MASS AND IDENTIFICATION

Hole/Interval ID	Bag	Mass (kg)
RES-028B 1787.86-1836.31	Bag 1	15.3
	Bag 2	13.3
	Bag 3	14.4
	Bag 4	12.1
RES-028B 1839.31-1855.04	Bag 1	17.0
RES-028D 1652.90-1698.38	Bag 1	16.8
	Bag 2	15.9
	Bag 3	15.3
	Bag 4	13.0
RES-028D 1698.38-1746.38	Bag 1	12.7
	Bag 2	12.8
	Bag 3	14.0
	Bag 4	14.8
RES-028D 1746.38-1864.10	Bag 1	15.6
	Bag 2	14.9
	Bag 3	14.6
	Bag 4	14.8
	Bag 5	13.4
	Bag 6	13.6
	Bag 7	13.6
	Bag 8	14.8
	Bag 9	14.3
RES-028D 1864.10-1968.15	Bag 1	14.5
	Bag 2	14.9
	Bag 3	16.4
	Bag 4	14.8
	Bag 5	15.4
	Bag 6	13.2
	Bag 7	10.6
	Bag 8	11.1
RES-028D 1968.15-2044.87	Bag 1	16.4
	Bag 2	18.3
	Bag 3	18.7
	Bag 4	20.8
RES- 031 1600.56-1663.50	Bag 1	12.8
	Bag 2	16.4
	Bag 3	10.7
	Bag 4	11.0

TABLE I-1
SAMPLE MASS AND IDENTIFICATION

Hole/Interval ID	Bag	Mass (kg)
RES-031 1663.50-1701.50	Bag 1	5.8
	Bag 2	10.0
	Bag 3	10.4
RES-031 1701.50-1717.85	Bag 1	15.4
RES-031 1717.85-1753.50	Bag 1	13.3
	Bag 2	8.0
	Bag 3	5.3
RES-031 1753.50-1796.00	Bag 1	12.1
	Bag 2	7.3
	Bag 3	9.3
RES-031 1796.00-1873.00	Bag 1	9.6
	Bag 2	8.7
	Bag 3	11.9
	Bag 4	10.8
	Bag 5	10.0
	Bag 6	11.7
RES-031 1873.00-1949.32	Bag 1	10.5
	Bag 2	11.5
	Bag 3	10.8
	Bag 4	10.1
	Bag 5	13.2
RES-031 1949.32-2031.28	Bag 1	12.5
	Bag 2	11.8
	Bag 3	11.0
	Bag 4	11.4
	Bag 5	10.5
	Bag 6	10.0
RES-031 2031.28-2110.71	Bag 1	9.8
	Bag 2	10.2
	Bag 3	11.7
	Bag 4	12.8
	Bag 5	10.0
RES-031 2110.71-2182.71	Bag 1	11.2
	Bag 2	12.1
	Bag 3	11.1
	Bag 4	6.0
	Bag 5	6.5
RES-031B 5672.00-5782.00	Bag 1	16.4
	Bag 2	14.8
	Bag 3	6.8

TABLE I-1
SAMPLE MASS AND IDENTIFICATION

Hole/Interval ID	Bag	Mass (kg)
RES-031B 5782.00-5864.70	Bag 1	12.9
	Bag 2	8.0
RES-031B 5864.70-6104.70	Bag 1	13.2
	Bag 2	13.1
	Bag 3	16.2
	Bag 4	13.4
	Bag 5	11.7
	Bag 6	12.9
RES-031B 6104.70-6314.70	Bag 1	15.4
	Bag 2	17.6
	Bag 3	15.2
	Bag 4	16.5
	Bag 5	13.6
	Total	4816.2

APPENDIX II – KM4420

FLOTATION TEST DATA

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DATE: September 19, 2014

PROJECT NO: KM4420-01

PURPOSE: Preliminary Rougher Test.

PROCEDURE: Perform a standard two product rougher test.

FEED: 2 kg of Lab Composite ground to a nominal 159 μ m K₈₀.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	Lime	Fuel Oil	8989	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	100	10				12			8.7	200
<u>BULK CIRCUIT:</u>										
Rougher 1	25		5	-	8		1	3	9.0	132
Rougher 2	√		3	-	-		1	2	9.0	149
Rougher 3	√		1	-	8		1	2	9.0	132
Rougher 4	√		1	-	-		1	2	9.0	136
<u>PYRITE CIRCUIT:</u>										
Rougher 1	-		-	10	-		1	2	8.8	120
Rougher 2	-		-	30	-		1	2	8.6	108

Flotation Data	Rougher	
Flotation Machine:	D2A	
Cell Size in liters:	4.4	
Air Aspiration:		Air
Water Type		Fresh
Impeller Speed in rpm:	1100	

Grinding Data	Primary Grind
Mill:	M5-Mild
Charge/Material:	20kg-Mild
Water:	1000 ml

KM4420-01 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Ro Con 1	10.9	217.9	13.9	0.277	19.7	22.9	75.2	84.2	37.4	44.8
Bulk Ro Con 2	4.8	95.9	7.60	0.027	24.9	29.5	18.1	3.6	20.8	25.4
Bulk Ro Con 3	2.7	54.7	2.19	0.023	31.6	35.8	3.0	1.7	15.0	17.6
Bulk Ro Con 4	1.6	32.0	1.05	0.016	18.5	20.7	0.8	0.7	5.2	6.0
Pyrite Ro Con 1	2.0	40.9	0.71	0.015	11.2	10.0	0.7	0.9	4.0	3.7
Pyrite Ro Con 2	1.5	30.4	0.43	0.017	2.6	1.23	0.3	0.7	0.7	0.3
Pyrite Ro Tail	76.4	1525.4	0.05	0.004	1.3	0.16	1.9	8.2	17.0	2.2
Feed	100	1997	2.02	0.036	5.8	5.57	100	100	100	100

KM4420-01 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	10.9	217.9	13.9	0.277	19.7	22.9	75.2	84.2	37.4	44.8
Product 1 to 2	15.7	313.8	12.0	0.201	21.3	24.9	93.3	87.8	58.1	70.3
Product 1 to 3	18.5	368.5	10.5	0.174	22.8	26.5	96.3	89.5	73.2	87.8
Product 1 to 4	20.1	400.5	9.77	0.162	22.5	26.1	97.1	90.3	78.3	93.8
Product 5	2.0	40.9	0.71	0.015	11.2	10.0	0.7	0.9	4.0	3.7
Product 5 to 6	3.6	71.3	0.59	0.016	7.5	6.26	1.0	1.6	4.7	4.0
Product 7	76.4	1525.4	0.05	0.004	1.3	0.16	1.9	8.2	17.0	2.2
Feed	100	1997	2.02	0.036	5.8	5.57	100	100	100	100

DATE: September 19, 2014

PROJECT NO: KM4420-02

PURPOSE: To Investigate Bulk Flotation.

PROCEDURE: Perform a one product rougher test.

FEED: 2 kg of Lab Composite ground to a nominal 159 μ m K₈₀.

Stage	Reagents Added g/tonne			Time (minutes)			pH	Redox
	Fuel Oil	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	10			12			7.9	93
<u>BULK CIRCUIT:</u>								
Rougher 1		3	15		1	3	7.9	89
Rougher 2		3	8		1	2	7.9	149
Rougher 3		3	-		1	2	7.9	159
Rougher 4		3	-		1	2	7.9	159

Flotation Data	Rougher	
Flotation Machine	D2A	
Cell Size in liters	4.4	
Aspiration		Air
Water Type		Fresh
Impeller Speed in rpm	1100	

Grinding Data	Primary Grind
Mill:	M5-Mild
Charge/Material:	20kg-Mild
Water:	1000 ml

KM4420-02 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Ro Con 1	10.6	212.1	12.7	0.281	26.2	29.7	66.9	80.9	47.8	55.6
Bulk Ro Con 2	6.7	133.6	7.70	0.026	27.2	32.3	25.5	4.8	31.2	38.1
Bulk Ro Con 3	2.3	46.1	2.81	0.032	6.8	6.36	3.2	2.0	2.7	2.6
Bulk Ro Con 4	1.8	35.2	1.15	0.028	3.4	2.18	1.0	1.3	1.0	0.7
Bulk Rougher Tail	78.6	1569.1	0.09	0.005	1.3	0.22	3.4	11.0	17.3	3.0
Feed	100.0	1996.1	2.02	0.037	5.8	5.68	100	100	100	100

KM4420-02 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	10.6	212.1	12.7	0.281	26.2	29.7	66.9	80.9	47.8	55.6
Product 1 to 2	17.3	345.7	10.8	0.183	26.6	30.7	92.4	85.7	79.0	93.7
Product 1 to 3	19.6	391.8	9.83	0.165	24.3	27.8	95.6	87.6	81.7	96.3
Product 1 to 4	21.4	427.0	9.12	0.154	22.5	25.7	96.6	89.0	82.7	97.0
Product 5	78.6	1569.1	0.09	0.005	1.3	0.22	3.4	11.0	17.3	3.0
Feed	100.0	1996.1	2.02	0.037	5.8	5.68	100	100	100	100

DATE: September 22, 2014

PROJECT NO: KM4420-03

PURPOSE: Preliminary Cleaner Test.

PROCEDURE: Perform a standard one product cleaner test.

FEED: 2 kg of Lab Composite ground to a nominal 159 μ m K₈₀.
Bulk Regrind Discharge - 42 μ m K₈₀.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	Lime	Fuel Oil	8989	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	125	10				12			9.2	181
<u>BULK CIRCUIT:</u>										
Rougher 1			5		15		1	3	9.0	159
Rougher 2			3		-		1	4	9.0	143
Regrind	200	10				12			11.1	11
Cleaner 1			2		8		1	6	11.0	13
Cleaner 2	√		1		8		1	5	11.0	5
Cleaner 3	√		1		8		1	4	11.0	40
Cleaner Scavenger	√	10	3				1	2	11.0	67
<u>PYRITE CIRCUIT:</u>										
Rougher 1				30	8		1	3	9.0	125
Rougher 2				10	8		1	3	9.0	135

Flotation Data	Rougher	Cleaner
Flotation Machine	D2A	D1B
Cell Size in liters	4.4	2.2
Aspiration	Air	
Water Type	Fresh	
Impeller Speed in rpm	1100	1200

Grinding Data	Primary Grind	Bulk Regrind
Mill:	M5-Mild	RM3-Mild
Charge/Material:	20kg-Mild	6kg-Stainless Steel
Water:	1000ml	estimated

KM4420-03 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Con	6.4	128.4	27.2	0.450	27.5	36.1	89.0	75.8	31.8	40.9
Bulk 3rd Clnr Tail	0.3	5.6	10.2	0.067	21.2	27.9	1.5	0.5	1.1	1.4
Bulk 2nd Clnr Tail	0.8	15.6	2.16	0.049	16.2	18.7	0.9	1.0	2.3	2.6
Bulk Clnr Scav Con	1.1	21.1	4.02	0.042	17.3	27.3	2.2	1.2	3.3	5.1
Bulk Clnr Scav Tail	8.3	166.3	0.33	0.010	18.0	19.9	1.4	2.2	27.0	29.2
Py Ro Con	4.9	97.8	1.29	0.097	19.9	21.4	3.2	12.4	17.6	18.5
Py Ro Tail	78.3	1566.9	0.05	0.003	1.2	0.17	1.9	7.0	17.0	2.4
Feed	100.0	2001.7	1.96	0.038	5.5	5.66	100	100	100	100

KM4420-03 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	6.4	128.4	27.2	0.450	27.5	36.1	89.0	75.8	31.8	40.9
Product 1 to 2	6.7	134.0	26.5	0.434	27.2	35.8	90.5	76.3	32.9	42.3
Product 1 to 3	7.5	149.6	24.0	0.394	26.1	34.0	91.3	77.3	35.2	44.9
Product 1 to 4	8.5	170.7	21.5	0.350	25.0	33.2	93.5	78.5	38.5	50.0
Product 1 to 5	16.8	337.0	11.0	0.182	21.5	26.6	94.9	80.6	65.5	79.2
Product 6	4.9	97.8	1.29	0.097	19.9	21.4	3.2	12.4	17.6	18.5
Product 7	78.3	1566.9	0.05	0.003	1.2	0.17	1.9	7.0	17.0	2.4
Feed	100.0	2001.7	1.96	0.038	5.5	5.66	100	100	100	100

DATE: September 22, 2014

PROJECT NO: KM4420-04

PURPOSE: Preliminary Cleaner Test.

PROCEDURE: Perform a standard one product cleaner test.

FEED: 2 kg of Lab Composite ground to a nominal 159 μ m K₈₀.
Bulk Regrind Discharge - 43 μ m K₈₀.

Stage	Reagents Added g/tonne				Time (minutes)			pH	Redox
	Lime	Fuel Oil	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind		10			12			7.9	110
BULK CIRCUIT:									
Rougher 1			4	8		1	3	7.9	130
Rougher 2			4	8		1	3	8.0	140
Rougher 3			4	8		1	3	8.0	135
Rougher 4			4			1	3	8.0	129
Regrind	300	10			16			11.0	25
Cleaner 1	-		2	15		1	5	11.0	-10
Cleaner 2	√		1	8		1	4	11.0	-28
Cleaner 3	√		1	8		1	3	11.0	-25
Cleaner Scavenger	√	10	2	-		1	2	11.0	-5

Flotation Data	Rougher	Cleaner
Flotation Machine	D2A	D1B
Cell Size in liters	4.4	2.2
Aspiration	Air	
Water Type	Fresh	
Impeller Speed in rpm	1100	1200

Grinding Data	Primary Grind	Bulk Regrind
Mill:	M5-Mild	RM3-Mild
Charge/Material:	20kg-Mild	6kg-Stainless Steel
Water:	1000ml	estimated

KM4420-04 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Con	7.0	140.8	25.4	0.408	28.5	39.0	90.4	80.6	37.3	48.1
Bulk 3rd Clnr Tail	0.3	6.3	6.80	0.152	23.0	30.0	1.1	1.3	1.3	1.7
Bulk 2nd Clnr Tail	1.3	26.8	2.09	0.064	16.4	18.7	1.4	2.4	4.1	4.4
Bulk Clnr Scav Con	0.8	16.7	1.85	0.048	28.0	34.8	0.8	1.1	4.3	5.1
Bulk Clnr Scav Tail	11.9	238.4	0.33	0.012	15.3	17.9	2.0	3.9	33.9	37.3
Bulk Ro Tail	78.5	1568.3	0.11	0.005	1.3	0.25	4.3	10.6	19.0	3.5
Feed	100.0	1997.3	1.98	0.036	5.4	5.72	100	100	100	100

KM4420-04 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	7.0	140.8	25.4	0.408	28.5	39.0	90.4	80.6	37.3	48.1
Product 1 to 2	7.4	147.1	24.6	0.397	28.3	38.6	91.5	82.0	38.7	49.7
Product 1 to 3	8.7	173.9	21.1	0.346	26.4	35.5	92.9	84.4	42.8	54.1
Product 1 to 4	9.5	190.6	19.4	0.320	26.6	35.5	93.7	85.5	47.1	59.2
Product 1 to 5	21.5	429.0	8.82	0.149	20.3	25.7	95.7	89.4	81.0	96.5
Product 6	78.5	1568.3	0.11	0.005	1.3	0.25	4.3	10.6	19.0	3.5
Feed	100.0	1997.3	1.98	0.036	5.4	5.72	100	100	100	100

DATE: September 24, 2014

PROJECT NO: KM4420-05

PURPOSE: Increase Sulphur Recovery.

PROCEDURE: Perform a standard two product rougher test.

FEED: 2 kg of Lab Composite ground to a nominal 159 μ m K₈₀.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	Lime	Fuel Oil	8989	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	100	10				12			8.7	175
<u>BULK CIRCUIT:</u>										
Rougher 1	50		5		15		1	3	9.0	150
Rougher 2	√		3		-		1	4	9.0	145
<u>PYRITE CIRCUIT:</u>										
Rougher 1				10	8		1	2	8.6	130
Rougher 2				5	-		1	2	8.6	125
Rougher 3				5	8		1	2	8.5	121
Rougher 4				5	-		1	2	8.4	113

Flotation Data	Rougher	
Flotation Machine:	D2A	
Cell Size in liters:	4.4	
Air Aspiration:		Air
Water Type		Fresh
Impeller Speed in rpm:	1100	

Grinding Data	Primary Grind
Mill:	M5-Mild
Charge/Material:	20kg-Mild
Water:	1000 ml

KM4420-05 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Ro Con 1	14.4	283.0	13.4	0.241	25.1	31.5	92.7	88.8	62.4	76.0
Bulk Ro Con 2	3.3	65.5	2.43	0.029	28.2	30.5	3.9	2.4	16.2	17.0
Pyrite Ro Con 1	2.0	39.8	0.94	0.018	13.5	13.9	0.9	1.0	4.7	4.7
Pyrite Ro Con 2	1.8	36.1	0.64	0.016	2.6	1.52	0.6	0.7	0.8	0.5
Pyrite Ro Con 3	2.0	39.8	0.35	0.011	2.1	0.7	0.3	0.6	0.7	0.2
Pyrite Ro Con 4	1.3	25.0	0.34	0.010	2.0	0.69	0.2	0.3	0.4	0.1
Pyrite Ro Tail	75.1	1476.7	0.04	0.003	1.1	0.11	1.3	6.2	14.7	1.4
Feed	100	1966	2.08	0.039	5.8	5.97	100	100	100	100

KM4420-05 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	14.4	283.0	13.4	0.241	25.1	31.5	92.7	88.8	62.4	76.0
Product 1 to 2	17.7	348.5	11.3	0.201	25.7	31.3	96.6	91.2	78.7	93.0
Product 3	2.0	388.3	0.94	0.018	13.5	13.9	0.9	1.0	4.7	4.7
Product 3 to 4	3.9	424.4	0.80	0.017	8.3	8.01	1.5	1.7	5.5	5.2
Product 3 to 5	5.9	464.2	0.64	0.015	6.1	5.50	1.8	2.3	6.3	5.4
Product 3 to 6	7.2	489.2	0.59	0.014	5.4	4.65	2.0	2.6	6.7	5.6
Product 7	75.1	1476.7	0.04	0.003	1.1	0.11	1.3	6.2	14.7	1.4
Feed	86	2390	2.08	0.039	5.8	5.97	5	10	27	12

DATE: September 24, 2014

PROJECT NO: KM4420-06

PURPOSE: Increase Sulphur Recovery.

PROCEDURE: Perform a standard one product rougher test.

FEED: 2 kg of Lab Composite ground to a nominal 159 μ m K₈₀.

Stage	Reagents Added g/tonne			Time (minutes)			pH	Redox
	Fuel Oil	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	10			12			7.6	72
BULK CIRCUIT:								
Rougher 1		4	15		1	3	7.6	63
Rougher 2		4	-		1	3	7.8	128
Rougher 3		4	8		1	3	7.8	160
Rougher 4		4	-		1	3	7.8	150
Rougher 5		4	-		1	3	7.7	156

Flotation Data	Rougher	
Flotation Machine:	D2A	
Cell Size in liters:	4.4	
Air Aspiration:	Air	
Water Type	Fresh	
Impeller Speed in rpm:	1100	

Grinding Data	Primary Grind
Mill:	M5-Mild
Charge/Material:	20kg-Mild
Water:	1000 ml

KM4420-06 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Ro Con 1	14.3	285.8	10.9	0.218	23.5	28.4	79.0	87.1	59.9	71.8
Bulk Ro Con 2	6.1	122.9	5.31	0.018	19.3	22.5	16.6	3.1	21.2	24.5
Bulk Ro Con 3	2.1	41.7	1.22	0.020	3.5	2.71	1.3	1.2	1.3	1.0
Bulk Ro Con 4	1.1	22.6	0.70	0.012	2.6	1.32	0.4	0.4	0.5	0.3
Bulk Ro Con 5	1.4	27.2	0.63	0.013	2.5	1.16	0.4	0.5	0.6	0.3
Bulk Ro Tail	75.0	1502.6	0.06	0.004	1.2	0.16	2.3	7.8	16.5	2.2
Feed	100	2003	1.97	0.036	5.6	5.64	100	100	100	100

KM4420-06 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	14.3	285.8	10.9	0.218	23.5	28.4	79.0	87.1	59.9	71.8
Product 1 to 2	20.4	408.7	9.22	0.158	22.2	26.6	95.6	90.1	81.1	96.3
Product 1 to 3	22.5	450.4	8.48	0.145	20.5	24.4	96.9	91.3	82.4	97.3
Product 1 to 4	23.6	473.0	8.11	0.139	19.6	23.3	97.3	91.7	82.9	97.6
Product 1 to 5	25.0	500.2	7.70	0.132	18.7	22.1	97.7	92.2	83.5	97.8
Product 6	75.0	1502.6	0.06	0.004	1.2	0.16	2.3	7.8	16.5	2.2
Feed	100	2003	1.97	0.036	5.6	5.64	100	100	100	100

DATE: September 29, 2014

PROJECT NO: KM4420-07

PURPOSE: Investigate pH 10.0

PROCEDURE: Perform a standard two product rougher test.

FEED: 2 kg of Lab Composite ground to a nominal 159 μ m K₈₀.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	Lime	Fuel Oil	8989	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	250	10				12			9.5	165
<u>BULK CIRCUIT:</u>										
Rougher 1	50		5		15		1	3	10.0	109
Rougher 2	√		3		8		1	2	10.0	102
Rougher 3	-		1		-		1	2	10.0	98
Rougher 4	-		1		-		1	2	10.0	109
<u>PYRITE CIRCUIT:</u>										
Rougher 1	-			15	8		1	4	9.9	133
Rougher 2	-			10	-		1	4	9.8	141

Flotation Data	Rougher	
Flotation Machine:	D2A	
Cell Size in liters:	4.4	
Air Aspiration:		Air
Water Type		Fresh
Impeller Speed in rpm:	1100	

Grinding Data	Primary Grind
Mill:	M5-Mild
Charge/Material:	20kg-Mild
Water:	1000 ml

KM4420-07 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Ro Con 1	10.8	215.0	15.7	0.286	19.2	24.6	84.0	84.9	38.0	44.6
Bulk Ro Con 2	2.5	49.3	3.35	0.051	16.0	18.2	4.1	3.5	7.3	7.6
Bulk Ro Con 3	4.3	86.9	2.30	0.023	20.3	25.1	5.0	2.8	16.3	18.4
Bulk Ro Con 4	2.2	43.1	2.99	0.020	25.9	35.4	3.2	1.2	10.3	12.9
Pyrite Ro Con 1	5.6	112.5	0.88	0.017	12.3	15.9	2.5	2.6	12.8	15.1
Pyrite Ro Tail	74.6	1491.9	0.03	0.002	1.1	0.11	1.2	5.0	15.4	1.4
Feed	100	1999	2.01	0.036	5.4	5.93	100	100	100	100

KM4420-07 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	10.8	215.0	15.7	0.286	19.2	24.6	84.0	84.9	38.0	44.6
Product 1 to 2	13.2	264.3	13.4	0.242	18.6	23.4	88.1	88.4	45.3	52.2
Product 1 to 3	17.6	351.2	10.65	0.188	19.0	23.8	93.1	91.2	61.6	70.6
Product 1 to 4	19.7	394.3	9.81	0.170	19.8	25.1	96.3	92.3	71.9	83.5
Product 5	5.6	112.5	0.88	0.017	12.3	15.9	2.5	2.6	12.8	15.1
Product 6	74.6	1491.9	0.03	0.002	1.1	0.11	1.2	5.0	15.4	1.4
Feed	100	1999	2.01	0.036	5.4	5.93	100	100	100	100

DATE: September 29, 2014

PROJECT NO: KM4420-08

PURPOSE: Investigate a Coarser Primary Grind.

PROCEDURE: Perform a standard two product rougher test.

FEED: 2 kg of Lab Composite ground to a nominal 225 μ m K₈₀.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	Lime	Fuel Oil	8989	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	100	10				9			8.6	150
<u>BULK CIRCUIT:</u>										
Rougher 1	50		3		15		1	3	9.0	97
Rougher 2	-		3		-		1	2	9.0	141
Rougher 3	-		2		-		1	2	9.0	163
Rougher 4	√		2		8		1	2	9.0	194
<u>PYRITE CIRCUIT:</u>										
Rougher 1	-			15	8		1	4	8.9	175
Rougher 2	-			10	-		1	4	8.9	169

Flotation Data	Rougher	
Flotation Machine:	D2A	
Cell Size in liters:	4.4	
Air Aspiration:		Air
Water Type		Fresh
Impeller Speed in rpm:	1100	

Grinding Data	Primary Grind
Mill:	M5-Mild
Charge/Material:	20kg-Mild
Water:	1000 ml

KM4420-08 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Ro Con 1	8.6	171.3	14.8	0.315	21.6	26.2	66.4	77.1	28.7	36.8
Bulk Ro Con 2	3.5	68.8	6.34	0.089	20.6	22.8	11.4	8.7	11.0	12.9
Bulk Ro Con 3	3.4	68.0	5.67	0.019	19.1	24.2	10.1	1.8	10.1	13.5
Bulk Ro Con 4	3.1	61.6	3.09	0.010	22.7	23.6	5.0	0.9	10.8	11.9
Pyrite Ro Con 1	7.8	155.1	1.21	0.011	21.8	18.2	4.9	2.5	26.2	23.2
Pyrite Ro Tail	73.6	1463.8	0.06	0.004	1.2	0.15	2.2	9.0	13.2	1.8
Feed	100	1989	1.92	0.035	6.5	6.13	100	100	100	100

KM4420-08 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	8.6	171.3	14.8	0.315	21.6	26.2	66.4	77.1	28.7	36.8
Product 1 to 2	12.1	240.1	12.4	0.250	21.3	25.2	77.8	85.8	39.7	49.7
Product 1 to 3	15.5	308.1	10.9	0.199	20.8	25.0	87.9	87.6	49.8	63.2
Product 1 to 4	18.6	369.7	9.60	0.168	21.1	24.8	92.9	88.5	60.6	75.1
Product 5	7.8	155.1	1.21	0.011	21.8	18.2	4.9	2.5	26.2	23.2
Product 6	73.6	1463.8	0.06	0.004	1.2	0.15	2.2	9.0	13.2	1.8
Feed	100	1989	1.92	0.035	6.5	6.13	100	100	100	100

DATE: September 29, 2014

PROJECT NO: KM4420-09

PURPOSE: Investigate a Fine Primary Grind.

PROCEDURE: Perform a standard two product rougher test.

FEED: 2 kg of Lab Composite ground to a nominal 104 μ m K₈₀.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	Lime	Fuel Oil	8989	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	125	10				15			8.9	115
<u>BULK CIRCUIT:</u>										
Rougher 1	-		4		15		1	3	9.0	120
Rougher 2	√		3		-		1	2	9.0	140
Rougher 3	√		3		-		1	2	9.0	139
Rougher 4	-		3		8		1	2	9.0	147
<u>PYRITE CIRCUIT:</u>										
Rougher 1	-			15	8		1	4	8.9	174
Rougher 2	-			10	-		1	4	8.9	159

Flotation Data	Rougher	
Flotation Machine:	D2A	
Cell Size in liters:	4.4	
Air Aspiration:		Air
Water Type		Fresh
Impeller Speed in rpm:	1100	

Grinding Data	Primary Grind
Mill:	M5-Mild
Charge/Material:	20kg-Mild
Water:	1000 ml

KM4420-09 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Ro Con 1	7.3	145.9	18.1	0.420	21.7	26.7	65.1	84.7	26.4	28.4
Bulk Ro Con 2	4.2	84.1	11.7	0.041	22.2	28.8	24.3	4.8	15.6	17.6
Bulk Ro Con 3	4.2	83.3	3.44	0.011	29.0	33.5	7.1	1.3	20.2	20.3
Bulk Ro Con 4	3.1	62.9	0.66	0.008	29.8	34.4	1.0	0.7	15.6	15.7
Pyrite Ro Con 1	5.8	116.8	0.41	0.009	7.0	19.4	1.2	1.5	6.8	16.5
Pyrite Ro Tail	75.4	1513.4	0.04	0.003	1.2	0.13	1.3	7.1	15.4	1.5
Feed	100	2006	2.02	0.036	6.0	6.85	100	100	100	100

KM4420-09 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	7.3	145.9	18.1	0.420	21.7	26.7	65.1	84.7	26.4	28.4
Product 1 to 2	11.5	230.0	15.8	0.281	21.9	27.5	89.4	89.4	42.0	46.0
Product 1 to 3	15.6	313.3	12.5	0.210	23.8	29.1	96.5	90.7	62.1	66.3
Product 1 to 4	18.8	376.2	10.5	0.176	24.8	30.0	97.5	91.4	77.8	82.0
Product 5	5.8	116.8	0.41	0.009	7.0	19.4	1.2	1.5	6.8	16.5
Product 6	75.4	1513.4	0.04	0.003	1.2	0.13	1.3	7.1	15.4	1.5
Feed	100	2006	2.02	0.036	6.0	6.85	100	100	100	100

DATE: September 29, 2014

PROJECT NO: KM4420-10

PURPOSE: Preliminary Cleaner Test.

PROCEDURE: Perform a standard one product cleaner test.

FEED: 2 kg of Lab Composite ground to a nominal 159 μ m K₈₀.
Bulk Regrind Discharge - 32 μ m K₈₀.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	Lime	Fuel Oil	8989	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	125	10				12			9.0	140
<u>BULK CIRCUIT:</u>										
Rougher 1			5		15		1	3	9.0	170
Rougher 2			3		8		1	4	9.0	171
Regrind	200	10				30			10.9	95
Cleaner 1	25		3		15		1	6	11.0	62
Cleaner 2	√		1		8		1	5	11.0	32
Cleaner 3	√		1		8		1	4	11.0	45
Cleaner Scavenger	√	10	3		8		1	2	11.0	45
<u>PYRITE CIRCUIT:</u>										
Rougher 1				15	8		1	4	8.9	160
Rougher 2				10	-		1	4	8.9	149

Flotation Data	Rougher	Cleaner
Flotation Machine	D2A	D1B
Cell Size in liters	4.4	2.2
Aspiration	Air	
Water Type	Fresh	
Impeller Speed in rpm	1100	1200

Grinding Data	Primary Grind	Bulk Regrind
Mill:	M5-Mild	RM3-Mild
Charge/Material:	20kg-Mild	6kg-Stainless Steel
Water:	1000ml	estimated

KM4420-10 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Con	5.9	117.5	32.0	0.496	25.2	34.7	90.6	82.8	25.2	33.4
Bulk 3rd Clnr Tail	0.4	8.8	3.75	0.066	21.7	24.2	0.8	0.8	1.6	1.7
Bulk 2nd Clnr Tail	1.5	29.7	1.56	0.035	18.9	21.2	1.1	1.5	4.8	5.2
Bulk Clnr Scav Con	0.8	15.4	4.71	0.044	23.4	29.1	1.7	1.0	3.1	3.7
Bulk Clnr Scav Tail	8.5	170.5	0.31	0.010	20.2	23.0	1.3	2.4	29.3	32.1
Py Ro Con	8.0	159.9	0.77	0.009	15.6	16.8	3.0	2.1	21.2	22.0
Py Ro Tail	74.9	1495.6	0.04	0.004	1.2	0.15	1.5	9.4	14.9	1.9
Feed	100.0	1997.4	2.08	0.035	5.9	6.11	100	100	100	100

KM4420-10 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	5.9	117.5	32.0	0.496	25.2	34.7	90.6	82.8	25.2	33.4
Product 1 to 2	6.3	126.3	30.0	0.466	25.0	34.0	91.4	83.7	26.8	35.2
Product 1 to 3	7.8	156.0	24.6	0.384	23.8	31.5	92.5	85.1	31.6	40.3
Product 1 to 4	8.6	171.4	22.8	0.353	23.8	31.3	94.3	86.1	34.6	44.0
Product 1 to 5	17.1	341.9	11.6	0.182	22.0	27.2	95.6	88.5	63.9	76.1
Product 6	8.0	159.9	0.77	0.009	15.6	16.8	3.0	2.1	21.2	22.0
Product 7	74.9	1495.6	0.04	0.004	1.2	0.15	1.5	9.4	14.9	1.9
Feed	100.0	1997.4	2.08	0.035	5.9	6.11	100	100	100	100

DATE: October 3, 2014

PROJECT NO: KM4420-11

PURPOSE: Investigate a 180µm Primary Grind Target.

PROCEDURE: Perform a standard two product rougher test.

FEED: 2 kg of Lab Composite ground to a nominal 176µm K₈₀.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	Lime	Fuel Oil	8989	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	125	10				11			8.7	148
<u>BULK CIRCUIT:</u>										
Rougher 1	25		5		15		1	3	9.0	109
Rougher 2	√		3		-		1	2	9.0	118
Rougher 3	√		1		8		1	2	9.0	125
Rougher 4	√		1		-		1	2	9.0	132
<u>PYRITE CIRCUIT:</u>										
Rougher 1	-		-	10	8		1	2	8.8	151
Rougher 2	-		-	10	8		1	2	8.7	160

Flotation Data	Rougher	
Flotation Machine:	D2A	
Cell Size in liters:	4.4	
Air Aspiration:		Air
Water Type		Fresh
Impeller Speed in rpm:	1100	

Grinding Data	Primary Grind
Mill:	M5-Mild
Charge/Material:	20kg-Mild
Water:	1000 ml

KM4420-11 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Ro Con 1	10.8	216.3	15.6	0.314	23.2	29.4	79.2	90.1	40.7	48.0
Bulk Ro Con 2	6.1	122.9	5.40	0.020	23.2	28.4	15.6	3.2	23.1	26.3
Bulk Ro Con 3	3.1	61.5	1.45	0.013	18.3	21.8	2.1	1.0	9.1	10.1
Bulk Ro Con 4	1.6	31.1	0.92	0.012	19.8	22.2	0.7	0.5	5.0	5.2
Pyrite Ro Con 1	3.3	66.6	0.49	0.007	13.9	16.9	0.8	0.6	7.5	8.5
Pyrite Ro Con 2	1.5	30.9	0.39	0.008	2.5	1.26	0.3	0.3	0.6	0.3
Pyrite Ro Tail	73.6	1474.0	0.04	0.002	1.2	0.14	1.4	4.3	14.0	1.6
Feed	100	2003	2.13	0.038	6.2	6.62	100	100	100	100

KM4420-11 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	10.8	216.3	15.6	0.314	23.2	29.4	79.2	90.1	40.7	48.0
Product 1 to 2	16.9	339.2	11.9	0.207	23.2	29.0	94.8	93.3	63.8	74.3
Product 1 to 3	20.0	400.7	10.3	0.177	22.4	27.9	96.9	94.4	72.9	84.4
Product 1 to 4	21.6	431.8	9.6	0.165	22.3	27.5	97.5	94.8	77.9	89.6
Product 5	3.3	66.6	0.49	0.007	13.9	16.9	0.8	0.6	7.5	8.5
Product 5 to 6	4.9	97.5	0.46	0.007	10.3	11.9	1.0	0.9	8.1	8.8
Product 7	73.6	1474.0	0.04	0.002	1.2	0.14	1.4	4.3	14.0	1.6
Feed	100	2003	2.13	0.038	6.2	6.62	100	100	100	100

DATE: October 3, 2014

PROJECT NO: KM4420-12

PURPOSE: Investigate a 140µm Primary Grind Target.

PROCEDURE: Perform a standard two product rougher test.

FEED: 2 kg of Lab Composite ground to a nominal 126µm K₈₀.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	Lime	Fuel Oil	8989	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	125	10				13			8.5	150
<u>BULK CIRCUIT:</u>										
Rougher 1	50		5		15		1	3	9.0	91
Rougher 2	√		3		-		1	2	9.0	121
Rougher 3	√		2		8		1	2	9.0	149
Rougher 4	√		2		-		1	2	9.0	98
<u>PYRITE CIRCUIT:</u>										
Rougher 1	-		-	15	8		1	2	8.8	158
Rougher 2	-		-	10	-		1	2	8.7	108

Flotation Data	Rougher	
Flotation Machine:	D2A	
Cell Size in liters:	4.4	
Air Aspiration:		Air
Water Type		Fresh
Impeller Speed in rpm:	1100	

Grinding Data	Primary Grind
Mill:	M5-Mild
Charge/Material:	20kg-Mild
Water:	1000 ml

KM4420-12 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Ro Con 1	9.6	193.4	16.2	0.369	22.5	29.4	76.7	89.7	37.9	44.3
Bulk Ro Con 2	5.7	115.0	6.17	0.028	21.2	30.9	17.4	4.1	21.2	27.7
Bulk Ro Con 3	3.6	71.5	1.50	0.014	25.0	31.3	2.6	1.2	15.5	17.5
Bulk Ro Con 4	1.5	30.2	0.86	0.012	17.8	19.8	0.6	0.5	4.7	4.7
Pyrite Ro Con 1	3.3	66.5	0.49	0.008	8.1	7.46	0.8	0.7	4.7	3.9
Pyrite Ro Con 2	1.5	30.8	0.41	0.009	2.3	0.96	0.3	0.3	0.6	0.2
Pyrite Ro Tail	74.7	1501.4	0.04	0.002	1.2	0.15	1.5	3.5	15.4	1.7
Feed	100	2009	2.03	0.040	5.7	6.38	100	100	100	100

KM4420-12 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	9.6	193.4	16.2	0.369	22.5	29.4	76.7	89.7	37.9	44.3
Product 1 to 2	15.4	308.4	12.5	0.242	22.0	30.0	94.1	93.8	59.1	72.1
Product 1 to 3	18.9	379.9	10.4	0.199	22.6	30.2	96.7	95.1	74.6	89.5
Product 1 to 4	20.4	410.1	9.69	0.185	22.2	29.4	97.3	95.5	79.3	94.2
Product 5	3.3	66.5	0.49	0.008	8.1	7.46	0.8	0.7	4.7	3.9
Product 5 to 6	4.8	97.3	0.46	0.008	6.3	5.40	1.1	1.0	5.3	4.1
Product 7	74.7	1501.4	0.04	0.002	1.2	0.15	1.5	3.5	15.4	1.7
Feed	100	2009	2.03	0.040	5.7	6.38	100	100	100	100

DATE: October 3, 2014

PROJECT NO: KM4420-13

PURPOSE: Repeat Test 03.

PROCEDURE: Perform a standard one product cleaner test.

FEED: 2 kg of Lab Composite ground to a nominal 159µm K₈₀.
Bulk Regrind Discharge - 40µm K₈₀.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	Lime	Fuel Oil	8989	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	125	10				12			8.6	66
<u>BULK CIRCUIT:</u>										
Rougher 1	50		5		8		1	3	9.0	52
Rougher 2			3		8		1	4	9.0	125
Regrind	200	10				12			10.6	28
Cleaner 1	75		2		15		1	6	11.0	20
Cleaner 2	√		1		8		1	5	11.0	-10
Cleaner 3	√		1		8		1	4	11.0	-19
Cleaner Scavenger	√	10	3		8		1	2	11.0	6
<u>PYRITE CIRCUIT:</u>										
Rougher 1	-			30	8		1	3	8.6	15
Rougher 2	-			10	-		1	3	8.4	12

Flotation Data	Rougher	Cleaner
Flotation Machine	D2A	D1B
Cell Size in liters	4.4	2.2
Aspiration	Air	
Water Type	Fresh	
Impeller Speed in rpm	1100	1200

Grinding Data	Primary Grind	Bulk Regrind
Mill:	M5-Mild	RM3-Mild
Charge/Material:	20kg-Mild	6kg-Stainless Steel
Water:	1000ml	estimated

KM4420-13 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Con	6.8	135.4	28.4	0.520	26.0	37.5	91.5	89.4	30.4	39.9
Bulk 3rd Clnr Tail	0.5	9.1	4.62	0.132	15.7	18.6	1.0	1.5	1.2	1.3
Bulk 2nd Clnr Tail	1.7	34.7	1.52	0.049	11.0	11.6	1.3	2.2	3.3	3.2
Bulk Clnr Scav Con	0.8	16.0	1.71	0.039	16.9	19.3	0.7	0.8	2.3	2.4
Bulk Clnr Scav Tail	8.8	176.6	0.33	0.007	13.2	14.8	1.4	1.6	20.1	20.6
Py Ro Con	8.0	159.8	0.77	0.006	20.6	24.7	2.9	1.2	28.4	31.0
Py Ro Tail	73.5	1472.7	0.04	0.002	1.1	0.14	1.3	3.3	14.2	1.6
Feed	100.0	2004.3	2.10	0.039	5.8	6.35	100	100	100	100

KM4420-13 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	6.8	135.4	28.4	0.520	26.0	37.5	91.5	89.4	30.4	39.9
Product 1 to 2	7.2	144.5	26.9	0.496	25.4	36.3	92.5	90.9	31.6	41.3
Product 1 to 3	8.9	179.2	22.0	0.409	22.6	31.5	93.8	93.1	34.9	44.4
Product 1 to 4	9.7	195.2	20.3	0.379	22.1	30.5	94.4	93.9	37.2	46.8
Product 1 to 5	18.6	371.8	10.8	0.202	17.9	23.1	95.8	95.5	57.4	67.4
Product 6	8.0	159.8	0.77	0.006	20.6	24.7	2.9	1.2	28.4	31.0
Product 7	73.5	1472.7	0.04	0.002	1.1	0.14	1.3	3.3	14.2	1.6
Feed	100.0	2004.3	2.10	0.039	5.8	6.35	100	100	100	100

DATE: October 3, 2014

PROJECT NO: KM4420-14

PURPOSE: Repeat Test 10.

PROCEDURE: Perform a standard two product cleaner test.

FEED: 2 kg of Lab Composite ground to a nominal 159µm K₈₀.
Bulk Regrind Discharge - 29µm K₈₀.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	Lime	Fuel Oil	8989	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	125	10				12			8.4	116
<u>BULK CIRCUIT:</u>										
Rougher 1	50		5		8		1	3	9.0	82
Rougher 2	√		3		8		1	4	9.0	84
Regrind	200	10				30			10.5	41
Cleaner 1	50		3		15		1	6	11.0	-20
Cleaner 2	√		1		8		1	5	11.0	-10
Cleaner 3	√		1		8		1	4	11.0	-9
Cleaner Scavenger	√	10	3		8		1	2	11.0	7
<u>PYRITE CIRCUIT:</u>										
Rougher 1	-		-	15	8		1	3	9.0	55
Rougher 2	-		-	10	-		1	3	8.6	74

Flotation Data	Rougher	Cleaner
Flotation Machine	D2A	D1B
Cell Size in liters	4.4	2.2
Aspiration	Air	
Water Type	Fresh	
Impeller Speed in rpm	1100	1200

Grinding Data	Primary Grind	Bulk Regrind
Mill:	M5-Mild	RM3-Mild
Charge/Material:	20kg-Mild	6kg-Stainless Steel
Water:	1000ml	estimated

KM4420-14 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Con	5.1	102.4	34.3	0.642	23.8	35.5	82.8	85.3	20.2	28.4
Bulk 3rd Clnr Tail	0.5	9.4	8.00	0.198	20.3	24.5	1.8	2.4	1.6	1.8
Bulk 2nd Clnr Tail	1.9	37.9	2.52	0.064	16.7	19.0	2.3	3.1	5.2	5.6
Bulk Clnr Scav Con	0.8	15.6	15.1	0.056	18.9	24.9	5.6	1.1	2.4	3.0
Bulk Clnr Scav Tail	9.3	187.8	0.60	0.012	17.5	19.9	2.7	3.0	27.2	29.2
Py Ro Con	7.7	154.4	0.88	0.007	22.3	25.1	3.2	1.5	28.5	30.2
Py Ro Tail	74.7	1501.2	0.05	0.002	1.2	0.15	1.8	3.5	14.9	1.8
Feed	100.0	2008.7	2.11	0.038	6.0	6.38	100	100	100	100

KM4420-14 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	5.1	102.4	34.3	0.642	23.8	35.5	82.8	85.3	20.2	28.4
Product 1 to 2	5.6	111.8	32.1	0.604	23.5	34.6	84.6	87.7	21.7	30.2
Product 1 to 3	7.5	149.7	24.6	0.467	21.8	30.6	86.8	90.8	27.0	35.8
Product 1 to 4	8.2	165.3	23.7	0.429	21.5	30.1	92.4	92.0	29.4	38.8
Product 1 to 5	17.6	353.1	11.4	0.207	19.4	24.7	95.0	95.0	56.6	68.0
Product 6	7.7	154.4	0.88	0.007	22.3	25.1	3.2	1.5	28.5	30.2
Product 7	74.7	1501.2	0.05	0.002	1.2	0.15	1.8	3.5	14.9	1.8
Feed	100.0	2008.7	2.11	0.038	6.0	6.38	100	100	100	100

DATE: October 8, 2014

PROJECT NO: KM4420-15

PURPOSE: To Repeat Test 05 With PAX in the Pyrite Circuit.

PROCEDURE: Perform a standard two product rougher test.

FEED: 2 kg of Lab Composite ground to a nominal 159 μ m K₈₀.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	Lime	Fuel Oil	8989	PAX	MIBC	Grind	Cond.	Float		
Primary Grind	150	10				12			8.6	31
<u>BULK CIRCUIT:</u>										
Rougher 1	50		5		8		1	3	9.0	-20
Rougher 2	-		3		8		1	4	9.0	86
<u>PYRITE CIRCUIT:</u>										
Rougher 1	-			10	8		1	2	8.8	65
Rougher 2	-			5	8		1	2	8.7	102
Rougher 3	-			5	8		1	2	8.6	55
Rougher 4	-			5	8		1	2	8.5	50

Flotation Data	Rougher	
Flotation Machine:	D2A	
Cell Size in liters:	4.4	
Air Aspiration:		Air
Water Type		Fresh
Impeller Speed in rpm:	1100	

Grinding Data	Primary Grind
Mill:	M5-Mild
Charge/Material:	20kg-Mild
Water:	1000 ml

KM4420-15 Lab Composite
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Bulk Ro Con	21.6	431.4	9.40	0.166	22.1	28.0	97.1	94.0	80.8	94.8
Pyrite Ro Con 1	2.5	49.2	0.76	0.014	8.0	7.96	0.9	0.9	3.3	3.1
Pyrite Ro Con 2	1.6	32.2	0.51	0.011	2.5	1.18	0.4	0.5	0.7	0.3
Pyrite Ro Con 3	1.0	20.3	0.53	0.011	2.5	1.09	0.3	0.3	0.4	0.2
Pyrite Ro Con 4	1.6	32.3	0.26	0.007	1.9	0.52	0.2	0.3	0.5	0.1
Pyrite Ro Tail	71.7	1433.1	0.04	0.002	1.2	0.13	1.2	4.1	14.2	1.5
Feed	100	1999	2.09	0.038	5.9	6.37	100	100	100	100

KM4420-15 Lab Composite
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	21.6	431.4	9.40	0.166	22.1	28.0	97.1	94.0	80.8	94.8
Product 2	2.5	480.6	0.76	0.014	8.0	7.96	0.9	0.9	3.3	3.1
Product 2 to 3	4.1	81.4	0.66	0.013	5.8	5.28	1.3	1.4	4.0	3.4
Product 2 to 4	5.1	101.7	0.63	0.012	5.2	4.44	1.5	1.7	4.4	3.5
Product 2 to 5	6.7	134.0	0.54	0.011	4.4	3.50	1.7	1.9	5.0	3.7
Product 6	71.7	1433.1	0.04	0.002	1.2	0.13	1.2	4.1	14.2	1.5
Feed	100	1999	2.09	0.038	5.9	6.37	100	100	100	100

DATE: October 9, 2014

PROJECT NO: KM4420-16

PURPOSE: Preliminary Locked Cycle Test.

PROCEDURE: Perform a standard one product locked cycle test.

FEED: 5 x 2 kg of Lab Composite ground to a nominal 159 μ m K₈₀.
Bulk Regrind Discharge - 42 μ m K₈₀

Stage	Reagents Added g/tonne				Time (minutes)			pH	Redox
	Lime	Fuel Oil	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind		10			12			7.5	150
<u>BULK CIRCUIT:</u>									
Rougher 1			4	15		1	3	7.5	103
Rougher 2			4	8		1	3	7.5	143
Rougher 3			4	8		1	3	7.5	108
Rougher 4			4	8		1	3	7.4	140
Regrind	300	10			18			11.0	15
Cleaner 1	-		2	15		1	5	11.0	13
Cleaner 2	√		1	15		1	4	11.0	20
Cleaner 3	√		1	15		1	3	11.0	34
Cleaner Scavenger	√	10	2	8		1	2	11.0	31

Grinding Data	Primary Grind	Copper Regrind
Mill:	M5-Mild	RM4-Mild
Charge/Material:	20kg-Mild	6kg-Stainless Steel
Water:	1000 ml	estimated

Flotation Data	Rougher	Cleaner
Flotation Machine:	D2A	D1B
Cell Size in liters:	4.4	2.2
Aspiration:	Air	
Water Type:	Fresh	
Impeller Speed in rpm:	1100	1200

KM4420-16
Estimated Dry Weight Table

Product	Cycles - Weight (gms)				
	I	II	III	IV	V
<u>BULK CIRCUIT:</u>					
Rougher Concentrate	390	410	420	420	420
Cleaner Scavenger Con	20	23	29	23	25
Cleaner Scavenger Tail	220	260	275	280	310
Cleaner Tail 2	29	39	42	45	37
Cleaner Tail 3	9	9	10	10	9
Bulk Concentrate	140	155	165	160	155
Primary Discharge pH	7.5	7.5	7.5	7.4	7.5
Primary Discharge Redox	150	131	105	104	132

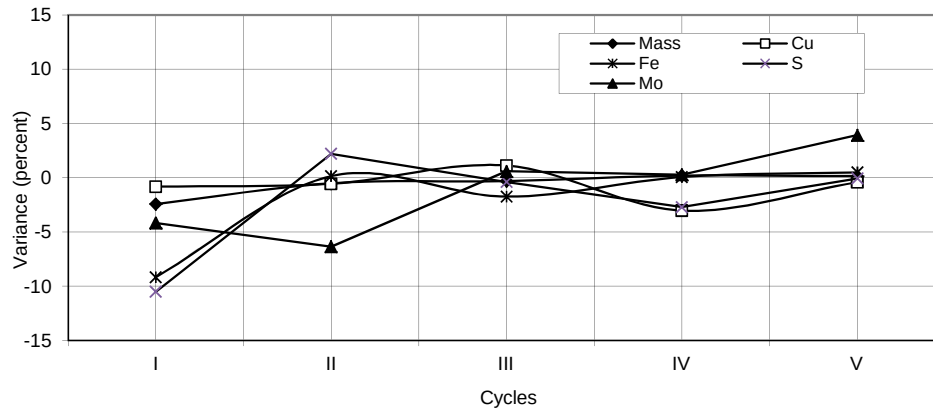
KM4420-16 Lab Composite
OVERALL CYCLE TEST MASS AND METALLURGICAL BALANCE

Product	Weight %	Weight g	Assay - percent or g/t					Distribution - percent			
			Cu	Mo	Fe	S	S(s)	Cu	Mo	Fe	S
Bulk Con I	1.6	158.4	24.3	0.409	28.1	37.7		18.9	17.1	7.7	9.8
Bulk Con II	1.9	186.0	20.6	0.335	29.9	39.6		18.8	16.5	9.7	12.0
Bulk Con III	1.9	192.0	20.3	0.351	30.2	40.8		19.2	17.8	10.1	12.8
Bulk Con IV	1.8	178.2	20.9	0.376	30.8	40.1		18.3	17.7	9.6	11.7
Bulk Con V	1.7	168.1	22.5	0.414	29.3	38.8		18.6	18.4	8.6	10.7
Bulk 3rd Clnr Tail	0.1	6.6	6.82	0.211	19.5	22.4		0.2	0.4	0.2	0.2
Bulk 2nd Clnr Tail	0.3	31.2	2.41	0.072	16.2	18.8		0.4	0.6	0.9	1.0
Bulk Clnr Scav Con	0.2	20.7	1.55	0.036	26.2	32.5		0.2	0.2	0.9	1.1
Bulk Clnr Scav Tail I	2.1	206.5	0.26	0.011	19.4	22.5		0.3	0.6	7.0	7.6
Bulk Clnr Scav Tail II	2.6	258.5	0.33	0.012	15.9	18.7		0.4	0.8	7.2	7.9
Bulk Clnr Scav Tail III	2.6	261.6	0.36	0.011	14.0	15.5		0.5	0.8	6.4	6.6
Bulk Clnr Scav Tail IV	2.7	271.3	0.40	0.013	15.0	16.5		0.5	0.9	7.1	7.3
Bulk Clnr Scav Tail V	3.1	305.1	0.35	0.012	15.1	17.5		0.5	0.9	8.0	8.7
Bulk Ro Tail I	15.9	1583.4	0.08	0.004	1.3	0.21		0.6	1.5	3.4	0.5
Bulk Ro Tail II	15.4	1542.0	0.08	0.004	1.2	0.20		0.6	1.5	3.2	0.5
Bulk Ro Tail III	15.4	1537.0	0.08	0.004	1.2	0.19		0.6	1.6	3.2	0.5
Bulk Ro Tail IV	15.5	1551.0	0.07	0.004	1.3	0.18	0.15	0.5	1.5	3.4	0.5
Bulk Ro Tail V	15.3	1526.4	0.11	0.004	1.3	0.24	0.19	0.8	1.5	3.5	0.6
FEED	100	9984	2.04	0.038	5.8	6.13	-	100.0	100.0	100.0	100.0

KM4420-16 Lab Composite
METALLURGICAL BALANCES BY TEST CYCLES

Product	Weight %	Weight g	Assay - percent or g/t				Distribution - percent			
			Cu	Mo	Fe	S	Cu	Mo	Fe	S
<u>CYCLE IV</u>										
Flotation Feed	100.0	2001	1.97	0.038	5.7	5.95	100.0	100.0	100.0	100.0
Bulk Con	8.9	178.2	20.9	0.376	30.8	40.1	94.4	88.2	47.7	60.0
Bulk Clnr Scav Tail	13.6	271.3	0.40	0.013	15.0	16.5	2.8	4.5	35.4	37.6
Bulk Ro Tail	77.5	1551.0	0.07	0.004	1.3	0.18	2.8	7.3	16.9	2.3
<u>CYCLE V</u>										
Flotation Feed	100.0	2000	2.03	0.039	5.8	6.11	100.0	100.0	100.0	100.0
Bulk Con	8.4	168.1	22.5	0.414	29.3	38.8	93.4	88.3	42.7	53.4
Bulk Clnr Scav Tail	15.3	305.1	0.35	0.012	15.1	17.5	2.6	4.5	39.9	43.7
Bulk Ro Tail	76.3	1526.4	0.11	0.004	1.3	0.24	4.0	7.1	17.4	3.0
<u>CYCLES IV and V</u>										
Flotation Feed	100.0	4000	2.00	0.039	5.8	6.03	100.0	100.0	100.0	100.0
Bulk Con	8.7	346.3	21.7	0.395	30.1	39.5	93.9	88.3	45.2	56.7
Bulk Clnr Scav Tail	14.4	576.4	0.37	0.012	15.1	17.0	2.7	4.5	37.7	40.7
Bulk Ro Tail	76.9	3077.4	0.09	0.004	1.3	0.21	3.4	7.2	17.2	2.7

Cycles	Mass		Calculated Head				Metal Unit Variances (%)			
	%Var.	g/cycle	Cu	Mo	Fe	S	Cu	Mo	Fe	S
I	-2.4	1948.3	2.07	0.037	5.4	5.62	-1	-4	-9	-11
II	-0.5	1986.5	2.04	0.036	5.8	6.29	-1	-6	0	2
III	-0.3	1990.6	2.07	0.038	5.7	6.12	1	1	-2	0
IV	0.2	2000.5	1.97	0.038	5.7	5.95	-3	0	0	-3
V	0.1	1999.6	2.03	0.039	5.8	6.11	0	4	0	0
Total	-	1996.8	2.04	0.038	5.8	6.13	-	-	-	-



KM4420-16 Lab Composite

CYCLES (IV+V) MASS BALANCE FLOWSHEET AND METALLURGICAL BALANCE DATA

Flotation Stream		Weight %	Assay (percent or g/t)				Distribution (percent)			
No.	Product		Cu	Mo	Fe	S	Cu	Mo	Fe	S
1	Bulk Ro Feed	100.0	2.00	0.039	5.8	6.03	100.0	100.0	100.0	100.0
2	Bulk Ro Tail	76.9	0.09	0.004	1.3	0.21	3.4	7.2	17.2	2.7
3	Bulk Ro Con	23.1	8.37	0.156	20.7	25.5	96.6	92.8	82.8	97.3
4	Bulk 1st Clnr Feed	26.0	7.72	0.147	20.6	25.3	100.4	98.4	93.1	109.0
5	Bulk 1st Clnr Tail	15.4	0.45	0.014	15.8	18.1	3.5	5.5	42.4	46.3
6	Bulk 1st Clnr Con	10.5	18.4	0.341	27.7	35.9	96.9	93.0	50.7	62.7
7	Bulk Clnr Scav Tail	14.4	0.37	0.012	15.1	17.0	2.7	4.5	37.7	40.7
8	Bulk Clnr Scav Con	1.0	1.55	0.036	26.2	32.5	0.8	1.0	4.7	5.6
10	Bulk 2nd Clnr Tail	1.6	2.41	0.072	16.2	18.8	1.9	2.9	4.4	4.9
11	Bulk 2nd Clnr Con	9.0	21.1	0.388	29.7	38.8	95.0	90.1	46.3	57.9
12	Bulk 3rd Clnr Tail	0.3	6.82	0.211	19.5	22.4	1.1	1.8	1.1	1.2
13	Bulk 3rd Clnr Con	8.7	21.7	0.395	30.1	39.5	93.9	88.3	45.2	56.7
14	Final Tail	91.3	0.13	0.005	3.5	2.86	6.1	11.7	54.8	43.3

DATE: October 10, 2014

PROJECT NO: KM4420-17

PURPOSE: To Investigate Selective Rougher Conditions.

PROCEDURE: Perform a standard two product locked cycle test.

FEED: 5 x 2 kg of Lab Composite ground to a nominal 159 μ m K₈₀.
Bulk Regrind Discharge - 41 μ m K₈₀.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	Lime	Fuel Oil	8989	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	100	10				12			8.4	140
<u>BULK CIRCUIT:</u>										
Rougher 1	25		5		15		1	3	9.0	135
Rougher 2	-		3		15		1	4	9.0	142
Regrind	200	10				12			10.9	18
Cleaner 1	25		2		15		1	6	11.0	11
Cleaner 2	√		1		15		1	5	11.0	8
Cleaner 3	√		1		15		1	4	11.0	20
Cleaner Scavenger	√	10	3				1	2	11.0	15
<u>PYRITE CIRCUIT:</u>										
Rougher 1				15	-		1	3	8.8	139
Rougher 2				10	8		1	3	8.8	148

Grinding Data	Primary Grind	Copper Regrind
Mill:	M5-Mild	RM3-Mild
Charge/Material:	20kg-Mild	6kg-Stainless Steel
Water:	1000 ml	estimated

Flotation Data	Rougher	Cleaner
Flotation Machine:	D2A	D1B
Cell Size in liters:	4.4	2.2
Air Aspiration:	Air	
Water Type:	Fresh	
Impeller Speed in rpm:	1100	1200

KM4420-17
Estimated Dry Weight Table

Product	Cycles - Weight (gms)				
	I	II	III	IV	V
<u>BULK CIRCUIT</u>					
Rougher Concentrate	330	350	340	320	350
Cleaner Scavenger Con	10	14	13	11	9
Cleaner Scavenger Tail	185	220	230	220	280
Cleaner Tail 2	28	38	38	35	36
Cleaner Tail 3	7	10	11	10	10
Bulk Concentrate	130	135	135	130	135
<u>PYRITE CIRCUIT</u>					
Rougher Concentrate	120	100	120	150	100
Primary Discharge pH	8.5	8.6	8.6	8.6	8.5
Primary Discharge Redox	140	166	180	173	180

KM4420-17 Lab Composite
OVERALL CYCLE TEST MASS AND METALLURGICAL BALANCE

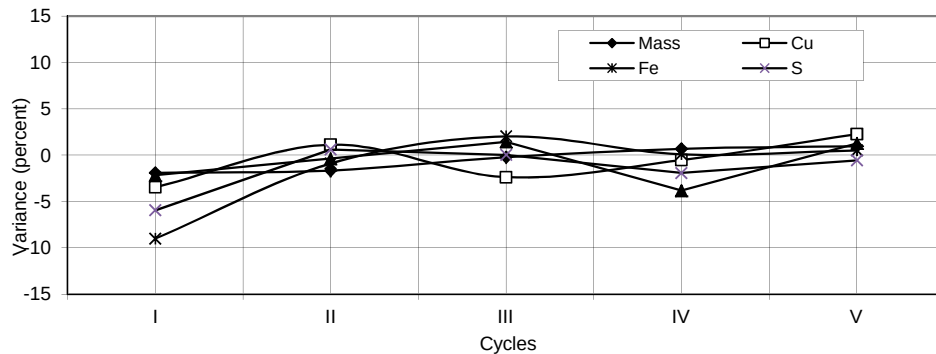
Product	Weight %	Weight g	Assay - percent or g/t					Distribution - percent			
			Cu	Mo	Fe	S	S(s)	Cu	Mo	Fe	S
Bulk Con I	1.4	140.9	26.2	0.451	25.0	39.2		18.1	17.1	6.6	8.9
Bulk Con II	1.5	151.0	25.6	0.429	25.9	39.3		19.0	17.5	7.3	9.6
Bulk Con III	1.5	146.4	25.5	0.450	25.9	37.9		18.3	17.8	7.1	8.9
Bulk Con IV	1.4	137.6	26.9	0.442	25.9	38.1		18.1	16.4	6.7	8.4
Bulk Con V	1.6	156.5	25.0	0.416	26.3	39.3		19.2	17.6	7.7	9.9
Bulk 3CT	0.1	7.3	5.28	0.123	21.4	27.9		0.2	0.2	0.3	0.3
Bulk 2CT	0.3	30.0	2.13	0.050	16.6	20.0		0.3	0.4	0.9	1.0
Bulk Clnr Scav Con	0.1	6.3	3.32	0.055	21.1	26.9		0.1	0.1	0.2	0.3
Bulk Clnr Scav TI I	1.8	178.8	0.31	0.010	17.5	22.4		0.3	0.5	5.8	6.4
Bulk Clnr Scav TI II	2.2	215.4	0.38	0.012	17.7	22.7		0.4	0.7	7.1	7.9
Bulk Clnr Scav TI III	2.3	227.9	0.38	0.011	16.8	20.7		0.4	0.7	7.1	7.6
Bulk Clnr Scav TI IV	2.1	209.2	0.45	0.013	16.0	19.9		0.5	0.7	6.2	6.7
Bulk Clnr Scav TI V	2.7	272.1	0.35	0.011	16.9	20.5		0.5	0.8	8.6	9.0
Pyrite Ro Con I	1.2	116.2	1.04	0.015	13.0	16.7		0.6	0.5	2.8	3.1
Pyrite Ro Con II	0.9	93.1	1.10	0.017	12.5	15.7		0.5	0.4	2.2	2.4
Pyrite Ro Con III	1.1	113.7	0.93	0.013	13.9	17.0		0.5	0.4	2.9	3.1
Pyrite Ro Con IV	1.5	149.0	1.23	0.016	14.4	17.1		0.9	0.6	4.0	4.1
Pyrite Ro Con V	0.9	91.2	1.02	0.022	4.8	4.5		0.5	0.5	0.8	0.7
Pyrite Ro TI I	15.2	1510.7	0.05	0.004	1.1	0.15		0.4	1.5	3.0	0.4
Pyrite Ro TI II*	15.0	1492.0	0.05	0.003	1.2	0.15		0.4	1.3	3.2	0.3
Pyrite Ro TI III*	15.0	1492.0	0.05	0.004	1.2	0.15		0.3	1.4	3.2	0.4
Pyrite Ro TI IV	15.1	1502.3	0.06	0.004	1.1	0.16	0.11	0.4	1.5	3.1	0.4
Pyrite Ro TI V	15.0	1483.6	0.05	0.003	1.1	0.15	0.11	0.4	1.4	3.0	0.4
FEED	100	9923	2.06	0.037	5.4	6.26	-	100.0	100.0	100.0	100.0

*Sample taken for environmental testing. Mass estimated.

KM4420-17 Lab Composite
METALLURGICAL BALANCES BY TEST CYCLES

Product	Weight %	Weight g	Assay - percent or g/t				Distribution - percent			
			Cu	Mo	Fe	S	Cu	Mo	Fe	S
<u>CYCLE IV</u>										
Flotation Feed	100.0	1998	2.03	0.036	5.4	6.10	100.0	100.0	100.0	100.0
Bulk Con	6.9	137.6	26.9	0.442	25.9	38.1	91.1	85.4	33.2	43.0
Bulk Clnr Scav Tail	10.5	209.2	0.45	0.013	16.0	19.9	2.3	3.7	31.2	34.2
Pyrite Ro Con	7.5	149.0	1.23	0.016	14.4	17.1	4.5	3.2	20.0	20.9
Pyrite Ro Tail	75.2	1502.3	0.06	0.004	1.1	0.16	2.1	7.7	15.5	1.9
<u>CYCLE V</u>										
Flotation Feed	100.0	2003	2.08	0.037	5.4	6.17	100.0	100.0	100.0	100.0
Bulk Con	7.8	156.5	25.0	0.416	26.3	39.3	93.7	86.7	38.2	49.8
Bulk Clnr Scav Tail	13.6	272.1	0.35	0.011	16.9	20.5	2.3	4.0	42.7	45.1
Pyrite Ro Con	4.6	91.2	1.02	0.022	4.8	4.5	2.2	2.6	4.1	3.3
Pyrite Ro Tail	74.1	1483.6	0.05	0.003	1.1	0.15	1.8	6.7	15.0	1.8
<u>CYCLES IV and V</u>										
Flotation Feed	100.0	4002	2.06	0.037	5.4	6.13	100.0	100.0	100.0	100.0
Bulk Con	7.3	294.1	25.9	0.428	26.1	38.7	92.4	86.0	35.7	46.4
Bulk Clnr Scav Tail	12.0	481.3	0.39	0.012	16.5	20.2	2.3	3.8	37.0	39.7
Pyrite Ro Con	6.0	240.2	1.15	0.018	10.8	12.3	3.4	2.9	12.0	12.0
Pyrite Ro Tail	74.6	2985.9	0.05	0.004	1.1	0.15	2.0	7.2	15.3	1.8

Cycles	Mass		Calculated Head				Metal Unit Variances (%)			
	%Var.	g/cycle	Cu	Mo	Fe	S	Cu	Mo	Fe	S
I	-1.9	1946.6	2.02	0.037	5.0	6.00	-3	-2	-9	-6
II	-1.7	1951.5	2.12	0.038	5.4	6.41	1	0	-1	1
III	-0.2	1980.0	2.01	0.038	5.5	6.28	-2	1	2	0
IV	0.7	1998.1	2.03	0.036	5.4	6.10	-1	-4	0	-2
V	0.9	2003.4	2.08	0.037	5.4	6.17	2	1	1	-1
Total	-	1984.6	2.06	0.037	5.4	6.26	-	-	-	-



KM4420-17 Lab Composite

CYCLES (IV+V) MASS BALANCE FLOWSHEET AND METALLURGICAL BALANCE DATA

Flotation Stream		Weight %	Assay (percent or g/t)				Distribution (percent)			
No.	Product		Cu	Mo	Fe	S	Cu	Mo	Fe	S
1	Bulk Ro Feed	100.0	2.06	0.037	5.4	6.13	100	100.0	100.0	100.0
2	Bulk Ro Tail	80.6	0.14	0.005	1.8	1.06	5.312	10.1	27.3	13.9
3	Bulk Ro Con	19.4	10.1	0.170	20.2	27.3	94.7	89.9	72.7	86.1
4	Bulk 1st Clnr Feed	21.6	9.33	0.159	19.9	26.8	97.7	93.6	80.0	94.0
5	Bulk 1st Clnr Tail	12.3	0.47	0.013	16.6	20.4	2.8	4.3	38.2	41.1
6	Bulk 1st Clnr Con	9.2	21.2	0.355	24.4	35.3	94.9	89.3	41.8	53.0
7	Bulk Clnr Scav Tail	12.0	0.39	0.012	16.5	20.2	2.3	3.8	37.0	39.7
8	Bulk Clnr Scav Con	0.3	3.32	0.055	21.1	26.9	0.5	0.5	1.2	1.4
10	Bulk 2nd Clnr Tail	1.5	2.13	0.050	16.6	20.0	1.5	2.0	4.6	4.9
11	Bulk 2nd Clnr Con	7.7	24.9	0.414	25.9	38.2	93.3	87.3	37.2	48.1
12	Bulk 3rd Clnr Tail	0.4	5.28	0.123	21.4	27.9	0.9	1.2	1.5	1.7
13	Bulk 3rd Clnr Con	7.3	25.9	0.428	26.1	38.7	92.4	86.0	35.7	46.4
14	Pyrite Ro Con	6.0	1.15	0.018	10.8	12.3	3.4	2.9	12.0	12.0
15	Pyrite Ro Tail	74.6	0.05	0.004	1.1	0.2	2.0	7.2	15.3	1.8
16	Final Tail	86.6	0.18	0.006	4.0	3.79	7.6	14.0	64.3	53.6

DATE: October 16, 2014

PROJECT NO: KM4420-18

PURPOSE: To Repeat Test 16 With Less Flotation Time and Collector in the Cleaner Circuit.

PROCEDURE: Perform a standard one product locked cycle test.

FEED: 5 x 2 kg of Lab Composite ground to a nominal 159 μ m K₈₀.
Bulk Regrind Discharge - 42 μ m K₈₀

Stage	Reagents Added g/tonne				Time (minutes)			pH	Redox
	Lime	Fuel Oil	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind		10			12			7.6	102
BULK CIRCUIT:									
Rougher 1			4	15		1	3	7.6	98
Rougher 2			4	8		1	3	7.5	87
Rougher 3			4	8		1	3	7.5	92
Rougher 4			4	8		1	3	7.5	74
Regrind	400	10			18			11.1	42
Cleaner 1	-		1	15		1	3	11.0	59
Cleaner 2	√		1	8		1	2	11.0	99
Cleaner 3	√		0.5	8		1	2	11.0	97
Cleaner Scavenger	√	10	1	30		1	2	11.0	111

Grinding Data	Primary Grind	Bulk Regrind
Mill:	M5-Mild	RM4-Mild
Charge/Material:	20kg-Mild	6kg-Stainless Steel
Water:	1000 ml	estimated

Flotation Data	Rougher	Cleaner
Flotation Machine:	D2A	D1B
Cell Size in liters:	4.4	2.2
Aspiration:	Air	
Water Type:	Fresh	
Impeller Speed in rpm:	1100	1200

KM4420-18
Estimated Dry Weight Table

Product	Cycles - Weight (gms)				
	I	II	III	IV	V
<u>BULK CIRCUIT:</u>					
Rougher Concentrate	430	410	420	410	410
Cleaner Scavenger Con	22	33	33	29	35
Cleaner Scavenger Tail	270	280	310	300	285
Cleaner Tail 2	45	48	47	53	53
Cleaner Tail 3	9	10	11	11	13
Bulk Concentrate	120	140	150	145	150
Primary Discharge pH	7.6	7.5	7.7	7.7	7.6
Primary Discharge Redox	150	73	125	52	102

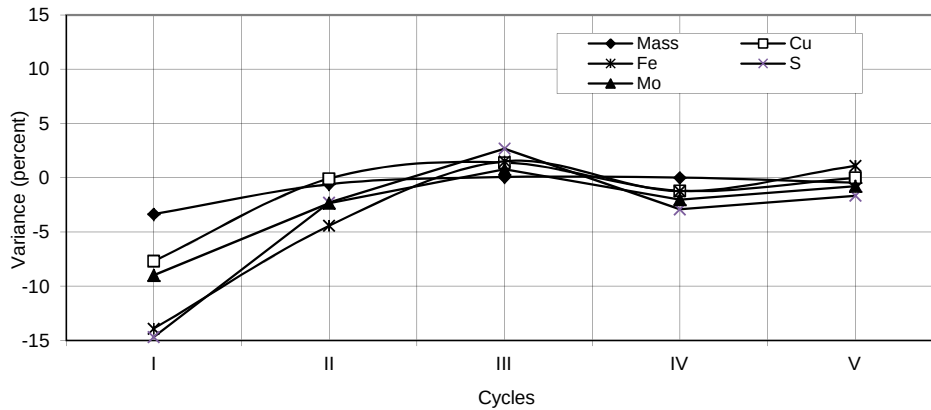
KM4420-18 Lab Composite
OVERALL CYCLE TEST MASS AND METALLURGICAL BALANCE

Product	Weight %	Weight g	Assay - percent or g/t					Distribution - percent			
			Cu	Mo	Fe	S	S(s)	Cu	Mo	Fe	S
Bulk Con I	1.3	134.9	26.6	0.425	29.0	38.0		17.4	15.9	6.7	8.6
Bulk Con II	1.6	160.6	24.1	0.378	29.4	39.6		18.8	16.9	8.0	10.7
Bulk Con III	1.7	167.2	23.4	0.376	30.8	39.7		19.0	17.4	8.8	11.2
Bulk Con IV	1.6	155.4	24.5	0.388	30.6	38.5		18.4	16.8	8.1	10.1
Bulk Con V	1.6	165.0	23.5	0.375	32.0	39.1		18.8	17.2	9.0	10.9
Bulk 3rd Clnr Tail	0.1	10.7	7.20	0.217	22.5	25.9		0.4	0.6	0.4	0.5
Bulk 2nd Clnr Tail	0.4	44.8	3.66	0.115	19.8	20.9		0.8	1.4	1.5	1.6
Bulk Clnr Scav Con	0.3	32.2	2.27	0.067	27.0	32.0		0.4	0.6	1.5	1.7
Bulk Clnr Scav Tail I	2.6	263.4	0.36	0.012	16.3	17.8		0.5	0.9	7.3	7.9
Bulk Clnr Scav Tail II	2.7	269.5	0.45	0.015	16.6	18.3		0.6	1.1	7.6	8.3
Bulk Clnr Scav Tail III	3.0	298.4	0.44	0.014	16.2	17.6		0.6	1.2	8.2	8.8
Bulk Clnr Scav Tail IV	2.8	284.0	0.51	0.017	17.0	18.5		0.7	1.3	8.2	8.9
Bulk Clnr Scav Tail V	2.7	265.9	0.43	0.014	17.1	18.5		0.6	1.1	7.7	8.3
Bulk Ro Tail I	15.3	1535.4	0.08	0.003	1.2	0.20		0.6	1.4	3.2	0.5
Bulk Ro Tail II	15.6	1558.8	0.08	0.004	1.3	0.20		0.6	1.6	3.5	0.5
Bulk Ro Tail III	15.4	1536.5	0.08	0.004	1.3	0.19		0.6	1.5	3.3	0.5
Bulk Ro Tail IV	15.6	1561.6	0.08	0.004	1.3	0.18	0.12	0.6	1.5	3.4	0.5
Bulk Ro Tail V	15.6	1560.5	0.09	0.004	1.3	0.19	0.11	0.6	1.6	3.5	0.5
FEED	100	10005	2.06	0.036	5.9	5.93	-	100.0	100.0	100.0	100.0

KM4420-18 Lab Composite
METALLURGICAL BALANCES BY TEST CYCLES

Product	Weight %	Weight g	Assay - percent or g/t				Distribution - percent			
			Cu	Mo	Fe	S	Cu	Mo	Fe	S
<u>CYCLE IV</u>										
Flotation Feed	100.0	2001	2.04	0.035	5.8	5.76	100.0	100.0	100.0	100.0
Bulk Con	7.8	155.4	24.5	0.388	30.6	38.5	93.4	85.5	41.0	51.9
Bulk Clnr Scav Tail	14.2	284.0	0.51	0.017	17.0	18.5	3.6	6.6	41.6	45.6
Bulk Ro Tail	78.0	1561.6	0.08	0.004	1.3	0.18	3.1	7.9	17.4	2.5
<u>CYCLE V</u>										
Flotation Feed	100.0	1991	2.07	0.036	6.0	5.86	100.0	100.0	100.0	100.0
Bulk Con	8.3	165.0	23.5	0.375	32.0	39.1	94.0	86.7	44.5	55.3
Bulk Clnr Scav Tail	13.4	265.9	0.43	0.014	17.1	18.5	2.8	5.4	38.3	42.1
Bulk Ro Tail	78.4	1560.5	0.09	0.004	1.3	0.19	3.2	8.0	17.2	2.6
<u>CYCLES IV and V</u>										
Flotation Feed	100.0	3992	2.05	0.036	5.9	5.81	100.0	100.0	100.0	100.0
Bulk Con	8.0	320.4	24.0	0.381	31.3	38.8	93.7	86.1	42.8	53.6
Bulk Clnr Scav Tail	13.8	549.9	0.47	0.016	17.0	18.5	3.2	6.0	39.9	43.9
Bulk Ro Tail	78.2	3122.1	0.08	0.004	1.3	0.19	3.1	7.9	17.3	2.5

Cycles	Mass		Calculated Head				Metal Unit Variances (%)			
	%Var.	g/cycle	Cu	Mo	Fe	S	Cu	Mo	Fe	S
I	-3.4	1933.7	1.97	0.034	5.2	5.24	-8	-9	-14	-15
II	-0.6	1988.9	2.07	0.035	5.6	5.83	0	-2	-4	-2
III	0.1	2002.1	2.09	0.036	6.0	6.09	1	1	2	3
IV	0.0	2001.0	2.04	0.035	5.8	5.76	-1	-2	-1	-3
V	-0.5	1991.4	2.07	0.036	6.0	5.86	0	-1	1	-2
Total	-	2001.0	2.06	0.036	5.9	5.93	-	-	-	-



KM4420-18 Lab Composite

CYCLES (IV+V) MASS BALANCE FLOWSHEET AND METALLURGICAL BALANCE DATA

Flotation Stream		Weight %	Assay (percent or g/t)				Distribution (percent)			
No.	Product		Cu	Mo	Fe	S	Cu	Mo	Fe	S
1	Bulk Ro Feed	100.0	2.05	0.036	5.9	5.81	100.0	100.0	100.0	100.0
2	Bulk Ro Tail	78.2	0.08	0.004	1.3	0.19	3.1	7.9	17.3	2.5
3	Bulk Ro Con	21.8	9.12	0.150	22.3	26.0	96.9	92.1	82.7	97.5
4	Bulk 1st Clnr Feed	26.2	8.19	0.143	22.4	25.9	104.5	105.7	99.8	116.9
5	Bulk 1st Clnr Tail	15.4	0.66	0.021	18.1	19.9	5.0	9.1	47.4	52.8
6	Bulk 1st Clnr Con	10.8	18.9	0.318	28.5	34.4	99.6	96.6	52.4	64.1
7	Bulk Clnr Scav Tail	13.8	0.47	0.016	17.0	18.5	3.2	6.0	39.9	43.9
8	Bulk Clnr Scav Con	1.6	2.27	0.067	27.0	32.0	1.8	3.1	7.4	8.9
10	Bulk 2nd Clnr Tail	2.2	3.66	0.115	19.8	20.9	4.0	7.3	7.6	8.1
11	Bulk 2nd Clnr Con	8.6	22.9	0.371	30.8	38.0	95.6	89.4	44.8	56.0
12	Bulk 3rd Clnr Tail	0.5	7.20	0.217	22.5	25.9	1.9	3.3	2.1	2.4
13	Bulk 3rd Clnr Con	8.0	24.0	0.381	31.3	38.8	93.7	86.1	42.8	53.6
14	Final Tail	92.0	0.14	0.005	3.7	2.93	6.3	13.9	57.2	46.4

DATE: October 20, 2014

PROJECT NO: KM4420-19

PURPOSE: To Repeat Test 17 at a Finer Regrind.

PROCEDURE: Perform a standard two product locked cycle test.

FEED: 5 x 2 kg of Lab Composite ground to a nominal 159 μ m K₈₀.
Bulk Regrind Discharge - 31 μ m K₈₀.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	Lime	Fuel Oil	8989	SIPX	MIBC	Grind	Cond.	Float		
Primary Grind	125	10				12			8.8	96
<u>BULK CIRCUIT:</u>										
Rougher 1	25		5		23		1	3	9.0	84
Rougher 2	-		3		-		1	4	9.0	97
Regrind	250	10				30			11.0	-6
Cleaner 1	-		3		15		1	7	11.0	-22
Cleaner 2	√		1		8		1	5	11.0	11
Cleaner 3	√		1		8		1	4	11.0	16
Cleaner Scavenger		10	2				1	2	11.0	15
<u>PYRITE CIRCUIT:</u>										
Rougher 1	-			15	8		1	4	8.7	101
Rougher 2	-			10	8		1	4	8.6	110

Grinding Data	Primary Grind	Bulk Regrind
Mill:	M5-Mild	RM3-Mild
Charge/Material:	20kg-Mild	6kg-Stainless Steel
Water:	1000 ml	estimated

Flotation Data	Rougher	Cleaner
Flotation Machine:	D2A	D1B
Cell Size in liters:	4.4	2.2
Air Aspiration:	Air	
Water Type:	Fresh	
Impeller Speed in rpm:	1100	1200

KM4420-19
Estimated Dry Weight Table

Product	Cycles - Weight (gms)				
	I	II	III	IV	V
<u>BULK CIRCUIT</u>					
Rougher Concentrate	330	320	340	340	340
Cleaner Scavenger Con	9	17	18	17	14
Cleaner Scavenger Tail	225	240	250	260	260
Cleaner Tail 2	23	33	37	39	40
Cleaner Tail 3	7	9	11	11	11
Bulk Concentrate	115	100	115	110	120
<u>PYRITE CIRCUIT</u>					
Rougher Concentrate	78	150	140	140	150
Primary Discharge pH	8.8	8.7	8.8	9.0	8.9
Primary Discharge Redox	98	120	103	100	111

KM4420-19 Lab Composite
OVERALL CYCLE TEST MASS AND METALLURGICAL BALANCE

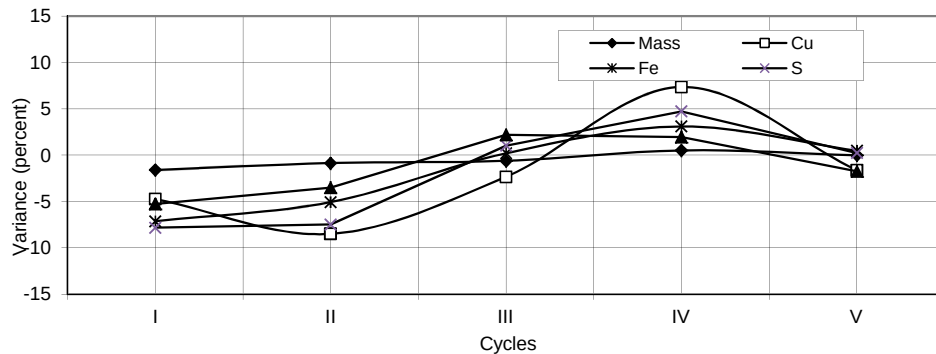
Product	Weight %	Weight g	Assay - percent or g/t					Distribution - percent			
			Cu	Mo	Fe	S	S(s)	Cu	Mo	Fe	S
Bulk Con I	1.2	117.8	31.8	0.540	24.6	35.6		17.9	16.6	5.1	6.6
Bulk Con II	1.0	101.7	33.7	0.605	23.9	34.3		16.4	16.1	4.3	5.5
Bulk Con III	1.2	119.1	31.1	0.573	24.6	34.6		17.8	17.8	5.2	6.5
Bulk Con IV	1.2	121.2	33.6	0.553	23.4	34.5		19.5	17.5	5.0	6.6
Bulk Con V	1.1	112.6	33.4	0.571	24.3	34.7		18.0	16.8	4.8	6.2
Bulk 3CT	0.1	8.6	7.30	0.190	19.5	23.5		0.3	0.4	0.3	0.3
Bulk 2CT	0.3	32.1	2.80	0.075	17.7	20.5		0.4	0.6	1.0	1.0
Bulk Clnr Scav Con	0.1	11.4	22.8	0.076	19.6	28.7		1.2	0.2	0.4	0.5
Bulk Clnr Scav TI I	2.2	223.0	0.48	0.013	23.6	29.8		0.5	0.7	9.3	10.5
Bulk Clnr Scav TI II	2.3	233.9	0.97	0.020	19.9	23.8		1.1	1.2	8.2	8.8
Bulk Clnr Scav TI III	2.4	241.5	0.82	0.016	18.9	22.8		0.9	1.0	8.1	8.7
Bulk Clnr Scav TI IV	2.6	258.3	0.96	0.017	18.3	22.3		1.2	1.1	8.3	9.1
Bulk Clnr Scav TI V	2.5	247.3	0.78	0.019	19.6	24.2		0.9	1.2	8.6	9.5
Pyrite Ro Con I	0.7	69.4	0.97	0.019	8.0	8.1		0.3	0.3	1.0	0.9
Pyrite Ro Con II	1.5	145.2	0.72	0.017	13.7	16.5		0.5	0.6	3.5	3.8
Pyrite Ro Con III	1.4	135.5	0.85	0.010	16.6	21.4		0.6	0.3	4.0	4.6
Pyrite Ro Con IV	1.4	135.2	0.71	0.012	18.3	22.6		0.5	0.4	4.4	4.8
Pyrite Ro Con V	1.4	141.5	0.66	0.011	14.9	18.0		0.4	0.4	3.7	4.0
Pyrite Ro TI I	15.6	1559.5	0.04	0.003	1.2	0.15		0.3	1.2	3.2	0.4
Pyrite Ro TI II*	15.0	1504.0	0.04	0.003	1.1	0.15		0.3	1.4	3.0	0.4
Pyrite Ro TI III*	14.9	1493.4	0.04	0.003	1.1	0.15		0.3	1.3	2.8	0.4
Pyrite Ro TI IV	15.0	1497.3	0.04	0.003	1.1	0.15	0.09	0.3	1.3	2.9	0.3
Pyrite Ro TI V	15.0	1500.3	0.04	0.003	1.1	0.14	0.09	0.3	1.2	3.0	0.3
FEED	100	10010	2.09	0.038	5.7	6.30	-	100.0	100.0	100.0	100.0

*Sample taken for environmental testing. Mass estimated.

KM4420-19 Lab Composite
METALLURGICAL BALANCES BY TEST CYCLES

Product	Weight %	Weight g	Assay - percent or g/t				Distribution - percent			
			Cu	Mo	Fe	S	Cu	Mo	Fe	S
<u>CYCLE IV</u>										
Flotation Feed	100.0	2012	2.23	0.039	5.8	6.57	100.0	100.0	100.0	100.0
Bulk Con	6.0	121.2	33.6	0.553	23.4	34.5	91.0	85.8	24.3	31.6
Bulk Clnr Scav Tail	12.8	258.3	0.96	0.017	18.3	22.3	5.5	5.5	40.5	43.6
Pyrite Ro Con	6.7	135.2	0.71	0.012	18.3	22.6	2.1	2.1	21.2	23.1
Pyrite Ro Tail	74.4	1497.3	0.04	0.003	1.1	0.15	1.3	6.6	14.1	1.7
<u>CYCLE V</u>										
Flotation Feed	100.0	2002	2.05	0.038	5.7	6.32	100.0	100.0	100.0	100.0
Bulk Con	5.6	112.6	33.4	0.571	24.3	34.7	91.7	85.4	24.0	30.9
Bulk Clnr Scav Tail	12.4	247.3	0.78	0.019	19.6	24.2	4.7	6.3	42.6	47.3
Pyrite Ro Con	7.1	141.5	0.66	0.011	14.9	18.0	2.3	2.1	18.5	20.1
Pyrite Ro Tail	75.0	1500.3	0.04	0.003	1.1	0.14	1.4	6.3	14.9	1.7
<u>CYCLES IV and V</u>										
Flotation Feed	100.0	4014	2.14	0.038	5.7	6.44	100.0	100.0	100.0	100.0
Bulk Con	5.8	233.8	33.5	0.562	23.8	34.6	91.3	85.6	24.2	31.3
Bulk Clnr Scav Tail	12.6	505.6	0.87	0.018	18.9	23.2	5.1	5.9	41.5	45.4
Pyrite Ro Con	6.9	276.7	0.68	0.011	16.6	20.2	2.2	2.1	19.9	21.7
Pyrite Ro Tail	74.7	2997.6	0.04	0.003	1.1	0.14	1.3	6.4	14.5	1.7

Cycles	Mass		Calculated Head				Metal Unit Variances (%)			
	%Var.	g/cycle	Cu	Mo	Fe	S	Cu	Mo	Fe	S
I	-1.6	1969.7	2.02	0.037	5.3	5.91	-5	-5	-7	-8
II	-0.9	1984.8	1.92	0.037	5.4	5.88	-9	-4	-5	-7
III	-0.6	1989.5	2.05	0.039	5.7	6.41	-2	2	0	1
IV	0.5	2012.0	2.23	0.039	5.8	6.57	7	2	3	5
V	0.0	2001.7	2.05	0.038	5.7	6.32	-2	-2	0	0
Total	-	2002.0	2.09	0.038	5.7	6.30	-	-	-	-



KM4420-19 Lab Composite

CYCLES (IV+V) MASS BALANCE FLOWSHEET AND METALLURGICAL BALANCE DATA

Flotation Stream		Weight %	Assay (percent or g/t)				Distribution (percent)			
No.	Product		Cu	Mo	Fe	S	Cu	Mo	Fe	S
1	Bulk Ro Feed	100.0	2.14	0.038	5.7	6.44	100	100.0	100.0	100.0
2	Bulk Ro Tail	81.6	0.09	0.004	2.4	1.8	3.549	8.5	34.3	23.3
3	Bulk Ro Con	18.4	11.2	0.190	20.5	26.8	96.5	91.5	65.7	76.7
4	Bulk 1st Clnr Feed	21.0	10.8	0.178	20.2	26.3	106.1	97.9	74.0	85.9
5	Bulk 1st Clnr Tail	13.2	1.82	0.020	19.0	23.5	11.2	7.0	43.4	47.9
6	Bulk 1st Clnr Con	7.9	25.8	0.442	22.3	31.1	94.9	90.9	30.5	37.9
7	Bulk Clnr Scav Tail	12.6	0.87	0.018	18.9	23.2	5.1	5.9	41.5	45.4
8	Bulk Clnr Scav Con	0.6	22.8	0.076	19.6	28.7	6.1	1.1	1.9	2.5
10	Bulk 2nd Clnr Tail	1.6	2.80	0.075	17.7	20.5	2.1	3.1	4.9	5.1
11	Bulk 2nd Clnr Con	6.3	31.7	0.536	23.5	33.8	92.8	87.7	25.6	32.8
12	Bulk 3rd Clnr Tail	0.4	7.30	0.190	19.5	23.5	1.5	2.1	1.5	1.6
13	Bulk 3rd Clnr Con	5.8	33.5	0.562	23.8	34.6	91.3	85.6	24.2	31.3
14	Pyrite Ro Con	6.9	0.68	0.011	16.6	20.2	2.2	2.1	19.9	21.7
15	Pyrite Ro Tail	74.7	0.04	0.003	1.1	0.14	1.3	6.4	14.5	1.7
16	Final Tail	87.3	0.21	0.006	5.0	5.07	8.7	14.4	75.8	68.7

DATE: October 28, 2014

PROJECT NO: KM4420-20

PURPOSE: Preliminary Rougher Test.

PROCEDURE: Perform a one product rougher test.

FEED: ~2 kg P2 WSA Bulk Final Concentrate.

Stage	Reagents Added g/tonne			Time (minutes)			pH	Redox
	NaHS	Fuel Oil	MIBC	Grind	Cond.	Float		
Natural				-			9.0	20
<u>MOLY CIRCUIT:</u>								
Rougher 1	680	-	-		5	2	11.2	-400
Rougher 2	17	-	-		1	2	11.2	-400
Rougher 3	8	-	-		1	2	11.2	-400
Rougher 4	35	4	-		1	2	11.2	-400

Flotation Data	Rougher	
Flotation Machine	D2C	
Cell Size in liters	4.4	
Aspiration	N ₂	
Water Type	Fresh	
Impeller Speed in rpm	1100	

KM4420-20 P2 WSA Bulk Final Concentrate
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Mo Ro Con 1	3.8	89.5	17.9	11.2	10.6	22.2	2.3	70.4	1.6	2.3
Mo Ro Con 2	2.6	60.3	27.3	5.68	11.2	21.7	2.3	24.1	1.2	1.5
Mo Ro Con 3	1.2	28.1	45.5	1.92	8.5	21.9	1.8	3.8	0.4	0.7
Mo Ro Con 4	1.0	23.6	39.0	0.65	16.5	28.3	1.3	1.1	0.7	0.8
Mo Rougher Tail	91.4	2135.8	30.5	0.004	26.0	37.7	92.3	0.6	96.1	94.6
Feed	100.0	2337.3	30.2	0.61	24.7	36.4	100	100	100	100

KM4420-20 P2 WSA Bulk Final Concentrate
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	3.8	89.5	17.9	11.2	10.6	22.2	2.3	70.4	1.6	2.3
Product 1 to 2	6.4	149.8	21.7	8.96	10.8	22.0	4.6	94.5	2.8	3.9
Product 1 to 3	7.6	177.9	25.4	7.85	10.5	22.0	6.4	98.3	3.2	4.6
Product 1 to 4	8.6	201.5	27.0	7.01	11.2	22.7	7.7	99.4	3.9	5.4
Product 5	91.4	2135.8	30.5	0.004	26.0	37.7	92.3	0.6	96.1	94.6
Feed	100.0	2337.3	30.2	0.61	24.7	36.4	100	100	100	100

DATE: October 28, 2014

PROJECT NO: KM4420-21

PURPOSE: Preliminary Cleaner Test.

PROCEDURE: Perform a standard one product cleaner test.

FEED: ~2 kg P2 WSA Bulk Final Concentrate.

Stage	Reagents Added g/tonne			Time (minutes)			pH	Redox
	NaHS	Fuel Oil	MIBC	Grind	Cond.	Float		
Natural				-			8.4	11
<u>MOLY CIRCUIT:</u>								
Rougher 1	435	-	-		5	4	10.8	-400
Cleaner 1	153	-	-		3	5	10.8	-560
Cleaner 2	298	-	-		2	3	11.0	-450
Cleaner 3	350	-	-		2	2	10.6	-450
Cleaner 4	270	-	-		1	1	10.7	-450

Flotation Data	Rougher	Clnr 1-3	Clnr 4
Flotation Machine	D2C	D1C	D1C
Cell Size in liters	4.4	2.2	1.0
Aspiration		N ₂	
Water Type		Fresh	
Impeller Speed in rpm	1100	1200	1200

KM4420-21 P2 WSA Bulk Final Concentrate
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t					Distribution - percent			
	%	grams	Cu	Mo	Fe	S	MgO	Cu	Mo	Fe	S
Mo Con	1.8	43.4	1.01	24.2	2.6	17.2	13.5	0.1	72.2	0.2	0.9
Mo 4th Clnr Tail	0.2	5.2	2.29	14.4	4.2	12.4		0.0	5.2	0.0	0.1
Mo 3rd Clnr Tail	0.5	11.0	6.00	9.14	5.6	11.9		0.1	6.9	0.1	0.2
Mo 2nd Clnr Tail	0.9	20.8	27.5	3.11	12.2	22.1		0.8	4.4	0.4	0.6
Mo 1st Clnr Tail	4.3	100.6	39.3	0.72	16.7	28.9		5.6	5.0	2.8	3.5
Mo Ro Tail	92.3	2167.1	30.6	0.04	26.8	36.4		93.5	6.3	96.5	94.8
Feed	100.0	2348.1	30.2	0.62	25.6	35.4	-	100	100	100	100

KM4420-21 P2 WSA Bulk Final Concentrate
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t					Distribution - percent			
	%	grams	Cu	Mo	Fe	S	MgO	Cu	Mo	Fe	S
Product 1	1.8	43.4	1.01	24.2	2.6	17.2	13.5	0.1	72.2	0.2	0.9
Product 1 to 2	2.1	48.6	1.15	23.2	2.7	16.7		0.1	77.4	0.2	1.0
Product 1 to 3	2.5	59.6	2.04	20.6	3.3	15.8		0.2	84.3	0.3	1.1
Product 1 to 4	3.4	80.4	8.63	16.1	5.6	17.4		1.0	88.7	0.7	1.7
Product 1 to 5	7.7	181.0	25.7	7.53	11.8	23.8		6.5	93.7	3.5	5.2
Product 6	92.3	2167.1	30.6	0.04	26.8	36.4		93.5	6.3	96.5	94.8
Feed	100.0	2348.1	30.2	0.62	25.6	35.4	-	100	100	100	100

DATE: October 29, 2014

PROJECT NO: KM4420-22

PURPOSE: To Investigate Flotation at Lower Density.

PROCEDURE: Perform a standard one product cleaner test.

FEED: ~2 kg P2 WSA Bulk Final Concentrate.

Stage	Reagents Added g/tonne			Time (minutes)			pH	Redox
	NaHS	Fuel Oil	MIBC	Grind	Cond.	Float		
Natural							8.8	12
<u>MOLY CIRCUIT:</u>								
Rougher 1	1394	-	8	5	5	4	11.2	-400
Regrind							9.7	13
Cleaner 1	340	-	8		1	4	11.0	-500
Cleaner 2	425	-	-		1	3	10.4	-500
Cleaner 3	170	-	4		1	2	9.9	-450
Cleaner 4	170	-	-		1	1	10.0	-450
Rougher Scavenger	205	-	-		2	2	11.2	-400

Flotation Data	Rougher	Clnr 1-3	Clnr 4
Flotation Machine	D2C	D1C	D1C
Cell Size in liters	8.0	2.2	1.0
Aspiration		N ₂	
Water Type		Fresh	
Impeller Speed in rpm	1100	1200	1200

Grinding Data	Moly Regrind
Mill:	RM3-Mild
Charge/Material:	6kg-Stainless Steel
Water:	estimated

KM4420-22 P2 WSA Bulk Final Concentrate
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Mo Con	0.9	19.6	0.52	27.6	1.6	20.2	0.0	39.9	0.1	0.5
Mo 4th Clnr Tail	0.2	5.4	0.90	24.3	2.4	17.3	0.0	9.7	0.0	0.1
Mo 3rd Clnr Tail	0.4	9.4	1.28	23.3	3.0	18.1	0.0	16.2	0.0	0.2
Mo 2nd Clnr Tail	0.3	6.8	9.60	6.05	11.4	19.5	0.1	3.0	0.1	0.2
Mo 1st Clnr Tail	2.2	49.5	28.3	2.79	17.8	29.0	2.0	10.2	1.5	1.7
Mo Ro Scav Con	2.0	45.7	26.4	2.77	18.7	31.9	1.7	9.3	1.5	1.8
Mo Ro Tail	94.0	2142.8	31.1	0.07	25.8	36.9	96.1	11.7	96.7	95.5
Feed	100.0	2279.2	30.4	0.59	25.1	36.3	100	100	100	100

KM4420-22 P2 WSA Bulk Final Concentrate
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	0.9	19.6	0.52	27.6	1.6	20.2	0.0	39.9	0.1	0.5
Product 1 to 2	1.1	25.0	0.60	26.9	1.8	19.6	0.0	49.6	0.1	0.6
Product 1 to 3	1.5	34.4	0.79	25.9	2.1	19.2	0.0	65.8	0.1	0.8
Product 1 to 4	1.8	41.2	2.24	22.6	3.6	19.2	0.1	68.8	0.3	1.0
Product 1 to 5	4.0	90.7	16.5	11.8	11.4	24.6	2.2	79.0	1.8	2.7
Product 6	2.0	45.7	26.4	2.77	18.7	31.9	1.7	9.3	1.5	1.8
Product 7	94.0	2142.8	31.1	0.07	25.8	36.9	96.1	11.7	96.7	95.5
Feed	100.0	2279.2	30.4	0.59	25.1	36.3	100	100	100	100

DATE: October 30, 2014

PROJECT NO: KM4420-23

PURPOSE: To Investigate an Acetone Wash on the Moly Rougher Concentrate.

PROCEDURE: Perform a standard one product cleaner test.

FEED: ~2 kg P4 WSA Bulk Final Concentrate.

Stage	Reagents Added g/tonne			Time (minutes)			pH	Redox
	NaHS	Fuel Oil	MIBC	Grind	Cond.	Float		
Natural							9.7	44
<u>MOLY CIRCUIT:</u>								
Rougher 1	1750		-		5	4	11.4	-450
Cleaner 1	175		-		1	3	10.4	-501
Cleaner 2	257		4		1	2	10.2	-482
Cleaner 3	175		-		1	1.5	10.6	-480
Cleaner Scavenger	-	2			1	2	10.4	-462

Flotation Data	Rougher	Cleaner
Flotation Machine	D2A	D1B
Cell Size in liters	8.0	2.2
Aspiration	N ₂	
Water Type	Fresh	
Impeller Speed in rpm	1100	1200

KM4420-23 P4 WSA Bulk Final Concentrate
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Mo Con	1.2	24.0	1.68	25.5	4.0	18.3	0.1	64.6	0.2	0.6
Mo 3rd Clnr Tail	0.1	2.7	3.94	16.6	6.7	16.4	0.0	4.8	0.0	0.1
Mo 2nd Clnr Tail	0.3	6.4	8.40	10.9	10.7	19.8	0.1	7.4	0.1	0.2
Mo Clnr Scav Con	0.2	3.2	5.12	15.2	7.2	18.3	0.0	5.1	0.0	0.1
Mo Clnr Scav Tail	0.7	13.3	18.0	2.92	14.8	20.9	0.5	4.1	0.4	0.4
Mo Ro Tail	97.5	1896.0	27.1	0.07	28.0	37.3	99.3	14.0	99.2	98.7
Feed	100.0	1945.6	26.6	0.49	27.5	36.84	100	100	100	100

KM4420-23 P4 WSA Bulk Final Concentrate
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	1.2	24.0	1.68	25.5	4.0	18.3	0.1	64.6	0.2	0.6
Product 1 to 2	1.4	26.7	1.91	24.6	4.3	18.1	0.1	69.4	0.2	0.7
Product 1 to 3	1.7	33.1	3.16	21.9	5.5	18.4	0.2	76.8	0.3	0.9
Product 1 to 4	1.9	36.3	3.34	21.3	5.7	18.4	0.2	81.9	0.4	0.9
Product 1 to 5	2.5	49.6	7.27	16.4	8.1	19.1	0.7	86.0	0.8	1.3
Product 6	97.5	1896.0	27.1	0.07	28.0	37.3	99.3	14.0	99.2	98.7
Feed	100.0	1945.6	26.6	0.49	27.5	36.8	100	100	100	100

DATE: October 31, 2014

PROJECT NO: KM4420-24

PURPOSE: To Investigate Heat Treatment.

PROCEDURE: Perform a standard one product cleaner test.

FEED: ~2 kg P4 WSA Bulk Final Concentrate.

Stage	Reagents Added g/tonne				Time (minutes)			pH	Redox
	NaHS	Fuel Oil	Temp °C	MIBC	Grind	Cond.	Float		
Natural								8.6	-
Condition			76			10		8.0	-
<u>MOLY CIRCUIT:</u>									
Rougher 1	1802	-		4		5	4	10.9	-490
Cleaner Condition	-		81			10	4	9.8	-
Cleaner 1	88	-		4		1	4	10.4	-500
Cleaner 2	525	-		-		1	3	10.6	-501

Flotation Data	Rougher	Cleaner
Flotation Machine	D2A	D1B
Cell Size in liters	8.0	2.2
Aspiration	N ₂	
Water Type	Fresh	
Impeller Speed in rpm	1100	1200

KM4420-24 P4 WSA Bulk Final Concentrate
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Mo Con	2.2	41.4	2.15	20.4	4.4	16.8	0.2	92.2	0.3	0.9
Mo 2nd Clnr Tail	0.1	2.3	13.0	1.84	14.2	16.7	0.1	0.5	0.1	0.1
Mo 1st Clnr Tail	1.0	19.8	15.0	0.50	16.1	20.5	0.6	1.1	0.6	0.6
Mo Ro Tail	96.7	1834.4	27.1	0.03	28.2	39.5	99.2	6.3	99.0	98.5
Feed	100.0	1897.9	26.4	0.48	27.5	38.78	100	100	100	100

KM4420-24 P4 WSA Bulk Final Concentrate
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t				Distribution - percent			
	%	grams	Cu	Mo	Fe	S	Cu	Mo	Fe	S
Product 1	2.2	41.4	2.15	20.4	4.4	16.8	0.2	92.2	0.3	0.9
Product 1 to 2	2.3	43.7	2.72	19.4	4.9	16.8	0.2	92.7	0.4	1.0
Product 1 to 3	3.3	63.5	6.55	13.5	8.4	18.0	0.8	93.7	1.0	1.5
Product 4	96.7	1834.4	27.1	0.03	28.2	39.5	99.2	6.3	99.0	98.5
Feed	100.0	1897.9	26.4	0.48	27.5	38.8	100	100	100	100

DATE: October 31, 2014

PROJECT NO: KM4420-25

PURPOSE: To Repeat Test 22 at a Finer Regrind.

PROCEDURE: Perform a standard one product cleaner test.

FEED: ~2 kg P4 WSA Bulk Final Concentrate.

Stage	Reagents Added g/tonne			Time (minutes)			pH	Redox
	NaHS	Fuel Oil	MIBC	Grind	Cond.	Float		
Natural							8.6	8
<u>MOLY CIRCUIT:</u>								
Rougher 1	1400			30	5		11.1	-501
Regrind							9.2	-28
Cleaner 1	175				2	8	10.3	-480
Cleaner 2	350				1	4	10.6	-450
Cleaner 3	350				1	3	10.6	-450
Cleaner Scavenger	-	2			1	2	10.3	-460

Flotation Data	Rougher	Cleaner
Flotation Machine	D2A	D1B
Cell Size in liters	8.0	2.2
Aspiration	N ₂	
Water Type	Fresh	
Impeller Speed in rpm	1100	1200

Grinding Data	Moly Regrind
Mill:	RM3-Mild
Charge/Material:	6kg-Stainless Steel
Water:	estimated

KM4420-25 P4 WSA Bulk Final Concentrate
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t					Distribution - percent			
	%	grams	Cu	Mo	Fe	S	MgO	Cu	Mo	Fe	S
Mo Con	1.1	20.0	0.21	32.7	0.5	20.8	12.2	0.0	69.4	0.0	0.6
Mo 3rd Clnr Tail	0.2	3.3	1.52	19.2	3.0	14.8		0.0	6.7	0.0	0.1
Mo 2nd Clnr Tail	0.3	5.3	7.70	9.53	10.5	15.2		0.1	5.4	0.1	0.1
Mo Clnr Scav Con	0.1	2.4	6.70	16.0	9.5	19.1		0.0	4.1	0.0	0.1
Mo Clnr Scav Tail	1.2	22.3	14.2	2.88	19.8	19.0		0.6	6.8	0.8	0.6
Mo Ro Tail	97.2	1847.8	27.1	0.04	28.9	39.4		99.2	7.6	99.0	98.6
Feed	100.0	1901.1	26.5	0.50	28.4	38.83	-	100	100	100	100

KM4420-25 P4 WSA Bulk Final Concentrate
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t					Distribution - percent			
	%	grams	Cu	Mo	Fe	S	MgO	Cu	Mo	Fe	S
Product 1	1.1	20.0	0.21	32.7	0.5	20.8	12.2	0.0	69.4	0.0	0.6
Product 1 to 2	1.2	23.3	0.40	30.8	0.9	20.0		0.0	76.1	0.0	0.6
Product 1 to 3	1.5	28.6	1.75	26.8	2.6	19.1		0.1	81.5	0.1	0.7
Product 1 to 4	1.6	31.0	2.13	26.0	3.2	19.1		0.1	85.6	0.2	0.8
Product 1 to 5	2.8	53.3	7.18	16.3	10.1	19.0		0.8	92.4	1.0	1.4
Product 6	97.2	1847.8	27.1	0.04	28.9	39.4		99.2	7.6	99.0	98.6
Feed	100.0	1901.1	26.5	0.50	28.4	38.8	-	100	100	100	100

DATE: November 4, 2014

PROJECT NO: KM4420-26

PURPOSE: To Investigate Starch Addition.

PROCEDURE: Perform a standard one product cleaner test.

FEED: 2 kg P6 WSA Bulk Final Concentrate.

Stage	Reagents Added g/tonne			Time (minutes)			pH	Redox
	PE26	NaHS	Fuel Oil	Grind	Cond.	Float		
Natural							7.9	102
<u>MOLY CIRCUIT:</u>								
Rougher 1	250	1400	-		5	4	11.5	-465
Cleaner 1	500	525	-		2	4	10.8	-488
Cleaner 2	2000	700	-		2	3	10.6	-501
Cleaner 3	3000	525	-		2	2	10.4	-412
Rougher Scavenger	-	175	-		2	2	11.5	-465

Flotation Data	Rougher	Cleaner
Flotation Machine	D2C	D1C
Cell Size in liters	4.4	2.2
Aspiration	N ₂	
Water Type	Fresh	
Impeller Speed in rpm	1100	1200

KM4420-26 P6 WSA Bulk Final Concentrate
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t					Distribution - percent				
	%	grams	Cu	Mo	Fe	S	MgO	Cu	Mo	Fe	S	MgO
Mo Con	0.9	18.0	1.58	24.2	4.3	17.7	11.0	0.0	36.3	0.2	0.4	17.4
Mo 3rd Clnr Tail	0.7	14.4	2.67	18.0	4.6	15.8	11.9	0.1	21.6	0.1	0.3	15.0
Mo 2nd Clnr Tail	0.5	9.7	8.40	9.62	8.0	16.1	11.8	0.1	7.8	0.2	0.2	10.0
Mo 1st Clnr Tail	2.9	59.1	29.2	1.16	20.6	32.5	2.25	2.8	5.7	2.5	2.7	11.6
Mo Ro Scav Con	1.8	36.5	20.3	7.24	14.8	26.0	5.59	1.2	22.0	1.1	1.3	17.8
Mo Ro Scav Tail	93.2	1894.0	31.7	0.04	24.2	35.5	0.17	95.8	6.5	95.9	95.0	28.2
Feed	100.0	2031.7	30.9	0.59	23.5	34.85	0.56	100	100	100	100	100

KM4420-26 P6 WSA Bulk Final Concentrate
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t					Distribution - percent				
	%	grams	Cu	Mo	Fe	S	MgO	Cu	Mo	Fe	S	MgO
Product 1	0.9	18.0	1.58	24.2	4.3	17.7	11.0	0.0	36.3	0.2	0.4	17.4
Product 1 to 2	1.6	32.4	2.06	21.4	4.4	16.9	11.4	0.1	57.9	0.3	0.8	32.3
Product 1 to 3	2.1	42.1	3.52	18.7	5.3	16.7	11.5	0.2	65.7	0.5	1.0	42.4
Product 1 to 4	5.0	101.2	18.5	8.47	14.2	25.9	6.10	3.0	71.4	3.0	3.7	54.0
Product 1 to 5	6.8	137.7	19.0	8.14	14.4	25.9	5.96	4.2	93.5	4.1	5.0	71.8
Product 6	93.2	1894.0	31.7	0.04	24.2	35.5	0.17	95.8	6.5	95.9	95.0	28.2
Feed	100.0	2031.7	30.9	0.59	23.5	34.9	0.56	100	100	100	100	100

DATE: November 5, 2014

PROJECT NO: KM4420-27

PURPOSE: To Investigate Roasting of Moly Concentrates and Reverse Flotation.

PROCEDURE: Perform a standard one product cleaner test where the moly concentrates were heat treated at 500°C for 30 minutes prior to flotation.

FEED: 0.130 kg of Test 21 to 25 Molybdenum Concentrates.

Stage	Reagents Added g/tonne					Time (minutes)			pH	Redox
	H ₂ SO ₄	Soda Ash	NaHS	Fuel Oil	MIBC	Grind	Cond.	Float		
Natural									4.7	222
Roasting							30			
<u>REVERSE CIRCUIT:</u>										
Rougher 1	9000				231		1	4	3.0	218
Cleaner 1A	5000				231		1	1	3.0	228
Cleaner 1B	3000				165		1	1	3.0	226
Cleaner 1C	2000				165		1	1	3.0	222
Final Mo Cleaner	-	37230	963	308	231		1	3	10.0	-475

Flotation Data	Rougher	Cleaner
Flotation Machine	D1B	D1B
Cell Size in liters	2.2	2.2
Aspiration	Air	
Water Type	Fresh	
Impeller Speed in rpm	1200	1200

KM4420-27 Test 21 to 25 Molybdenum Concentrates
Overall Metallurgical Balance

Product	Weight		Assay - percent or g/t					Distribution - percent				
	%	grams	Cu	Mo	Fe	S	MgO	Cu	Mo	Fe	S	MgO
Fn Mo Clnr Con	17.4	22.4	0.70	51.1	1.0	35.9	1.1	9.5	38.7	6.3	38.6	1.5
Fn Mo Clnr TI	26.0	33.5	2.28	42.4	3.0	30.3	2.8	46.4	48.1	27.9	48.8	5.8
Reverse Con 1A	25.2	32.4	0.73	1.59	2.8	1.02	23.0	14.4	1.7	25.6	1.6	46.0
Reverse Con 1B	16.7	21.5	0.71	3.26	2.6	2.26	22.1	9.3	2.4	15.9	2.3	29.3
Reverse Con 1C	6.4	8.3	1.29	8.17	3.7	5.70	18.1	6.5	2.3	8.5	2.3	9.3
Reverse Clnr Tail	8.2	10.6	2.17	18.9	5.3	12.5	12.4	14.0	6.8	15.8	6.4	8.1
Feed	100.0	128.7	1.28	23.0	2.8	16.2	12.6	100	100	100	100	100

KM4420-27 Test 21 to 25 Molybdenum Concentrates
Cumulative Metallurgical Balance

Cumulative Product	Cum. Weight		Assay - percent or g/t					Distribution - percent				
	%	grams	Cu	Mo	Fe	S	MgO	Cu	Mo	Fe	S	MgO
Product 1	17.4	22.4	0.70	51.1	1.0	35.9	1.1	9.5	38.7	6.3	38.6	1.5
Product 1 to 2	43.4	55.9	1.65	45.9	2.2	32.5	2.1	55.9	86.8	34.2	87.4	7.3
Product 3	25.2	32.4	0.73	1.59	2.8	1.02	23.0	14.4	1.7	25.6	1.6	46.0
Product 3 to 4	41.9	53.9	0.72	2.26	2.7	1.51	22.6	23.6	4.1	41.5	3.9	75.3
Product 3 to 5	48.3	62.2	0.80	3.04	2.9	2.07	22.0	30.1	6.4	50.0	6.2	84.6
Product 3 to 6	56.6	72.8	1.00	5.36	3.2	3.59	20.6	44.1	13.2	65.8	12.6	92.7
Feed	100.0	128.7	1.28	23.0	2.8	16.2	12.6	100	100	100	100	100

DATE: November 6, 2014

PROJECT NO: KM4420-28

PURPOSE: Preliminary Locked Cycle Test.

PROCEDURE: Perform a standard one product locked cycle test with the moly cleaner scavenger concentrate recirculated to the rougher feed.

FEED: 5 x 2 kg of P6 Bulk Final Concentrate Startup.
Moly Re grind Discharge - 37 μ m K₈₀.

Stage	Reagents Added g/tonne			Time (minutes)			pH	Redox
	NaHS		MIBC	Grind	Cond.	Float		
Primary Grind							8.4	98
<u>MOLY CIRCUIT:</u>								
Rougher 1	2100		-		5	5	11.4	-490
Regrind				10			9.0	-82
Cleaner 1	263		-		3	4	10.5	-460
Cleaner 2	350		-		1	3	10.4	-475
Cleaner Scavenger	-		4		1	2	10.4	-460

Flotation Data	Rougher	Cleaner
Flotation Machine:	D2A	D1B
Cell Size in liters:	8.0	2.2
Aspiration:	N ₂	
Water Type:	Fresh	
Impeller Speed in rpm:	1100	1200

Grinding Data	Moly Re grind
Mill:	RM3-Mild
Charge/Material:	6kg-Stainless Steel
Water:	estimated

KM4420-28

Estimated Dry Weight Table

Product	Cycles - Weight (gms)				
	I	II	III	IV	V
<u>MOLY CIRCUIT:</u>					
Rougher Concentrate	-	-	-	150	125
Cleaner Scavenger Con	-	-	4	5	8
Cleaner Scavenger Tail	155	58	94	110	82
Cleaner Tail 2	22	22	15	20	21
Moly Concentrate	47	48	37	47	47
Rougher Feed pH	8.4	8.9	8.6	8.3	8.6
Rougher Feed Redox	98	82	70	70	72

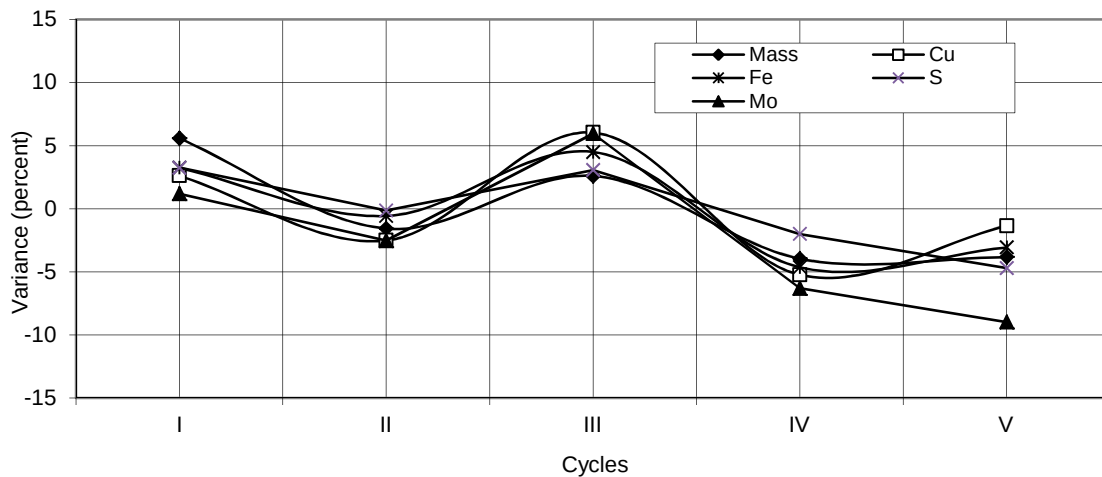
KM4420-28 P6 Bulk Final Concentrate Startup
OVERALL CYCLE TEST MASS AND METALLURGICAL BALANCE

Product	Weight %	Weight g	Assay - percent or g/t					Distribution - percent			
			Cu	Mo	Fe	S	MgO	Cu	Mo	Fe	S
Moly Con I	0.4	44.5	1.13	25.8	2.3	18.7		0.0	18.7	0.0	0.2
Moly Con II	0.4	43.1	1.01	25.2	2.3	17.5		0.0	17.6	0.0	0.2
Moly Con III	0.3	31.6	1.11	24.6	2.2	17.2		0.0	12.7	0.0	0.2
Moly Con IV	0.4	41.3	1.13	24.2	2.5	16.9	13.6	0.0	16.2	0.0	0.2
Moly Con V	0.4	41.6	1.12	23.2	2.3	16.7	13.6	0.0	15.7	0.0	0.2
Moly 2nd Clnr Tail	0.2	16.6	12.10	4.84	11.5	15.8		0.1	1.3	0.1	0.1
Moly Clnr Scav Con	0.1	7.3	9.90	6.94	10.1	15.3	11.5	0.0	0.8	0.0	0.0
Moly Clnr Scav Tail I	1.5	152.8	7.80	0.226	7.5	8.37		0.4	0.6	0.5	0.4
Moly Clnr Scav Tail II	0.5	52.2	19.8	1.22	18.4	21.8		0.3	1.0	0.4	0.3
Moly Clnr Scav Tail III	0.8	86.2	27.7	0.666	22.5	29.6		0.8	0.9	0.8	0.7
Moly Clnr Scav Tail IV	1.0	99.7	25.2	0.889	20.6	27.2		0.8	1.4	0.8	0.8
Moly Clnr Scav Tail V	0.7	71.7	22.5	1.56	18.8	24.5		0.5	1.8	0.5	0.5
Moly Ro Tail I	19.2	1968.7	30.2	0.031	25.8	36.1		20.1	1.0	20.2	20.1
Moly Ro Tail II	18.8	1924.0	29.4	0.026	25.5	35.8		19.1	0.8	19.5	19.4
Moly Ro Tail III	19.4	1987.1	30.4	0.236	25.5	35.2		20.4	7.6	20.1	19.7
Moly Ro Tail IV	17.8	1829.3	29.3	0.036	25.1	36.1		18.1	1.1	18.2	18.6
Moly Ro Tail V	18.1	1859.7	30.5	0.022	25.5	35.0		19.2	0.7	18.8	18.4
FEED	100	10257	28.8	0.600	24.6	34.5	-	100.0	100.0	100.0	100.0

KM4420-28 P6 Bulk Final Concentrate Startup
METALLURGICAL BALANCES BY TEST CYCLES

Product	Weight %	Weight g	Assay - percent or g/t				Distribution - percent			
			Cu	Mo	Fe	S	Cu	Mo	Fe	S
<u>CYCLE IV</u>										
Flotation Feed	100.0	1970	28.5	0.585	24.4	35.2	100.0	100.0	100.0	100.0
Moly Con	2.1	41.3	1.13	24.2	2.5	16.9	0.1	86.7	0.2	1.0
Moly Clnr Scav Tail	5.1	99.7	25.2	0.89	20.6	27.2	4.5	7.7	4.3	3.9
Moly Ro Tail	92.8	1829.3	29.3	0.036	25.1	36.1	95.4	5.7	95.5	95.1
<u>CYCLE V</u>										
Flotation Feed	100.0	1973	29.6	0.568	24.8	34.2	100.0	100.0	100.0	100.0
Moly Con	2.1	41.6	1.12	23.2	2.3	16.7	0.1	86.3	0.2	1.0
Moly Clnr Scav Tail	3.6	71.7	22.5	1.56	18.8	24.5	2.8	10.0	2.8	2.6
Moly Ro Tail	94.3	1859.7	30.5	0.022	25.5	35.0	97.2	3.7	97.0	96.4
<u>CYCLES IV and V</u>										
Flotation Feed	100.0	3943	29.0	0.576	24.6	34.7	100.0	100.0	100.0	100.0
Moly Con	2.1	82.9	1.12	23.7	2.4	16.8	0.1	86.5	0.2	1.0
Moly Clnr Scav Tail	4.3	171.4	24.1	1.17	19.8	26.1	3.6	8.8	3.5	3.3
Moly Ro Tail	93.6	3689.0	29.9	0.029	25.3	35.5	96.3	4.7	96.3	95.7

Cycles	Mass		Calculated Head				Metal Unit Variances (%)			
	%Var.	g/cycle	Cu	Mo	Fe	S	Cu	Mo	Fe	S
I	5.6	2166.0	28.0	0.575	24.0	33.8	3	1	3	3
II	-1.6	2019.3	28.6	0.594	24.8	35.0	-3	-3	-1	0
III	2.6	2104.9	29.8	0.619	25.0	34.7	6	6	5	3
IV	-4.0	1970.3	28.5	0.585	24.4	35.2	-5	-6	-5	-2
V	-3.8	1973.0	29.6	0.568	24.8	34.2	-1	-9	-3	-5
Total	-	2051.5	28.8	0.600	24.6	34.5	-	-	-	-



KM4420-28 P6 Bulk Final Concentrate Startup

CYCLES (IV+V) MASS BALANCE FLOWSHEET AND METALLURGICAL BALANCE DATA

Flotation Stream		Weight %	Assay (percent or g/t)				Distribution (percent)			
No.	Product		Cu	Mo	Fe	S	Cu	Mo	Fe	S
1	Fresh Feed	100.0	29.0	0.576	24.6	34.7	100.0	100.0	100.0	100.0
2	Moly Ro Feed	100.4	29.0	0.600	24.5	34.7	100.1	104.5	100.2	100.2
3	Moly Ro Tail	93.6	29.9	0.029	25.3	35.5	96.3	4.7	96.3	95.7
4	Moly Ro Con	6.8	16.2	8.43	13.9	22.6	3.8	99.8	3.9	4.4
5	Moly 1st Clnr Feed	7.7	15.8	8.04	13.7	21.9	4.2	106.8	4.3	4.8
6	Moly 1st Clnr Tail	4.7	23.0	1.62	19.1	25.2	3.7	13.3	3.7	3.4
7	Moly 1st Clnr Con	2.9	4.26	18.3	5.0	16.5	0.4	93.6	0.6	1.4
8	Moly Clnr Scav Tail	4.3	24.1	1.17	19.8	26.1	3.6	8.8	3.5	3.3
9	Moly Clnr Scav Con	0.4	9.90	6.94	10.1	15.3	0.1	4.5	0.2	0.2
10	Moly 2nd Clnr Tail	0.8	12.1	4.84	11.5	15.8	0.4	7.1	0.4	0.4
11	Moly 2nd Clnr Con	2.1	1.12	23.7	2.4	16.8	0.1	86.5	0.2	1.0
12	Final Tail	97.9	29.6	0.080	25.1	35.1	99.9	13.5	99.8	99.0

APPENDIX III – KM4420

PARTICLE SIZING DATA

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TABLE III-1
SCREEN ANALYSIS
KM4420 Lab Composite - 10 Minute Grind Calibration

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.40	98.6
65 Mesh	212	13.00	85.6
100 Mesh	150	18.40	67.2
150 Mesh	106	12.70	54.5
200 Mesh	75	8.90	45.6
270 Mesh	53	6.90	38.7
400 Mesh	38	4.90	33.8
TOTAL		100.00	**

K80= 192 μm

Note: 10 min. grind calibration using 2 kg. Ore, 1000 ml water and
 20 kg. of Mild Steel rods in Mill: M5

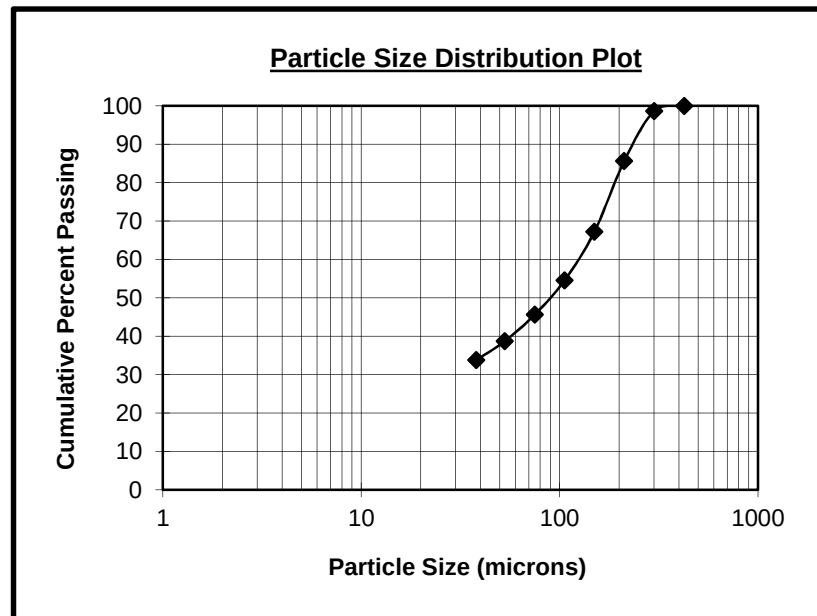


TABLE III-2
SCREEN ANALYSIS
KM4420 Lab Composite - 11 Minute Grind Calibration

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.30	99.7
65 Mesh	212	10.10	89.6
100 Mesh	150	17.20	72.4
150 Mesh	106	14.20	58.2
200 Mesh	75	9.90	48.3
270 Mesh	53	7.20	41.1
400 Mesh	38	5.50	35.6
TOTAL		100.00	**

K80= 176 μm

Note: 11 min. grind calibration using 2 kg. Ore, 1000 ml water and
20 kg. of Mild Steel rods in Mill: M5

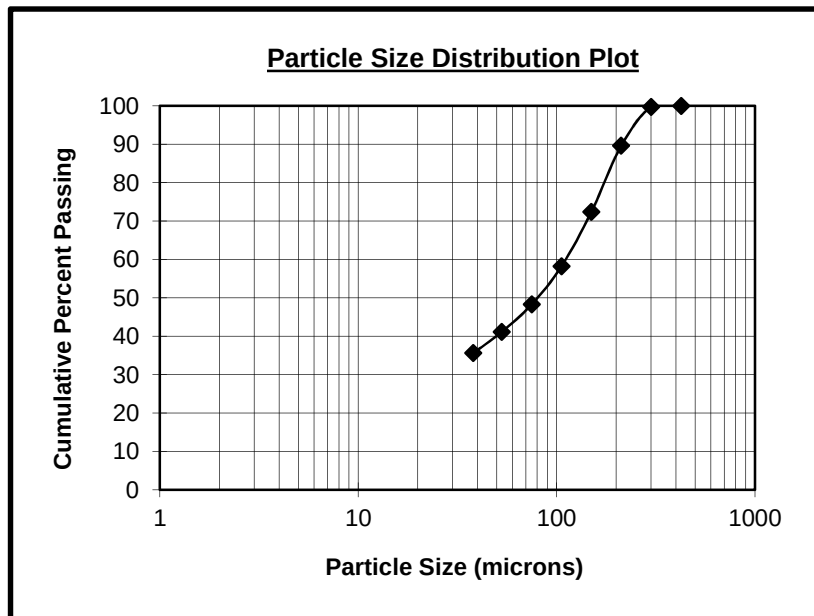


TABLE III-3
SCREEN ANALYSIS
KM4420 Lab Composite - 12 Minute Grind Calibration

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.10	99.9
65 Mesh	212	5.80	94.1
100 Mesh	150	16.80	77.3
150 Mesh	106	15.50	61.8
200 Mesh	75	10.80	51.0
270 Mesh	53	7.60	43.4
400 Mesh	38	5.90	37.5
TOTAL		100.00	**

K80= 159 μm

Note: 12 min. grind calibration using 2 kg. Ore, 1000 ml water and
20 kg. of Mild Steel rods in Mill: M5

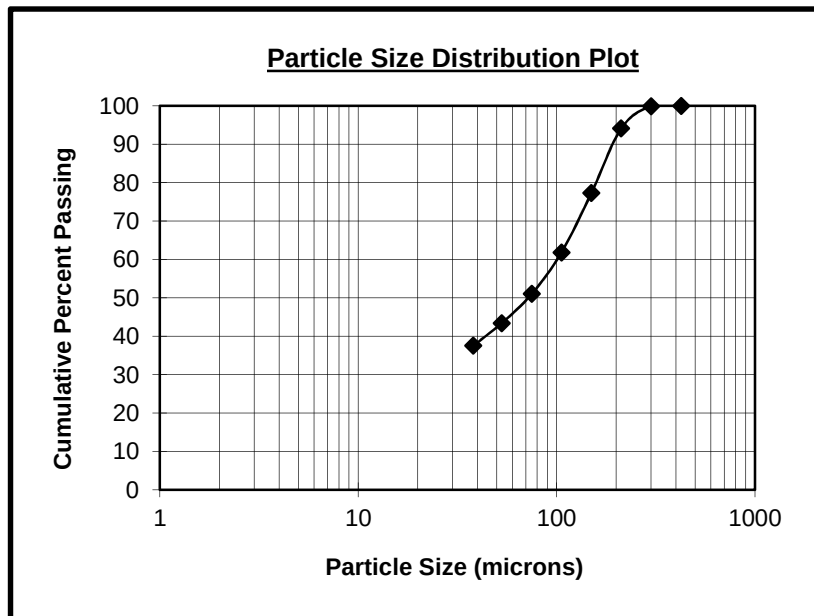


TABLE III-4
SCREEN ANALYSIS
KM4420 Lab Composite - 16 Minute Grind Calibration

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
48 Mesh	300	0.00	100.0
65 Mesh	212	0.10	99.9
100 Mesh	150	3.40	96.5
150 Mesh	106	16.20	80.3
200 Mesh	75	16.00	64.3
270 Mesh	53	12.20	52.1
400 Mesh	38	7.40	44.7
TOTAL		100.00	**

K80= 105 μm

Note: 16 min. grind calibration using 2 kg. Ore, 1000 ml water and
 20 kg. of Mild Steel rods in Mill: M5

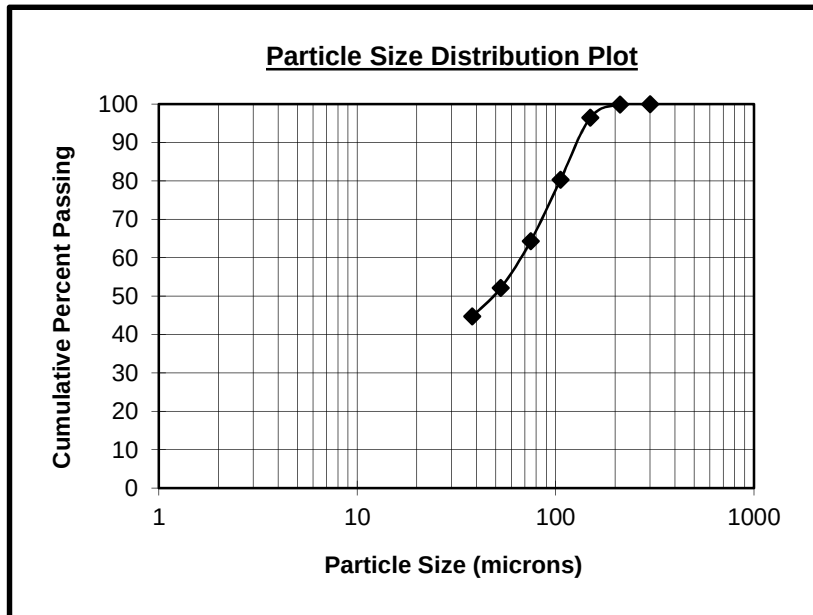


TABLE III-5
CYCLOSIZING ANALYSIS
KM4420 Lab Composite - 12 Minute Grind Calibration

Product	Size (µm)		Weight % Retained	Cumulative % Passing
	Limiting	Effective		
35 Mesh	425	425	0.00	100.0
48 Mesh	300	300	0.10	99.9
65 Mesh	212	212	6.00	93.9
100 Mesh	150	150	16.30	77.6
150 Mesh	106	106	15.90	61.7
200 Mesh	75	75	10.80	50.9
270 Mesh	53	53	7.00	43.9
Cyclone 1	45	41	2.70	41.2
Cyclone 2	31	29	5.30	35.9
Cyclone 3	22	20	6.00	29.9
Cyclone 4	15	14	5.30	24.6
Cyclone 5	12	11	5.70	18.9
Total			100.00	**

Operating Conditions	Measured	Factor
Temperature (°C)	19.60	0.998
Specific Gravity	2.83	0.959
Flow Rate (mm)	180	1.012
Elutriation Time (min)	20	0.955
Overall Factor		0.925
K80 Size (microns)		159

Note: 12 min. grind calibration using 2 kg. Ore, 1000 ml water and
20 kg. of Mild Steel rods in Mill: M5

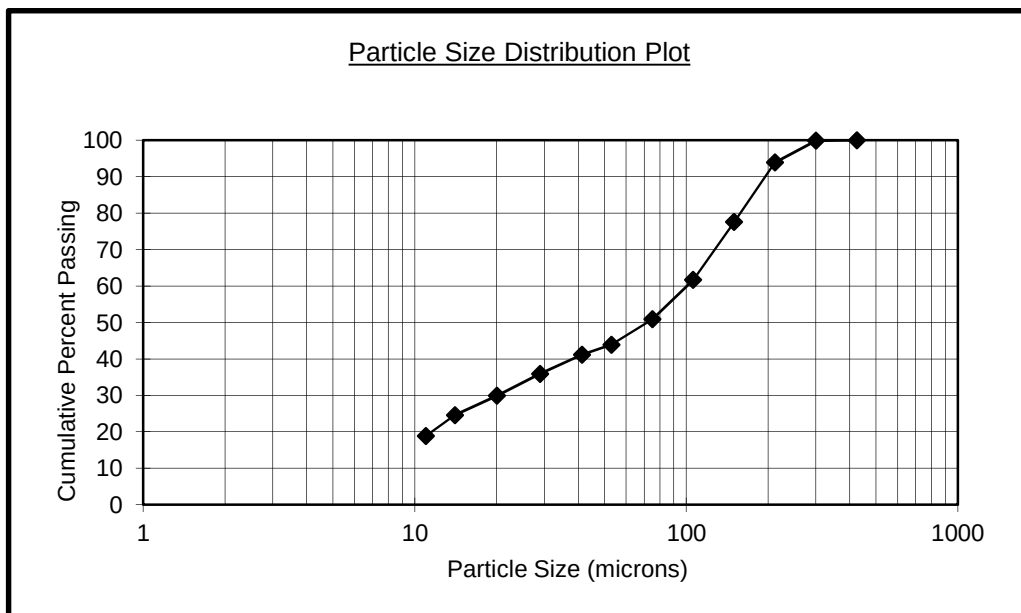


TABLE III-6
CYCLOSIZING ANALYSIS
KM4420-P4 WSA Bulk Cleaner Scavenger Tailing

Product	Size (μm)		Weight % Retained	Cumulative % Passing
	Limiting	Effective		
48 Mesh	300	300	0.00	100.0
65 Mesh	212	212	0.80	99.2
100 Mesh	150	150	1.60	97.6
150 Mesh	106	106	4.10	93.5
200 Mesh	75	75	4.00	89.5
270 Mesh	53	53	6.50	83.0
Cyclone 1	45	38	7.60	75.4
Cyclone 2	31	26	7.40	68.0
Cyclone 3	22	18	8.20	59.8
Cyclone 4	15	13	7.60	52.2
Cyclone 5	12	10	9.30	42.9
Total			100.00	**

Operating Conditions	Measured	Factor
Temperature ($^{\circ}\text{C}$)	17.00	1.033
Specific Gravity	3.32	0.845
Flow Rate (mm)	180	1.012
Elutriation Time (min)	20	0.955
Overall Factor		0.844
K80 Size (microns)		47

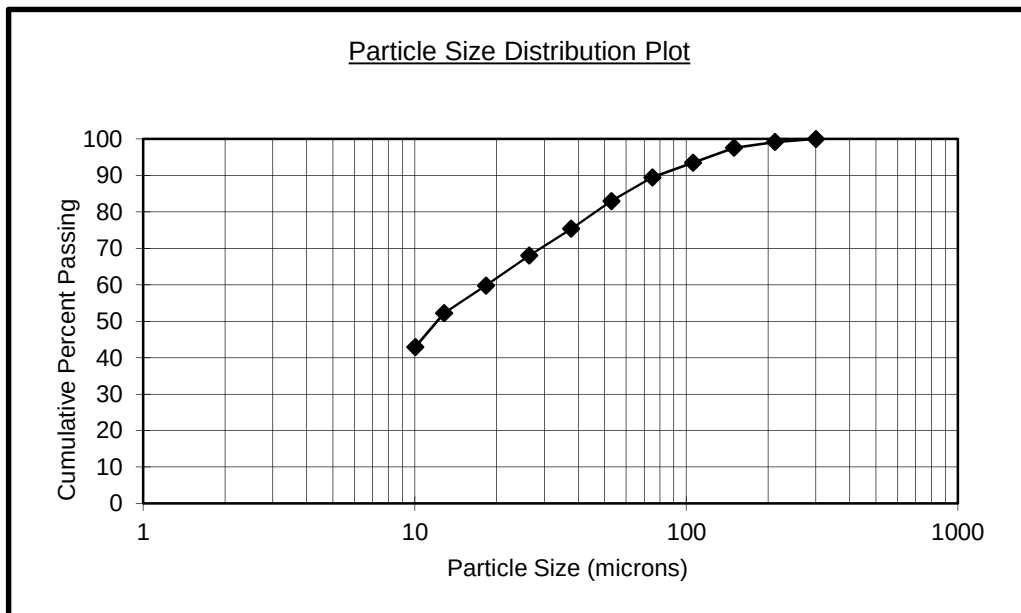


TABLE III-7
CYCLOSIZING ANALYSIS
KM4420-P4 WSA Bulk Final Concentrate

Product	Size (μm)		Weight % Retained	Cumulative % Passing
	Limiting	Effective		
65 Mesh	212	212	0.00	100.0
100 Mesh	150	150	0.40	99.6
150 Mesh	106	106	2.00	97.6
200 Mesh	75	75	5.50	92.1
270 Mesh	53	53	9.30	82.8
Cyclone 1	50	35	17.40	65.4
Cyclone 2	33	23	16.60	48.8
Cyclone 3	23	16	15.20	33.6
Cyclone 4	16	11	10.50	23.1
Cyclone 5	13	9	5.60	17.5
Total			100.00	**

Operating Conditions	Measured	Factor
Temperature (°C)	17.20	1.030
Specific Gravity	4.25	0.709
Flow Rate (mm)	180	1.012
Elutriation Time (min)	20	0.955
Overall Factor		0.706
K80 Size (microns)		50

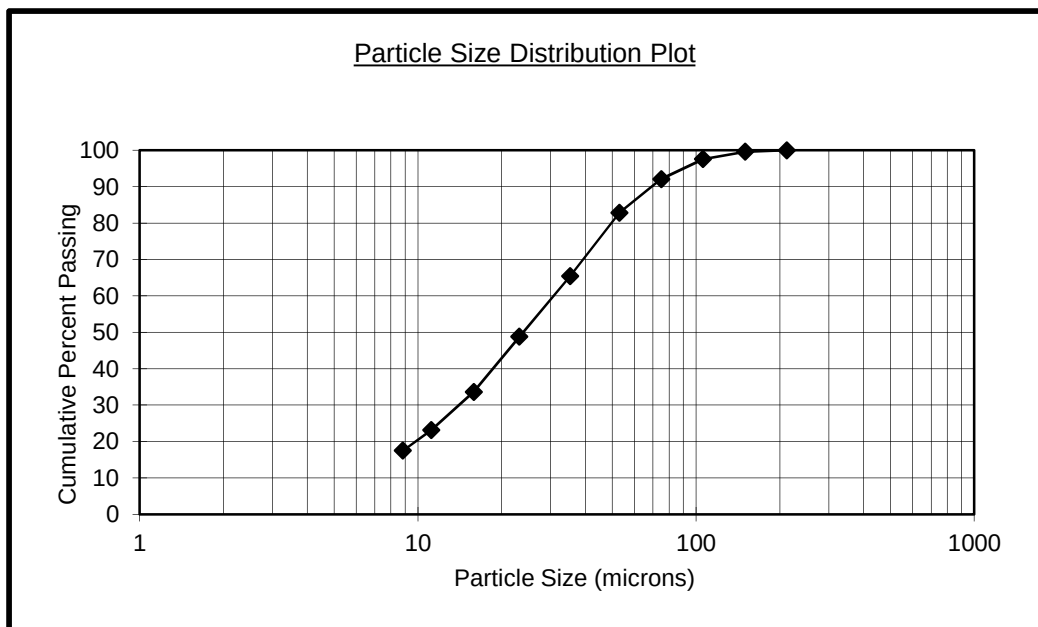


TABLE III-8
CYCLOSIZING ANALYSIS
KM4420-P4 WSA Bulk Rougher Tailing

Product	Size (μm)		Weight % Retained	Cumulative % Passing
	Limiting	Effective		
35 Mesh	425	425	0.00	100.0
48 Mesh	300	300	4.40	95.6
65 Mesh	212	212	10.60	85.0
100 Mesh	150	150	11.90	73.1
150 Mesh	106	106	12.50	60.6
200 Mesh	75	75	10.00	50.6
270 Mesh	53	53	7.40	43.2
Cyclone 1	45	44	0.90	42.3
Cyclone 2	31	31	4.90	37.4
Cyclone 3	22	21	6.30	31.1
Cyclone 4	15	15	5.30	25.8
Cyclone 5	12	12	4.90	20.9
Total			100.00	**

Operating Conditions	Measured	Factor
Temperature (°C)	17.20	1.030
Specific Gravity	2.71	0.995
Flow Rate (mm)	180	1.012
Elutriation Time (min)	20	0.955
Overall Factor		0.990
K80 Size (microns)		184

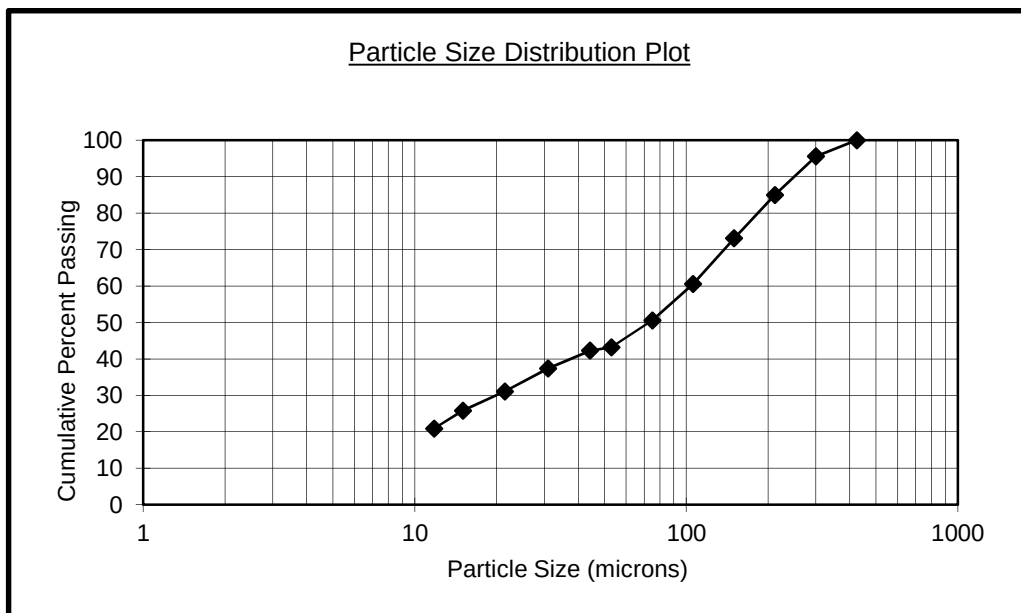


TABLE III-9
CYCLOSIZING ANALYSIS
KM4420-P8 WSB Bulk Cleaner Scavenger Tailing

Product	Size (μm)		Weight % Retained	Cumulative % Passing
	Limiting	Effective		
48 Mesh	300	300	0.00	100.0
65 Mesh	212	212	0.20	99.8
100 Mesh	150	150	0.60	99.2
150 Mesh	106	106	1.40	97.8
200 Mesh	75	75	3.50	94.3
270 Mesh	53	53	5.00	89.3
Cyclone 1	50	46	5.10	84.2
Cyclone 2	33	30	5.00	79.2
Cyclone 3	23	21	7.80	71.4
Cyclone 4	16	14	9.60	61.8
Cyclone 5	13	11	9.10	52.7
Total			100.00	**

Operating Conditions	Measured	Factor
Temperature ($^{\circ}\text{C}$)	16.50	1.040
Specific Gravity	3.03	0.908
Flow Rate (mm)	180	1.012
Elutriation Time (min)	20	0.955
Overall Factor		0.913
K80 Size (microns)		32

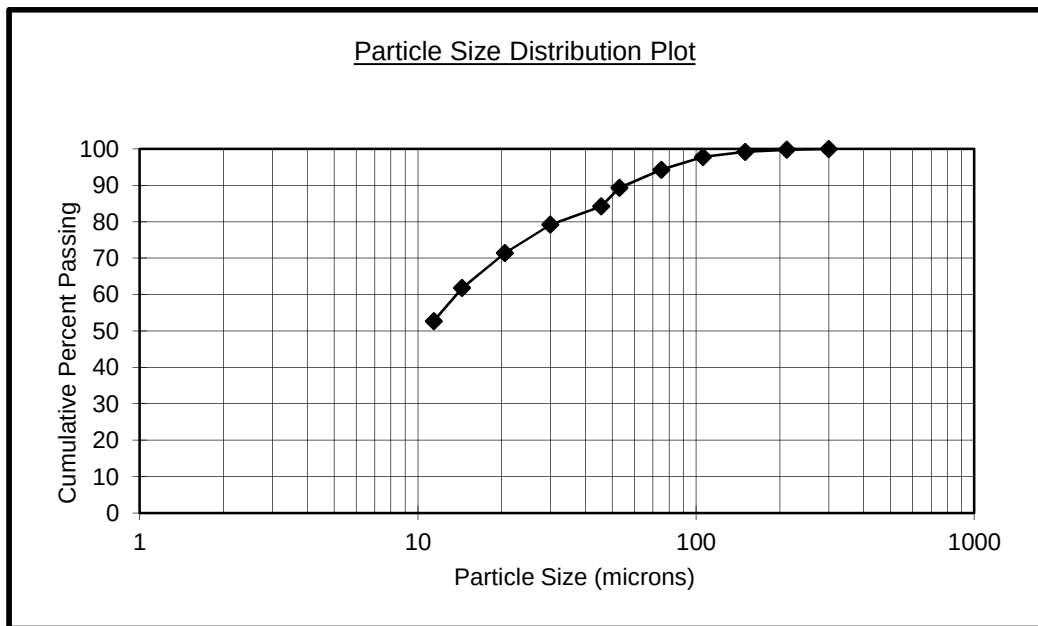


TABLE III-10
CYCLOSIZING ANALYSIS
KM4420-P8 WSB Bulk Final Concentrate

Product	Size (μm)		Weight % Retained	Cumulative % Passing
	Limiting	Effective		
48 Mesh	300	300	0.00	100.0
65 Mesh	212	212	0.07	99.9
100 Mesh	150	150	1.00	98.9
150 Mesh	106	106	3.67	95.3
200 Mesh	75	75	7.40	87.9
270 Mesh	53	53	11.27	76.6
Cyclone 1	50	35	14.53	62.1
Cyclone 2	33	23	19.13	42.9
Cyclone 3	23	16	14.67	28.3
Cyclone 4	16	11	9.20	19.1
Cyclone 5	13	9	4.47	14.6
Total			100.00	**

Operating Conditions	Measured	Factor
Temperature (°C)	16.50	1.040
Specific Gravity	4.32	0.702
Flow Rate (mm)	180	1.012
Elutriation Time (min)	20	0.955
Overall Factor		0.705
K80 Size (microns)		59

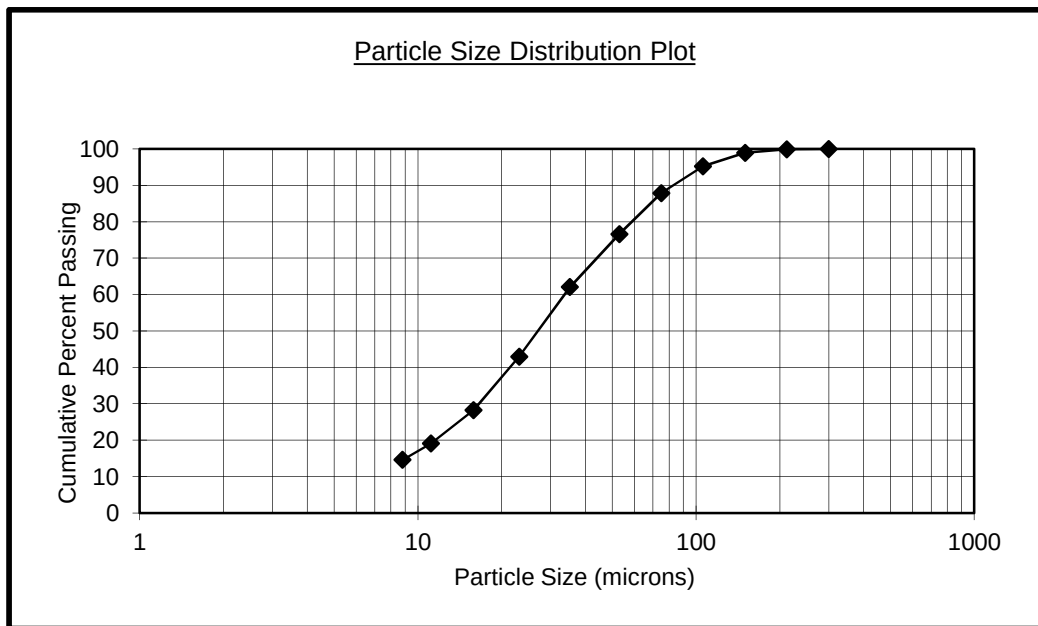


TABLE III-11
CYCLOSIZING ANALYSIS
KM4420-P8 WSB Flotation Feed

Product	Size (μm)		Weight % Retained	Cumulative % Passing
	Limiting	Effective		
35 Mesh	425	425	0.00	100.0
48 Mesh	300	300	0.93	99.1
65 Mesh	212	212	10.20	88.9
100 Mesh	150	150	14.13	74.7
150 Mesh	106	106	13.47	61.3
200 Mesh	75	75	10.00	51.3
270 Mesh	53	53	7.53	43.7
Cyclone 1	45	43	2.13	41.6
Cyclone 2	31	30	5.33	36.3
Cyclone 3	22	21	6.53	29.7
Cyclone 4	15	15	5.53	24.2
Cyclone 5	12	11	5.73	18.5
Total			100.00	**

Operating Conditions	Measured	Factor
Temperature (°C)	16.50	1.040
Specific Gravity	2.86	0.952
Flow Rate (mm)	180	1.012
Elutriation Time (min)	20	0.955
Overall Factor		0.957
K80 Size (microns)		172

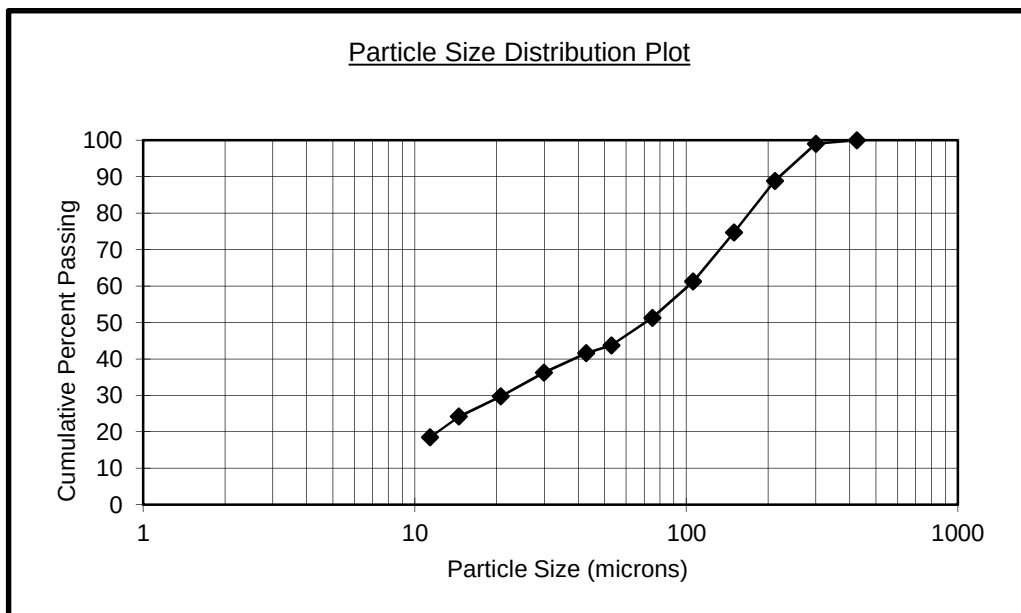


TABLE III-12
CYCLOSIZING ANALYSIS
KM4420-P8 WSB Pyrite Rougher Concentrate

Product	Size (μm)		Weight % Retained	Cumulative % Passing
	Limiting	Effective		
35 Mesh	425	425	0.00	100.0
48 Mesh	300	300	0.40	99.6
65 Mesh	212	212	4.07	95.5
100 Mesh	150	150	7.07	88.5
150 Mesh	106	106	7.13	81.3
200 Mesh	75	75	6.27	75.1
270 Mesh	53	53	5.47	69.6
Cyclone 1	50	44	4.27	65.3
Cyclone 2	33	29	3.47	61.9
Cyclone 3	23	20	6.47	55.4
Cyclone 4	16	14	8.47	46.9
Cyclone 5	13	11	7.47	39.5
Total			100.00	**

Operating Conditions	Measured	Factor
Temperature (°C)	16.50	1.040
Specific Gravity	3.18	0.874
Flow Rate (mm)	180	1.012
Elutriation Time (min)	20	0.955
Overall Factor		0.878
K80 Size (microns)		99

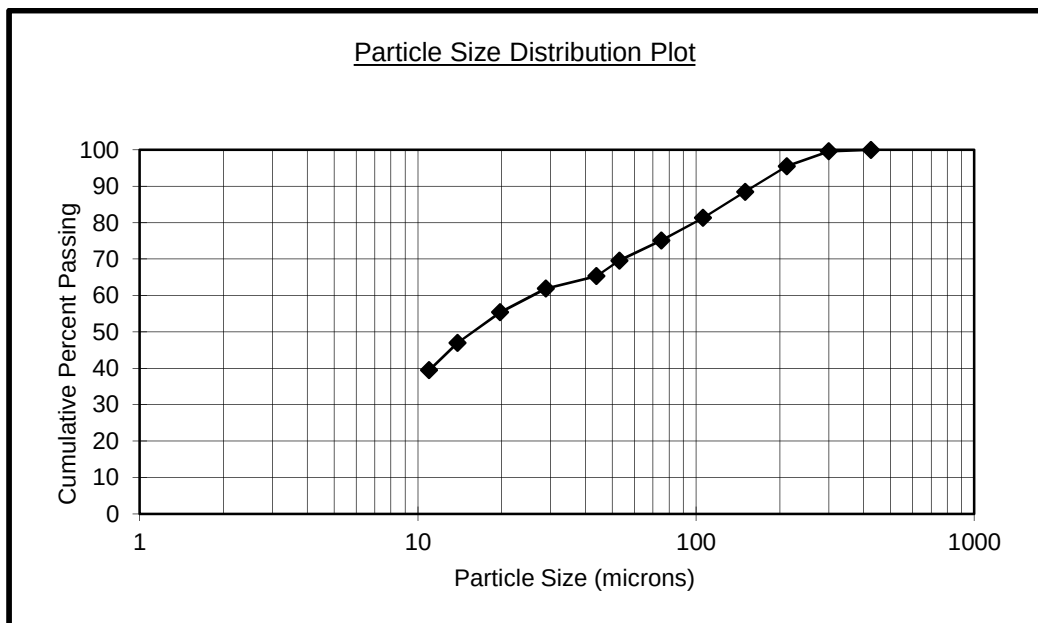


TABLE III-13
CYCLOSIZING ANALYSIS
KM4420-P8 WSB Pyrite Rougher Tailing

Product	Size (µm)		Weight % Retained	Cumulative % Passing
	Limiting	Effective		
35 Mesh	425	425	0.00	100.0
48 Mesh	300	300	0.80	99.2
65 Mesh	212	212	9.67	89.5
100 Mesh	150	150	12.60	76.9
150 Mesh	106	106	14.53	62.4
200 Mesh	75	75	11.47	50.9
270 Mesh	53	53	8.60	42.3
Cyclone 1	45	45	0.93	41.4
Cyclone 2	31	32	5.73	35.7
Cyclone 3	22	22	7.27	28.4
Cyclone 4	15	15	5.53	22.9
Cyclone 5	12	12	5.33	17.5
Total			100.00	**

Operating Conditions	Measured	Factor
Temperature (°C)	16.50	1.040
Specific Gravity	2.68	1.003
Flow Rate (mm)	180	1.012
Elutriation Time (min)	20	0.955
Overall Factor		1.008
K80 Size (microns)		164

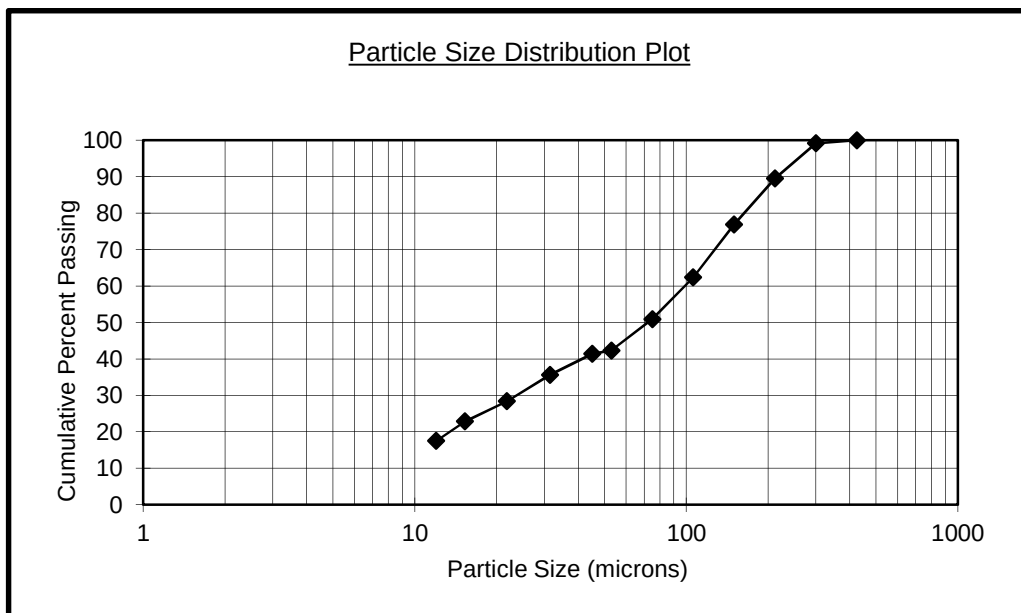


TABLE III-14
SCREEN ANALYSIS
KM4420-04 Bulk Rougher Tailing

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
48 Mesh	300	0.00	100.0
65 Mesh	212	3.40	96.6
100 Mesh	150	14.40	82.2
150 Mesh	106	15.70	66.5
200 Mesh	75	11.20	55.3
270 Mesh	53	8.40	46.9
400 Mesh	38	6.20	40.7
TOTAL		100.00	**

K80= 143 μm

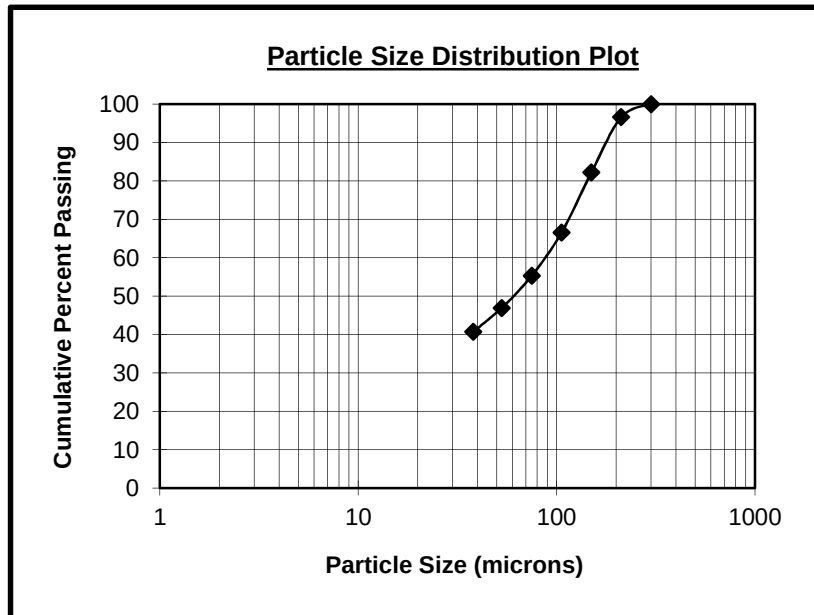


TABLE III-15
SCREEN ANALYSIS
KM4420-05 Pyrite Rougher Tailing

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
48 Mesh	300	0.00	100.0
65 Mesh	212	0.80	99.2
100 Mesh	150	13.20	86.0
150 Mesh	106	16.90	69.1
200 Mesh	75	13.10	56.0
270 Mesh	53	9.70	46.3
400 Mesh	38	6.80	39.5
TOTAL		100.00	**

K80= 134 μm

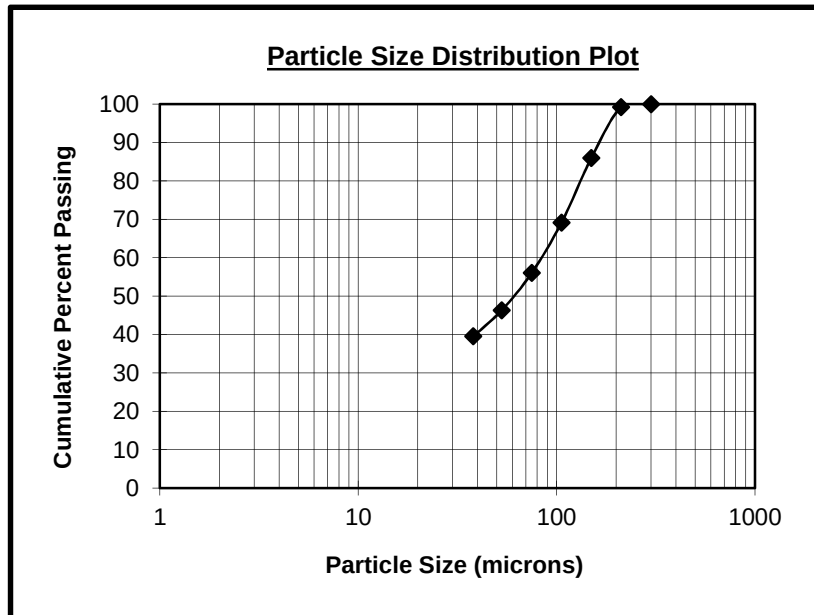


TABLE III-16
SCREEN ANALYSIS
KM4420-06 Bulk Rougher Tailing

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
48 Mesh	300	0.00	100.0
65 Mesh	212	2.80	97.2
100 Mesh	150	16.20	81.0
150 Mesh	106	16.40	64.6
200 Mesh	75	11.10	53.5
270 Mesh	53	8.90	44.6
400 Mesh	38	6.40	38.2
TOTAL		100.00	**

K80= 147 μm

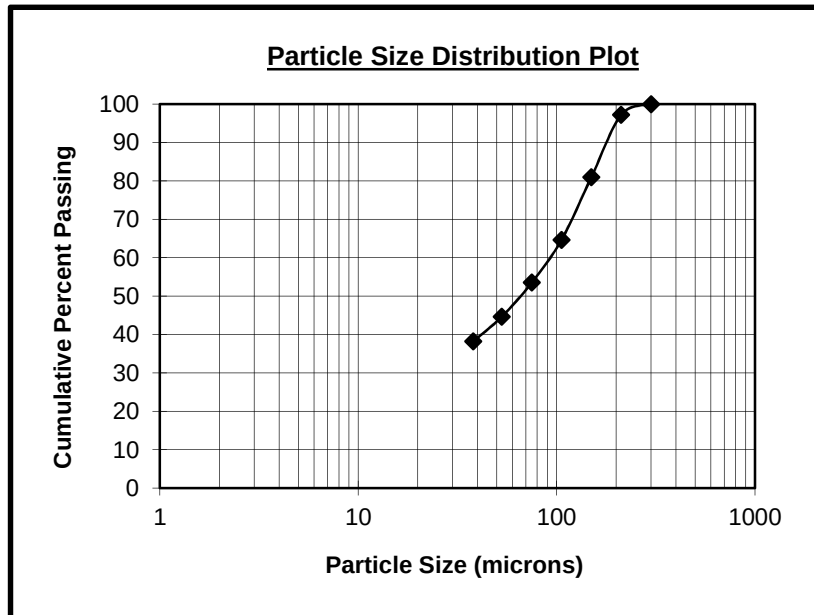


TABLE III-17
SCREEN ANALYSIS
KM4420-08 Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	5.50	94.5
65 Mesh	212	17.30	77.2
100 Mesh	150	12.50	64.7
150 Mesh	106	10.20	54.5
200 Mesh	75	7.40	47.1
270 Mesh	53	5.70	41.4
400 Mesh	38	4.10	37.3
TOTAL		100.00	**

K80= 225 μm

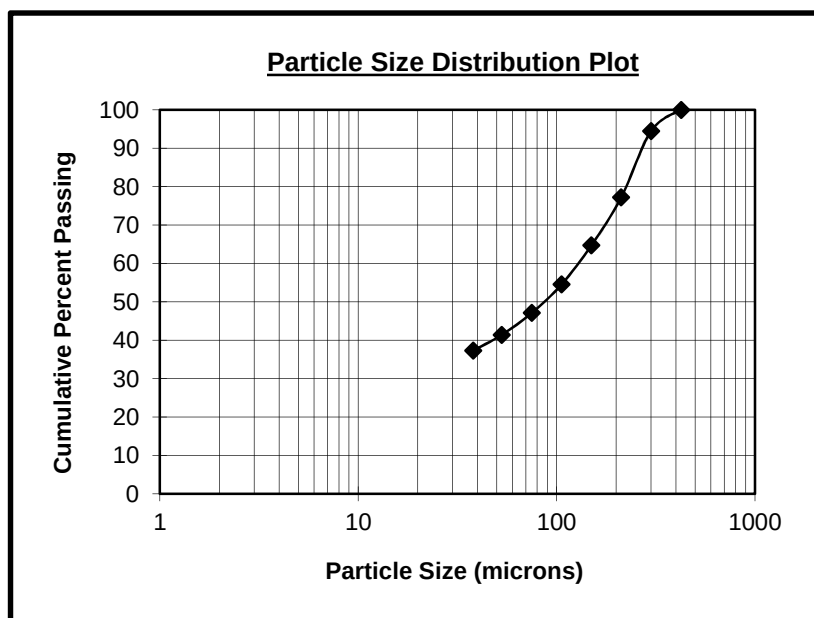


TABLE III-18
SCREEN ANALYSIS
KM4420-09 Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
48 Mesh	300	0.00	100.0
65 Mesh	212	0.10	99.9
100 Mesh	150	3.80	96.1
150 Mesh	106	14.90	81.2
200 Mesh	75	15.80	65.4
270 Mesh	53	11.40	54.0
400 Mesh	38	7.40	46.6
TOTAL		100.00	**

K80= 104 μm

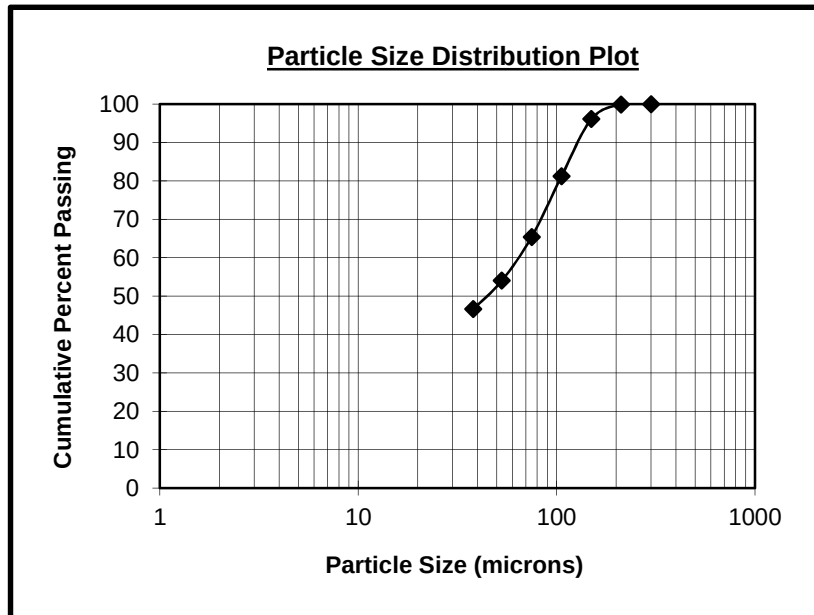
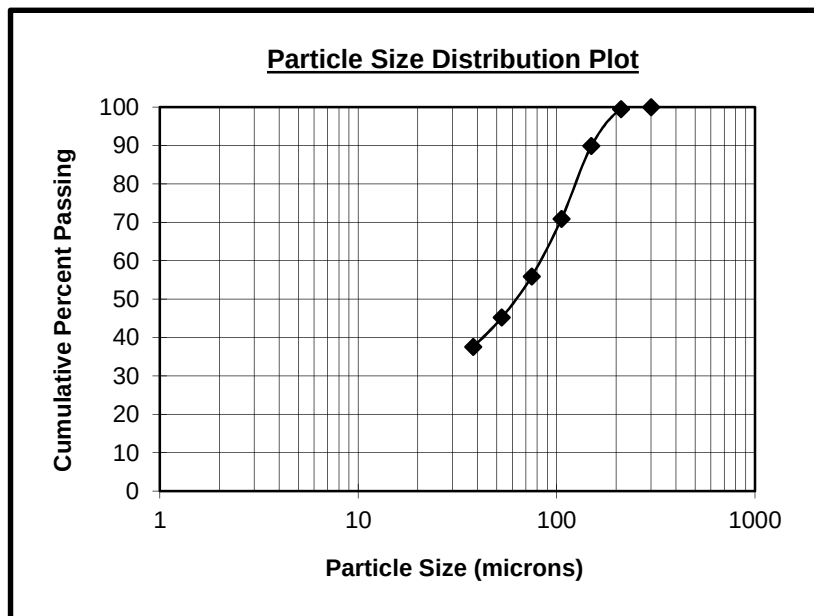


TABLE III-19
SCREEN ANALYSIS
KM4420-12 Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
48 Mesh	300	0.00	100.0
65 Mesh	212	0.50	99.5
100 Mesh	150	9.60	89.9
150 Mesh	106	19.00	70.9
200 Mesh	75	15.00	55.9
270 Mesh	53	10.70	45.2
400 Mesh	38	7.70	37.5
TOTAL		100.00	**

K80= 126 μm



Result Analysis Report

Project and Test number:

KM4420-03

Measured by:

Darren

Measured:

Monday, September 22, 2014 2:51:37 PM

Sample Name:

Bulk Regrind Discharge - Average

Edited by:

Darren

Analysed:

Monday, September 22, 2014 2:51:39 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

19.72 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.448 %

Result Emulation:

Off

Concentration:

0.0198 %Vol

Span :

3.879

Uniformity:

1.18

Result units:

Volume

Specific Surface Area:

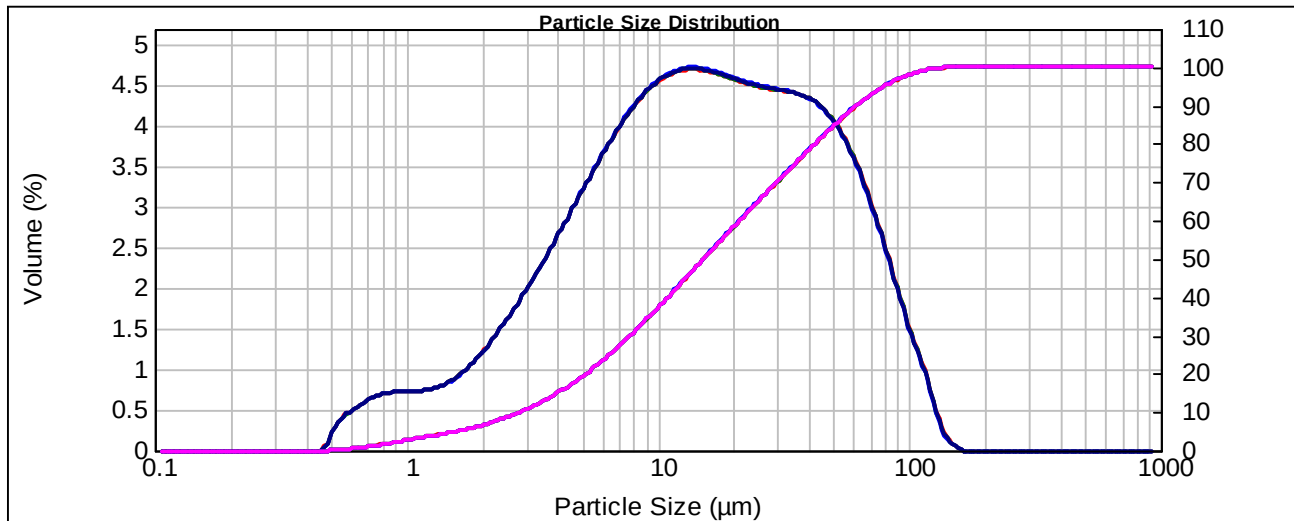
0.927 m²/g

Surface Weighted Mean D[3,2]:

6.473 um

Vol. Weighted Mean D[4,3]:

24.766 um

d(0.1): 2.829 um d(0.5): 15.171 um **d(0.8): 42.035 um** d(0.9): 61.669 um d(0.98): 98.71 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	0.92	10.965	2.81	52.481	2.32	251.189	0.00
0.110	0.00	0.525	0.25	2.512	1.02	12.023	2.83	57.544	2.17	275.423	0.00
0.120	0.00	0.575	0.29	2.754	1.14	13.183	2.83	63.096	1.98	301.995	0.00
0.132	0.00	0.631	0.34	3.020	1.26	14.454	2.83	69.183	1.77	331.131	0.00
0.145	0.00	0.692	0.39	3.311	1.39	15.849	2.81	75.858	1.54	363.078	0.00
0.158	0.00	0.759	0.42	3.631	1.52	17.378	2.78	83.176	1.29	398.107	0.00
0.174	0.00	0.832	0.43	3.981	1.65	19.055	2.76	91.201	1.03	436.516	0.00
0.191	0.00	0.912	0.44	4.365	1.79	20.893	2.73	100.000	0.79	478.630	0.00
0.209	0.00	1.000	0.44	4.786	1.93	22.909	2.71	109.648	0.60	524.807	0.00
0.229	0.00	1.096	0.44	5.248	2.06	25.119	2.69	120.226	0.33	575.440	0.00
0.251	0.00	1.202	0.45	5.754	2.20	27.542	2.68	131.826	0.11	630.957	0.00
0.275	0.00	1.318	0.48	6.310	2.32	30.200	2.67	144.544	0.04	691.831	0.00
0.302	0.00	1.445	0.52	6.918	2.44	33.113	2.65	158.489	0.00	758.578	0.00
0.331	0.00	1.585	0.57	7.586	2.54	36.308	2.63	173.780	0.00	831.764	0.00
0.363	0.00	1.738	0.64	8.318	2.64	39.811	2.59	190.546	0.00	912.011	0.00
0.398	0.00	1.905	0.72	9.120	2.71	43.652	2.53	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	0.82	10.000	2.77	47.863	2.44	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-04

Measured by:

Darren

Measured:

Monday, September 22, 2014 3:54:12 PM

Sample Name:

Bulk Regrind Discharge - Average

Edited by:

Darren

Analysed:

Monday, September 22, 2014 3:54:13 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

24.67 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.460 %

Result Emulation:

Off

Concentration:

0.0249 %Vol

Span :

4.130

Uniformity:

1.25

Result units:

Volume

Specific Surface Area:

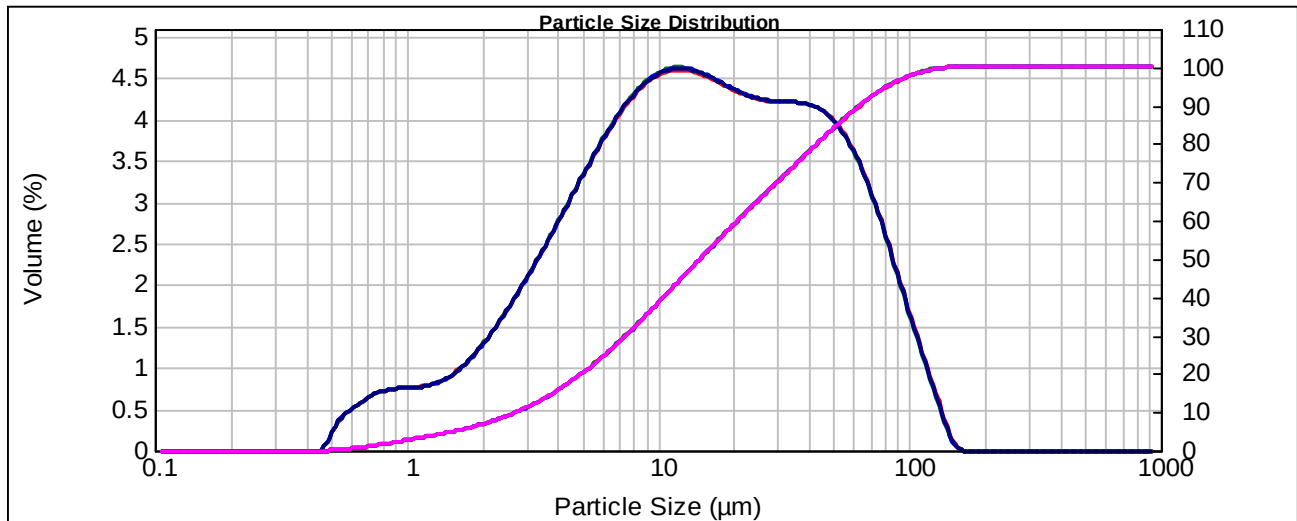
0.949 m²/g

Surface Weighted Mean D[3,2]:

6.321 um

Vol. Weighted Mean D[4,3]:

25.025 um

d(0.1): 2.729 um d(0.5): 14.711 um **d(0.8): 42.815 um** d(0.9): 63.484 um d(0.98): 102.13 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	0.96	10.965	2.77	52.481	2.30	251.189	0.00
0.110	0.00	0.525	0.25	2.512	1.08	12.023	2.78	57.544	2.18	275.423	0.00
0.120	0.00	0.575	0.30	2.754	1.20	13.183	2.76	63.096	2.01	301.995	0.00
0.132	0.00	0.631	0.35	3.020	1.32	14.454	2.74	69.183	1.82	331.131	0.00
0.145	0.00	0.692	0.40	3.311	1.58	15.849	2.70	75.858	1.60	363.078	0.00
0.158	0.00	0.759	0.43	3.631	1.72	17.378	2.66	83.176	1.36	398.107	0.00
0.174	0.00	0.832	0.44	3.981	1.86	19.055	2.59	91.201	1.12	436.516	0.00
0.191	0.00	0.912	0.45	4.365	1.99	20.893	2.55	100.000	0.88	478.630	0.00
0.209	0.00	1.000	0.46	4.786	2.13	22.909	2.54	109.648	0.66	524.807	0.00
0.229	0.00	1.096	0.46	5.248	2.25	25.119	2.53	120.226	0.44	575.440	0.00
0.251	0.00	1.202	0.48	5.754	2.37	27.542	2.52	131.826	0.21	630.957	0.00
0.275	0.00	1.318	0.50	6.310	2.48	30.200	2.50	144.544	0.03	691.831	0.00
0.302	0.00	1.445	0.55	6.918	2.58	33.113	2.46	158.489	0.00	758.578	0.00
0.331	0.00	1.585	0.60	7.586	2.65	36.308	2.40	173.780	0.00	831.764	0.00
0.363	0.00	1.738	0.68	8.318	2.71	39.811	2.40	190.546	0.00	912.011	0.00
0.398	0.00	1.905	0.76	9.120	2.75	43.652	2.40	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	0.86	10.000		47.863		229.087			
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-10

Measured by:

Darren

Measured:

Monday, September 29, 2014 8:43:01 AM

Sample Name:

Bulk Regrind Discharge - Average

Edited by:

Darren

Analysed:

Monday, September 29, 2014 8:43:03 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

25.60 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.350 %

Result Emulation:

Off

Concentration:

0.0263 %Vol

Span :

2.802

Uniformity:

0.875

Result units:

Volume

Specific Surface Area:

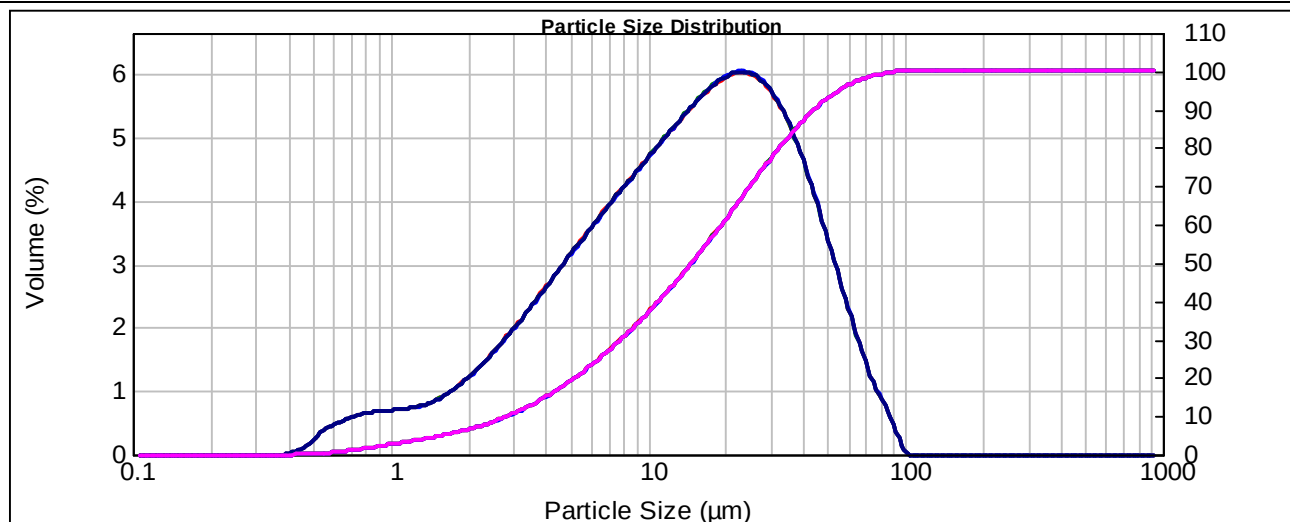
0.944 m²/g

Surface Weighted Mean D[3,2]:

6.354 um

Vol. Weighted Mean D[4,3]:

19.796 um

d(0.1): 2.839 um d(0.5): 14.778 um **d(0.8): 32.374 um** d(0.9): 44.252 um d(0.98): 67.97 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.13	2.291	0.92	10.965	2.99	52.481	1.70	251.189	0.00
0.110	0.00	0.525	0.23	2.512	1.02	12.023	3.11	57.544	1.38	275.423	0.00
0.120	0.00	0.575	0.28	2.754	1.14	13.183	3.22	63.096	1.07	301.995	0.00
0.132	0.00	0.631	0.33	3.020	1.26	14.454	3.33	69.183	0.78	331.131	0.00
0.145	0.00	0.692	0.37	3.311	1.38	15.849	3.43	75.858	0.56	363.078	0.00
0.158	0.00	0.759	0.39	3.631	1.51	17.378	3.52	83.176	0.38	398.107	0.00
0.174	0.00	0.832	0.41	3.981	1.64	19.055	3.59	91.201	0.10	436.516	0.00
0.191	0.00	0.912	0.42	4.365	1.77	20.893	3.63	100.000	0.00	478.630	0.00
0.209	0.00	1.000	0.42	4.786	1.90	22.909	3.63	109.648	0.00	524.807	0.00
0.229	0.00	1.096	0.43	5.248	2.03	25.119	3.60	120.226	0.00	575.440	0.00
0.251	0.00	1.202	0.45	5.754	2.16	27.542	3.51	131.826	0.00	630.957	0.00
0.275	0.00	1.318	0.48	6.310	2.28	30.200	3.37	144.544	0.00	691.831	0.00
0.302	0.00	1.445	0.52	6.918	2.40	33.113	3.19	158.489	0.00	758.578	0.00
0.331	0.00	1.585	0.58	7.586	2.52	36.308	2.95	173.780	0.00	831.764	0.00
0.363	0.00	1.738	0.64	8.318	2.64	39.811	2.67	190.546	0.00	912.011	0.00
0.398	0.02	1.905	0.73	9.120	2.76	43.652	2.37	208.930	0.00	1000.000	0.00
0.437	0.06	2.089	0.82	10.000	2.87	47.863	2.04	229.087	0.00		
0.479		2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-13

Measured by:

tristan

Measured:

Friday, October 03, 2014 9:47:37 AM

Sample Name:

Bulk Regrind Discharge - Average

Edited by:

tristan

Analysed:

Friday, October 03, 2014 9:47:38 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

16.60 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.568 %

Result Emulation:

Off

Concentration:

0.0159 %Vol

Span :

4.039

Uniformity:

1.22

Result units:

Volume

Specific Surface Area:

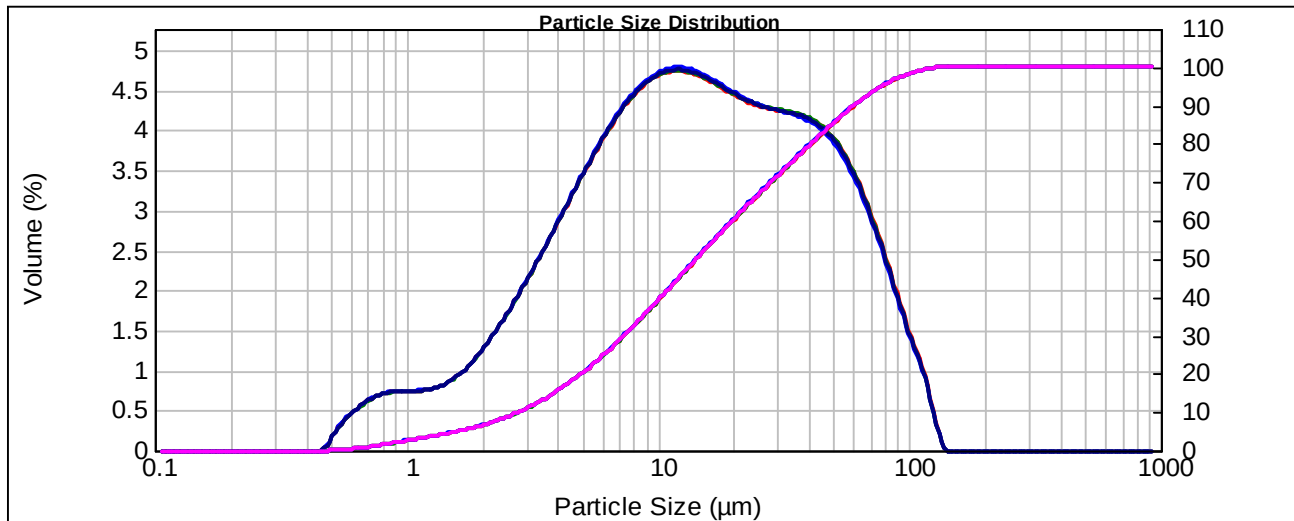
0.945 m²/g

Surface Weighted Mean D[3,2]:

6.349 um

Vol. Weighted Mean D[4,3]:

23.776 um

d(0.1): 2.782 um d(0.5): 14.188 um **d(0.8): 40.468 um** d(0.9): 60.086 um d(0.98): 96.06 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.08	2.291	0.97	10.965	2.86	52.481	2.22	251.189	0.00
0.110	0.00	0.525	0.21	2.512	1.09	12.023	2.86	57.544	2.08	275.423	0.00
0.120	0.00	0.575	0.28	2.754	1.22	13.183	2.84	63.096	1.90	301.995	0.00
0.132	0.00	0.631	0.34	3.020	1.35	14.454	2.81	69.183	1.70	331.131	0.00
0.145	0.00	0.692	0.39	3.311	1.49	15.849	2.77	75.858	1.48	363.078	0.00
0.158	0.00	0.759	0.42	3.631	1.64	17.378	2.73	83.176	1.24	398.107	0.00
0.174	0.00	0.832	0.44	3.981	1.78	19.055	2.68	91.201	1.00	436.516	0.00
0.191	0.00	0.912	0.45	4.365	1.93	20.893	2.64	100.000	0.77	478.630	0.00
0.209	0.00	1.000	0.45	4.786	2.07	22.909	2.61	109.648	0.58	524.807	0.00
0.229	0.00	1.096	0.45	5.248	2.21	25.119	2.58	120.226	0.50	575.440	0.00
0.251	0.00	1.202	0.46	5.754	2.34	27.542	2.56	131.826	0.42	630.957	0.00
0.275	0.00	1.318	0.49	6.310	2.47	30.200	2.55	144.544	0.35	691.831	0.00
0.302	0.00	1.445	0.53	6.918	2.57	33.113	2.53	158.489	0.28	758.578	0.00
0.331	0.00	1.585	0.59	7.586	2.67	36.308	2.51	173.780	0.22	831.764	0.00
0.363	0.00	1.738	0.66	8.318	2.75	39.811	2.47	190.546	0.17	912.011	0.00
0.398	0.00	1.905	0.75	9.120	2.81	43.652	2.42	208.930	0.12	1000.000	0.00
0.437	0.00	2.089	0.85	10.000	2.84	47.863	2.33	229.087	0.08		
0.479	0.00	2.291		10.965		52.481		251.189	0.05		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-14

Measured by:

tristan

Measured:

Friday, October 03, 2014 1:31:51 PM

Sample Name:

Bulk Regrind Discharge - Average

Edited by:

tristan

Analysed:

Friday, October 03, 2014 1:31:53 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

22.05 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.457 %

Result Emulation:

Off

Concentration:

0.0211 %Vol

Span :

2.878

Uniformity:

0.899

Result units:

Volume

Specific Surface Area:

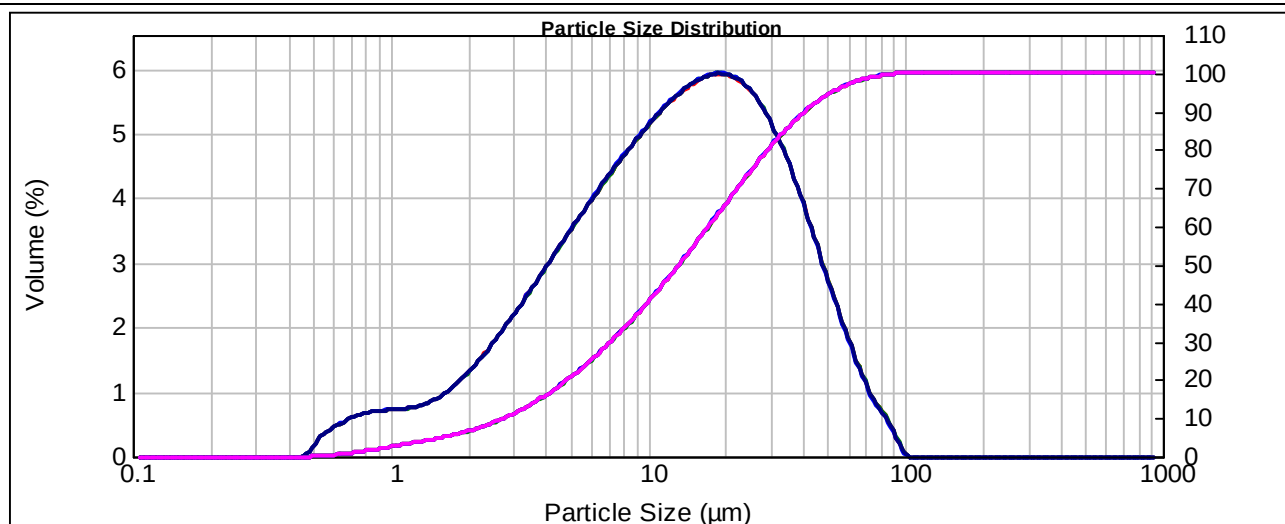
0.976 m²/g

Surface Weighted Mean D[3,2]:

6.149 um

Vol. Weighted Mean D[4,3]:

18.118 um

d(0.1): 2.755 um d(0.5): 13.177 um **d(0.8): 29.208 um** d(0.9): 40.676 um d(0.98): 64.86 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.09	2.291	1.00	10.965	3.24	52.481	1.36	251.189	0.00
0.110	0.00	0.525	0.22	2.512	1.12	12.023	3.34	57.544	1.09	275.423	0.00
0.120	0.00	0.575	0.27	2.754	1.26	13.183	3.42	63.096	0.83	301.995	0.00
0.132	0.00	0.631	0.33	3.020	1.39	14.454	3.49	69.183	0.61	331.131	0.00
0.145	0.00	0.692	0.40	3.311	1.53	15.849	3.54	75.858	0.44	363.078	0.00
0.158	0.00	0.759	0.48	3.631	1.68	17.378	3.57	83.176	0.31	398.107	0.00
0.174	0.00	0.832	0.42	3.981	1.82	19.055	3.56	91.201	0.08	436.516	0.00
0.191	0.00	0.912	0.43	4.365	1.97	20.893	3.53	100.000	0.00	478.630	0.00
0.209	0.00	1.000	0.44	4.786	2.11	22.909	3.53	109.648	0.00	524.807	0.00
0.229	0.00	1.096	0.45	5.248	2.25	25.119	3.46	120.226	0.00	575.440	0.00
0.251	0.00	1.202	0.46	5.754	2.39	27.542	3.35	131.826	0.00	630.957	0.00
0.275	0.00	1.318	0.49	6.310	2.53	30.200	3.20	144.544	0.00	691.831	0.00
0.302	0.00	1.445	0.54	6.918	2.66	33.113	3.01	158.489	0.00	758.578	0.00
0.331	0.00	1.585	0.60	7.586	2.79	36.308	2.78	173.780	0.00	831.764	0.00
0.363	0.00	1.738	0.68	8.318	2.91	39.811	2.24	190.546	0.00	912.011	0.00
0.398	0.00	1.905	0.78	9.120	3.03	43.652	1.95	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	0.88	10.000	3.14	47.863	1.65	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-16

Measured by:

quentin

Measured:

Thursday, October 09, 2014 1:14:04 PM

Sample Name:

Bulk Regrind Discharge V - Average

Edited by:

quentin

Analysed:

Thursday, October 09, 2014 1:14:06 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

19.31 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.525 %

Result Emulation:

Off

Concentration:

0.0191 %Vol

Span :

4.024

Uniformity:

1.22

Result units:

Volume

Specific Surface Area:

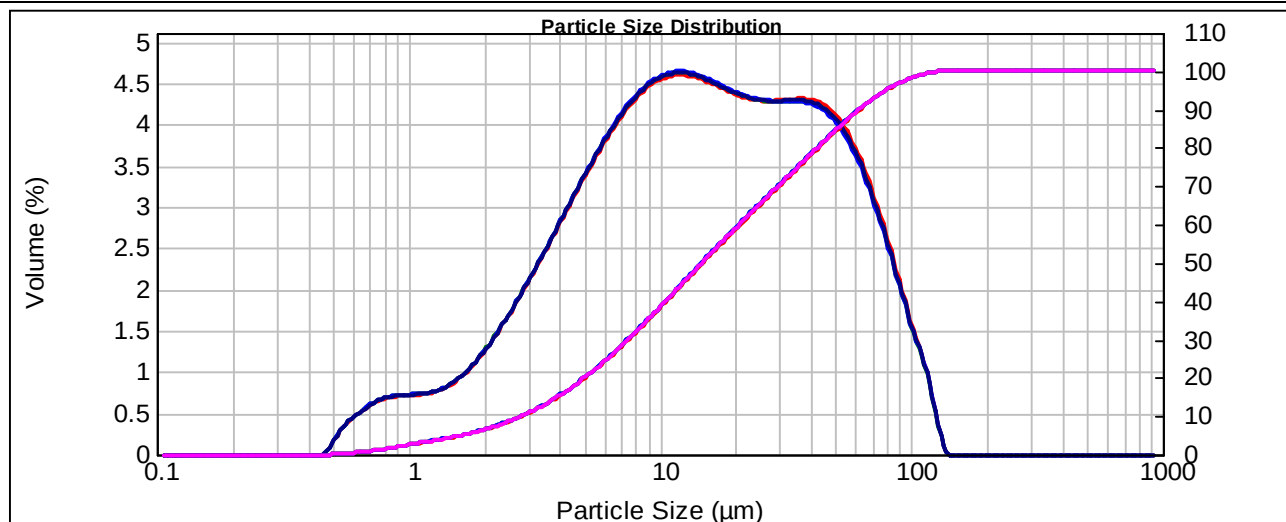
0.93 m²/g

Surface Weighted Mean D[3,2]:

6.454 um

Vol. Weighted Mean D[4,3]:

24.516 um

d(0.1): 2.810 um d(0.5): 14.681 um **d(0.8): 42.187 um** d(0.9): 61.884 um d(0.98): 97.41 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.08	2.291	0.96	10.965	2.78	52.481	2.34	251.189	0.00
0.110	0.00	0.525	0.21	2.512	1.08	12.023	2.78	57.544	2.20	275.423	0.00
0.120	0.00	0.575	0.27	2.754	1.21	13.183	2.77	63.096	2.02	301.995	0.00
0.132	0.00	0.631	0.33	3.020	1.34	14.454	2.74	69.183	1.82	331.131	0.00
0.145	0.00	0.692	0.41	3.311	1.48	15.849	2.71	75.858	1.58	363.078	0.00
0.158	0.00	0.759	0.41	3.631	1.61	17.378	2.67	83.176	1.33	398.107	0.00
0.174	0.00	0.832	0.42	3.981	1.75	19.055	2.64	91.201	1.07	436.516	0.00
0.191	0.00	0.912	0.43	4.365	1.89	20.893	2.61	100.000	0.82	478.630	0.00
0.209	0.00	1.000	0.44	4.786	2.03	22.909	2.58	109.648	0.63	524.807	0.00
0.229	0.00	1.096	0.44	5.248	2.16	25.119	2.58	120.226	0.27	575.440	0.00
0.251	0.00	1.202	0.46	5.754	2.29	27.542	2.58	131.826	0.00	630.957	0.00
0.275	0.00	1.318	0.48	6.310	2.41	30.200	2.58	144.544	0.00	691.831	0.00
0.302	0.00	1.445	0.52	6.918	2.51	33.113	2.58	158.489	0.00	758.578	0.00
0.331	0.00	1.585	0.58	7.586	2.60	36.308	2.58	173.780	0.00	831.764	0.00
0.363	0.00	1.738	0.66	8.318	2.67	39.811	2.56	190.546	0.00	912.011	0.00
0.398	0.00	1.905	0.75	9.120	2.73	43.652	2.52	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	0.85	10.000	2.76	47.863	2.45	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-17

Measured by:

tristan

Measured:

Friday, October 10, 2014 9:57:02 AM

Sample Name:

Bulk Regrind Discharge V - Average

Edited by:

tristan

Analysed:

Friday, October 10, 2014 9:57:03 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

21.78 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.545 %

Result Emulation:

Off

Concentration:

0.0214 %Vol

Span :

4.281

Uniformity:

1.28

Result units:

Volume

Specific Surface Area:

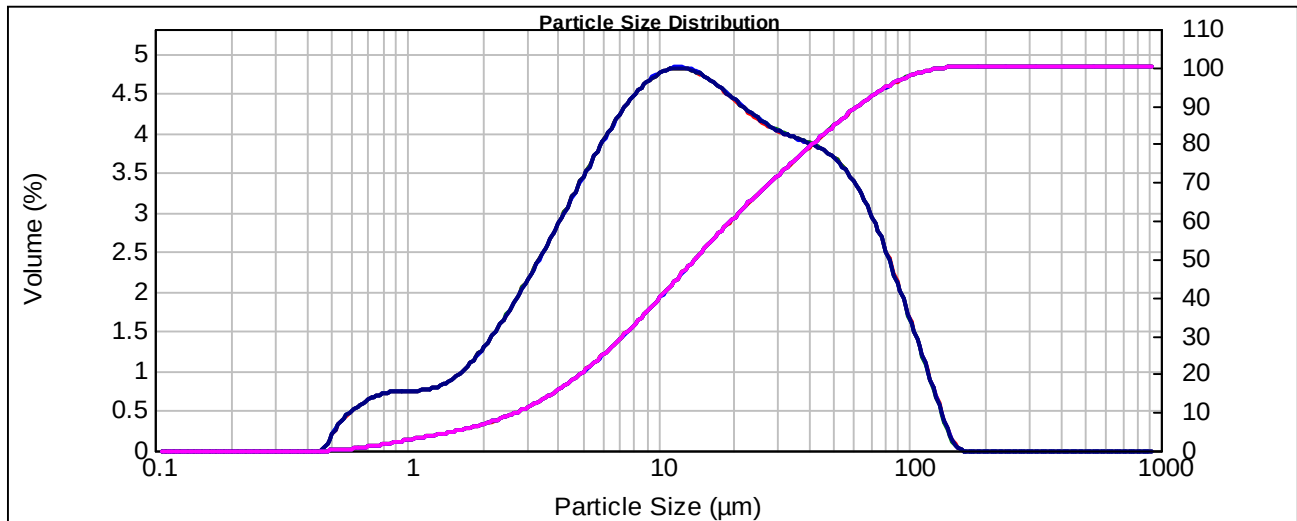
0.954 m²/g

Surface Weighted Mean D[3,2]:

6.290 um

Vol. Weighted Mean D[4,3]:

24.448 um

d(0.1): 2.748 um d(0.5): 14.061 um **d(0.8): 41.311 um** d(0.9): 62.948 um d(0.98): 102.68 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.09	2.291	0.97	10.965	2.90	52.481	2.14	251.189	0.00
0.110	0.00	0.525	0.23	2.512	1.09	12.023	2.90	57.544	2.04	275.423	0.00
0.120	0.00	0.575	0.29	2.754	1.22	13.183	2.88	63.096	1.90	301.995	0.00
0.132	0.00	0.631	0.35	3.020	1.35	14.454	2.84	69.183	1.74	331.131	0.00
0.145	0.00	0.692	0.40	3.311	1.49	15.849	2.79	75.858	1.56	363.078	0.00
0.158	0.00	0.759	0.43	3.631	1.63	17.378	2.73	83.176	1.34	398.107	0.00
0.174	0.00	0.832	0.44	3.981	1.77	19.055	2.67	91.201	1.12	436.516	0.00
0.191	0.00	0.912	0.45	4.365	1.92	20.893	2.60	100.000	0.90	478.630	0.00
0.209	0.00	1.000	0.46	4.786	2.06	22.909	2.54	109.648	0.67	524.807	0.00
0.229	0.00	1.096	0.46	5.248	2.20	25.119	2.48	120.226	0.45	575.440	0.00
0.251	0.00	1.202	0.47	5.754	2.34	27.542	2.44	131.826	0.22	630.957	0.00
0.275	0.00	1.318	0.49	6.310	2.46	30.200	2.37	144.544	0.04	691.831	0.00
0.302	0.00	1.445	0.53	6.918	2.58	33.113	2.34	158.489	0.00	758.578	0.00
0.331	0.00	1.585	0.60	7.586	2.68	36.308	2.31	173.780	0.00	831.764	0.00
0.363	0.00	1.738	0.67	8.318	2.76	39.811	2.27	190.546	0.00	912.011	0.00
0.398	0.00	1.905	0.76	9.120	2.83	43.652	2.22	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	0.86	10.000	2.87	47.863	2.22	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-18

Measured by:

Jeremyu

Measured:

Thursday, October 16, 2014 10:48:57 AM

Sample Name:

Bulk Regrind Discharge V - Average

Edited by:

Jeremyu

Analysed:

Thursday, October 16, 2014 10:48:59 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

29.06 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.480 %

Result Emulation:

Off

Concentration:

0.0293 %Vol

Span :

4.268

Uniformity:

1.29

Result units:

Volume

Specific Surface Area:

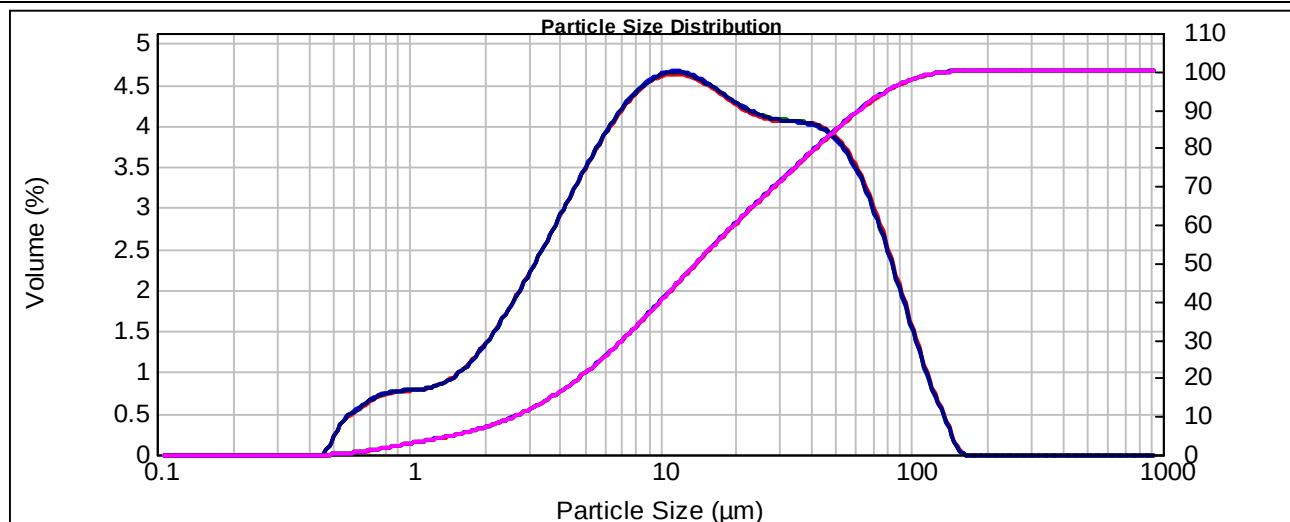
0.977 m²/g

Surface Weighted Mean D[3,2]:

6.141 um

Vol. Weighted Mean D[4,3]:

24.365 um

d(0.1): 2.650 um d(0.5): 13.991 um **d(0.8): 41.630 um** d(0.9): 62.361 um d(0.98): 101.28 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.11	2.291	1.01	10.965	2.80	52.481	2.23	251.189	0.00
0.110	0.00	0.525	0.26	2.512	1.13	12.023	2.79	57.544	2.10	275.423	0.00
0.120	0.00	0.575	0.30	2.754	1.26	13.183	2.76	63.096	1.94	301.995	0.00
0.132	0.00	0.631	0.36	3.020	1.39	14.454	2.72	69.183	1.76	331.131	0.00
0.145	0.00	0.692	0.41	3.311	1.53	15.849	2.68	75.858	1.54	363.078	0.00
0.158	0.00	0.759	0.44	3.631	1.67	17.378	2.62	83.176	1.30	398.107	0.00
0.174	0.00	0.832	0.46	3.981	1.81	19.055	2.57	91.201	1.07	436.516	0.00
0.191	0.00	0.912	0.47	4.365	1.95	20.893	2.53	100.000	0.83	478.630	0.00
0.209	0.00	1.000	0.47	4.786	2.08	22.909	2.49	109.648	0.60	524.807	0.00
0.229	0.00	1.096	0.48	5.248	2.22	25.119	2.47	120.226	0.41	575.440	0.00
0.251	0.00	1.202	0.49	5.754	2.34	27.542	2.45	131.826	0.25	630.957	0.00
0.275	0.00	1.318	0.52	6.310	2.45	30.200	2.44	144.544	0.05	691.831	0.00
0.302	0.00	1.445	0.57	6.918	2.56	33.113	2.43	158.489	0.00	758.578	0.00
0.331	0.00	1.585	0.63	7.586	2.64	36.308	2.41	173.780	0.00	831.764	0.00
0.363	0.00	1.738	0.70	8.318	2.71	39.811	2.38	190.546	0.00	912.011	0.00
0.398	0.00	1.905	0.79	9.120	2.76	43.652	2.32	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	0.90	10.000	2.79	47.863	2.32	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-19

Measured by:

Jeremy

Measured:

Monday, October 20, 2014 12:43:42 PM

Sample Name:

Bulk Regrind Discharge V - Average

Edited by:

Jeremy

Analysed:

Monday, October 20, 2014 12:43:43 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

23.93 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

1.069 %

Result Emulation:

Off

Concentration:

0.0236 %Vol

Span :

2.910

Uniformity:

0.899

Result units:

Volume

Specific Surface Area:

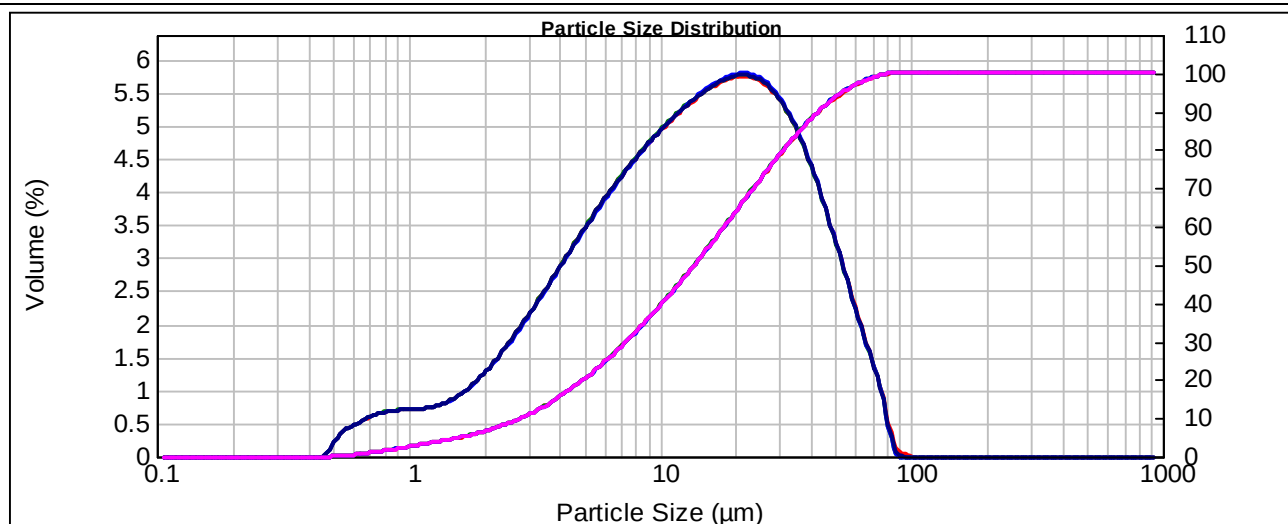
0.963 m²/g

Surface Weighted Mean D[3,2]:

6.233 um

Vol. Weighted Mean D[4,3]:

18.755 um

d(0.1): 2.796 um d(0.5): 13.706 um **d(0.8): 30.965 um** d(0.9): 42.679 um d(0.98): 64.29 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	0.97	10.965	3.10	52.481	1.65	251.189	0.00
0.110	0.00	0.525	0.24	2.512	1.09	12.023	3.18	57.544	1.34	275.423	0.00
0.120	0.00	0.575	0.28	2.754	1.22	13.183	3.26	63.096	1.03	301.995	0.00
0.132	0.00	0.631	0.33	3.020	1.36	14.454	3.33	69.183	0.78	331.131	0.00
0.145	0.00	0.692	0.38	3.311	1.50	15.849	3.39	75.858	0.40	363.078	0.00
0.158	0.00	0.759	0.40	3.631	1.64	17.378	3.43	83.176	0.02	398.107	0.00
0.174	0.00	0.832	0.42	3.981	1.79	19.055	3.46	91.201	0.00	436.516	0.00
0.191	0.00	0.912	0.43	4.365	1.93	20.893	3.47	100.000	0.00	478.630	0.00
0.209	0.00	1.000	0.44	4.786	2.07	22.909	3.40	109.648	0.00	524.807	0.00
0.229	0.00	1.096	0.44	5.248	2.21	25.119	3.45	120.226	0.00	575.440	0.00
0.251	0.00	1.202	0.45	5.754	2.34	27.542	3.30	131.826	0.00	630.957	0.00
0.275	0.00	1.318	0.48	6.310	2.47	30.200	3.17	144.544	0.00	691.831	0.00
0.302	0.00	1.445	0.52	6.918	2.59	33.113	3.00	158.489	0.00	758.578	0.00
0.331	0.00	1.585	0.59	7.586	2.70	36.308	2.78	173.780	0.00	831.764	0.00
0.363	0.00	1.738	0.66	8.318	2.81	39.811	2.53	190.546	0.00	912.011	0.00
0.398	0.00	1.905	0.75	9.120	2.91	43.652	2.25	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	0.86	10.000	3.01	47.863	1.95	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-21

Measured by:

kent

Measured:

Wednesday, October 29, 2014 11:41:34 AM

Sample Name:

Molybdenum Rougher Concentrate - Average kent

Edited by:

Analysed:

Wednesday, October 29, 2014 11:41:36 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

24.69 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.107 %

Result Emulation:

Off

Concentration:

0.0289 %Vol

Span :

3.397

Uniformity:

1.43

Result units:

Volume

Specific Surface Area:

0.832 m²/g

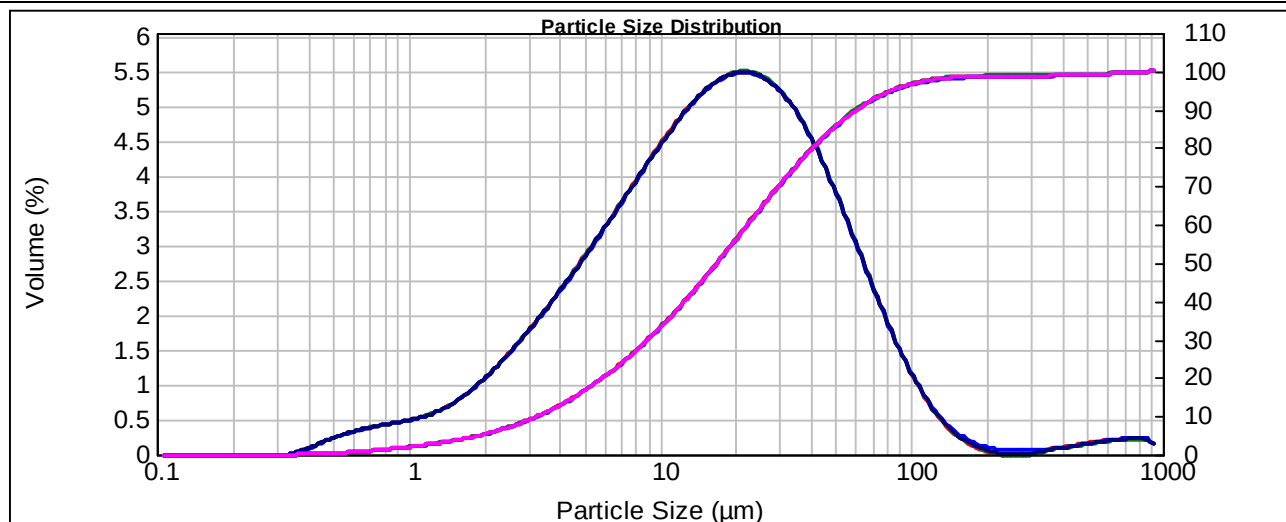
Surface Weighted Mean D[3,2]:

7.212 um

Vol. Weighted Mean D[4,3]:

31.913 um

d(0.1): 3.263 um d(0.5): 16.875 um **d(0.8): 40.472 um** d(0.9): 60.582 um d(0.98): 126.19 um



Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.14	2.291	0.82	10.965	2.85	52.481	2.05	251.189	0.01
0.110	0.00	0.525	0.17	2.512	0.92	12.023	2.96	57.544	1.83	275.423	0.01
0.120	0.00	0.575	0.20	2.754	1.02	13.183	3.06	63.096	1.60	301.995	0.02
0.132	0.00	0.631	0.22	3.020	1.13	14.454	3.15	69.183	1.39	331.131	0.04
0.145	0.00	0.692	0.24	3.311	1.24	15.849	3.22	75.858	1.17	363.078	0.06
0.158	0.00	0.759	0.26	3.631	1.35	17.378	3.27	83.176	0.97	398.107	0.07
0.174	0.00	0.832	0.27	3.981	1.47	19.055	3.30	91.201	0.79	436.516	0.08
0.191	0.00	0.912	0.29	4.365	1.59	20.893	3.31	100.000	0.62	478.630	0.09
0.209	0.00	1.000	0.30	4.786	1.71	22.909	3.29	109.648	0.48	524.807	0.11
0.229	0.00	1.096	0.33	5.248	1.83	25.119	3.25	120.226	0.35	575.440	0.12
0.251	0.00	1.202	0.36	5.754	1.96	27.542	3.18	131.826	0.25	630.957	0.13
0.275	0.00	1.318	0.40	6.310	2.09	30.200	3.09	144.544	0.17	691.831	0.13
0.302	0.00	1.445	0.45	6.918	2.22	33.113	2.97	158.489	0.11	758.578	0.13
0.331	0.00	1.585	0.51	7.586	2.35	36.308	2.82	173.780	0.07	831.764	0.13
0.363	0.05	1.738	0.57	8.318	2.48	39.811	2.66	190.546	0.04	912.011	0.04
0.398	0.06	1.905	0.65	9.120	2.61	43.652	2.47	208.930	0.02	1000.000	
0.437	0.11	2.089	0.73	10.000	2.73	47.863	2.26	229.087	0.01		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-22

Measured by:

tristan

Measured:

Wednesday, October 29, 2014 2:47:03 PM

Sample Name:

Molybdenum Regrind Discharge - Average

Edited by:

tristan

Analysed:

Wednesday, October 29, 2014 2:47:04 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

9.01 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.287 %

Result Emulation:

Off

Concentration:

0.0124 %Vol

Span :

2.535

Uniformity:

0.787

Result units:

Volume

Specific Surface Area:

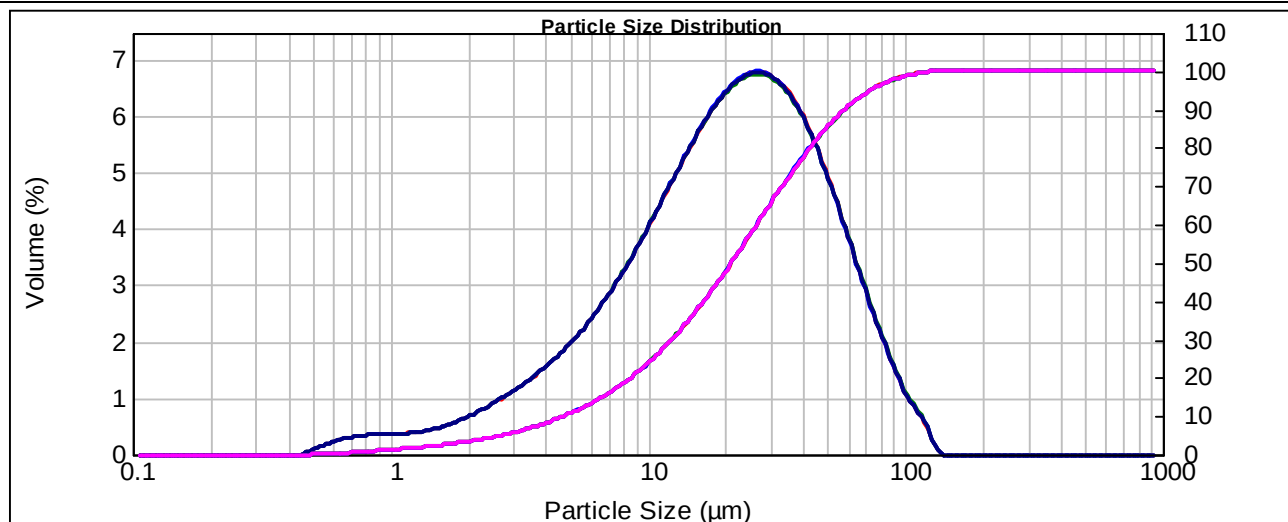
0.626 m²/g

Surface Weighted Mean D[3,2]:

9.580 um

Vol. Weighted Mean D[4,3]:

27.077 um

d(0.1): 4.698 um d(0.5): 21.032 um **d(0.8): 42.547 um** d(0.9): 58.004 um d(0.98): 90.7 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.06	2.291	0.52	10.965	2.73	52.481	2.64	251.189	0.00
0.110	0.00	0.525	0.10	2.512	0.58	12.023	2.95	57.544	2.31	275.423	0.00
0.120	0.00	0.575	0.14	2.754	0.65	13.183	3.16	63.096	1.96	301.995	0.00
0.132	0.00	0.631	0.17	3.020	0.72	14.454	3.36	69.183	1.64	331.131	0.00
0.145	0.00	0.692	0.19	3.311	0.80	15.849	3.55	75.858	1.33	363.078	0.00
0.158	0.00	0.759	0.20	3.631	0.88	17.378	3.72	83.176	1.04	398.107	0.00
0.174	0.00	0.832	0.21	3.981	0.98	19.055	3.86	91.201	0.77	436.516	0.00
0.191	0.00	0.912	0.22	4.365	1.08	20.893	3.97	100.000	0.56	478.630	0.00
0.209	0.00	1.000	0.22	4.786	1.19	22.909	4.04	109.648	0.43	524.807	0.00
0.229	0.00	1.096	0.22	5.248	1.31	25.119	4.07	120.226	0.19	575.440	0.00
0.251	0.00	1.202	0.23	5.754	1.44	27.542	4.06	131.826	0.00	630.957	0.00
0.275	0.00	1.318	0.25	6.310	1.59	30.200	3.99	144.544	0.00	691.831	0.00
0.302	0.00	1.445	0.28	6.918	1.75	33.113	3.88	158.489	0.00	758.578	0.00
0.331	0.00	1.585	0.31	7.586	1.93	36.308	3.71	173.780	0.00	831.764	0.00
0.363	0.00	1.738	0.35	8.318	2.12	39.811	3.50	190.546	0.00	912.011	0.00
0.398	0.00	1.905	0.40	9.120	2.31	43.652	3.25	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	0.46	10.000	2.52	47.863	2.95	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-25

Measured by:

quentin

Measured:

Friday, October 31, 2014 2:41:56 PM

Sample Name:

Molybdenum Re grind Discharge - Average

Edited by:

quentin

Analysed:

Friday, October 31, 2014 2:41:57 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

8.53 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

1.679 %

Result Emulation:

Off

Concentration:

0.0091 %Vol

Span :

2.930

Uniformity:

0.903

Result units:

Volume

Specific Surface Area:

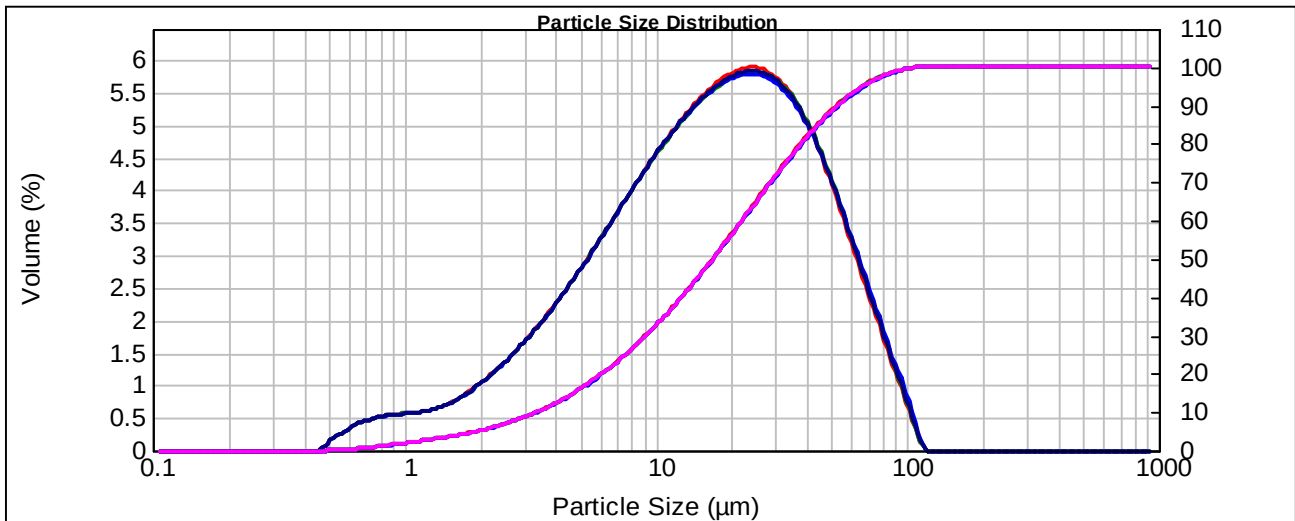
0.81 m²/g

Surface Weighted Mean D[3,2]:

7.405 um

Vol. Weighted Mean D[4,3]:

23.153 um

d(0.1): 3.353 um d(0.5): 16.836 um **d(0.8): 37.785 um** d(0.9): 52.680 um d(0.98): 81.43 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.09	2.291	0.77	10.965	2.93	52.481	2.22	251.189	0.00
0.110	0.00	0.525	0.14	2.512	0.86	12.023	3.04	57.544	1.94	275.423	0.00
0.120	0.00	0.575	0.21	2.754	0.96	13.183	3.15	63.096	1.66	301.995	0.00
0.132	0.00	0.631	0.26	3.020	1.06	14.454	3.25	69.183	1.39	331.131	0.00
0.145	0.00	0.692	0.28	3.311	1.17	15.849	3.33	75.858	1.12	363.078	0.00
0.158	0.00	0.759	0.31	3.631	1.29	17.378	3.40	83.176	0.84	398.107	0.00
0.174	0.00	0.832	0.33	3.981	1.41	19.055	3.46	91.201	0.59	436.516	0.00
0.191	0.00	0.912	0.34	4.365	1.54	20.893	3.50	100.000	0.31	478.630	0.00
0.209	0.00	1.000	0.35	4.786	1.68	22.909	3.51	109.648	0.03	524.807	0.00
0.229	0.00	1.096	0.36	5.248	1.81	25.119	3.50	120.226	0.00	575.440	0.00
0.251	0.00	1.202	0.37	5.754	1.96	27.542	3.46	131.826	0.00	630.957	0.00
0.275	0.00	1.318	0.40	6.310	2.10	30.200	3.27	144.544	0.00	691.831	0.00
0.302	0.00	1.445	0.43	6.918	2.25	33.113	3.12	158.489	0.00	758.578	0.00
0.331	0.00	1.585	0.48	7.586	2.39	36.308	2.94	173.780	0.00	831.764	0.00
0.363	0.00	1.738	0.54	8.318	2.53	39.811	2.73	190.546	0.00	912.011	0.00
0.398	0.00	1.905	0.61	9.120	2.67	43.652	2.48	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	0.69	10.000	2.80	47.863		229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-28

Measured by:

quentin

Measured:

Thursday, November 06, 2014 2:17:37 PM

Sample Name:

Molybdenum Re grind Discharge V - Average

Edited by:

quentin

Analysed:

Thursday, November 06, 2014 2:17:38 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

12.70 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.267 %

Result Emulation:

Off

Concentration:

0.0133 %Vol

Span :

3.252

Uniformity:

1.02

Result units:

Volume

Specific Surface Area:

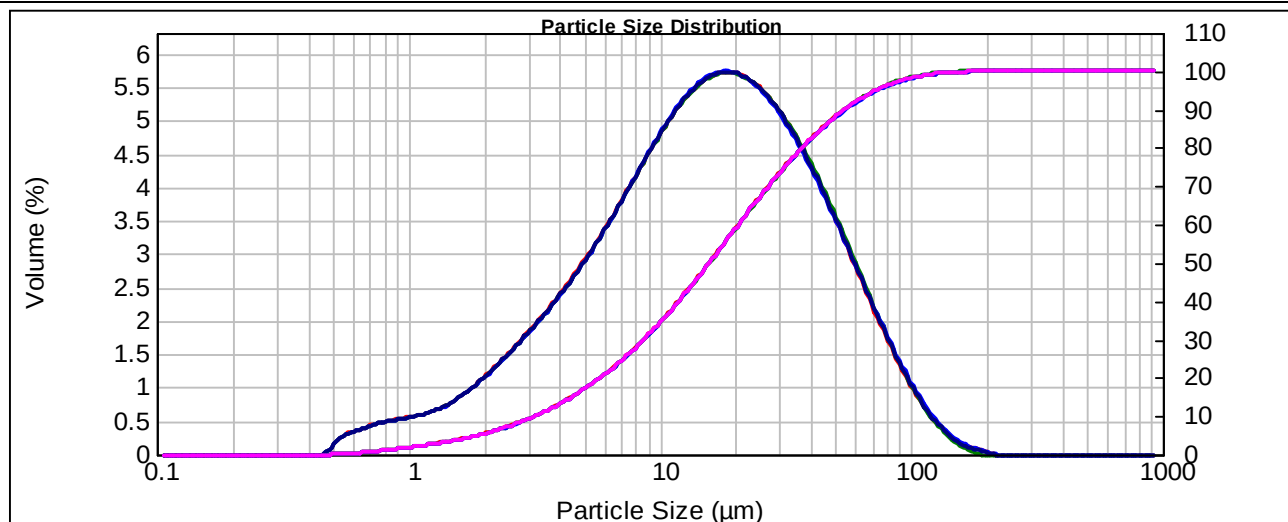
0.837 m²/g

Surface Weighted Mean D[3,2]:

7.172 um

Vol. Weighted Mean D[4,3]:

23.470 um

d(0.1): 3.174 um d(0.5): 15.707 um **d(0.8): 36.747 um** d(0.9): 54.254 um d(0.98): 95.49 um


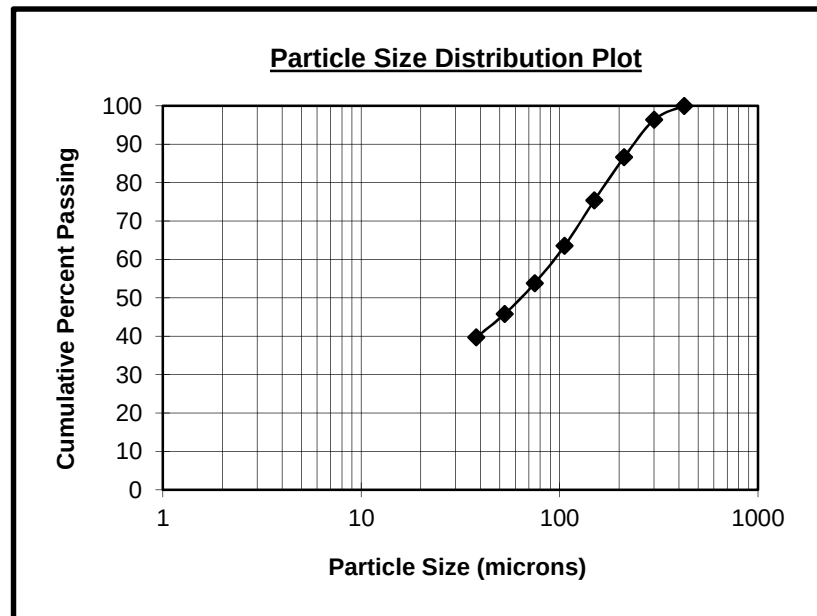
Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.08	2.291	0.86	10.965	3.09	52.481	1.91	251.189	0.00
0.110	0.00	0.525	0.18	2.512	0.96	12.023	3.21	57.544	1.70	275.423	0.00
0.120	0.00	0.575	0.20	2.754	1.06	13.183	3.31	63.096	1.49	301.995	0.00
0.132	0.00	0.631	0.23	3.020	1.16	14.454	3.38	69.183	1.28	331.131	0.00
0.145	0.00	0.692	0.27	3.311	1.26	15.849	3.43	75.858	1.08	363.078	0.00
0.158	0.00	0.759	0.29	3.631	1.37	17.378	3.45	83.176	0.88	398.107	0.00
0.174	0.00	0.832	0.31	3.981	1.49	19.055	3.44	91.201	0.71	436.516	0.00
0.191	0.00	0.912	0.33	4.365	1.61	20.893	3.40	100.000	0.55	478.630	0.00
0.209	0.00	1.000	0.34	4.786	1.74	22.909	3.25	109.648	0.40	524.807	0.00
0.229	0.00	1.096	0.36	5.248	1.88	25.119	3.14	120.226	0.29	575.440	0.00
0.251	0.00	1.202	0.39	5.754	2.02	27.542	3.01	131.826	0.19	630.957	0.00
0.275	0.00	1.318	0.43	6.310	2.18	30.200	2.86	144.544	0.11	691.831	0.00
0.302	0.00	1.445	0.48	6.918	2.33	33.113	2.69	158.489	0.07	758.578	0.00
0.331	0.00	1.585	0.54	7.586	2.49	36.308	2.51	173.780	0.04	831.764	0.00
0.363	0.00	1.738	0.61	8.318	2.65	39.811	2.32	190.546	0.01	912.011	0.00
0.398	0.00	1.905	0.69	9.120	2.81	43.652	2.12	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	0.78	10.000	2.96	47.863		229.087			
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

TABLE III-33
SCREEN ANALYSIS
KM4420-P1 WSA Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	3.60	96.4
65 Mesh	212	9.80	86.6
100 Mesh	150	11.20	75.4
150 Mesh	106	11.90	63.5
200 Mesh	75	9.70	53.8
270 Mesh	53	8.00	45.8
400 Mesh	38	6.10	39.7
TOTAL		100.00	**

K80= 174 μm



Result Analysis Report

Project and Test number:

KM4420-P1

Measured by:

tristan

Measured:

Tuesday, October 28, 2014 9:47:42 AM

Sample Name:

WSA Bulk Regrind Discharge - Average

Edited by:

mike

Analysed:

Tuesday, October 28, 2014 9:47:43 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

19.15 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.427 %

Result Emulation:

Off

Concentration:

0.0174 %Vol

Span :

7.081

Uniformity:

2.27

Result units:

Volume

Specific Surface Area:

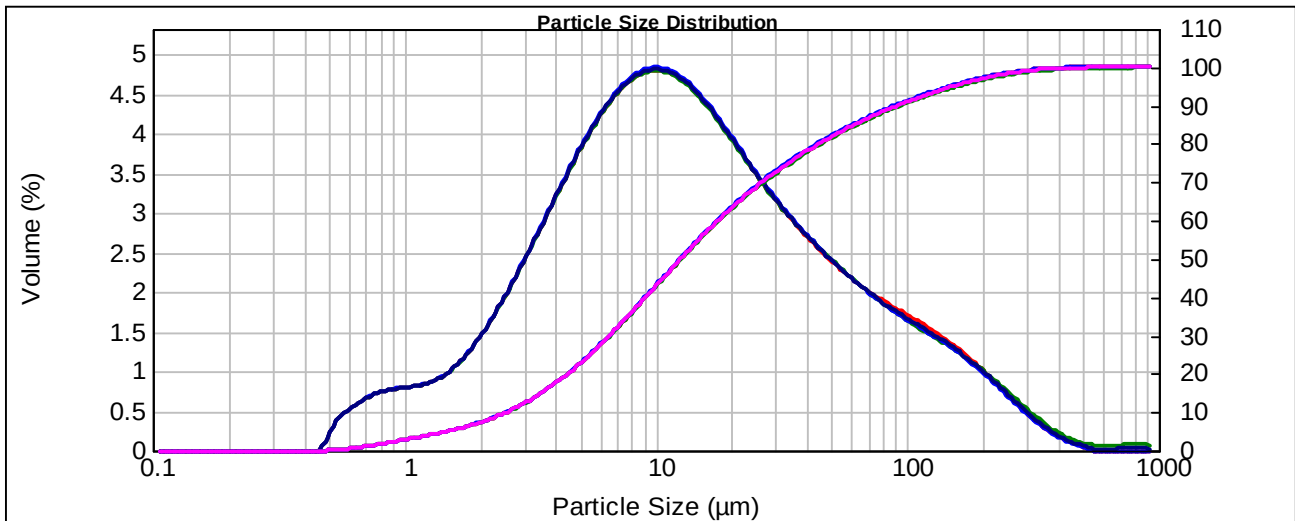
1.02 m²/g

Surface Weighted Mean D[3,2]:

5.911 um

Vol. Weighted Mean D[4,3]:

34.213 um

d(0.1): 2.544 um d(0.5): 12.534 um **d(0.8): 44.388 um** d(0.9): 91.301 um d(0.98): 230.4 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.11	2.291	1.10	10.965	2.87	52.481	1.37	251.189	0.39
0.110	0.00	0.525	0.26	2.512	1.24	12.023	2.83	57.544	1.31	275.423	0.32
0.120	0.00	0.575	0.31	2.754	1.38	13.183	2.76	63.096	1.24	301.995	0.25
0.132	0.00	0.631	0.36	3.020	1.53	14.454	2.68	69.183	1.18	331.131	0.19
0.145	0.00	0.692	0.41	3.311	1.69	15.849	2.59	75.858	1.13	363.078	0.14
0.158	0.00	0.759	0.44	3.631	1.84	17.378	2.48	83.176	1.08	398.107	0.09
0.174	0.00	0.832	0.46	3.981	2.00	19.055	2.38	91.201	1.03	436.516	0.06
0.191	0.00	0.912	0.47	4.365	2.15	20.893	2.26	100.000	0.98	478.630	0.04
0.209	0.00	1.000	0.48	4.786	2.30	22.909	2.15	109.648	0.93	524.807	0.01
0.229	0.00	1.096	0.49	5.248	2.43	25.119	2.05	120.226	0.89	575.440	0.01
0.251	0.00	1.202	0.52	5.754	2.55	27.542	1.95	131.826	0.84	630.957	0.01
0.275	0.00	1.318	0.55	6.310	2.66	30.200	1.85	144.544	0.78	691.831	0.01
0.302	0.00	1.445	0.60	6.918	2.75	33.113	1.76	158.489	0.73	758.578	0.02
0.331	0.00	1.585	0.67	7.586	2.82	36.308	1.67	173.780	0.67	831.764	0.02
0.363	0.00	1.738	0.76	8.318	2.87	39.811	1.59	190.546	0.60	912.011	0.01
0.398	0.00	1.905	0.86	9.120	2.89	43.652	1.52	208.930	0.53	1000.000	0.01
0.437	0.00	2.089	0.98	10.000	2.90	47.863	1.44	229.087	0.46		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Average of 3 measurements from 4420

Result Analysis Report

Project and Test number:

KM4420-P1

Measured by:

tristan

Measured:

Tuesday, October 28, 2014 9:41:49 AM

Sample Name:

WSA Bulk Final Concentrate - Average

Edited by:

mike

Analysed:

Tuesday, November 04, 2014 11:53:15 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

20.57 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.116 %

Result Emulation:

Off

Concentration:

0.0261 %Vol

Span :

3.870

Uniformity:

1.21

Result units:

Volume

Specific Surface Area:

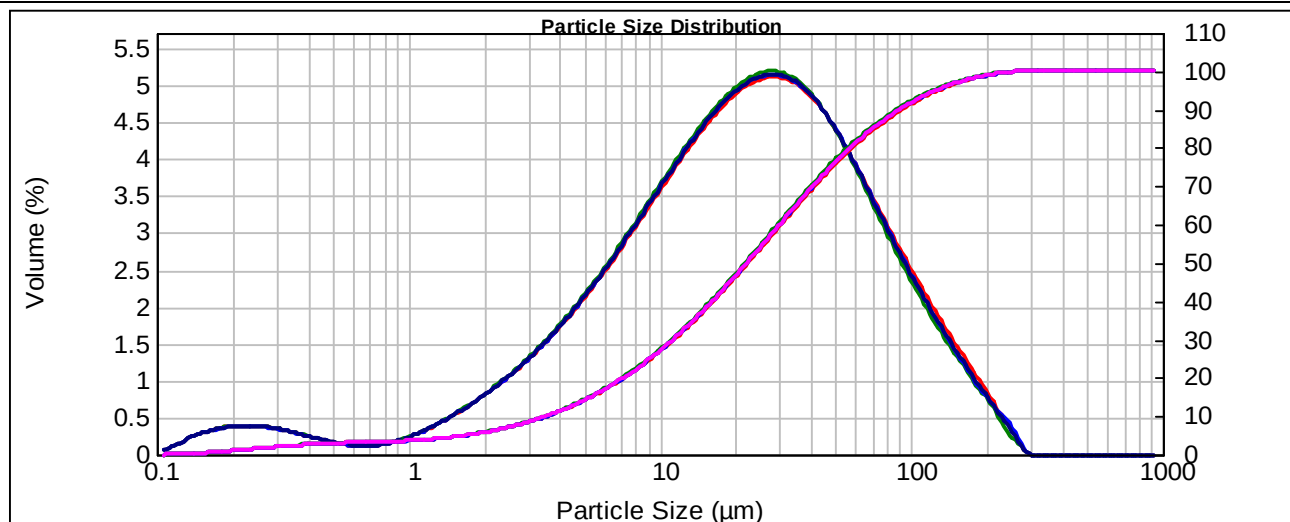
1.36 m²/g

Surface Weighted Mean D[3,2]:

4.405 um

Vol. Weighted Mean D[4,3]:

36.490 um

d(0.1): 3.514 um d(0.5): 22.137 um **d(0.8): 56.924 um** d(0.9): 89.186 um d(0.98): 169.44 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.02	0.479	0.10	2.291	0.61	10.965	2.36	52.481	2.50	251.189	0.13
0.110	0.07	0.525	0.08	2.512	0.67	12.023	2.48	57.544	2.35	275.423	0.01
0.120	0.10	0.575	0.07	2.754	0.75	13.183	2.59	63.096	2.19	301.995	0.00
0.132	0.15	0.631	0.07	3.020	0.82	14.454	2.70	69.183	2.02	331.131	0.00
0.145	0.17	0.692	0.07	3.311	0.91	15.849	2.80	75.858	1.86	363.078	0.00
0.158	0.20	0.759	0.08	3.631	1.00	17.378	2.89	83.176	1.69	398.107	0.00
0.174	0.22	0.832	0.10	3.981	1.09	19.055	2.96	91.201	1.54	436.516	0.00
0.191	0.23	0.912	0.12	4.365	1.19	20.893	3.02	100.000	1.39	478.630	0.00
0.209	0.23	1.000	0.15	4.786	1.29	22.909	3.07	109.648	1.24	524.807	0.00
0.229	0.23	1.096	0.19	5.248	1.39	25.119	3.09	120.226	1.10	575.440	0.00
0.251	0.23	1.202	0.23	5.754	1.51	27.542	3.10	131.826	0.97	630.957	0.00
0.275	0.22	1.318	0.28	6.310	1.62	30.200	3.08	144.544	0.84	691.831	0.00
0.302	0.20	1.445	0.32	6.918	1.74	33.113	2.97	158.489	0.72	758.578	0.00
0.331	0.18	1.585	0.37	7.586	1.86	36.308	2.88	173.780	0.60	831.764	0.00
0.363	0.16	1.738	0.43	8.318	1.99	39.811	2.78	190.546	0.47	912.011	0.00
0.398	0.14	1.905	0.48	9.120	2.11	43.652	2.65	208.930	0.36	1000.000	0.00
0.437	0.12	2.089	0.54	10.000	2.24	47.863		229.087			
0.479		2.291		10.965		52.481		251.189			

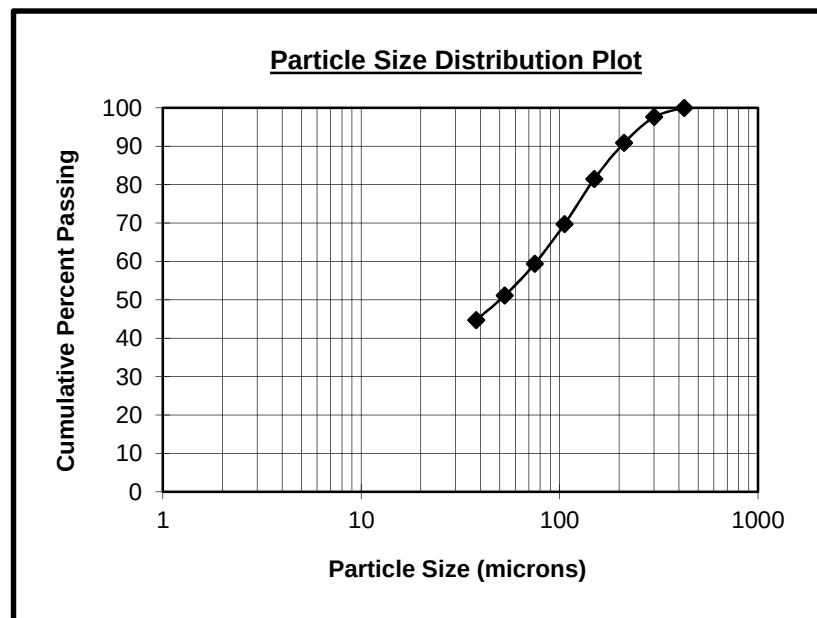
Operator notes:

Average of 3 measurements from 4420

TABLE III-36
SCREEN ANALYSIS
KM4420-P2 WSA Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	2.40	97.6
65 Mesh	212	6.70	90.9
100 Mesh	150	9.40	81.5
150 Mesh	106	11.80	69.7
200 Mesh	75	10.30	59.4
270 Mesh	53	8.30	51.1
400 Mesh	38	6.40	44.7
TOTAL		100.00	**

K80= 144 μm



Result Analysis Report

Project and Test number:

KM4420-P2

Measured by:

Jordan

Measured:

Wednesday, October 29, 2014 7:31:36 AM

Sample Name:

WSA Bulk Regrind Discharge - Average

Edited by:

Jordan

Analysed:

Wednesday, October 29, 2014 7:31:37 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

11.23 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.760 %

Result Emulation:

Off

Concentration:

0.0093 %Vol

Span :

4.125

Uniformity:

1.37

Result units:

Volume

Specific Surface Area:

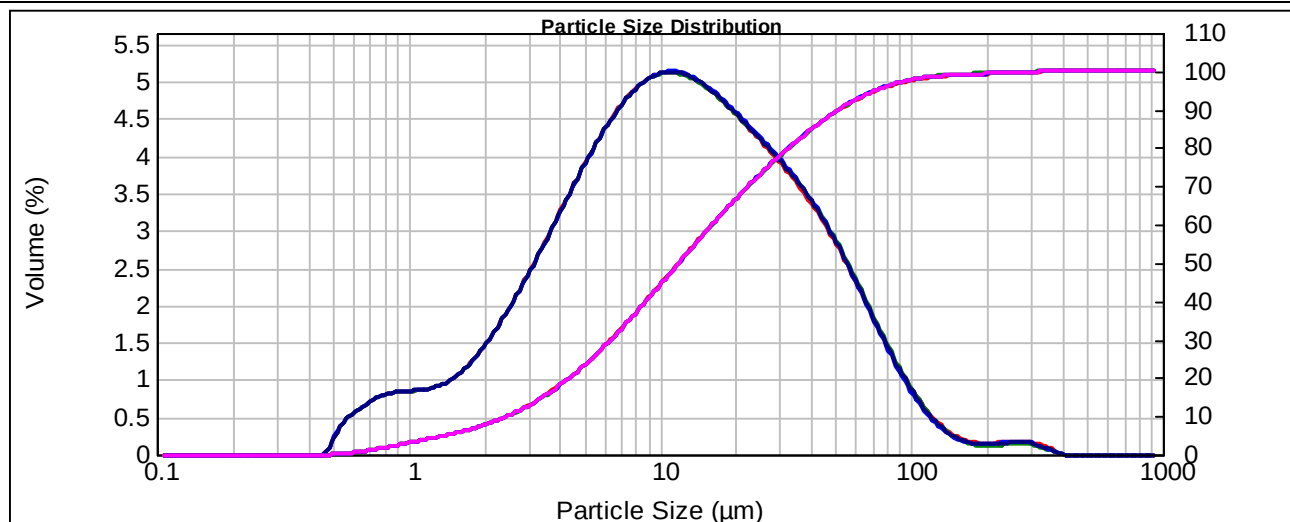
1.06 m²/g

Surface Weighted Mean D[3,2]:

5.662 um

Vol. Weighted Mean D[4,3]:

21.884 um

d(0.1): 2.475 um d(0.5): 11.889 um **d(0.8): 32.539 um** d(0.9): 51.516 um d(0.98): 103.36 um


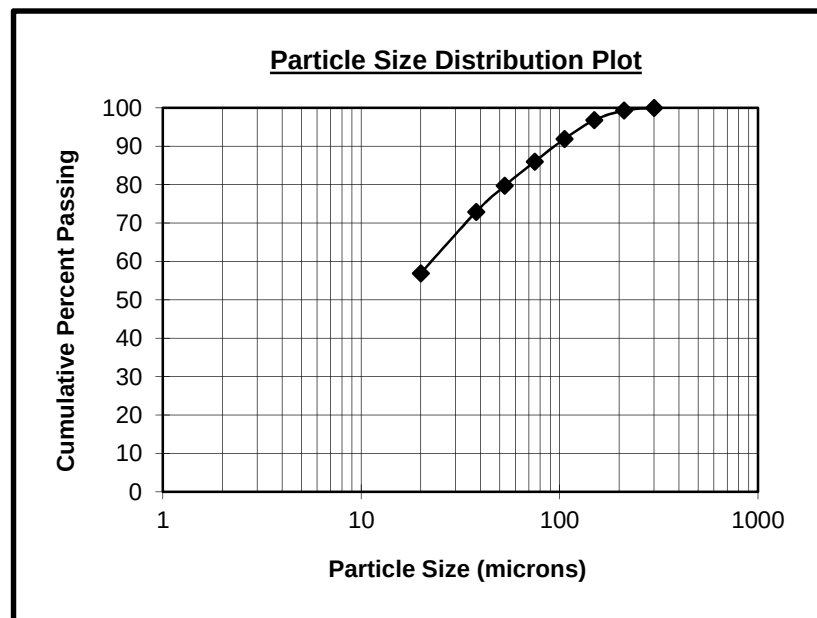
Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.11	2.291	1.11	10.965	3.09	52.481	1.56	251.189	0.10
0.110	0.00	0.525	0.27	2.512	1.24	12.023	3.07	57.544	1.40	275.423	0.10
0.120	0.00	0.575	0.33	2.754	1.39	13.183	3.03	63.096	1.23	301.995	0.08
0.132	0.00	0.631	0.39	3.020	1.54	14.454	2.98	69.183	1.06	331.131	0.05
0.145	0.00	0.692	0.45	3.311	1.70	15.849	2.91	75.858	0.90	363.078	0.02
0.158	0.00	0.759	0.48	3.631	1.86	17.378	2.83	83.176	0.74	398.107	0.00
0.174	0.00	0.832	0.50	3.981	2.02	19.055	2.76	91.201	0.59	436.516	0.00
0.191	0.00	0.912	0.51	4.365	2.18	20.893	2.67	100.000	0.46	478.630	0.00
0.209	0.00	1.000	0.52	4.786	2.34	22.909	2.59	109.648	0.35	524.807	0.00
0.229	0.00	1.096	0.54	5.248	2.49	25.119	2.50	120.226	0.26	575.440	0.00
0.251	0.00	1.202	0.57	5.754	2.62	27.542	2.41	131.826	0.18	630.957	0.00
0.275	0.00	1.318	0.62	6.310	2.75	30.200	2.32	144.544	0.13	691.831	0.00
0.302	0.00	1.445	0.68	6.918	2.86	33.113	2.22	158.489	0.10	758.578	0.00
0.331	0.00	1.585	0.77	7.586	2.95	36.308	2.11	173.780	0.08	831.764	0.00
0.363	0.00	1.738	0.87	8.318	3.06	39.811	1.99	190.546	0.09	912.011	0.00
0.398	0.00	1.905	0.98	9.120	3.08	43.652	1.86	208.930	0.09	1000.000	0.00
0.437	0.00	2.089		10.000		47.863	1.72	229.087			
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

TABLE III-38
SCREEN ANALYSIS
KM4420-P2 WSA Bulk Cleaner Scavenger Tailing

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
48 Mesh	300	0.00	100.0
65 Mesh	212	0.70	99.3
100 Mesh	150	2.50	96.8
150 Mesh	106	4.90	91.9
200 Mesh	75	5.90	86.0
270 Mesh	53	6.30	79.7
400 Mesh	38	6.80	72.9
635 Mesh	20	16.00	56.9
TOTAL		100.00	**

K80= 54 μm



Result Analysis Report

Project and Test number:

KM4420-P2

Measured by:

Jordan

Measured:

Wednesday, October 29, 2014 7:38:32 AM

Sample Name:

WSA Bulk Final Concentrate - Average

Edited by:

Jordan

Analysed:

Wednesday, October 29, 2014 7:38:33 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

9.48 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.198 %

Result Emulation:

Off

Concentration:

0.0126 %Vol

Span :

2.739

Uniformity:

0.862

Result units:

Volume

Specific Surface Area:

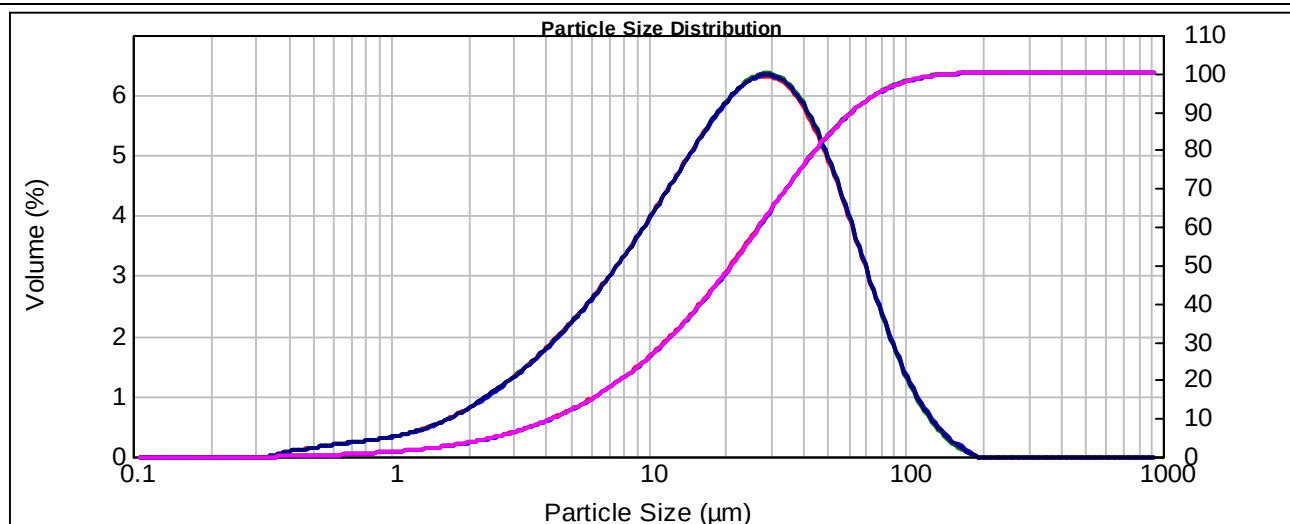
0.659 m²/g

Surface Weighted Mean D[3,2]:

9.098 um

Vol. Weighted Mean D[4,3]:

28.319 um

d(0.1): 4.276 um d(0.5): 21.114 um **d(0.8): 44.790 um** d(0.9): 62.114 um d(0.98): 101.34 um


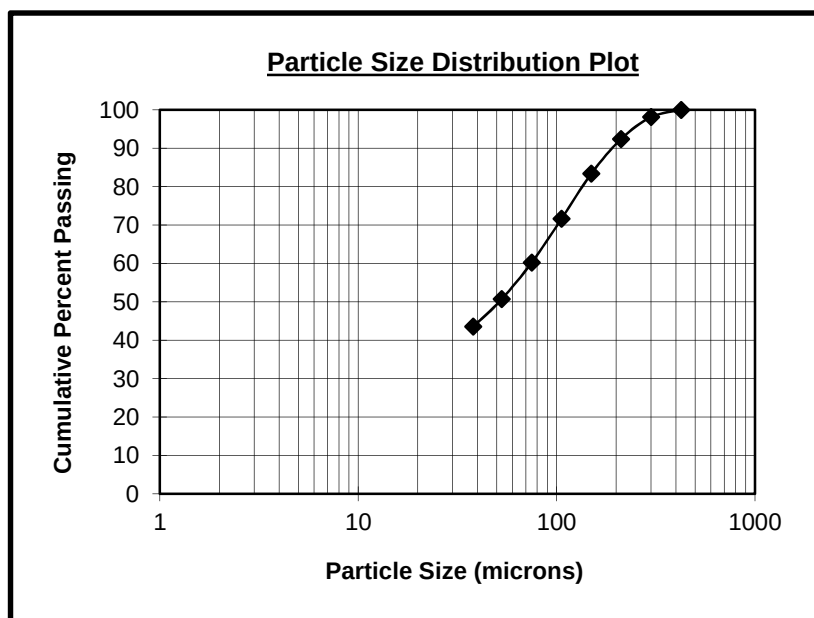
Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.09	2.291	0.61	10.965	2.59	52.481	2.70	251.189	0.00
0.110	0.00	0.525	0.10	2.512	0.68	12.023	2.75	57.544	2.41	275.423	0.00
0.120	0.00	0.575	0.12	2.754	0.75	13.183	2.92	63.096	2.09	301.995	0.00
0.132	0.00	0.631	0.13	3.020	0.84	14.454	3.08	69.183	1.78	331.131	0.00
0.145	0.00	0.692	0.14	3.311	0.92	15.849	3.24	75.858	1.48	363.078	0.00
0.158	0.00	0.759	0.15	3.631	1.02	17.378	3.39	83.176	1.20	398.107	0.00
0.174	0.00	0.832	0.17	3.981	1.11	19.055	3.52	91.201	0.94	436.516	0.00
0.191	0.00	0.912	0.18	4.365	1.22	20.893	3.64	100.000	0.72	478.630	0.00
0.209	0.00	1.000	0.20	4.786	1.33	22.909	3.73	109.648	0.52	524.807	0.00
0.229	0.00	1.096	0.22	5.248	1.44	25.119	3.79	120.226	0.37	575.440	0.00
0.251	0.00	1.202	0.25	5.754	1.56	27.542	3.81	131.826	0.25	630.957	0.00
0.275	0.00	1.318	0.28	6.310	1.69	30.200	3.78	144.544	0.14	691.831	0.00
0.302	0.00	1.445	0.32	6.918	1.83	33.113	3.72	158.489	0.09	758.578	0.00
0.331	0.00	1.585	0.37	7.586	1.97	36.308	3.60	173.780	0.01	831.764	0.00
0.363	0.04	1.738	0.42	8.318	2.12	39.811	3.43	190.546	0.00	912.011	0.00
0.398	0.06	1.905	0.48	9.120	2.27	43.652	3.23	208.930	0.00	1000.000	0.00
0.437	0.07	2.089	0.54	10.000	2.43	47.863	2.98	229.087	0.00		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

TABLE III-40
SCREEN ANALYSIS
KM4420-P3 WSA Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.90	98.1
65 Mesh	212	5.70	92.4
100 Mesh	150	9.00	83.4
150 Mesh	106	11.80	71.6
200 Mesh	75	11.40	60.2
270 Mesh	53	9.50	50.7
400 Mesh	38	7.20	43.5
TOTAL		100.00	**

K80= 136 μm



Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

Hoang

Measured:

Thursday, October 30, 2014 3:55:51 PM

Sample Name:

WSA Bulk Regrind Discharge - Average

Edited by:

Hoang

Analysed:

Thursday, October 30, 2014 3:55:52 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

15.39 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.628 %

Result Emulation:

Off

Concentration:

0.0126 %Vol

Span :

5.607

Uniformity:

1.7

Result units:

Volume

Specific Surface Area:

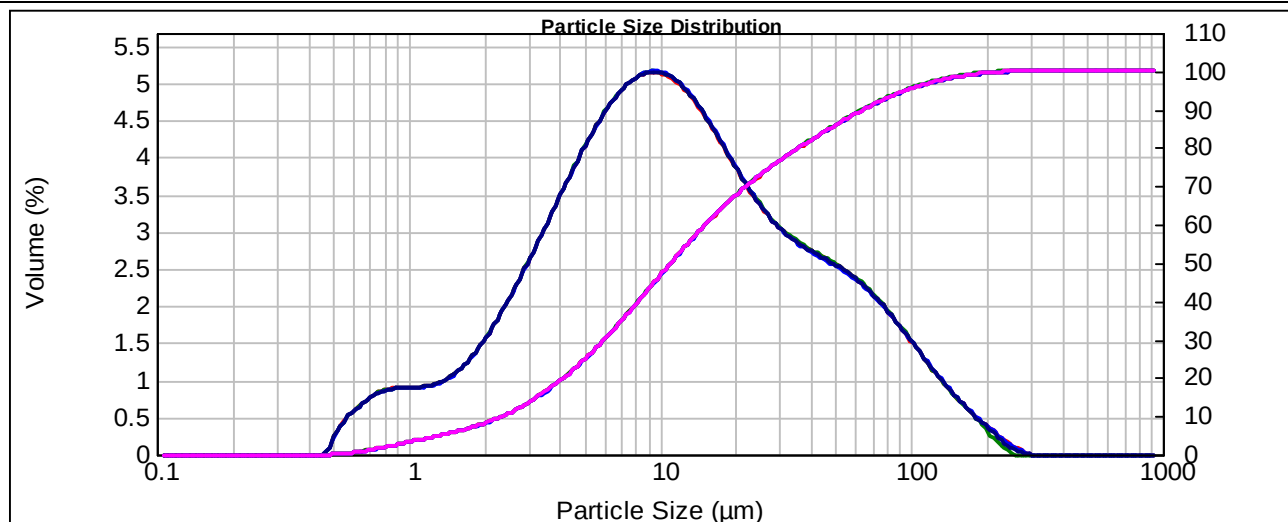
1.1 m²/g

Surface Weighted Mean D[3,2]:

5.449 um

Vol. Weighted Mean D[4,3]:

24.075 um

d(0.1): 2.364 um d(0.5): 11.062 um **d(0.8): 35.600 um** d(0.9): 64.390 um d(0.98): 135.52 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.11	2.291	1.19	10.965	3.04	52.481	1.49	251.189	0.04
0.110	0.00	0.525	0.27	2.512	1.33	12.023	2.96	57.544	1.43	275.423	0.00
0.120	0.00	0.575	0.35	2.754	1.49	13.183	2.86	63.096	1.35	301.995	0.00
0.132	0.00	0.631	0.42	3.020	1.66	14.454	2.75	69.183	1.27	331.131	0.00
0.145	0.00	0.692	0.48	3.311	1.83	15.849	2.61	75.858	1.18	363.078	0.00
0.158	0.00	0.759	0.51	3.631	2.00	17.378	2.47	83.176	1.08	398.107	0.00
0.174	0.00	0.832	0.53	3.981	2.17	19.055	2.33	91.201	0.97	436.516	0.00
0.191	0.00	0.912	0.54	4.365	2.33	20.893	2.20	100.000	0.86	478.630	0.00
0.209	0.00	1.000	0.54	4.786	2.49	22.909	2.07	109.648	0.76	524.807	0.00
0.229	0.00	1.096	0.55	5.248	2.64	25.119	1.97	120.226	0.65	575.440	0.00
0.251	0.00	1.202	0.56	5.754	2.77	27.542	1.87	131.826	0.55	630.957	0.00
0.275	0.00	1.318	0.59	6.310	2.89	30.200	1.79	144.544	0.46	691.831	0.00
0.302	0.00	1.445	0.64	6.918	2.98	33.113	1.73	158.489	0.38	758.578	0.00
0.331	0.00	1.585	0.72	7.586	3.05	36.308	1.67	173.780	0.30	831.764	0.00
0.363	0.00	1.738	0.81	8.318	3.09	39.811	1.63	190.546	0.22	912.011	0.00
0.398	0.00	1.905	0.92	9.120	3.10	43.652	1.58	208.930	0.15	1000.000	0.00
0.437	0.00	2.089	1.05	10.000	3.09	47.863	1.54	229.087	0.07		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes: Average of 3 measurements from 4420

Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

quentin

Measured:

Friday, October 31, 2014 2:16:40 PM

Sample Name:

WSA Bulk Final Concentrate - Average

Edited by:

quentin

Analysed:

Friday, October 31, 2014 2:16:41 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

11.14 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.233 %

Result Emulation:

Off

Concentration:

0.0188 %Vol

Span :

2.599

Uniformity:

0.813

Result units:

Volume

Specific Surface Area:

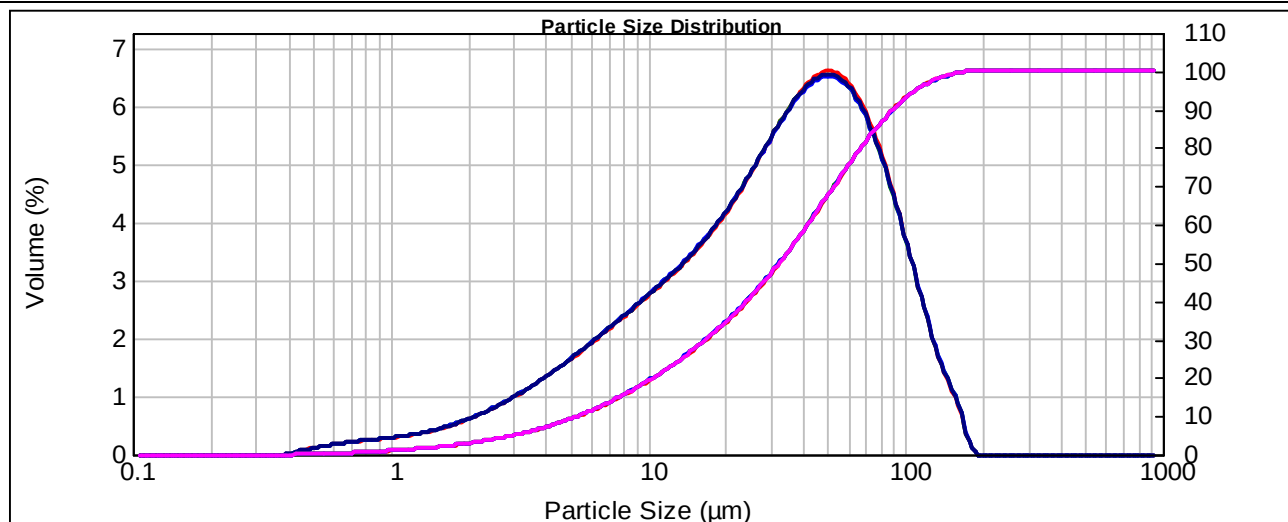
0.522 m²/g

Surface Weighted Mean D[3,2]:

11.486 um

Vol. Weighted Mean D[4,3]:

40.901 um

d(0.1): 5.314 um d(0.5): 32.408 um **d(0.8): 67.200 um** d(0.9): 89.535 um d(0.98): 132.36 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.07	2.291	0.46	10.965	1.79	52.481	3.91	251.189	0.00
0.110	0.00	0.525	0.09	2.512	0.51	12.023	1.89	57.544	3.82	275.423	0.00
0.120	0.00	0.575	0.11	2.754	0.57	13.183	1.99	63.096	3.66	301.995	0.00
0.132	0.00	0.631	0.12	3.020	0.63	14.454	2.10	69.183	3.44	331.131	0.00
0.145	0.00	0.692	0.13	3.311	0.69	15.849	2.22	75.858	3.15	363.078	0.00
0.158	0.00	0.759	0.15	3.631	0.76	17.378	2.36	83.176	2.81	398.107	0.00
0.174	0.00	0.832	0.16	3.981	0.83	19.055	2.50	91.201	2.44	436.516	0.00
0.191	0.00	0.912	0.17	4.365	0.91	20.893	2.66	100.000	2.05	478.630	0.00
0.209	0.00	1.000	0.18	4.786	0.99	22.909	2.83	109.648	1.66	524.807	0.00
0.229	0.00	1.096	0.19	5.248	1.07	25.119	3.01	120.226	1.28	575.440	0.00
0.251	0.00	1.202	0.21	5.754	1.16	27.542	3.19	131.826	0.92	630.957	0.00
0.275	0.00	1.318	0.23	6.310	1.24	30.200	3.38	144.544	0.69	691.831	0.00
0.302	0.00	1.445	0.26	6.918	1.33	33.113	3.55	158.489	0.41	758.578	0.00
0.331	0.00	1.585	0.29	7.586	1.42	36.308	3.70	173.780	0.03	831.764	0.00
0.363	0.00	1.738	0.32	8.318	1.51	39.811	3.83	190.546	0.00	912.011	0.00
0.398	0.02	1.905	0.36	9.120	1.60	43.652	3.91	208.930	0.00	1000.000	0.00
0.437	0.05	2.089	0.41	10.000	1.69	47.863	3.94	229.087	0.00		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

TABLE III-43
SCREEN ANALYSIS
KM4420-P3 WSB Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	2.30	97.7
65 Mesh	212	5.80	91.9
100 Mesh	150	11.90	80.0
150 Mesh	106	12.60	67.4
200 Mesh	75	11.30	56.1
270 Mesh	53	8.70	47.4
400 Mesh	38	7.00	40.4
TOTAL		100.00	**

K80= 150 μm

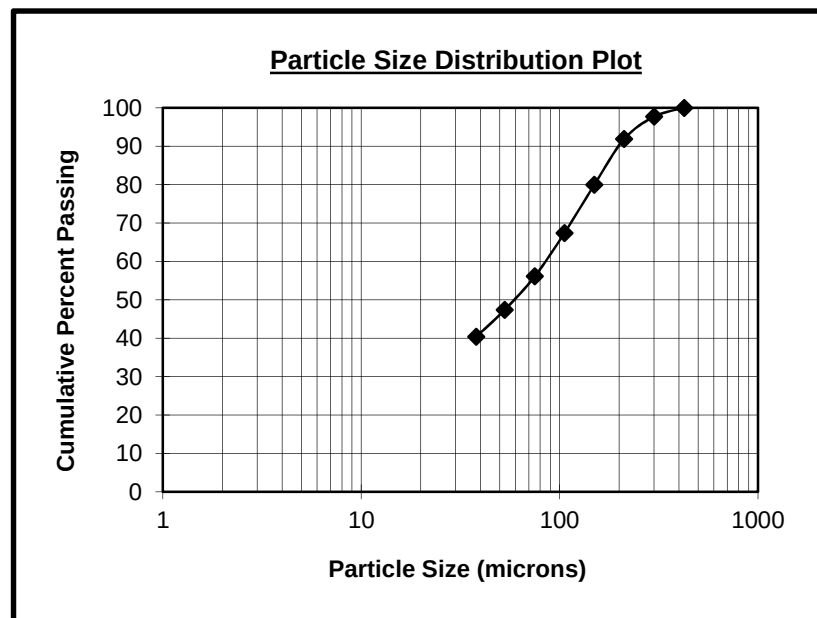
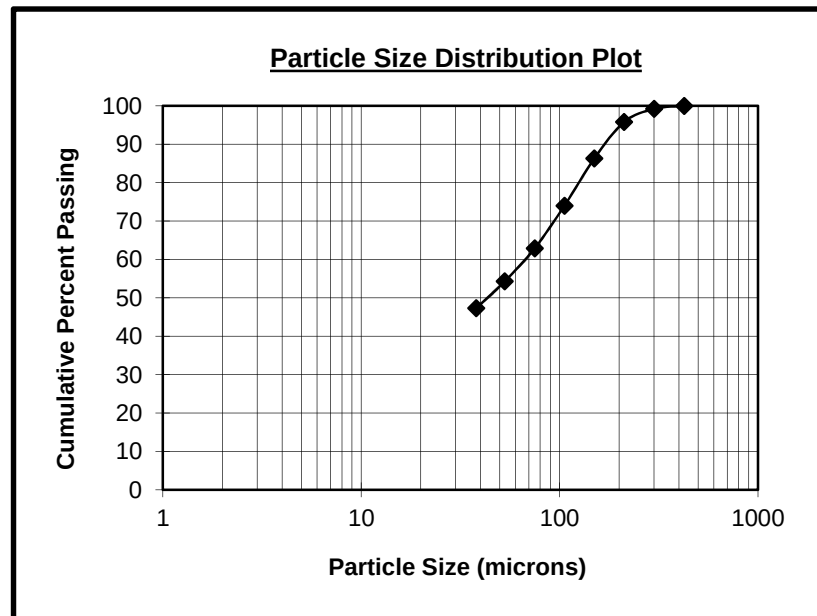


TABLE III-44
SCREEN ANALYSIS
KM4420-P3 WSB Bulk Rougher Concentrate

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.80	99.2
65 Mesh	212	3.40	95.8
100 Mesh	150	9.50	86.3
150 Mesh	106	12.30	74.0
200 Mesh	75	11.10	62.9
270 Mesh	53	8.60	54.3
400 Mesh	38	7.00	47.3
TOTAL		100.00	**

K80= 126 μm



Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

quentin

Measured:

Friday, October 31, 2014 8:11:54 AM

Sample Name:

WSB Bulk Re grind Discharge - Average

Edited by:

quentin

Analysed:

Friday, October 31, 2014 8:11:55 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

15.97 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.562 %

Result Emulation:

Off

Concentration:

0.0140 %Vol

Span :

4.560

Uniformity:

1.41

Result units:

Volume

Specific Surface Area:

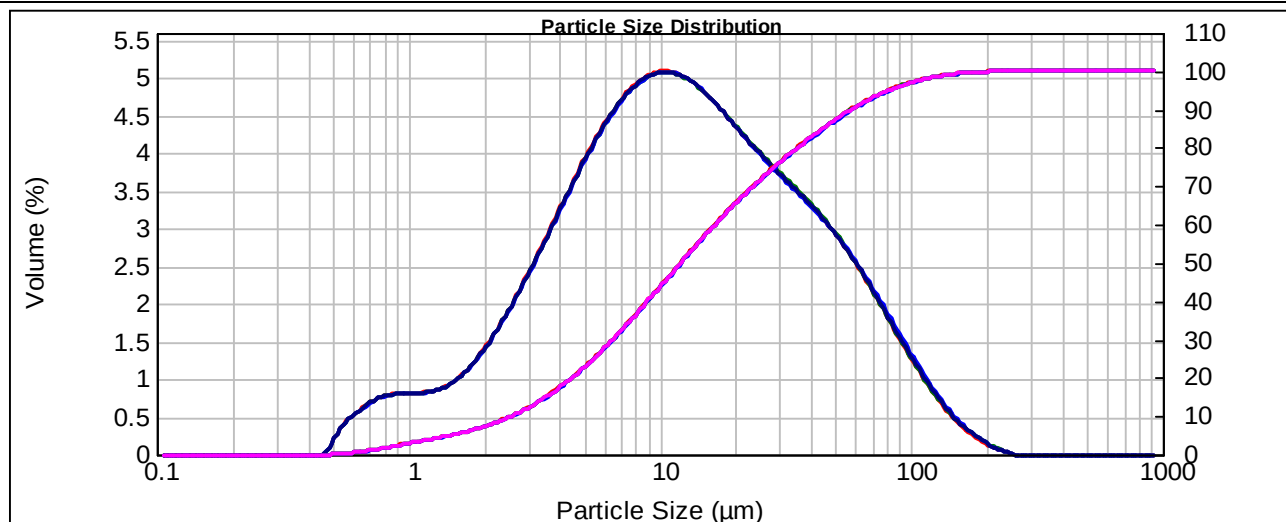
1.03 m²/g

Surface Weighted Mean D[3,2]:

5.817 um

Vol. Weighted Mean D[4,3]:

22.768 um

d(0.1): 2.567 um d(0.5): 12.094 um **d(0.8): 35.201 um** d(0.9): 57.718 um d(0.98): 112.58 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	1.08	10.965	3.04	52.481	1.65	251.189	0.00
0.110	0.00	0.525	0.24	2.512	1.22	12.023	3.01	57.544	1.53	275.423	0.00
0.120	0.00	0.575	0.31	2.754	1.37	13.183	2.96	63.096	1.40	301.995	0.00
0.132	0.00	0.631	0.38	3.020	1.53	14.454	2.89	69.183	1.27	331.131	0.00
0.145	0.00	0.692	0.46	3.311	1.69	15.849	2.80	75.858	1.13	363.078	0.00
0.158	0.00	0.759	0.43	3.631	1.86	17.378	2.71	83.176	0.99	398.107	0.00
0.174	0.00	0.832	0.48	3.981	2.03	19.055	2.62	91.201	0.85	436.516	0.00
0.191	0.00	0.912	0.49	4.365	2.19	20.893	2.53	100.000	0.71	478.630	0.00
0.209	0.00	1.000	0.49	4.786	2.35	22.909	2.44	109.648	0.58	524.807	0.00
0.229	0.00	1.096	0.49	5.248	2.50	25.119	2.35	120.226	0.47	575.440	0.00
0.251	0.00	1.202	0.50	5.754	2.63	27.542	2.27	131.826	0.36	630.957	0.00
0.275	0.00	1.318	0.53	6.310	2.76	30.200	2.19	144.544	0.27	691.831	0.00
0.302	0.00	1.445	0.58	6.918	2.86	33.113	2.11	158.489	0.20	758.578	0.00
0.331	0.00	1.585	0.65	7.586	2.94	36.308	2.03	173.780	0.14	831.764	0.00
0.363	0.00	1.738	0.73	8.318	3.00	39.811	1.95	190.546	0.08	912.011	0.00
0.398	0.00	1.905	0.83	9.120	3.04	43.652	1.86	208.930	0.05	1000.000	0.00
0.437	0.00	2.089	0.95	10.000	3.05	47.863	1.76	229.087	0.02		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

quentin

Measured:

Friday, October 31, 2014 8:20:08 AM

Sample Name:

WSB Bulk Cleaner Scavenger Feed Average

Edited by:

quentin

Analysed:

Friday, October 31, 2014 8:20:09 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

14.93 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.712 %

Result Emulation:

Off

Concentration:

0.0115 %Vol

Span :

6.789

Uniformity:

1.91

Result units:

Volume

Specific Surface Area:

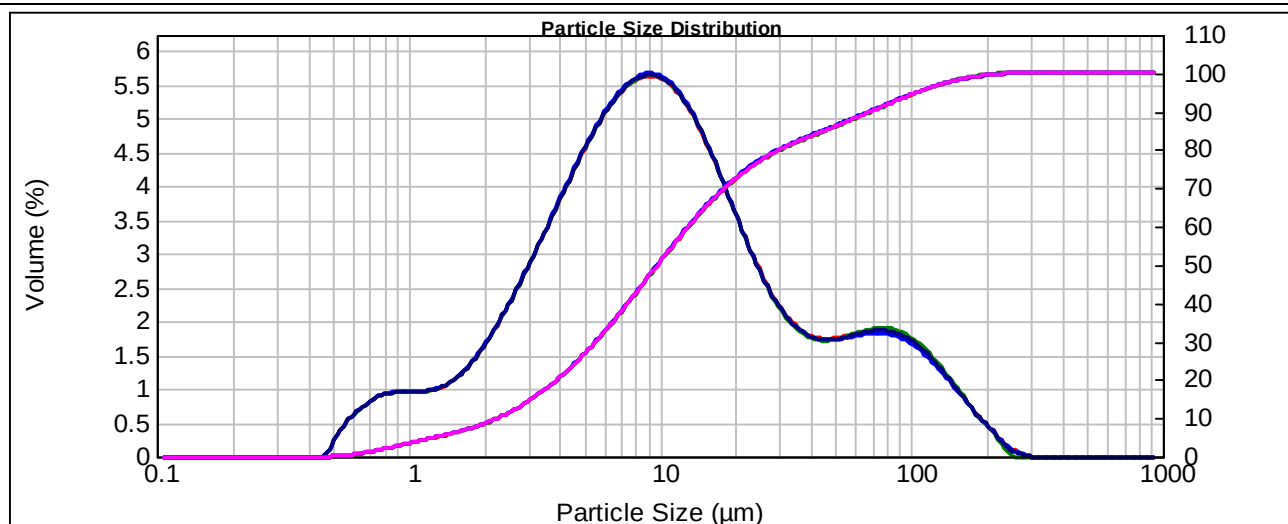
1.17 m²/g

Surface Weighted Mean D[3,2]:

5.136 um

Vol. Weighted Mean D[4,3]:

23.515 um

d(0.1): 2.257 um d(0.5): 9.795 um **d(0.8): 29.801 um** d(0.9): 68.761 um d(0.98): 145.54 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.11	2.291	1.27	10.965	3.28	52.481	1.06	251.189	0.03
0.110	0.00	0.525	0.28	2.512	1.44	12.023	3.16	57.544	1.09	275.423	0.00
0.120	0.00	0.575	0.37	2.754	1.62	13.183	3.01	63.096	1.11	301.995	0.00
0.132	0.00	0.631	0.45	3.020	1.80	14.454	2.82	69.183	1.12	331.131	0.00
0.145	0.00	0.692	0.51	3.311	1.99	15.849	2.62	75.858	1.12	363.078	0.00
0.158	0.00	0.759	0.55	3.631	2.18	17.378	2.40	83.176	1.10	398.107	0.00
0.174	0.00	0.832	0.57	3.981	2.37	19.055	2.17	91.201	1.06	436.516	0.00
0.191	0.00	0.912	0.58	4.365	2.56	20.893	1.95	100.000	1.00	478.630	0.00
0.209	0.00	1.000	0.58	4.786	2.74	22.909	1.74	109.648	0.92	524.807	0.00
0.229	0.00	1.096	0.58	5.248	2.91	25.119	1.55	120.226	0.83	575.440	0.00
0.251	0.00	1.202	0.59	5.754	3.06	27.542	1.38	131.826	0.72	630.957	0.00
0.275	0.00	1.318	0.63	6.310	3.19	30.200	1.25	144.544	0.61	691.831	0.00
0.302	0.00	1.445	0.68	6.918	3.29	33.113	1.15	158.489	0.49	758.578	0.00
0.331	0.00	1.585	0.76	7.586	3.36	36.308	1.09	173.780	0.38	831.764	0.00
0.363	0.00	1.738	0.86	8.318	3.40	39.811	1.05	190.546	0.28	912.011	0.00
0.398	0.00	1.905	0.98	9.120	3.40	43.652	1.04	208.930	0.19	1000.000	0.00
0.437	0.00	2.089	1.12	10.000	3.36	47.863	1.04	229.087	0.07		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

quentin

Measured:

Friday, October 31, 2014 2:26:49 PM

Sample Name:

P3 Bulk Final Concentrate - Average

Edited by:

quentin

Analysed:

Friday, October 31, 2014 2:26:50 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

13.90 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.212 %

Result Emulation:

Off

Concentration:

0.0253 %Vol

Span :

2.395

Uniformity:

0.742

Result units:

Volume

Specific Surface Area:

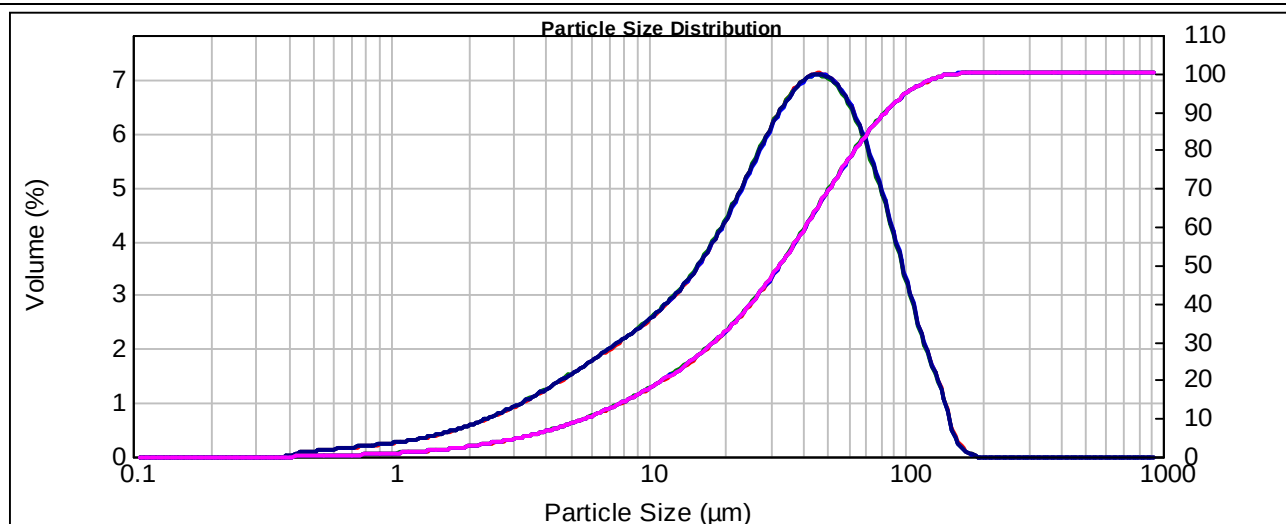
0.49 m²/g

Surface Weighted Mean D[3,2]:

12.239 um

Vol. Weighted Mean D[4,3]:

39.631 um

d(0.1): 5.734 um d(0.5): 32.667 um **d(0.8): 63.774 um** d(0.9): 83.973 um d(0.98): 122.4 um


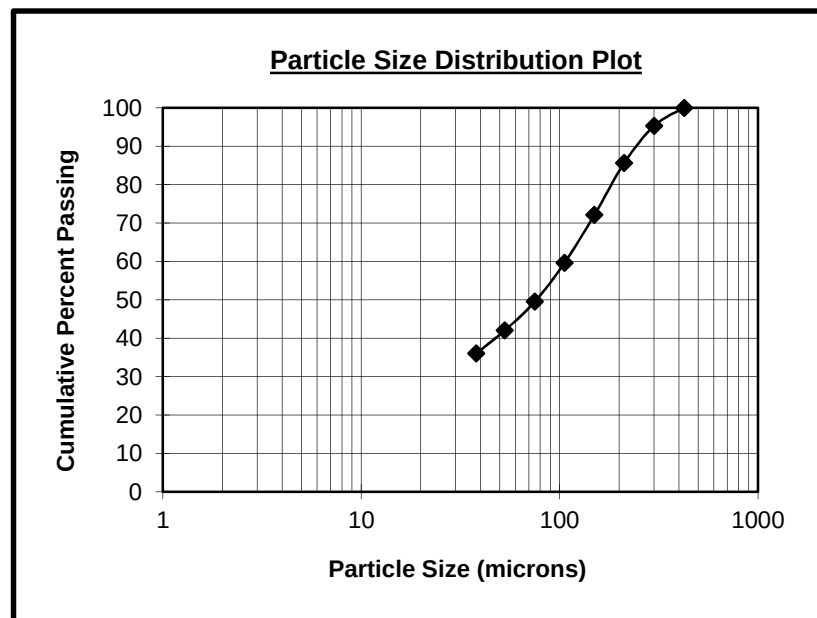
Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.06	2.291	0.43	10.965	1.67	52.481	4.14	251.189	0.00
0.110	0.00	0.525	0.07	2.512	0.48	12.023	1.79	57.544	3.96	275.423	0.00
0.120	0.00	0.575	0.08	2.754	0.53	13.183	1.92	63.096	3.71	301.995	0.00
0.132	0.00	0.631	0.09	3.020	0.59	14.454	2.07	69.183	3.40	331.131	0.00
0.145	0.00	0.692	0.11	3.311	0.65	15.849	2.23	75.858	3.04	363.078	0.00
0.158	0.00	0.759	0.12	3.631	0.71	17.378	2.43	83.176	2.64	398.107	0.00
0.174	0.00	0.832	0.13	3.981	0.78	19.055	2.63	91.201	2.23	436.516	0.00
0.191	0.00	0.912	0.14	4.365	0.84	20.893	2.86	100.000	1.81	478.630	0.00
0.209	0.00	1.000	0.15	4.786	0.92	22.909	3.10	109.648	1.39	524.807	0.00
0.229	0.00	1.096	0.17	5.248	0.99	25.119	3.33	120.226	1.05	575.440	0.00
0.251	0.00	1.202	0.19	5.754	1.07	27.542	3.57	131.826	0.77	630.957	0.00
0.275	0.00	1.318	0.21	6.310	1.14	30.200	3.79	144.544	0.29	691.831	0.00
0.302	0.00	1.445	0.24	6.918	1.22	33.113	3.98	158.489	0.10	758.578	0.00
0.331	0.00	1.585	0.27	7.586	1.30	36.308	4.14	173.780	0.01	831.764	0.00
0.363	0.00	1.738	0.30	8.318	1.38	39.811	4.24	190.546	0.00	912.011	0.00
0.398	0.02	1.905	0.34	9.120	1.47	43.652	4.28	208.930	0.00	1000.000	0.00
0.437	0.05	2.089	0.38	10.000	1.57	47.863	4.24	229.087	0.00		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

TABLE III-48
SCREEN ANALYSIS
KM4420-P4 WSA Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	4.70	95.3
65 Mesh	212	9.70	85.6
100 Mesh	150	13.50	72.1
150 Mesh	106	12.50	59.6
200 Mesh	75	10.10	49.5
270 Mesh	53	7.50	42.0
400 Mesh	38	6.00	36.0
TOTAL		100.00	**

K80= 185 μm



Result Analysis Report

Project and Test number:

KM4420-P4

Measured by:

quentin

Measured:

Monday, November 03, 2014 7:11:08 AM

Sample Name:

WSA Bulk Regrind Discharge - Average

Edited by:

quentin

Analysed:

Monday, November 03, 2014 7:11:10 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

11.82 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.483 %

Result Emulation:

Off

Concentration:

0.0113 %Vol

Span :

4.153

Uniformity:

1.29

Result units:

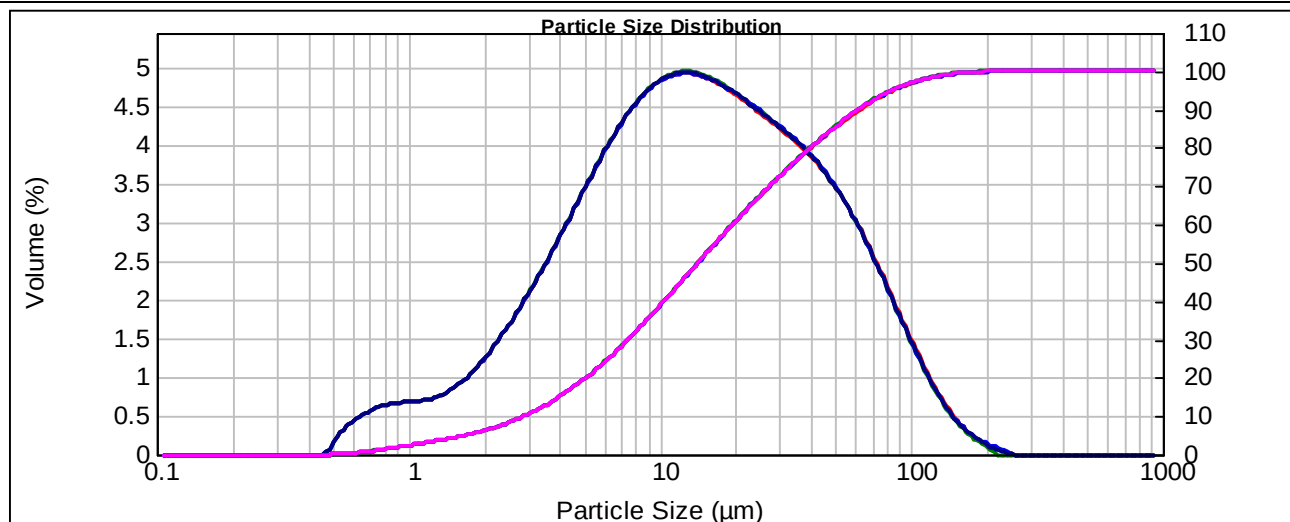
Volume

Specific Surface Area:
0.921 m²/g
Surface Weighted Mean D[3,2]:

6.518 um

Vol. Weighted Mean D[4,3]:

24.782 um

 d(0.1): 2.879 um d(0.5): 14.153 um **d(0.8): 39.598 um** d(0.9): 61.651 um d(0.98): 112.23 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.08	2.291	0.95	10.965	2.96	52.481	1.95	251.189	0.00
0.110	0.00	0.525	0.20	2.512	1.07	12.023	2.97	57.544	1.81	275.423	0.00
0.120	0.00	0.575	0.25	2.754	1.19	13.183	2.96	63.096	1.66	301.995	0.00
0.132	0.00	0.631	0.31	3.020	1.32	14.454	2.94	69.183	1.50	331.131	0.00
0.145	0.00	0.692	0.35	3.311	1.46	15.849	2.90	75.858	1.32	363.078	0.00
0.158	0.00	0.759	0.38	3.631	1.61	17.378	2.86	83.176	1.14	398.107	0.00
0.174	0.00	0.832	0.40	3.981	1.76	19.055	2.81	91.201	0.97	436.516	0.00
0.191	0.00	0.912	0.41	4.365	1.91	20.893	2.75	100.000	0.80	478.630	0.00
0.209	0.00	1.000	0.41	4.786	2.06	22.909	2.69	109.648	0.63	524.807	0.00
0.229	0.00	1.096	0.42	5.248	2.21	25.119	2.63	120.226	0.49	575.440	0.00
0.251	0.00	1.202	0.44	5.754	2.36	27.542	2.57	131.826	0.37	630.957	0.00
0.275	0.00	1.318	0.47	6.310	2.49	30.200	2.51	144.544	0.26	691.831	0.00
0.302	0.00	1.445	0.51	6.918	2.61	33.113	2.44	158.489	0.18	758.578	0.00
0.331	0.00	1.585	0.57	7.586	2.72	36.308	2.36	173.780	0.12	831.764	0.00
0.363	0.00	1.738	0.65	8.318	2.81	39.811	2.28	190.546	0.07	912.011	0.00
0.398	0.00	1.905	0.74	9.120	2.88	43.652	2.19	208.930	0.04	1000.000	0.00
0.437	0.00	2.089	0.84	10.000	2.93	47.863	2.08	229.087	0.01		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P4

Measured by:

quentin

Measured:

Monday, November 03, 2014 7:16:52 AM

Sample Name:

WSA Bulk Final Concentrate - Average

Edited by:

quentin

Analysed:

Monday, November 03, 2014 7:16:53 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

15.07 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.197 %

Result Emulation:

Off

Concentration:

0.0261 %Vol

Span :

2.580

Uniformity:

0.805

Result units:

Volume

Specific Surface Area:

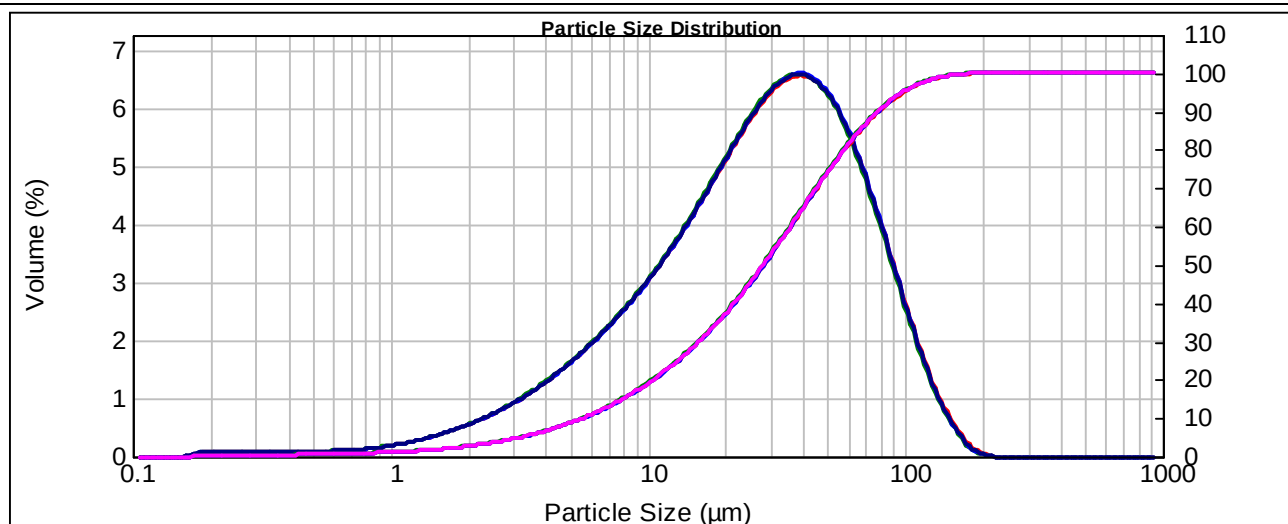
0.601 m²/g

Surface Weighted Mean D[3,2]:

9.980 um

Vol. Weighted Mean D[4,3]:

36.117 um

d(0.1): 5.576 um d(0.5): 28.111 um **d(0.8): 57.652 um** d(0.9): 78.093 um d(0.98): 120.23 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.06	2.291	0.42	10.965	2.04	52.481	3.60	251.189	0.00
0.110	0.00	0.525	0.06	2.512	0.47	12.023	2.20	57.544	3.37	275.423	0.00
0.120	0.00	0.575	0.06	2.754	0.53	13.183	2.36	63.096	3.10	301.995	0.00
0.132	0.00	0.631	0.06	3.020	0.59	14.454	2.54	69.183	2.79	331.131	0.00
0.145	0.00	0.692	0.06	3.311	0.66	15.849	2.71	75.858	2.46	363.078	0.00
0.158	0.00	0.759	0.07	3.631	0.73	17.378	2.90	83.176	2.10	398.107	0.00
0.174	0.04	0.832	0.09	3.981	0.81	19.055	3.08	91.201	1.75	436.516	0.00
0.191	0.05	0.912	0.10	4.365	0.89	20.893	3.27	100.000	1.41	478.630	0.00
0.209	0.05	1.000	0.12	4.786	0.98	22.909	3.45	109.648	1.09	524.807	0.00
0.229	0.05	1.096	0.14	5.248	1.07	25.119	3.61	120.226	0.80	575.440	0.00
0.251	0.05	1.202	0.16	5.754	1.17	27.542	3.75	131.826	0.55	630.957	0.00
0.275	0.05	1.318	0.19	6.310	1.28	30.200	3.86	144.544	0.35	691.831	0.00
0.302	0.05	1.445	0.22	6.918	1.39	33.113	3.94	158.489	0.20	758.578	0.00
0.331	0.05	1.585	0.25	7.586	1.51	36.308	3.97	173.780	0.07	831.764	0.00
0.363	0.05	1.738	0.29	8.318	1.63	39.811	3.96	190.546	0.03	912.011	0.00
0.398	0.05	1.905	0.33	9.120	1.76	43.652	3.89	208.930	0.00	1000.000	0.00
0.437	0.05	2.089	0.37	10.000	1.90	47.863	3.77	229.087	0.00		
0.479	0.05	2.291		10.965		52.481		251.189	0.00		

Operator notes:

TABLE III-51
SCREEN ANALYSIS
KM4420-P4 WSB Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	3.20	96.8
65 Mesh	212	8.70	88.1
100 Mesh	150	12.90	75.2
150 Mesh	106	12.90	62.3
200 Mesh	75	10.00	52.3
270 Mesh	53	7.70	44.6
400 Mesh	38	6.80	37.8
TOTAL		100.00	**

K80= 172 μm

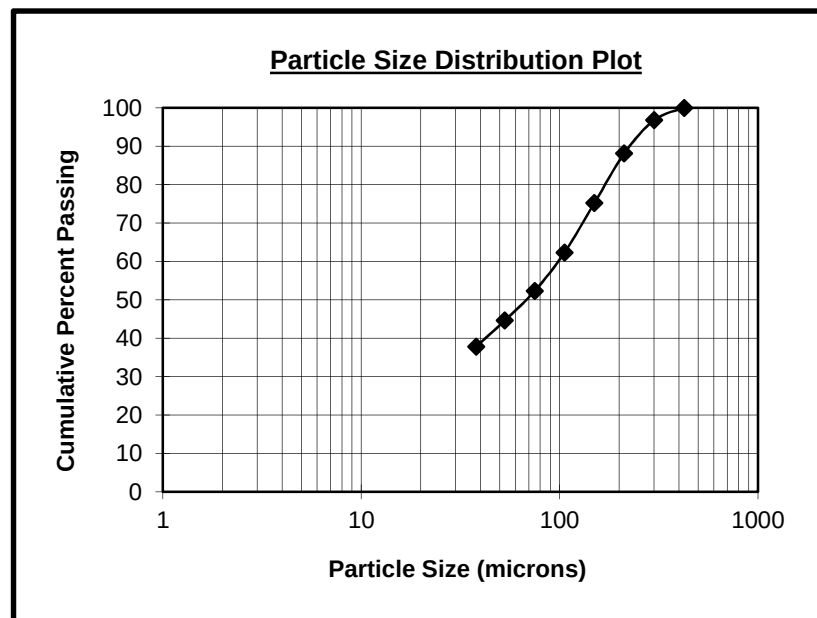
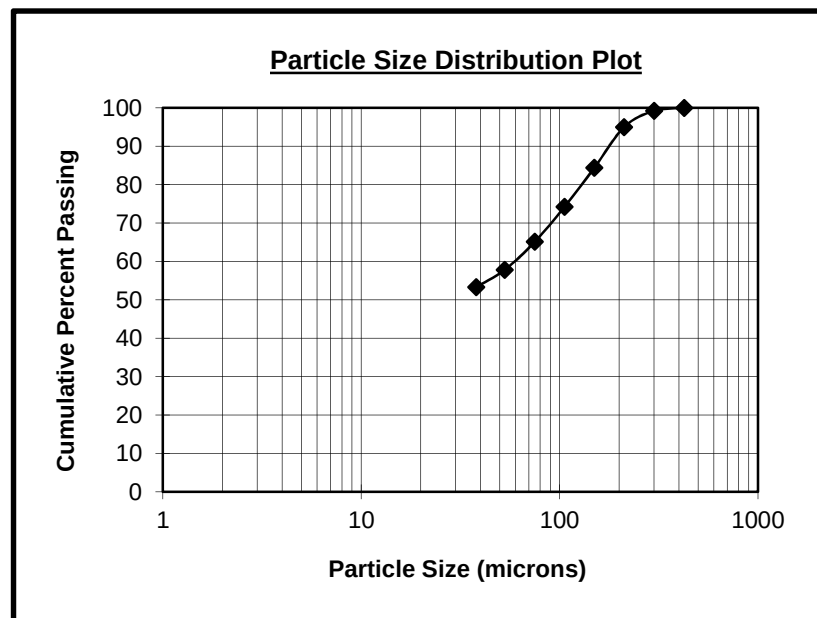


TABLE III-52
SCREEN ANALYSIS
KM4420-P4 WSB Bulk Rougher Concentrate

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.80	99.2
65 Mesh	212	4.20	95.0
100 Mesh	150	10.60	84.4
150 Mesh	106	10.20	74.2
200 Mesh	75	9.10	65.1
270 Mesh	53	7.30	57.8
400 Mesh	38	4.50	53.3
TOTAL		100.00	**

K80= 130 μm



Result Analysis Report

Project and Test number:

KM4420-P4

Measured by:

Jordan

Measured:

Wednesday, November 12, 2014 8:55:01 AM

Sample Name:

WSB Bulk Regrind Discharge - Average

Edited by:

Jordan

Analysed:

Wednesday, November 12, 2014 8:55:02 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

13.62 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.517 %

Result Emulation:

Off

Concentration:

0.0125 %Vol

Span :

4.260

Uniformity:

1.32

Result units:

Volume

Specific Surface Area:

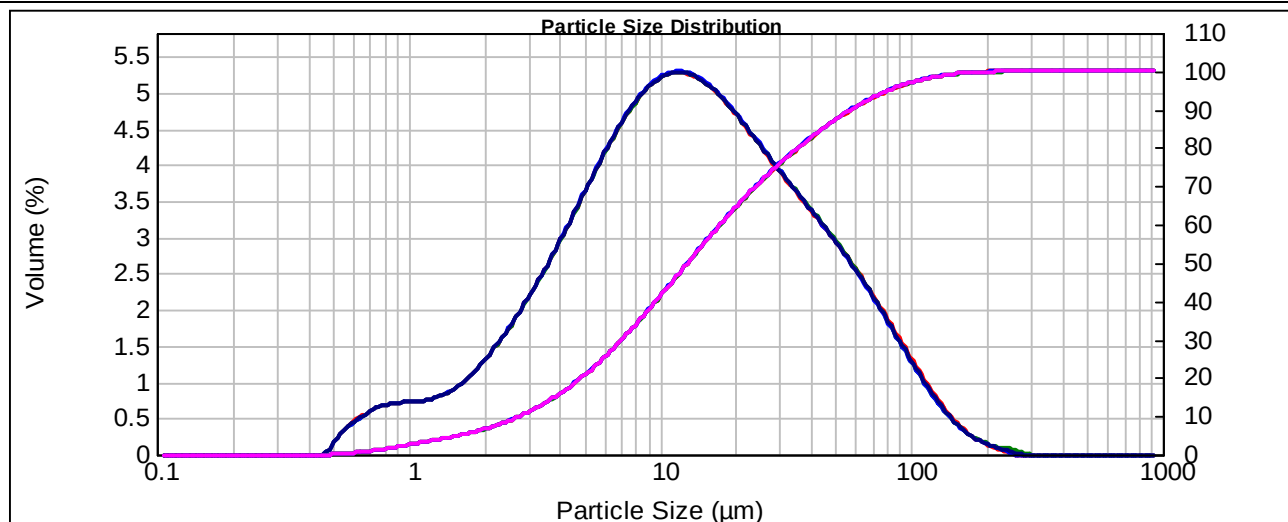
0.966 m²/g

Surface Weighted Mean D[3,2]:

6.210 um

Vol. Weighted Mean D[4,3]:

23.195 um

d(0.1): 2.760 um d(0.5): 12.897 um **d(0.8): 35.424 um** d(0.9): 57.706 um d(0.98): 111.74 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.08	2.291	0.99	10.965	3.18	52.481	1.66	251.189	0.01
0.110	0.00	0.525	0.21	2.512	1.11	12.023	3.18	57.544	1.54	275.423	0.00
0.120	0.00	0.575	0.27	2.754	1.24	13.183	3.15	63.096	1.41	301.995	0.00
0.132	0.00	0.631	0.33	3.020	1.38	14.454	3.10	69.183	1.28	331.131	0.00
0.145	0.00	0.692	0.38	3.311	1.53	15.849	3.03	75.858	1.14	363.078	0.00
0.158	0.00	0.759	0.41	3.631	1.69	17.378	2.94	83.176	0.99	398.107	0.00
0.174	0.00	0.832	0.43	3.981	1.85	19.055	2.84	91.201	0.85	436.516	0.00
0.191	0.00	0.912	0.44	4.365	2.01	20.893	2.73	100.000	0.71	478.630	0.00
0.209	0.00	1.000	0.44	4.786	2.18	22.909	2.62	109.648	0.58	524.807	0.00
0.229	0.00	1.096	0.45	5.248	2.35	25.119	2.51	120.226	0.46	575.440	0.00
0.251	0.00	1.202	0.47	5.754	2.51	27.542	2.40	131.826	0.35	630.957	0.00
0.275	0.00	1.318	0.50	6.310	2.66	30.200	2.30	144.544	0.25	691.831	0.00
0.302	0.00	1.445	0.54	6.918	2.80	33.113	2.19	158.489	0.18	758.578	0.00
0.331	0.00	1.585	0.61	7.586	2.93	36.308	2.09	173.780	0.13	831.764	0.00
0.363	0.00	1.738	0.68	8.318	3.03	39.811	1.98	190.546	0.08	912.011	0.00
0.398	0.00	1.905	0.78	9.120	3.11	43.652	1.88	208.930	0.06	1000.000	0.00
0.437	0.00	2.089	0.88	10.000	3.16	47.863	1.77	229.087	0.03		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P4

Measured by:

quentin

Measured:

Monday, November 03, 2014 7:31:00 AM

Sample Name:

WSB Bulk Cleaner Scavenger Feed

Edited by:

quentin

Analysed:

Monday, November 03, 2014 7:31:01 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

20.66 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.563 %

Result Emulation:

Off

Concentration:

0.0173 %Vol

Span :

4.091

Uniformity:

1.28

Result units:

Volume

Specific Surface Area:

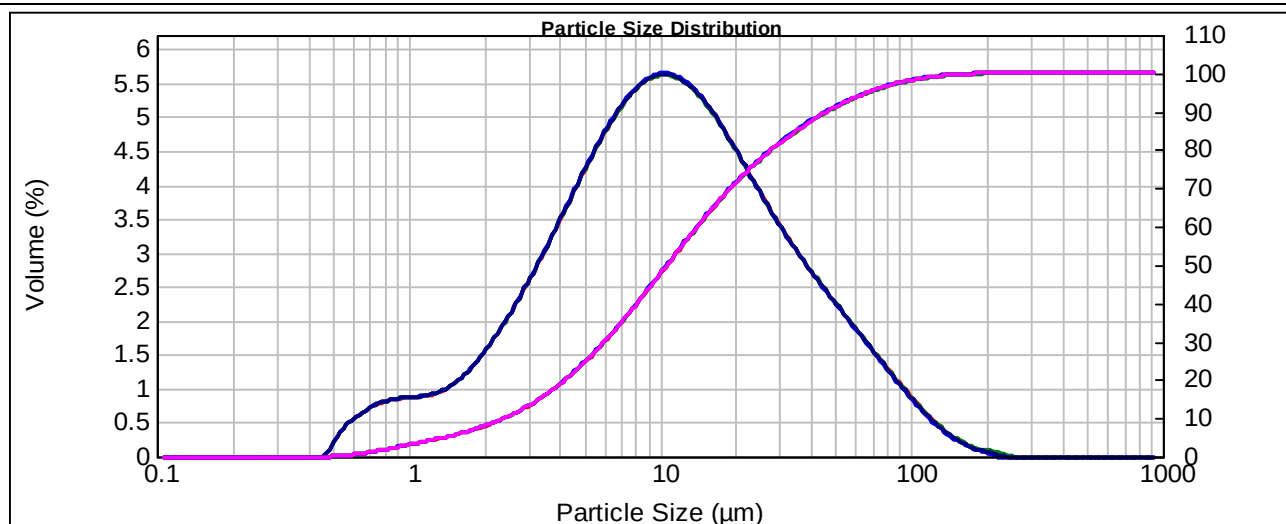
1.11 m²/g

Surface Weighted Mean D[3,2]:

5.429 um

Vol. Weighted Mean D[4,3]:

18.967 um

d(0.1): 2.409 um d(0.5): 10.682 um **d(0.8): 27.653 um** d(0.9): 46.108 um d(0.98): 95.35 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	1.18	10.965	3.37	52.481	1.24	251.189	0.00
0.110	0.00	0.525	0.26	2.512	1.32	12.023	3.32	57.544	1.13	275.423	0.00
0.120	0.00	0.575	0.33	2.754	1.48	13.183	3.24	63.096	1.02	301.995	0.00
0.132	0.00	0.631	0.39	3.020	1.64	14.454	3.14	69.183	0.91	331.131	0.00
0.145	0.00	0.692	0.45	3.311	1.82	15.849	3.02	75.858	0.79	363.078	0.00
0.158	0.00	0.759	0.49	3.631	1.99	17.378	2.88	83.176	0.68	398.107	0.00
0.174	0.00	0.832	0.51	3.981	2.17	19.055	2.73	91.201	0.57	436.516	0.00
0.191	0.00	0.912	0.52	4.365	2.36	20.893	2.57	100.000	0.47	478.630	0.00
0.209	0.00	1.000	0.53	4.786	2.54	22.909	2.41	109.648	0.37	524.807	0.00
0.229	0.00	1.096	0.53	5.248	2.71	25.119	2.26	120.226	0.29	575.440	0.00
0.251	0.00	1.202	0.55	5.754	2.87	27.542	2.11	131.826	0.21	630.957	0.00
0.275	0.00	1.318	0.59	6.310	3.02	30.200	1.97	144.544	0.15	691.831	0.00
0.302	0.00	1.445	0.64	6.918	3.15	33.113	1.84	158.489	0.10	758.578	0.00
0.331	0.00	1.585	0.72	7.586	3.25	36.308	1.71	173.780	0.06	831.764	0.00
0.363	0.00	1.738	0.81	8.318	3.33	39.811	1.59	190.546	0.04	912.011	0.00
0.398	0.00	1.905	0.92	9.120	3.37	43.652	1.47	208.930	0.02	1000.000	0.00
0.437	0.00	2.089	1.04	10.000	3.39	47.863	1.36	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P4

Measured by:

quentin

Measured:

Monday, November 03, 2014 7:24:57 AM

Sample Name:

WSB Bulk Final Concentrate - Average

Edited by:

quentin

Analysed:

Monday, November 03, 2014 7:24:58 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

12.36 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.215 %

Result Emulation:

Off

Concentration:

0.0210 %Vol

Span :

2.547

Uniformity:

0.793

Result units:

Volume

Specific Surface Area:

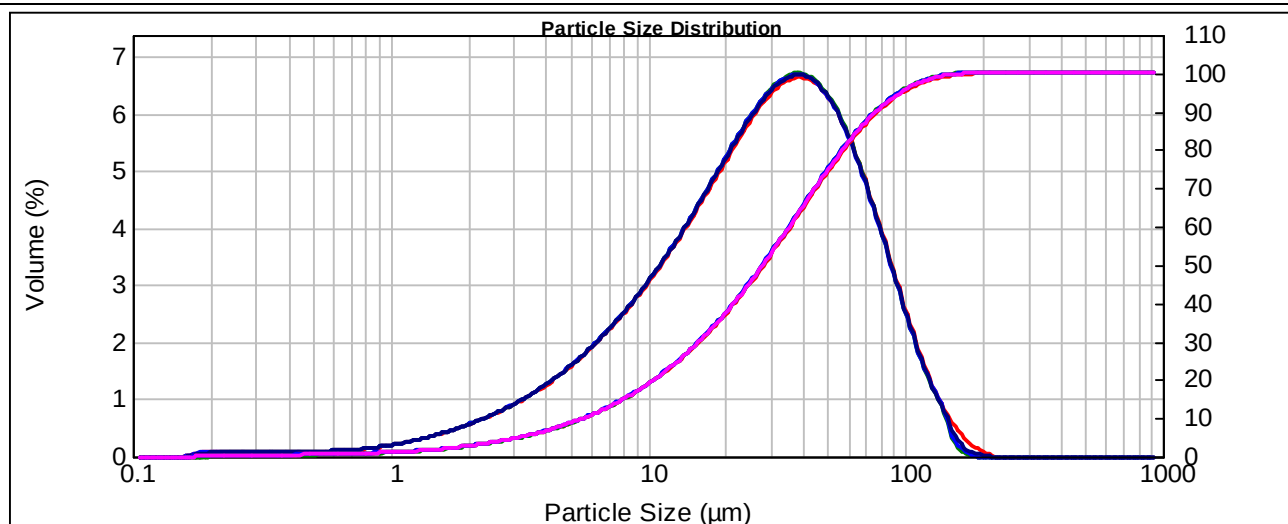
0.594 m²/g

Surface Weighted Mean D[3,2]:

10.108 um

Vol. Weighted Mean D[4,3]:

35.678 um

d(0.1): 5.619 um d(0.5): 27.972 um **d(0.8): 56.932 um** d(0.9): 76.852 um d(0.98): 117.43 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.06	2.291	0.42	10.965	2.06	52.481	3.61	251.189	0.00
0.110	0.00	0.525	0.06	2.512	0.47	12.023	2.22	57.544	3.37	275.423	0.00
0.120	0.00	0.575	0.06	2.754	0.52	13.183	2.39	63.096	3.09	301.995	0.00
0.132	0.00	0.631	0.07	3.020	0.58	14.454	2.57	69.183	2.77	331.131	0.00
0.145	0.00	0.692	0.07	3.311	0.64	15.849	2.75	75.858	2.43	363.078	0.00
0.158	0.00	0.759	0.08	3.631	0.71	17.378	2.94	83.176	2.06	398.107	0.00
0.174	0.03	0.832	0.10	3.981	0.78	19.055	3.13	91.201	1.71	436.516	0.00
0.191	0.04	0.912	0.11	4.365	0.87	20.893	3.31	100.000	1.37	478.630	0.00
0.209	0.05	1.000	0.13	4.786	0.95	22.909	3.49	109.648	1.04	524.807	0.00
0.229	0.05	1.096	0.15	5.248	1.05	25.119	3.65	120.226	0.77	575.440	0.00
0.251	0.05	1.202	0.17	5.754	1.15	27.542	3.80	131.826	0.54	630.957	0.00
0.275	0.05	1.318	0.20	6.310	1.26	30.200	3.91	144.544	0.29	691.831	0.00
0.302	0.05	1.445	0.23	6.918	1.37	33.113	3.98	158.489	0.10	758.578	0.00
0.331	0.05	1.585	0.26	7.586	1.49	36.308	4.02	173.780	0.04	831.764	0.00
0.363	0.05	1.738	0.30	8.318	1.62	39.811	4.00	190.546	0.02	912.011	0.00
0.398	0.05	1.905	0.34	9.120	1.76	43.652	3.93	208.930	0.00	1000.000	0.00
0.437	0.05	2.089	0.38	10.000	1.91	47.863	3.79	229.087	0.00		
0.479	0.05	2.291		10.965		52.481		251.189	0.00		

Operator notes:

TABLE III-56
SCREEN ANALYSIS
KM4420-P5 WSA - Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	4.30	95.7
65 Mesh	212	10.30	85.4
100 Mesh	150	13.50	71.9
150 Mesh	106	13.10	58.8
200 Mesh	75	9.90	48.9
270 Mesh	53	7.40	41.5
400 Mesh	38	6.50	35.0
TOTAL		100.00	**

K80= 186 μm

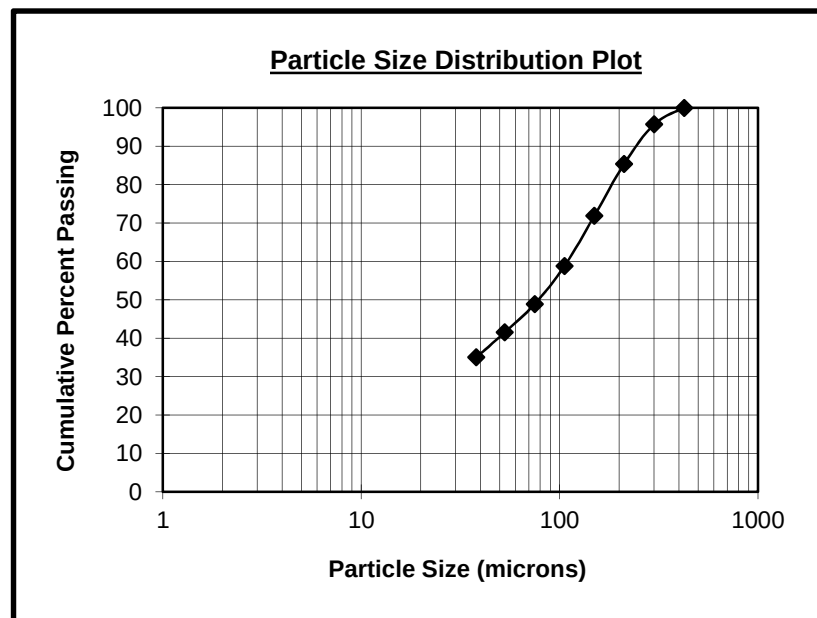
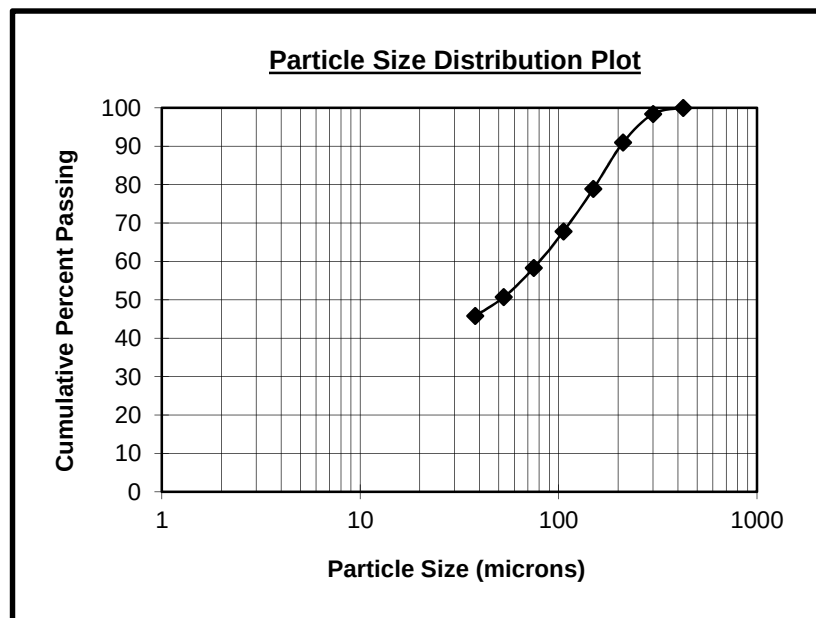


TABLE III-57
SCREEN ANALYSIS
KM4420-P5 WSA Bulk Rougher Concentrate

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.60	98.4
65 Mesh	212	7.40	91.0
100 Mesh	150	12.10	78.9
150 Mesh	106	11.10	67.8
200 Mesh	75	9.50	58.3
270 Mesh	53	7.60	50.7
400 Mesh	38	4.90	45.8
TOTAL		100.00	**

K80= 155 μm



Result Analysis Report

Project and Test number:

KM4420-P5

Measured by:

quentin

Measured:

Monday, November 03, 2014 7:49:08 AM

Sample Name:

WSA Bulk Regrind Discharge - Average

Edited by:

quentin

Analysed:

Monday, November 03, 2014 7:49:09 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

12.01 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.580 %

Result Emulation:

Off

Concentration:

0.0131 %Vol

Span :

8.007

Uniformity:

2.45

Result units:

Volume

Specific Surface Area:

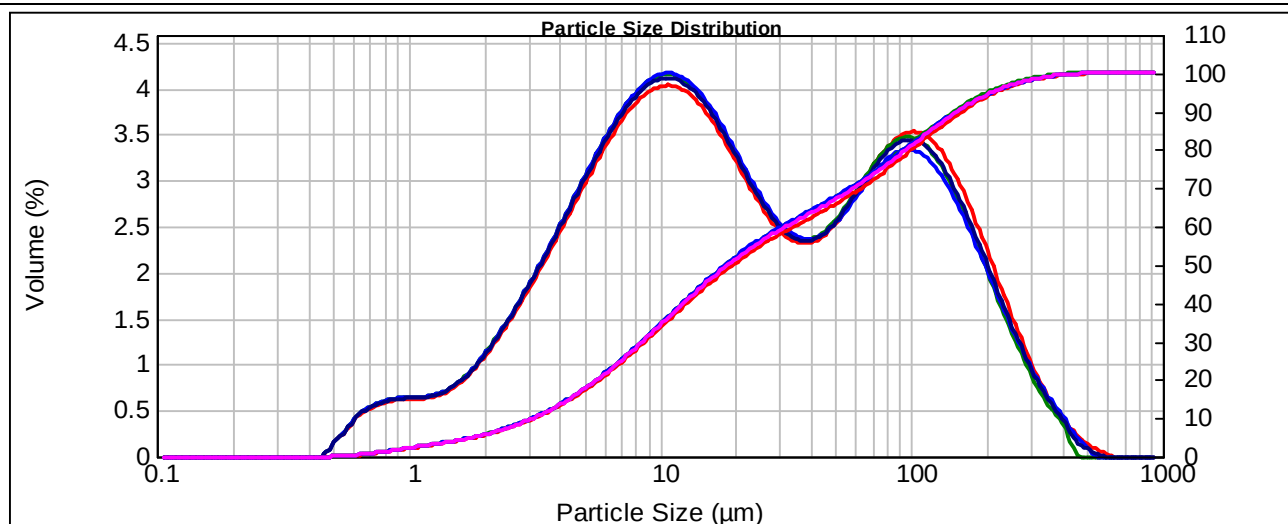
0.81 m²/g

Surface Weighted Mean D[3,2]:

7.407 um

Vol. Weighted Mean D[4,3]:

53.416 um

d(0.1): 3.125 um d(0.5): 18.606 um **d(0.8): 95.163 um** d(0.9): 152.104 um d(0.98): 280.98 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.09	2.291	0.84	10.965	2.47	52.481	1.62	251.189	0.78
0.110	0.00	0.525	0.15	2.512	0.95	12.023	2.44	57.544	1.71	275.423	0.63
0.120	0.00	0.575	0.24	2.754	1.06	13.183	2.38	63.096	1.82	301.995	0.50
0.132	0.00	0.631	0.30	3.020	1.18	14.454	2.30	69.183	1.91	331.131	0.38
0.145	0.00	0.692	0.36	3.311	1.30	15.849	2.21	75.858	1.99	363.078	0.30
0.158	0.00	0.759	0.36	3.631	1.42	17.378	2.09	83.176	2.04	398.107	0.19
0.174	0.00	0.832	0.37	3.981	1.55	19.055	1.97	91.201	2.07	436.516	0.09
0.191	0.00	0.912	0.38	4.365	1.68	20.893	1.85	100.000	2.07	478.630	0.05
0.209	0.00	1.000	0.38	4.786	1.81	22.909	1.73	109.648	2.03	524.807	0.01
0.229	0.00	1.096	0.38	5.248	1.93	25.119	1.62	120.226	1.96	575.440	0.00
0.251	0.00	1.202	0.40	5.754	2.06	27.542	1.53	131.826	1.86	630.957	0.00
0.275	0.00	1.318	0.42	6.310	2.17	30.200	1.46	144.544	1.73	691.831	0.00
0.302	0.00	1.445	0.46	6.918	2.26	33.113	1.41	158.489	1.59	758.578	0.00
0.331	0.00	1.585	0.51	7.586	2.35	36.308	1.42	173.780	1.43	831.764	0.00
0.363	0.00	1.738	0.58	8.318	2.41	39.811	1.42	190.546	1.27	912.011	0.00
0.398	0.00	1.905	0.66	9.120	2.46	43.652	1.47	208.930	1.10	1000.000	0.00
0.437	0.00	2.089	0.75	10.000	2.48	47.863	1.53	229.087	0.93		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P5

Measured by:

quentin

Measured:

Monday, November 03, 2014 7:39:57 AM

Sample Name:

WSA Bulk Cleaner Scavenger Feed

Edited by:

quentin

Analysed:

Monday, November 03, 2014 7:39:59 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

18.43 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.711 %

Result Emulation:

Off

Concentration:

0.0143 %Vol

Span :

4.850

Uniformity:

2.1

Result units:

Volume

Specific Surface Area:

1.18 m²/g

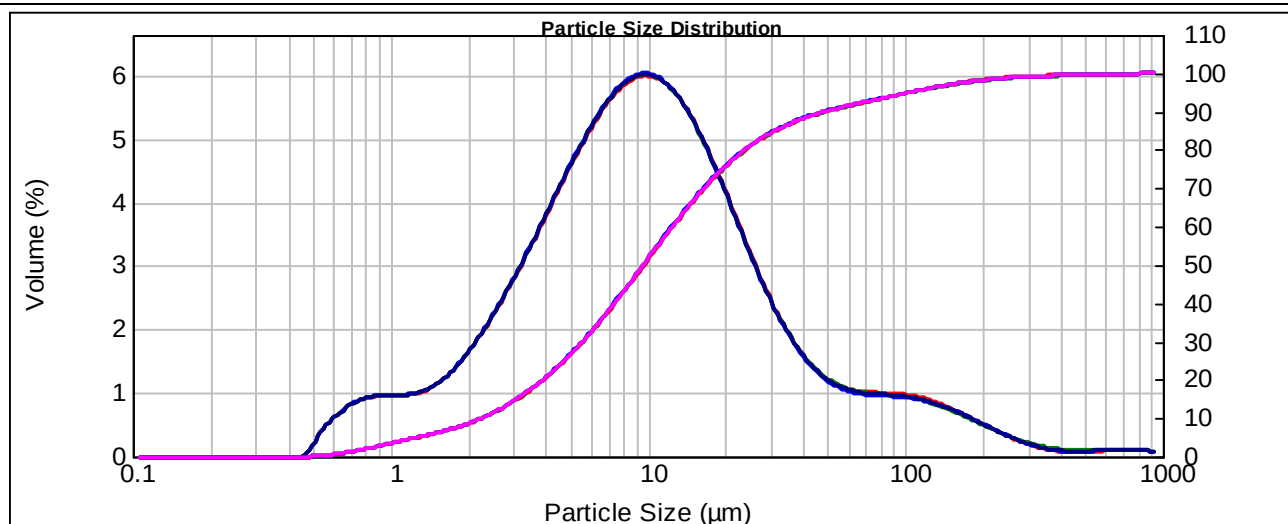
Surface Weighted Mean D[3,2]:

5.078 um

Vol. Weighted Mean D[4,3]:

25.045 um

d(0.1): 2.258 um d(0.5): 9.613 um **d(0.8): 23.774 um** d(0.9): 48.878 um d(0.98): 184.85 um



Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.11	2.291	1.26	10.965	3.56	52.481	0.67	251.189	0.17
0.110	0.00	0.525	0.28	2.512	1.42	12.023	3.46	57.544	0.63	275.423	0.13
0.120	0.00	0.575	0.37	2.754	1.60	13.183	3.33	63.096	0.61	301.995	0.10
0.132	0.00	0.631	0.45	3.020	1.78	14.454	3.16	69.183	0.60	331.131	0.08
0.145	0.00	0.692	0.51	3.311	1.97	15.849	2.97	75.858	0.59	363.078	0.06
0.158	0.00	0.759	0.55	3.631	2.17	17.378	2.74	83.176	0.58	398.107	0.05
0.174	0.00	0.832	0.57	3.981	2.36	19.055	2.51	91.201	0.58	436.516	0.05
0.191	0.00	0.912	0.58	4.365	2.56	20.893	2.27	100.000	0.56	478.630	0.05
0.209	0.00	1.000	0.58	4.786	2.76	22.909	2.02	109.648	0.54	524.807	0.06
0.229	0.00	1.096	0.58	5.248	2.95	25.119	1.79	120.226	0.52	575.440	0.06
0.251	0.00	1.202	0.60	5.754	3.12	27.542	1.57	131.826	0.48	630.957	0.07
0.275	0.00	1.318	0.63	6.310	3.28	30.200	1.37	144.544	0.44	691.831	0.07
0.302	0.00	1.445	0.68	6.918	3.41	33.113	1.19	158.489	0.40	758.578	0.07
0.331	0.00	1.585	0.76	7.586	3.52	36.308	1.03	173.780	0.35	831.764	0.06
0.363	0.00	1.738	0.86	8.318	3.58	39.811	0.90	190.546	0.31	912.011	0.02
0.398	0.00	1.905	0.98	9.120	3.62	43.652	0.80	208.930	0.26	1000.000	
0.437	0.00	2.089	1.11	10.000	3.61	47.863	0.72	229.087	0.21		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P5

Measured by:

quentin

Measured:

Monday, November 03, 2014 7:58:08 AM

Sample Name:

WSA Bulk Final Concentrate - Average

Edited by:

quentin

Analysed:

Monday, November 03, 2014 7:58:09 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

17.27 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.327 %

Result Emulation:

Off

Concentration:

0.0380 %Vol

Span :

2.623

Uniformity:

0.821

Result units:

Volume

Specific Surface Area:

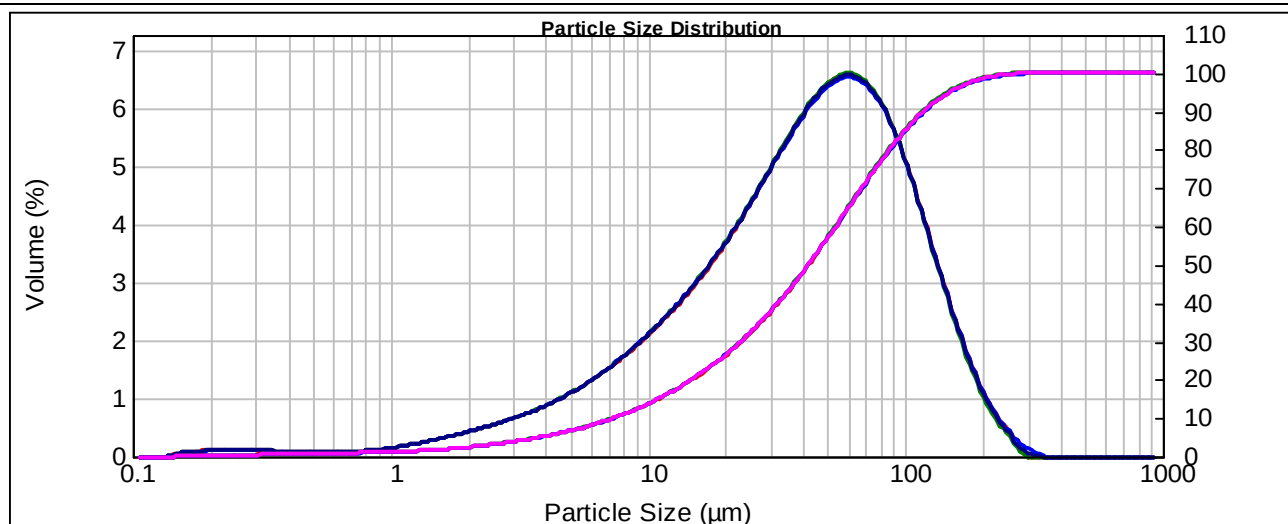
0.553 m²/g

Surface Weighted Mean D[3,2]:

10.853 um

Vol. Weighted Mean D[4,3]:

54.088 um

d(0.1): 7.321 um d(0.5): 42.016 um **d(0.8): 86.637 um** d(0.9): 117.513 um d(0.98): 184.12 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.05	2.291	0.31	10.965	1.42	52.481	3.93	251.189	0.18
0.110	0.00	0.525	0.05	2.512	0.34	12.023	1.53	57.544	3.95	275.423	0.05
0.120	0.00	0.575	0.05	2.754	0.38	13.183	1.65	63.096	3.92	301.995	0.02
0.132	0.00	0.631	0.05	3.020	0.42	14.454	1.78	69.183	3.83	331.131	0.00
0.145	0.00	0.692	0.05	3.311	0.46	15.849	1.91	75.858	3.69	363.078	0.00
0.158	0.04	0.759	0.06	3.631	0.50	17.378	2.06	83.176	3.47	398.107	0.00
0.174	0.06	0.832	0.07	3.981	0.55	19.055	2.21	91.201	3.22	436.516	0.00
0.191	0.06	0.912	0.08	4.365	0.60	20.893	2.37	100.000	2.91	478.630	0.00
0.209	0.06	1.000	0.10	4.786	0.66	22.909	2.54	109.648	2.72	524.807	0.00
0.229	0.06	1.096	0.11	5.248	0.72	25.119	2.72	120.226	2.57	575.440	0.00
0.251	0.07	1.202	0.13	5.754	0.79	27.542	2.90	131.826	2.22	630.957	0.00
0.275	0.07	1.318	0.15	6.310	0.86	30.200	3.09	144.544	1.86	691.831	0.00
0.302	0.07	1.445	0.18	6.918	0.94	33.113	3.27	158.489	1.51	758.578	0.00
0.331	0.06	1.585	0.20	7.586	1.02	36.308	3.45	173.780	1.20	831.764	0.00
0.363	0.06	1.738	0.23	8.318	1.11	39.811	3.61	190.546	0.92	912.011	0.00
0.398	0.05	1.905	0.25	9.120	1.21	43.652	3.75	208.930	0.67	1000.000	0.00
0.437	0.05	2.089	0.28	10.000	1.31	47.863	3.86	229.087	0.47		
0.479	0.05	2.291		10.965		52.481		251.189	0.32		

Operator notes:

TABLE III-61
SCREEN ANALYSIS
KM4420-P6 WSA Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.20	98.8
65 Mesh	212	13.20	85.6
100 Mesh	150	16.10	69.5
150 Mesh	106	15.90	53.6
200 Mesh	75	11.80	41.8
270 Mesh	53	7.80	34.0
400 Mesh	38	5.30	28.7
TOTAL		100.00	**

K80= 189 μm

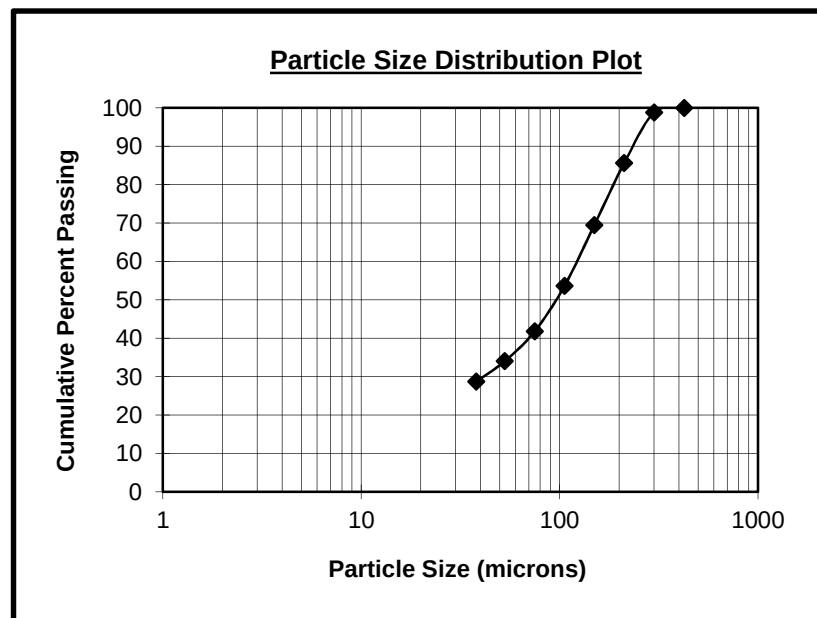
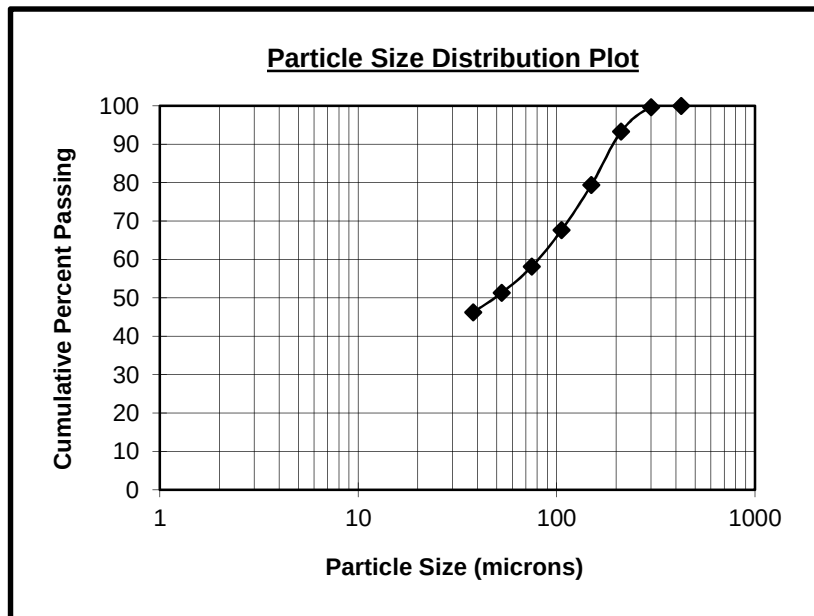


TABLE III-62
SCREEN ANALYSIS
KM4420-P6 WSA Bulk Rougher Concentrate

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.40	99.6
65 Mesh	212	6.30	93.3
100 Mesh	150	13.90	79.4
150 Mesh	106	11.80	67.6
200 Mesh	75	9.50	58.1
270 Mesh	53	6.80	51.3
400 Mesh	38	5.10	46.2
TOTAL		100.00	**

K80= 152 μm



Result Analysis Report

Project and Test number:

KM4420-P6

Measured by:

tristan

Measured:

Tuesday, November 04, 2014 4:04:14 PM

Sample Name:

WSA Bulk Re grind Discharge - Average

Edited by:

tristan

Analysed:

Tuesday, November 04, 2014 4:04:15 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

14.00 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.730 %

Result Emulation:

Off

Concentration:

0.0124 %Vol

Span :

4.410

Uniformity:

1.41

Result units:

Volume

Specific Surface Area:

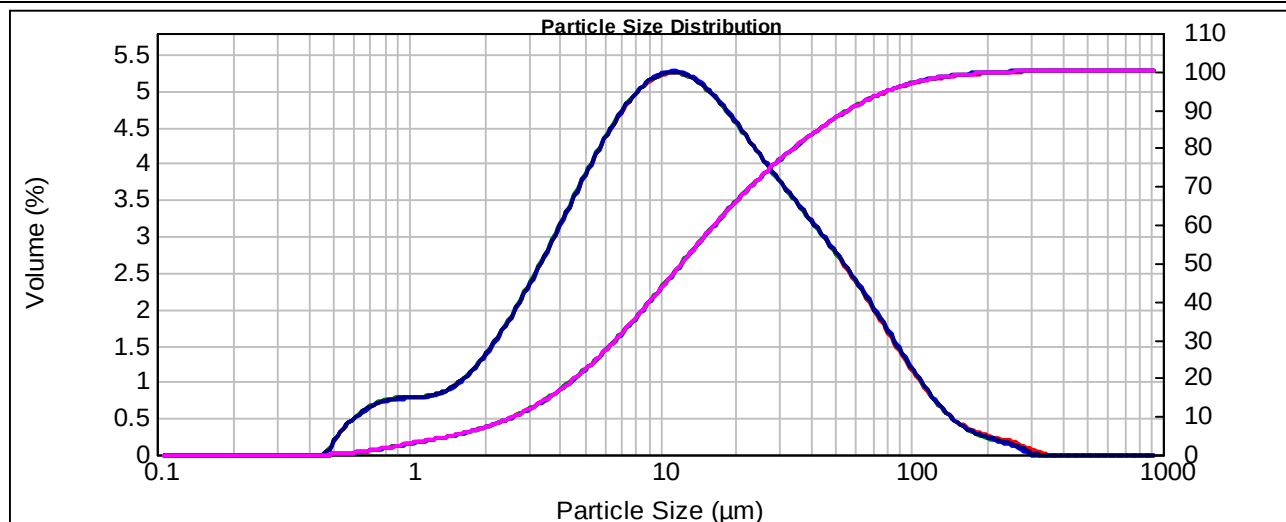
1.01 m²/g

Surface Weighted Mean D[3,2]:

5.947 um

Vol. Weighted Mean D[4,3]:

23.084 um

d(0.1): 2.644 um d(0.5): 12.255 um **d(0.8): 34.157 um** d(0.9): 56.682 um d(0.98): 118.07 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.09	2.291	1.04	10.965	3.16	52.481	1.55	251.189	0.08
0.110	0.00	0.525	0.22	2.512	1.18	12.023	3.14	57.544	1.44	275.423	0.03
0.120	0.00	0.575	0.29	2.754	1.33	13.183	3.10	63.096	1.31	301.995	0.00
0.132	0.00	0.631	0.36	3.020	1.48	14.454	3.04	69.183	1.18	331.131	0.00
0.145	0.00	0.692	0.41	3.311	1.64	15.849	2.95	75.858	1.05	363.078	0.00
0.158	0.00	0.759	0.44	3.631	1.80	17.378	2.86	83.176	0.91	398.107	0.00
0.174	0.00	0.832	0.46	3.981	1.97	19.055	2.75	91.201	0.78	436.516	0.00
0.191	0.00	0.912	0.47	4.365	2.14	20.893	2.64	100.000	0.65	478.630	0.00
0.209	0.00	1.000	0.47	4.786	2.30	22.909	2.53	109.648	0.54	524.807	0.00
0.229	0.00	1.096	0.48	5.248	2.46	25.119	2.42	120.226	0.43	575.440	0.00
0.251	0.00	1.202	0.49	5.754	2.61	27.542	2.31	131.826	0.34	630.957	0.00
0.275	0.00	1.318	0.52	6.310	2.75	30.200	2.20	144.544	0.27	691.831	0.00
0.302	0.00	1.445	0.56	6.918	2.87	33.113	2.09	158.489	0.22	758.578	0.00
0.331	0.00	1.585	0.63	7.586	2.98	36.308	1.99	173.780	0.17	831.764	0.00
0.363	0.00	1.738	0.71	8.318	3.06	39.811	1.88	190.546	0.14	912.011	0.00
0.398	0.00	1.905	0.81	9.120	3.12	43.652	1.78	208.930	0.12	1000.000	0.00
0.437	0.00	2.089	0.92	10.000	3.15	47.863	1.67	229.087	0.09		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P6

Measured by:

tristan

Measured:

Tuesday, November 04, 2014 4:10:28 PM

Sample Name:

WSA Bulk Final Concentrate - Average

Edited by:

tristan

Analysed:

Tuesday, November 04, 2014 4:10:30 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

12.50 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.199 %

Result Emulation:

Off

Concentration:

0.0218 %Vol

Span :

2.739

Uniformity:

0.861

Result units:

Volume

Specific Surface Area:

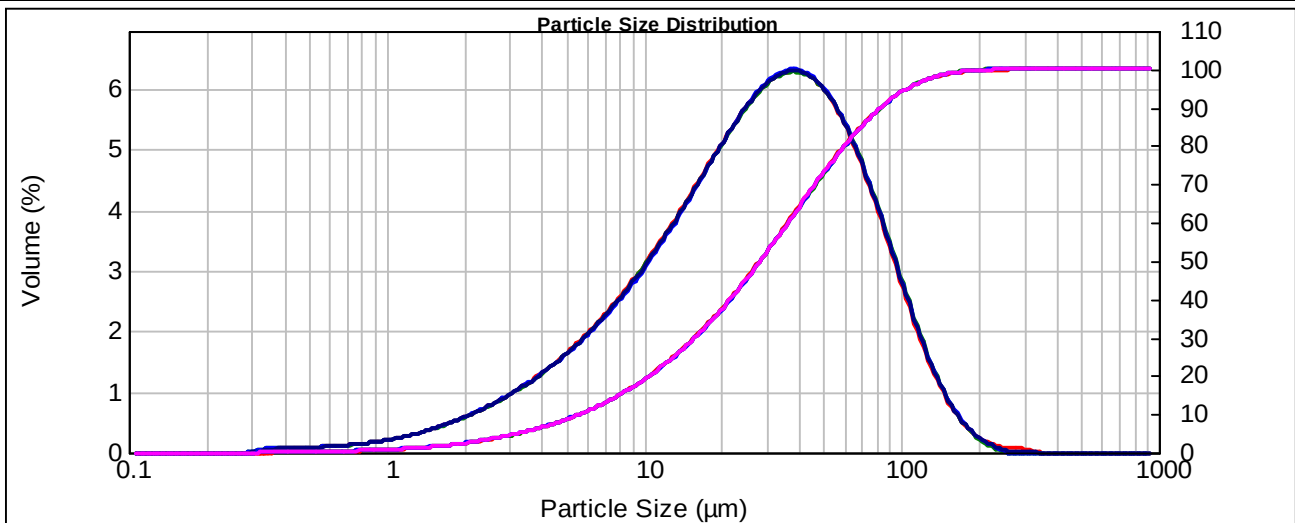
0.514 m²/g

Surface Weighted Mean D[3,2]:

11.679 um

Vol. Weighted Mean D[4,3]:

37.943 um

d(0.1): 5.630 um d(0.5): 28.324 um **d(0.8): 60.162 um** d(0.9): 83.198 um d(0.98): 134.22 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.05	2.291	0.44	10.965	2.06	52.481	3.46	251.189	0.01
0.110	0.00	0.525	0.06	2.512	0.49	12.023	2.22	57.544	3.28	275.423	0.01
0.120	0.00	0.575	0.06	2.754	0.55	13.183	2.38	63.096	3.04	301.995	0.01
0.132	0.00	0.631	0.07	3.020	0.61	14.454	2.55	69.183	2.78	331.131	0.00
0.145	0.00	0.692	0.08	3.311	0.67	15.849	2.72	75.858	2.50	363.078	0.00
0.158	0.00	0.759	0.09	3.631	0.74	17.378	2.89	83.176	2.18	398.107	0.00
0.174	0.00	0.832	0.10	3.981	0.82	19.055	3.05	91.201	1.87	436.516	0.00
0.191	0.00	0.912	0.11	4.365	0.90	20.893	3.22	100.000	1.56	478.630	0.00
0.209	0.00	1.000	0.13	4.786	0.98	22.909	3.37	109.648	1.25	524.807	0.00
0.229	0.00	1.096	0.15	5.248	1.07	25.119	3.51	120.226	0.98	575.440	0.00
0.251	0.00	1.202	0.17	5.754	1.17	27.542	3.62	131.826	0.73	630.957	0.00
0.275	0.00	1.318	0.20	6.310	1.28	30.200	3.72	144.544	0.52	691.831	0.00
0.302	0.01	1.445	0.23	6.918	1.39	33.113	3.77	158.489	0.36	758.578	0.00
0.331	0.03	1.585	0.27	7.586	1.51	36.308	3.80	173.780	0.24	831.764	0.00
0.363	0.04	1.738	0.31	8.318	1.64	39.811	3.78	190.546	0.14	912.011	0.00
0.398	0.04	1.905	0.35	9.120	1.77	43.652	3.72	208.930	0.09	1000.000	0.00
0.437	0.05	2.089	0.39	10.000	1.92	47.863	3.61	229.087	0.05		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

TABLE III-65
SCREEN ANALYSIS
KM4420-P7 WSA Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.20	98.8
65 Mesh	212	10.20	88.6
100 Mesh	150	12.40	76.2
150 Mesh	106	13.30	62.9
200 Mesh	75	10.50	52.4
270 Mesh	53	8.40	44.0
400 Mesh	38	6.00	38.0
TOTAL		100.00	**

K80= 168 μm

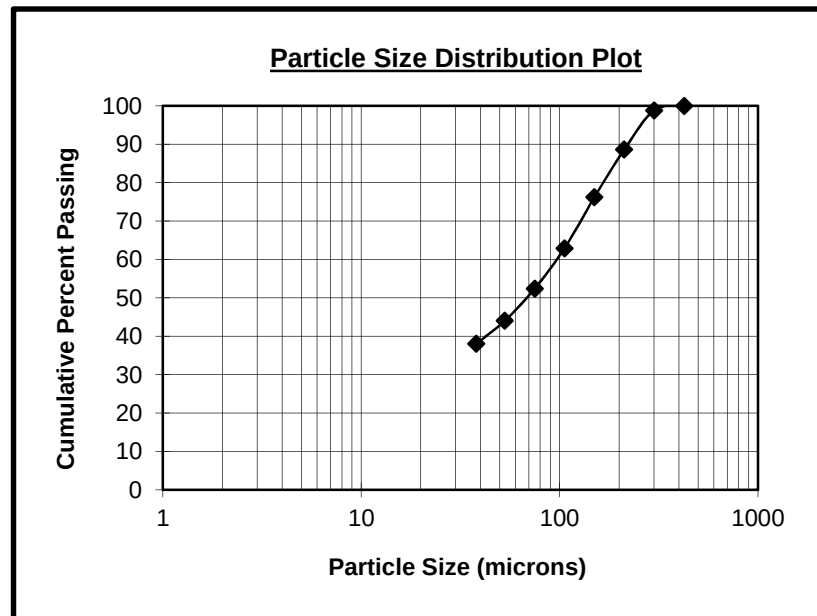
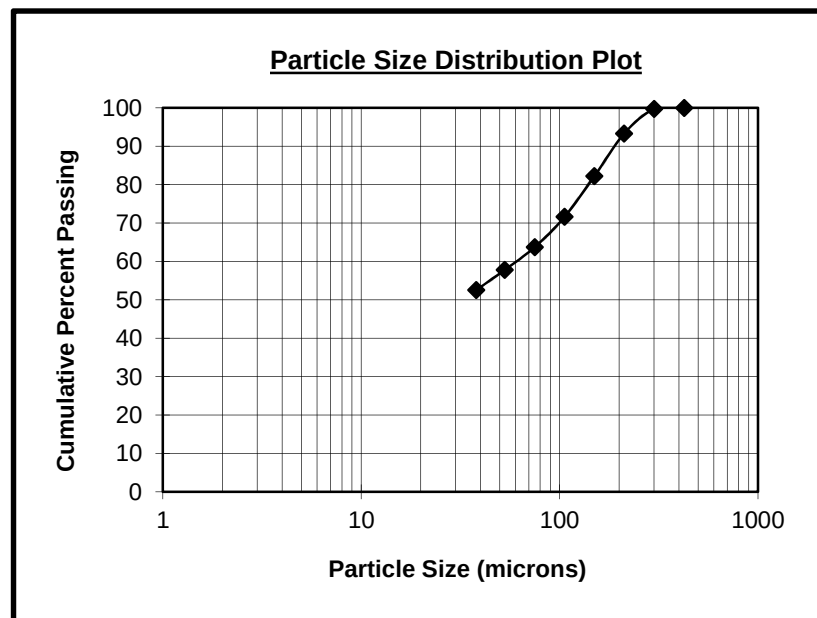


TABLE III-66
SCREEN ANALYSIS
KM4420-P7 WSA Bulk Rougher Concentrate

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.30	99.7
65 Mesh	212	6.40	93.3
100 Mesh	150	11.10	82.2
150 Mesh	106	10.60	71.6
200 Mesh	75	7.90	63.7
270 Mesh	53	5.90	57.8
400 Mesh	38	5.30	52.5
TOTAL		100.00	**

K80= 140 μm



Result Analysis Report

Project and Test number:

KM4420-P7

Measured by:

tristan

Measured:

Wednesday, November 05, 2014 8:49:34 AM

Sample Name:

WSA Bulk Re grind Discharge - Average

Edited by:

tristan

Analysed:

Wednesday, November 05, 2014 8:49:35 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

15.02 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

1.202 %

Result Emulation:

Off

Concentration:

0.0128 %Vol

Span :

4.332

Uniformity:

1.37

Result units:

Volume

Specific Surface Area:

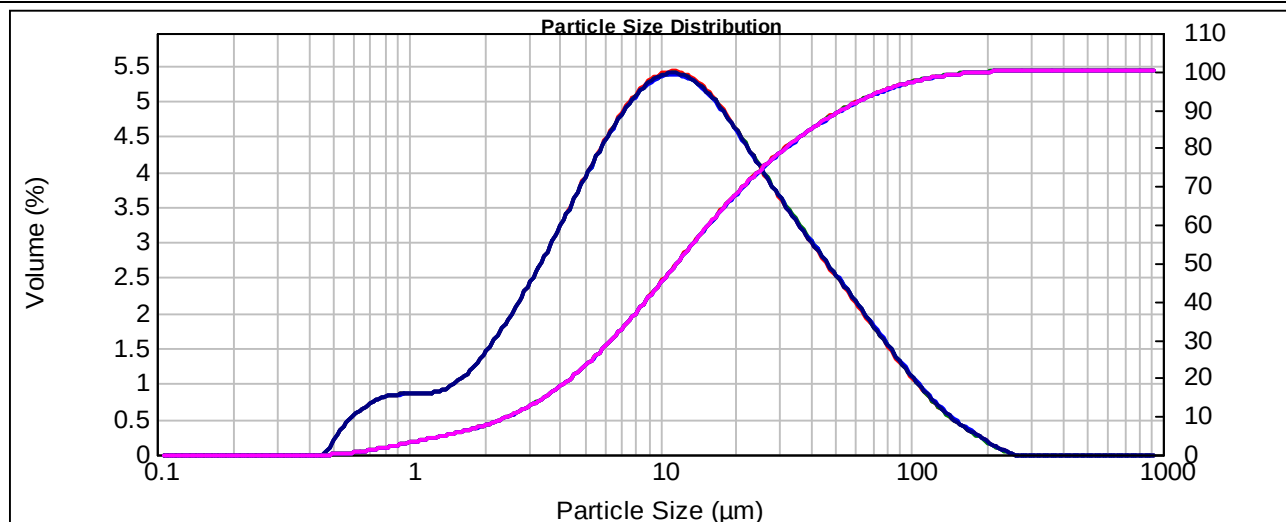
1.06 m²/g

Surface Weighted Mean D[3,2]:

5.678 um

Vol. Weighted Mean D[4,3]:

21.617 um

d(0.1): 2.507 um d(0.5): 11.704 um **d(0.8): 31.681 um** d(0.9): 53.211 um d(0.98): 112.43 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	1.09	10.965	3.24	52.481	1.41	251.189	0.00
0.110	0.00	0.525	0.25	2.512	1.22	12.023	3.22	57.544	1.30	275.423	0.00
0.120	0.00	0.575	0.33	2.754	1.37	13.183	3.18	63.096	1.18	301.995	0.00
0.132	0.00	0.631	0.40	3.020	1.52	14.454	3.10	69.183	1.06	331.131	0.00
0.145	0.00	0.692	0.45	3.311	1.68	15.849	3.01	75.858	0.95	363.078	0.00
0.158	0.00	0.759	0.49	3.631	1.84	17.378	2.90	83.176	0.83	398.107	0.00
0.174	0.00	0.832	0.50	3.981	2.01	19.055	2.77	91.201	0.72	436.516	0.00
0.191	0.00	0.912	0.51	4.365	2.18	20.893	2.64	100.000	0.62	478.630	0.00
0.209	0.00	1.000	0.51	4.786	2.34	22.909	2.51	109.648	0.52	524.807	0.00
0.229	0.00	1.096	0.51	5.248	2.50	25.119	2.37	120.226	0.43	575.440	0.00
0.251	0.00	1.202	0.52	5.754	2.66	27.542	2.24	131.826	0.35	630.957	0.00
0.275	0.00	1.318	0.55	6.310	2.80	30.200	2.11	144.544	0.28	691.831	0.00
0.302	0.00	1.445	0.60	6.918	2.93	33.113	1.99	158.489	0.22	758.578	0.00
0.331	0.00	1.585	0.66	7.586	3.04	36.308	1.87	173.780	0.17	831.764	0.00
0.363	0.00	1.738	0.75	8.318	3.13	39.811	1.75	190.546	0.11	912.011	0.00
0.398	0.00	1.905	0.85	9.120	3.20	43.652	1.64	208.930	0.06	1000.000	0.00
0.437	0.00	2.089	0.96	10.000	3.24	47.863	1.53	229.087	0.02		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P7

Measured by:

Kevin

Measured:

Wednesday, November 05, 2014 10:20:49 AM

Sample Name:

WSA Bulk Final Concentrate - Average

Edited by:

Kevin

Analysed:

Wednesday, November 05, 2014 10:20:50 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

19.83 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.259 %

Result Emulation:

Off

Concentration:

0.0412 %Vol

Span :

2.836

Uniformity:

0.891

Result units:

Volume

Specific Surface Area:

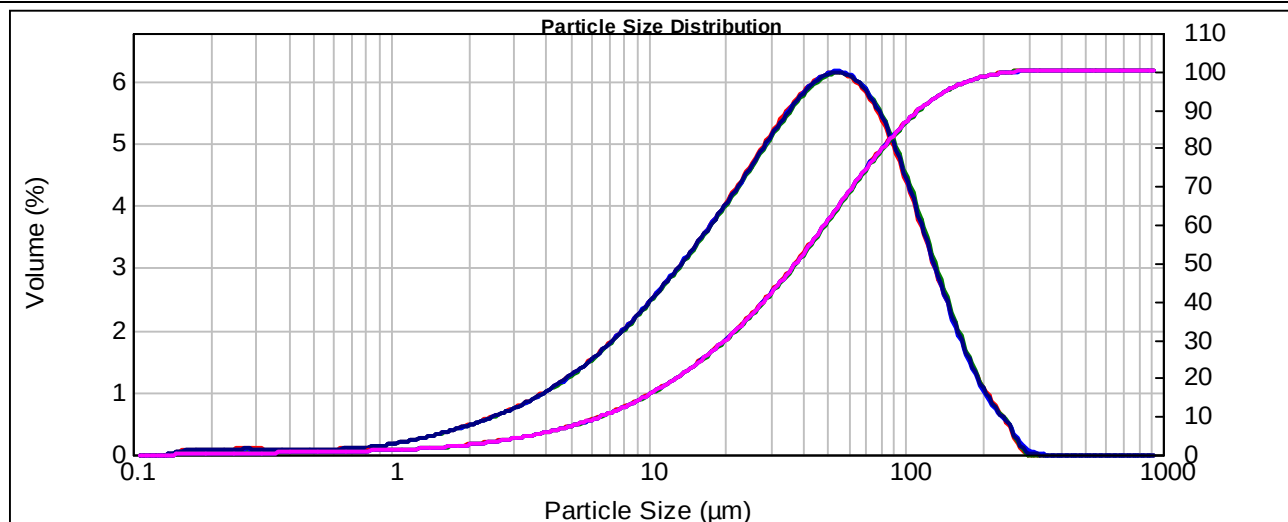
0.559 m²/g

Surface Weighted Mean D[3,2]:

10.740 um

Vol. Weighted Mean D[4,3]:

50.873 um

d(0.1): 6.602 um d(0.5): 37.674 um **d(0.8): 81.654 um** d(0.9): 113.440 um d(0.98): 184.99 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.05	2.291	0.35	10.965	1.63	52.481	3.69	251.189	0.21
0.110	0.00	0.525	0.05	2.512	0.39	12.023	1.75	57.544	3.67	275.423	0.04
0.120	0.00	0.575	0.05	2.754	0.43	13.183	1.87	63.096	3.60	301.995	0.01
0.132	0.00	0.631	0.06	3.020	0.47	14.454	2.00	69.183	3.48	331.131	0.00
0.145	0.00	0.692	0.06	3.311	0.52	15.849	2.13	75.858	3.31	363.078	0.00
0.158	0.03	0.759	0.07	3.631	0.57	17.378	2.27	83.176	3.09	398.107	0.00
0.174	0.04	0.832	0.08	3.981	0.63	19.055	2.41	91.201	2.84	436.516	0.00
0.191	0.05	0.912	0.09	4.365	0.69	20.893	2.55	100.000	2.56	478.630	0.00
0.209	0.05	1.000	0.11	4.786	0.76	22.909	2.70	109.648	2.25	524.807	0.00
0.229	0.05	1.096	0.12	5.248	0.83	25.119	2.85	120.226	1.94	575.440	0.00
0.251	0.06	1.202	0.14	5.754	0.91	27.542	3.01	131.826	1.64	630.957	0.00
0.275	0.06	1.318	0.17	6.310	1.00	30.200	3.16	144.544	1.35	691.831	0.00
0.302	0.06	1.445	0.19	6.918	1.09	33.113	3.30	158.489	1.09	758.578	0.00
0.331	0.05	1.585	0.22	7.586	1.19	36.308	3.43	173.780	0.85	831.764	0.00
0.363	0.05	1.738	0.25	8.318	1.29	39.811	3.54	190.546	0.65	912.011	0.00
0.398	0.05	1.905	0.28	9.120	1.40	43.652	3.62	208.930	0.49	1000.000	0.00
0.437	0.05	2.089	0.31	10.000	1.51	47.863	3.68	229.087	0.36		
0.479	0.05	2.291		10.965		52.481		251.189			

Operator notes:

TABLE III-69
SCREEN ANALYSIS
KM4420-P7 WSB Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.40	98.6
65 Mesh	212	9.30	89.3
100 Mesh	150	14.60	74.7
150 Mesh	106	13.40	61.3
200 Mesh	75	11.10	50.2
270 Mesh	53	8.10	42.1
400 Mesh	38	6.40	35.7
TOTAL		100.00	**

K80= 171 μm

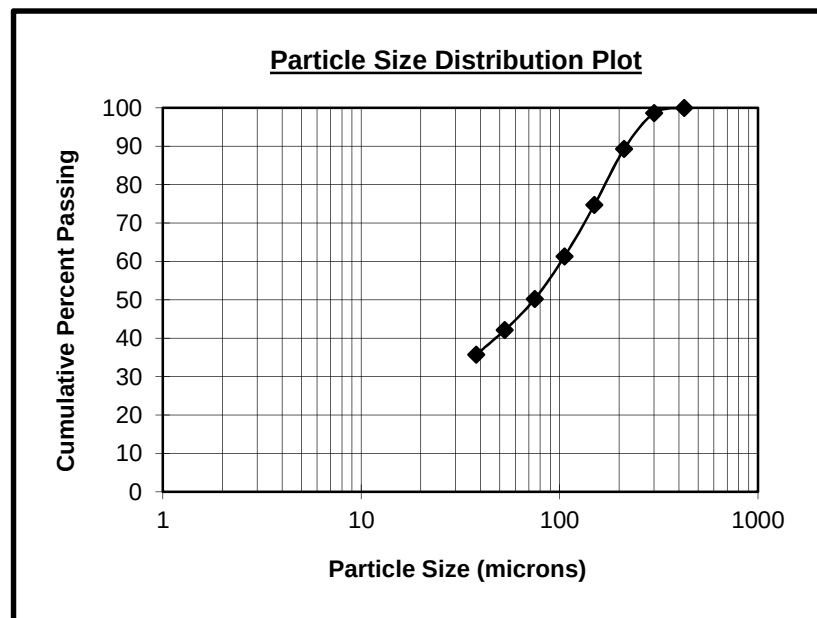
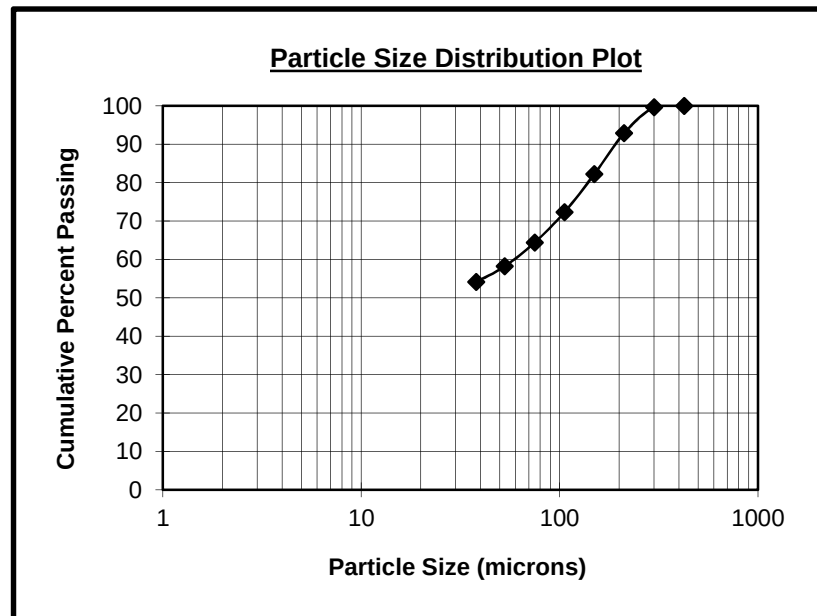


TABLE III-70
SCREEN ANALYSIS
KM4420-P7 WSB Bulk Rougher Concentrate

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.40	99.6
65 Mesh	212	6.70	92.9
100 Mesh	150	10.70	82.2
150 Mesh	106	9.90	72.3
200 Mesh	75	7.90	64.4
270 Mesh	53	6.20	58.2
400 Mesh	38	4.10	54.1
TOTAL		100.00	**

K80= 139 μm



Result Analysis Report

Project and Test number:

KM4420-P7

Measured by:

quentin

Measured:

Thursday, November 06, 2014 12:43:38 PM

Sample Name:

WSB Bulk Re grind Discharge - Average

Edited by:

quentin

Analysed:

Thursday, November 06, 2014 12:43:39 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

12.22 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.617 %

Result Emulation:

Off

Concentration:

0.0107 %Vol

Span :

4.154

Uniformity:

1.27

Result units:

Volume

Specific Surface Area:

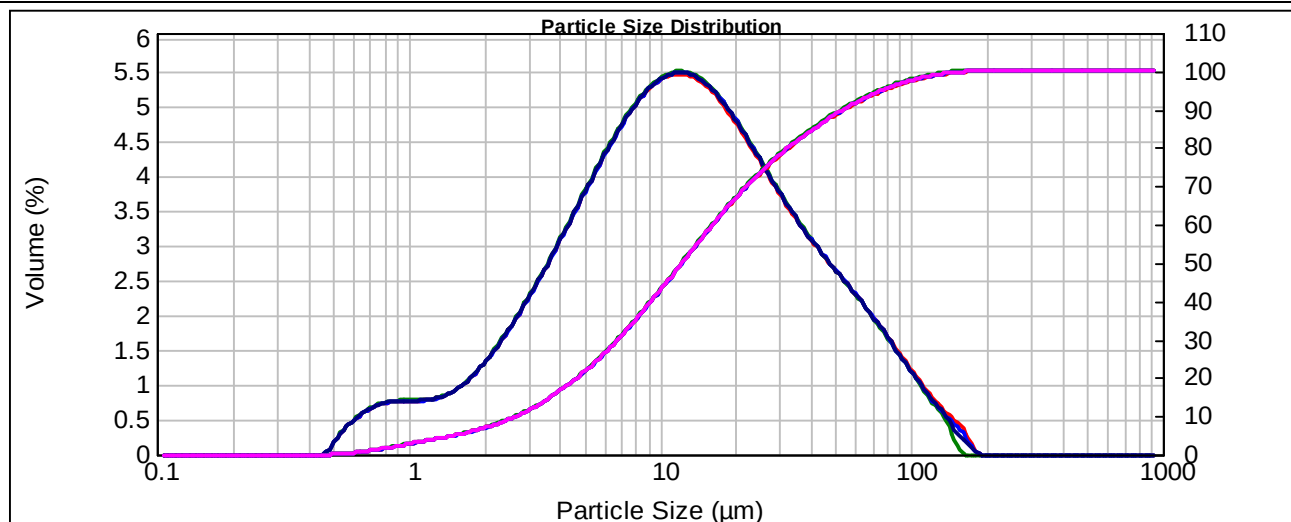
1.01 m²/g

Surface Weighted Mean D[3,2]:

5.969 um

Vol. Weighted Mean D[4,3]:

21.415 um

d(0.1): 2.678 um d(0.5): 12.226 um **d(0.8): 32.242 um** d(0.9): 53.461 um d(0.98): 103.68 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.08	2.291	1.02	10.965	3.31	52.481	1.49	251.189	0.00
0.110	0.00	0.525	0.22	2.512	1.15	12.023	3.31	57.544	1.38	275.423	0.00
0.120	0.00	0.575	0.29	2.754	1.29	13.183	3.28	63.096	1.27	301.995	0.00
0.132	0.00	0.631	0.36	3.020	1.44	14.454	3.22	69.183	1.16	331.131	0.00
0.145	0.00	0.692	0.41	3.311	1.60	15.849	3.13	75.858	1.04	363.078	0.00
0.158	0.00	0.759	0.45	3.631	1.76	17.378	3.03	83.176	0.91	398.107	0.00
0.174	0.00	0.832	0.46	3.981	1.93	19.055	2.90	91.201	0.79	436.516	0.00
0.191	0.00	0.912	0.47	4.365	2.10	20.893	2.76	100.000	0.66	478.630	0.00
0.209	0.00	1.000	0.47	4.786	2.27	22.909	2.62	109.648	0.53	524.807	0.00
0.229	0.00	1.096	0.47	5.248	2.43	25.119	2.47	120.226	0.43	575.440	0.00
0.251	0.00	1.202	0.48	5.754	2.60	27.542	2.32	131.826	0.34	630.957	0.00
0.275	0.00	1.318	0.51	6.310	2.75	30.200	2.18	144.544	0.18	691.831	0.00
0.302	0.00	1.445	0.55	6.918	2.90	33.113	2.05	158.489	0.11	758.578	0.00
0.331	0.00	1.585	0.61	7.586	3.03	36.308	1.92	173.780	0.02	831.764	0.00
0.363	0.00	1.738	0.69	8.318	3.13	39.811	1.81	190.546	0.00	912.011	0.00
0.398	0.00	1.905	0.79	9.120	3.22	43.652	1.70	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	0.90	10.000	3.28	47.863	1.59	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P7

Measured by:

quentin

Measured:

Thursday, November 06, 2014 1:08:18 PM

Sample Name:

WSB Bulk Final Concentrate - Average

Edited by:

quentin

Analysed:

Thursday, November 06, 2014 1:08:19 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

12.15 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.261 %

Result Emulation:

Off

Concentration:

0.0245 %Vol

Span :

2.739

Uniformity:

0.864

Result units:

Volume

Specific Surface Area:

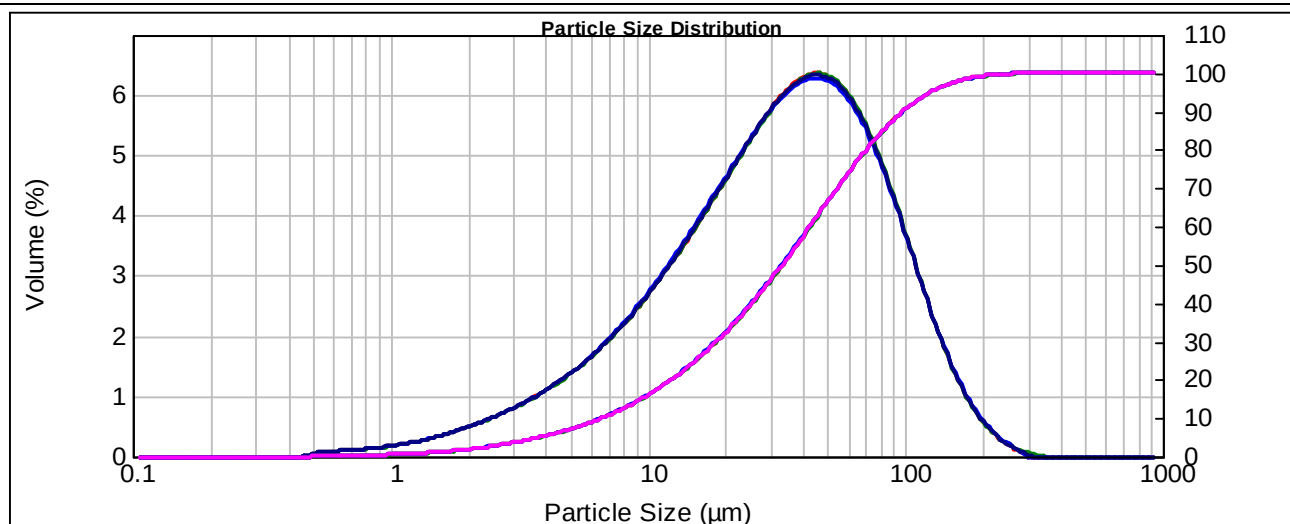
0.43 m²/g

Surface Weighted Mean D[3,2]:

13.958 um

Vol. Weighted Mean D[4,3]:

44.544 um

d(0.1): 6.591 um d(0.5): 33.209 um **d(0.8): 70.452 um** d(0.9): 97.556 um d(0.98): 159.57 um


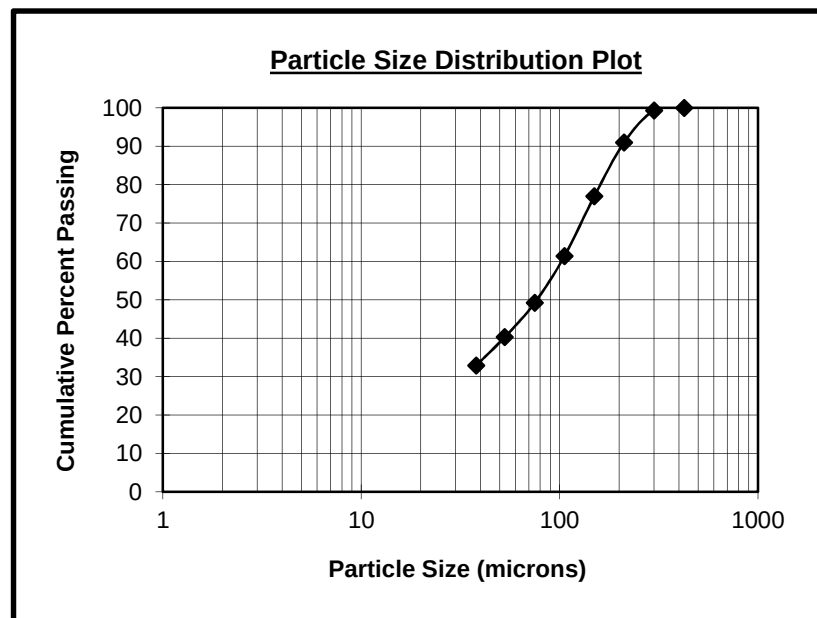
Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.03	2.291	0.37	10.965	1.82	52.481	3.71	251.189	0.10
0.110	0.00	0.525	0.05	2.512	0.42	12.023	1.97	57.544	3.59	275.423	0.03
0.120	0.00	0.575	0.05	2.754	0.46	13.183	2.12	63.096	3.42	301.995	0.00
0.132	0.00	0.631	0.06	3.020	0.51	14.454	2.27	69.183	3.22	331.131	0.00
0.145	0.00	0.692	0.07	3.311	0.56	15.849	2.43	75.858	2.97	363.078	0.00
0.158	0.00	0.759	0.08	3.631	0.62	17.378	2.60	83.176	2.69	398.107	0.00
0.174	0.00	0.832	0.09	3.981	0.68	19.055	2.76	91.201	2.39	436.516	0.00
0.191	0.00	0.912	0.10	4.365	0.75	20.893	2.93	100.000	2.07	478.630	0.00
0.209	0.00	1.000	0.11	4.786	0.83	22.909	3.09	109.648	1.75	524.807	0.00
0.229	0.00	1.096	0.13	5.248	0.91	25.119	3.25	120.226	1.45	575.440	0.00
0.251	0.00	1.202	0.15	5.754	1.00	27.542	3.40	131.826	1.16	630.957	0.00
0.275	0.00	1.318	0.17	6.310	1.09	30.200	3.53	144.544	0.90	691.831	0.00
0.302	0.00	1.445	0.20	6.918	1.19	33.113	3.64	158.489	0.69	758.578	0.00
0.331	0.00	1.585	0.23	7.586	1.30	36.308	3.73	173.780	0.50	831.764	0.00
0.363	0.00	1.738	0.26	8.318	1.42	39.811	3.79	190.546	0.36	912.011	0.00
0.398	0.00	1.905	0.29	9.120	1.55	43.652	3.80	208.930	0.24	1000.000	0.00
0.437	0.00	2.089	0.33	10.000	1.68	47.863	3.78	229.087	0.14		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

TABLE III-73
SCREEN ANALYSIS
KM4420-P8 WSA Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.70	99.3
65 Mesh	212	8.30	91.0
100 Mesh	150	14.00	77.0
150 Mesh	106	15.60	61.4
200 Mesh	75	12.20	49.2
270 Mesh	53	8.90	40.3
400 Mesh	38	7.40	32.9
TOTAL		100.00	**

K80= 162 μm



Result Analysis Report

Project and Test number:

KM4420-P8

Measured by:

quentin

Measured:

Thursday, November 06, 2014 2:10:09 PM

Sample Name:

WSA Bulk Regrind Discharge - Average

Edited by:

quentin

Analysed:

Thursday, November 06, 2014 2:10:10 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

18.81 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.494 %

Result Emulation:

Off

Concentration:

0.0174 %Vol

Span :

4.282

Uniformity:

1.33

Result units:

Volume

Specific Surface Area:

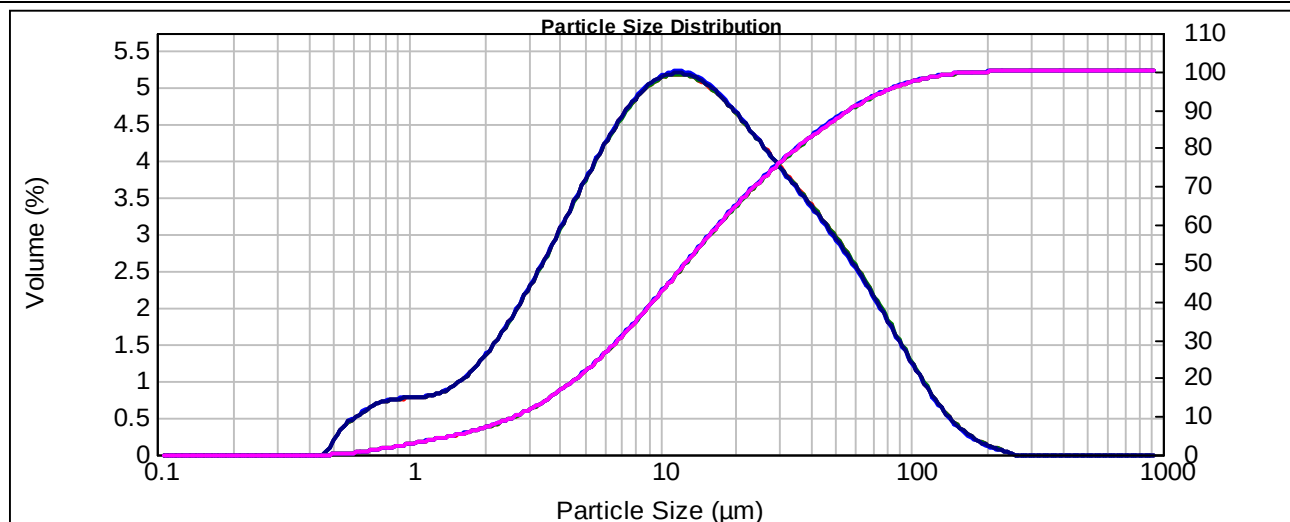
0.996 m²/g

Surface Weighted Mean D[3,2]:

6.025 um

Vol. Weighted Mean D[4,3]:

22.811 um

d(0.1): 2.670 um d(0.5): 12.671 um **d(0.8): 35.088 um** d(0.9): 56.928 um d(0.98): 109.55 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	1.02	10.965	3.12	52.481	1.66	251.189	0.00
0.110	0.00	0.525	0.24	2.512	1.15	12.023	3.11	57.544	1.53	275.423	0.00
0.120	0.00	0.575	0.29	2.754	1.29	13.183	3.09	63.096	1.40	301.995	0.00
0.132	0.00	0.631	0.35	3.020	1.43	14.454	3.04	69.183	1.26	331.131	0.00
0.145	0.00	0.692	0.40	3.311	1.59	15.849	2.97	75.858	1.12	363.078	0.00
0.158	0.00	0.759	0.43	3.631	1.75	17.378	2.89	83.176	0.98	398.107	0.00
0.174	0.00	0.832	0.45	3.981	1.91	19.055	2.80	91.201	0.83	436.516	0.00
0.191	0.00	0.912	0.46	4.365	2.07	20.893	2.70	100.000	0.69	478.630	0.00
0.209	0.00	1.000	0.46	4.786	2.23	22.909	2.60	109.648	0.56	524.807	0.00
0.229	0.00	1.096	0.47	5.248	2.38	25.119	2.50	120.226	0.44	575.440	0.00
0.251	0.00	1.202	0.49	5.754	2.53	27.542	2.39	131.826	0.33	630.957	0.00
0.275	0.00	1.318	0.51	6.310	2.67	30.200	2.29	144.544	0.24	691.831	0.00
0.302	0.00	1.445	0.56	6.918	2.79	33.113	2.09	158.489	0.17	758.578	0.00
0.331	0.00	1.585	0.62	7.586	2.90	36.308	1.99	173.780	0.12	831.764	0.00
0.363	0.00	1.738	0.70	8.318	2.99	39.811	1.88	190.546	0.07	912.011	0.00
0.398	0.00	1.905	0.79	9.120	3.06	43.652	1.77	208.930	0.05	1000.000	0.00
0.437	0.00	2.089	0.90	10.000	3.10	47.863		229.087			
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P8

Measured by:

quentin

Measured:

Thursday, November 06, 2014 1:17:49 PM

Sample Name:

WSA Bulk Final Concentrate - Average

Edited by:

quentin

Analysed:

Thursday, November 06, 2014 1:17:51 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

10.82 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.229 %

Result Emulation:

Off

Concentration:

0.0220 %Vol

Span :

2.715

Uniformity:

0.858

Result units:

Volume

Specific Surface Area:

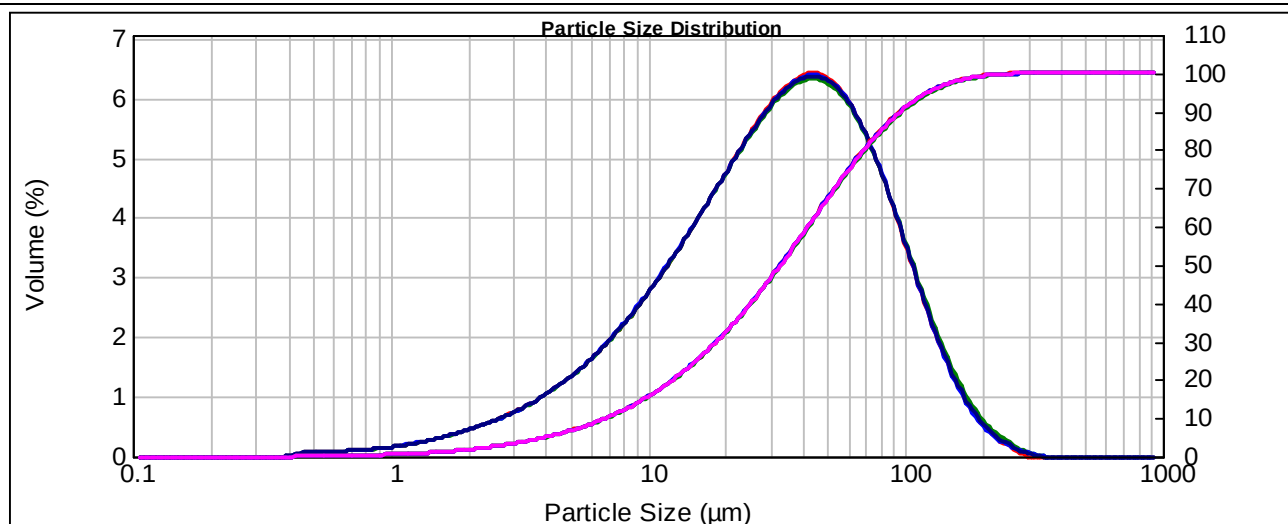
0.427 m²/g

Surface Weighted Mean D[3,2]:

14.066 um

Vol. Weighted Mean D[4,3]:

44.040 um

d(0.1): 6.858 um d(0.5): 32.789 um **d(0.8): 69.164 um** d(0.9): 95.892 um d(0.98): 158.21 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.04	2.291	0.34	10.965	1.86	52.481	3.70	251.189	0.09
0.110	0.00	0.525	0.05	2.512	0.38	12.023	2.02	57.544	3.57	275.423	0.04
0.120	0.00	0.575	0.05	2.754	0.42	13.183	2.18	63.096	3.39	301.995	0.02
0.132	0.00	0.631	0.06	3.020	0.47	14.454	2.34	69.183	3.17	331.131	0.00
0.145	0.00	0.692	0.06	3.311	0.53	15.849	2.50	75.858	2.91	363.078	0.00
0.158	0.00	0.759	0.07	3.631	0.59	17.378	2.68	83.176	2.62	398.107	0.00
0.174	0.00	0.832	0.08	3.981	0.65	19.055	2.84	91.201	2.31	436.516	0.00
0.191	0.00	0.912	0.09	4.365	0.72	20.893	3.01	100.000	1.99	478.630	0.00
0.209	0.00	1.000	0.10	4.786	0.80	22.909	3.18	109.648	1.68	524.807	0.00
0.229	0.00	1.096	0.12	5.248	0.89	25.119	3.34	120.226	1.38	575.440	0.00
0.251	0.00	1.202	0.14	5.754	0.98	27.542	3.48	131.826	1.10	630.957	0.00
0.275	0.00	1.318	0.16	6.310	1.09	30.200	3.61	144.544	0.85	691.831	0.00
0.302	0.00	1.445	0.18	6.918	1.20	33.113	3.71	158.489	0.65	758.578	0.00
0.331	0.00	1.585	0.21	7.586	1.32	36.308	3.79	173.780	0.47	831.764	0.00
0.363	0.00	1.738	0.23	8.318	1.44	39.811	3.83	190.546	0.33	912.011	0.00
0.398	0.01	1.905	0.27	9.120	1.57	43.652	3.83	208.930	0.23	1000.000	0.00
0.437	0.04	2.089	0.30	10.000	1.72	47.863	3.79	229.087	0.15		
0.479	0.04	2.291		10.965		52.481		251.189			

Operator notes:

TABLE III-76
SCREEN ANALYSIS
KM4420-P8 WSB Flotation Feed

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.10	99.9
65 Mesh	212	11.60	88.3
100 Mesh	150	14.60	73.7
150 Mesh	106	12.60	61.1
200 Mesh	75	10.40	50.7
270 Mesh	53	9.00	41.7
400 Mesh	38	5.70	36.0
TOTAL		100.00	**

K80= 175 μm

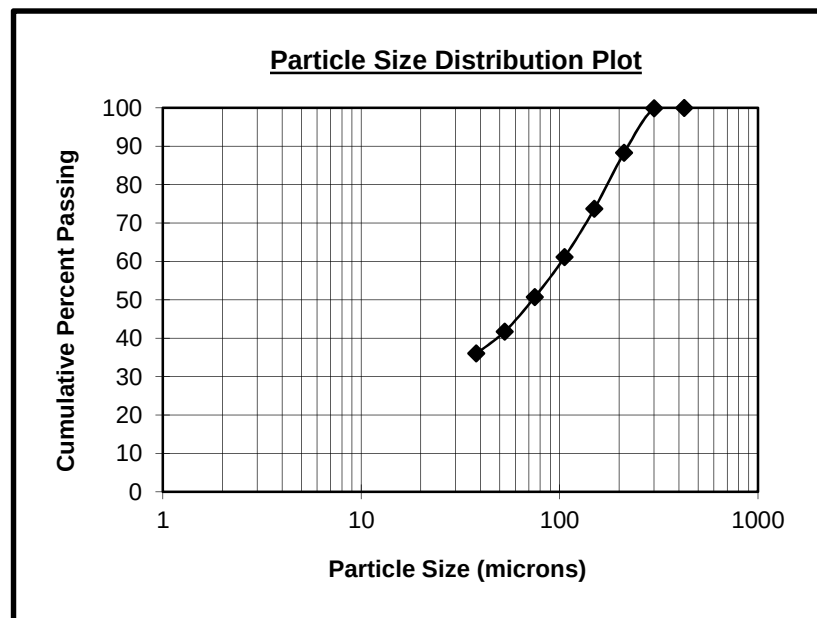
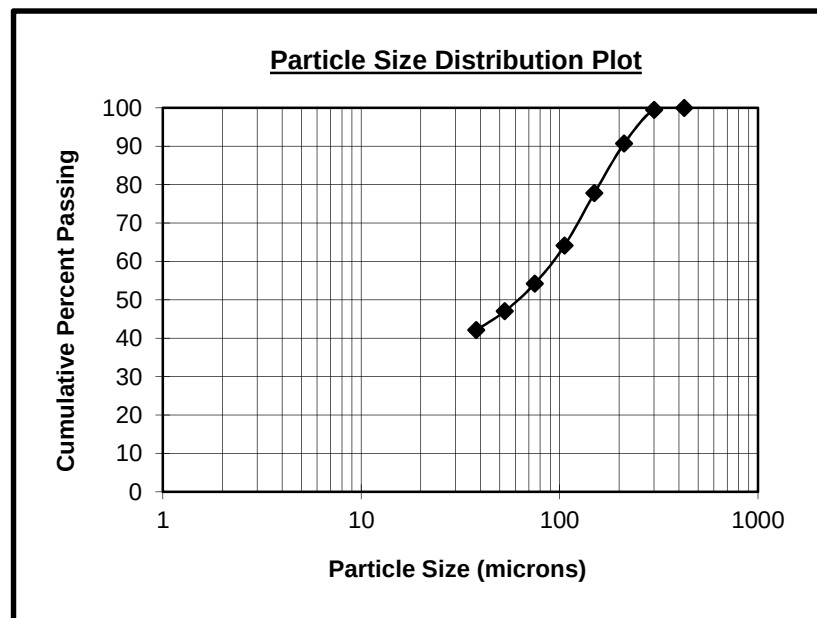


TABLE III-77
SCREEN ANALYSIS
KM4420-P8 WSB Bulk Rougher Concentrate

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.50	99.5
65 Mesh	212	8.80	90.7
100 Mesh	150	12.90	77.8
150 Mesh	106	13.70	64.1
200 Mesh	75	9.90	54.2
270 Mesh	53	7.20	47.0
400 Mesh	38	4.90	42.1
TOTAL		100.00	**

K80= 160 μm



Result Analysis Report

Project and Test number:

KM4420-P8

Measured by:

quentin

Measured:

Thursday, November 06, 2014 2:23:50 PM

Sample Name:

WSB Bulk Regrind Discharge - Average

Edited by:

quentin

Analysed:

Thursday, November 06, 2014 2:23:51 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

15.42 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.505 %

Result Emulation:

Off

Concentration:

0.0149 %Vol

Span :

4.598

Uniformity:

1.41

Result units:

Volume

Specific Surface Area:

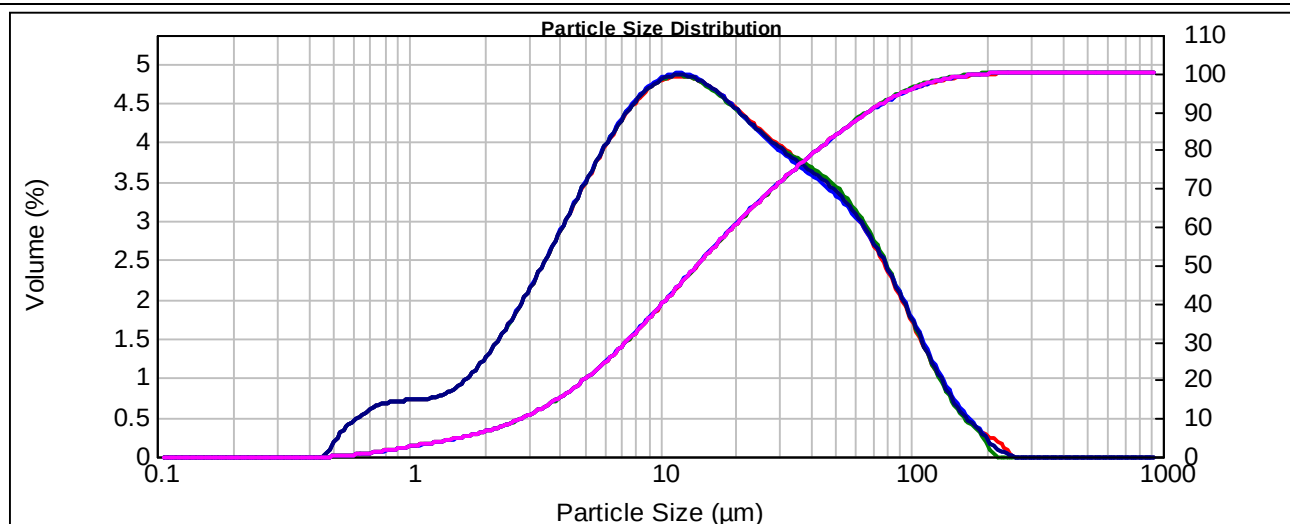
0.934 m²/g

Surface Weighted Mean D[3,2]:

6.425 um

Vol. Weighted Mean D[4,3]:

26.332 um

d(0.1): 2.830 um d(0.5): 14.090 um **d(0.8): 42.259 um** d(0.9): 67.619 um d(0.98): 124.77 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.08	2.291	0.95	10.965	2.92	52.481	1.95	251.189	0.00
0.110	0.00	0.525	0.21	2.512	1.07	12.023	2.91	57.544	1.85	275.423	0.00
0.120	0.00	0.575	0.27	2.754	1.21	13.183	2.89	63.096	1.74	301.995	0.00
0.132	0.00	0.631	0.33	3.020	1.34	14.454	2.85	69.183	1.61	331.131	0.00
0.145	0.00	0.692	0.41	3.311	1.49	15.849	2.80	75.858	1.46	363.078	0.00
0.158	0.00	0.759	0.41	3.631	1.63	17.378	2.73	83.176	1.30	398.107	0.00
0.174	0.00	0.832	0.42	3.981	1.78	19.055	2.66	91.201	1.14	436.516	0.00
0.191	0.00	0.912	0.43	4.365	1.93	20.893	2.59	100.000	0.97	478.630	0.00
0.209	0.00	1.000	0.44	4.786	2.08	22.909	2.52	109.648	0.81	524.807	0.00
0.229	0.00	1.096	0.44	5.248	2.23	25.119	2.45	120.226	0.65	575.440	0.00
0.251	0.00	1.202	0.45	5.754	2.36	27.542	2.38	131.826	0.51	630.957	0.00
0.275	0.00	1.318	0.47	6.310	2.49	30.200	2.27	144.544	0.39	691.831	0.00
0.302	0.00	1.445	0.51	6.918	2.61	33.113	2.22	158.489	0.29	758.578	0.00
0.331	0.00	1.585	0.57	7.586	2.71	36.308	2.16	173.780	0.22	831.764	0.00
0.363	0.00	1.738	0.65	8.318	2.79	39.811	2.10	190.546	0.13	912.011	0.00
0.398	0.00	1.905	0.74	9.120	2.86	43.652	2.03	208.930	0.06	1000.000	0.00
0.437	0.00	2.089	0.84	10.000	2.90	47.863	2.03	229.087	0.02		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P8

Measured by:

quentin

Measured:

Thursday, November 06, 2014 1:57:26 PM

Sample Name:

WSB Bulk Final Concentrate - Average

Edited by:

quentin

Analysed:

Thursday, November 06, 2014 1:57:28 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

10.39 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.280 %

Result Emulation:

Off

Concentration:

0.0218 %Vol

Span :

2.599

Uniformity:

0.822

Result units:

Volume

Specific Surface Area:

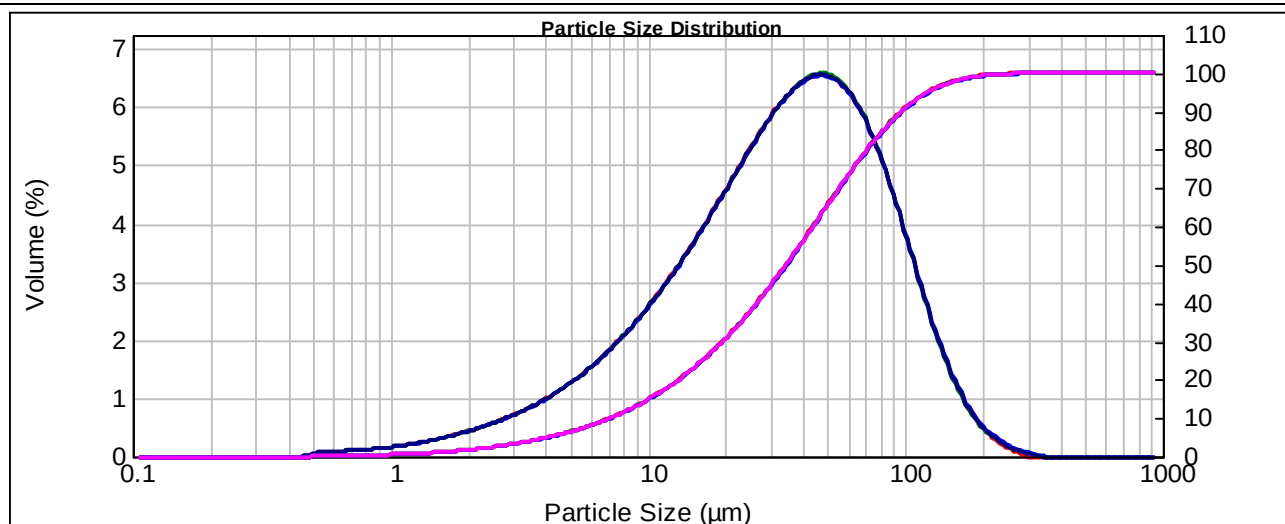
0.408 m²/g

Surface Weighted Mean D[3,2]:

14.691 um

Vol. Weighted Mean D[4,3]:

45.009 um

d(0.1): 7.122 um d(0.5): 34.432 um **d(0.8): 70.922 um** d(0.9): 96.607 um d(0.98): 155.03 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.03	2.291	0.33	10.965	1.75	52.481	3.88	251.189	0.08
0.110	0.00	0.525	0.05	2.512	0.37	12.023	1.90	57.544	3.78	275.423	0.04
0.120	0.00	0.575	0.05	2.754	0.41	13.183	2.06	63.096	3.61	301.995	0.01
0.132	0.00	0.631	0.06	3.020	0.45	14.454	2.22	69.183	3.39	331.131	0.00
0.145	0.00	0.692	0.07	3.311	0.50	15.849	2.39	75.858	3.13	363.078	0.00
0.158	0.00	0.759	0.07	3.631	0.56	17.378	2.57	83.176	2.82	398.107	0.00
0.174	0.00	0.832	0.08	3.981	0.62	19.055	2.75	91.201	2.48	436.516	0.00
0.191	0.00	0.912	0.09	4.365	0.69	20.893	2.93	100.000	2.13	478.630	0.00
0.209	0.00	1.000	0.10	4.786	0.76	22.909	3.11	109.648	1.77	524.807	0.00
0.229	0.00	1.096	0.12	5.248	0.84	25.119	3.28	120.226	1.43	575.440	0.00
0.251	0.00	1.202	0.13	5.754	0.93	27.542	3.44	131.826	1.12	630.957	0.00
0.275	0.00	1.318	0.15	6.310	1.02	30.200	3.60	144.544	0.84	691.831	0.00
0.302	0.00	1.445	0.18	6.918	1.12	33.113	3.73	158.489	0.62	758.578	0.00
0.331	0.00	1.585	0.20	7.586	1.23	36.308	3.83	173.780	0.44	831.764	0.00
0.363	0.00	1.738	0.23	8.318	1.35	39.811	3.91	190.546	0.30	912.011	0.00
0.398	0.00	1.905	0.26	9.120	1.48	43.652	3.95	208.930	0.20	1000.000	0.00
0.437	0.00	2.089	0.29	10.000	1.61	47.863	3.94	229.087	0.12		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

TABLE III-80
SCREEN ANALYSIS
KM4420-P1 Flotation Feed 09:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	3.19	96.8
65 Mesh	212	7.72	89.1
100 Mesh	150	10.72	78.4
150 Mesh	106	12.55	65.8
200 Mesh	75	10.61	55.2
270 Mesh	53	8.39	46.8
400 Mesh	38	7.56	39.3
TOTAL		100.00	**

K80= 159 μm

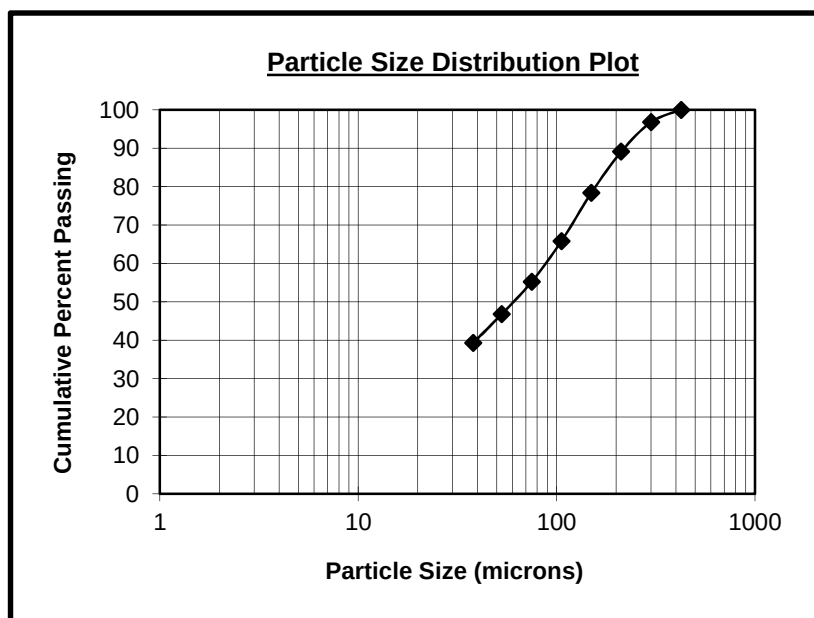


TABLE III-81
SCREEN ANALYSIS
KM4420-P1 Flotation Feed 10:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	2.94	97.1
65 Mesh	212	7.90	89.2
100 Mesh	150	11.53	77.6
150 Mesh	106	13.37	64.3
200 Mesh	75	11.16	53.1
270 Mesh	53	8.24	44.8
400 Mesh	38	7.30	37.5
TOTAL		100.00	**

K80= 162 μm

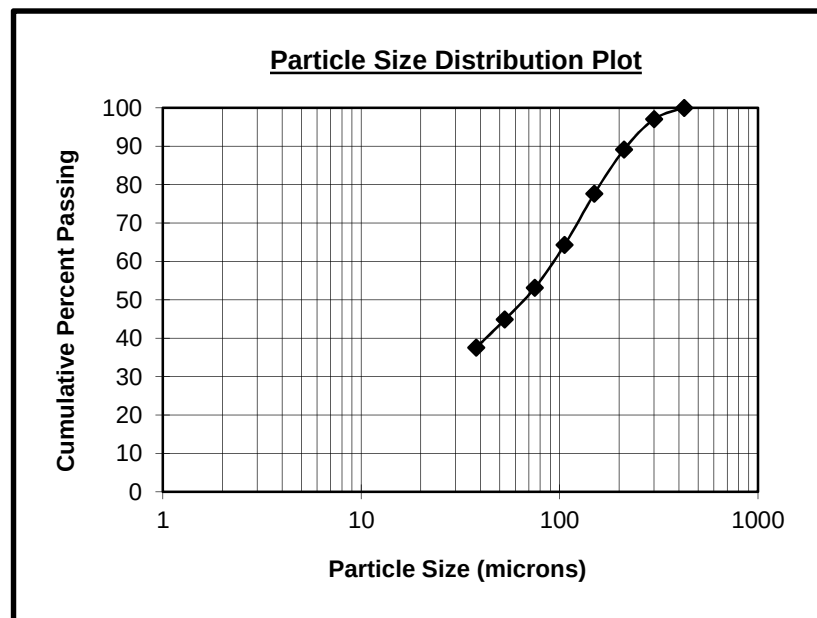


TABLE III-82
SCREEN ANALYSIS
KM4420-P1 Flotation Feed 12:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	4.31	95.7
65 Mesh	212	10.21	85.5
100 Mesh	150	13.79	71.7
150 Mesh	106	14.14	57.5
200 Mesh	75	10.62	46.9
270 Mesh	53	7.52	39.4
400 Mesh	38	6.39	33.0
TOTAL		100.00	**

K80= 186 μm

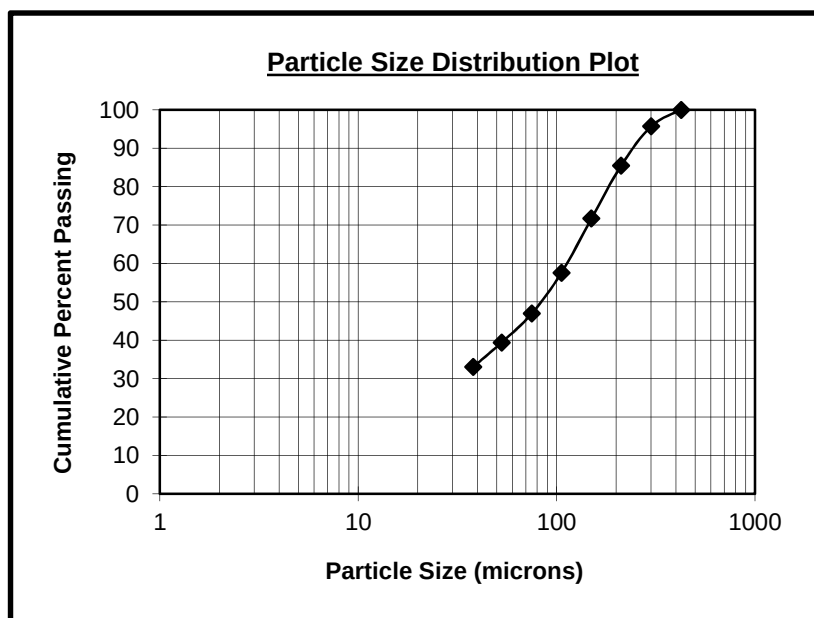


TABLE III-83
SCREEN ANALYSIS
KM4420-P1 Flotation Feed 14:00

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	4.28	95.7
65 Mesh	212	9.28	86.4
100 Mesh	150	11.84	74.6
150 Mesh	106	12.57	62.0
200 Mesh	75	9.88	52.1
270 Mesh	53	7.74	44.4
400 Mesh	38	6.79	37.6
TOTAL		100.00	**

K80= 177 μm

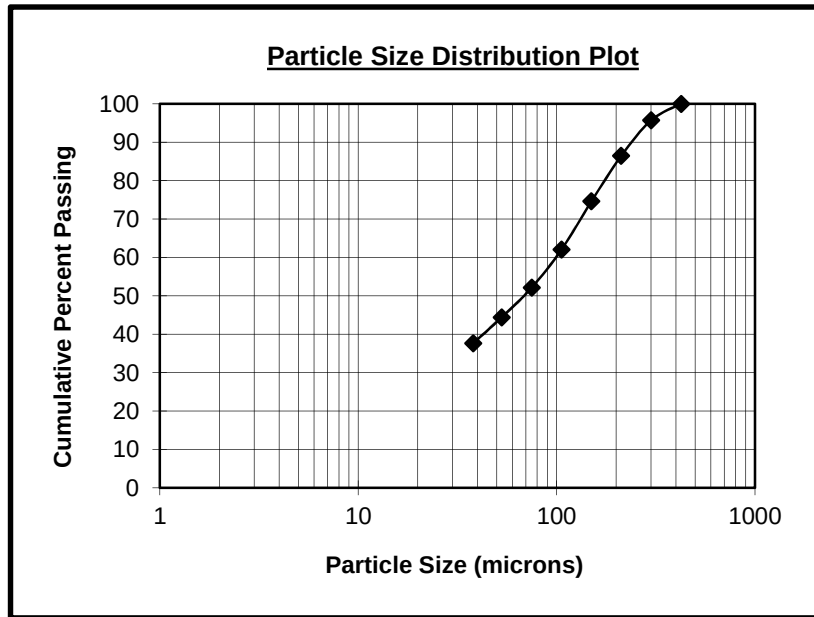


TABLE III-84
SCREEN ANALYSIS
KM4420-P1 Flotation Feed 14:45

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	4.57	95.4
65 Mesh	212	9.40	86.0
100 Mesh	150	12.20	73.8
150 Mesh	106	12.45	61.4
200 Mesh	75	9.59	51.8
270 Mesh	53	7.74	44.1
400 Mesh	38	6.77	37.3
TOTAL		100.00	**

K80= 180 μm

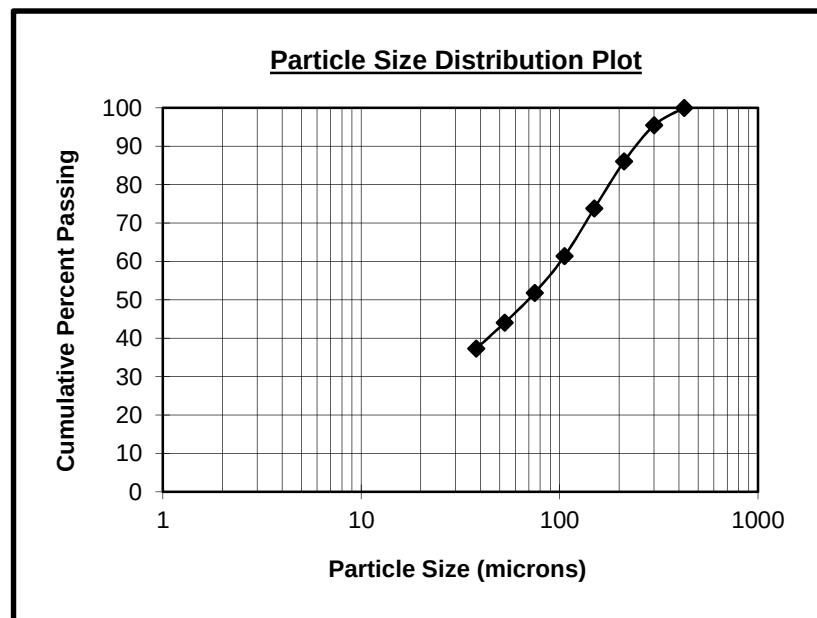


TABLE III-85
SCREEN ANALYSIS
KM4420-P2 Flotation Feed 07:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	2.87	97.1
65 Mesh	212	6.89	90.2
100 Mesh	150	11.31	78.9
150 Mesh	106	13.94	65.0
200 Mesh	75	11.42	53.6
270 Mesh	53	8.63	44.9
400 Mesh	38	6.94	38.0
TOTAL		100.00	**

K80= 155 μm

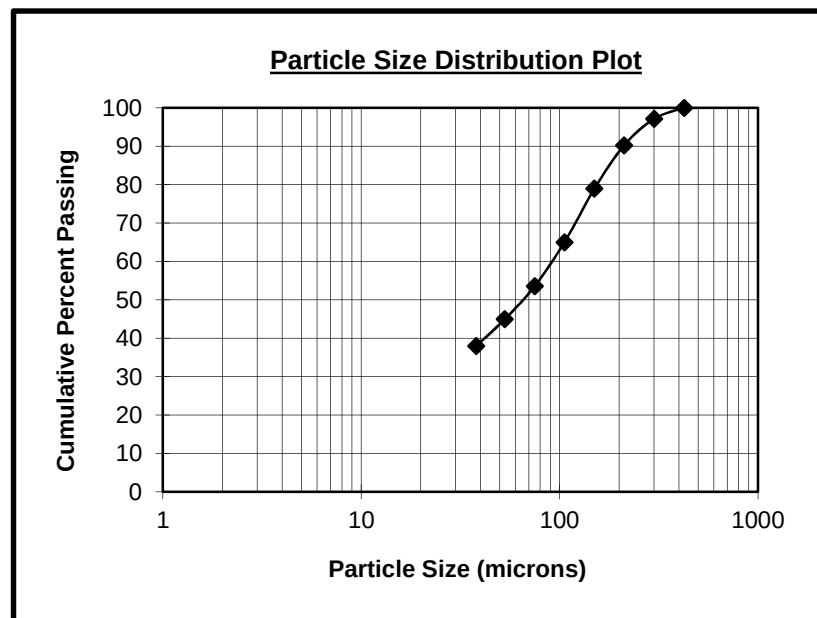


TABLE III-86
SCREEN ANALYSIS
KM4420-P2 Flotation Feed 08:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	2.09	97.9
65 Mesh	212	5.68	92.2
100 Mesh	150	9.08	83.1
150 Mesh	106	12.32	70.8
200 Mesh	75	11.11	59.7
270 Mesh	53	8.71	51.0
400 Mesh	38	7.83	43.2
TOTAL		100.00	**

K80= 138 μm

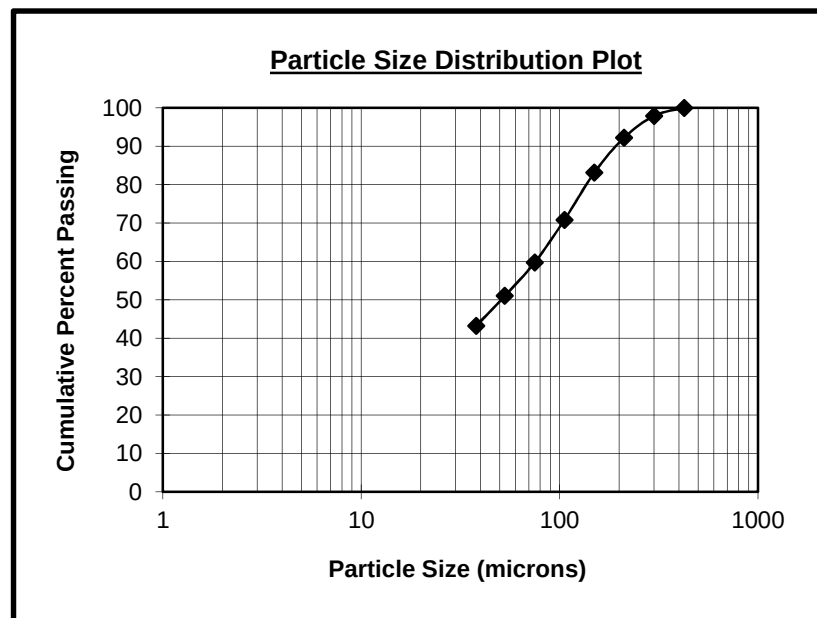


TABLE III-87
SCREEN ANALYSIS
KM4420-P2 Flotation Feed 10:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	2.44	97.6
65 Mesh	212	6.12	91.4
100 Mesh	150	9.26	82.2
150 Mesh	106	12.49	69.7
200 Mesh	75	11.22	58.5
270 Mesh	53	9.06	49.4
400 Mesh	38	7.73	41.7
TOTAL		100.00	**

K80= 142 μm

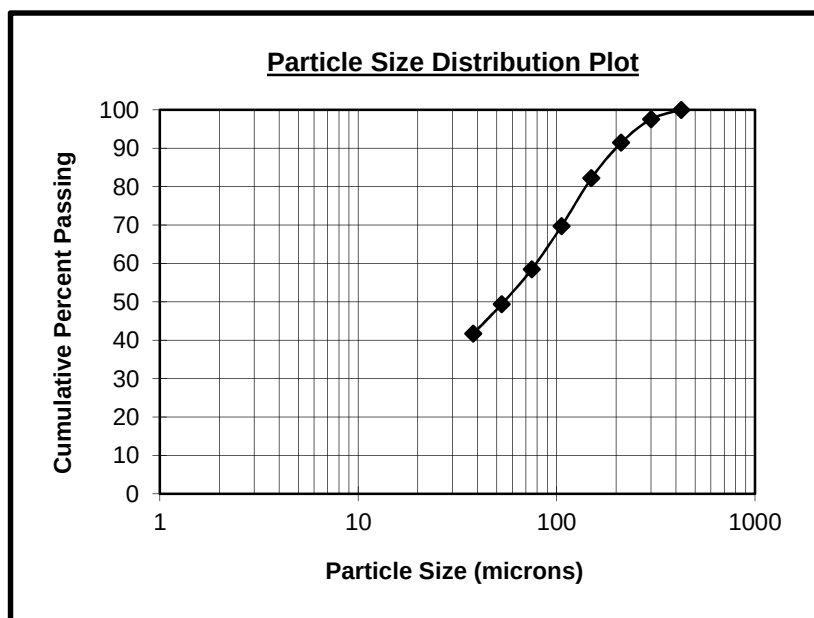


TABLE III-88
SCREEN ANALYSIS
KM4420-P2 Flotation Feed 11:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	3.70	96.3
65 Mesh	212	7.65	88.7
100 Mesh	150	10.60	78.0
150 Mesh	106	13.24	64.8
200 Mesh	75	11.51	53.3
270 Mesh	53	8.73	44.6
400 Mesh	38	7.20	37.4
TOTAL		100.00	**

K80= 160 μm

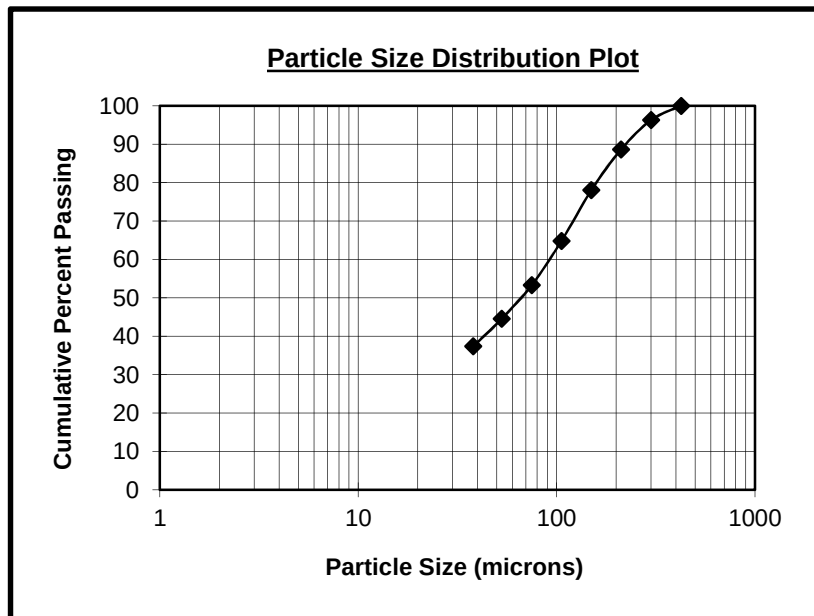


TABLE III-89
SCREEN ANALYSIS
KM4420-P3 Flotation Feed 08:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	2.83	97.2
65 Mesh	212	6.55	90.6
100 Mesh	150	9.12	81.5
150 Mesh	106	11.72	69.8
200 Mesh	75	10.71	59.1
270 Mesh	53	8.72	50.3
400 Mesh	38	7.56	42.8
TOTAL		100.00	**

K80= 144 μm

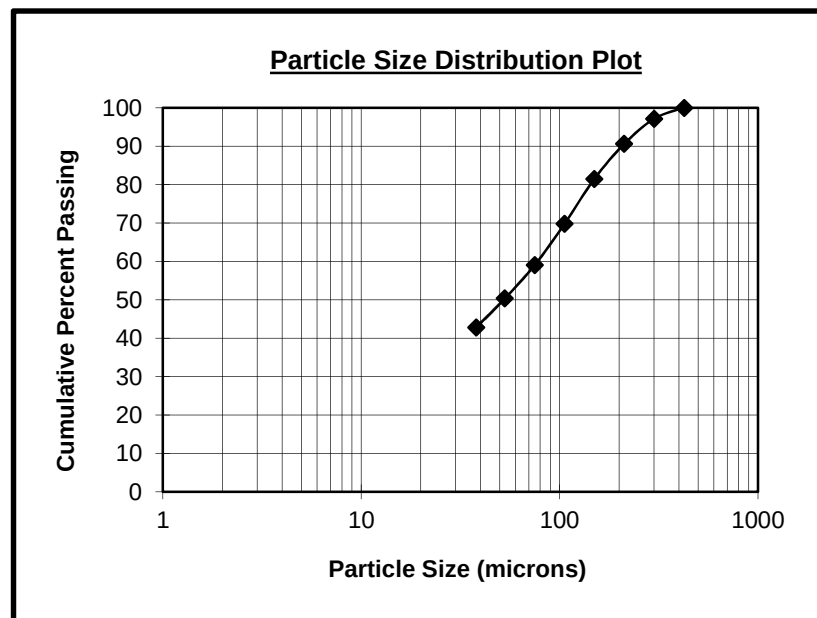


TABLE III-90
SCREEN ANALYSIS
KM4420-P3 Flotation Feed 10:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.27	98.7
65 Mesh	212	3.82	94.9
100 Mesh	150	7.49	87.4
150 Mesh	106	11.93	75.5
200 Mesh	75	11.68	63.8
270 Mesh	53	9.58	54.2
400 Mesh	38	8.74	45.5
TOTAL		100.00	**

K80= 122 μm

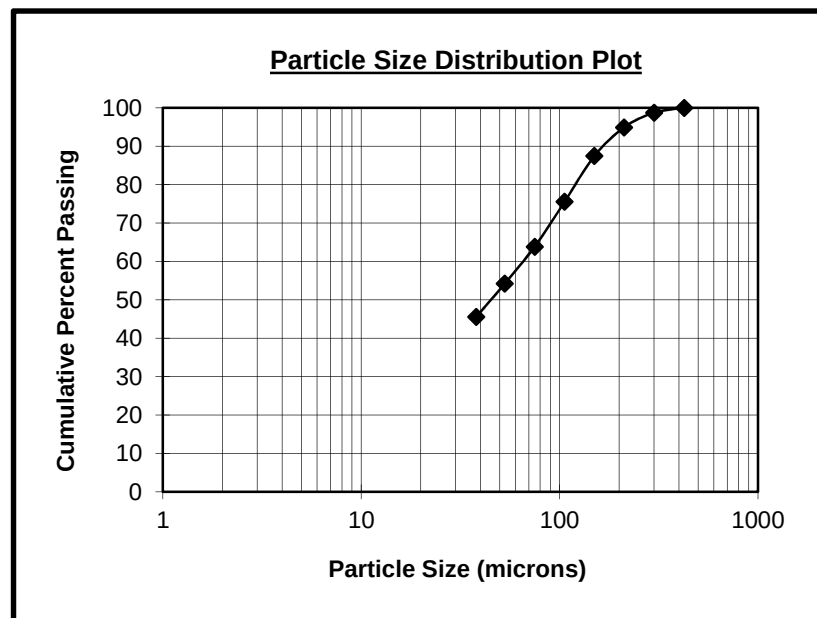


TABLE III-91
SCREEN ANALYSIS
KM4420-P3 Flotation Feed 12:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.85	98.2
65 Mesh	212	5.04	93.1
100 Mesh	150	8.30	84.8
150 Mesh	106	11.79	73.0
200 Mesh	75	11.17	61.9
270 Mesh	53	9.08	52.8
400 Mesh	38	8.09	44.7
TOTAL		100.00	**

K80= 131 μm

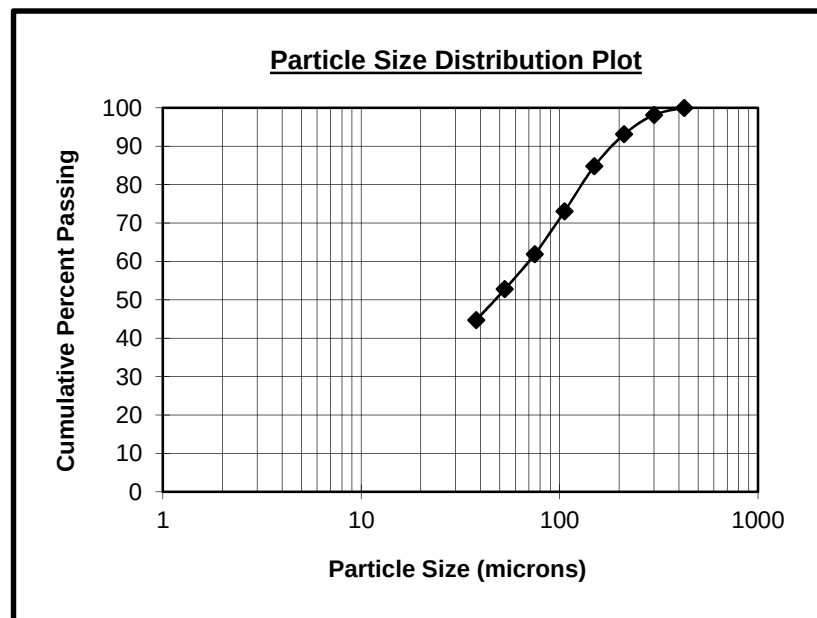


TABLE III-92
SCREEN ANALYSIS
KM4420-P3 Flotation Feed 14:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	2.62	97.4
65 Mesh	212	6.50	90.9
100 Mesh	150	10.15	80.7
150 Mesh	106	13.23	67.5
200 Mesh	75	11.48	56.0
270 Mesh	53	8.70	47.3
400 Mesh	38	7.46	39.9
TOTAL		100.00	**

K80= 147 μm

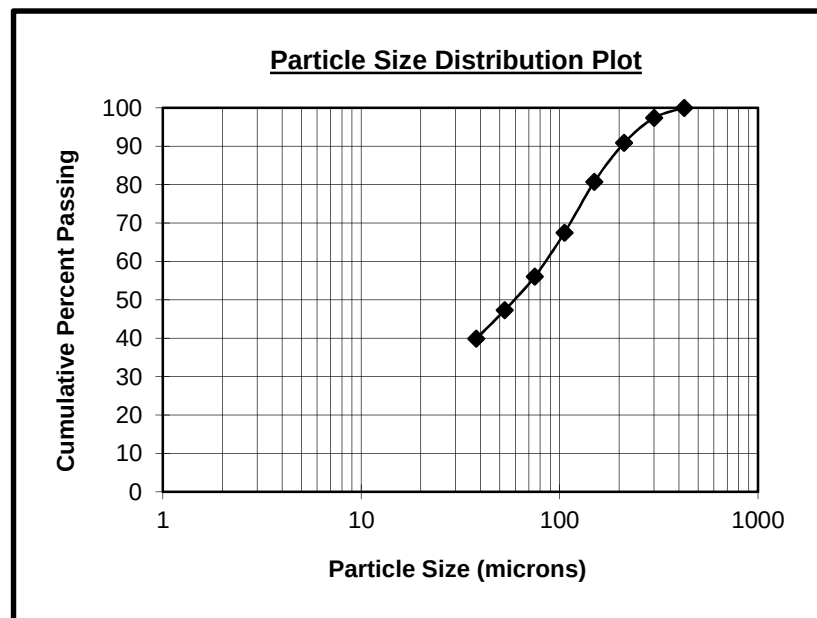


TABLE III-93
SCREEN ANALYSIS
KM4420-P4 Flotation Feed 08:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	2.42	97.6
65 Mesh	212	6.73	90.8
100 Mesh	150	11.07	79.8
150 Mesh	106	13.90	65.9
200 Mesh	75	11.12	54.8
270 Mesh	53	8.25	46.5
400 Mesh	38	7.01	39.5
TOTAL		100.00	**

K80= 151 μm

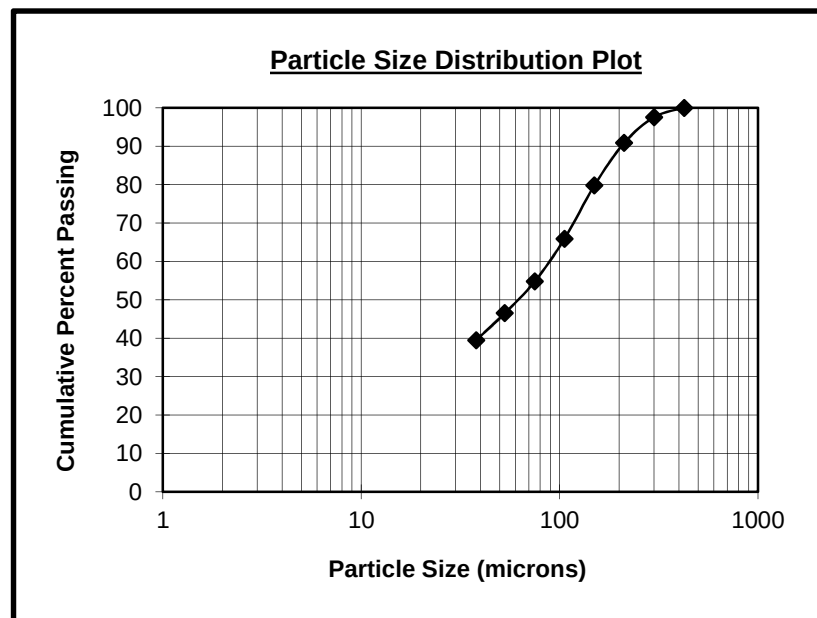


TABLE III-94
SCREEN ANALYSIS
KM4420-P4 Flotation Feed 10:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	5.07	94.9
65 Mesh	212	8.98	86.0
100 Mesh	150	11.54	74.4
150 Mesh	106	12.46	62.0
200 Mesh	75	10.09	51.9
270 Mesh	53	7.69	44.2
400 Mesh	38	6.59	37.6
TOTAL		100.00	**

K80= 178 μm

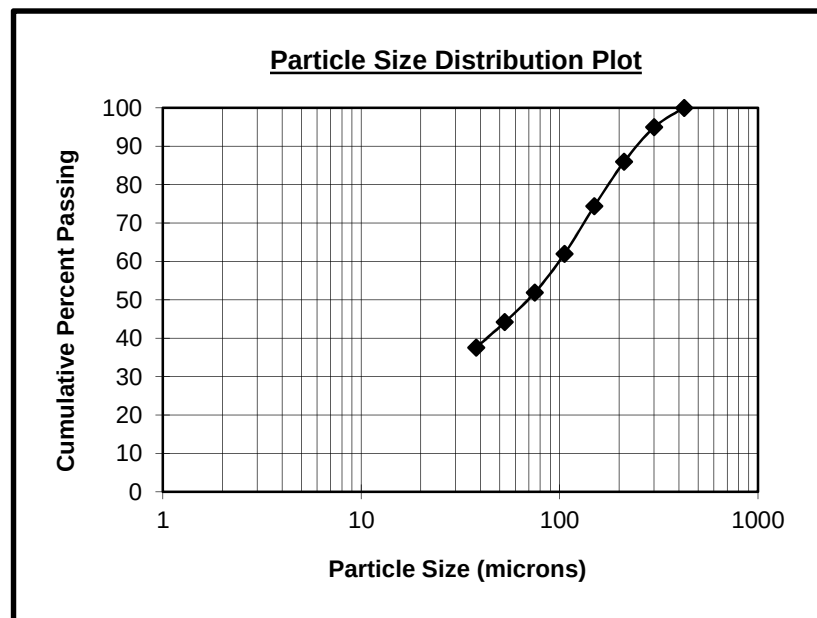


TABLE III-95
SCREEN ANALYSIS
KM4420-P4 Flotation Feed 12:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	4.53	95.5
65 Mesh	212	9.41	86.1
100 Mesh	150	12.56	73.5
150 Mesh	106	13.32	60.2
200 Mesh	75	10.29	49.9
270 Mesh	53	7.53	42.3
400 Mesh	38	6.56	35.8
TOTAL		100.00	**

K80= 181 μm

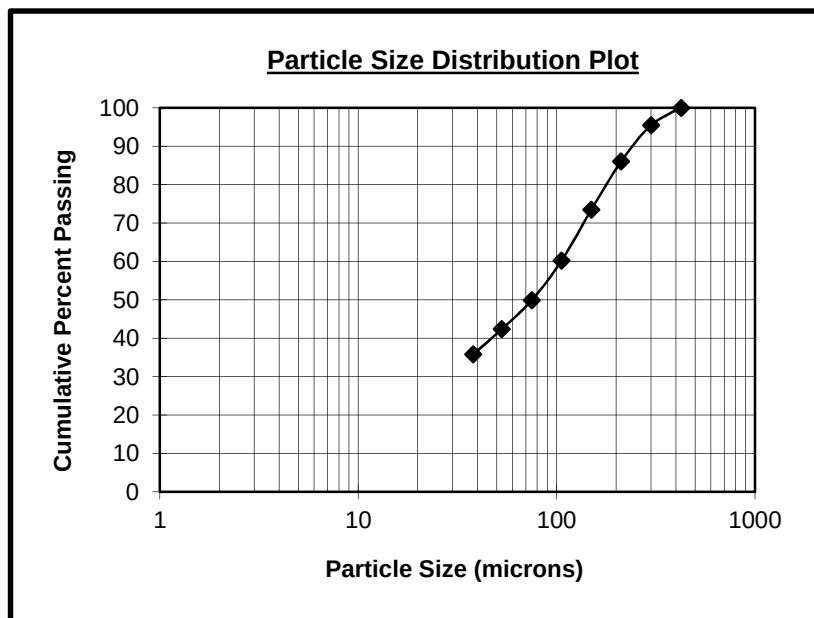


TABLE III-96
SCREEN ANALYSIS
KM4420-P4 Flotation Feed 14:00

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	2.98	97.0
65 Mesh	212	7.37	89.6
100 Mesh	150	10.70	78.9
150 Mesh	106	12.75	66.2
200 Mesh	75	10.50	55.7
270 Mesh	53	8.05	47.7
400 Mesh	38	7.14	40.5
TOTAL		100.00	**

K80= 156 μm

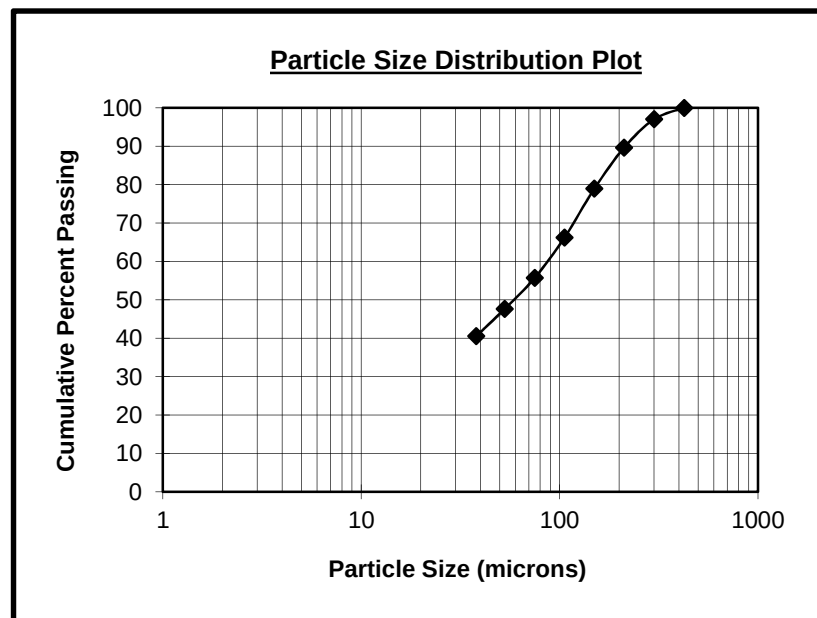


TABLE III-97
SCREEN ANALYSIS
KM4420-P5 Flotation Feed 08:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	3.59	96.4
65 Mesh	212	8.12	88.3
100 Mesh	150	11.42	76.9
150 Mesh	106	13.17	63.7
200 Mesh	75	10.48	53.2
270 Mesh	53	7.56	45.7
400 Mesh	38	6.34	39.3
TOTAL		100.00	**

K80= 166 μm

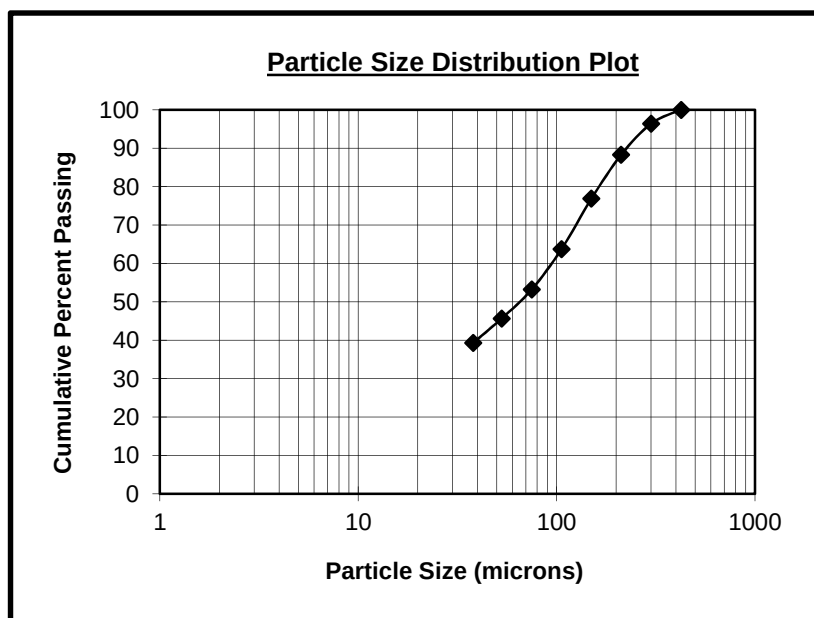


TABLE III-98
SCREEN ANALYSIS
KM4420-P5 Flotation Feed 10:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	3.31	96.7
65 Mesh	212	7.49	89.2
100 Mesh	150	10.93	78.3
150 Mesh	106	13.47	64.8
200 Mesh	75	11.16	53.7
270 Mesh	53	8.24	45.4
400 Mesh	38	6.94	38.5
TOTAL		100.00	**

K80= 159 μm

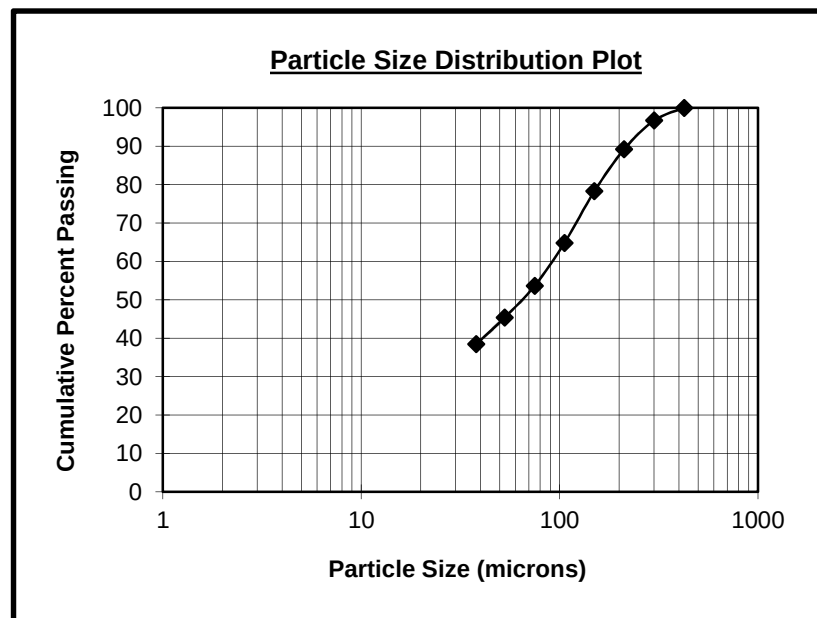


TABLE III-99
SCREEN ANALYSIS
KM4420-P5 Flotation Feed 11:45

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	4.59	95.4
65 Mesh	212	9.55	85.9
100 Mesh	150	12.52	73.3
150 Mesh	106	13.35	60.0
200 Mesh	75	10.55	49.4
270 Mesh	53	7.85	41.6
400 Mesh	38	6.52	35.1
TOTAL		100.00	**

K80= 182 μm

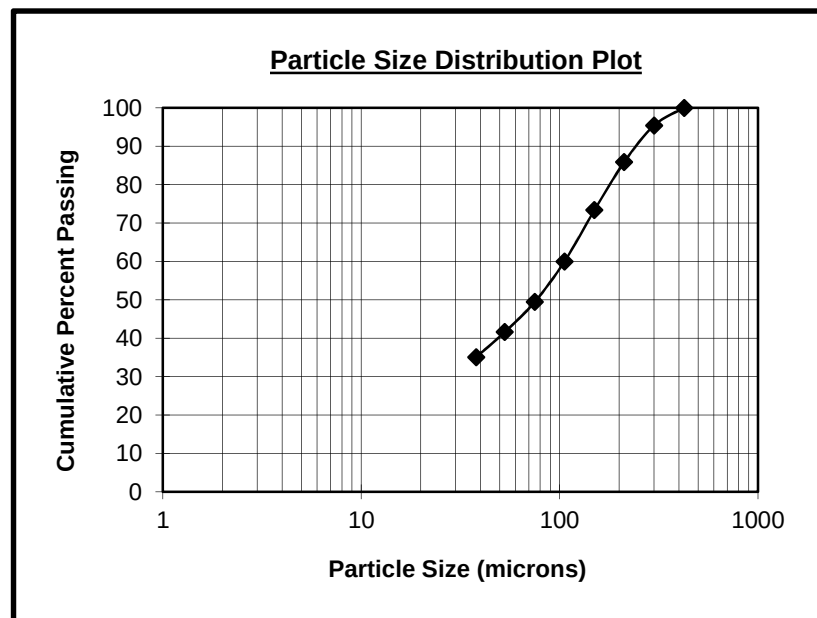


TABLE III-100
SCREEN ANALYSIS
KM4420-P6 Flotation Feed 09:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.06	98.9
65 Mesh	212	8.47	90.5
100 Mesh	150	13.03	77.4
150 Mesh	106	14.34	63.1
200 Mesh	75	11.29	51.8
270 Mesh	53	8.27	43.5
400 Mesh	38	7.07	36.5
TOTAL		100.00	**

K80= 161 μm

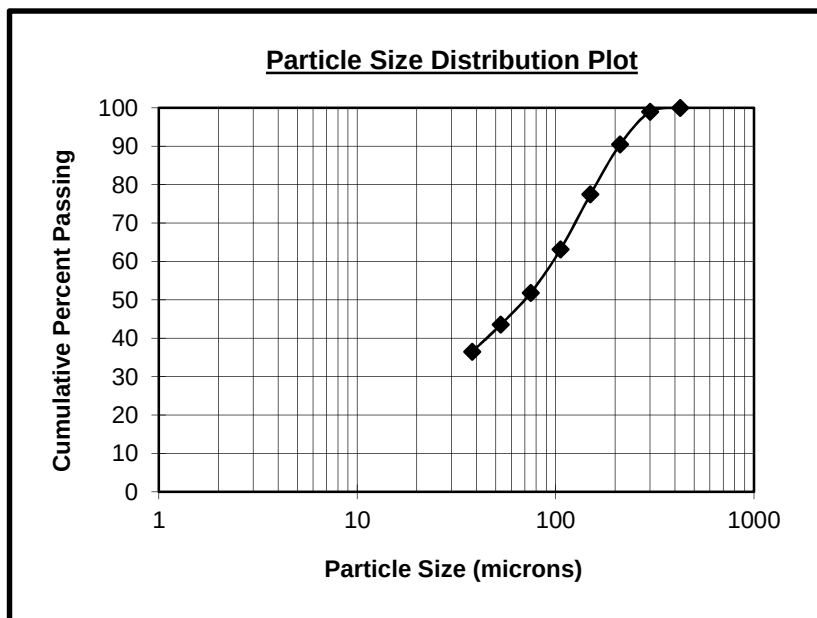


TABLE III-101
SCREEN ANALYSIS
KM4420-P6 Flotation Feed 10:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.69	98.3
65 Mesh	212	9.90	88.4
100 Mesh	150	12.94	75.5
150 Mesh	106	12.82	62.7
200 Mesh	75	9.89	52.8
270 Mesh	53	7.59	45.2
400 Mesh	38	6.66	38.5
TOTAL		100.00	**

K80= 170 μm

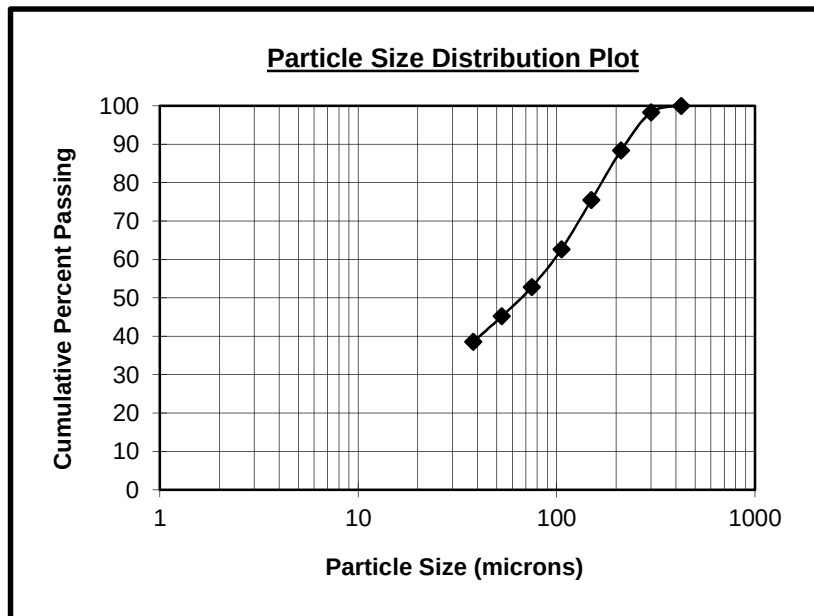


TABLE III-102
SCREEN ANALYSIS
KM4420-P6 Flotation Feed 12:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.44	98.6
65 Mesh	212	10.60	88.0
100 Mesh	150	15.11	72.9
150 Mesh	106	14.88	58.0
200 Mesh	75	10.63	47.4
270 Mesh	53	7.53	39.8
400 Mesh	38	6.35	33.5
TOTAL		100.00	**

K80= 178 μm

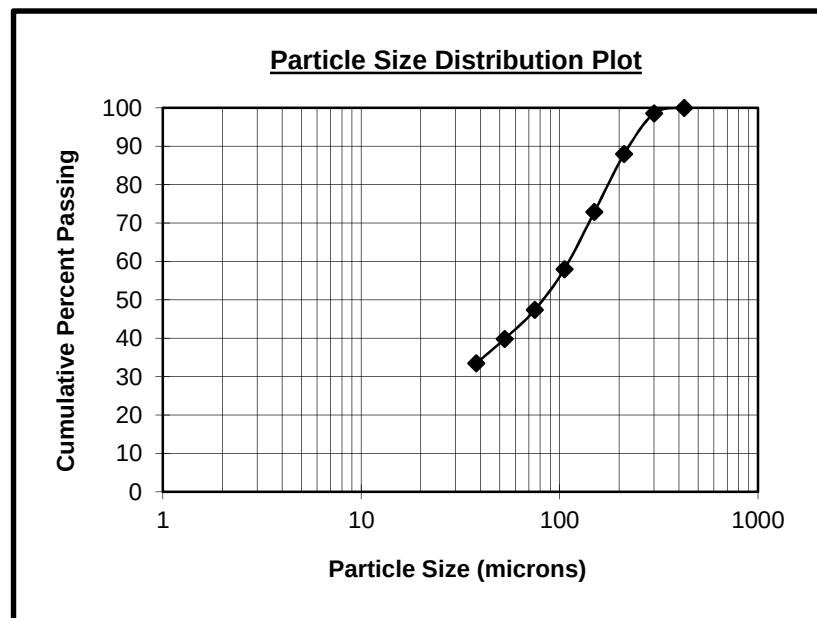


TABLE III-103
SCREEN ANALYSIS
KM4420-P6 Flotation Feed 14:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.02	99.0
65 Mesh	212	7.22	91.8
100 Mesh	150	12.23	79.5
150 Mesh	106	14.60	64.9
200 Mesh	75	11.63	53.3
270 Mesh	53	8.36	44.9
400 Mesh	38	7.01	37.9
TOTAL		100.00	**

K80= 152 μm

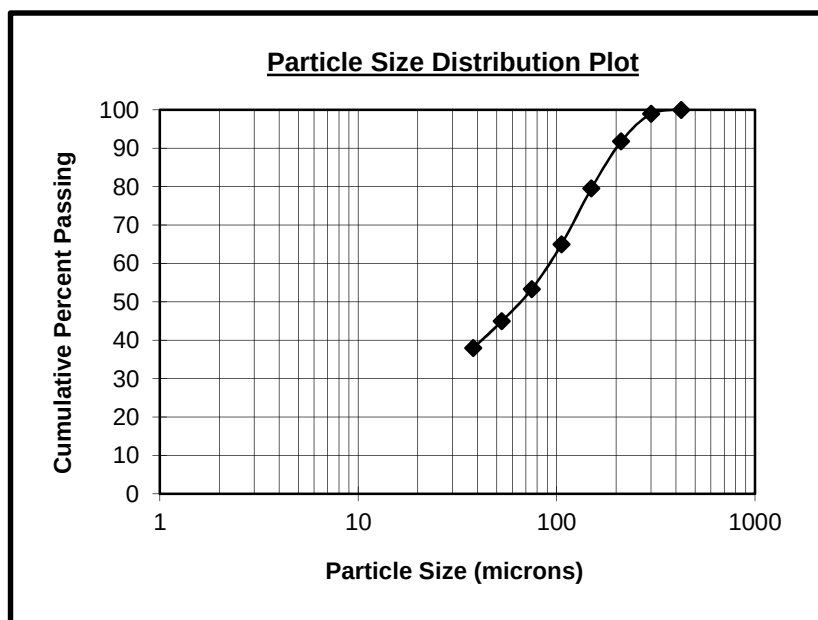


TABLE III-104
SCREEN ANALYSIS
KM4420-P7 Flotation Feed 08:00

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.63	99.4
65 Mesh	212	4.47	94.9
100 Mesh	150	8.37	86.5
150 Mesh	106	13.27	73.3
200 Mesh	75	12.53	60.7
270 Mesh	53	9.47	51.3
400 Mesh	38	7.96	43.3
TOTAL		100.00	**

K80= 127 μm

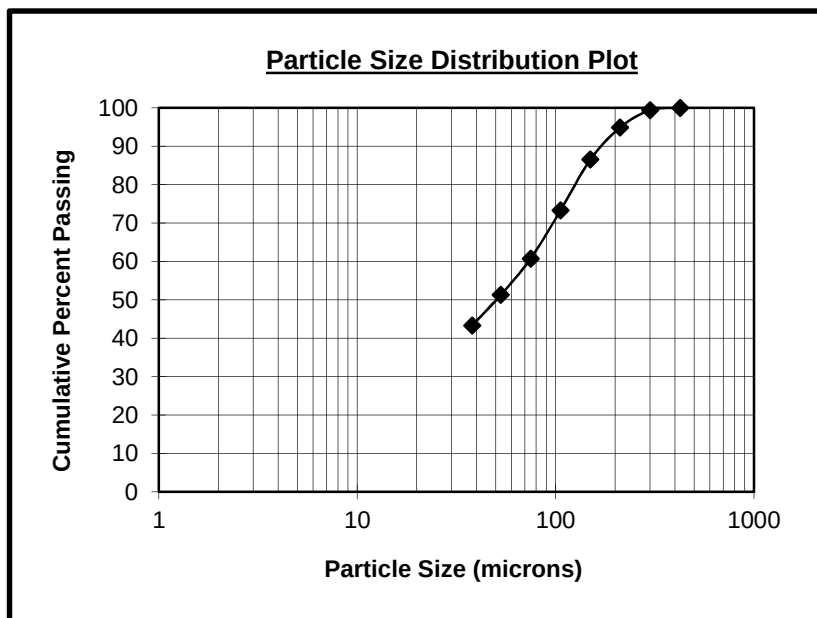


TABLE III-105
SCREEN ANALYSIS
KM4420-P7 Flotation Feed 08:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.82	99.2
65 Mesh	212	5.46	93.7
100 Mesh	150	9.38	84.3
150 Mesh	106	13.75	70.6
200 Mesh	75	12.81	57.8
270 Mesh	53	9.46	48.3
400 Mesh	38	7.86	40.5
TOTAL		100.00	**

K80= 135 μm

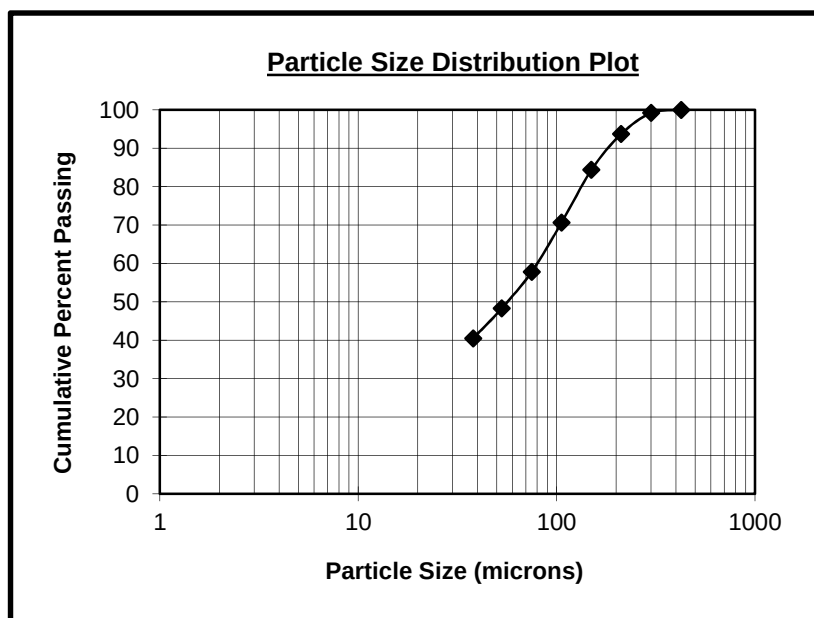


TABLE III-106
SCREEN ANALYSIS
KM4420-P7 Flotation Feed 09:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.95	99.1
65 Mesh	212	6.29	92.8
100 Mesh	150	10.24	82.5
150 Mesh	106	13.43	69.1
200 Mesh	75	11.96	57.1
270 Mesh	53	9.15	48.0
400 Mesh	38	8.09	39.9
TOTAL		100.00	**

K80= 141 μm

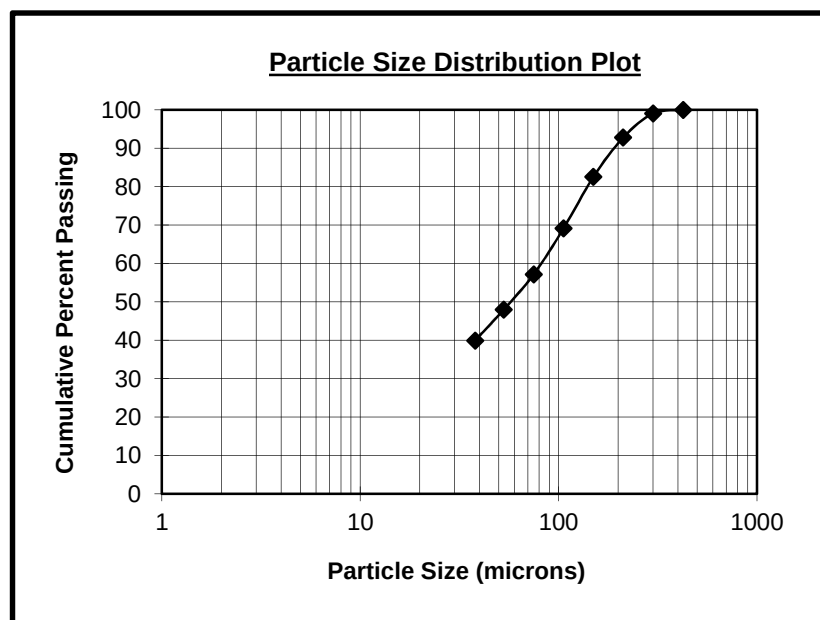


TABLE III-107
SCREEN ANALYSIS
KM4420-P7 Flotation Feed 10:00

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.96	99.0
65 Mesh	212	7.74	91.3
100 Mesh	150	11.55	79.7
150 Mesh	106	13.96	65.8
200 Mesh	75	11.75	54.0
270 Mesh	53	8.69	45.3
400 Mesh	38	7.40	37.9
TOTAL		100.00	**

K80= 151 μm

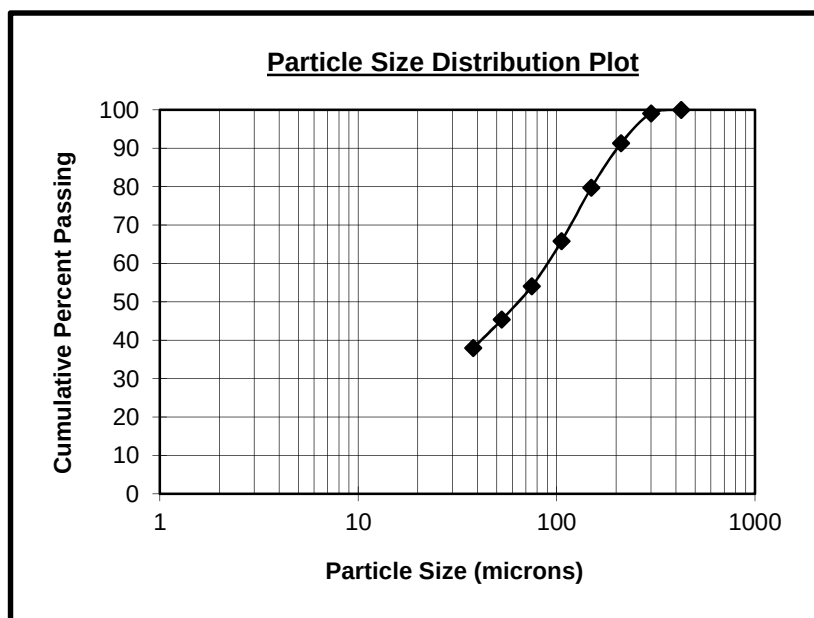


TABLE III-108
SCREEN ANALYSIS
KM4420-P7 Flotation Feed 10:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.08	98.9
65 Mesh	212	7.54	91.4
100 Mesh	150	11.90	79.5
150 Mesh	106	14.43	65.1
200 Mesh	75	11.90	53.2
270 Mesh	53	8.66	44.5
400 Mesh	38	7.38	37.1
TOTAL		100.00	**

K80= 152 μm

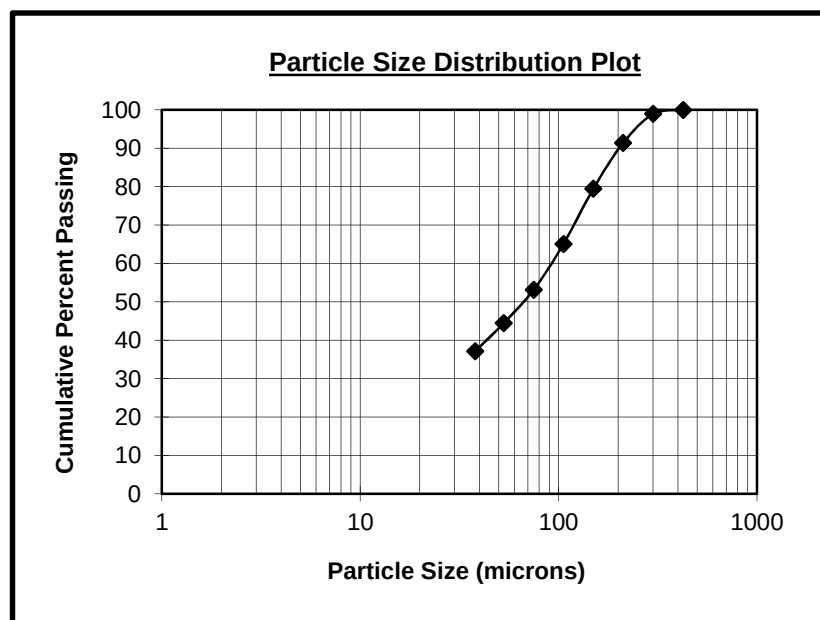


TABLE III-109
SCREEN ANALYSIS
KM4420-P7 Flotation Feed 11:00

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.55	98.4
65 Mesh	212	9.05	89.4
100 Mesh	150	12.74	76.7
150 Mesh	106	14.10	62.6
200 Mesh	75	11.15	51.4
270 Mesh	53	8.04	43.4
400 Mesh	38	6.97	36.4
TOTAL		100.00	**

K80= 165 μm

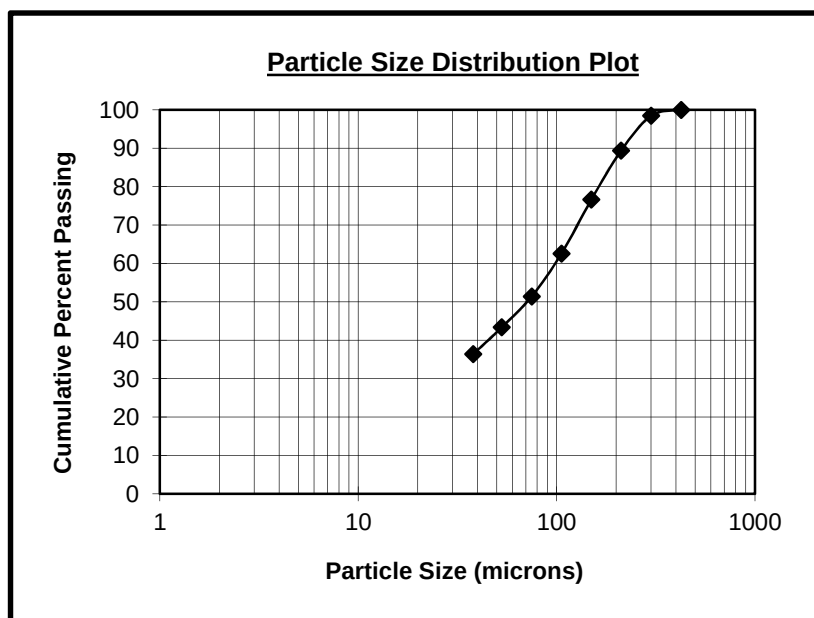


TABLE III-110
SCREEN ANALYSIS
KM4420-P7 Flotation Feed 12:00

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.52	98.5
65 Mesh	212	8.97	89.5
100 Mesh	150	12.30	77.2
150 Mesh	106	13.47	63.7
200 Mesh	75	10.70	53.0
270 Mesh	53	7.90	45.1
400 Mesh	38	6.93	38.2
TOTAL		100.00	**

K80= 163 μm

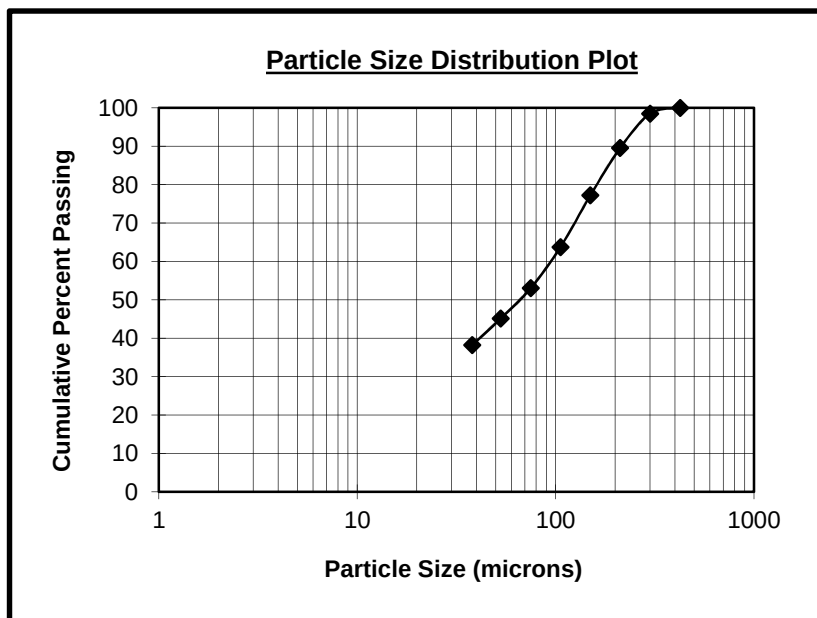


TABLE III-111
SCREEN ANALYSIS
KM4420-P7 Flotation Feed 13:15

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.78	98.2
65 Mesh	212	9.35	88.9
100 Mesh	150	12.14	76.7
150 Mesh	106	13.42	63.3
200 Mesh	75	10.31	53.0
270 Mesh	53	7.73	45.3
400 Mesh	38	6.78	38.5
TOTAL		100.00	**

K80= 165 μm

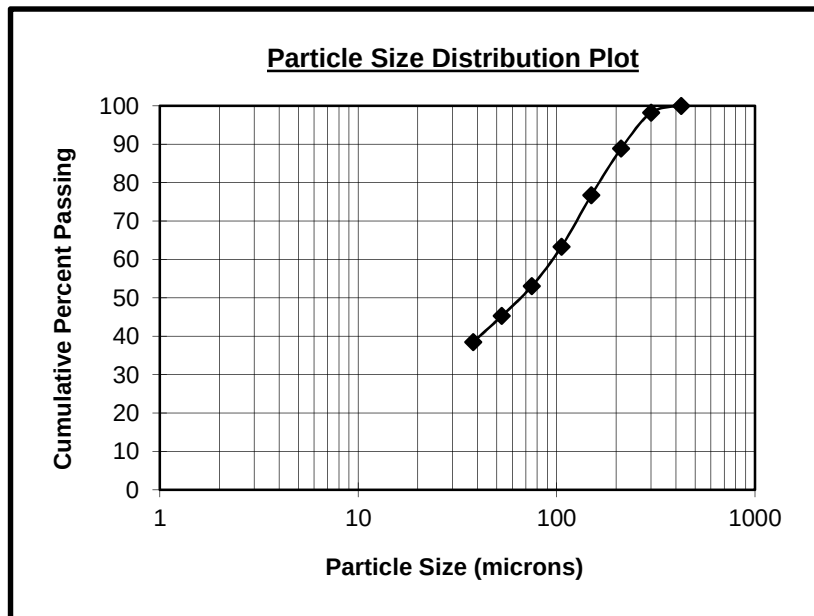


TABLE III-112
SCREEN ANALYSIS
KM4420-P7 Flotation Feed 14:00

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.73	98.3
65 Mesh	212	10.18	88.1
100 Mesh	150	13.71	74.4
150 Mesh	106	14.27	60.1
200 Mesh	75	10.61	49.5
270 Mesh	53	7.71	41.8
400 Mesh	38	6.64	35.2
TOTAL		100.00	**

K80= 174 μm

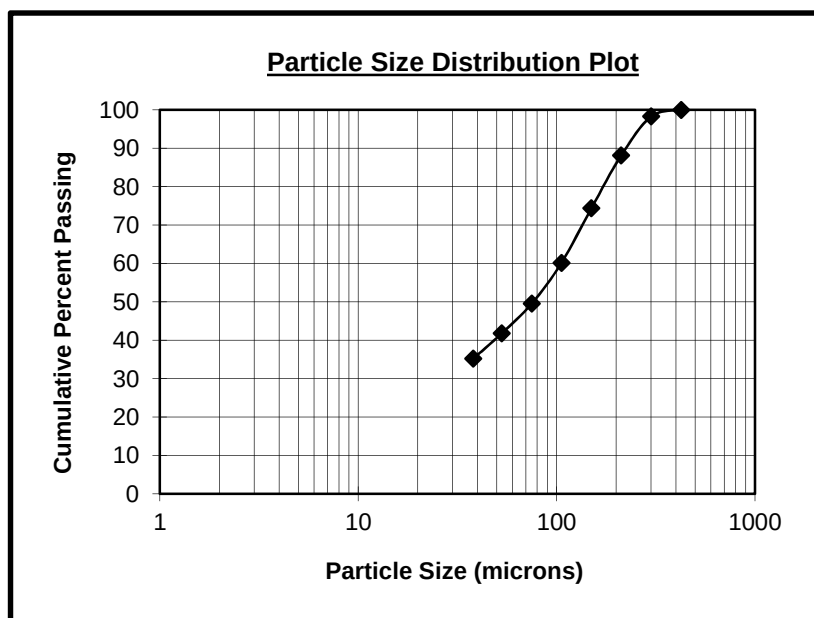


TABLE III-113
SCREEN ANALYSIS
KM4420-P7 Flotation Feed 15:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.09	98.9
65 Mesh	212	7.67	91.2
100 Mesh	150	12.15	79.1
150 Mesh	106	14.81	64.3
200 Mesh	75	11.81	52.5
270 Mesh	53	8.55	43.9
400 Mesh	38	7.04	36.9
TOTAL		100.00	**

K80= 154 μm

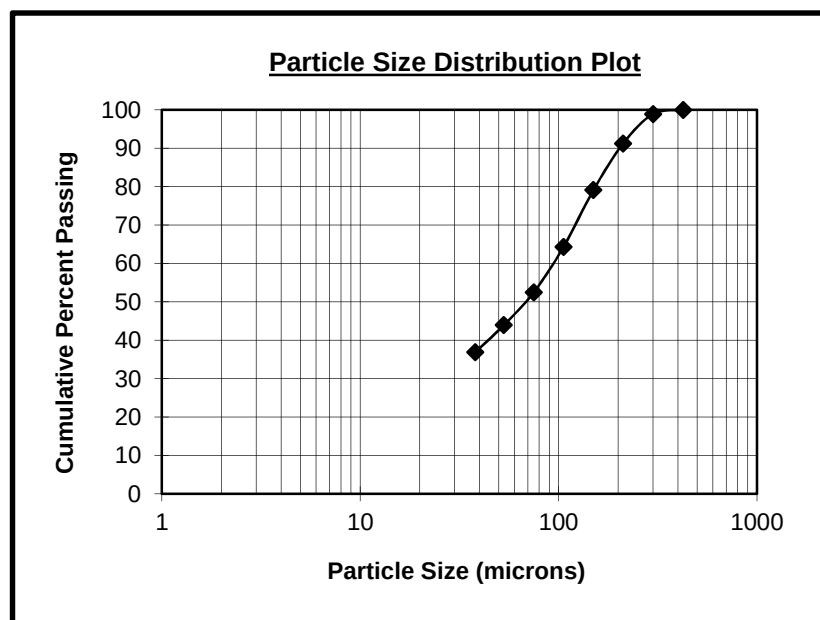


TABLE III-114
SCREEN ANALYSIS
KM4420-P8 Flotation Feed 08:00

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.12	98.9
65 Mesh	212	7.04	91.8
100 Mesh	150	10.85	81.0
150 Mesh	106	13.78	67.2
200 Mesh	75	11.56	55.7
270 Mesh	53	8.87	46.8
400 Mesh	38	7.48	39.3
TOTAL		100.00	**

K80= 147 μm

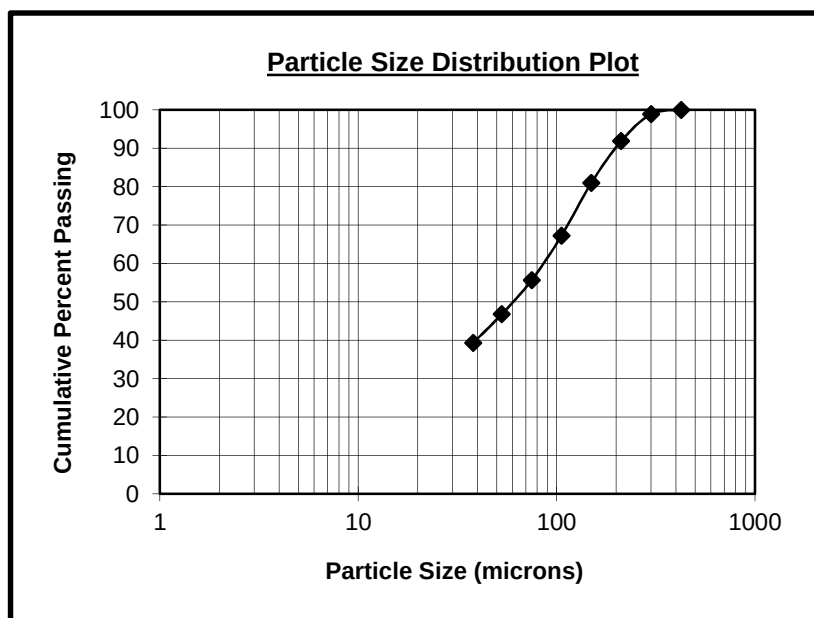


TABLE III-115
SCREEN ANALYSIS
KM4420-P8 Flotation Feed 08:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.96	99.0
65 Mesh	212	7.05	92.0
100 Mesh	150	11.10	80.9
150 Mesh	106	14.47	66.4
200 Mesh	75	12.08	54.4
270 Mesh	53	9.02	45.3
400 Mesh	38	7.54	37.8
TOTAL		100.00	**

K80= 147 μm

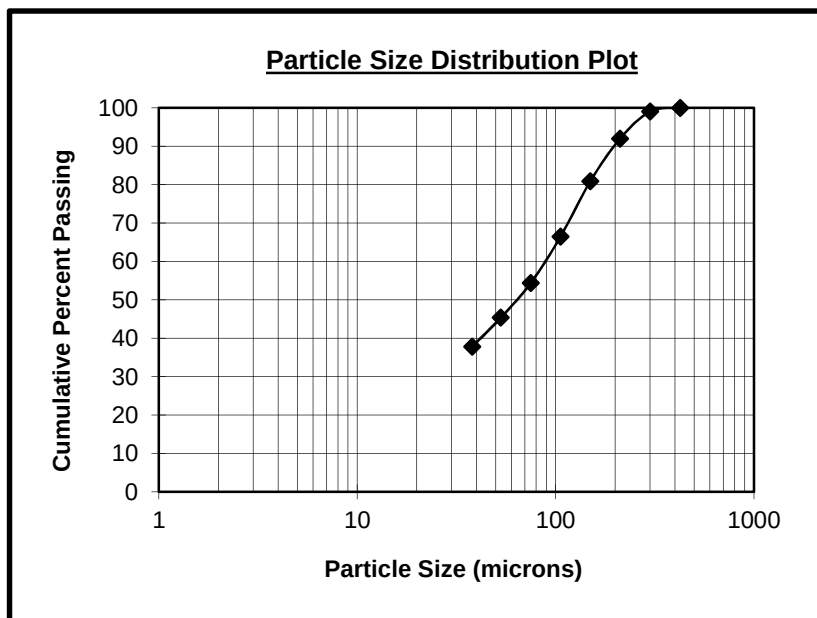


TABLE III-116
SCREEN ANALYSIS
KM4420-P8 Flotation Feed 09:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.97	99.0
65 Mesh	212	8.01	91.0
100 Mesh	150	12.12	78.9
150 Mesh	106	14.51	64.4
200 Mesh	75	11.80	52.6
270 Mesh	53	8.77	43.8
400 Mesh	38	7.38	36.5
TOTAL		100.00	**

K80= 155 μm

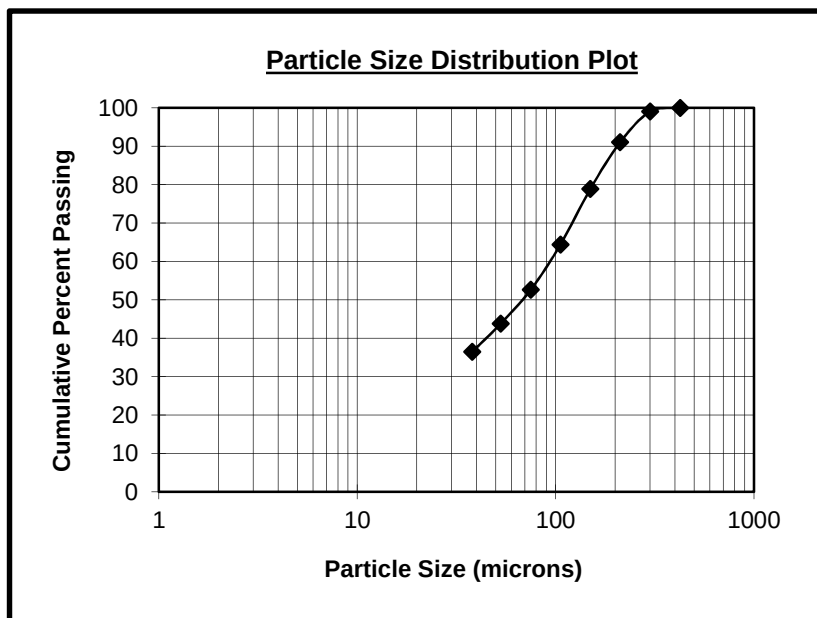


TABLE III-117
SCREEN ANALYSIS
KM4420-P8 Flotation Feed 10:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.04	99.0
65 Mesh	212	6.63	92.3
100 Mesh	150	10.22	82.1
150 Mesh	106	13.24	68.9
200 Mesh	75	11.66	57.2
270 Mesh	53	9.06	48.2
400 Mesh	38	7.74	40.4
TOTAL		100.00	**

K80= 142 μm

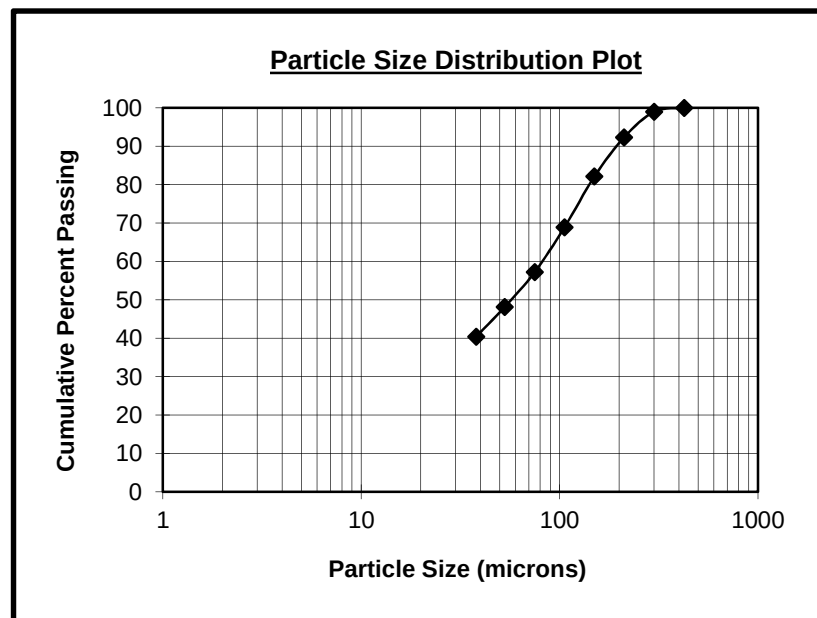


TABLE III-118
SCREEN ANALYSIS
KM4420-P8 Flotation Feed 11:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.95	99.0
65 Mesh	212	7.01	92.0
100 Mesh	150	10.88	81.2
150 Mesh	106	13.71	67.4
200 Mesh	75	11.62	55.8
270 Mesh	53	9.02	46.8
400 Mesh	38	16.82	30.0
TOTAL		100.00	**

K80= 146 μm

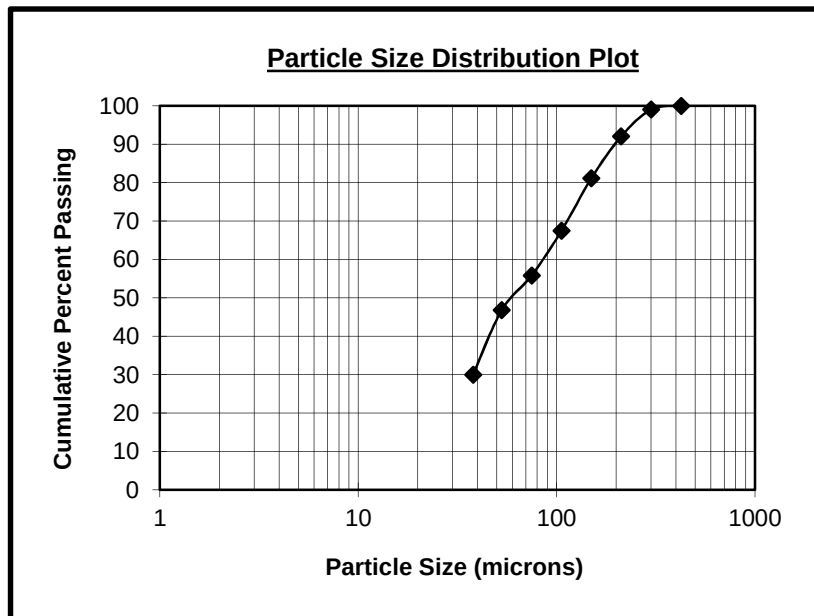


TABLE III-119
SCREEN ANALYSIS
KM4420-P8 Flotation Feed 12:30

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	0.85	99.2
65 Mesh	212	7.27	91.9
100 Mesh	150	11.98	79.9
150 Mesh	106	14.66	65.2
200 Mesh	75	11.91	53.3
270 Mesh	53	8.60	44.7
400 Mesh	38	7.19	37.6
TOTAL		100.00	**

K80= 150 μm

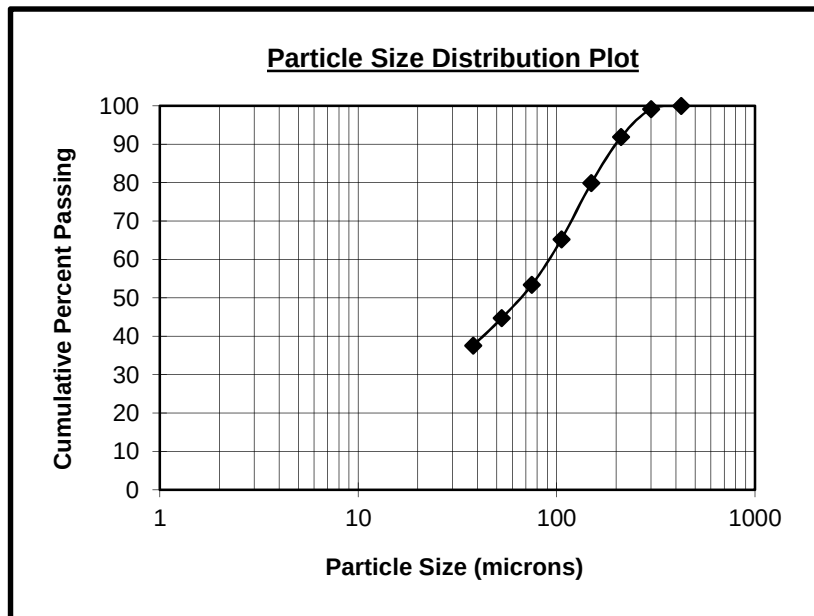


TABLE III-120
SCREEN ANALYSIS
KM4420-P8 Flotation Feed 14:00

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.22	98.8
65 Mesh	212	9.34	89.4
100 Mesh	150	12.42	77.0
150 Mesh	106	12.99	64.0
200 Mesh	75	9.95	54.1
270 Mesh	53	7.72	46.4
400 Mesh	38	6.96	39.4
TOTAL		100.00	**

K80= 164 μm

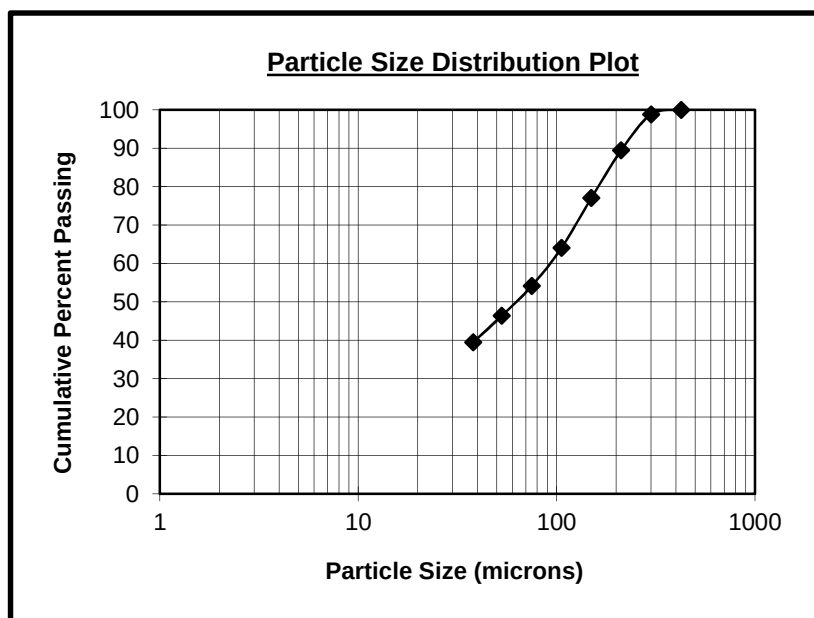
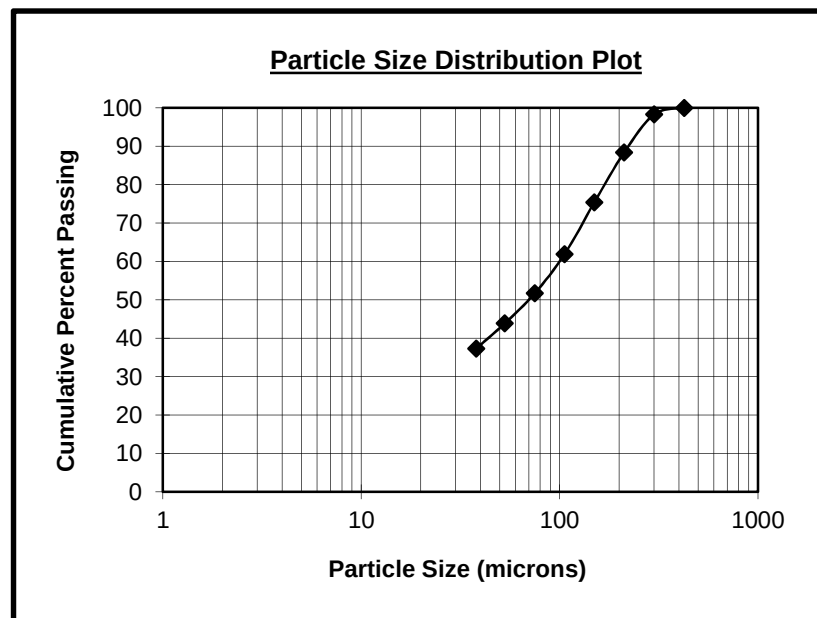


TABLE III-121
SCREEN ANALYSIS
KM4420-P8 Flotation Feed 15:15

Product	Particle Size μm	Weight % Retained	Cumulative % Passing
35 Mesh	425	0.00	100.0
48 Mesh	300	1.71	98.3
65 Mesh	212	9.87	88.4
100 Mesh	150	13.01	75.4
150 Mesh	106	13.54	61.9
200 Mesh	75	10.18	51.7
270 Mesh	53	7.81	43.9
400 Mesh	38	6.60	37.3
TOTAL		100.00	**

K80= 171 μm



Result Analysis Report

Project and Test number:

KM4420-P1

Measured by:

shayne

Measured:

Monday, October 27, 2014 10:02:41 AM

Sample Name:

Bulk Regrind Discharge 09:45 - Average

Edited by:

shayne

Analysed:

Monday, October 27, 2014 10:02:42 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

21.03 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.427 %

Result Emulation:

Off

Concentration:

0.0193 %Vol

Span :

10.116

Uniformity:

2.92

Result units:

Volume

Specific Surface Area:

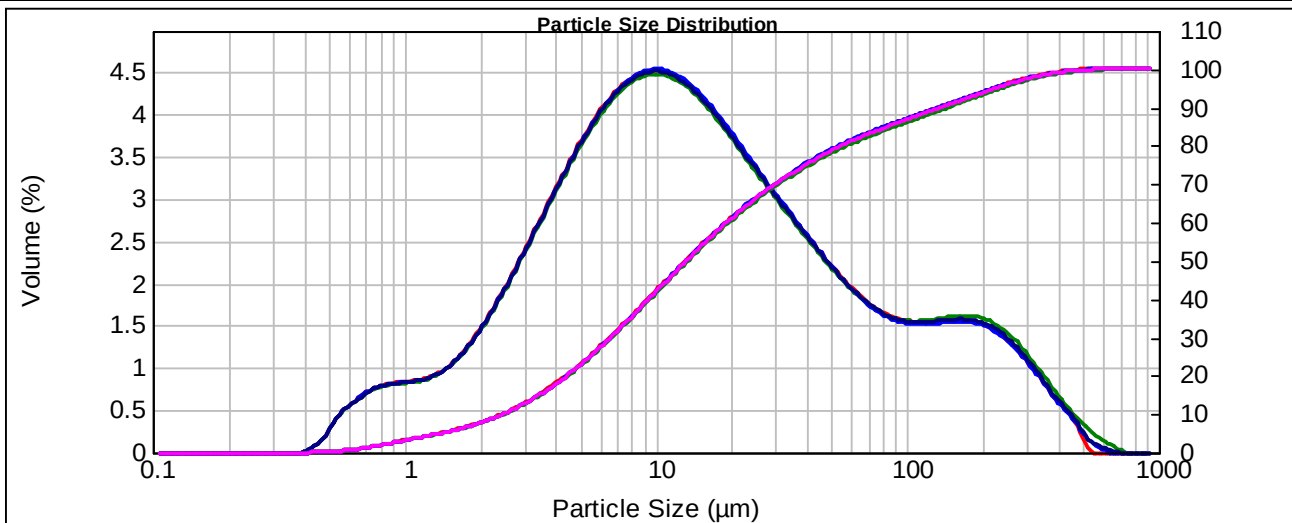
1.03 m²/g

Surface Weighted Mean D[3,2]:

5.828 um

Vol. Weighted Mean D[4,3]:

44.395 um

d(0.1): 2.462 um d(0.5): 13.189 um **d(0.8): 54.546 um** d(0.9): 135.874 um d(0.98): 319.28 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.15	2.291	1.10	10.965	2.69	52.481	1.24	251.189	0.78
0.110	0.00	0.525	0.27	2.512	1.23	12.023	2.65	57.544	1.16	275.423	0.70
0.120	0.00	0.575	0.33	2.754	1.37	13.183	2.60	63.096	1.10	301.995	0.61
0.132	0.00	0.631	0.39	3.020	1.51	14.454	2.53	69.183	1.04	331.131	0.52
0.145	0.00	0.692	0.44	3.311	1.51	15.849	2.44	75.858	0.99	363.078	0.42
0.158	0.00	0.759	0.47	3.631	1.65	17.378	2.35	83.176	0.96	398.107	0.33
0.174	0.00	0.832	0.48	3.981	1.79	19.055	2.26	91.201	0.94	436.516	0.25
0.191	0.00	0.912	0.50	4.365	2.07	20.893	2.16	100.000	0.93	478.630	0.13
0.209	0.00	1.000	0.50	4.786	2.20	22.909	2.06	109.648	0.93	524.807	0.07
0.229	0.00	1.096	0.51	5.248	2.32	25.119	1.96	120.226	0.93	575.440	0.04
0.251	0.00	1.202	0.53	5.754	2.43	27.542	1.87	131.826	0.94	630.957	0.01
0.275	0.00	1.318	0.57	6.310	2.52	30.200	1.77	144.544	0.95	691.831	0.00
0.302	0.00	1.445	0.62	6.918	2.59	33.113	1.68	158.489	0.95	758.578	0.00
0.331	0.00	1.585	0.68	7.586	2.65	36.308	1.59	173.780	0.94	831.764	0.00
0.363	0.00	1.738	0.77	8.318	2.69	39.811	1.50	190.546	0.93	912.011	0.00
0.398	0.02	1.905	0.87	9.120	2.71	43.652	1.41	208.930	0.89	1000.000	0.00
0.437	0.06	2.089	0.98	10.000	2.71	47.863	1.32	229.087	0.84		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P1

Measured by:

blair

Measured:

Monday, October 27, 2014 11:02:11 AM

Sample Name:

Bulk Re grind Discharge 10:50

Edited by:

blair

Analysed:

Monday, October 27, 2014 11:02:12 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

24.72 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.453 %

Result Emulation:

Off

Concentration:

0.0210 %Vol

Span :

6.477

Uniformity:

2.56

Result units:

Volume

Specific Surface Area:

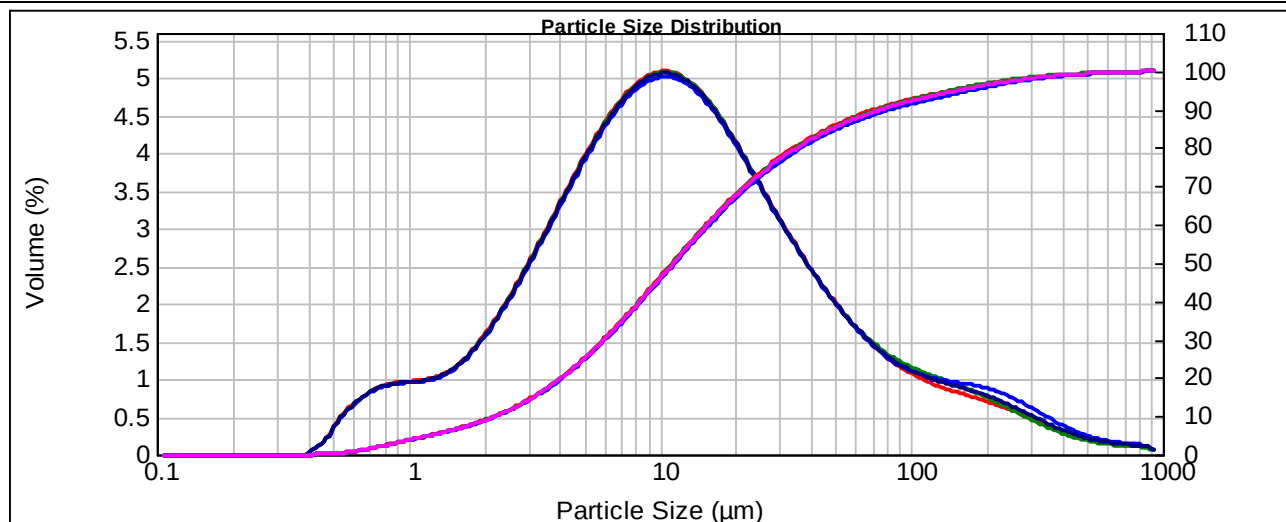
1.15 m²/g

Surface Weighted Mean D[3,2]:

5.225 um

Vol. Weighted Mean D[4,3]:

34.196 um

d(0.1): 2.217 um d(0.5): 11.313 um **d(0.8): 34.970 um** d(0.9): 75.489 um d(0.98): 280.68 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.20	2.291	1.18	10.965	3.03	52.481	1.10	251.189	0.37
0.110	0.00	0.525	0.33	2.512	1.31	12.023	2.99	57.544	1.01	275.423	0.33
0.120	0.00	0.575	0.40	2.754	1.45	13.183	2.93	63.096	0.93	301.995	0.29
0.132	0.00	0.631	0.46	3.020	1.60	14.454	2.85	69.183	0.86	331.131	0.25
0.145	0.00	0.692	0.51	3.311	1.75	15.849	2.74	75.858	0.79	363.078	0.21
0.158	0.00	0.759	0.55	3.631	1.91	17.378	2.62	83.176	0.74	398.107	0.18
0.174	0.00	0.832	0.56	3.981	2.06	19.055	2.49	91.201	0.69	436.516	0.15
0.191	0.00	0.912	0.58	4.365	2.22	20.893	2.36	100.000	0.65	478.630	0.13
0.209	0.00	1.000	0.59	4.786	2.36	22.909	2.21	109.648	0.62	524.807	0.11
0.229	0.00	1.096	0.59	5.248	2.50	25.119	2.07	120.226	0.59	575.440	0.10
0.251	0.00	1.202	0.61	5.754	2.63	27.542	1.93	131.826	0.57	630.957	0.09
0.275	0.00	1.318	0.64	6.310	2.75	30.200	1.80	144.544	0.54	691.831	0.08
0.302	0.00	1.445	0.68	6.918	2.85	33.113	1.67	158.489	0.52	758.578	0.07
0.331	0.00	1.585	0.75	7.586	2.93	36.308	1.54	173.780	0.50	831.764	0.07
0.363	0.00	1.738	0.84	8.318	2.99	39.811	1.42	190.546	0.47	912.011	0.02
0.398	0.03	1.905	0.94	9.120	3.03	43.652	1.31	208.930	0.44	1000.000	
0.437	0.10	2.089	1.05	10.000	3.04	47.863	1.20	229.087	0.41		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P1

Measured by:

blair

Measured:

Monday, October 27, 2014 11:23:01 AM

Sample Name:

Bulk Regrind Discharge 11:15 - Average

Edited by:

blair

Analysed:

Monday, October 27, 2014 11:23:02 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

16.01 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.554 %

Result Emulation:

Off

Concentration:

0.0125 %Vol

Span :

4.512

Uniformity:

1.48

Result units:

Volume

Specific Surface Area:

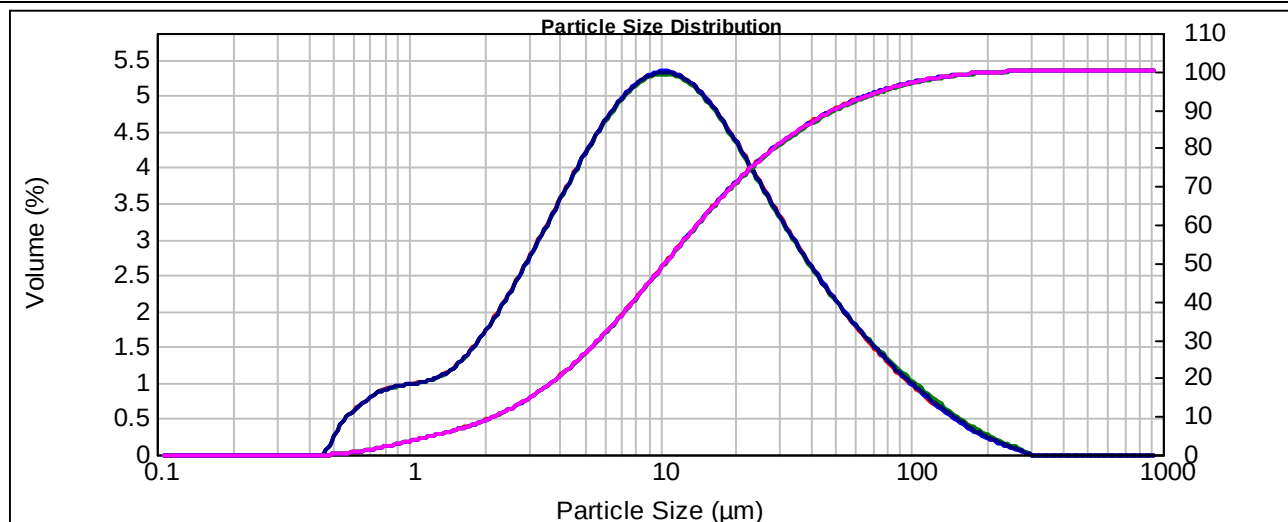
1.16 m²/g

Surface Weighted Mean D[3,2]:

5.166 um

Vol. Weighted Mean D[4,3]:

20.561 um

d(0.1): 2.205 um d(0.5): 10.512 um **d(0.8): 28.555 um** d(0.9): 49.634 um d(0.98): 117.92 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.12	2.291	1.27	10.965	3.19	52.481	1.18	251.189	0.05
0.110	0.00	0.525	0.30	2.512	1.41	12.023	3.15	57.544	1.08	275.423	0.01
0.120	0.00	0.575	0.36	2.754	1.57	13.183	3.08	63.096	0.98	301.995	0.00
0.132	0.00	0.631	0.43	3.020	1.72	14.454	2.99	69.183	0.89	331.131	0.00
0.145	0.00	0.692	0.50	3.311	1.88	15.849	2.89	75.858	0.80	363.078	0.00
0.158	0.00	0.759	0.54	3.631	2.04	17.378	2.76	83.176	0.72	398.107	0.00
0.174	0.00	0.832	0.56	3.981	2.20	19.055	2.63	91.201	0.64	436.516	0.00
0.191	0.00	0.912	0.58	4.365	2.36	20.893	2.49	100.000	0.56	478.630	0.00
0.209	0.00	1.000	0.59	4.786	2.51	22.909	2.34	109.648	0.49	524.807	0.00
0.229	0.00	1.096	0.61	5.248	2.65	25.119	2.20	120.226	0.42	575.440	0.00
0.251	0.00	1.202	0.63	5.754	2.79	27.542	2.05	131.826	0.36	630.957	0.00
0.275	0.00	1.318	0.67	6.310	2.91	30.200	1.91	144.544	0.30	691.831	0.00
0.302	0.00	1.445	0.73	6.918	3.01	33.113	1.78	158.489	0.24	758.578	0.00
0.331	0.00	1.585	0.81	7.586	3.09	36.308	1.64	173.780	0.19	831.764	0.00
0.363	0.00	1.738	0.90	8.318	3.15	39.811	1.52	190.546	0.15	912.011	0.00
0.398	0.00	1.905	1.01	9.120	3.19	43.652	1.40	208.930	0.11	1000.000	0.00
0.437	0.00	2.089	1.14	10.000	3.20	47.863	1.29	229.087	0.07		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P1

Measured by:

michael.carrell

Measured:

Monday, October 27, 2014 12:52:03 PM

Sample Name:

Bulk Regrind Discharge 12:40

Edited by:

michael.carrell

Analysed:

Monday, October 27, 2014 12:52:05 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

15.69 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.553 %

Result Emulation:

Off

Concentration:

0.0128 %Vol

Span :

7.826

Uniformity:

2.66

Result units:

Volume

Specific Surface Area:

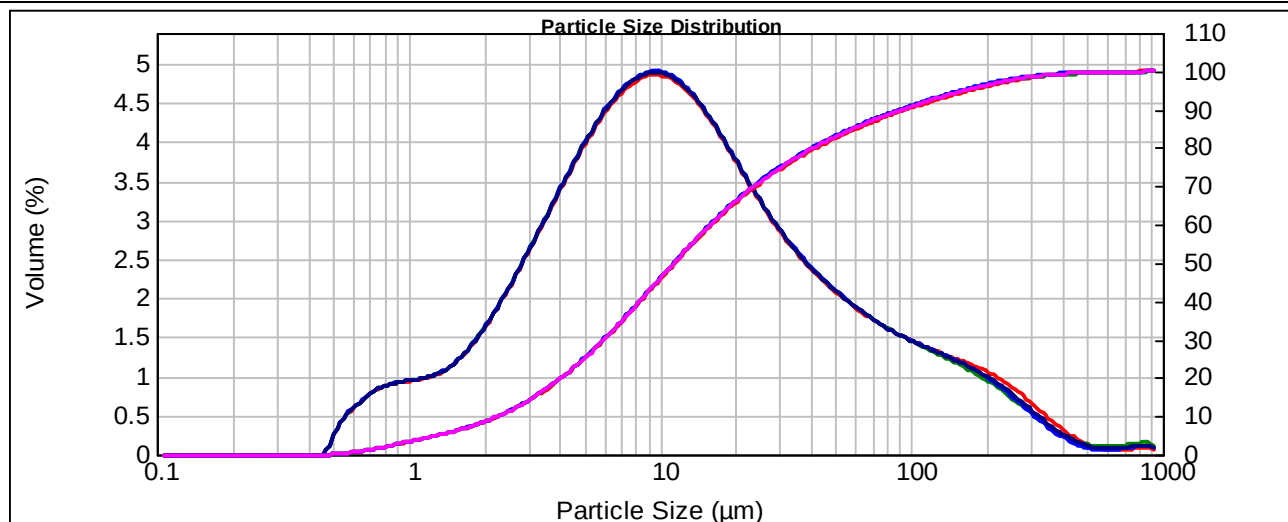
1.11 m²/g

Surface Weighted Mean D[3,2]:

5.420 um

Vol. Weighted Mean D[4,3]:

35.579 um

d(0.1): 2.271 um d(0.5): 11.399 um **d(0.8): 40.741 um** d(0.9): 91.481 um d(0.98): 261.95 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.12	2.291	1.22	10.965	2.89	52.481	1.19	251.189	0.44
0.110	0.00	0.525	0.29	2.512	1.35	12.023	2.83	57.544	1.13	275.423	0.37
0.120	0.00	0.575	0.35	2.754	1.50	13.183	2.75	63.096	1.08	301.995	0.31
0.132	0.00	0.631	0.42	3.020	1.65	14.454	2.65	69.183	1.03	331.131	0.24
0.145	0.00	0.692	0.49	3.311	1.80	15.849	2.53	75.858	0.98	363.078	0.19
0.158	0.00	0.759	0.52	3.631	1.96	17.378	2.40	83.176	0.93	398.107	0.14
0.174	0.00	0.832	0.55	3.981	2.11	19.055	2.27	91.201	0.89	436.516	0.10
0.191	0.00	0.912	0.56	4.365	2.25	20.893	2.14	100.000	0.86	478.630	0.07
0.209	0.00	1.000	0.57	4.786	2.39	22.909	2.01	109.648	0.82	524.807	0.05
0.229	0.00	1.096	0.59	5.248	2.52	25.119	1.89	120.226	0.79	575.440	0.05
0.251	0.00	1.202	0.61	5.754	2.64	27.542	1.77	131.826	0.76	630.957	0.05
0.275	0.00	1.318	0.64	6.310	2.74	30.200	1.67	144.544	0.72	691.831	0.06
0.302	0.00	1.445	0.70	6.918	2.83	33.113	1.57	158.489	0.69	758.578	0.07
0.331	0.00	1.585	0.77	7.586	2.89	36.308	1.48	173.780	0.65	831.764	0.07
0.363	0.00	1.738	0.86	8.318	2.93	39.811	1.40	190.546	0.60	912.011	0.02
0.398	0.00	1.905	0.97	9.120	2.94	43.652	1.33	208.930	0.55	1000.000	
0.437	0.00	2.089	1.09	10.000	2.93	47.863	1.26	229.087	0.50		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P1

Measured by:

mike

Measured:

Monday, October 27, 2014 2:45:17 PM

Sample Name:

Bulk Regrind Discharge 14:20 - Average

Edited by:

mike

Analysed:

Monday, October 27, 2014 2:45:19 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

23.08 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.415 %

Result Emulation:

Off

Concentration:

0.0200 %Vol

Span :

7.683

Uniformity:

2.48

Result units:

Volume

Specific Surface Area:

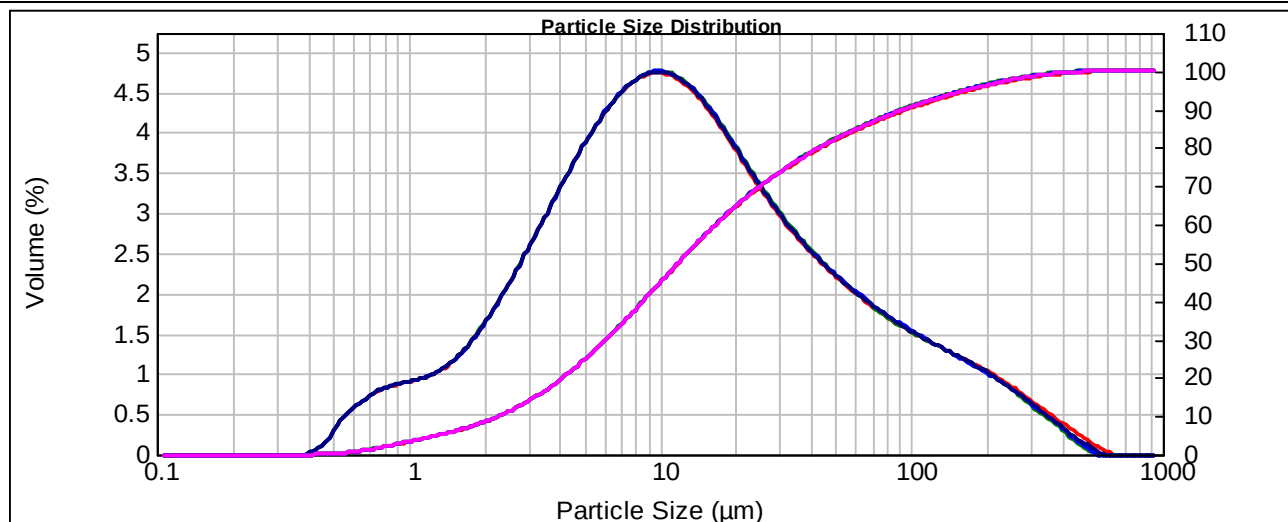
1.1 m²/g

Surface Weighted Mean D[3,2]:

5.453 um

Vol. Weighted Mean D[4,3]:

34.765 um

d(0.1): 2.281 um d(0.5): 11.828 um **d(0.8): 42.862 um** d(0.9): 93.151 um d(0.98): 257.09 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.16	2.291	1.21	10.965	2.83	52.481	1.27	251.189	0.47
0.110	0.00	0.525	0.28	2.512	1.34	12.023	2.78	57.544	1.21	275.423	0.41
0.120	0.00	0.575	0.34	2.754	1.48	13.183	2.71	63.096	1.15	301.995	0.35
0.132	0.00	0.631	0.40	3.020	1.62	14.454	2.62	69.183	1.09	331.131	0.29
0.145	0.00	0.692	0.46	3.311	1.76	15.849	2.52	75.858	1.04	363.078	0.24
0.158	0.00	0.759	0.49	3.631	1.91	17.378	2.41	83.176	0.99	398.107	0.17
0.174	0.00	0.832	0.52	3.981	2.05	19.055	2.30	91.201	0.94	436.516	0.11
0.191	0.00	0.912	0.54	4.365	2.19	20.893	2.18	100.000	0.90	478.630	0.07
0.209	0.00	1.000	0.57	4.786	2.32	22.909	2.06	109.648	0.86	524.807	0.02
0.229	0.00	1.096	0.57	5.248	2.44	25.119	1.95	120.226	0.82	575.440	0.00
0.251	0.00	1.202	0.60	5.754	2.56	27.542	1.84	131.826	0.78	630.957	0.00
0.275	0.00	1.318	0.64	6.310	2.65	30.200	1.74	144.544	0.74	691.831	0.00
0.302	0.00	1.445	0.70	6.918	2.73	33.113	1.65	158.489	0.70	758.578	0.00
0.331	0.00	1.585	0.78	7.586	2.80	36.308	1.56	173.780	0.66	831.764	0.00
0.363	0.00	1.738	0.87	8.318	2.84	39.811	1.48	190.546	0.62	912.011	0.00
0.398	0.02	1.905	0.97	9.120	2.86	43.652	1.41	208.930	0.57	1000.000	0.00
0.437	0.07	2.089	1.09	10.000	2.86	47.863	1.34	229.087	0.52		
0.479	0.07	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P2

Measured by:

blair

Measured:

Tuesday, October 28, 2014 7:53:23 AM

Sample Name:

Bulk Regrind Discharge 07:45 - Average

Edited by:

blair

Analysed:

Tuesday, October 28, 2014 7:53:24 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

23.13 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.285 %

Result Emulation:

Off

Concentration:

0.0189 %Vol

Span :

3.521

Uniformity:

1.14

Result units:

Volume

Specific Surface Area:

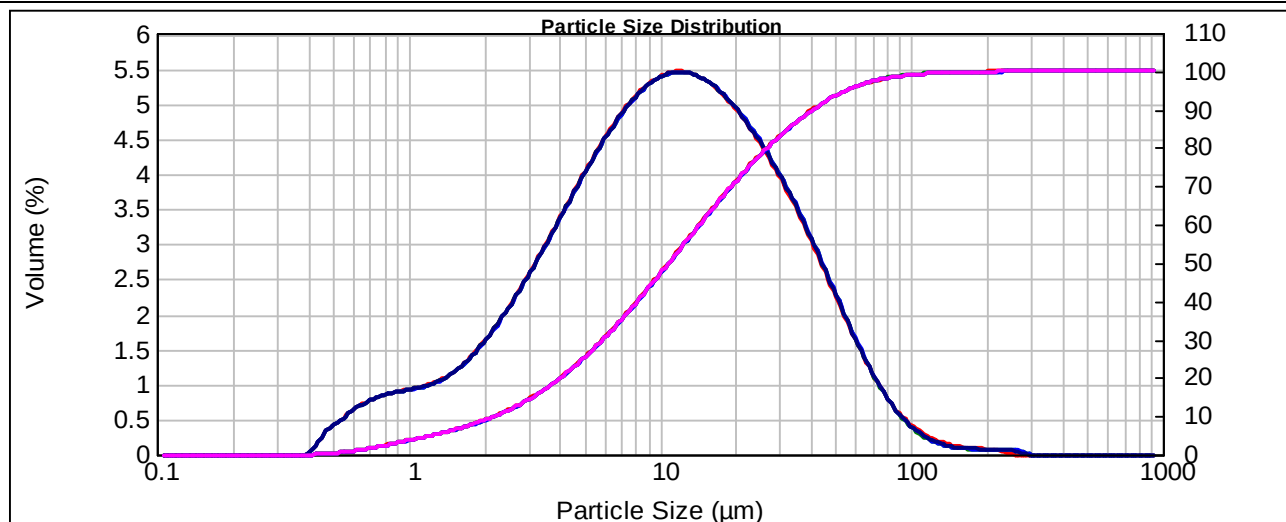
1.18 m²/g

Surface Weighted Mean D[3,2]:

5.081 um

Vol. Weighted Mean D[4,3]:

17.556 um

d(0.1): 2.209 um d(0.5): 10.866 um **d(0.8): 26.749 um** d(0.9): 40.469 um d(0.98): 76.13 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.25	2.291	1.20	10.965	3.28	52.481	1.17	251.189	0.03
0.110	0.00	0.525	0.31	2.512	1.33	12.023	3.28	57.544	0.98	275.423	0.00
0.120	0.00	0.575	0.38	2.754	1.47	13.183	3.26	63.096	0.80	301.995	0.00
0.132	0.00	0.631	0.44	3.020	1.62	14.454	3.22	69.183	0.64	331.131	0.00
0.145	0.00	0.692	0.51	3.311	1.78	15.849	3.16	75.858	0.50	363.078	0.00
0.158	0.00	0.759	0.58	3.631	1.94	17.378	3.08	83.176	0.38	398.107	0.00
0.174	0.00	0.832	0.65	3.981	2.10	19.055	2.98	91.201	0.28	436.516	0.00
0.191	0.00	0.912	0.72	4.365	2.26	20.893	2.87	100.000	0.20	478.630	0.00
0.209	0.00	1.000	0.79	4.786	2.41	22.909	2.75	109.648	0.15	524.807	0.00
0.229	0.00	1.096	0.86	5.248	2.56	25.119	2.61	120.226	0.11	575.440	0.00
0.251	0.00	1.202	0.93	5.754	2.71	27.542	2.46	131.826	0.08	630.957	0.00
0.275	0.00	1.318	1.00	6.310	2.84	30.200	2.31	144.544	0.06	691.831	0.00
0.302	0.00	1.445	1.07	6.918	2.96	33.113	2.14	158.489	0.05	758.578	0.00
0.331	0.00	1.585	1.14	7.586	3.07	36.308	1.95	173.780	0.05	831.764	0.00
0.363	0.00	1.738	1.21	8.318	3.15	39.811	1.76	190.546	0.05	912.011	0.00
0.398	0.03	1.905	1.28	9.120	3.22	43.652	1.57	208.930	0.04	1000.000	0.00
0.437	0.18	2.089	1.35	10.000	3.26	47.863	1.37	229.087	0.04		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P2

Measured by:

blair

Measured:

Tuesday, October 28, 2014 8:25:01 AM

Sample Name:

Bulk Regrind Discharge 08:15

Edited by:
Analysed:

Tuesday, October 28, 2014 8:25:02 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

26.31 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.215 %

Result Emulation:

Off

Concentration:

0.0221 %Vol

Span :

3.664

Uniformity:

1.15

Result units:

Volume

Specific Surface Area:

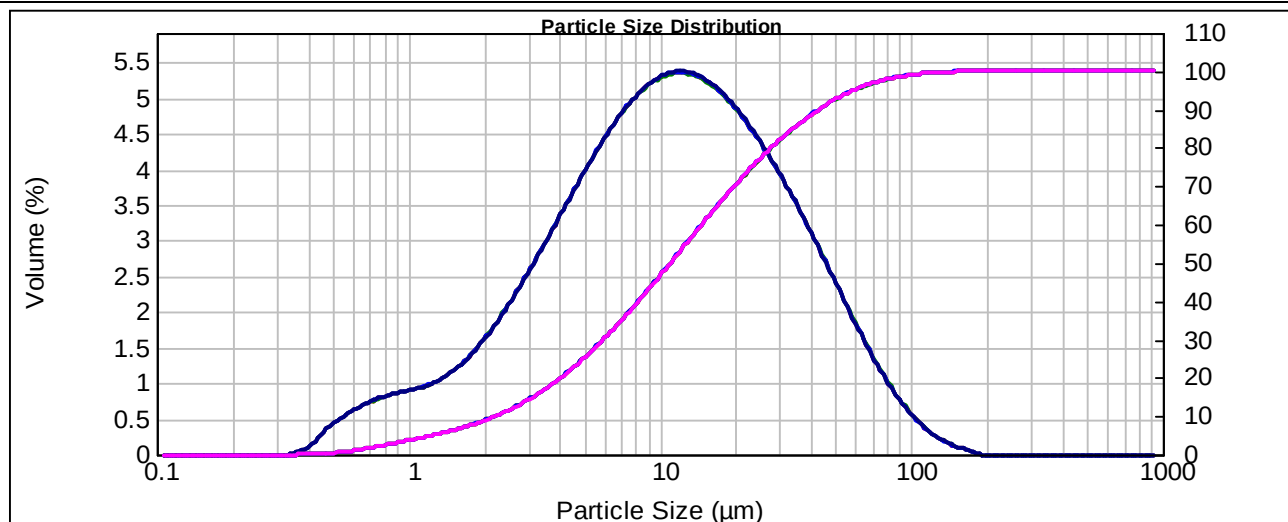
1.18 m²/g

Surface Weighted Mean D[3,2]:

5.075 um

Vol. Weighted Mean D[4,3]:

17.919 um

d(0.1): 2.213 um d(0.5): 11.014 um **d(0.8): 27.672 um** d(0.9): 42.567 um d(0.98): 80.22 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.25	2.291	1.20	10.965	3.23	52.481	1.27	251.189	0.00
0.110	0.00	0.525	0.31	2.512	1.33	12.023	3.23	57.544	1.10	275.423	0.00
0.120	0.00	0.575	0.37	2.754	1.47	13.183	3.21	63.096	0.93	301.995	0.00
0.132	0.00	0.631	0.42	3.020	1.62	14.454	3.17	69.183	0.77	331.131	0.00
0.145	0.00	0.692	0.46	3.311	1.77	15.849	3.17	75.858	0.77	363.078	0.00
0.158	0.00	0.759	0.49	3.631	1.93	17.378	3.11	83.176	0.63	398.107	0.00
0.174	0.00	0.832	0.51	3.981	2.08	19.055	2.94	91.201	0.50	436.516	0.00
0.191	0.00	0.912	0.53	4.365	2.23	20.893	2.83	100.000	0.39	478.630	0.00
0.209	0.00	1.000	0.57	4.786	2.39	22.909	2.70	109.648	0.29	524.807	0.00
0.229	0.00	1.096	0.55	5.248	2.53	25.119	2.57	120.226	0.21	575.440	0.00
0.251	0.00	1.202	0.60	5.754	2.67	27.542	2.43	131.826	0.15	630.957	0.00
0.275	0.00	1.318	0.65	6.310	2.80	30.200	2.28	144.544	0.10	691.831	0.00
0.302	0.00	1.445	0.70	6.918	2.91	33.113	2.13	158.489	0.06	758.578	0.00
0.331	0.00	1.585	0.78	7.586	3.02	36.308	1.96	173.780	0.05	831.764	0.00
0.363	0.04	1.738	0.87	8.318	3.10	39.811	1.79	190.546	0.01	912.011	0.00
0.398	0.08	1.905	0.97	9.120	3.16	43.652	1.62	208.930	0.00	1000.000	0.00
0.437	0.19	2.089	1.08	10.000	3.21	47.863	1.44	229.087	0.00		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P2

Measured by:

blair

Measured:

Tuesday, October 28, 2014 8:47:27 AM

Sample Name:

Bulk Regrind Discharge 08:30

Edited by:

blair

Analysed:

Tuesday, October 28, 2014 8:47:28 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

19.11 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.343 %

Result Emulation:

Off

Concentration:

0.0171 %Vol

Span :

4.154

Uniformity:

1.99

Result units:

Volume

Specific Surface Area:

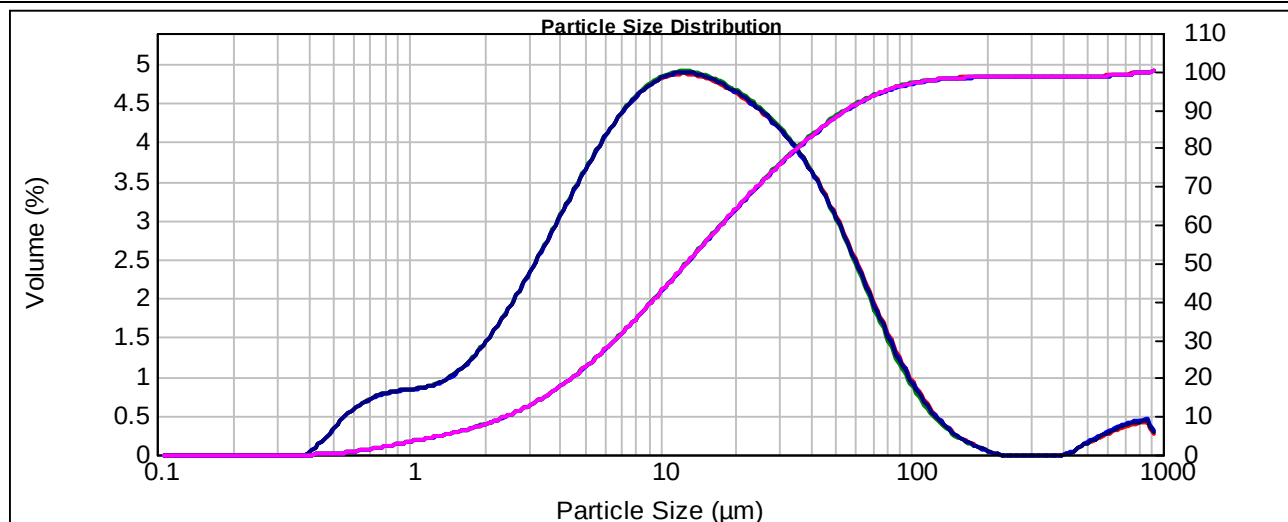
1.06 m²/g

Surface Weighted Mean D[3,2]:

5.654 um

Vol. Weighted Mean D[4,3]:

31.338 um

d(0.1): 2.456 um d(0.5): 12.802 um **d(0.8): 35.275 um** d(0.9): 55.636 um d(0.98): 131.91 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.19	2.291	1.07	10.965	2.94	52.481	1.66	251.189	0.00
0.110	0.00	0.525	0.29	2.512	1.19	12.023	2.94	57.544	1.48	275.423	0.00
0.120	0.00	0.575	0.34	2.754	1.32	13.183	2.93	63.096	1.30	301.995	0.00
0.132	0.00	0.631	0.40	3.020	1.46	14.454	2.91	69.183	1.12	331.131	0.00
0.145	0.00	0.692	0.44	3.311	1.75	15.849	2.88	75.858	0.94	363.078	0.00
0.158	0.00	0.759	0.47	3.631	1.90	17.378	2.84	83.176	0.78	398.107	0.00
0.174	0.00	0.832	0.48	3.981	2.04	19.055	2.74	91.201	0.63	436.516	0.05
0.191	0.00	0.912	0.49	4.365	2.18	20.893	2.69	100.000	0.50	478.630	0.09
0.209	0.00	1.000	0.50	4.786	2.32	22.909	2.62	109.648	0.38	524.807	0.13
0.229	0.00	1.096	0.51	5.248	2.44	25.119	2.55	120.226	0.29	575.440	0.17
0.251	0.00	1.202	0.53	5.754	2.56	27.542	2.46	131.826	0.21	630.957	0.20
0.275	0.00	1.318	0.57	6.310	2.66	30.200	2.37	144.544	0.10	691.831	0.23
0.302	0.00	1.445	0.61	6.918	2.75	33.113	2.25	158.489	0.06	758.578	0.25
0.331	0.00	1.585	0.68	7.586	2.82	36.308	2.13	173.780	0.03	831.764	0.26
0.363	0.00	1.738	0.75	8.318	2.88	39.811	1.99	190.546	0.00	912.011	0.08
0.398	0.04	1.905	0.85	9.120	2.92	43.652	1.83	208.930	0.00	1000.000	
0.437	0.11	2.089	0.95	10.000		47.863		229.087			
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P2

Measured by:

alkmm.metlab

Measured:

Tuesday, October 28, 2014 10:34:16 AM

Sample Name:

Bulk Regrind Discharge 10:15 - Average

Edited by:

alkmm.metlab

Analysed:

Tuesday, October 28, 2014 10:34:17 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

26.16 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.389 %

Result Emulation:

Off

Concentration:

0.0225 %Vol

Span :

4.359

Uniformity:

2.2

Result units:

Volume

Specific Surface Area:

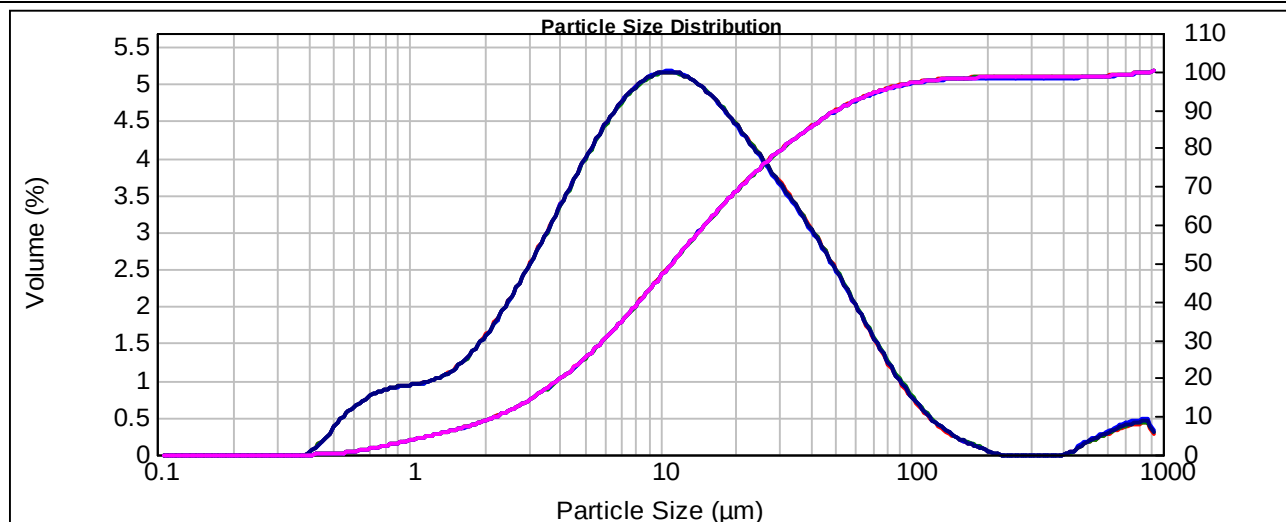
1.15 m²/g

Surface Weighted Mean D[3,2]:

5.212 um

Vol. Weighted Mean D[4,3]:

29.853 um

d(0.1): 2.240 um d(0.5): 11.192 um **d(0.8): 30.865 um** d(0.9): 51.026 um d(0.98): 135.8 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.20	2.291	1.18	10.965	3.10	52.481	1.36	251.189	0.00
0.110	0.00	0.525	0.32	2.512	1.32	12.023	3.07	57.544	1.21	275.423	0.00
0.120	0.00	0.575	0.38	2.754	1.46	13.183	3.03	63.096	1.06	301.995	0.00
0.132	0.00	0.631	0.44	3.020	1.61	14.454	2.96	69.183	0.92	331.131	0.00
0.145	0.00	0.692	0.49	3.311	1.76	15.849	2.88	75.858	0.78	363.078	0.00
0.158	0.00	0.759	0.52	3.631	1.92	17.378	2.79	83.176	0.64	398.107	0.00
0.174	0.00	0.832	0.54	3.981	2.08	19.055	2.69	91.201	0.53	436.516	0.05
0.191	0.00	0.912	0.56	4.365	2.24	20.893	2.58	100.000	0.42	478.630	0.10
0.209	0.00	1.000	0.57	4.786	2.39	22.909	2.47	109.648	0.33	524.807	0.14
0.229	0.00	1.096	0.58	5.248	2.53	25.119	2.36	120.226	0.25	575.440	0.17
0.251	0.00	1.202	0.60	5.754	2.67	27.542	2.25	131.826	0.19	630.957	0.21
0.275	0.00	1.318	0.64	6.310	2.79	30.200	2.13	144.544	0.14	691.831	0.24
0.302	0.00	1.445	0.69	6.918	2.89	33.113	2.02	158.489	0.10	758.578	0.26
0.331	0.00	1.585	0.76	7.586	2.98	36.308	1.90	173.780	0.07	831.764	0.27
0.363	0.00	1.738	0.84	8.318	3.04	39.811	1.77	190.546	0.04	912.011	0.08
0.398	0.04	1.905	0.94	9.120	3.09	43.652	1.64	208.930	0.00	1000.000	
0.437	0.11	2.089	1.06	10.000	3.10	47.863	1.50	229.087	0.00		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P2

Measured by:

shayne

Measured:

Tuesday, October 28, 2014 11:06:27 AM

Sample Name:

Bulk Regrind Discharge 11:00 - Average

Edited by:

shayne

Analysed:

Tuesday, October 28, 2014 11:06:28 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

28.58 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.501 %

Result Emulation:

Off

Concentration:

0.0223 %Vol

Span :

3.631

Uniformity:

1.14

Result units:

Volume

Specific Surface Area:

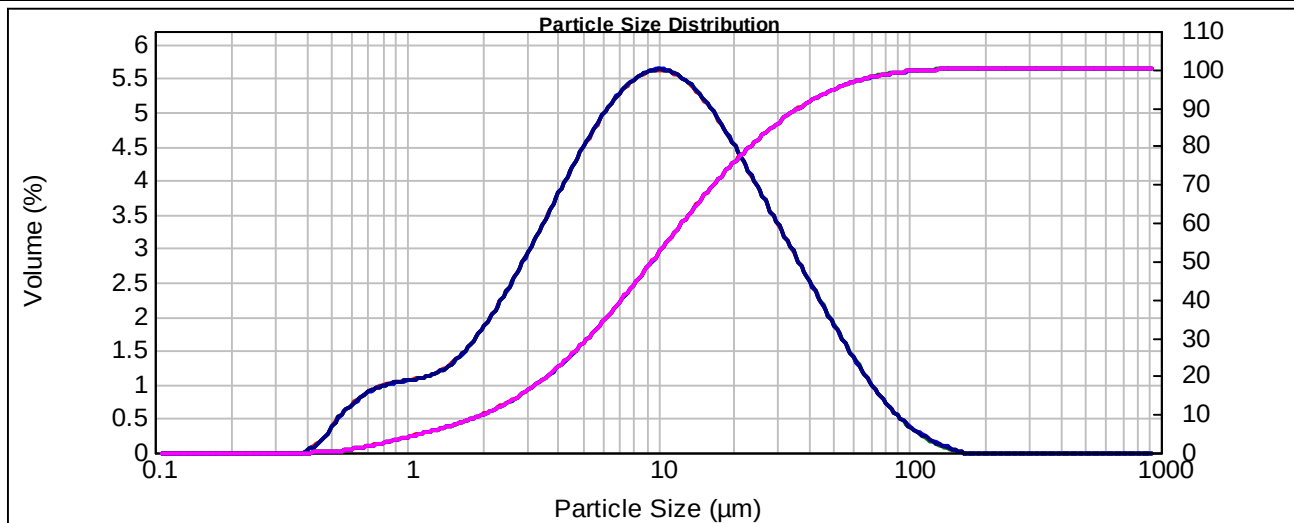
1.27 m²/g

Surface Weighted Mean D[3,2]:

4.719 um

Vol. Weighted Mean D[4,3]:

15.490 um

d(0.1): 2.028 um d(0.5): 9.516 um **d(0.8): 23.411 um** d(0.9): 36.579 um d(0.98): 70.84 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.20	2.291	1.35	10.965	3.36	52.481	0.98	251.189	0.00
0.110	0.00	0.525	0.34	2.512	1.51	12.023	3.31	57.544	0.84	275.423	0.00
0.120	0.00	0.575	0.42	2.754	1.67	13.183	3.23	63.096	0.70	301.995	0.00
0.132	0.00	0.631	0.49	3.020	1.83	14.454	3.13	69.183	0.57	331.131	0.00
0.145	0.00	0.692	0.55	3.311	2.01	15.849	3.01	75.858	0.46	363.078	0.00
0.158	0.00	0.759	0.59	3.631	2.18	17.378	2.87	83.176	0.36	398.107	0.00
0.174	0.00	0.832	0.61	3.981	2.35	19.055	2.73	91.201	0.27	436.516	0.00
0.191	0.00	0.912	0.63	4.365	2.52	20.893	2.57	100.000	0.20	478.630	0.00
0.209	0.00	1.000	0.64	4.786	2.69	22.909	2.41	109.648	0.14	524.807	0.00
0.229	0.00	1.096	0.66	5.248	2.84	25.119	2.25	120.226	0.09	575.440	0.00
0.251	0.00	1.202	0.68	5.754	2.98	27.542	2.09	131.826	0.05	630.957	0.00
0.275	0.00	1.318	0.73	6.310	3.10	30.200	1.93	144.544	0.02	691.831	0.00
0.302	0.00	1.445	0.78	6.918	3.21	33.113	1.77	158.489	0.00	758.578	0.00
0.331	0.00	1.585	0.87	7.586	3.29	36.308	1.60	173.780	0.00	831.764	0.00
0.363	0.00	1.738	0.96	8.318	3.35	39.811	1.44	190.546	0.00	912.011	0.00
0.398	0.03	1.905	1.08	9.120	3.38	43.652	1.29	208.930	0.00	1000.000	0.00
0.437	0.10	2.089	1.21	10.000	3.38	47.863	1.13	229.087	0.00		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P2

Measured by:

alkmm.metlab

Measured:

Tuesday, October 28, 2014 11:26:59 AM

Sample Name:

Bulk Regrind Discharge 11:20 - Average

Edited by:

alkmm.metlab

Analysed:

Tuesday, October 28, 2014 11:27:00 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

29.11 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.413 %

Result Emulation:

Off

Concentration:

0.0244 %Vol

Span :

4.385

Uniformity:

1.69

Result units:

Volume

Specific Surface Area:

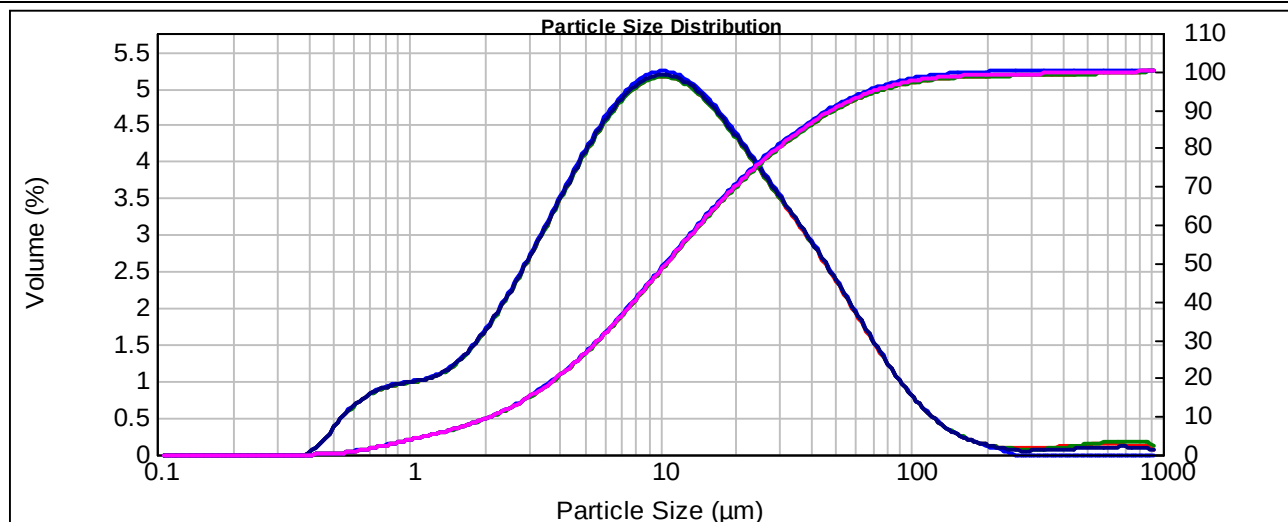
1.19 m²/g

Surface Weighted Mean D[3,2]:

5.034 um

Vol. Weighted Mean D[4,3]:

23.054 um

d(0.1): 2.145 um d(0.5): 10.650 um **d(0.8): 29.396 um** d(0.9): 48.839 um d(0.98): 112.69 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.20	2.291	1.25	10.965	3.10	52.481	1.30	251.189	0.03
0.110	0.00	0.525	0.33	2.512	1.39	12.023	3.06	57.544	1.17	275.423	0.03
0.120	0.00	0.575	0.39	2.754	1.54	13.183	3.00	63.096	1.03	301.995	0.03
0.132	0.00	0.631	0.46	3.020	1.69	14.454	2.93	69.183	0.89	331.131	0.04
0.145	0.00	0.692	0.51	3.311	1.85	15.849	2.83	75.858	0.77	363.078	0.04
0.158	0.00	0.759	0.55	3.631	2.01	17.378	2.73	83.176	0.65	398.107	0.04
0.174	0.00	0.832	0.57	3.981	2.17	19.055	2.62	91.201	0.54	436.516	0.05
0.191	0.00	0.912	0.59	4.365	2.32	20.893	2.51	100.000	0.44	478.630	0.05
0.209	0.00	1.000	0.60	4.786	2.47	22.909	2.39	109.648	0.35	524.807	0.06
0.229	0.00	1.096	0.61	5.248	2.61	25.119	2.28	120.226	0.28	575.440	0.06
0.251	0.00	1.202	0.64	5.754	2.74	27.542	2.16	131.826	0.22	630.957	0.06
0.275	0.00	1.318	0.68	6.310	2.85	30.200	2.05	144.544	0.17	691.831	0.06
0.302	0.00	1.445	0.73	6.918	2.95	33.113	1.93	158.489	0.13	758.578	0.06
0.331	0.00	1.585	0.81	7.586	3.03	36.308	1.81	173.780	0.10	831.764	0.06
0.363	0.00	1.738	0.90	8.318	3.08	39.811	1.69	190.546	0.08	912.011	0.02
0.398	0.04	1.905	1.00	9.120	3.11	43.652	1.57	208.930	0.06	1000.000	
0.437	0.11	2.089	1.12	10.000	3.12	47.863	1.43	229.087	0.04		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

Hoang

Measured:

Wednesday, October 29, 2014 3:29:57 PM

Sample Name:

Bulk Cleaner Scav Con - 15:30 - Average

Edited by:

Hoang

Analysed:

Wednesday, October 29, 2014 3:29:59 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

12.57 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.888 %

Result Emulation:

Off

Concentration:

0.0087 %Vol

Span :

5.834

Uniformity:

1.67

Result units:

Volume

Specific Surface Area:

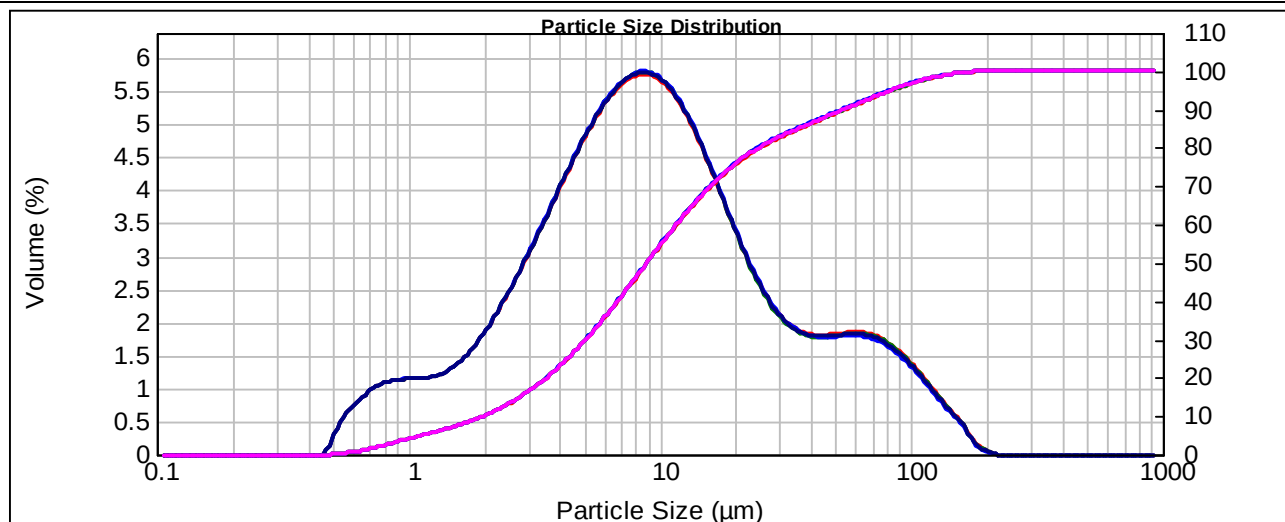
1.29 m²/g

Surface Weighted Mean D[3,2]:

4.647 um

Vol. Weighted Mean D[4,3]:

19.199 um

d(0.1): 1.978 um d(0.5): 8.864 um **d(0.8): 24.683 um** d(0.9): 53.689 um d(0.98): 114.34 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.14	2.291	1.40	10.965	3.28	52.481	1.10	251.189	0.00
0.110	0.00	0.525	0.35	2.512	1.57	12.023	3.13	57.544	1.10	275.423	0.00
0.120	0.00	0.575	0.44	2.754	1.75	13.183	2.95	63.096	1.09	301.995	0.00
0.132	0.00	0.631	0.53	3.020	1.93	14.454	2.74	69.183	1.07	331.131	0.00
0.145	0.00	0.692	0.61	3.311	2.13	15.849	2.51	75.858	1.02	363.078	0.00
0.158	0.00	0.759	0.65	3.631	2.33	17.378	2.28	83.176	0.95	398.107	0.00
0.174	0.00	0.832	0.68	3.981	2.52	19.055	2.04	91.201	0.87	436.516	0.00
0.191	0.00	0.912	0.69	4.365	2.71	20.893	1.82	100.000	0.77	478.630	0.00
0.209	0.00	1.000	0.69	4.786	2.89	22.909	1.62	109.648	0.66	524.807	0.00
0.229	0.00	1.096	0.70	5.248	3.05	25.119	1.45	120.226	0.54	575.440	0.00
0.251	0.00	1.202	0.71	5.754	3.20	27.542	1.31	131.826	0.43	630.957	0.00
0.275	0.00	1.318	0.74	6.310	3.32	30.200	1.14	144.544	0.34	691.831	0.00
0.302	0.00	1.445	0.80	6.918	3.41	33.113	1.09	158.489	0.22	758.578	0.00
0.331	0.00	1.585	0.88	7.586	3.47	36.308	1.08	173.780	0.08	831.764	0.00
0.363	0.00	1.738	0.98	8.318	3.46	39.811	1.09	190.546	0.04	912.011	0.00
0.398	0.00	1.905	1.10	9.120	3.39	43.652	1.08	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	1.25	10.000		47.863	1.09	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

lloyd

Measured:

Wednesday, October 29, 2014 8:06:42 AM

Sample Name:

Bulk Regrind Discharge 08:00

Edited by:

lloyd

Analysed:

Wednesday, October 29, 2014 8:06:44 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

16.38 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.403 %

Result Emulation:

Off

Concentration:

0.0160 %Vol

Span :

5.771

Uniformity:

1.81

Result units:

Volume

Specific Surface Area:

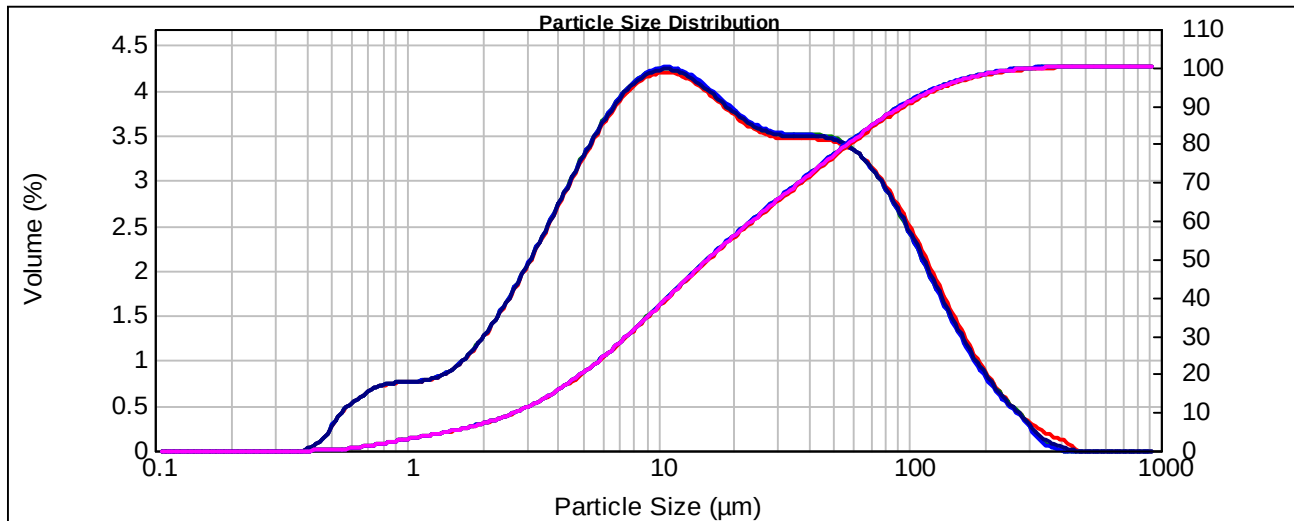
0.944 m²/g

Surface Weighted Mean D[3,2]:

6.355 um

Vol. Weighted Mean D[4,3]:

35.521 um

d(0.1): 2.714 um d(0.5): 15.842 um **d(0.8): 57.019 um** d(0.9): 94.133 um d(0.98): 191.04 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.15	2.291	0.94	10.965	2.54	52.481	2.05	251.189	0.27
0.110	0.00	0.525	0.26	2.512	1.05	12.023	2.52	57.544	2.01	275.423	0.21
0.120	0.00	0.575	0.31	2.754	1.17	13.183	2.48	63.096	1.95	301.995	0.12
0.132	0.00	0.631	0.36	3.020	1.30	14.454	2.43	69.183	1.87	331.131	0.07
0.145	0.00	0.692	0.41	3.311	1.43	15.849	2.38	75.858	1.77	363.078	0.04
0.158	0.00	0.759	0.43	3.631	1.56	17.378	2.32	83.176	1.66	398.107	0.02
0.174	0.00	0.832	0.45	3.981	1.69	19.055	2.26	91.201	1.54	436.516	0.00
0.191	0.00	0.912	0.46	4.365	1.82	20.893	2.21	100.000	1.40	478.630	0.00
0.209	0.00	1.000	0.46	4.786	1.95	22.909	2.17	109.648	1.26	524.807	0.00
0.229	0.00	1.096	0.46	5.248	2.07	25.119	2.13	120.226	1.13	575.440	0.00
0.251	0.00	1.202	0.48	5.754	2.19	27.542	2.11	131.826	0.99	630.957	0.00
0.275	0.00	1.318	0.50	6.310	2.29	30.200	2.10	144.544	0.86	691.831	0.00
0.302	0.00	1.445	0.54	6.918	2.37	33.113	2.10	158.489	0.73	758.578	0.00
0.331	0.00	1.585	0.59	7.586	2.45	36.308	2.10	173.780	0.62	831.764	0.00
0.363	0.00	1.738	0.66	8.318	2.50	39.811	2.10	190.546	0.51	912.011	0.00
0.398	0.02	1.905	0.74	9.120	2.53	43.652	2.09	208.930	0.42	1000.000	0.00
0.437	0.06	2.089	0.84	10.000	2.55	47.863	2.08	229.087	0.34		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

alkmm.metlab

Measured:

Wednesday, October 29, 2014 8:27:11 AM

Sample Name:

Bulk Regrind Discharge 08:15 - Average

Edited by:

alkmm.metlab

Analysed:

Wednesday, October 29, 2014 8:27:12 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

17.08 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.513 %

Result Emulation:

Off

Concentration:

0.0135 %Vol

Span :

3.384

Uniformity:

1.05

Result units:

Volume

Specific Surface Area:

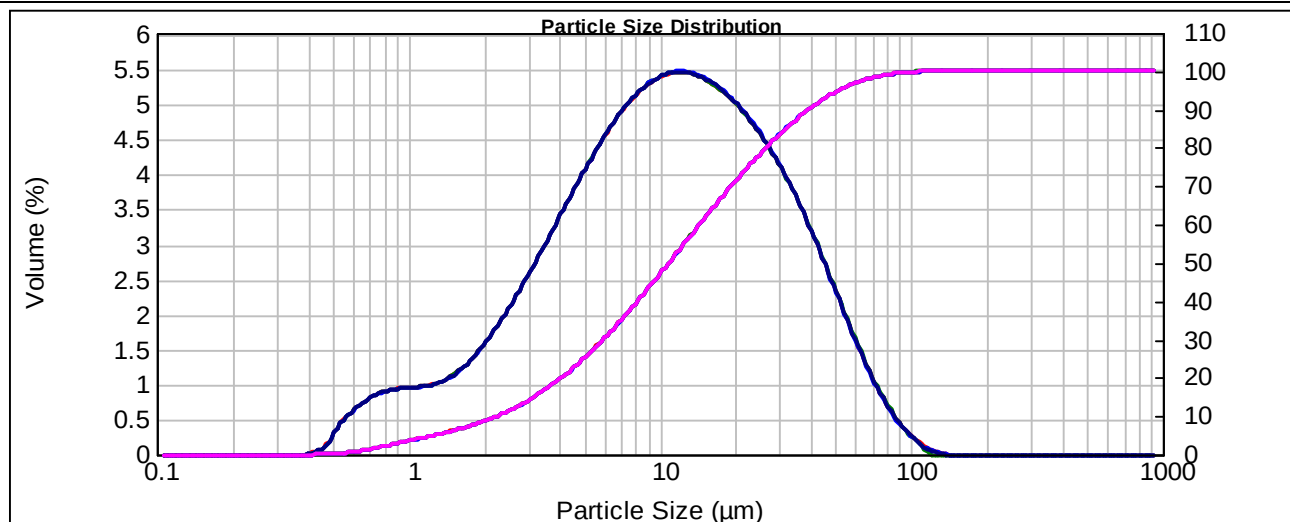
1.16 m²/g

Surface Weighted Mean D[3,2]:

5.175 um

Vol. Weighted Mean D[4,3]:

16.548 um

d(0.1): 2.254 um d(0.5): 10.846 um **d(0.8): 26.378 um** d(0.9): 38.954 um d(0.98): 66.81 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.16	2.291	1.19	10.965	3.29	52.481	1.19	251.189	0.00
0.110	0.00	0.525	0.30	2.512	1.33	12.023	3.29	57.544	0.98	275.423	0.00
0.120	0.00	0.575	0.38	2.754	1.48	13.183	3.27	63.096	0.78	301.995	0.00
0.132	0.00	0.631	0.44	3.020	1.63	14.454	3.24	69.183	0.60	331.131	0.00
0.145	0.00	0.692	0.50	3.311	1.96	15.849	3.18	75.858	0.44	363.078	0.00
0.158	0.00	0.759	0.54	3.631	2.12	17.378	3.11	83.176	0.30	398.107	0.00
0.174	0.00	0.832	0.56	3.981	2.29	19.055	2.93	91.201	0.20	436.516	0.00
0.191	0.00	0.912	0.57	4.365	2.45	20.893	2.82	100.000	0.12	478.630	0.00
0.209	0.00	1.000	0.59	4.786	2.60	22.909	2.70	109.648	0.04	524.807	0.00
0.229	0.00	1.096	0.60	5.248	2.74	25.119	2.55	120.226	0.02	575.440	0.00
0.251	0.00	1.202	0.63	5.754	2.87	27.542	2.40	131.826	0.00	630.957	0.00
0.275	0.00	1.318	0.68	6.310	2.99	30.200	2.23	144.544	0.00	691.831	0.00
0.302	0.00	1.445	0.75	6.918	3.17	33.113	2.04	158.489	0.00	758.578	0.00
0.331	0.00	1.585	0.84	7.586	3.23	36.308	1.83	173.780	0.00	831.764	0.00
0.363	0.00	1.738	0.94	8.318	3.27	39.811	1.62	190.546	0.00	912.011	0.00
0.398	0.01	1.905	1.06	9.120	3.27	43.652	1.40	208.930	0.00	1000.000	0.00
0.437	0.05	2.089		10.000		47.863		229.087			
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

alkmm.metlab

Measured:

Wednesday, October 29, 2014 8:48:08 AM

Sample Name:

Bulk Regrind Discharge 08:40 Average

Edited by:

alkmm.metlab

Analysed:

Wednesday, October 29, 2014 8:48:10 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

28.47 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.437 %

Result Emulation:

Off

Concentration:

0.0261 %Vol

Span :

4.557

Uniformity:

1.39

Result units:

Volume

Specific Surface Area:

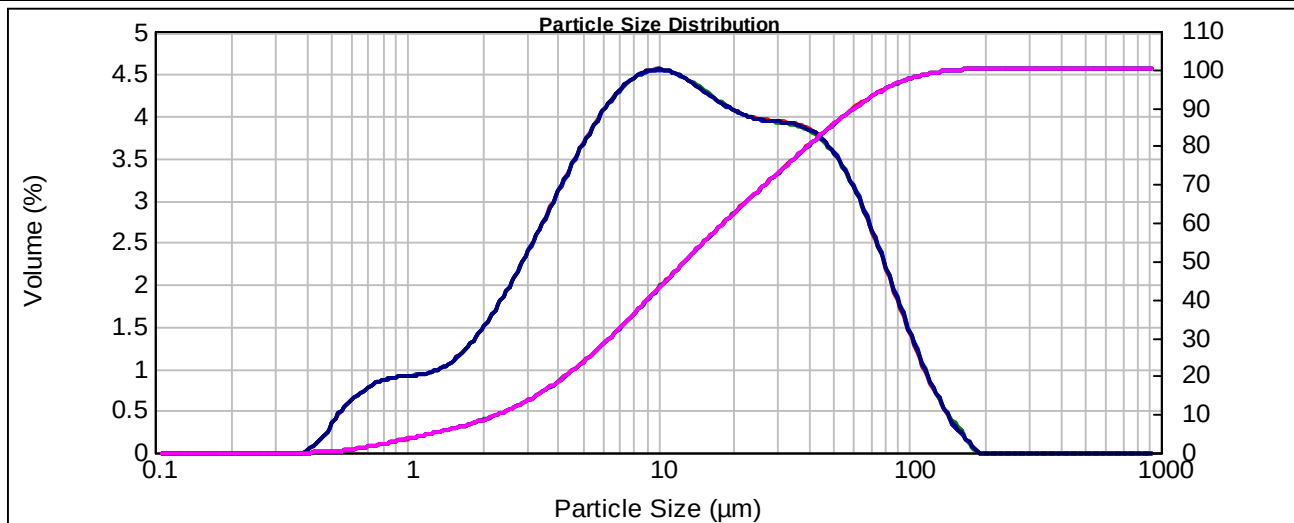
1.09 m²/g

Surface Weighted Mean D[3,2]:

5.512 um

Vol. Weighted Mean D[4,3]:

23.582 um

d(0.1): 2.332 um d(0.5): 12.827 um **d(0.8): 39.584 um** d(0.9): 60.787 um d(0.98): 105.28 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.19	2.291	1.10	10.965	2.72	52.481	2.04	251.189	0.00
0.110	0.00	0.525	0.31	2.512	1.22	12.023	2.69	57.544	1.90	275.423	0.00
0.120	0.00	0.575	0.37	2.754	1.36	13.183	2.65	63.096	1.74	301.995	0.00
0.132	0.00	0.631	0.43	3.020	1.49	14.454	2.60	69.183	1.56	331.131	0.00
0.145	0.00	0.692	0.48	3.311	1.64	15.849	2.54	75.858	1.37	363.078	0.00
0.158	0.00	0.759	0.51	3.631	1.78	17.378	2.49	83.176	1.16	398.107	0.00
0.174	0.00	0.832	0.53	3.981	1.93	19.055	2.45	91.201	0.97	436.516	0.00
0.191	0.00	0.912	0.54	4.365	2.07	20.893	2.42	100.000	0.78	478.630	0.00
0.209	0.00	1.000	0.55	4.786	2.20	22.909	2.38	109.648	0.60	524.807	0.00
0.229	0.00	1.096	0.56	5.248	2.32	25.119	2.37	120.226	0.45	575.440	0.00
0.251	0.00	1.202	0.58	5.754	2.44	27.542	2.37	131.826	0.32	630.957	0.00
0.275	0.00	1.318	0.60	6.310	2.54	30.200	2.35	144.544	0.18	691.831	0.00
0.302	0.00	1.445	0.65	6.918	2.62	33.113	2.33	158.489	0.12	758.578	0.00
0.331	0.00	1.585	0.71	7.586	2.68	36.308	2.29	173.780	0.02	831.764	0.00
0.363	0.00	1.738	0.79	8.318	2.72	39.811	2.23	190.546	0.00	912.011	0.00
0.398	0.03	1.905	0.88	9.120	2.74	43.652	2.15	208.930	0.00	1000.000	0.00
0.437	0.09	2.089	0.99	10.000	2.74	47.863		229.087			
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

alkmm.metlab

Measured:

Wednesday, October 29, 2014 9:34:07 AM

Sample Name:

Bulk Regrind Discharge 09:15

Edited by:

alkmm.metlab

Analysed:

Wednesday, October 29, 2014 9:34:08 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

18.42 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.472 %

Result Emulation:

Off

Concentration:

0.0172 %Vol

Span :

6.330

Uniformity:

2.02

Result units:

Volume

Specific Surface Area:

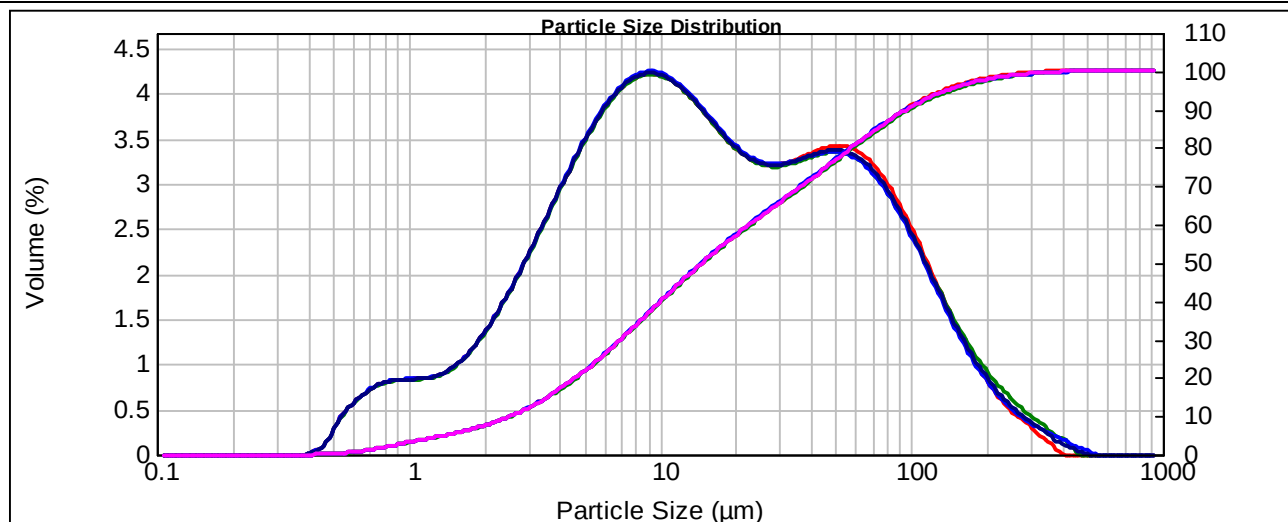
0.996 m²/g

Surface Weighted Mean D[3,2]:

6.026 um

Vol. Weighted Mean D[4,3]:

35.960 um

d(0.1): 2.539 um d(0.5): 14.711 um **d(0.8): 57.732 um** d(0.9): 95.656 um d(0.98): 200.78 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.15	2.291	1.02	10.965	2.48	52.481	2.02	251.189	0.29
0.110	0.00	0.525	0.28	2.512	1.14	12.023	2.42	57.544	1.99	275.423	0.23
0.120	0.00	0.575	0.34	2.754	1.27	13.183	2.35	63.096	1.94	301.995	0.19
0.132	0.00	0.631	0.40	3.020	1.41	14.454	2.27	69.183	1.87	331.131	0.14
0.145	0.00	0.692	0.45	3.311	1.55	15.849	2.19	75.858	1.78	363.078	0.08
0.158	0.00	0.759	0.48	3.631	1.69	17.378	2.11	83.176	1.67	398.107	0.06
0.174	0.00	0.832	0.49	3.981	1.83	19.055	2.05	91.201	1.55	436.516	0.03
0.191	0.00	0.912	0.50	4.365	1.96	20.893	1.99	100.000	1.41	478.630	0.00
0.209	0.00	1.000	0.50	4.786	2.09	22.909	1.93	109.648	1.27	524.807	0.00
0.229	0.00	1.096	0.51	5.248	2.21	25.119	1.93	120.226	1.12	575.440	0.00
0.251	0.00	1.202	0.52	5.754	2.31	27.542	1.93	131.826	0.98	630.957	0.00
0.275	0.00	1.318	0.54	6.310	2.40	30.200	1.94	144.544	0.85	691.831	0.00
0.302	0.00	1.445	0.58	6.918	2.47	33.113	1.95	158.489	0.72	758.578	0.00
0.331	0.00	1.585	0.64	7.586	2.51	36.308	1.98	173.780	0.61	831.764	0.00
0.363	0.00	1.738	0.71	8.318	2.54	39.811	2.00	190.546	0.51	912.011	0.00
0.398	0.02	1.905	0.80	9.120	2.54	43.652	2.02	208.930	0.42	1000.000	0.00
0.437	0.05	2.089	0.91	10.000	2.52	47.863	2.03	229.087	0.35		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

alkmm.metlab

Measured:

Wednesday, October 29, 2014 10:15:53 AM

Sample Name:

Bulk Regrind Discharge 10:00 - Average

Edited by:

alkmm.metlab

Analysed:

Wednesday, October 29, 2014 10:15:54 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

23.80 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.487 %

Result Emulation:

Off

Concentration:

0.0235 %Vol

Span :

7.801

Uniformity:

2.46

Result units:

Volume

Specific Surface Area:

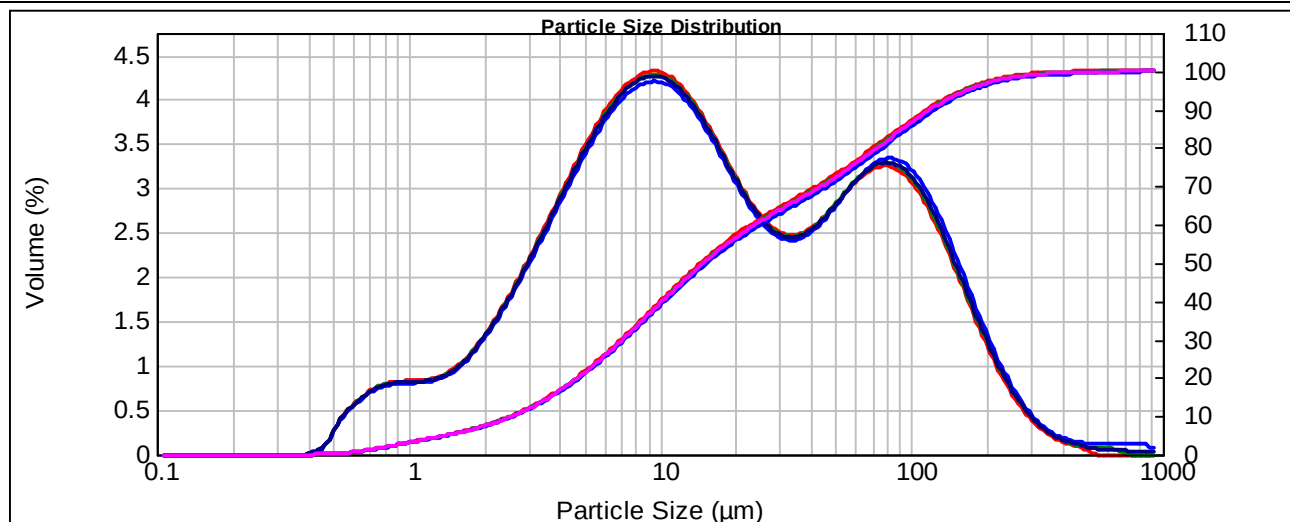
0.974 m²/g

Surface Weighted Mean D[3,2]:

6.157 um

Vol. Weighted Mean D[4,3]:

43.023 um

d(0.1): 2.579 um d(0.5): 14.918 um **d(0.8): 73.271 um** d(0.9): 118.950 um d(0.98): 230.45 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.14	2.291	1.00	10.965	2.51	52.481	1.78	251.189	0.38
0.110	0.00	0.525	0.27	2.512	1.12	12.023	2.44	57.544	1.85	275.423	0.29
0.120	0.00	0.575	0.33	2.754	1.25	13.183	2.35	63.096	1.92	301.995	0.21
0.132	0.00	0.631	0.39	3.020	1.38	14.454	2.24	69.183	1.96	331.131	0.16
0.145	0.00	0.692	0.44	3.311	1.52	15.849	2.12	75.858	1.98	363.078	0.11
0.158	0.00	0.759	0.47	3.631	1.66	17.378	2.00	83.176	1.97	398.107	0.08
0.174	0.00	0.832	0.48	3.981	1.79	19.055	1.87	91.201	1.92	436.516	0.07
0.191	0.00	0.912	0.49	4.365	1.93	20.893	1.75	100.000	1.84	478.630	0.05
0.209	0.00	1.000	0.49	4.786	2.06	22.909	1.65	109.648	1.73	524.807	0.04
0.229	0.00	1.096	0.50	5.248	2.18	25.119	1.56	120.226	1.60	575.440	0.04
0.251	0.00	1.202	0.51	5.754	2.29	27.542	1.51	131.826	1.45	630.957	0.04
0.275	0.00	1.318	0.53	6.310	2.39	30.200	1.47	144.544	1.28	691.831	0.03
0.302	0.00	1.445	0.57	6.918	2.46	33.113	1.47	158.489	1.11	758.578	0.02
0.331	0.00	1.585	0.63	7.586	2.52	36.308	1.50	173.780	0.94	831.764	0.02
0.363	0.00	1.738	0.70	8.318	2.56	39.811	1.55	190.546	0.78	912.011	0.01
0.398	0.01	1.905	0.79	9.120	2.57	43.652	1.61	208.930	0.63	1000.000	0.01
0.437	0.01	2.089	0.89	10.000	2.55	47.863	1.70	229.087	0.50		
0.479	0.04	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

Hoang

Measured:

Wednesday, October 29, 2014 10:31:52 AM

Sample Name:

Bulk Regrind Discharge 10:30 - Average

Edited by:

Hoang

Analysed:

Wednesday, October 29, 2014 10:31:53 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

13.28 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.648 %

Result Emulation:

Off

Concentration:

0.0107 %Vol

Span :

5.778

Uniformity:

1.79

Result units:

Volume

Specific Surface Area:

1.11 m²/g

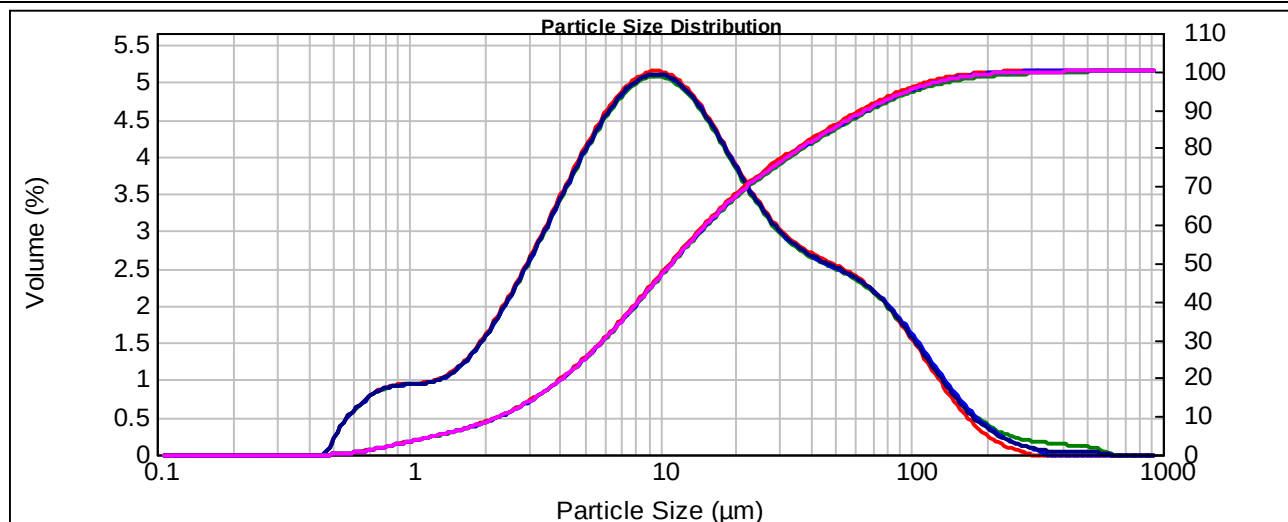
Surface Weighted Mean D[3,2]:

5.414 um

Vol. Weighted Mean D[4,3]:

25.254 um

d(0.1): 2.316 um d(0.5): 11.140 um **d(0.8): 36.322 um** d(0.9): 66.681 um d(0.98): 142 um



Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	1.19	10.965	3.03	52.481	1.47	251.189	0.09
0.110	0.00	0.525	0.27	2.512	1.33	12.023	2.96	57.544	1.43	275.423	0.06
0.120	0.00	0.575	0.35	2.754	1.49	13.183	2.86	63.096	1.37	301.995	0.04
0.132	0.00	0.631	0.43	3.020	1.64	14.454	2.75	69.183	1.30	331.131	0.03
0.145	0.00	0.692	0.49	3.311	1.64	15.849	2.62	75.858	1.22	363.078	0.03
0.158	0.00	0.759	0.53	3.631	1.97	17.378	2.48	83.176	1.12	398.107	0.03
0.174	0.00	0.832	0.55	3.981	2.13	19.055	2.34	91.201	1.02	436.516	0.02
0.191	0.00	0.912	0.56	4.365	2.29	20.893	2.20	100.000	0.90	478.630	0.02
0.209	0.00	1.000	0.57	4.786	2.45	22.909	2.06	109.648	0.78	524.807	0.02
0.229	0.00	1.096	0.57	5.248	2.59	25.119	1.95	120.226	0.67	575.440	0.00
0.251	0.00	1.202	0.59	5.754	2.73	27.542	1.84	131.826	0.55	630.957	0.00
0.275	0.00	1.318	0.62	6.310	2.84	30.200	1.76	144.544	0.45	691.831	0.00
0.302	0.00	1.445	0.67	6.918	2.94	33.113	1.69	158.489	0.36	758.578	0.00
0.331	0.00	1.585	0.74	7.586	3.01	36.308	1.63	173.780	0.27	831.764	0.00
0.363	0.00	1.738	0.83	8.318	3.06	39.811	1.59	190.546	0.21	912.011	0.00
0.398	0.00	1.905	0.94	9.120	3.08	43.652	1.55	208.930	0.16	1000.000	0.00
0.437	0.00	2.089	1.06	10.000	3.07	47.863	1.51	229.087	0.12		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

lloyd

Measured:

Wednesday, October 29, 2014 11:53:31 AM

Sample Name:

Bulk Regrind Discharge 11:30 - Average

Edited by:

lloyd

Analysed:

Wednesday, October 29, 2014 11:53:32 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

23.15 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.585 %

Result Emulation:

Off

Concentration:

0.0191 %Vol

Span :

4.309

Uniformity:

1.34

Result units:

Volume

Specific Surface Area:

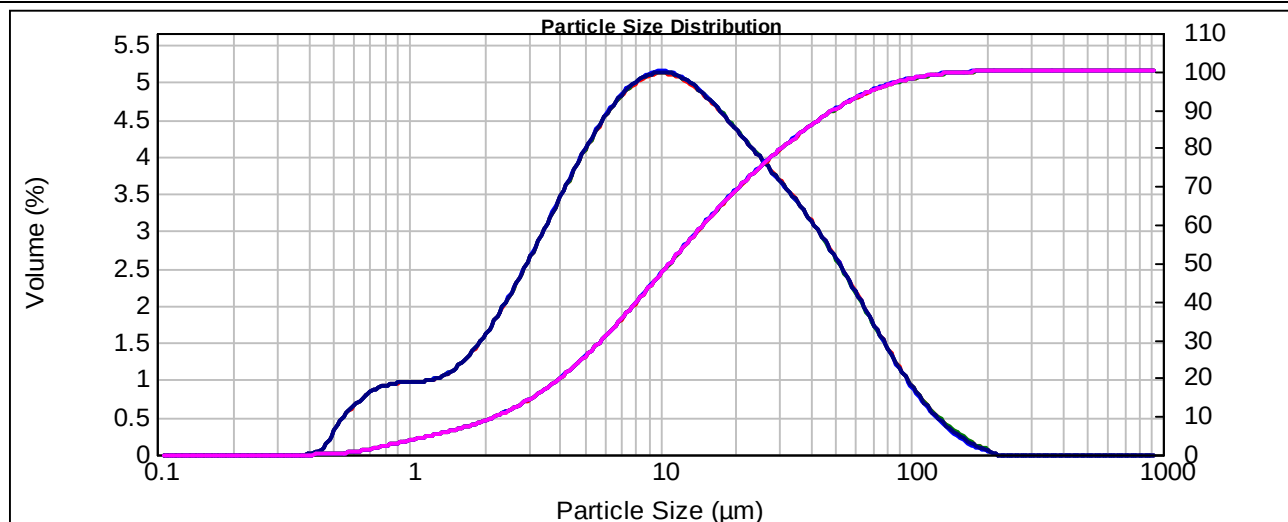
1.16 m²/g

Surface Weighted Mean D[3,2]:

5.191 um

Vol. Weighted Mean D[4,3]:

19.894 um

d(0.1): 2.231 um d(0.5): 10.963 um **d(0.8): 30.563 um** d(0.9): 49.474 um d(0.98): 97.24 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.16	2.291	1.20	10.965	3.07	52.481	1.45	251.189	0.00
0.110	0.00	0.525	0.31	2.512	1.34	12.023	3.03	57.544	1.31	275.423	0.00
0.120	0.00	0.575	0.39	2.754	1.50	13.183	2.97	63.096	1.16	301.995	0.00
0.132	0.00	0.631	0.46	3.020	1.65	14.454	2.90	69.183	1.02	331.131	0.00
0.145	0.00	0.692	0.52	3.311	1.98	15.849	2.82	75.858	0.88	363.078	0.00
0.158	0.00	0.759	0.55	3.631	2.14	17.378	2.73	83.176	0.74	398.107	0.00
0.174	0.00	0.832	0.57	3.981	2.30	19.055	2.63	91.201	0.62	436.516	0.00
0.191	0.00	0.912	0.58	4.365	2.45	20.893	2.54	100.000	0.50	478.630	0.00
0.209	0.00	1.000	0.59	4.786	2.59	22.909	2.44	109.648	0.40	524.807	0.00
0.229	0.00	1.096	0.59	5.248	2.72	25.119	2.35	120.226	0.31	575.440	0.00
0.251	0.00	1.202	0.61	5.754	2.83	27.542	2.25	131.826	0.23	630.957	0.00
0.275	0.00	1.318	0.64	6.310	2.93	30.200	2.15	144.544	0.17	691.831	0.00
0.302	0.00	1.445	0.68	6.918	3.00	33.113	2.05	158.489	0.11	758.578	0.00
0.331	0.00	1.585	0.75	7.586	3.05	36.308	1.95	173.780	0.07	831.764	0.00
0.363	0.00	1.738	0.84	8.318	3.08	39.811	1.83	190.546	0.04	912.011	0.00
0.398	0.01	1.905	0.95	9.120	3.08	43.652	1.71	208.930	0.00	1000.000	0.00
0.437	0.05	2.089	1.07	10.000	3.08	47.863	1.58	229.087	0.00		
0.479	0.05	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

blair

Measured:

Wednesday, October 29, 2014 12:06:41 PM

Sample Name:

Bulk Regrind Discharge 12:00 - Average

Edited by:

blair

Analysed:

Wednesday, October 29, 2014 12:06:42 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

24.25 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.478 %

Result Emulation:

Off

Concentration:

0.0218 %Vol

Span :

4.586

Uniformity:

1.43

Result units:

Volume

Specific Surface Area:

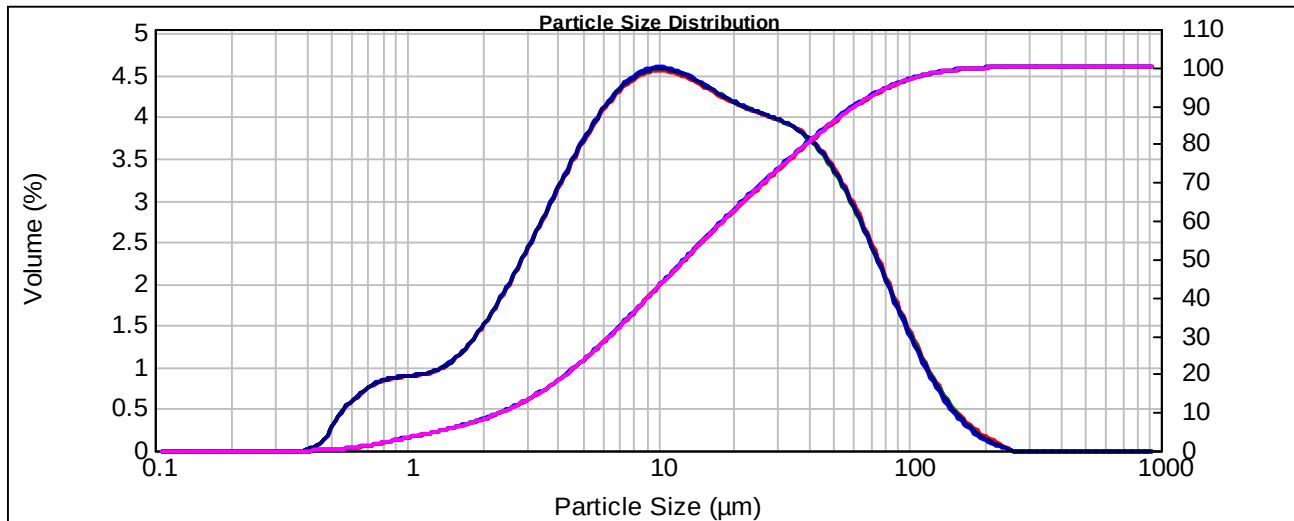
1.07 m²/g

Surface Weighted Mean D[3,2]:

5.619 um

Vol. Weighted Mean D[4,3]:

24.054 um

d(0.1): 2.384 um d(0.5): 12.807 um **d(0.8): 38.911 um** d(0.9): 61.117 um d(0.98): 114.14 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.15	2.291	1.11	10.965	2.74	52.481	1.90	251.189	0.00
0.110	0.00	0.525	0.28	2.512	1.24	12.023	2.71	57.544	1.76	275.423	0.00
0.120	0.00	0.575	0.35	2.754	1.38	13.183	2.68	63.096	1.60	301.995	0.00
0.132	0.00	0.631	0.41	3.020	1.52	14.454	2.64	69.183	1.44	331.131	0.00
0.145	0.00	0.692	0.47	3.311	1.66	15.849	2.59	75.858	1.27	363.078	0.00
0.158	0.00	0.759	0.50	3.631	1.81	17.378	2.55	83.176	1.10	398.107	0.00
0.174	0.00	0.832	0.52	3.981	1.95	19.055	2.51	91.201	0.93	436.516	0.00
0.191	0.00	0.912	0.53	4.365	2.09	20.893	2.48	100.000	0.78	478.630	0.00
0.209	0.00	1.000	0.54	4.786	2.22	22.909	2.43	109.648	0.63	524.807	0.00
0.229	0.00	1.096	0.55	5.248	2.34	25.119	2.40	120.226	0.50	575.440	0.00
0.251	0.00	1.202	0.56	5.754	2.45	27.542	2.37	131.826	0.38	630.957	0.00
0.275	0.00	1.318	0.59	6.310	2.55	30.200	2.33	144.544	0.28	691.831	0.00
0.302	0.00	1.445	0.64	6.918	2.63	33.113	2.28	158.489	0.20	758.578	0.00
0.331	0.00	1.585	0.71	7.586	2.69	36.308	2.22	173.780	0.14	831.764	0.00
0.363	0.00	1.738	0.79	8.318	2.73	39.811	2.13	190.546	0.08	912.011	0.00
0.398	0.01	1.905	0.88	9.120	2.75	43.652	2.02	208.930	0.05	1000.000	0.00
0.437	0.05	2.089	0.99	10.000	2.75	47.863		229.087			
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

Hoang

Measured:

Wednesday, October 29, 2014 1:15:57 PM

Sample Name:

Bulk Regrind Discharge 13:15 - Average

Edited by:

Hoang

Analysed:

Wednesday, October 29, 2014 1:15:58 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

7.38 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

1.548 %

Result Emulation:

Off

Concentration:

0.0065 %Vol

Span :

5.247

Uniformity:

1.63

Result units:

Volume

Specific Surface Area:

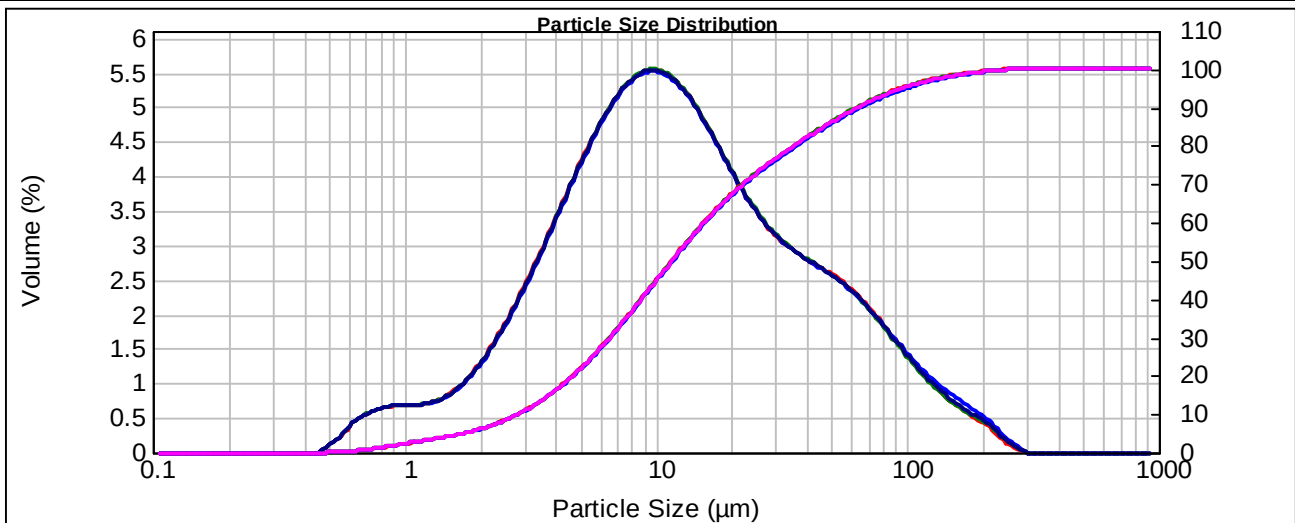
0.97 m²/g

Surface Weighted Mean D[3,2]:

6.186 um

Vol. Weighted Mean D[4,3]:

24.604 um

d(0.1): 2.830 um d(0.5): 11.566 um **d(0.8): 35.392 um** d(0.9): 63.524 um d(0.98): 141.79 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.07	2.291	1.04	10.965	3.27	52.481	1.48	251.189	0.07
0.110	0.00	0.525	0.12	2.512	1.19	12.023	3.19	57.544	1.41	275.423	0.01
0.120	0.00	0.575	0.23	2.754	1.36	13.183	3.08	63.096	1.32	301.995	0.00
0.132	0.00	0.631	0.30	3.020	1.54	14.454	2.94	69.183	1.23	331.131	0.00
0.145	0.00	0.692	0.38	3.311	1.73	15.849	2.78	75.858	1.12	363.078	0.00
0.158	0.00	0.759	0.40	3.631	1.93	17.378	2.62	83.176	1.01	398.107	0.00
0.174	0.00	0.832	0.41	3.981	2.13	19.055	2.46	91.201	0.90	436.516	0.00
0.191	0.00	0.912	0.42	4.365	2.32	20.893	2.30	100.000	0.79	478.630	0.00
0.209	0.00	1.000	0.43	4.786	2.52	22.909	2.16	109.648	0.69	524.807	0.00
0.229	0.00	1.096	0.44	5.248	2.70	25.119	2.04	120.226	0.60	575.440	0.00
0.251	0.00	1.202	0.46	5.754	2.87	27.542	1.93	131.826	0.52	630.957	0.00
0.275	0.00	1.318	0.47	6.310	3.02	30.200	1.84	144.544	0.46	691.831	0.00
0.302	0.00	1.445	0.50	6.918	3.15	33.113	1.77	158.489	0.40	758.578	0.00
0.331	0.00	1.585	0.57	7.586	3.24	36.308	1.71	173.780	0.34	831.764	0.00
0.363	0.00	1.738	0.66	8.318	3.31	39.811	1.66	190.546	0.28	912.011	0.00
0.398	0.00	1.905	0.77	9.120	3.33	43.652	1.60	208.930	0.23	1000.000	0.00
0.437	0.00	2.089	0.90	10.000	3.32	47.863	1.55	229.087	0.12		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P3

Measured by:

blair

Measured:

Wednesday, October 29, 2014 2:07:15 PM

Sample Name:

Bulk Regrind Discharge 14:00 - Average

Edited by:

blair

Analysed:

Wednesday, October 29, 2014 2:07:16 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

9.35 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.631 %

Result Emulation:

Off

Concentration:

0.0077 %Vol

Span :

5.447

Uniformity:

1.69

Result units:

Volume

Specific Surface Area:

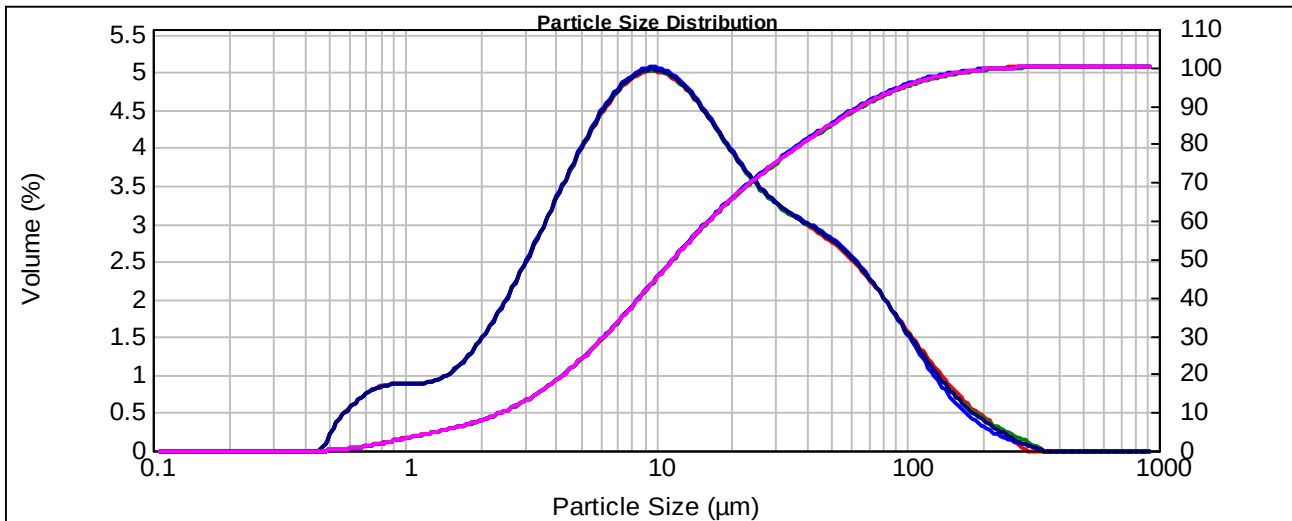
1.06 m²/g

Surface Weighted Mean D[3,2]:

5.640 um

Vol. Weighted Mean D[4,3]:

25.386 um

d(0.1): 2.449 um d(0.5): 11.747 um **d(0.8): 38.082 um** d(0.9): 66.441 um d(0.98): 140.74 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	1.11	10.965	2.98	52.481	1.60	251.189	0.09
0.110	0.00	0.525	0.26	2.512	1.25	12.023	2.92	57.544	1.53	275.423	0.05
0.120	0.00	0.575	0.34	2.754	1.41	13.183	2.83	63.096	1.44	301.995	0.03
0.132	0.00	0.631	0.41	3.020	1.56	14.454	2.73	69.183	1.34	331.131	0.00
0.145	0.00	0.692	0.47	3.311	1.73	15.849	2.62	75.858	1.23	363.078	0.00
0.158	0.00	0.759	0.50	3.631	1.90	17.378	2.50	83.176	1.12	398.107	0.00
0.174	0.00	0.832	0.52	3.981	2.06	19.055	2.38	91.201	1.00	436.516	0.00
0.191	0.00	0.912	0.53	4.365	2.23	20.893	2.27	100.000	0.88	478.630	0.00
0.209	0.00	1.000	0.53	4.786	2.39	22.909	2.16	109.648	0.76	524.807	0.00
0.229	0.00	1.096	0.53	5.248	2.54	25.119	2.07	120.226	0.65	575.440	0.00
0.251	0.00	1.202	0.54	5.754	2.67	27.542	2.00	131.826	0.55	630.957	0.00
0.275	0.00	1.318	0.57	6.310	2.79	30.200	1.93	144.544	0.45	691.831	0.00
0.302	0.00	1.445	0.61	6.918	2.89	33.113	1.88	158.489	0.37	758.578	0.00
0.331	0.00	1.585	0.68	7.586	2.96	36.308	1.83	173.780	0.30	831.764	0.00
0.363	0.00	1.738	0.76	8.318	3.01	39.811	1.78	190.546	0.24	912.011	0.00
0.398	0.00	1.905	0.87	9.120	3.03	43.652	1.73	208.930	0.18	1000.000	0.00
0.437	0.00	2.089	0.98	10.000	3.02	47.863	1.67	229.087	0.14		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P4

Measured by:

blair

Measured:

Thursday, October 30, 2014 8:12:22 AM

Sample Name:

Bulk Regrind Discharge 08:00 - Average

Edited by:

blair

Analysed:

Thursday, October 30, 2014 8:12:24 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

23.81 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.500 %

Result Emulation:

Off

Concentration:

0.0206 %Vol

Span :

4.667

Uniformity:

1.46

Result units:

Volume

Specific Surface Area:

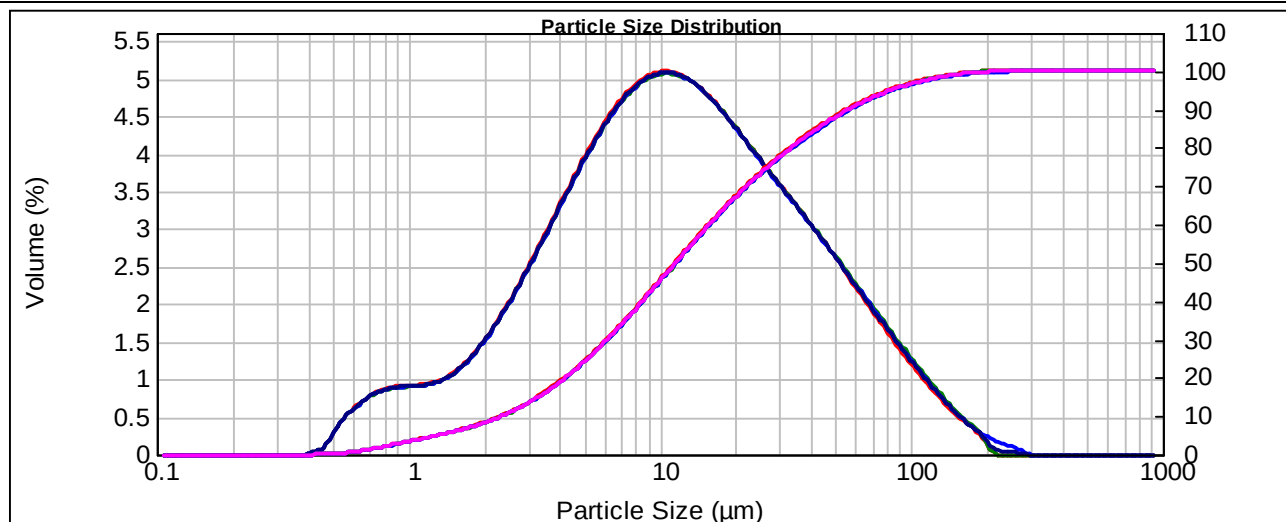
1.11 m²/g

Surface Weighted Mean D[3,2]:

5.410 um

Vol. Weighted Mean D[4,3]:

22.257 um

d(0.1): 2.339 um d(0.5): 11.533 um **d(0.8): 33.167 um** d(0.9): 56.163 um d(0.98): 117.71 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.15	2.291	1.15	10.965	3.05	52.481	1.47	251.189	0.02
0.110	0.00	0.525	0.29	2.512	1.28	12.023	3.02	57.544	1.36	275.423	0.00
0.120	0.00	0.575	0.36	2.754	1.43	13.183	2.97	63.096	1.24	301.995	0.00
0.132	0.00	0.631	0.43	3.020	1.58	14.454	2.90	69.183	1.13	331.131	0.00
0.145	0.00	0.692	0.48	3.311	1.74	15.849	2.82	75.858	1.02	363.078	0.00
0.158	0.00	0.759	0.52	3.631	1.90	17.378	2.72	83.176	0.91	398.107	0.00
0.174	0.00	0.832	0.53	3.981	2.06	19.055	2.62	91.201	0.80	436.516	0.00
0.191	0.00	0.912	0.54	4.365	2.22	20.893	2.52	100.000	0.70	478.630	0.00
0.209	0.00	1.000	0.55	4.786	2.37	22.909	2.41	109.648	0.60	524.807	0.00
0.229	0.00	1.096	0.56	5.248	2.51	25.119	2.31	120.226	0.50	575.440	0.00
0.251	0.00	1.202	0.57	5.754	2.64	27.542	2.20	131.826	0.41	630.957	0.00
0.275	0.00	1.318	0.60	6.310	2.76	30.200	2.10	144.544	0.33	691.831	0.00
0.302	0.00	1.445	0.65	6.918	2.86	33.113	2.00	158.489	0.26	758.578	0.00
0.331	0.00	1.585	0.72	7.586	2.95	36.308	1.89	173.780	0.19	831.764	0.00
0.363	0.00	1.738	0.80	8.318	3.01	39.811	1.79	190.546	0.10	912.011	0.00
0.398	0.01	1.905	0.90	9.120	3.05	43.652	1.69	208.930	0.03	1000.000	0.00
0.437	0.05	2.089	1.02	10.000	3.06	47.863	1.58	229.087	0.02		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P4

Measured by:

mike

Measured:

Thursday, October 30, 2014 9:13:31 AM

Sample Name:

Bulk Regrind Discharge 09:05 - Average

Edited by:

mike

Analysed:

Thursday, October 30, 2014 9:13:32 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

12.45 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.639 %

Result Emulation:

Off

Concentration:

0.0099 %Vol

Span :

3.901

Uniformity:

1.22

Result units:

Volume

Specific Surface Area:

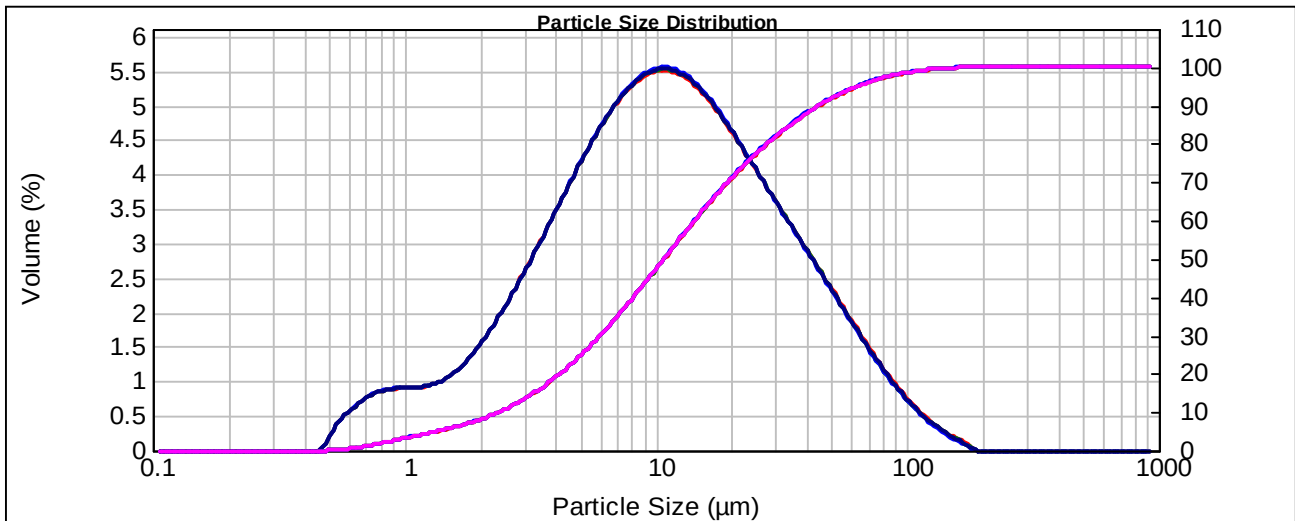
1.12 m²/g

Surface Weighted Mean D[3,2]:

5.370 um

Vol. Weighted Mean D[4,3]:

18.408 um

d(0.1): 2.369 um d(0.5): 10.763 um **d(0.8): 27.595 um** d(0.9): 44.357 um d(0.98): 88.31 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	1.18	10.965	3.32	52.481	1.26	251.189	0.00
0.110	0.00	0.525	0.26	2.512	1.33	12.023	3.29	57.544	1.12	275.423	0.00
0.120	0.00	0.575	0.34	2.754	1.49	13.183	3.23	63.096	0.98	301.995	0.00
0.132	0.00	0.631	0.41	3.020	1.65	14.454	3.14	69.183	0.85	331.131	0.00
0.145	0.00	0.692	0.48	3.311	1.82	15.849	3.04	75.858	0.72	363.078	0.00
0.158	0.00	0.759	0.51	3.631	2.00	17.378	2.92	83.176	0.60	398.107	0.00
0.174	0.00	0.832	0.53	3.981	2.17	19.055	2.79	91.201	0.49	436.516	0.00
0.191	0.00	0.912	0.54	4.365	2.34	20.893	2.66	100.000	0.39	478.630	0.00
0.209	0.00	1.000	0.55	4.786	2.51	22.909	2.51	109.648	0.31	524.807	0.00
0.229	0.00	1.096	0.55	5.248	2.67	25.119	2.37	120.226	0.23	575.440	0.00
0.251	0.00	1.202	0.57	5.754	2.82	27.542	2.23	131.826	0.17	630.957	0.00
0.275	0.00	1.318	0.60	6.310	2.96	30.200	2.09	144.544	0.11	691.831	0.00
0.302	0.00	1.445	0.65	6.918	3.08	33.113	1.95	158.489	0.08	758.578	0.00
0.331	0.00	1.585	0.72	7.586	3.18	36.308	1.82	173.780	0.01	831.764	0.00
0.363	0.00	1.738	0.81	8.318	3.25	39.811	1.68	190.546	0.00	912.011	0.00
0.398	0.00	1.905	0.92	9.120	3.30	43.652	1.54	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	1.05	10.000	3.33	47.863	1.40	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P4

Measured by:

Hoang

Measured:

Thursday, October 30, 2014 9:39:09 AM

Sample Name:

Bulk Regrind Discharge 09:40 - Average

Edited by:

Hoang

Analysed:

Thursday, October 30, 2014 9:39:10 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

16.36 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.659 %

Result Emulation:

Off

Concentration:

0.0125 %Vol

Span :

3.438

Uniformity:

1.07

Result units:

Volume

Specific Surface Area:

1.18 m²/g

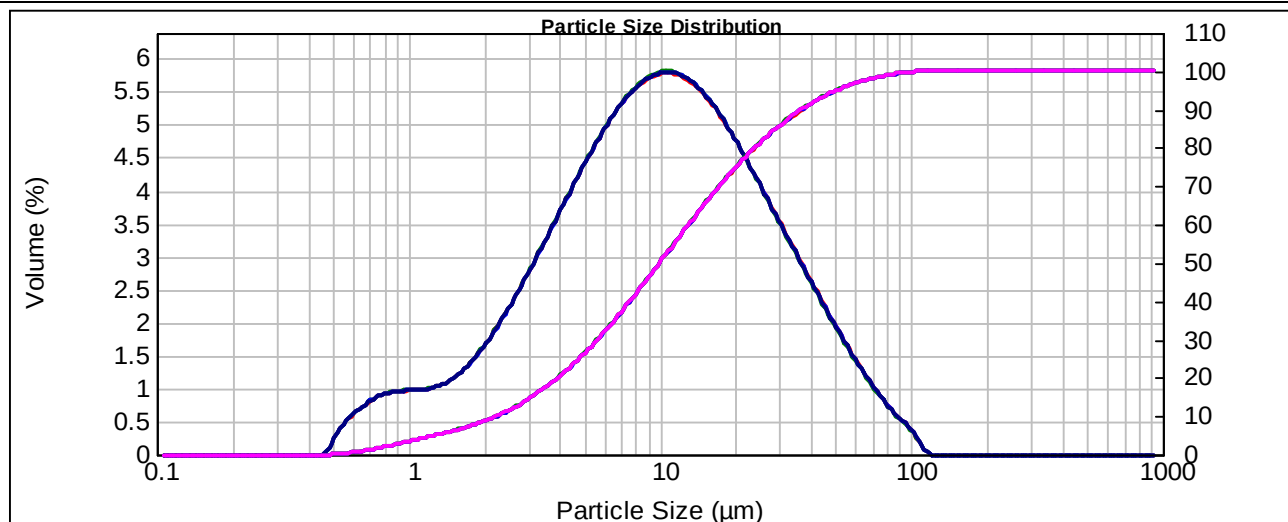
Surface Weighted Mean D[3,2]:

5.073 um

Vol. Weighted Mean D[4,3]:

15.554 um

d(0.1): 2.239 um d(0.5): 9.965 um **d(0.8): 23.769 um** d(0.9): 36.497 um d(0.98): 67.85 um



Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.11	2.291	1.26	10.965	3.48	52.481	1.01	251.189	0.00
0.110	0.00	0.525	0.29	2.512	1.42	12.023	3.44	57.544	0.86	275.423	0.00
0.120	0.00	0.575	0.37	2.754	1.58	13.183	3.37	63.096	0.71	301.995	0.00
0.132	0.00	0.631	0.44	3.020	1.76	14.454	3.28	69.183	0.58	331.131	0.00
0.145	0.00	0.692	0.51	3.311	1.93	15.849	3.16	75.858	0.47	363.078	0.00
0.158	0.00	0.759	0.55	3.631	2.12	17.378	3.02	83.176	0.36	398.107	0.00
0.174	0.00	0.832	0.57	3.981	2.30	19.055	2.87	91.201	0.27	436.516	0.00
0.191	0.00	0.912	0.58	4.365	2.48	20.893	2.71	100.000	0.16	478.630	0.00
0.209	0.00	1.000	0.59	4.786	2.65	22.909	2.54	109.648	0.00	524.807	0.00
0.229	0.00	1.096	0.59	5.248	2.82	25.119	2.36	120.226	0.01	575.440	0.00
0.251	0.00	1.202	0.61	5.754	2.97	27.542	2.19	131.826	0.00	630.957	0.00
0.275	0.00	1.318	0.64	6.310	3.11	30.200	2.01	144.544	0.00	691.831	0.00
0.302	0.00	1.445	0.70	6.918	3.23	33.113	1.84	158.489	0.00	758.578	0.00
0.331	0.00	1.585	0.77	7.586	3.34	36.308	1.66	173.780	0.00	831.764	0.00
0.363	0.00	1.738	0.87	8.318	3.41	39.811	1.50	190.546	0.00	912.011	0.00
0.398	0.00	1.905	0.99	9.120	3.47	43.652	1.33	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	1.12	10.000	3.49	47.863	1.17	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P4

Measured by:

mike

Measured:

Thursday, October 30, 2014 10:50:34 AM

Sample Name:

Bulk Regrind Discharge 10:40 - Average

Edited by:

mike

Analysed:

Thursday, October 30, 2014 10:50:35 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

19.59 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.404 %

Result Emulation:

Off

Concentration:

0.0182 %Vol

Span :

4.290

Uniformity:

1.61

Result units:

Volume

Specific Surface Area:

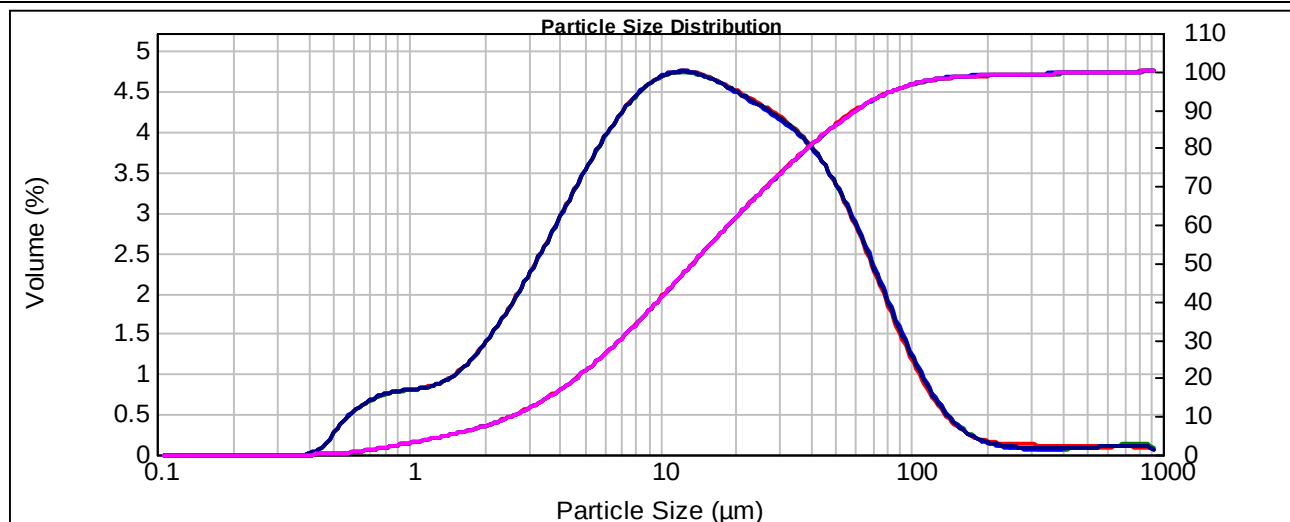
1.01 m²/g

Surface Weighted Mean D[3,2]:

5.953 um

Vol. Weighted Mean D[4,3]:

27.972 um

d(0.1): 2.571 um d(0.5): 13.565 um **d(0.8): 38.748 um** d(0.9): 60.769 um d(0.98): 127.16 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.14	2.291	1.03	10.965	2.85	52.481	1.87	251.189	0.06
0.110	0.00	0.525	0.26	2.512	1.15	12.023	2.86	57.544	1.71	275.423	0.05
0.120	0.00	0.575	0.31	2.754	1.28	13.183	2.85	63.096	1.54	301.995	0.05
0.132	0.00	0.631	0.37	3.020	1.41	14.454	2.82	69.183	1.36	331.131	0.05
0.145	0.00	0.692	0.42	3.311	1.41	15.849	2.79	75.858	1.17	363.078	0.05
0.158	0.00	0.759	0.45	3.631	1.55	17.378	2.75	83.176	0.99	398.107	0.05
0.174	0.00	0.832	0.46	3.981	1.69	19.055	2.71	91.201	0.82	436.516	0.05
0.191	0.00	0.912	0.48	4.365	1.97	20.893	2.67	100.000	0.66	478.630	0.05
0.209	0.00	1.000	0.48	4.786	2.24	22.909	2.62	109.648	0.52	524.807	0.06
0.229	0.00	1.096	0.50	5.248	2.24	25.119	2.58	120.226	0.40	575.440	0.06
0.251	0.00	1.202	0.51	5.754	2.37	27.542	2.53	131.826	0.30	630.957	0.06
0.275	0.00	1.318	0.54	6.310	2.48	30.200	2.48	144.544	0.22	691.831	0.07
0.302	0.00	1.445	0.59	6.918	2.58	33.113	2.42	158.489	0.16	758.578	0.07
0.331	0.00	1.585	0.65	7.586	2.67	36.308	2.34	173.780	0.12	831.764	0.07
0.363	0.00	1.738	0.73	8.318	2.74	39.811	2.25	190.546	0.09	912.011	0.02
0.398	0.02	1.905	0.82	9.120	2.79	43.652	2.14	208.930	0.08	1000.000	
0.437	0.05	2.089	0.92	10.000	2.83	47.863	2.02	229.087	0.06		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P4

Measured by:

mike

Measured:

Thursday, October 30, 2014 12:06:02 PM

Sample Name:

Bulk Regrind Discharge 11:40 - Average

Edited by:

mike

Analysed:

Thursday, October 30, 2014 12:06:03 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

24.08 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.513 %

Result Emulation:

Off

Concentration:

0.0202 %Vol

Span :

4.250

Uniformity:

1.35

Result units:

Volume

Specific Surface Area:

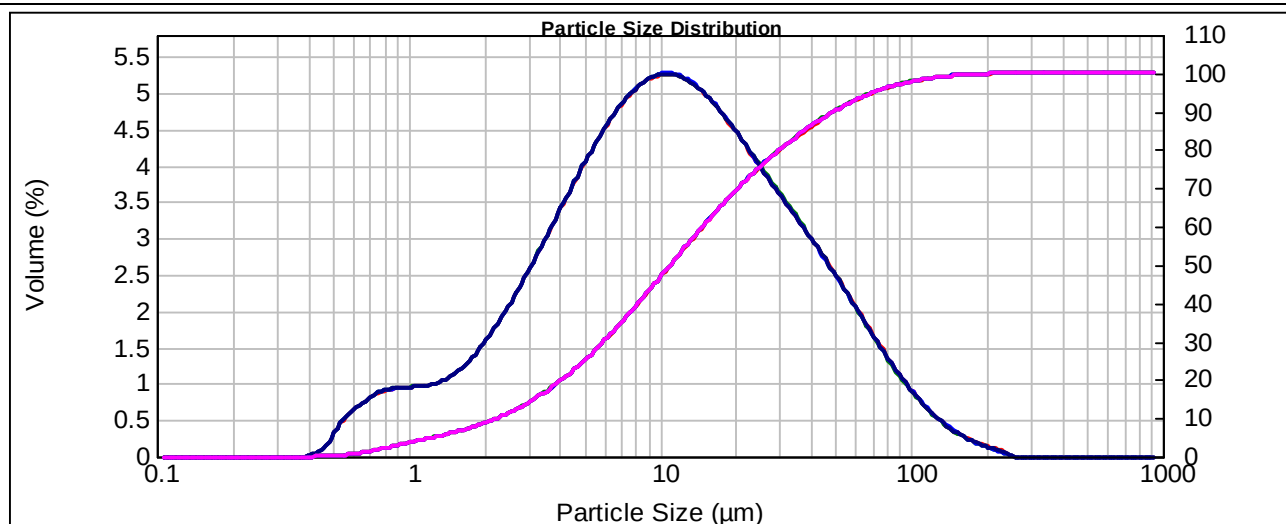
1.15 m²/g

Surface Weighted Mean D[3,2]:

5.221 um

Vol. Weighted Mean D[4,3]:

20.066 um

d(0.1): 2.255 um d(0.5): 11.004 um **d(0.8): 29.864 um** d(0.9): 49.017 um d(0.98): 101.58 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.17	2.291	1.18	10.965	3.16	52.481	1.37	251.189	0.00
0.110	0.00	0.525	0.31	2.512	1.32	12.023	3.13	57.544	1.23	275.423	0.00
0.120	0.00	0.575	0.38	2.754	1.47	13.183	3.08	63.096	1.10	301.995	0.00
0.132	0.00	0.631	0.45	3.020	1.62	14.454	3.00	69.183	0.96	331.131	0.00
0.145	0.00	0.692	0.51	3.311	1.78	15.849	2.91	75.858	0.84	363.078	0.00
0.158	0.00	0.759	0.54	3.631	1.95	17.378	2.81	83.176	0.71	398.107	0.00
0.174	0.00	0.832	0.56	3.981	2.11	19.055	2.70	91.201	0.60	436.516	0.00
0.191	0.00	0.912	0.57	4.365	2.27	20.893	2.58	100.000	0.50	478.630	0.00
0.209	0.00	1.000	0.58	4.786	2.43	22.909	2.46	109.648	0.40	524.807	0.00
0.229	0.00	1.096	0.58	5.248	2.58	25.119	2.34	120.226	0.32	575.440	0.00
0.251	0.00	1.202	0.60	5.754	2.72	27.542	2.22	131.826	0.25	630.957	0.00
0.275	0.00	1.318	0.63	6.310	2.84	30.200	2.10	144.544	0.20	691.831	0.00
0.302	0.00	1.445	0.68	6.918	2.95	33.113	1.99	158.489	0.15	758.578	0.00
0.331	0.00	1.585	0.75	7.586	3.04	36.308	1.87	173.780	0.11	831.764	0.00
0.363	0.00	1.738	0.83	8.318	3.11	39.811	1.75	190.546	0.08	912.011	0.00
0.398	0.02	1.905	0.93	9.120	3.15	43.652	1.63	208.930	0.06	1000.000	0.00
0.437	0.06	2.089	1.05	10.000	3.17	47.863	1.50	229.087	0.02		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P4

Measured by:

mike

Measured:

Thursday, October 30, 2014 11:59:26 AM

Sample Name:

Bulk Regrind Discharge 11:45 - Average

Edited by:

mike

Analysed:

Thursday, October 30, 2014 11:59:28 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

20.96 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.451 %

Result Emulation:

Off

Concentration:

0.0189 %Vol

Span :

4.451

Uniformity:

1.44

Result units:

Volume

Specific Surface Area:

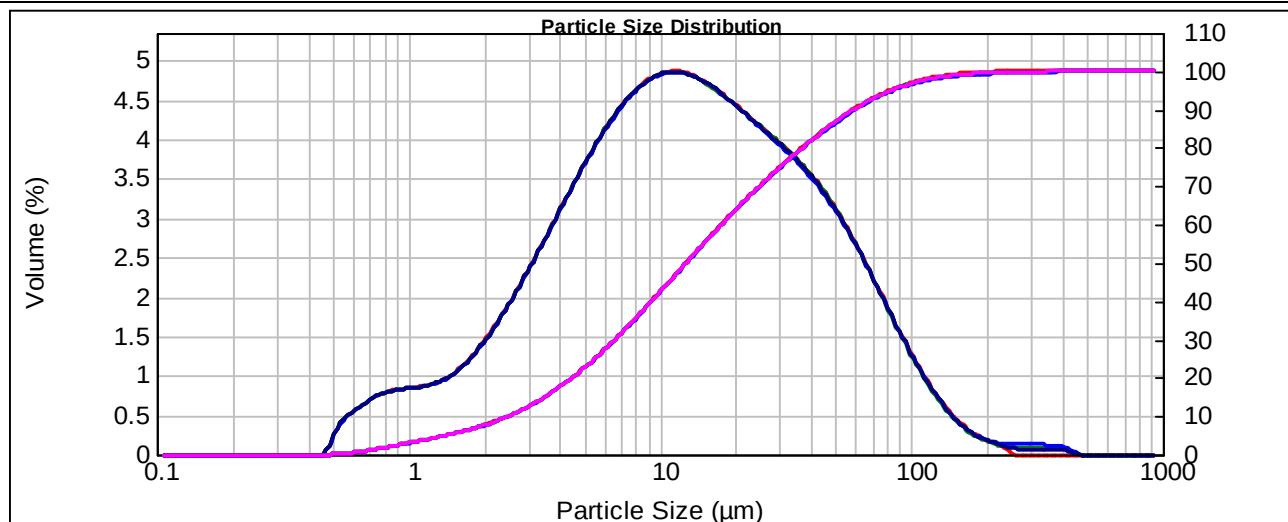
1.04 m²/g

Surface Weighted Mean D[3,2]:

5.797 um

Vol. Weighted Mean D[4,3]:

24.103 um

d(0.1): 2.492 um d(0.5): 12.710 um **d(0.8): 36.800 um** d(0.9): 59.059 um d(0.98): 117.56 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.12	2.291	1.08	10.965	2.92	52.481	1.74	251.189	0.04
0.110	0.00	0.525	0.28	2.512	1.21	12.023	2.91	57.544	1.60	275.423	0.05
0.120	0.00	0.575	0.32	2.754	1.35	13.183	2.88	63.096	1.45	301.995	0.04
0.132	0.00	0.631	0.38	3.020	1.49	14.454	2.84	69.183	1.30	331.131	0.04
0.145	0.00	0.692	0.44	3.311	1.78	15.849	2.79	75.858	1.15	363.078	0.04
0.158	0.00	0.759	0.47	3.631	1.63	17.378	2.73	83.176	0.99	398.107	0.03
0.174	0.00	0.832	0.49	3.981	1.93	19.055	2.67	91.201	0.84	436.516	0.00
0.191	0.00	0.912	0.50	4.365	2.08	20.893	2.60	100.000	0.70	478.630	0.00
0.209	0.00	1.000	0.51	4.786	2.22	22.909	2.54	109.648	0.56	524.807	0.00
0.229	0.00	1.096	0.52	5.248	2.35	25.119	2.47	120.226	0.45	575.440	0.00
0.251	0.00	1.202	0.54	5.754	2.48	27.542	2.40	131.826	0.34	630.957	0.00
0.275	0.00	1.318	0.57	6.310	2.59	30.200	2.33	144.544	0.26	691.831	0.00
0.302	0.00	1.445	0.62	6.918	2.69	33.113	2.26	158.489	0.19	758.578	0.00
0.331	0.00	1.585	0.68	7.586	2.78	36.308	2.18	173.780	0.14	831.764	0.00
0.363	0.00	1.738	0.76	8.318	2.84	39.811	2.09	190.546	0.11	912.011	0.00
0.398	0.00	1.905	0.86	9.120	2.89	43.652	1.98	208.930	0.08	1000.000	0.00
0.437	0.00	2.089	0.97	10.000	2.92	47.863	1.87	229.087	0.06		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P4

Measured by:

mike

Measured:

Thursday, October 30, 2014 1:51:11 PM

Sample Name:

Bulk Regrind Discharge 13:30 - Average

Edited by:

mike

Analysed:

Thursday, October 30, 2014 1:51:12 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

23.91 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.462 %

Result Emulation:

Off

Concentration:

0.0213 %Vol

Span :

4.539

Uniformity:

1.49

Result units:

Volume

Specific Surface Area:

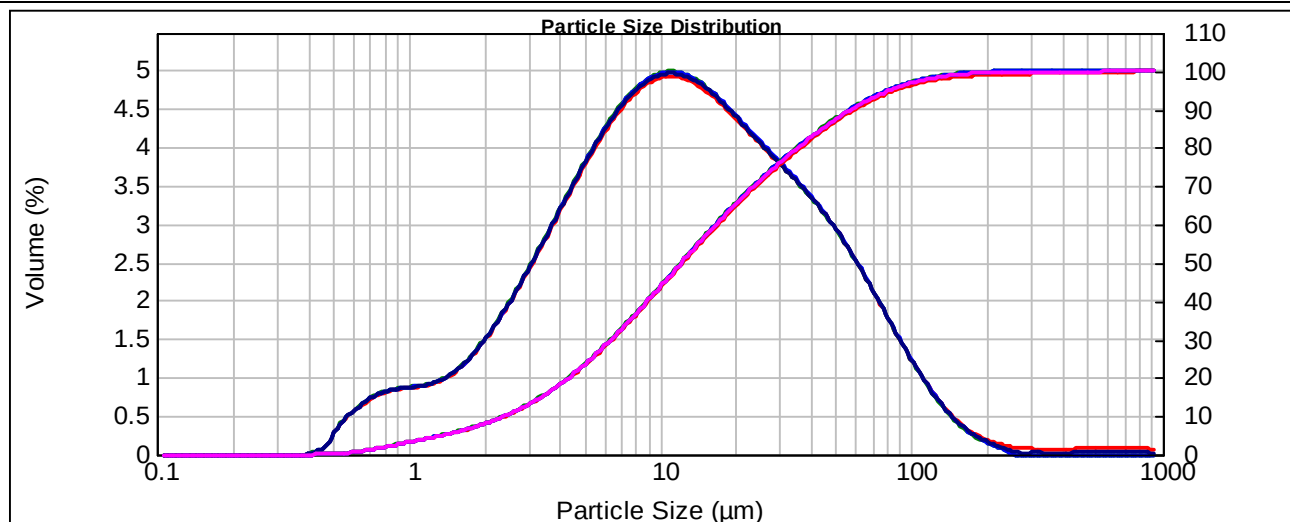
1.07 m²/g

Surface Weighted Mean D[3,2]:

5.599 um

Vol. Weighted Mean D[4,3]:

23.824 um

d(0.1): 2.409 um d(0.5): 12.175 um **d(0.8): 35.295 um** d(0.9): 57.677 um d(0.98): 116.24 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.14	2.291	1.12	10.965	2.98	52.481	1.64	251.189	0.01
0.110	0.00	0.525	0.27	2.512	1.25	12.023	2.96	57.544	1.52	275.423	0.01
0.120	0.00	0.575	0.34	2.754	1.39	13.183	2.92	63.096	1.38	301.995	0.02
0.132	0.00	0.631	0.40	3.020	1.53	14.454	2.87	69.183	1.24	331.131	0.01
0.145	0.00	0.692	0.45	3.311	1.68	15.849	2.80	75.858	1.10	363.078	0.01
0.158	0.00	0.759	0.49	3.631	1.83	17.378	2.73	83.176	0.95	398.107	0.01
0.174	0.00	0.832	0.51	3.981	1.98	19.055	2.65	91.201	0.81	436.516	0.02
0.191	0.00	0.912	0.52	4.365	2.13	20.893	2.56	100.000	0.68	478.630	0.02
0.209	0.00	1.000	0.54	4.786	2.27	22.909	2.48	109.648	0.55	524.807	0.02
0.229	0.00	1.096	0.54	5.248	2.41	25.119	2.39	120.226	0.44	575.440	0.02
0.251	0.00	1.202	0.56	5.754	2.54	27.542	2.31	131.826	0.34	630.957	0.02
0.275	0.00	1.318	0.59	6.310	2.66	30.200	2.23	144.544	0.26	691.831	0.02
0.302	0.00	1.445	0.64	6.918	2.76	33.113	2.15	158.489	0.19	758.578	0.02
0.331	0.00	1.585	0.71	7.586	2.84	36.308	2.06	173.780	0.14	831.764	0.02
0.363	0.00	1.738	0.79	8.318	2.91	39.811	1.97	190.546	0.10	912.011	0.00
0.398	0.01	1.905	0.89	9.120	2.95	43.652	1.87	208.930	0.07	1000.000	
0.437	0.05	2.089	1.00	10.000	2.98	47.863	1.76	229.087	0.04		
0.479		2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P5

Measured by:

Hoang

Measured:

Friday, October 31, 2014 8:30:27 AM

Sample Name:

Bulk Regrind Discharge 08:30 - Average

Edited by:

Hoang

Analysed:

Friday, October 31, 2014 8:30:29 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

28.23 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.666 %

Result Emulation:

Off

Concentration:

0.0191 %Vol

Span :

2.862

Uniformity:

0.915

Result units:

Volume

Specific Surface Area:

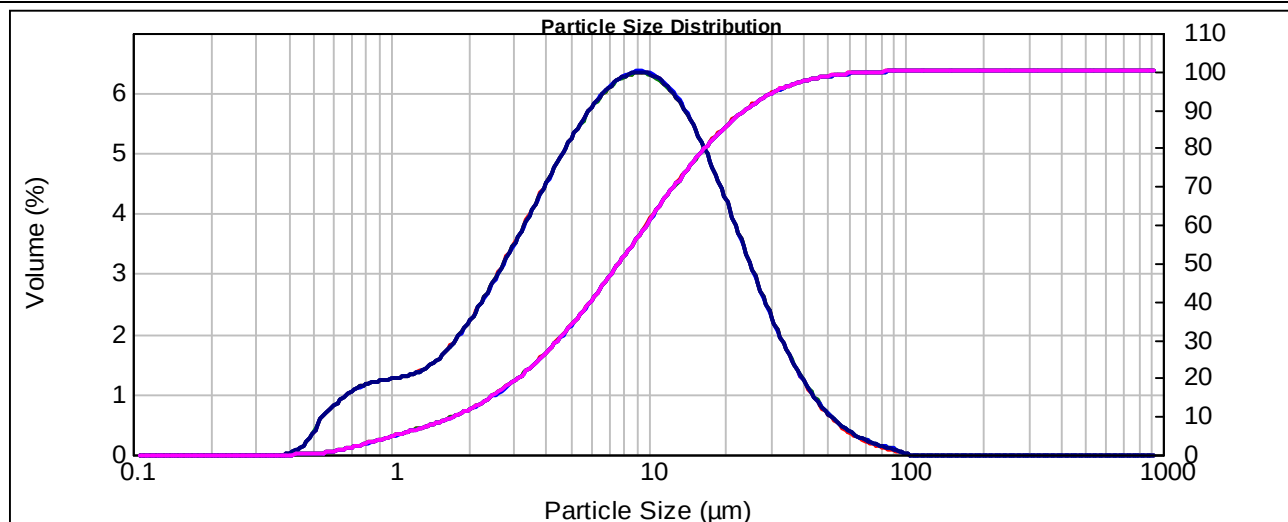
1.45 m²/g

Surface Weighted Mean D[3,2]:

4.124 um

Vol. Weighted Mean D[4,3]:

10.979 um

d(0.1): 1.772 um d(0.5): 7.746 um **d(0.8): 16.664 um** d(0.9): 23.942 um d(0.98): 43.25 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.21	2.291	1.63	10.965	3.71	52.481	0.31	251.189	0.00
0.110	0.00	0.525	0.40	2.512	1.81	12.023	3.60	57.544	0.23	275.423	0.00
0.120	0.00	0.575	0.49	2.754	2.00	13.183	3.45	63.096	0.17	301.995	0.00
0.132	0.00	0.631	0.57	3.020	2.19	14.454	3.26	69.183	0.12	331.131	0.00
0.145	0.00	0.692	0.65	3.311	2.38	15.849	3.05	75.858	0.09	363.078	0.00
0.158	0.00	0.759	0.69	3.631	2.58	17.378	2.81	83.176	0.06	398.107	0.00
0.174	0.00	0.832	0.72	3.981	2.77	19.055	2.55	91.201	0.03	436.516	0.00
0.191	0.00	0.912	0.74	4.365	2.96	20.893	2.28	100.000	0.00	478.630	0.00
0.209	0.00	1.000	0.76	4.786	3.14	22.909	2.01	109.648	0.00	524.807	0.00
0.229	0.00	1.096	0.78	5.248	3.30	25.119	1.75	120.226	0.00	575.440	0.00
0.251	0.00	1.202	0.81	5.754	3.45	27.542	1.49	131.826	0.00	630.957	0.00
0.275	0.00	1.318	0.86	6.310	3.58	30.200	1.25	144.544	0.00	691.831	0.00
0.302	0.00	1.445	0.94	6.918	3.76	33.113	1.04	158.489	0.00	758.578	0.00
0.331	0.00	1.585	1.04	7.586	3.80	36.308	0.84	173.780	0.00	831.764	0.00
0.363	0.00	1.738	1.16	8.318	3.81	39.811	0.67	190.546	0.00	912.011	0.00
0.398	0.02	1.905	1.30	9.120	3.78	43.652	0.53	208.930	0.00	1000.000	0.00
0.437	0.08	2.089	1.46	10.000		47.863	0.40	229.087	0.00		
0.479		2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P5

Measured by:

Kevin

Measured:

Friday, October 31, 2014 9:41:07 AM

Sample Name:

Bulk Regrind Discharge 09:30 - Average

Edited by:

Kevin

Analysed:

Friday, October 31, 2014 9:41:09 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

13.95 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.678 %

Result Emulation:

Off

Concentration:

0.0109 %Vol

Span :

4.236

Uniformity:

1.34

Result units:

Volume

Specific Surface Area:

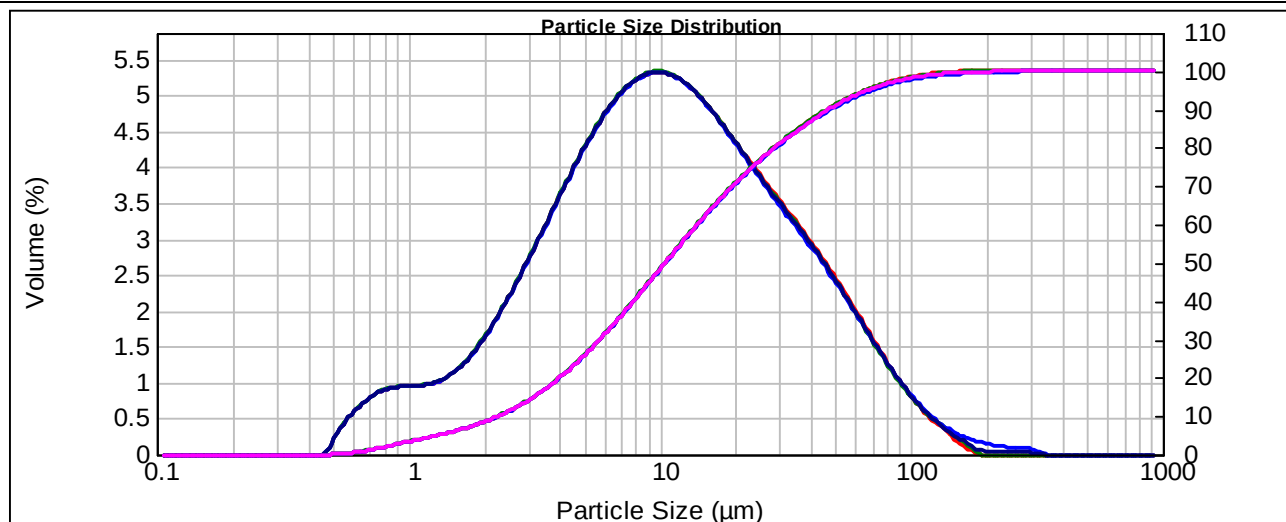
1.15 m²/g

Surface Weighted Mean D[3,2]:

5.233 um

Vol. Weighted Mean D[4,3]:

19.063 um

d(0.1): 2.275 um d(0.5): 10.483 um **d(0.8): 28.520 um** d(0.9): 46.683 um d(0.98): 94.24 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	1.25	10.965	3.17	52.481	1.33	251.189	0.02
0.110	0.00	0.525	0.27	2.512	1.40	12.023	3.12	57.544	1.19	275.423	0.02
0.120	0.00	0.575	0.35	2.754	1.56	13.183	3.04	63.096	1.05	301.995	0.01
0.132	0.00	0.631	0.43	3.020	1.73	14.454	2.95	69.183	0.91	331.131	0.00
0.145	0.00	0.692	0.50	3.311	1.90	15.849	2.85	75.858	0.78	363.078	0.00
0.158	0.00	0.759	0.54	3.631	2.08	17.378	2.73	83.176	0.66	398.107	0.00
0.174	0.00	0.832	0.56	3.981	2.25	19.055	2.62	91.201	0.54	436.516	0.00
0.191	0.00	0.912	0.57	4.365	2.41	20.893	2.50	100.000	0.44	478.630	0.00
0.209	0.00	1.000	0.58	4.786	2.57	22.909	2.38	109.648	0.35	524.807	0.00
0.229	0.00	1.096	0.58	5.248	2.72	25.119	2.27	120.226	0.27	575.440	0.00
0.251	0.00	1.202	0.60	5.754	2.85	27.542	2.15	131.826	0.21	630.957	0.00
0.275	0.00	1.318	0.63	6.310	2.97	30.200	2.04	144.544	0.15	691.831	0.00
0.302	0.00	1.445	0.68	6.918	3.06	33.113	1.93	158.489	0.09	758.578	0.00
0.331	0.00	1.585	0.76	7.586	3.14	36.308	1.82	173.780	0.04	831.764	0.00
0.363	0.00	1.738	0.86	8.318	3.18	39.811	1.71	190.546	0.03	912.011	0.00
0.398	0.00	1.905	0.97	9.120	3.20	43.652	1.59	208.930	0.02	1000.000	0.00
0.437	0.00	2.089	1.10	10.000	3.20	47.863	1.46	229.087	0.02		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P5

Measured by:

Kevin

Measured:

Friday, October 31, 2014 10:47:52 AM

Sample Name:

Bulk Regrind Discharge 10:30 - Average

Edited by:

Kevin

Analysed:

Friday, October 31, 2014 10:47:53 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

19.85 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.660 %

Result Emulation:

Off

Concentration:

0.0159 %Vol

Span :

4.759

Uniformity:

1.6

Result units:

Volume

Specific Surface Area:

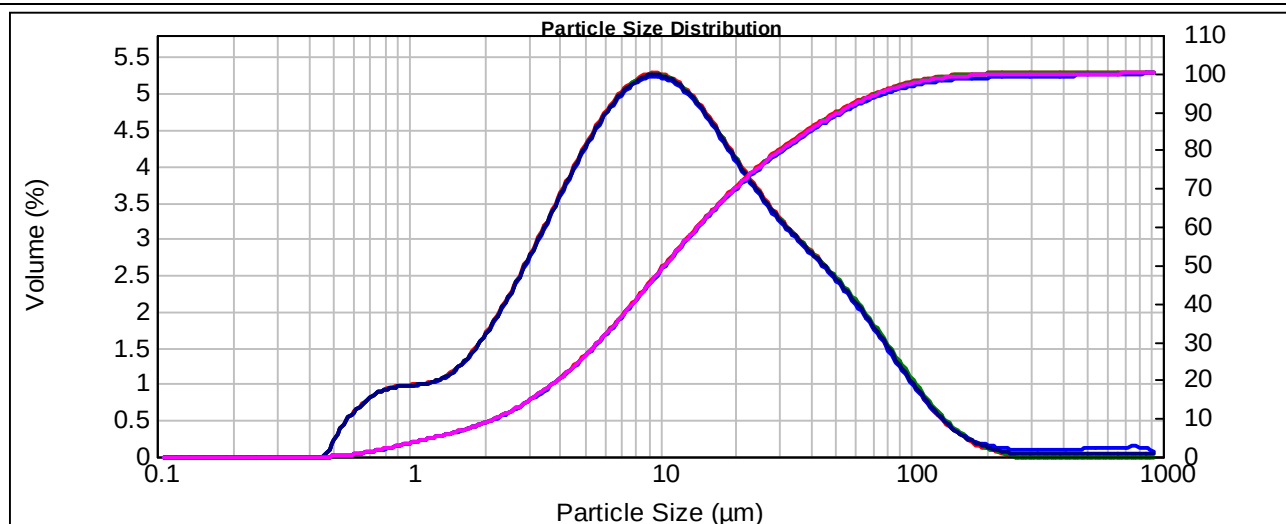
1.15 m²/g

Surface Weighted Mean D[3,2]:

5.203 um

Vol. Weighted Mean D[4,3]:

21.839 um

d(0.1): 2.234 um d(0.5): 10.493 um **d(0.8): 30.299 um** d(0.9): 52.173 um d(0.98): 110.57 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.11	2.291	1.26	10.965	3.11	52.481	1.38	251.189	0.02
0.110	0.00	0.525	0.28	2.512	1.40	12.023	3.04	57.544	1.28	275.423	0.02
0.120	0.00	0.575	0.36	2.754	1.56	13.183	2.95	63.096	1.16	301.995	0.02
0.132	0.00	0.631	0.44	3.020	1.73	14.454	2.85	69.183	1.05	331.131	0.02
0.145	0.00	0.692	0.51	3.311	1.90	15.849	2.73	75.858	0.93	363.078	0.02
0.158	0.00	0.759	0.55	3.631	2.07	17.378	2.60	83.176	0.81	398.107	0.02
0.174	0.00	0.832	0.57	3.981	2.23	19.055	2.47	91.201	0.69	436.516	0.02
0.191	0.00	0.912	0.58	4.365	2.40	20.893	2.34	100.000	0.57	478.630	0.02
0.209	0.00	1.000	0.59	4.786	2.55	22.909	2.22	109.648	0.46	524.807	0.02
0.229	0.00	1.096	0.60	5.248	2.70	25.119	2.11	120.226	0.36	575.440	0.02
0.251	0.00	1.202	0.62	5.754	2.83	27.542	2.01	131.826	0.28	630.957	0.03
0.275	0.00	1.318	0.65	6.310	2.95	30.200	1.91	144.544	0.21	691.831	0.03
0.302	0.00	1.445	0.70	6.918	3.11	33.113	1.82	158.489	0.15	758.578	0.03
0.331	0.00	1.585	0.78	7.586	3.15	36.308	1.74	173.780	0.11	831.764	0.02
0.363	0.00	1.738	0.88	8.318	3.16	39.811	1.65	190.546	0.08	912.011	0.01
0.398	0.00	1.905	0.99	9.120	3.15	43.652	1.57	208.930	0.06	1000.000	
0.437	0.00	2.089	1.12	10.000		47.863	1.47	229.087			
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P6

Measured by:

shayne

Measured:

Monday, November 03, 2014 9:53:36 AM

Sample Name:

Bulk Regrind Discharge 09:45 - Average

Edited by:

shayne

Analysed:

Monday, November 03, 2014 9:53:37 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

19.14 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.592 %

Result Emulation:

Off

Concentration:

0.0156 %Vol

Span :

3.988

Uniformity:

1.26

Result units:

Volume

Specific Surface Area:

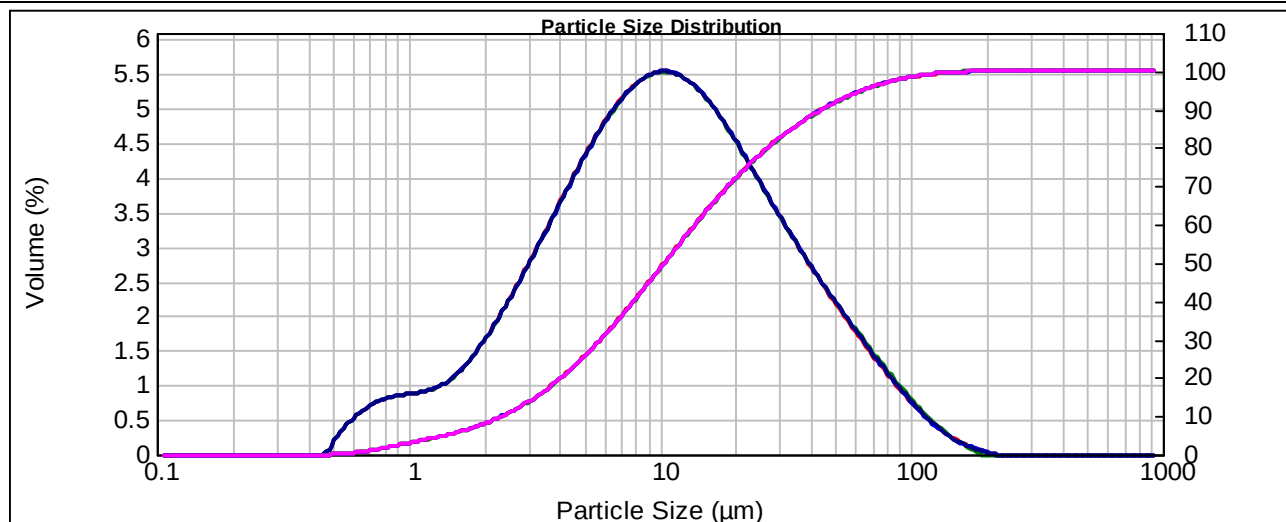
1.12 m²/g

Surface Weighted Mean D[3,2]:

5.352 um

Vol. Weighted Mean D[4,3]:

18.206 um

d(0.1): 2.358 um d(0.5): 10.421 um **d(0.8): 26.806 um** d(0.9): 43.916 um d(0.98): 90.18 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.09	2.291	1.26	10.965	3.32	52.481	1.19	251.189	0.00
0.110	0.00	0.525	0.24	2.512	1.42	12.023	3.27	57.544	1.07	275.423	0.00
0.120	0.00	0.575	0.31	2.754	1.58	13.183	3.20	63.096	0.95	301.995	0.00
0.132	0.00	0.631	0.38	3.020	1.75	14.454	3.11	69.183	0.84	331.131	0.00
0.145	0.00	0.692	0.44	3.311	1.92	15.849	3.00	75.858	0.73	363.078	0.00
0.158	0.00	0.759	0.48	3.631	2.09	17.378	2.87	83.176	0.62	398.107	0.00
0.174	0.00	0.832	0.50	3.981	2.26	19.055	2.73	91.201	0.51	436.516	0.00
0.191	0.00	0.912	0.52	4.365	2.43	20.893	2.59	100.000	0.42	478.630	0.00
0.209	0.00	1.000	0.54	4.786	2.59	22.909	2.43	109.648	0.32	524.807	0.00
0.229	0.00	1.096	0.54	5.248	2.74	25.119	2.28	120.226	0.25	575.440	0.00
0.251	0.00	1.202	0.57	5.754	2.89	27.542	2.13	131.826	0.18	630.957	0.00
0.275	0.00	1.318	0.61	6.310	3.02	30.200	1.99	144.544	0.11	691.831	0.00
0.302	0.00	1.445	0.67	6.918	3.12	33.113	1.85	158.489	0.08	758.578	0.00
0.331	0.00	1.585	0.76	7.586	3.21	36.308	1.71	173.780	0.04	831.764	0.00
0.363	0.00	1.738	0.86	8.318	3.28	39.811	1.57	190.546	0.01	912.011	0.00
0.398	0.00	1.905	0.98	9.120	3.32	43.652	1.44	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	1.12	10.000	3.33	47.863	1.32	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P6

Measured by:

blair

Measured:

Monday, November 03, 2014 11:00:26 AM

Sample Name:

Bulk Regrind Discharge 10:30 - Average

Edited by:

blair

Analysed:

Monday, November 03, 2014 11:00:27 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

23.14 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.558 %

Result Emulation:

Off

Concentration:

0.0190 %Vol

Span :

4.091

Uniformity:

1.28

Result units:

Volume

Specific Surface Area:

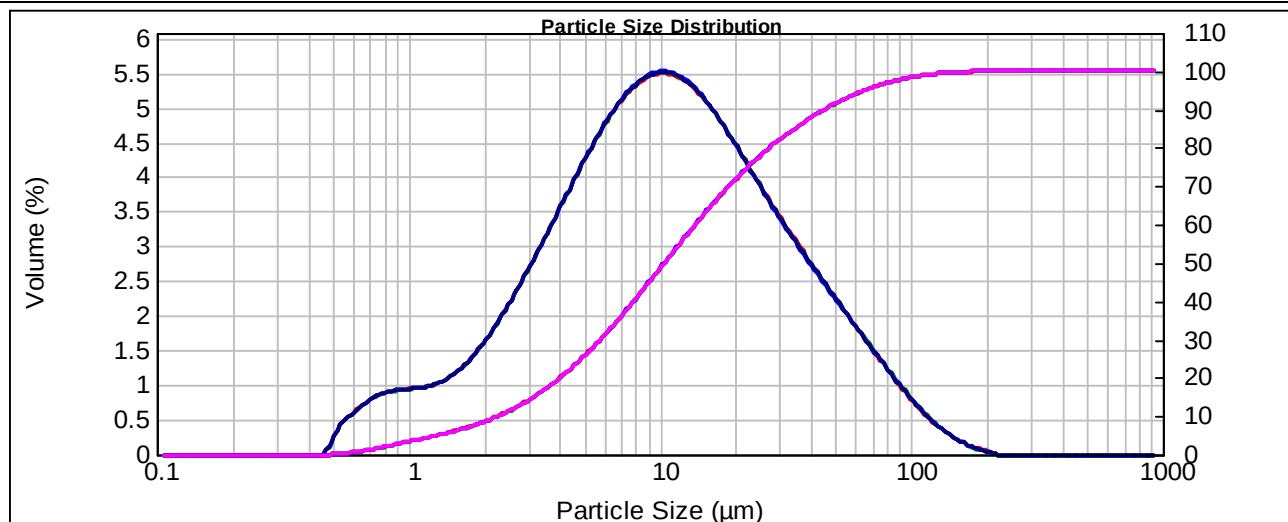
1.15 m²/g

Surface Weighted Mean D[3,2]:

5.207 um

Vol. Weighted Mean D[4,3]:

18.451 um

d(0.1): 2.268 um d(0.5): 10.430 um **d(0.8): 27.222 um** d(0.9): 44.936 um d(0.98): 91.87 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.12	2.291	1.23	10.965	3.30	52.481	1.23	251.189	0.00
0.110	0.00	0.525	0.30	2.512	1.38	12.023	3.25	57.544	1.11	275.423	0.00
0.120	0.00	0.575	0.36	2.754	1.54	13.183	3.17	63.096	0.99	301.995	0.00
0.132	0.00	0.631	0.43	3.020	1.70	14.454	3.08	69.183	0.87	331.131	0.00
0.145	0.00	0.692	0.49	3.311	1.87	15.849	2.96	75.858	0.76	363.078	0.00
0.158	0.00	0.759	0.53	3.631	2.04	17.378	2.83	83.176	0.64	398.107	0.00
0.174	0.00	0.832	0.55	3.981	2.21	19.055	2.69	91.201	0.53	436.516	0.00
0.191	0.00	0.912	0.56	4.365	2.39	20.893	2.55	100.000	0.43	478.630	0.00
0.209	0.00	1.000	0.57	4.786	2.55	22.909	2.40	109.648	0.34	524.807	0.00
0.229	0.00	1.096	0.58	5.248	2.71	25.119	2.25	120.226	0.26	575.440	0.00
0.251	0.00	1.202	0.60	5.754	2.86	27.542	2.11	131.826	0.19	630.957	0.00
0.275	0.00	1.318	0.64	6.310	2.99	30.200	1.98	144.544	0.13	691.831	0.00
0.302	0.00	1.445	0.69	6.918	3.11	33.113	1.85	158.489	0.09	758.578	0.00
0.331	0.00	1.585	0.77	7.586	3.20	36.308	1.72	173.780	0.05	831.764	0.00
0.363	0.00	1.738	0.86	8.318	3.27	39.811	1.59	190.546	0.03	912.011	0.00
0.398	0.00	1.905	0.97	9.120	3.31	43.652	1.47	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	1.10	10.000	3.32	47.863	1.35	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P6

Measured by:

Darren

Measured:

Monday, November 03, 2014 12:15:13 PM

Sample Name:

Bulk Regrind Discharge 12:00 - Average

Edited by:

Darren

Analysed:

Monday, November 03, 2014 12:15:15 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

25.81 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.530 %

Result Emulation:

Off

Concentration:

0.0219 %Vol

Span :

4.263

Uniformity:

1.35

Result units:

Volume

Specific Surface Area:

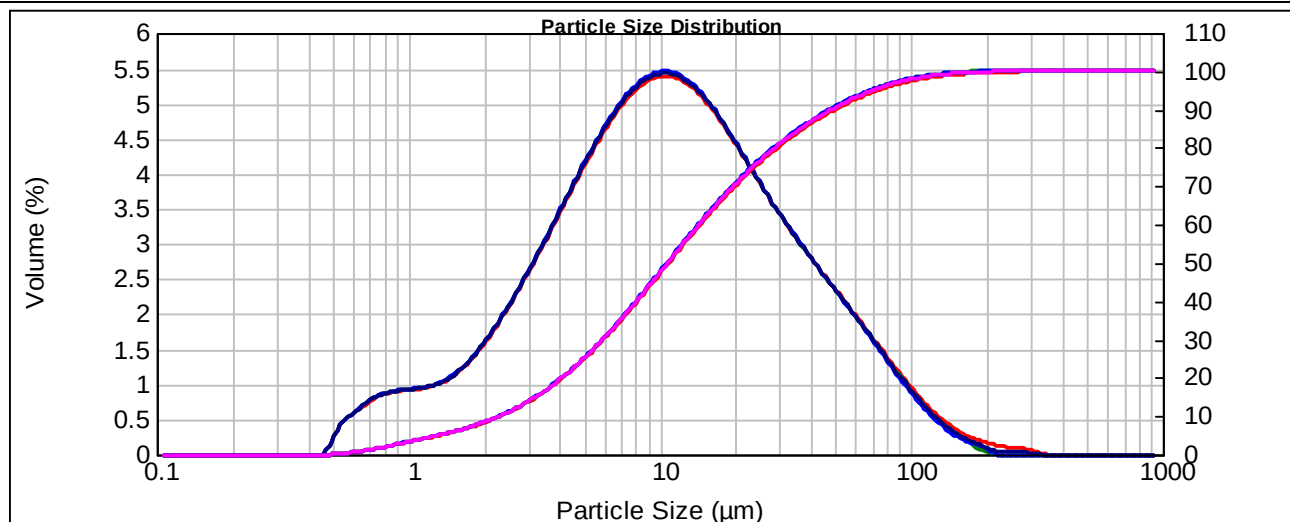
1.13 m²/g

Surface Weighted Mean D[3,2]:

5.297 um

Vol. Weighted Mean D[4,3]:

19.620 um

d(0.1): 2.302 um d(0.5): 10.725 um **d(0.8): 28.648 um** d(0.9): 48.027 um d(0.98): 99.92 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.12	2.291	1.21	10.965	3.26	52.481	1.30	251.189	0.02
0.110	0.00	0.525	0.29	2.512	1.35	12.023	3.22	57.544	1.18	275.423	0.02
0.120	0.00	0.575	0.35	2.754	1.50	13.183	3.15	63.096	1.07	301.995	0.01
0.132	0.00	0.631	0.42	3.020	1.66	14.454	3.05	69.183	0.95	331.131	0.00
0.145	0.00	0.692	0.48	3.311	1.82	15.849	2.94	75.858	0.83	363.078	0.00
0.158	0.00	0.759	0.52	3.631	1.99	17.378	2.81	83.176	0.72	398.107	0.00
0.174	0.00	0.832	0.54	3.981	2.16	19.055	2.68	91.201	0.61	436.516	0.00
0.191	0.00	0.912	0.55	4.365	2.33	20.893	2.54	100.000	0.50	478.630	0.00
0.209	0.00	1.000	0.57	4.786	2.50	22.909	2.39	109.648	0.40	524.807	0.00
0.229	0.00	1.096	0.57	5.248	2.65	25.119	2.25	120.226	0.31	575.440	0.00
0.251	0.00	1.202	0.59	5.754	2.80	27.542	2.12	131.826	0.24	630.957	0.00
0.275	0.00	1.318	0.63	6.310	2.93	30.200	1.99	144.544	0.18	691.831	0.00
0.302	0.00	1.445	0.68	6.918	3.05	33.113	1.87	158.489	0.13	758.578	0.00
0.331	0.00	1.585	0.75	7.586	3.14	36.308	1.75	173.780	0.10	831.764	0.00
0.363	0.00	1.738	0.84	8.318	3.21	39.811	1.63	190.546	0.05	912.011	0.00
0.398	0.00	1.905	0.95	9.120	3.26	43.652	1.52	208.930	0.03	1000.000	0.00
0.437	0.00	2.089	1.07	10.000	3.27	47.863	1.41	229.087	0.02		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P6

Measured by:

mike

Measured:

Monday, November 03, 2014 2:36:31 PM

Sample Name:

Bulk Regrind Discharge 14:15 - Average

Edited by:

mike

Analysed:

Monday, November 03, 2014 2:36:32 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

19.62 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.593 %

Result Emulation:

Off

Concentration:

0.0166 %Vol

Span :

4.336

Uniformity:

1.34

Result units:

Volume

Specific Surface Area:

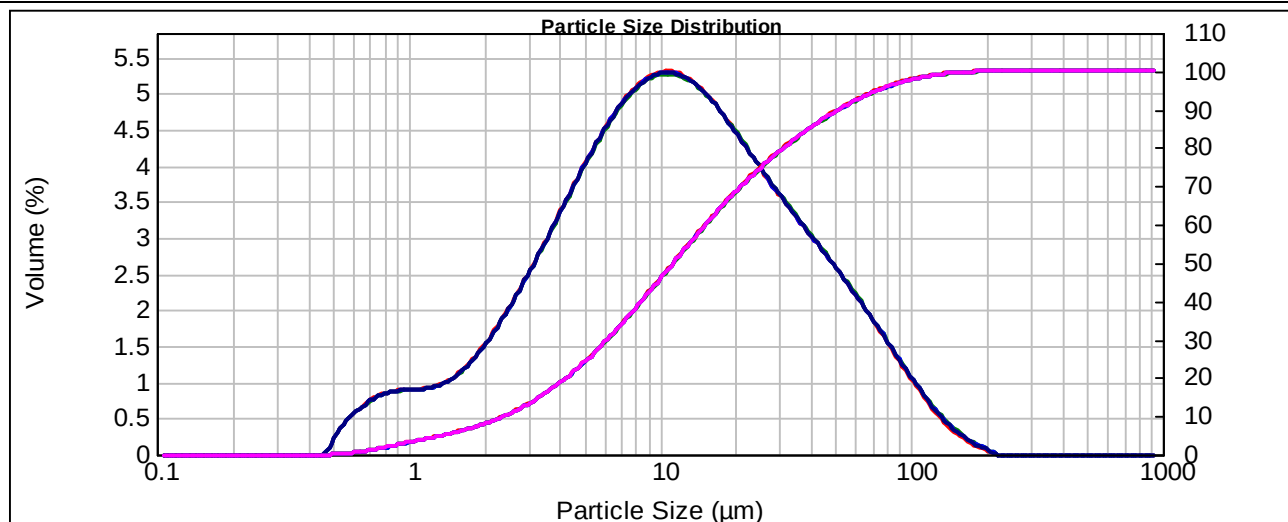
1.09 m²/g

Surface Weighted Mean D[3,2]:

5.498 um

Vol. Weighted Mean D[4,3]:

20.532 um

d(0.1): 2.396 um d(0.5): 11.304 um **d(0.8): 31.028 um** d(0.9): 51.406 um d(0.98): 101.4 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	1.15	10.965	3.18	52.481	1.45	251.189	0.00
0.110	0.00	0.525	0.26	2.512	1.29	12.023	3.15	57.544	1.33	275.423	0.00
0.120	0.00	0.575	0.33	2.754	1.44	13.183	3.09	63.096	1.21	301.995	0.00
0.132	0.00	0.631	0.41	3.020	1.59	14.454	3.01	69.183	1.09	331.131	0.00
0.145	0.00	0.692	0.47	3.311	1.76	15.849	2.92	75.858	0.96	363.078	0.00
0.158	0.00	0.759	0.50	3.631	1.92	17.378	2.81	83.176	0.83	398.107	0.00
0.174	0.00	0.832	0.52	3.981	2.09	19.055	2.70	91.201	0.70	436.516	0.00
0.191	0.00	0.912	0.54	4.365	2.25	20.893	2.57	100.000	0.58	478.630	0.00
0.209	0.00	1.000	0.54	4.786	2.41	22.909	2.45	109.648	0.46	524.807	0.00
0.229	0.00	1.096	0.55	5.248	2.57	25.119	2.33	120.226	0.36	575.440	0.00
0.251	0.00	1.202	0.56	5.754	2.71	27.542	2.21	131.826	0.26	630.957	0.00
0.275	0.00	1.318	0.59	6.310	2.84	30.200	2.10	144.544	0.19	691.831	0.00
0.302	0.00	1.445	0.64	6.918	2.95	33.113	1.99	158.489	0.13	758.578	0.00
0.331	0.00	1.585	0.71	7.586	3.05	36.308	1.88	173.780	0.08	831.764	0.00
0.363	0.00	1.738	0.80	8.318	3.12	39.811	1.77	190.546	0.05	912.011	0.00
0.398	0.00	1.905	0.90	9.120	3.17	43.652	1.67	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	1.02	10.000	3.19	47.863	1.56	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P7

Measured by:

mike

Measured:

Tuesday, November 04, 2014 9:45:36 AM

Sample Name:

Bulk Regrind Discharge 09:15 - Average

Edited by:

mike

Analysed:

Tuesday, November 04, 2014 9:45:37 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

22.89 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.641 %

Result Emulation:

Off

Concentration:

0.0190 %Vol

Span :

4.175

Uniformity:

1.37

Result units:

Volume

Specific Surface Area:

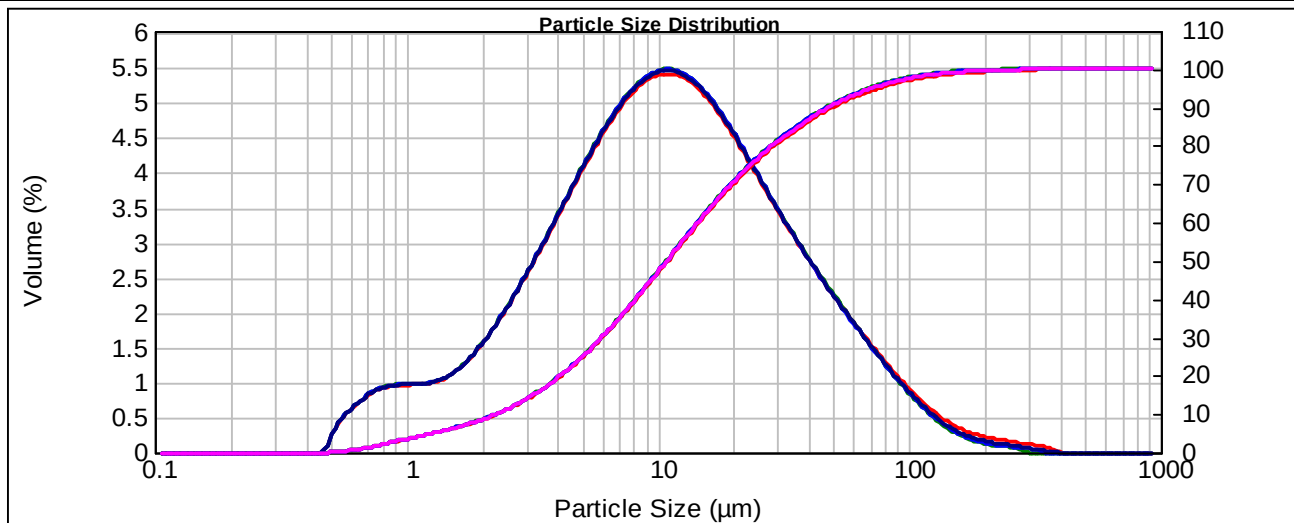
1.14 m²/g

Surface Weighted Mean D[3,2]:

5.257 um

Vol. Weighted Mean D[4,3]:

20.097 um

d(0.1): 2.271 um d(0.5): 10.835 um **d(0.8): 28.378 um** d(0.9): 47.513 um d(0.98): 105.57 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.12	2.291	1.18	10.965	3.28	52.481	1.23	251.189	0.06
0.110	0.00	0.525	0.30	2.512	1.32	12.023	3.26	57.544	1.11	275.423	0.04
0.120	0.00	0.575	0.37	2.754	1.47	13.183	3.20	63.096	1.00	301.995	0.03
0.132	0.00	0.631	0.45	3.020	1.62	14.454	3.11	69.183	0.89	331.131	0.02
0.145	0.00	0.692	0.52	3.311	1.79	15.849	3.01	75.858	0.78	363.078	0.00
0.158	0.00	0.759	0.56	3.631	1.95	17.378	2.89	83.176	0.67	398.107	0.00
0.174	0.00	0.832	0.58	3.981	2.12	19.055	2.75	91.201	0.57	436.516	0.00
0.191	0.00	0.912	0.58	4.365	2.28	20.893	2.61	100.000	0.48	478.630	0.00
0.209	0.00	1.000	0.59	4.786	2.45	22.909	2.45	109.648	0.39	524.807	0.00
0.229	0.00	1.096	0.59	5.248	2.61	25.119	2.30	120.226	0.31	575.440	0.00
0.251	0.00	1.202	0.60	5.754	2.76	27.542	2.15	131.826	0.25	630.957	0.00
0.275	0.00	1.318	0.63	6.310	2.90	30.200	2.01	144.544	0.19	691.831	0.00
0.302	0.00	1.445	0.67	6.918	3.02	33.113	1.87	158.489	0.15	758.578	0.00
0.331	0.00	1.585	0.74	7.586	3.12	36.308	1.73	173.780	0.12	831.764	0.00
0.363	0.00	1.738	0.83	8.318	3.20	39.811	1.60	190.546	0.10	912.011	0.00
0.398	0.00	1.905	0.93	9.120	3.26	43.652	1.47	208.930	0.08	1000.000	0.00
0.437	0.00	2.089	1.05	10.000	3.29	47.863	1.35	229.087	0.07		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P7

Measured by:

mike

Measured:

Tuesday, November 04, 2014 12:15:51 PM

Sample Name:

Bulk Regrind Discharge 11:45 - Average

Edited by:

mike

Analysed:

Tuesday, November 04, 2014 12:15:52 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

18.50 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.619 %

Result Emulation:

Off

Concentration:

0.0162 %Vol

Span :

4.640

Uniformity:

1.49

Result units:

Volume

Specific Surface Area:

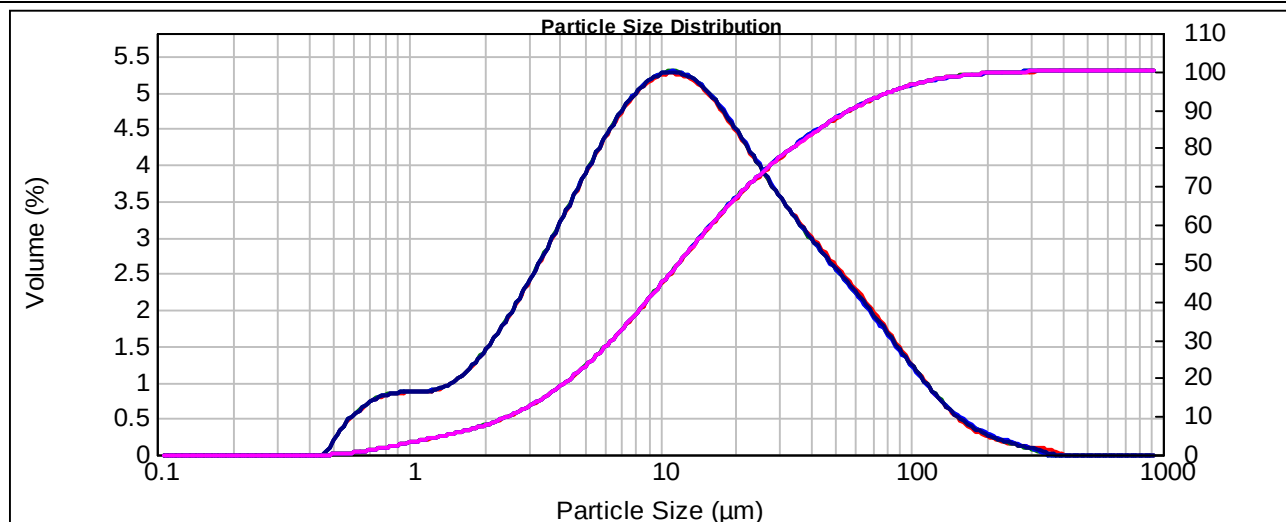
1.05 m²/g

Surface Weighted Mean D[3,2]:

5.709 um

Vol. Weighted Mean D[4,3]:

23.335 um

d(0.1): 2.500 um d(0.5): 11.882 um **d(0.8): 33.446 um** d(0.9): 57.630 um d(0.98): 126.27 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	1.08	10.965	3.17	52.481	1.45	251.189	0.08
0.110	0.00	0.525	0.25	2.512	1.22	12.023	3.15	57.544	1.35	275.423	0.06
0.120	0.00	0.575	0.32	2.754	1.36	13.183	3.10	63.096	1.24	301.995	0.04
0.132	0.00	0.631	0.39	3.020	1.51	14.454	3.03	69.183	1.14	331.131	0.02
0.145	0.00	0.692	0.45	3.311	1.67	15.849	2.94	75.858	1.03	363.078	0.00
0.158	0.00	0.759	0.49	3.631	1.83	17.378	2.83	83.176	0.91	398.107	0.00
0.174	0.00	0.832	0.51	3.981	1.99	19.055	2.71	91.201	0.80	436.516	0.00
0.191	0.00	0.912	0.52	4.365	2.16	20.893	2.58	100.000	0.69	478.630	0.00
0.209	0.00	1.000	0.52	4.786	2.32	22.909	2.45	109.648	0.59	524.807	0.00
0.229	0.00	1.096	0.52	5.248	2.47	25.119	2.32	120.226	0.49	575.440	0.00
0.251	0.00	1.202	0.53	5.754	2.62	27.542	2.19	131.826	0.40	630.957	0.00
0.275	0.00	1.318	0.56	6.310	2.76	30.200	2.07	144.544	0.32	691.831	0.00
0.302	0.00	1.445	0.60	6.918	2.89	33.113	1.96	158.489	0.26	758.578	0.00
0.331	0.00	1.585	0.67	7.586	2.99	36.308	1.85	173.780	0.21	831.764	0.00
0.363	0.00	1.738	0.75	8.318	3.08	39.811	1.75	190.546	0.16	912.011	0.00
0.398	0.00	1.905	0.85	9.120	3.14	43.652	1.65	208.930	0.13	1000.000	0.00
0.437	0.00	2.089	0.96	10.000	3.17	47.863	1.55	229.087	0.10		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P7

Measured by:

mike

Measured:

Tuesday, November 04, 2014 1:41:03 PM

Sample Name:

Bulk Regrind Discharge 13:20 - Average

Edited by:

mike

Analysed:

Tuesday, November 04, 2014 1:41:04 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

21.22 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.585 %

Result Emulation:

Off

Concentration:

0.0185 %Vol

Span :

4.264

Uniformity:

1.33

Result units:

Volume

Specific Surface Area:

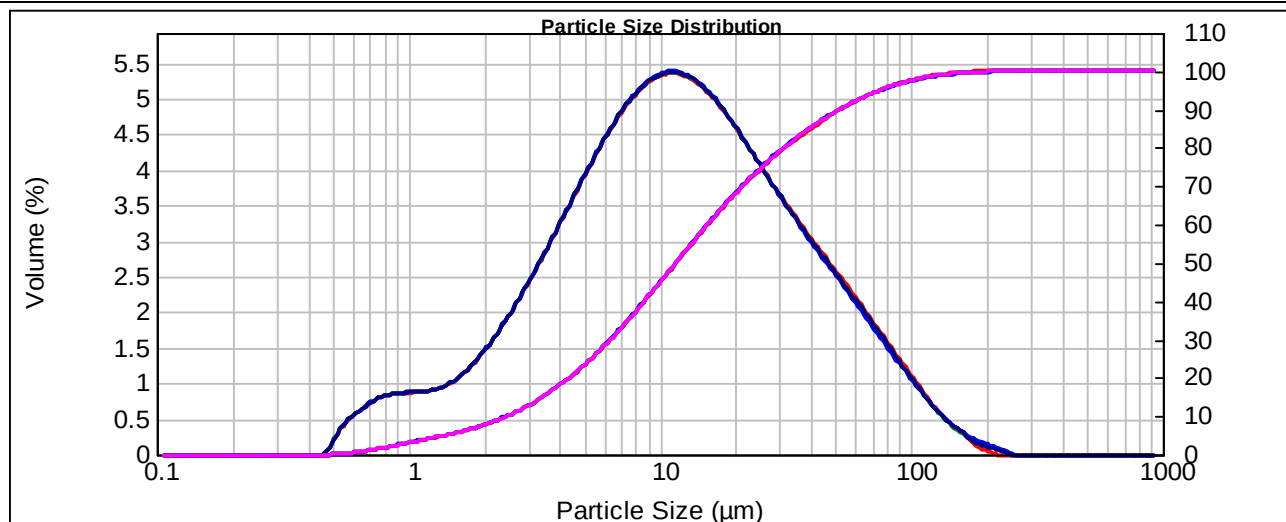
1.07 m²/g

Surface Weighted Mean D[3,2]:

5.607 um

Vol. Weighted Mean D[4,3]:

20.937 um

d(0.1): 2.457 um d(0.5): 11.563 um **d(0.8): 31.124 um** d(0.9): 51.761 um d(0.98): 105.03 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	1.11	10.965	3.23	52.481	1.42	251.189	0.00
0.110	0.00	0.525	0.25	2.512	1.24	12.023	3.21	57.544	1.30	275.423	0.00
0.120	0.00	0.575	0.33	2.754	1.39	13.183	3.17	63.096	1.18	301.995	0.00
0.132	0.00	0.631	0.40	3.020	1.54	14.454	3.09	69.183	1.07	331.131	0.00
0.145	0.00	0.692	0.46	3.311	1.70	15.849	3.00	75.858	0.95	363.078	0.00
0.158	0.00	0.759	0.49	3.631	1.86	17.378	2.89	83.176	0.82	398.107	0.00
0.174	0.00	0.832	0.51	3.981	2.03	19.055	2.77	91.201	0.71	436.516	0.00
0.191	0.00	0.912	0.52	4.365	2.19	20.893	2.64	100.000	0.59	478.630	0.00
0.209	0.00	1.000	0.53	4.786	2.36	22.909	2.51	109.648	0.48	524.807	0.00
0.229	0.00	1.096	0.53	5.248	2.52	25.119	2.38	120.226	0.38	575.440	0.00
0.251	0.00	1.202	0.55	5.754	2.67	27.542	2.25	131.826	0.29	630.957	0.00
0.275	0.00	1.318	0.57	6.310	2.81	30.200	2.12	144.544	0.22	691.831	0.00
0.302	0.00	1.445	0.62	6.918	2.94	33.113	2.00	158.489	0.16	758.578	0.00
0.331	0.00	1.585	0.69	7.586	3.05	36.308	1.88	173.780	0.09	831.764	0.00
0.363	0.00	1.738	0.77	8.318	3.13	39.811	1.76	190.546	0.07	912.011	0.00
0.398	0.00	1.905	0.87	9.120	3.19	43.652	1.65	208.930	0.04	1000.000	0.00
0.437	0.00	2.089	0.99	10.000	3.23	47.863	1.53	229.087	0.01		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P8

Measured by:

mike

Measured:

Wednesday, November 05, 2014 9:49:21 AM

Sample Name:

Bulk Regrind Discharge 09:00 - Average

Edited by:

mike

Analysed:

Wednesday, November 05, 2014 9:49:22 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

16.79 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.491 %

Result Emulation:

Off

Concentration:

0.0154 %Vol

Span :

4.314

Uniformity:

1.34

Result units:

Volume

Specific Surface Area:

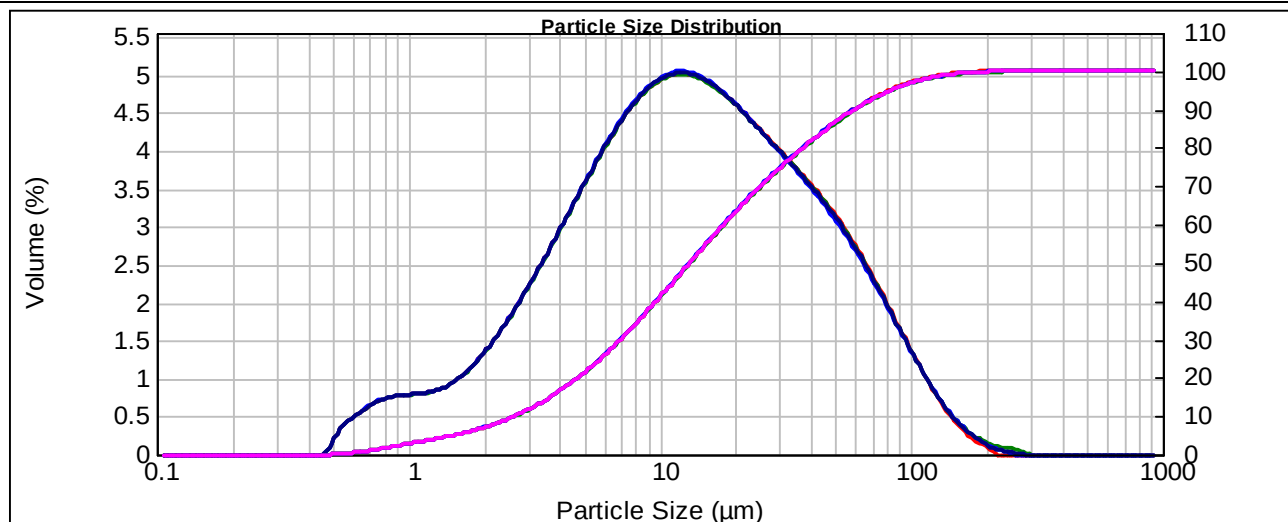
0.993 m²/g

Surface Weighted Mean D[3,2]:

6.043 um

Vol. Weighted Mean D[4,3]:

23.635 um

d(0.1): 2.635 um d(0.5): 13.123 um **d(0.8): 36.944 um** d(0.9): 59.255 um d(0.98): 112 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	1.02	10.965	3.02	52.481	1.76	251.189	0.01
0.110	0.00	0.525	0.24	2.512	1.14	12.023	3.03	57.544	1.63	275.423	0.00
0.120	0.00	0.575	0.30	2.754	1.27	13.183	3.01	63.096	1.50	301.995	0.00
0.132	0.00	0.631	0.36	3.020	1.41	14.454	2.97	69.183	1.35	331.131	0.00
0.145	0.00	0.692	0.41	3.311	1.41	15.849	2.92	75.858	1.21	363.078	0.00
0.158	0.00	0.759	0.44	3.631	1.55	17.378	2.85	83.176	1.05	398.107	0.00
0.174	0.00	0.832	0.46	3.981	1.70	19.055	2.78	91.201	0.90	436.516	0.00
0.191	0.00	0.912	0.47	4.365	1.85	20.893	2.70	100.000	0.75	478.630	0.00
0.209	0.00	1.000	0.48	4.786	2.00	22.909	2.61	109.648	0.60	524.807	0.00
0.229	0.00	1.096	0.48	5.248	2.15	25.119	2.53	120.226	0.47	575.440	0.00
0.251	0.00	1.202	0.50	5.754	2.29	27.542	2.44	131.826	0.36	630.957	0.00
0.275	0.00	1.318	0.53	6.310	2.44	30.200	2.35	144.544	0.26	691.831	0.00
0.302	0.00	1.445	0.57	6.918	2.57	33.113	2.27	158.489	0.18	758.578	0.00
0.331	0.00	1.585	0.64	7.586	2.69	36.308	2.18	173.780	0.13	831.764	0.00
0.363	0.00	1.738	0.71	8.318	2.79	39.811	2.08	190.546	0.07	912.011	0.00
0.398	0.00	1.905	0.80	9.120	2.88	43.652	1.99	208.930	0.04	1000.000	0.00
0.437	0.00	2.089	0.91	10.000	2.95	47.863	1.88	229.087	0.02		
0.479	0.00	2.291		10.965	3.00	52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P8

Measured by:

mike

Measured:

Wednesday, November 05, 2014 11:14:53 AM

Sample Name:

Bulk Regrind Discharge 10:45 - Average

Edited by:

mike

Analysed:

Wednesday, November 05, 2014 11:14:55 AM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

17.78 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.537 %

Result Emulation:

Off

Concentration:

0.0159 %Vol

Span :

4.218

Uniformity:

1.3

Result units:

Volume

Specific Surface Area:

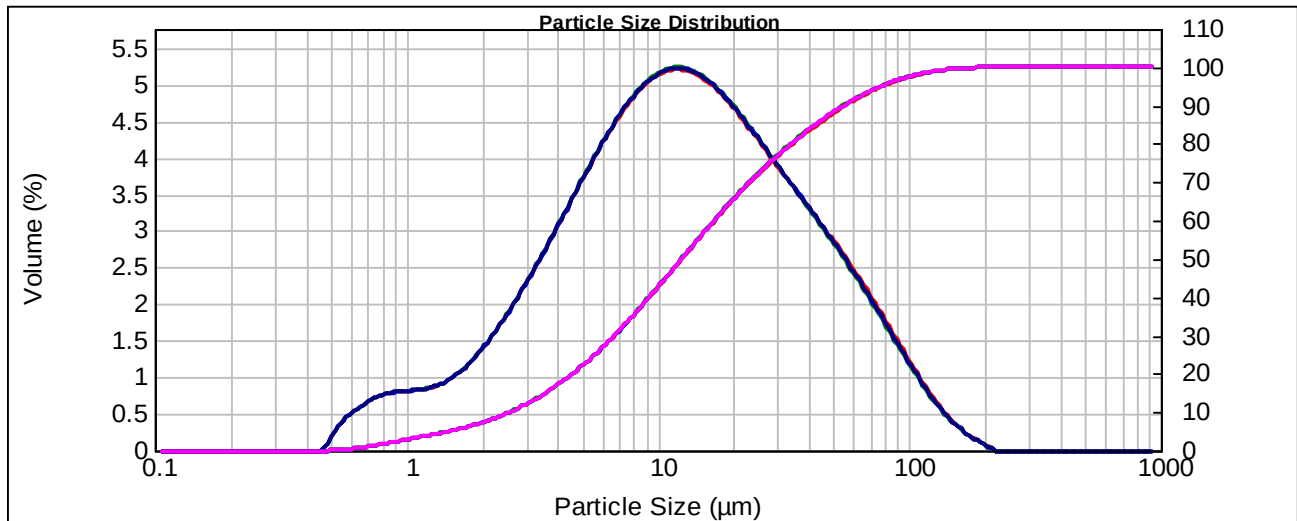
1.02 m²/g

Surface Weighted Mean D[3,2]:

5.878 um

Vol. Weighted Mean D[4,3]:

22.048 um

d(0.1): 2.572 um d(0.5): 12.423 um **d(0.8): 33.832 um** d(0.9): 54.970 um d(0.98): 105.75 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.09	2.291	1.06	10.965	3.14	52.481	1.59	251.189	0.00
0.110	0.00	0.525	0.24	2.512	1.18	12.023	3.14	57.544	1.47	275.423	0.00
0.120	0.00	0.575	0.30	2.754	1.32	13.183	3.12	63.096	1.34	301.995	0.00
0.132	0.00	0.631	0.37	3.020	1.46	14.454	3.07	69.183	1.21	331.131	0.00
0.145	0.00	0.692	0.42	3.311	1.61	15.849	3.01	75.858	1.07	363.078	0.00
0.158	0.00	0.759	0.46	3.631	1.76	17.378	2.92	83.176	0.93	398.107	0.00
0.174	0.00	0.832	0.48	3.981	1.92	19.055	2.83	91.201	0.79	436.516	0.00
0.191	0.00	0.912	0.49	4.365	2.07	20.893	2.73	100.000	0.66	478.630	0.00
0.209	0.00	1.000	0.49	4.786	2.23	22.909	2.62	109.648	0.53	524.807	0.00
0.229	0.00	1.096	0.50	5.248	2.38	25.119	2.50	120.226	0.41	575.440	0.00
0.251	0.00	1.202	0.52	5.754	2.53	27.542	2.39	131.826	0.30	630.957	0.00
0.275	0.00	1.318	0.55	6.310	2.67	30.200	2.28	144.544	0.22	691.831	0.00
0.302	0.00	1.445	0.59	6.918	2.79	33.113	2.17	158.489	0.15	758.578	0.00
0.331	0.00	1.585	0.66	7.586	2.91	36.308	2.05	173.780	0.09	831.764	0.00
0.363	0.00	1.738	0.74	8.318	3.00	39.811	1.94	190.546	0.05	912.011	0.00
0.398	0.00	1.905	0.83	9.120	3.07	43.652	1.83	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	0.94	10.000	3.12	47.863	1.71	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P8

Measured by:

mike

Measured:

Wednesday, November 05, 2014 12:23:46 PM

Sample Name:

Bulk Regrind Discharge 12:00 - Average

Edited by:

mike

Analysed:

Wednesday, November 05, 2014 12:23:47 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

18.79 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.527 %

Result Emulation:

Off

Concentration:

0.0167 %Vol

Span :

4.100

Uniformity:

1.26

Result units:

Volume

Specific Surface Area:

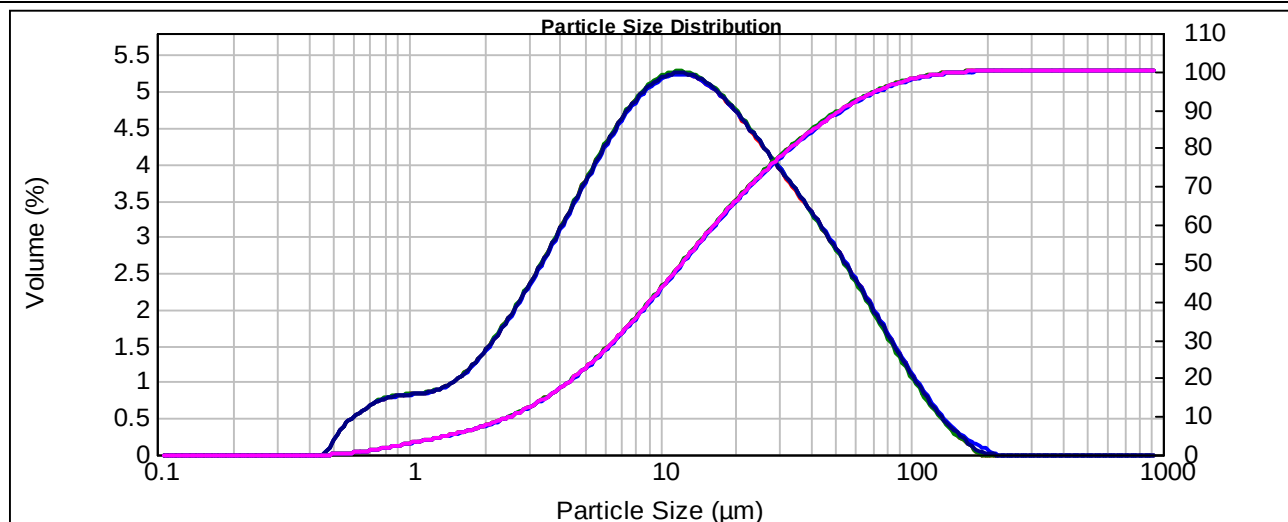
1.03 m²/g

Surface Weighted Mean D[3,2]:

5.822 um

Vol. Weighted Mean D[4,3]:

21.344 um

d(0.1): 2.546 um d(0.5): 12.275 um **d(0.8): 32.961 um** d(0.9): 52.876 um d(0.98): 100.36 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.10	2.291	1.07	10.965	3.16	52.481	1.58	251.189	0.00
0.110	0.00	0.525	0.24	2.512	1.19	12.023	3.16	57.544	1.44	275.423	0.00
0.120	0.00	0.575	0.31	2.754	1.33	13.183	3.13	63.096	1.30	301.995	0.00
0.132	0.00	0.631	0.37	3.020	1.47	14.454	3.09	69.183	1.16	331.131	0.00
0.145	0.00	0.692	0.43	3.311	1.78	15.849	3.02	75.858	1.02	363.078	0.00
0.158	0.00	0.759	0.46	3.631	1.93	17.378	2.94	83.176	0.87	398.107	0.00
0.174	0.00	0.832	0.48	3.981	2.09	19.055	2.85	91.201	0.73	436.516	0.00
0.191	0.00	0.912	0.49	4.365	2.25	20.893	2.75	100.000	0.60	478.630	0.00
0.209	0.00	1.000	0.50	4.786	2.40	22.909	2.64	109.648	0.47	524.807	0.00
0.229	0.00	1.096	0.51	5.248	2.69	25.119	2.53	120.226	0.36	575.440	0.00
0.251	0.00	1.202	0.52	5.754	2.81	27.542	2.42	131.826	0.26	630.957	0.00
0.275	0.00	1.318	0.56	6.310	2.93	30.200	2.30	144.544	0.18	691.831	0.00
0.302	0.00	1.445	0.60	6.918	3.02	33.113	2.19	158.489	0.11	758.578	0.00
0.331	0.00	1.585	0.67	7.586	3.14	36.308	2.07	173.780	0.03	831.764	0.00
0.363	0.00	1.738	0.75	8.318	3.09	39.811	1.95	190.546	0.01	912.011	0.00
0.398	0.00	1.905	0.84	9.120	3.14	43.652	1.83	208.930	0.00	1000.000	0.00
0.437	0.00	2.089	0.95	10.000		47.863	1.71	229.087	0.00		
0.479	0.00	2.291		10.965		52.481		251.189	0.00		

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P8

Measured by:

mike

Measured:

Wednesday, November 05, 2014 1:42:26 PM

Sample Name:

Bulk Regrind Discharge 13:15 - Average

Edited by:

mike

Analysed:

Wednesday, November 05, 2014 1:42:27 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

17.63 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.512 %

Result Emulation:

Off

Concentration:

0.0161 %Vol

Span :

4.191

Uniformity:

1.31

Result units:

Volume

Specific Surface Area:

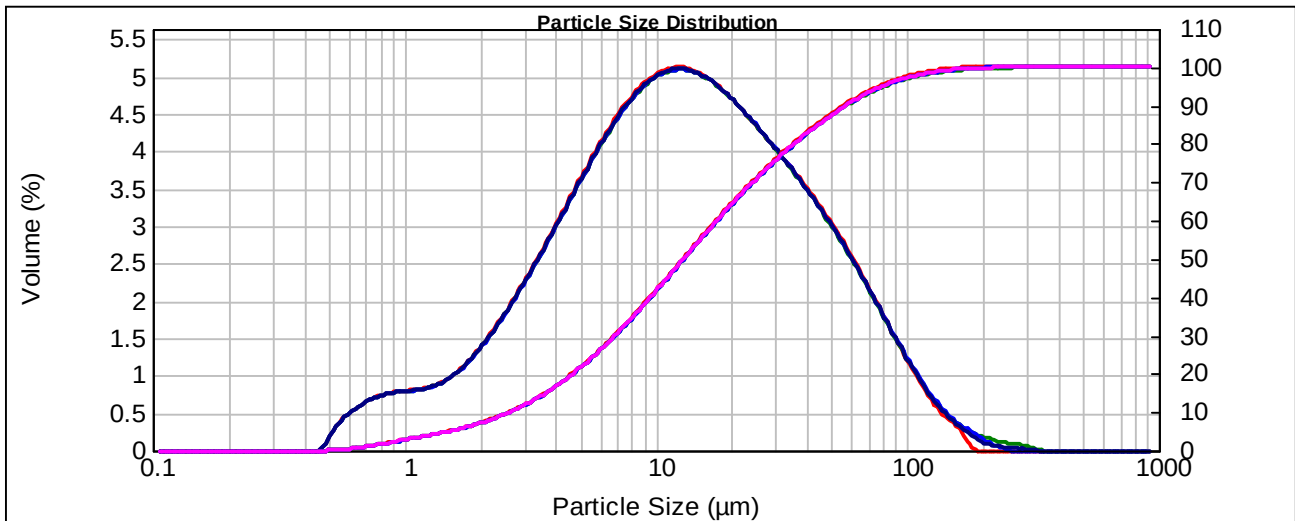
1 m²/g

Surface Weighted Mean D[3,2]:

5.998 um

Vol. Weighted Mean D[4,3]:

22.932 um

d(0.1): 2.616 um d(0.5): 12.882 um **d(0.8): 35.343 um** d(0.9): 56.605 um d(0.98): 109.1 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.09	2.291	1.04	10.965	3.07	52.481	1.68	251.189	0.02
0.110	0.00	0.525	0.23	2.512	1.16	12.023	3.07	57.544	1.55	275.423	0.01
0.120	0.00	0.575	0.29	2.754	1.30	13.183	3.06	63.096	1.40	301.995	0.01
0.132	0.00	0.631	0.35	3.020	1.43	14.454	3.03	69.183	1.26	331.131	0.00
0.145	0.00	0.692	0.41	3.311	1.58	15.849	2.98	75.858	1.11	363.078	0.00
0.158	0.00	0.759	0.44	3.631	1.72	17.378	2.91	83.176	0.95	398.107	0.00
0.174	0.00	0.832	0.46	3.981	1.87	19.055	2.83	91.201	0.81	436.516	0.00
0.191	0.00	0.912	0.47	4.365	2.02	20.893	2.75	100.000	0.67	478.630	0.00
0.209	0.00	1.000	0.48	4.786	2.18	22.909	2.66	109.648	0.53	524.807	0.00
0.229	0.00	1.096	0.49	5.248	2.32	25.119	2.57	120.226	0.42	575.440	0.00
0.251	0.00	1.202	0.51	5.754	2.46	27.542	2.47	131.826	0.32	630.957	0.00
0.275	0.00	1.318	0.54	6.310	2.60	30.200	2.37	144.544	0.24	691.831	0.00
0.302	0.00	1.445	0.58	6.918	2.72	33.113	2.27	158.489	0.17	758.578	0.00
0.331	0.00	1.585	0.65	7.586	2.83	36.308	2.16	173.780	0.11	831.764	0.00
0.363	0.00	1.738	0.73	8.318	2.92	39.811	2.05	190.546	0.06	912.011	0.00
0.398	0.00	1.905	0.82	9.120	2.99	43.652	1.94	208.930	0.05	1000.000	0.00
0.437	0.00	2.089	0.93	10.000	3.04	47.863	1.81	229.087	0.03		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

Result Analysis Report

Project and Test number:

KM4420-P8

Measured by:

mike

Measured:

Wednesday, November 05, 2014 3:11:17 PM

Sample Name:

Bulk Regrind Discharge 15:00 - Average

Edited by:

mike

Analysed:

Wednesday, November 05, 2014 3:11:18 PM

Particle Name:

Silica 0.1

Accessory Name:

Hydro 2000MU (A)

Analysis model:

General purpose

Sensitivity:

Normal

Particle RI:

1.544

Absorption:

0.1

Size range:

0.100 to 1000.000 um

Obscuration:

20.02 %

Dispersant Name:

Water

Dispersant RI:

1.330

Weighted Residual:

0.510 %

Result Emulation:

Off

Concentration:

0.0189 %Vol

Span :

4.715

Uniformity:

1.44

Result units:

Volume

Specific Surface Area:

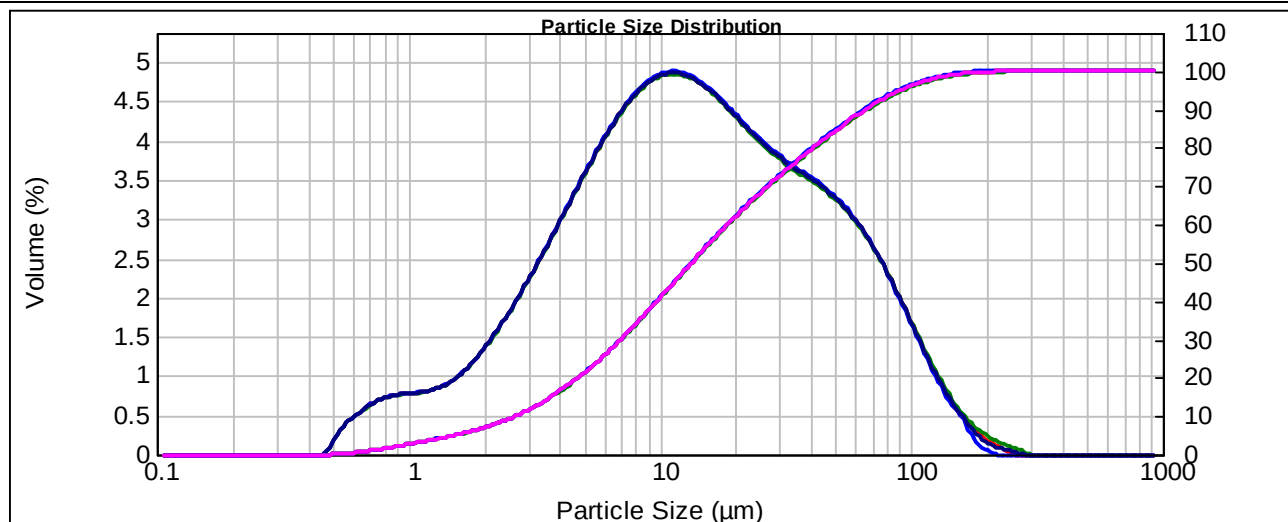
0.979 m²/g

Surface Weighted Mean D[3,2]:

6.132 um

Vol. Weighted Mean D[4,3]:

25.338 um

d(0.1): 2.654 um d(0.5): 13.349 um **d(0.8): 40.642 um** d(0.9): 65.592 um d(0.98): 120.63 um


Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %	Size (µm)	Volume In %
0.100	0.00	0.479	0.09	2.291	1.03	10.965	2.93	52.481	1.88	251.189	0.02
0.110	0.00	0.525	0.22	2.512	1.15	12.023	2.91	57.544	1.79	275.423	0.00
0.120	0.00	0.575	0.28	2.754	1.28	13.183	2.88	63.096	1.68	301.995	0.00
0.132	0.00	0.631	0.35	3.020	1.42	14.454	2.82	69.183	1.56	331.131	0.00
0.145	0.00	0.692	0.40	3.311	1.56	15.849	2.76	75.858	1.42	363.078	0.00
0.158	0.00	0.759	0.43	3.631	1.71	17.378	2.68	83.176	1.26	398.107	0.00
0.174	0.00	0.832	0.45	3.981	1.85	19.055	2.60	91.201	1.10	436.516	0.00
0.191	0.00	0.912	0.46	4.365	2.00	20.893	2.52	100.000	0.93	478.630	0.00
0.209	0.00	1.000	0.47	4.786	2.15	22.909	2.44	109.648	0.76	524.807	0.00
0.229	0.00	1.096	0.48	5.248	2.29	25.119	2.37	120.226	0.61	575.440	0.00
0.251	0.00	1.202	0.50	5.754	2.43	27.542	2.30	131.826	0.47	630.957	0.00
0.275	0.00	1.318	0.53	6.310	2.55	30.200	2.24	144.544	0.35	691.831	0.00
0.302	0.00	1.445	0.57	6.918	2.66	33.113	2.19	158.489	0.25	758.578	0.00
0.331	0.00	1.585	0.64	7.586	2.76	36.308	2.14	173.780	0.16	831.764	0.00
0.363	0.00	1.738	0.72	8.318	2.83	39.811	2.08	190.546	0.09	912.011	0.00
0.398	0.00	1.905	0.81	9.120	2.89	43.652	2.03	208.930	0.06	1000.000	0.00
0.437	0.00	2.089	0.91	10.000	2.92	47.863	1.96	229.087	0.04		
0.479	0.00	2.291		10.965		52.481		251.189			

Operator notes:

APPENDIX IV – KM4420

SPECIAL DATA

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ADDITIONAL DATA

ALS Minerals Certificate VA14175247
ALS Environmental Certificate L1542360
ALS Environmental Certificate L1542438
ALS Environmental Certificate L1543754

TABLE IV-1A
REPLICATE COMPOSITE HEAD ASSAY DATA

Sample	Assay - percent or g/tonne					
	Cu	Fe	Fe(t)	Mo	S(t)	S(s)
Lab Comp Head 1	2.11	6.0	6.6	0.039	6.50	6.43
Lab Comp Head 2	2.11	6.6	6.5	0.042	6.56	6.50
Lab Comp Head 3	2.04	6.2	6.3	0.037	6.19	6.11
Lab Comp Head 4	1.99	6.3	6.3	0.035	5.99	5.92
Average	2.06	6.3	6.43	0.038	6.31	6.24

TABLE IV-1B
WHOLE ROCK ANALYSIS DATA

Sample	Assay - percent											
	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SiO ₂	TiO ₂
Lab Comp Hd 1	10.7	0.030	0.43	0.033	8.97	3.63	1.83	0.018	0.078	0.19	61.88	1.01
Lab Comp Hd 2	10.5	0.028	0.40	0.033	8.93	3.50	1.79	0.017	0.071	0.17	60.6	0.98

TABLE IV-2A
 STATISTICAL ANALYSIS OF HEAD ASSAYS
Lab Composite

Test	Assay - percent or g/tonne			
	Cu	Mo	Fe	S
1	2.02	0.036	5.8	5.57
2	2.02	0.037	5.8	5.68
3	1.96	0.038	5.5	5.66
4	1.98	0.036	5.4	5.72
5	2.08	0.039	5.8	5.97
6	1.97	0.036	5.6	5.64
7	2.01	0.036	5.4	5.93
8	1.92	0.035	6.5	6.13
9	2.02	0.036	6.0	6.85
10	2.08	0.035	5.9	6.11
11	2.13	0.038	6.2	6.62
12	2.03	0.040	5.7	6.38
13	2.10	0.039	5.8	6.35
14	2.11	0.038	6.0	6.38
15	2.09	0.038	5.9	6.37
16	2.04	0.038	5.8	6.13
17	2.06	0.037	5.4	6.26
18	2.06	0.036	5.9	5.93
19	2.09	0.038	5.7	6.30
Calculated Head	2.04	0.037	5.8	6.10
Measured Head	2.06	0.038	6.3	6.31

TABLE IV-2B
STATISTICAL ANALYSIS OF HEAD ASSAYS
P2 WSA Bulk Final Concentrate

Test	Assay - percent or g/tonne			
	Cu	Mo	Fe	S
20	30.2	0.608	24.7	36.4
21	30.2	0.620	25.6	35.4
22	30.4	0.595	25.1	36.3
Calculated Head	30.3	0.608	25.1	36.0
Measured Head	29.7	0.634	25.4	35.4

TABLE IV-2C
STATISTICAL ANALYSIS OF HEAD ASSAYS
P4 WSA Bulk Final Concentrate

Test	Assay - percent or g/tonne			
	Cu	Mo	Fe	S
23	26.6	0.486	27.5	36.8
24	26.4	0.482	27.5	38.8
25	26.5	0.496	28.4	38.8
Calculated Head	26.5	0.488	27.8	38.1
Measured Head	26.9	0.504	28.1	36.8

TABLE IV-2D
STATISTICAL ANALYSIS OF HEAD ASSAYS
P6 WSA Bulk Final Concentrate

Test	Assay - percent or g/tonne				
	Cu	Mo	Fe	S	MgO
26	30.9	0.590	23.5	34.9	0.56
28	28.8	0.600	24.6	34.5	-
Calculated Head	29.8	0.595	24.1	34.7	0.56
Measured Head	30.5	0.596	25.1	34.7	0.56

TABLE IV-3A
COMPARATIVE CONCENTRATE COPPER ASSAYS

Test		Copper - percent	
		AAS	Titre
3		27.8	27.2
4		24.8	25.4
10		32.0	32.0
13		28.2	28.4
14		34.1	34.3
16	Con I	24.3	24.7
	Con II	20.6	21.0
	Con III	20.3	21.1
	Con IV	20.9	21.5
	Con V	22.5	23.7
17	Con I	26.0	26.2
	Con II	25.8	25.6
	Con III	26.2	25.5
	Con IV	26.6	26.9
	Con V	24.7	25.0
18	Con I	25.3	26.6
	Con II	23.0	24.1
	Con III	22.4	23.4
	Con IV	23.4	24.5
	Con V	22.4	23.5
19	Con I	31.7	31.8
	Con II	33.9	33.7
	Con III	31.2	31.1
	Con IV	33.8	33.6
	Con V	33.3	33.4
21	Mo Ro Tls	30.9	30.6
22	Mo Ro Tls	30.3	31.1
23	Mo Ro Tls	27.4	27.1
24	Mo Ro Tls	27.0	27.1
25	Mo Ro Tls	26.6	27.1
26	Mo Ro Tls	31.7	31.7
28	Mo Ro Tls I	30.2	30.2
	Mo Ro Tls II	29.0	29.4
	Mo Ro Tls III	29.9	30.4
	Mo Ro Tls IV	29.7	29.3
	Mo Ro Tls V	30.5	30.5

TABLE IV-3A Continued
COMPARATIVE CONCENTRATE COPPER ASSAYS

Run		Copper - percent	
		AAS	Titre
P1	Startup Bulk Final Con	31.5	31.6
	Bulk Final Con WSA	31.6	30.4
P2	Startup Bulk Final Con	35.8	35.7
	Bulk Final Con WSA	29.7	29.7
P3	Startup Bulk Final Con	22.6	23.4
	Bulk Final Con WSA	20.6	20.2
	Bulk Final Con WSB	22.4	23.0
P4	Startup Bulk Final Con	24.0	23.9
	Bulk Final Con WSA	27.2	26.9
	Bulk Final Con WSB	27.1	26.7
P5	Bulk Final Con WSA	20.6	21.0
P6	Startup Bulk Final Con	29.1	30.4
	Bulk Final Con WSA	30.0	30.5
P7	Startup Bulk Final Con	29.0	29.8
	Bulk Final Con WSA	23.3	24.2
	Bulk Final Con WSA-cut 2	24.7	26.0
	Bulk Final Con WSB	25.0	26.1
P8	Startup Bulk Final Con	27.3	28.2
	Bulk Final Con WSA	28.2	29.5
	Bulk Final Con WSA-cut 2	28.7	29.9
	Bulk Final Con WSB	27.9	29.5
	Bulk Final Con WSB-cut 2	28.9	29.7

TABLE IV-4
P2 BULK CLEANER SCAVENGER TAILINGS - ASSAYS BY SIZE

Fraction	Mass percent	Assay - Percent			Distribution - percent		
		Cu	Fe	S	Cu	Fe	S
>150µm	3.2	3.00	4.9	6.02	6	1	1
<150>106µm	4.9	7.50	28.3	35.9	24	7	7
<106>75µm	5.9	5.64	33.4	39.4	22	9	9
<75>53µm	6.3	3.04	30.8	39.5	13	9	9
<53>38µm	6.8	1.87	32.2	42.4	8	10	11
<38>20µm	16.0	0.76	30.7	39.1	8	23	23
<20µm	56.9	0.47	15.1	18.9	18	41	40
Total	100	1.50	21.1	26.7	100	100	100



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Account: KRL

CERTIFICATE VA14175247

Project: KM4420

P.O. No.: A1295

This report is for 4 Pulp samples submitted to our lab in Vancouver, BC, Canada on 12- NOV- 2014.

The following have access to data associated with this certificate:

ALS METALLURGY

SIMONE BAWTREE

BRENDA TREMBLAY

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI- 21	Received Sample Weight
LOG- 24	Pulp Login - Rcd w/o Barcode

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
ME- MS61c	4- Acid ICP- MS for Concentrates	
Hg- CON01	Mercury in ores by ICP	ICP- AES
F- CON01	Fluorine Concentrate	WST- SIM
Mo- CON02	Mo Concentrate	

To: ALS METALLURGY, DIV OF ALS CANADA LTD
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This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Colin Ramshaw, Vancouver Laboratory Manager



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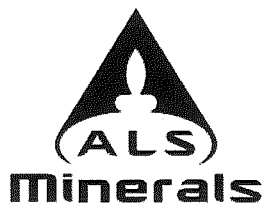
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CERTIFICATE OF ANALYSIS VA14175247

Sample Description	Method Analyte Units LOR	WEI- 21	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c
		Recvd Wt. kg 0.02	Ag ppm 0.1	Al % 0.02	As ppm 2	Ba ppm 50	Be ppm 0.5	Bi ppm 0.1	Ca % 0.05	Cd ppm 0.2	Ce ppm 0.1	Co ppm 1	Cr ppm 10	Cs ppm 0.5	Cu ppm 2	Fe % 0.02
KM4420- 28 Mo Con IV & V		0.02	11.2	0.49	35	<50	0.7	13.4	0.58	<0.2	7.5	18	20	0.7	11450	3.15
KM4420- P4 Bulk Final Con WSA		0.02	43.1	0.33	378	<50	<0.5	87.3	0.10	13.7	7.4	147	50	<0.5	>100000	27.6
KM4420- P5 Bulk Final Con WSA		0.02	32.8	0.34	291	<50	<0.5	65.2	0.08	11.8	7.1	197	40	<0.5	>100000	31.9
KM4420- P8 Bulk Final Con WSB		0.02	45.7	0.54	430	50	<0.5	96.4	0.12	14.7	10.6	126	40	<0.5	>100000	26.4



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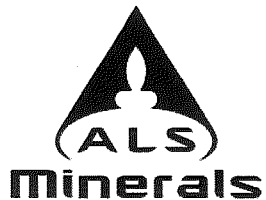
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CERTIFICATE OF ANALYSIS VA14175247

Sample Description	Method Analyte Units LOR	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c
		Ga	Ge	Hf	In	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni	P
		ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm
		0.5	0.5	1	0.05	0.02	5	2	0.02	10	0.5	0.02	1	2	100
KM4420- 28 Mo Con IV & V		4.8	1.0	<1	1.07	0.11	<5	10	8.23	320	>100000	0.03	1	30	200
KM4420- P4 Bulk Final Con WSA		3.7	1.2	<1	7.29	0.14	<5	<2	0.30	30	5170	<0.02	1	100	200
KM4420- P5 Bulk Final Con WSA		3.4	1.4	<1	6.47	0.17	<5	<2	0.25	30	4060	<0.02	1	126	200
KM4420- P8 Bulk Final Con WSB		4.6	1.1	1	8.86	0.22	5	2	0.35	50	5110	<0.02	1	87	300

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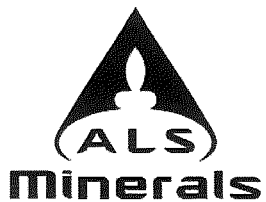
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CERTIFICATE OF ANALYSIS VA14175247

Sample Description	Method Analyte Units LOR	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c
		Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U
		ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm
		1	0.02	0.05	0.5	1	10	2	2	0.5	0.5	2	0.01	0.2	1
KM4420- 28 Mo Con IV & V		7	375	>10.0	0.8	1	200	7	36	<0.5	15.3	<2	0.03	1.1	2
KM4420- P4 Bulk Final Con WSA		6	8.71	>10.0	4.3	1	220	44	66	<0.5	22.1	<2	0.02	0.8	1
KM4420- P5 Bulk Final Con WSA		7	6.99	>10.0	3.3	1	200	35	54	<0.5	18.4	<2	0.02	0.6	1
KM4420- P8 Bulk Final Con WSB		10	8.95	>10.0	4.4	1	230	50	88	<0.5	24.6	<2	0.03	0.9	1

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CERTIFICATE OF ANALYSIS VA14175247

Sample Description	Method Analyte Units LOR	ME- MS61c	ME- MS61c	ME- MS61c	ME- MS61c	Hg- CON01	F- CON01	Mo- CON02
		W	Y	Zn	Zr	Hg	F	Mo
		ppm 1	ppm 1	ppm 20	ppm 5	ppm 1	ppm 20	% 0.01
KM4420- 28 Mo Con IV & V		43	4	700	10			22.6
KM4420- P4 Bulk Final Con WSA		20	3	2940	10	<1	600	
KM4420- P5 Bulk Final Con WSA		12	2	2800	6	<1	560	
KM4420- P8 Bulk Final Con WSB		17	4	3600	18	<1	730	

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CERTIFICATE OF ANALYSIS VA14175247

CERTIFICATE COMMENTS

Applies to Method:

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

F- CON01

Hg- CON01

LOG- 24

ME- MS61c

Mo- CON02

WEI- 21

LABORATORY ADDRESSES



ALS Metallurgy
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2957 Bowers Place
Kamloops BC V1S 1W5

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Report Date: 19-NOV-14 14:29 (MT)
Version: FINAL

Client Phone: 250-828-6157

Certificate of Analysis

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Project P.O. #: 1078 P
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1542360-1 Water 27-OCT-14 15:30 KM4420- P1 MORNING PROCESS	L1542360-2 Water 27-OCT-14 15:30 KM4420- P1 AFTERNOON PROCESS	L1542360-3 Water 29-OCT-14 07:15 KM4420- P3 MORNING PROCESS	L1542360-4 Water 29-OCT-14 15:30 KM4420- P3 AFTERNOON PROCESS	L1542360-5 Water 30-OCT-14 07:15 KM4420- P4 MORNING PROCESS
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	43.5			175	183
	pH (pH)	7.27	7.82	7.89	7.76	7.78
	Total Dissolved Solids (mg/L)	81	77	186	307	318
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	3.4	2.6	3.1	3.5	3.4
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	45.3	39.9	47.2	39.9	39.2
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	45.3	39.9	47.2	39.9	39.2
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	3.67	3.64	4.46	5.31	5.32
	Fluoride (F) (mg/L)	0.057	0.056	0.625	1.20	1.21
	Nitrate and Nitrite (as N) (mg/L)	0.0098	0.0084	<0.0051	<0.0051	<0.0051
	Nitrate (as N) (mg/L)	0.0098	0.0084	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sulfate (SO4) (mg/L)	7.78	7.07	82.7	166	172
Organic / Inorganic Carbon	Dissolved Inorganic Carbon (mg/L)	8.85			9.22	9.26
	Dissolved Organic Carbon (mg/L)	1.63			5.00	5.08
	Total Inorganic Carbon (mg/L)	9.30			8.72	9.39
	Total Organic Carbon (mg/L)	1.53			4.98	5.39
Total Metals	Aluminum (Al)-Total (mg/L)	0.0182			0.261	0.451
	Antimony (Sb)-Total (mg/L)	0.00063			<0.00050	0.00056
	Arsenic (As)-Total (mg/L)	0.00311			0.00164	0.00283
	Barium (Ba)-Total (mg/L)	<0.020			<0.020	0.022
	Beryllium (Be)-Total (mg/L)	<0.0010			<0.0010	<0.0010
	Bismuth (Bi)-Total (mg/L)	<0.20			<0.20	<0.20
	Boron (B)-Total (mg/L)	<0.10			<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	0.000122			0.000139	0.000303
	Calcium (Ca)-Total (mg/L)	15.2			64.0	66.7
	Chromium (Cr)-Total (mg/L)	<0.0010			<0.0010	0.0014
	Cobalt (Co)-Total (mg/L)	<0.00030			0.00039	0.00073
	Copper (Cu)-Total (mg/L)	0.0174			0.0255	0.0539
	Iron (Fe)-Total (mg/L)	0.046			0.275	0.644
	Lead (Pb)-Total (mg/L)	0.00929			0.00492	0.0218
	Lithium (Li)-Total (mg/L)	<0.0050			<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	1.90			4.68	4.88
	Manganese (Mn)-Total (mg/L)	0.00794			0.141	0.153

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1542360-6 Water 30-OCT-14 15:30 KM4420- P4 AFTERNOON PROCESS	L1542360-7 Water 31-OCT-14 07:15 KM4420- P5 MORNING PROCESS	L1542360-8 Water 31-OCT-14 16:00 KM4420- P5 AFTERNOON PROCESS		
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	219	222	245		
	pH (pH)	7.69	7.68	7.66		
	Total Dissolved Solids (mg/L)	390	396	373		
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	3.8	3.8	3.7		
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	35.5	37.7	30.0		
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0		
	Alkalinity, Total (as CaCO3) (mg/L)	35.5	37.7	30.0		
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050		
	Chloride (Cl) (mg/L)	5.94	5.97	6.40		
	Fluoride (F) (mg/L)	1.56	1.56	1.75		
	Nitrate and Nitrite (as N) (mg/L)	<0.0051	<0.0051	<0.0051		
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050		
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010		
	Sulfate (SO4) (mg/L)	223	224	254		
Organic / Inorganic Carbon	Dissolved Inorganic Carbon (mg/L)	8.29	9.17	8.83		
	Dissolved Organic Carbon (mg/L)	7.63	7.28	9.02		
	Total Inorganic Carbon (mg/L)	7.87	8.86	8.65		
	Total Organic Carbon (mg/L)	8.36	7.81	9.89		
Total Metals	Aluminum (Al)-Total (mg/L)	0.748	0.745	1.00		
	Antimony (Sb)-Total (mg/L)	<0.00050	0.00054	0.00060		
	Arsenic (As)-Total (mg/L)	0.00141	0.00277	0.00222		
	Barium (Ba)-Total (mg/L)	<0.020	0.021	0.021		
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20		
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10		
	Cadmium (Cd)-Total (mg/L)	0.000144	0.000305	0.000246		
	Calcium (Ca)-Total (mg/L)	77.3	76.3	88.8		
	Chromium (Cr)-Total (mg/L)	0.0019	0.0021	0.0024		
	Cobalt (Co)-Total (mg/L)	0.00074	0.00097	0.00090		
	Copper (Cu)-Total (mg/L)	0.0624	0.0671	0.103		
	Iron (Fe)-Total (mg/L)	0.721	0.970	0.951		
	Lead (Pb)-Total (mg/L)	0.00687	0.0185	0.0148		
	Lithium (Li)-Total (mg/L)	0.0061	0.0062	0.0064		
	Magnesium (Mg)-Total (mg/L)	5.49	5.54	5.21		
	Manganese (Mn)-Total (mg/L)	0.174	0.184	0.170		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1542360-1	L1542360-2	L1542360-3	L1542360-4	L1542360-5
		Description	Water	Water	Water	Water	Water
		Sampled Date	27-OCT-14	27-OCT-14	29-OCT-14	29-OCT-14	30-OCT-14
		Sampled Time	15:30	15:30	07:15	15:30	07:15
		Client ID	KM4420- P1 MORNING PROCESS	KM4420- P1 AFTERNOON PROCESS	KM4420- P3 MORNING PROCESS	KM4420- P3 AFTERNOON PROCESS	KM4420- P4 MORNING PROCESS
Grouping	Analyte						
WATER							
Total Metals	Mercury (Hg)-Total (mg/L)		0.000024			0.000038	0.000147
	Molybdenum (Mo)-Total (mg/L)		0.0012			0.0273	0.0270
	Nickel (Ni)-Total (mg/L)		0.0015			0.0028	0.0045
	Phosphorus (P)-Total (mg/L)		<0.30			<0.30	<0.30
	Potassium (K)-Total (mg/L)		<2.0			21.4	21.2
	Selenium (Se)-Total (mg/L)		0.00115			0.00345	0.00363
	Silicon (Si)-Total (mg/L)		2.72			2.34	2.63
	Silver (Ag)-Total (mg/L)		0.000060			0.000079	0.000184
	Sodium (Na)-Total (mg/L)		6.3			9.8	9.6
	Strontium (Sr)-Total (mg/L)		0.0798			0.362	0.370
	Thallium (Tl)-Total (mg/L)		<0.00020			<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)		<0.00050			<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)		<0.010			0.018	0.028
	Uranium (U)-Total (mg/L)		<0.00020			<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)		<0.0010			<0.0010	0.0013
	Zinc (Zn)-Total (mg/L)		0.0545			0.0248	0.0775
Dissolved Metals	Dissolved Mercury Filtration Location		LAB			LAB	LAB
	Dissolved Metals Filtration Location		LAB			LAB	LAB
	Aluminum (Al)-Dissolved (mg/L)		0.0095			0.0305	0.0241
	Antimony (Sb)-Dissolved (mg/L)		0.00056			<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)		0.00268			0.00121	0.00153
	Barium (Ba)-Dissolved (mg/L)		<0.020			<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)		<0.0010			<0.0010	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)		<0.20			<0.20	<0.20
	Boron (B)-Dissolved (mg/L)		<0.10			<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)		0.000105			0.000129	0.000249
	Calcium (Ca)-Dissolved (mg/L)		14.5			62.6	65.6
	Chromium (Cr)-Dissolved (mg/L)		<0.0010			<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)		<0.00030			<0.00030	0.00035
	Copper (Cu)-Dissolved (mg/L)		0.0112			0.0040	0.0060
	Iron (Fe)-Dissolved (mg/L)		<0.030			<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)		0.00381			<0.00050	0.00066
	Lithium (Li)-Dissolved (mg/L)		<0.0050			<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)		1.76			4.47	4.58
	Manganese (Mn)-Dissolved (mg/L)		0.00683			0.132	0.143
	Mercury (Hg)-Dissolved (mg/L)		<0.000010			<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)		0.0011			0.0261	0.0266

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1542360-6	L1542360-7	L1542360-8		
		Description	Water	Water	Water		
		Sampled Date	30-OCT-14	31-OCT-14	31-OCT-14		
		Sampled Time	15:30	07:15	16:00		
		Client ID	KM4420- P4 AFTERNOON PROCESS	KM4420- P5 MORNING PROCESS	KM4420- P5 AFTERNOON PROCESS		
Grouping	Analyte						
WATER							
Total Metals	Mercury (Hg)-Total (mg/L)		0.000059	0.000092	<0.000010		
	Molybdenum (Mo)-Total (mg/L)		0.0373	0.0357	0.0551		
	Nickel (Ni)-Total (mg/L)		0.0039	0.0057	0.0041		
	Phosphorus (P)-Total (mg/L)		<0.30	<0.30	<0.30		
	Potassium (K)-Total (mg/L)		27.8	27.5	32.8		
	Selenium (Se)-Total (mg/L)		0.00526	0.00536	0.00845		
	Silicon (Si)-Total (mg/L)		2.94	2.93	3.28		
	Silver (Ag)-Total (mg/L)		0.000172	0.000202	0.000345		
	Sodium (Na)-Total (mg/L)		11.0	11.0	12.8		
	Strontium (Sr)-Total (mg/L)		0.430	0.429	0.482		
	Thallium (Tl)-Total (mg/L)		<0.00020	<0.00020	<0.00020		
	Tin (Sn)-Total (mg/L)		0.00055	0.00055	0.00076		
	Titanium (Ti)-Total (mg/L)		0.047	0.051	0.047		
	Uranium (U)-Total (mg/L)		<0.00020	<0.00020	0.00021		
	Vanadium (V)-Total (mg/L)		0.0020	0.0025	0.0025		
	Zinc (Zn)-Total (mg/L)		0.0278	0.0771	0.0541		
Dissolved Metals	Dissolved Mercury Filtration Location		LAB	LAB	LAB		
	Dissolved Metals Filtration Location		LAB	LAB	LAB		
	Aluminum (Al)-Dissolved (mg/L)		0.0385	0.0267	0.0567		
	Antimony (Sb)-Dissolved (mg/L)		<0.00050	<0.00050	0.00055		
	Arsenic (As)-Dissolved (mg/L)		0.00095	0.00135	0.00138		
	Barium (Ba)-Dissolved (mg/L)		<0.020	<0.020	<0.020		
	Beryllium (Be)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010		
	Bismuth (Bi)-Dissolved (mg/L)		<0.20	<0.20	<0.20		
	Boron (B)-Dissolved (mg/L)		<0.10	<0.10	<0.10		
	Cadmium (Cd)-Dissolved (mg/L)		0.000131	0.000294	0.000193		
	Calcium (Ca)-Dissolved (mg/L)		79.0	80.5	90.2		
	Chromium (Cr)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010		
	Cobalt (Co)-Dissolved (mg/L)		0.00031	0.00041	0.00032		
	Copper (Cu)-Dissolved (mg/L)		0.0026	0.0041	0.0040		
	Iron (Fe)-Dissolved (mg/L)		<0.030	<0.030	<0.030		
	Lead (Pb)-Dissolved (mg/L)		<0.00050	0.00066	<0.00050		
	Lithium (Li)-Dissolved (mg/L)		0.0058	0.0060	0.0059		
	Magnesium (Mg)-Dissolved (mg/L)		5.22	5.19	4.78		
	Manganese (Mn)-Dissolved (mg/L)		0.170	0.178	0.162		
	Mercury (Hg)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010		
	Molybdenum (Mo)-Dissolved (mg/L)		0.0379	0.0366	0.0556		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1542360-1 Water 27-OCT-14 15:30 KM4420- P1 MORNING PROCESS	L1542360-2 Water 27-OCT-14 15:30 KM4420- P1 AFTERNOON PROCESS	L1542360-3 Water 29-OCT-14 07:15 KM4420- P3 MORNING PROCESS	L1542360-4 Water 29-OCT-14 15:30 KM4420- P3 AFTERNOON PROCESS	L1542360-5 Water 30-OCT-14 07:15 KM4420- P4 MORNING PROCESS
Grouping	Analyte					
WATER						
Dissolved Metals	Nickel (Ni)-Dissolved (mg/L)	0.0013			0.0018	0.0026
	Phosphorus (P)-Dissolved (mg/L)	<0.30			<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	<2.0			20.7	20.8
	Selenium (Se)-Dissolved (mg/L)	0.00107			0.00319	0.00333
	Silicon (Si)-Dissolved (mg/L)	2.58			1.65	1.66
	Silver (Ag)-Dissolved (mg/L)	<0.000020			<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	6.0			9.6	9.5
	Strontium (Sr)-Dissolved (mg/L)	0.0757			0.349	0.362
	Thallium (Tl)-Dissolved (mg/L)	<0.00020			<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050			<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010			<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020			<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010			<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0442			0.0159	0.0529

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1542360-6 Water 30-OCT-14 15:30 KM4420- P4 AFTERNOON PROCESS	L1542360-7 Water 31-OCT-14 07:15 KM4420- P5 MORNING PROCESS	L1542360-8 Water 31-OCT-14 16:00 KM4420- P5 AFTERNOON PROCESS		
Grouping	Analyte					
WATER						
Dissolved Metals	Nickel (Ni)-Dissolved (mg/L)	0.0021	0.0027	0.0020		
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30		
	Potassium (K)-Dissolved (mg/L)	28.6	28.4	32.7		
	Selenium (Se)-Dissolved (mg/L)	0.00506	0.00514	0.00794		
	Silicon (Si)-Dissolved (mg/L)	1.48	1.50	1.39		
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	0.000047		
	Sodium (Na)-Dissolved (mg/L)	11.6	11.6	13.1		
	Strontium (Sr)-Dissolved (mg/L)	0.447	0.446	0.484		
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020		
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	0.00055		
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	0.010		
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020		
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Dissolved (mg/L)	0.0131	0.0528	0.0220		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Samples Listed:

Sample Number	Client Sample ID	Qualifier	Description
L1542360-1	KM4420- P1 MORNING PRO	WSMT	Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.
L1542360-4	KM4420- P3 AFTERNOON P	WSMT	Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.
L1542360-5	KM4420- P4 MORNING PRO	WSMT	Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.
L1542360-6	KM4420- P4 AFTERNOON P	WSMT	Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.
L1542360-7	KM4420- P5 MORNING PRO	WSMT	Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.
L1542360-8	KM4420- P5 AFTERNOON P	WSMT	Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Bromide (Br)	DLM	L1542360-1, -2, -3, -4, -5, -6, -7, -8
Duplicate	Fluoride (F)	DLM	L1542360-1, -2, -3, -4, -5, -6, -7, -8
Duplicate	Nitrate (as N)	DLM	L1542360-1, -2, -3, -4, -5, -6, -7, -8
Duplicate	Bromide (Br)	DLM	L1542360-1, -2, -3, -4, -5, -6, -7, -8
Duplicate	Fluoride (F)	DLM	L1542360-1, -2, -3, -4, -5, -6, -7, -8
Duplicate	Nitrite (as N)	DLM	L1542360-1, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Total Organic Carbon	MS-B	L1542360-8
Matrix Spike	Dissolved Organic Carbon	MS-B	L1542360-8

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
Samples of industrial wastes, acid mine drainage, or other solutions that contain appreciable amounts of hydrolyzable metal ions such as aluminum, iron, and manganese may require hot peroxide treatment to ensure oxidation and hydrolysis of reduced forms of polyvalent cations. Acidity results may be highly variable if this procedure is not followed. Results in this report for 'Acidity (as CaCO3)' have not been peroxide treated.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
Samples of industrial wastes, acid mine drainage, or other solutions that contain appreciable amounts of hydrolyzable metal ions such as aluminum, iron, and manganese may require hot peroxide treatment to ensure oxidation and hydrolysis of reduced forms of polyvalent cations. Acidity results may be highly variable if this procedure is not followed. Results in this report for 'Acidity (as CaCO3)' have not been peroxide treated.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.

Reference Information

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-N+N-CALC-VA Water Nitrite & Nitrate in Water (Calculation) EPA 300.0

Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

ANIONS-NO2-IC-VA Water Nitrite in Water by Ion Chromatography EPA 300.0

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.

ANIONS-NO3-IC-VA Water Nitrate in Water by Ion Chromatography EPA 300.0

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.

ANIONS-SO4-IC-VA Water Sulfate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-DIC-VA Water Dissolved inorganic carbon by CO2 purge APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved inorganic carbon (DIC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-DOC-VA Water Dissolved organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TIC-VA Water Total inorganic carbon by CO2 purge APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA Water Total organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

Reference Information

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

**** ALS test methods may incorporate modifications from specified reference methods to improve performance.**

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
----------------------------	---------------------

VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA
----	---

Chain of Custody Numbers:

10-227970

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg ww - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Gross Alpha/Beta Case Narrative

ALS Environmental

L1542360

Work Order Number: 1411154

1. This report consists of the analytical results for one water sample received by ALS on 11/07/14.
2. This sample was prepared according to the current revision of SOP 702.
3. The sample was analyzed for gross alpha and beta activity by gas flow proportional counting according to the current revision of SOP 724. The analysis was completed on 11/16/14. Gross alpha results are referenced to ^{241}Am . Gross beta results are referenced to $^{90}\text{Sr/Y}$.
4. The analysis results for this sample are reported in units of BQ/L. The sample was not filtered prior to analysis.
5. No anomalous situations were encountered during the preparation or analysis of this sample. All quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Mindy Norton
Mindy Norton
Radiochemistry Primary Data Reviewer

11/18/14
Date

Debby Fazio
Radiochemistry Final Data Reviewer

11/18/14
Date

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1411154

Client Name: ALS Environmental

Client Project Name:

Client Project Number: L1542360

Client PO Number: L1542360

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L1542360-8	1411154-1		WATER	31-Oct-14	

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Method Blank Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411154

Client Name: ALS Environmental

ClientProject ID: L1542360

Lab ID: AB141112-3MB

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 12-Nov-14

Date Prepared: 12-Nov-14

Date Analyzed: 16-Nov-14

Prep Batch: AB141112-3

QCBatchID: AB141112-3-1

Run ID: AB141112-3B

Count Time: 1000 minutes

Final Aliquot: 200 ml

Result Units: BQ/l

File Name: ABC1116

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.023	0.111	U
12587-47-2	GROSS BETA	BDL	0.035	0.148	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: AB1411154-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Environmental -- FC

Work Order Number: 1411154

Client Name: ALS Environmental

ClientProject ID: L1542360

Lab ID: AB141112-3LCS

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 12-Nov-14

Date Prepared: 12-Nov-14

Date Analyzed: 13-Nov-14

Prep Batch: AB141112-3

QCBatchID: AB141112-3-1

Run ID: AB141112-3B

Count Time: 30 minutes

Final Aliquot: 200 ml

Result Units: BQ/l

File Name: ABC1113A

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
12587-46-1	GROSS ALPHA	8.6 +/- 1.5	0.2	7.645	113	70 - 130	P,M3
12587-47-2	GROSS BETA	7.7 +/- 1.3	0.5	7.633	101	70 - 130	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: AB1411154-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411154

Client Name: ALS Environmental

ClientProject ID: L1542360

Field ID: L1542360-8

Lab ID: 1411154-1

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 31-Oct-14

Date Prepared: 12-Nov-14

Date Analyzed: 15-Nov-14

Prep Batch: AB141112-3

QCBatchID: AB141112-3-1

Run ID: AB141112-3B

Count Time: 1000 minutes

Report Basis: Unfiltered

Final Aliquot: 110 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: BQ/l

File Name: ABC1115A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.052	0.111	U
12587-47-2	GROSS BETA	1.12 +/- 0.19	0.07	0.148	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: AB1411154-1



ALS Metallurgy
ATTN: Cameron Bruin
2957 Bowers Place
Kamloops BC V1S 1W5

Date Received: 04-NOV-14
Report Date: 01-DEC-14 16:42 (MT)
Version: FINAL

Client Phone: 250-828-6157

Certificate of Analysis

Lab Work Order #: L1542438
Project P.O. #: 1078p
Job Reference: KM 4420 RESOLUTION COPPER
C of C Numbers: 10-246375
Legal Site Desc:

Amber Springer
Account Manager

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ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1542438-1 Process Water 03-NOV-14 11:30 KM4420 P6 FRESH WATER SAMPLE	L1542438-2 Process Water 03-NOV-14 15:30 KM4420 P6 PM PROCESS WATER	L1542438-3 Process Water 04-NOV-14 07:00 KM4420 P7AM PROCESS WATER	L1542438-4 Process Water 04-NOV-14 KM4420 P6 BLIND SAMPLE WATER	L1542438-5 Process Water KM 4420-P6 AM PROCESS H2O
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	42.7	173	182	175	248
	pH (pH)	8.31	7.79	7.79	7.82	7.66
	Total Dissolved Solids (mg/L)	74	315	330	321	440
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	<1.0	2.5	2.5	2.5	3.0
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	37.0	29.5	36.1	34.6	33.6
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	37.0	29.5	36.1	34.6	33.6
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	3.83	5.60	6.00	5.74	6.39
	Fluoride (F) (mg/L)	0.054	1.21	1.26	1.22	1.67
	Nitrate and Nitrite (as N) (mg/L)	0.0224	<0.0051	0.0216	0.0256	<0.0051
	Nitrate (as N) (mg/L)	0.0224	<0.0050	0.0164	0.0196	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	0.0052	0.0060	<0.0010
	Sulfate (SO4) (mg/L)	5.90	170	177	174	253
Organic / Inorganic Carbon	Dissolved Inorganic Carbon (mg/L)	8.39	8.20	8.76	43.5	9.43
	Dissolved Organic Carbon (mg/L)	2.90	8.6	8.3	8.0	7.9
	Total Inorganic Carbon (mg/L)	8.36	8.31	9.04	44.1	9.11
	Total Organic Carbon (mg/L)	2.90	7.9	8.7	8.2	8.1
Total Metals	Aluminum (Al)-Total (mg/L)	0.0199	0.396	0.492	0.234	0.140
	Antimony (Sb)-Total (mg/L)	<0.00050	0.00054	0.00069	<0.00050	0.00075
	Arsenic (As)-Total (mg/L)	<0.00050	0.00229	0.00342	0.00155	0.00180
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000010	0.000163	0.000264	0.000125	0.000495
	Calcium (Ca)-Total (mg/L)	14.2	65.1	66.7	64.3	86.9
	Chromium (Cr)-Total (mg/L)	<0.0010	0.0015	0.0021	0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	0.00056	0.00079	0.00037	0.00076
	Copper (Cu)-Total (mg/L)	0.0094	0.0617	0.109	0.0424	0.0186
	Iron (Fe)-Total (mg/L)	0.045	0.574	0.820	0.268	0.182
	Lead (Pb)-Total (mg/L)	<0.00050	0.0164	0.0271	0.00929	0.00818
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0058
	Magnesium (Mg)-Total (mg/L)	1.77	3.36	3.56	3.18	4.46
	Manganese (Mn)-Total (mg/L)	0.00166	0.0983	0.115	0.0918	0.195

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1542438-6 Process Water KM 4420-P5 PM PROCESS WATER				
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	249				
	pH (pH)					
	Total Dissolved Solids (mg/L)					
Anions and Nutrients	Acidity (as CaCO3) (mg/L)					
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)					
	Alkalinity, Carbonate (as CaCO3) (mg/L)					
	Alkalinity, Hydroxide (as CaCO3) (mg/L)					
	Alkalinity, Total (as CaCO3) (mg/L)					
	Bromide (Br) (mg/L)					
	Chloride (Cl) (mg/L)					
	Fluoride (F) (mg/L)					
	Nitrate and Nitrite (as N) (mg/L)					
	Nitrate (as N) (mg/L)					
	Nitrite (as N) (mg/L)					
	Sulfate (SO4) (mg/L)					
Organic / Inorganic Carbon	Dissolved Inorganic Carbon (mg/L)					
	Dissolved Organic Carbon (mg/L)	10.5				
	Total Inorganic Carbon (mg/L)					
	Total Organic Carbon (mg/L)	10.8				
Total Metals	Aluminum (Al)-Total (mg/L)	0.830				
	Antimony (Sb)-Total (mg/L)	0.00060				
	Arsenic (As)-Total (mg/L)	0.00198				
	Barium (Ba)-Total (mg/L)	<0.020				
	Beryllium (Be)-Total (mg/L)	<0.0010				
	Bismuth (Bi)-Total (mg/L)	<0.20				
	Boron (B)-Total (mg/L)	<0.10				
	Cadmium (Cd)-Total (mg/L)	0.000241				
	Calcium (Ca)-Total (mg/L)	87.9				
	Chromium (Cr)-Total (mg/L)	0.0023				
	Cobalt (Co)-Total (mg/L)	0.00074				
	Copper (Cu)-Total (mg/L)	0.0867				
	Iron (Fe)-Total (mg/L)	0.674				
	Lead (Pb)-Total (mg/L)	0.0109				
	Lithium (Li)-Total (mg/L)	0.0064				
	Magnesium (Mg)-Total (mg/L)	4.79				
	Manganese (Mn)-Total (mg/L)	0.168				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1542438-1 Process Water 03-NOV-14 11:30 KM4420 P6 FRESH WATER SAMPLE	L1542438-2 Process Water 03-NOV-14 15:30 KM4420 P6 PM PROCESS WATER	L1542438-3 Process Water 04-NOV-14 07:00 KM4420 P7AM PROCESS WATER	L1542438-4 Process Water 04-NOV-14 KM4420 P6 BLIND SAMPLE WATER	L1542438-5 Process Water KM 4420-P6 AM PROCESS H2O
Grouping	Analyte					
WATER						
Total Metals	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	0.0451	0.0462	0.0454	0.0519
	Nickel (Ni)-Total (mg/L)	<0.0010	0.0028	0.0048	0.0025	0.0043
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	<2.0	24.0	24.9	23.6	30.6
	Selenium (Se)-Total (mg/L)	0.00012	0.00688	0.00686	0.00674	0.00682
	Silicon (Si)-Total (mg/L)	2.74	2.49	2.73	2.17	1.64
	Silver (Ag)-Total (mg/L)	<0.000020	0.000243	0.000373	0.000206	0.000092
	Sodium (Na)-Total (mg/L)	3.8	10.7	11.0	10.5	13.6
	Strontium (Sr)-Total (mg/L)	0.0714	0.325	0.336	0.316	0.474
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	0.00050	0.00061	<0.00050	0.00060
	Titanium (Ti)-Total (mg/L)	<0.010	0.025	0.033	0.018	0.015
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	0.0010	0.0015	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	0.0334	0.0708	0.0336	0.144
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0125	0.116	0.0778	0.109	0.0484
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00072
	Arsenic (As)-Dissolved (mg/L)	<0.00050	0.00090	0.00141	0.00099	0.00158
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	0.021
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000010	0.000106	0.000173	0.000114	0.000505
	Calcium (Ca)-Dissolved (mg/L)	14.2	63.9	67.3	64.7	91.6
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	0.00031	<0.00030	0.00072
	Copper (Cu)-Dissolved (mg/L)	0.0028	0.0066	0.0125	0.0097	0.0061
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	0.052
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	0.00064	<0.00050	0.00247
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0058
	Magnesium (Mg)-Dissolved (mg/L)	1.74	3.19	3.32	3.15	4.61
	Manganese (Mn)-Dissolved (mg/L)	0.00102	0.0878	0.100	0.0894	0.198
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	0.000017	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	0.0422	0.0418	0.0422	0.0517

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1542438-6 Process Water KM 4420-P5 PM PROCESS WATER				
Grouping	Analyte					
WATER						
Total Metals	Mercury (Hg)-Total (mg/L)	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	0.0566				
	Nickel (Ni)-Total (mg/L)	0.0038				
	Phosphorus (P)-Total (mg/L)	<0.30				
	Potassium (K)-Total (mg/L)	32.5				
	Selenium (Se)-Total (mg/L)	0.00782				
	Silicon (Si)-Total (mg/L)	2.63				
	Silver (Ag)-Total (mg/L)	0.000321				
	Sodium (Na)-Total (mg/L)	13.1				
	Strontium (Sr)-Total (mg/L)	0.494				
	Thallium (Tl)-Total (mg/L)	<0.00020				
	Tin (Sn)-Total (mg/L)	0.00078				
	Titanium (Ti)-Total (mg/L)	0.036				
	Uranium (U)-Total (mg/L)	<0.00020				
	Vanadium (V)-Total (mg/L)	0.0020				
	Zinc (Zn)-Total (mg/L)	0.0493				
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD				
	Dissolved Metals Filtration Location	FIELD				
	Aluminum (Al)-Dissolved (mg/L)	0.194				
	Antimony (Sb)-Dissolved (mg/L)	0.00052				
	Arsenic (As)-Dissolved (mg/L)	0.00135				
	Barium (Ba)-Dissolved (mg/L)	<0.020				
	Beryllium (Be)-Dissolved (mg/L)	<0.0010				
	Bismuth (Bi)-Dissolved (mg/L)	<0.20				
	Boron (B)-Dissolved (mg/L)	<0.10				
	Cadmium (Cd)-Dissolved (mg/L)	0.000216				
	Calcium (Ca)-Dissolved (mg/L)	91.9				
	Chromium (Cr)-Dissolved (mg/L)	<0.0010				
	Cobalt (Co)-Dissolved (mg/L)	0.00034				
	Copper (Cu)-Dissolved (mg/L)	0.0070				
	Iron (Fe)-Dissolved (mg/L)	<0.030				
	Lead (Pb)-Dissolved (mg/L)	<0.00050				
	Lithium (Li)-Dissolved (mg/L)	0.0063				
	Magnesium (Mg)-Dissolved (mg/L)	4.64				
	Manganese (Mn)-Dissolved (mg/L)	0.165				
	Mercury (Hg)-Dissolved (mg/L)	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	0.0559				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1542438-1 Process Water 03-NOV-14 11:30 KM4420 P6 FRESH WATER SAMPLE	L1542438-2 Process Water 03-NOV-14 15:30 KM4420 P6 PM PROCESS WATER	L1542438-3 Process Water 04-NOV-14 07:00 KM4420 P7AM PROCESS WATER	L1542438-4 Process Water 04-NOV-14 KM4420 P6 BLIND SAMPLE WATER	L1542438-5 Process Water KM 4420-P6 AM PROCESS H2O
Grouping	Analyte					
WATER						
Dissolved Metals	Nickel (Ni)-Dissolved (mg/L)	<0.0010	0.0012	0.0019	0.0014	0.0038
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	<2.0	25.1	26.2	24.3	31.9
	Selenium (Se)-Dissolved (mg/L)	0.00013	0.00689	0.00673	0.00711	0.00603
	Silicon (Si)-Dissolved (mg/L)	2.75	1.99	2.01	1.98	1.60
	Silver (Ag)-Dissolved (mg/L)	<0.000020	0.000093	0.000127	0.000097	<0.000020
	Sodium (Na)-Dissolved (mg/L)	3.7	11.0	11.4	10.7	14.3
	Strontium (Sr)-Dissolved (mg/L)	0.0705	0.320	0.330	0.313	0.492
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00057
	Titanium (Ti)-Dissolved (mg/L)	<0.010	0.015	0.015	0.014	0.012
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	0.0169	0.0439	0.0237	0.140

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1542438-6 Process Water KM 4420-P5 PM PROCESS WATER				
Grouping	Analyte					
WATER						
Dissolved Metals	Nickel (Ni)-Dissolved (mg/L)	0.0022				
	Phosphorus (P)-Dissolved (mg/L)	<0.30				
	Potassium (K)-Dissolved (mg/L)	33.5				
	Selenium (Se)-Dissolved (mg/L)	0.00918				
	Silicon (Si)-Dissolved (mg/L)	1.49				
	Silver (Ag)-Dissolved (mg/L)	0.000181				
	Sodium (Na)-Dissolved (mg/L)	13.6				
	Strontium (Sr)-Dissolved (mg/L)	0.506				
	Thallium (Tl)-Dissolved (mg/L)	<0.00020				
	Tin (Sn)-Dissolved (mg/L)	0.00055				
	Titanium (Ti)-Dissolved (mg/L)	0.012				
	Uranium (U)-Dissolved (mg/L)	<0.00020				
	Vanadium (V)-Dissolved (mg/L)	<0.0010				
	Zinc (Zn)-Dissolved (mg/L)	0.0309				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Aluminum (Al)-Dissolved	DLA	L1542438-1, -2, -3, -4, -5, -6
Duplicate	Beryllium (Be)-Dissolved	DLA	L1542438-1, -2, -3, -4, -5, -6
Duplicate	Lead (Pb)-Dissolved	DLA	L1542438-1, -2, -3, -4, -5, -6
Duplicate	Selenium (Se)-Dissolved	DLA	L1542438-1, -2, -3, -4, -5, -6
Duplicate	Silver (Ag)-Dissolved	DLA	L1542438-1, -2, -3, -4, -5, -6
Duplicate	Thallium (Tl)-Dissolved	DLA	L1542438-1, -2, -3, -4, -5, -6
Duplicate	Tin (Sn)-Dissolved	DLA	L1542438-1, -2, -3, -4, -5, -6
Duplicate	Vanadium (V)-Dissolved	DLA	L1542438-1, -2, -3, -4, -5, -6
Duplicate	Aluminum (Al)-Total	DLA	L1542438-1, -2, -3, -4, -5, -6
Duplicate	Beryllium (Be)-Total	DLA	L1542438-1, -2, -3, -4, -5, -6
Duplicate	Tin (Sn)-Total	DLA	L1542438-1, -2, -3, -4, -5, -6
Duplicate	Vanadium (V)-Total	DLA	L1542438-1, -2, -3, -4, -5, -6
Duplicate	Bromide (Br)	DLM	L1542438-1, -2, -3, -4, -5
Duplicate	Fluoride (F)	DLM	L1542438-1, -2, -3, -4, -5
Duplicate	Nitrate (as N)	DLM	L1542438-1, -2, -3, -4, -5
Duplicate	Bromide (Br)	DLM	L1542438-1, -2, -3, -4, -5
Duplicate	Fluoride (F)	DLM	L1542438-1, -2, -3, -4, -5
Duplicate	Nitrite (as N)	DLM	L1542438-1, -2, -3, -4, -5
Matrix Spike	Total Organic Carbon	MS-B	L1542438-1, -2, -3, -4, -5, -6
Matrix Spike	Dissolved Organic Carbon	MS-B	L1542438-1, -2, -3, -4, -5, -6
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1542438-1, -2, -3, -4, -5, -6
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1542438-1, -2, -3, -4, -5, -6
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1542438-1, -2, -3, -4, -5, -6

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
Samples of industrial wastes, acid mine drainage, or other solutions that contain appreciable amounts of hydrolyzable metal ions such as aluminum, iron, and manganese may require hot peroxide treatment to ensure oxidation and hydrolysis of reduced forms of polyvalent cations. Acidity results may be highly variable if this procedure is not followed. Results in this report for 'Acidity (as CaCO3)' have not been peroxide treated.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
Samples of industrial wastes, acid mine drainage, or other solutions that contain appreciable amounts of hydrolyzable metal ions such as aluminum, iron, and manganese may require hot peroxide treatment to ensure oxidation and hydrolysis of reduced forms of polyvalent cations. Acidity results may be highly variable if this procedure is not followed. Results in this report for 'Acidity (as CaCO3)' have not been peroxide treated.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			

Reference Information

ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-N+N-CALC-VA	Water	Nitrite & Nitrate in Water (Calculation)	EPA 300.0
Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).			
ANIONS-NO2-IC-VA	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
ANIONS-NO3-IC-VA	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
CARBONS-DIC-VA	Water	Dissolved inorganic carbon by CO2 purge	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved inorganic carbon (DIC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-TIC-VA	Water	Total inorganic carbon by CO2 purge	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-DIS-LOW-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS(Low)	EPA SW-846 3005A & EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
HG-TOT-LOW-CVAFS-VA	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
MET-D-CCMS-VA	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
MET-DIS-ICP-VA	Water	Dissolved Metals in Water by ICPOES	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-T-CCMS-VA	Water	Total Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States			

Reference Information

Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

10-246375

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg ww - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Gross Alpha/Beta Case Narrative

ALS Environmental

L1542438

Work Order Number: 1411156

1. This report consists of the analytical results for five water samples received by ALS on 11/07/14.
2. These samples were prepared according to the current revision of SOP 702.
3. The samples were analyzed for gross alpha and beta activity by gas flow proportional counting according to the current revision of SOP 724. The analyses were completed on 11/22/14. Gross alpha results are referenced to ^{241}Am . Gross beta results are referenced to $^{90}\text{Sr/Y}$.
4. The analysis results for these samples are reported in units of BQ/L. The samples were not filtered prior to analysis.
5. No anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Emily Knodel
Radiochemistry Primary Data Reviewer

11/24/14
Date


Debbie Fazio
Radiochemistry Final Data Reviewer

11/24/14
Date

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1411156

Client Name: ALS Environmental

Client Project Name:

Client Project Number: L1542438

Client PO Number: L1542438

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L1542438-1	1411156-1		WATER	03-Nov-14	
L1542438-2	1411156-2		WATER	03-Nov-14	
L1542438-3	1411156-3		WATER	04-Nov-14	
L1542438-4	1411156-4		WATER	04-Nov-14	
L1542438-5	1411156-5		WATER	04-Nov-14	

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Method Blank Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411156

Client Name: ALS Environmental

ClientProject ID: L1542438

Lab ID: AB141120-1MB

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 20-Nov-14

Date Prepared: 20-Nov-14

Date Analyzed: 22-Nov-14

Prep Batch: AB141120-1

QCBatchID: AB141120-1-3

Run ID: AB141120-1B

Count Time: 1000 minutes

Final Aliquot: 200 ml

Result Units: BQ/l

File Name: ABC1122D

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.027	0.111	U
12587-47-2	GROSS BETA	BDL	0.039	0.148	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: AB1411156-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Environmental -- FC

Work Order Number: 1411156

Client Name: ALS Environmental

ClientProject ID: L1542438

Lab ID: AB141120-1LCS

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 20-Nov-14

Date Prepared: 20-Nov-14

Date Analyzed: 22-Nov-14

Prep Batch: AB141120-1

QCBatchID: AB141120-1-3

Run ID: AB141120-1B

Count Time: 180 minutes

Final Aliquot: 200 ml

Result Units: BQ/l

File Name: ABC1122

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
12587-46-1	GROSS ALPHA	7.8 +/- 1.3	0.1	7.645	103	70 - 130	P
12587-47-2	GROSS BETA	8.2 +/- 1.3	0.2	7.629	108	70 - 130	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: AB1411156-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Matrix Spike Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411156

Client Name: ALS Environmental

ClientProject ID: L1542438

Field ID: L1542438-1

Lab ID: 1411156-1MS

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 03-Nov-14

Date Prepared: 20-Nov-14

Date Analyzed: 22-Nov-14

Prep Batch: AB141120-1

QCBatchID: AB141120-1-3

Run ID: AB141120-1B

Count Time: 180 minutes

Report Basis: Unfiltered

Final Aliquot: 200 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: BQ/l

File Name: ABC1122

CASNO	Target Nuclide	Matrix Spike	Sample Results	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
12587-46-1	GROSS ALPHA	8.6	0.068	0.1	7.64	111	70 - 130	P
12587-47-2	GROSS BETA	8.2	0.045	0.2	7.63	107	70 - 130	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

N - Matrix Spike Recovery outside control limits

P - Matrix Spike Recovery within control limits

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

MDC - Minimum Detectable Concentration

Data Package ID: AB1411156-1

Date Printed: Monday, November 24, 2014

ALS Environmental -- FC

LIMS Version: 6.725

Page 1 of 1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411156

Client Name: ALS Environmental

ClientProject ID: L1542438

Field ID: L1542438-1

Lab ID: 1411156-1

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 03-Nov-14

Date Prepared: 20-Nov-14

Date Analyzed: 22-Nov-14

Prep Batch: AB141120-1

QCBatchID: AB141120-1-3

Run ID: AB141120-1B

Count Time: 180 minutes

Report Basis: Unfiltered

Final Aliquot: 200 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: BQ/l

File Name: ABC1122

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.092	0.111	U
12587-47-2	GROSS BETA	BDL	0.099	0.148	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: AB1411156-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411156

Client Name: ALS Environmental

ClientProject ID: L1542438

Field ID: L1542438-2

Lab ID: 1411156-2

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 03-Nov-14

Date Prepared: 20-Nov-14

Date Analyzed: 22-Nov-14

Prep Batch: AB141120-1

QCBatchID: AB141120-1-3

Run ID: AB141120-1B

Count Time: 1000 minutes

Report Basis: Unfiltered

Final Aliquot: 140 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: BQ/l

File Name: ABC1122D

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.042	0.111	U
12587-47-2	GROSS BETA	0.74 +/- 0.13	0.05	0.148	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: AB1411156-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411156

Client Name: ALS Environmental

ClientProject ID: L1542438

Field ID: L1542438-3

Lab ID: 1411156-3

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 04-Nov-14

Date Prepared: 20-Nov-14

Date Analyzed: 22-Nov-14

Prep Batch: AB141120-1

QCBatchID: AB141120-1-3

Run ID: AB141120-1B

Count Time: 1000 minutes

Report Basis: Unfiltered

Final Aliquot: 140 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: BQ/l

File Name: ABC1122D

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.044	0.111	U
12587-47-2	GROSS BETA	0.80 +/- 0.14	0.06	0.148	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: AB1411156-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411156

Client Name: ALS Environmental

ClientProject ID: L1542438

Field ID: L1542438-4

Lab ID: 1411156-4

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 04-Nov-14

Date Prepared: 20-Nov-14

Date Analyzed: 22-Nov-14

Prep Batch: AB141120-1

QCBatchID: AB141120-1-3

Run ID: AB141120-1B

Count Time: 1000 minutes

Report Basis: Unfiltered

Final Aliquot: 150 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: BQ/l

File Name: ABC1122D

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.044	0.111	U
12587-47-2	GROSS BETA	0.75 +/- 0.13	0.05	0.148	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: AB1411156-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411156

Client Name: ALS Environmental

ClientProject ID: L1542438

Field ID: L1542438-5

Lab ID: 1411156-5

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 04-Nov-14

Date Prepared: 20-Nov-14

Date Analyzed: 22-Nov-14

Prep Batch: AB141120-1

QCBatchID: AB141120-1-3

Run ID: AB141120-1B

Count Time: 1000 minutes

Report Basis: Unfiltered

Final Aliquot: 90.0 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: BQ/l

File Name: ABC1122D

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.057	0.111	U
12587-47-2	GROSS BETA	1.02 +/- 0.18	0.09	0.148	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: AB1411156-1



Gross Alpha/Beta Case Narrative

ALS Environmental

L1542438

Work Order Number: 1411251

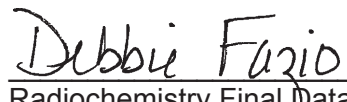
1. This report consists of analytical results for one water sample received by ALS on 11/13/2014.
2. These samples were prepared according to the current revision of SOP 702.
3. The samples were analyzed for gross alpha and beta activity by gas flow proportional counting according to the current revision of SOP 724. The analyses were completed on 11/25/2014. Gross alpha results are referenced to ^{241}Am . Gross beta results are referenced to $^{90}\text{Sr/Y}$.
4. The analysis results for these samples are reported in units of pCi/L. The samples were not filtered prior to analysis.
5. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate.
6. No anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.



Jill Latelle
Radiochemistry Primary Data Reviewer

11/30/14
Date



Debbie Fazio
Radiochemistry Final Data Reviewer

11/30/14
Date

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1411251

Client Name: ALS Environmental

Client Project Name:

Client Project Number: L1542438

Client PO Number: L1542438

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L1542438-6	1411251-1		WATER	04-Nov-14	

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Method Blank Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411251

Client Name: ALS Environmental

ClientProject ID: L1542438

Lab ID: AB141121-2MB

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 21-Nov-14

Date Prepared: 21-Nov-14

Date Analyzed: 25-Nov-14

Prep Batch: AB141121-2

QCBatchID: AB141121-2-1

Run ID: AB141121-2B

Count Time: 1000 minutes

Final Aliquot: 200 ml

Result Units: BQ/l

File Name: ABC1125B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.028	0.111	U
12587-47-2	GROSS BETA	BDL	0.040	0.148	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: AB1411251-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Environmental -- FC

Work Order Number: 1411251

Client Name: ALS Environmental

ClientProject ID: L1542438

Lab ID: AB141121-2LCS

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 21-Nov-14

Date Prepared: 21-Nov-14

Date Analyzed: 25-Nov-14

Prep Batch: AB141121-2

QCBatchID: AB141121-2-1

Run ID: AB141121-2B

Count Time: 120 minutes

Final Aliquot: 200 ml

Result Units: BQ/l

File Name: ABC1125

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
12587-46-1	GROSS ALPHA	7.6 +/- 1.3	0.1	7.645	99.3	70 - 130	P
12587-47-2	GROSS BETA	7.8 +/- 1.3	0.2	7.627	102	70 - 130	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: AB1411251-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411251

Client Name: ALS Environmental

ClientProject ID: L1542438

Field ID: L1542438-6

Lab ID: 1411251-1

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 04-Nov-14

Date Prepared: 21-Nov-14

Date Analyzed: 25-Nov-14

Prep Batch: AB141121-2

QCBatchID: AB141121-2-1

Run ID: AB141121-2B

Count Time: 1000 minutes

Report Basis: Unfiltered

Final Aliquot: 110 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: BQ/l

File Name: ABC1125B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.064	0.111	U
12587-47-2	GROSS BETA	1.07 +/- 0.18	0.07	0.148	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: AB1411251-1



ALS Metallurgy
ATTN: Cameron Bruin
2957 Bowers Place
Kamloops BC V1S 1W5

Date Received: 06-NOV-14
Report Date: 21-NOV-14 12:33 (MT)
Version: FINAL

Client Phone: 250-828-6157

Certificate of Analysis

Lab Work Order #: L1543754
Project P.O. #: NOT SUBMITTED
Job Reference: KM 4420
C of C Numbers: 10-249636
Legal Site Desc:

Amber Springer
Account Manager

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ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1543754-1 Process Water 04-NOV-14 15:30 P7 PM PROCESS H2O	L1543754-2 Process Water 05-NOV-14 07:00 P8 AM PROCESS H2O	L1543754-3 Process Water 05-NOV-14 15:30 P8 PM PROCESS H2O	L1543754-4 Process Water 06-NOV-14 BLIND SAMPLE 2	
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	241	233	294	299	
	pH (pH)	7.46	7.23	7.26	7.40	
	Total Dissolved Solids (mg/L)	447	420	564	535	
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	2.1	2.7	2.8	2.2	
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	27.1	23.3	25.2	26.7	
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	
	Alkalinity, Total (as CaCO3) (mg/L)	27.1	23.3	25.2	26.7	
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.25 ^{DLM}	<0.25 ^{DLM}	
	Chloride (Cl) (mg/L)	6.84	6.66	7.7	7.6	
	Fluoride (F) (mg/L)	1.99	1.84	2.43	2.41	
	Nitrate and Nitrite (as N) (mg/L)	0.0269	0.0105	<0.025 ^{DLM}	<0.025 ^{DLM}	
	Nitrate (as N) (mg/L)	0.0221	0.0068	<0.025 ^{DLM}	<0.025 ^{DLM}	
	Nitrite (as N) (mg/L)	0.0048	0.0037	0.0060	<0.0050 ^{DLM}	
	Sulfate (SO4) (mg/L)	245	236	315	311	
		6.0 ^M	4.9 ^M	5.9 ^M	5.8 ^M	
Organic / Inorganic Carbon	Dissolved Inorganic Carbon (mg/L)					
	Dissolved Organic Carbon (mg/L)	7.73	14.0	20.8	21.2	
	Total Inorganic Carbon (mg/L)	5.9 ^M	4.5 ^M	5.5 ^M	5.3 ^M	
	Total Organic Carbon (mg/L)	7.85	13.9	20.6	20.8	
Total Metals	Aluminum (Al)-Total (mg/L)	0.541	0.262	0.298	0.247	
	Antimony (Sb)-Total (mg/L)	0.00071	0.00072	0.00058	0.00057	
	Arsenic (As)-Total (mg/L)	0.00218	0.00172	0.00109	0.00109	
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	
	Cadmium (Cd)-Total (mg/L)	0.000178	0.000196	0.000139	0.000149	
	Calcium (Ca)-Total (mg/L)	87.7	86.8	106	107	
	Chromium (Cr)-Total (mg/L)	0.0020	0.0011	<0.0010	0.0010	
	Cobalt (Co)-Total (mg/L)	0.00073	0.00041	0.00038	0.00037	
	Copper (Cu)-Total (mg/L)	0.124	0.0414	0.0320	0.0347	
	Iron (Fe)-Total (mg/L)	0.786	0.310	0.260	0.243	
	Lead (Pb)-Total (mg/L)	0.0112	0.00846	0.00369	0.00354	
	Lithium (Li)-Total (mg/L)	0.0055	0.0055	0.0070	0.0067	
	Magnesium (Mg)-Total (mg/L)	3.49	3.29	4.17	4.18	
	Manganese (Mn)-Total (mg/L)	0.0794	0.0809	0.0819	0.0831	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1543754-1 Process Water 04-NOV-14 15:30 P7 PM PROCESS H2O	L1543754-2 Process Water 05-NOV-14 07:00 P8 AM PROCESS H2O	L1543754-3 Process Water 05-NOV-14 15:30 P8 PM PROCESS H2O	L1543754-4 Process Water 06-NOV-14 BLIND SAMPLE 2	
Grouping	Analyte					
WATER						
Total Metals	Mercury (Hg)-Total (mg/L)	0.000012	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Total (mg/L)	0.0824	0.0759	0.0802	0.0787	
	Nickel (Ni)-Total (mg/L)	0.0047	0.0023	0.0019	0.0019	
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	
	Potassium (K)-Total (mg/L)	34.5	33.0	41.0	41.0	
	Selenium (Se)-Total (mg/L)	0.00919	0.00854	0.00783	0.00900	
	Silicon (Si)-Total (mg/L)	2.38	1.93	1.77	1.73	
	Silver (Ag)-Total (mg/L)	0.000486	0.000431	0.000262	0.000253	
	Sodium (Na)-Total (mg/L)	14.0	14.0	16.3	16.3	
	Strontium (Sr)-Total (mg/L)	0.477	0.450	0.561	0.564	
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Total (mg/L)	0.00082	0.00071	0.00072	0.00071	
	Titanium (Ti)-Total (mg/L)	0.032	<0.010	<0.010	<0.010	
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Vanadium (V)-Total (mg/L)	0.0017	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Total (mg/L)	0.0328	0.0395	0.0226	0.0251	
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	
	Aluminum (Al)-Dissolved (mg/L)	0.120	0.0829	0.0854	0.0878	
	Antimony (Sb)-Dissolved (mg/L)	0.00055	0.00057	0.00050	<0.00050	
	Arsenic (As)-Dissolved (mg/L)	0.00105	0.00113	0.00090	0.00089	
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	
	Cadmium (Cd)-Dissolved (mg/L)	0.000141	0.000172	0.000127	0.000124	
	Calcium (Ca)-Dissolved (mg/L)	90.8	87.8	110	112	
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	
	Copper (Cu)-Dissolved (mg/L)	0.0110	0.0146	0.0100	0.0104	
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Lithium (Li)-Dissolved (mg/L)	0.0053	0.0051	0.0069	0.0065	
	Magnesium (Mg)-Dissolved (mg/L)	3.37	3.30	4.34	4.39	
	Manganese (Mn)-Dissolved (mg/L)	0.0724	0.0772	0.0804	0.0810	
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)	0.0800	0.0718	0.0785	0.0753	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1543754-1 Process Water 04-NOV-14 15:30 P7 PM PROCESS H2O	L1543754-2 Process Water 05-NOV-14 07:00 P8 AM PROCESS H2O	L1543754-3 Process Water 05-NOV-14 15:30 P8 PM PROCESS H2O	L1543754-4 Process Water 06-NOV-14 BLIND SAMPLE 2	
Grouping	Analyte					
WATER						
Dissolved Metals	Nickel (Ni)-Dissolved (mg/L)	0.0012	0.0014	0.0013	0.0013	
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	
	Potassium (K)-Dissolved (mg/L)	35.9	35.9	47.0	47.4	
	Selenium (Se)-Dissolved (mg/L)	0.00977	0.00863	0.00809	0.00723	
	Silicon (Si)-Dissolved (mg/L)	1.53	1.65	1.52	1.54	
	Silver (Ag)-Dissolved (mg/L)	0.000332	0.000325	0.000173	0.000165	
	Sodium (Na)-Dissolved (mg/L)	14.7	15.1	18.2	18.4	
	Strontium (Sr)-Dissolved (mg/L)	0.494	0.457	0.592	0.596	
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Dissolved (mg/L)	0.00070	0.00063	0.00070	0.00069	
	Titanium (Ti)-Dissolved (mg/L)	0.013	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	0.0168	0.0296	0.0165	0.0188	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Aluminum (Al)-Dissolved	DLA	L1543754-1, -2, -3, -4
Duplicate	Antimony (Sb)-Dissolved	DLA	L1543754-1, -2, -3, -4
Duplicate	Arsenic (As)-Dissolved	DLA	L1543754-1, -2, -3, -4
Duplicate	Beryllium (Be)-Dissolved	DLA	L1543754-1, -2, -3, -4
Duplicate	Selenium (Se)-Dissolved	DLA	L1543754-1, -2, -3, -4
Duplicate	Silver (Ag)-Dissolved	DLA	L1543754-1, -2, -3, -4
Duplicate	Tin (Sn)-Dissolved	DLA	L1543754-1, -2, -3, -4
Duplicate	Vanadium (V)-Dissolved	DLA	L1543754-1, -2, -3, -4
Duplicate	Chloride (Cl)	DLM	L1543754-1, -2, -3, -4
Duplicate	Bromide (Br)	DLM	L1543754-1, -2, -3, -4
Duplicate	Fluoride (F)	DLM	L1543754-1, -2, -3, -4
Duplicate	Nitrite (as N)	DLM	L1543754-1, -2, -3, -4
Duplicate	Total Inorganic Carbon	M	L1543754-1, -2, -3, -4
Duplicate	Dissolved Inorganic Carbon	M	L1543754-1, -2, -3, -4
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Total Inorganic Carbon	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1543754-1, -2, -3, -4
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1543754-1, -2, -3, -4

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
M	A peak has been manually integrated.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
Samples of industrial wastes, acid mine drainage, or other solutions that contain appreciable amounts of hydrolyzable metal ions such as aluminum, iron, and manganese may require hot peroxide treatment to ensure oxidation and hydrolysis of reduced forms of polyvalent cations. Acidity results may be highly variable if this procedure is not followed. Results in this report for 'Acidity (as CaCO3)' have not been peroxide treated.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
Samples of industrial wastes, acid mine drainage, or other solutions that contain appreciable amounts of hydrolyzable metal ions such as aluminum, iron, and manganese may require hot peroxide treatment to ensure oxidation and hydrolysis of reduced forms of polyvalent cations. Acidity results may be highly variable if this procedure is not followed. Results in this report for 'Acidity (as CaCO3)' have not been peroxide treated.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ALK-PCT-VA Water Alkalinity by Auto. Titration APHA 2320 Alkalinity

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA Water Bromide by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA Water Chloride by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA Water Fluoride by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-N+N-CALC-VA Water Nitrite & Nitrate in Water (Calculation) EPA 300.0

Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

ANIONS-NO2-IC-VA Water Nitrite in Water by Ion Chromatography EPA 300.0

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.

ANIONS-NO3-IC-VA Water Nitrate in Water by Ion Chromatography EPA 300.0

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.

ANIONS-SO4-IC-VA Water Sulfate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-DIC-VA Water Dissolved inorganic carbon by CO2 purge APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved inorganic carbon (DIC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-DOC-VA Water Dissolved organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TIC-VA Water Total inorganic carbon by CO2 purge APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA Water Total organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method

Reference Information

6020A).

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

**** ALS test methods may incorporate modifications from specified reference methods to improve performance.**

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
----------------------------	---------------------

VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA
----	---

Chain of Custody Numbers:

10-249636

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg ww - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Gross Alpha/Beta Case Narrative

ALS Environmental

L1543754

Work Order Number: 1411208

1. This report consists of the analytical results for four water samples received by ALS on 11/11/14.
2. These samples were prepared according to the current revision of SOP 702.
3. The samples were analyzed for gross alpha and beta activity by gas flow proportional counting according to the current revision of SOP 724. The analyses were completed on 11/18/14. Gross alpha results are referenced to ^{241}Am . Gross beta results are referenced to $^{90}\text{Sr/Y}$.
4. The analysis results for these samples are reported in units of BQ/L. The samples were not filtered prior to analysis.
5. ALS uses the following convention for reporting significant digits in the TPU and MDC results. The TPU value is rounded to two significant digits. The MDC value is rounded to the same decimal place as the TPU value. In practice, this could result in an MDC reported value of zero for samples with significant activity, including the batch laboratory control sample.
6. No anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Emily Knodel
Emily Knodel
Radiochemistry Primary Data Reviewer

11/21/14
Date

Debbie Fazio
Radiochemistry Final Data Reviewer

11/21/14
Date

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1411208

Client Name: ALS Environmental

Client Project Name:

Client Project Number: L1543754

Client PO Number: L1543754

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L1543754-1	1411208-1		WATER	04-Nov-14	
L1543754-2	1411208-2		WATER	05-Nov-14	
L1543754-3	1411208-3		WATER	05-Nov-14	
L1543754-4	1411208-4		WATER	06-Nov-14	

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Method Blank Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411208

Client Name: ALS Environmental

ClientProject ID: L1543754

Lab ID: AB141113-1MB

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 13-Nov-14

Date Prepared: 13-Nov-14

Date Analyzed: 18-Nov-14

Prep Batch: AB141113-1

QCBatchID: AB141113-1-2

Run ID: AB141113-1A

Count Time: 1000 minutes

Final Aliquot: 200 ml

Result Units: BQ/l

File Name: ABC1118

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.028	0.111	U
12587-47-2	GROSS BETA	BDL	0.038	0.148	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: AB1411208-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Environmental -- FC

Work Order Number: 1411208

Client Name: ALS Environmental

ClientProject ID: L1543754

Lab ID: AB141113-1LCS

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 13-Nov-14

Date Prepared: 13-Nov-14

Date Analyzed: 17-Nov-14

Prep Batch: AB141113-1

QCBatchID: AB141113-1-2

Run ID: AB141113-1A

Count Time: 660 minutes

Final Aliquot: 200 ml

Result Units: BQ/l

File Name: ABC1117I

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
12587-46-1	GROSS ALPHA	8.0 +/- 1.3	0	7.645	105	70 - 130	P
12587-47-2	GROSS BETA	7.4 +/- 1.2	0.1	7.631	97.0	70 - 130	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: AB1411208-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411208

Client Name: ALS Environmental

ClientProject ID: L1543754

Field ID: L1543754-1

Lab ID: 1411208-1

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 04-Nov-14

Date Prepared: 13-Nov-14

Date Analyzed: 17-Nov-14

Prep Batch: AB141113-1

QCBatchID: AB141113-1-2

Run ID: AB141113-1A

Count Time: 660 minutes

Report Basis: Unfiltered

Final Aliquot: 100 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: BQ/l

File Name: ABC1117I

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.076	0.111	U
12587-47-2	GROSS BETA	1.20 +/- 0.21	0.10	0.148	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: AB1411208-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411208

Client Name: ALS Environmental

ClientProject ID: L1543754

Field ID: L1543754-2

Lab ID: 1411208-2

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 05-Nov-14

Date Prepared: 13-Nov-14

Date Analyzed: 17-Nov-14

Prep Batch: AB141113-1

QCBatchID: AB141113-1-2

Run ID: AB141113-1A

Count Time: 660 minutes

Report Basis: Unfiltered

Final Aliquot: 100 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: BQ/l

File Name: ABC1117I

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.060	0.111	U
12587-47-2	GROSS BETA	1.11 +/- 0.19	0.09	0.148	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: AB1411208-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411208

Client Name: ALS Environmental

ClientProject ID: L1543754

Field ID: L1543754-3

Lab ID: 1411208-3

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 05-Nov-14

Date Prepared: 13-Nov-14

Date Analyzed: 18-Nov-14

Prep Batch: AB141113-1

QCBatchID: AB141113-1-2

Run ID: AB141113-1A

Count Time: 1000 minutes

Report Basis: Unfiltered

Final Aliquot: 90.0 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: BQ/l

File Name: ABC1118

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.080	0.111	U
12587-47-2	GROSS BETA	1.41 +/- 0.24	0.09	0.148	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: AB1411208-1

Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1411208

Client Name: ALS Environmental

ClientProject ID: L1543754

Field ID: L1543754-4

Lab ID: 1411208-4

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 20

Date Collected: 06-Nov-14

Date Prepared: 13-Nov-14

Date Analyzed: 18-Nov-14

Prep Batch: AB141113-1

QCBatchID: AB141113-1-2

Run ID: AB141113-1A

Count Time: 1000 minutes

Report Basis: Unfiltered

Final Aliquot: 90.0 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: BQ/l

File Name: ABC1118

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	BDL	0.073	0.111	U
12587-47-2	GROSS BETA	1.45 +/- 0.24	0.09	0.148	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: AB1411208-1

APPENDIX V – KM4420

MINERALOGICAL DATA

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TABLE 1A
SUMMARY OF PERCENT LIBERATION BY SIZE AND CLASS
Lab Composite, 159µm K80
KM4420

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	1.3	0.0	0.0	14.1	20.5	14.9	2.1	2.6	36.4	29.6	21.4	10.6	13.7	15.4	24.6
Binary - Cp		0.3	0.2	2.9	0.7		6.6	1.1	4.4	0.7		8.9	0.3	0.5	0.2
Binary - Bn	0.0		0.2	0.0	0.0	0.6		1.5	0.1	0.0	3.8		6.2	0.0	0.0
Binary - Ch	0.0	0.2		0.4	0.1	0.6	2.1		0.0	0.1	1.6	10.6		0.0	0.0
Binary - Py	2.3	2.3	5.2		0.7	5.7	7.8	9.5		0.6	3.3	2.0	11.2		0.2
Binary - Gn	8.0	7.4	6.5	5.9		15.0	17.3	14.2	5.8		3.3	3.3	3.4	1.9	
Multiphase	2.3	2.4	5.9	3.7	0.5	7.1	8.7	9.1	6.4	0.6	0.0	0.7	0.6	0.7	0.1
Total	13.9	12.6	18.0	27.0	22.4	43.8	44.5	37.9	53.1	31.6	33.4	36.1	35.5	18.5	25.1

Size Range	<C5				
Mineral Status	Cp	Bn	Ch	Py	Gn
Liberated	8.2	3.5	6.6	1.3	20.5
Binary - Cp		0.4	0.4	0.0	0.2
Binary - Bn	0.0		1.3	0.0	0.0
Binary - Ch	0.1	2.4		0.0	0.0
Binary - Py	0.0	0.0	0.0		0.1
Binary - Gn	0.5	0.4	0.4	0.2	
Multiphase	0.0	0.0	0.0	0.0	0.0
Total	8.9	6.8	8.6	1.5	20.9

SUMMARY OF MINERAL DISTRIBUTION BY CLASS OF ASSOCIATION

Mineral Status	Mineral Liberation-2 Dimensions					Mineral Liberation-3 Dimensions				
	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	45.8	16.2	22.8	67.2	95.2	32.2	0.0	3.5	59.0	94.0
Binary - Cp		16.3	1.9	7.8	1.8		19.4	2.4	9.8	2.2
Binary - Bn	4.4		9.2	0.1	0.0	5.5		11.4	0.1	0.0
Binary - Ch	2.3	15.3		0.4	0.2	2.9	18.3		0.5	0.2
Binary - Py	11.3	12.1	25.9		1.6	14.1	14.4	32.4		2.0
Binary - Gn	26.8	28.4	24.5	13.7		33.4	33.9	30.6	17.1	
Multiphase	9.4	11.7	15.7	10.9	1.2	11.8	14.0	19.6	13.6	1.5
Total	100	100	100	100	100	100	100	100	100	100

Notes 1) Cp-Chalcopryrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite,
Py-Pyrite, Molybdenite and Sphalerite, Gn-Non-Sulphide Minerals.

2) 0.0 Indicates these minerals were not observed during the counting procedure.

3) The 150 and 53µm sizing fractions correspond to the Tyler 100 and 270 mesh sieves.
C1 to C5 indicates cyclones 1 to 5 on the cyclosizer.

4) The Total line is the distribution of mineral in the size fraction. Original data is from the size by assay and distribution tables.

5) The calculated liberation of the unsized product as measured in two dimensions has been converted to three dimensions using correction factors developed by ALS Metallurgy Kamloops.

6) The three dimension liberation is zero if the liberation in two dimensions is less than 20 percent.

7) Mineral liberation was achieved using QEMSCAN and checked and adjusted using optical methods as necessary.

TABLE 1B
SIZE BY ASSAY AND DISTRIBUTION BASED ON METAL CONTENT
Lab Composite, 159µm K80

Size Fraction	Mass %	Assays-percent					Distribution				
		Cu	Fe	S			Cu	Fe	S		
>150µm	22.4	1.24	5.80	5.70			14.8	23.1	23.5		
<150>53µm	33.7	2.39	7.10	8.02			43.0	42.6	49.7		
<53µm>C5	25.0	2.55	5.60	5.00			34.1	24.9	23.0		
<C5	18.9	0.80	2.79	1.13			8.1	9.4	3.9		
Total	100	1.87	5.62	5.44			100	100	100		

Notes: 1) The assays shown in this table are utilized to determine the mineralogical distribution shown in Table C

TABLE 1C
SIZE BY ASSAY AND DISTRIBUTION BASED ON MINERAL CONTENT
Lab Composite, 159µm K80

Size Fraction	Mass %	Assays-percent					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	22.4	1.72	0.26	0.61	9.2	88.2	13.9	12.6	18.0	27.0	22.4
<150>53µm	33.7	3.60	0.62	0.86	12.0	82.9	43.8	44.5	37.9	53.1	31.6
<53µm>C5	25.0	3.70	0.68	1.08	5.7	88.9	33.4	36.1	35.5	18.5	25.1
<C5	18.9	1.30	0.17	0.35	0.6	97.6	8.9	6.8	8.6	1.5	20.9
Total	100	2.77	0.47	0.76	7.6	88.4	100	100	100	100	100

Notes: 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite, Py-Pyrite, Molybdenite and Sphalerite, Gn-Non-Sulphide Minerals.

2) Mineral assays are based on gravimetric factors to convert the metal to the pure mineral.

3) See appendix I for details of gravimetric factors.

4) An assay value of "0" indicates the assay value is less than the detection limit.

TABLE 1D
ESTIMATED RELATIVE PROPORTION AND COMPOSITION OF MINERAL GRAINS
Lab Composite, 159µm K80

Binary Component	Proportion by Weight-2D					Proportion by Weight-3D					Composition of Grains				
	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	1.27	0.08	0.17	5.13	84.1	0.89	0.00	0.03	4.50	83.0	100	100	100	100	100
Binary - Cp		0.08	0.01	0.60	1.6		0.09	0.02	0.74	2.0		37	19	66	68
Binary - Bn	0.12		0.07	0.01	0.0	0.15		0.09	0.01	0.0	63		50	14	20
Binary - Ch	0.06	0.07		0.03	0.2	0.08	0.09		0.04	0.2	81	50		13	47
Binary - Py	0.31	0.06	0.20		1.4	0.39	0.07	0.25		1.8	34	86	87		58
Binary - Gn	0.74	0.13	0.19	1.04		0.93	0.16	0.23	1.30		32	80	53	42	
Multiphase	0.26	0.05	0.12	0.83	1.1	0.33	0.07	0.15	1.03	1.3	11	2	5	36	45
Average Composition	2.77	0.47	0.76	7.63	88.4	2.77	0.47	0.76	7.63	88.4	34	13	20	64	95

Notes 1) The two-dimensional proportion of minerals is a weighted estimate which is based on the liberation and the mineral content of the unsized sample.

2) The three-dimensional data is based on converting the two dimensional liberation data using ALS Metallurgy Kamloops correction factors.

3) Composition values of "0" represents values <2% and "100" represents values >98%.

TABLE 1E
DISTRIBUTION BY SIZE RANGE OF COPPER AND IRON BEARING MINERALS
Lab Composite, 159µm K80

Size Fraction	Mass %	% Copper Bearing Minerals						% Copper of Total Copper						% Iron of Total Iron			
		Cp	Bn	Ch	Cv	En	NCu	Cp	Bn	Ch	Cv	En	NCu	Cs	Py	FeOx	Gn
>150µm	22.4	66.3	10.2	19.8	3.1	0.6	0.0	48.3	13.5	33.2	4.4	0.6	0.0	8.8	70.5	3.8	16.9
<150>53µm	33.7	69.8	12.0	15.2	1.3	0.1	1.5	52.5	16.5	25.9	1.8	0.1	3.1	14.5	70.1	3.0	12.3
<53µm>C5	25.0	67.7	12.4	16.6	2.3	0.9	0.1	50.6	17.0	27.9	3.3	1.0	0.2	21.6	41.1	7.0	30.3
<C5	18.9	71.7	9.3	7.2	10.3	1.5	0.0	56.4	13.3	13.0	15.6	1.7	0.0	10.3	5.4	9.1	75.2
Total	100	68.7	11.6	15.7	2.7	0.6	0.7	51.6	16.0	26.6	3.8	0.6	1.4	14.6	56.9	4.8	23.8

Notes 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite, Cv-Covellite, En-Enargite/Tennantite, NCu-Native Copper/Cuprite.

Cs-Chalcopyrite and Bornite, Py-Pyrite, FeOx-Magnetite, Hematite, Goethite and Limonite, Gn-Non Sulphide Minerals

TABLE 1F
COMPARATIVE ASSAY TABLE
Lab Composite, 159µm K80

Methods	Cu	Fe	S
QEMSCAN	1.9	6.2	5.3
Chemical	1.9	5.6	5.4

Notes 1) This table compares the chemical composition of the samples determined by chemical analysis with the composition determined by QEMSCAN analysis.

TABLE 1G
THE WEIGHT OF THE OBSERVED MINERALS
Lab Composite, 159µm K80

Mineral	Mineral Assays (percent)					Normailed Distribution
	>150µm	<150>53µm	<53µm>C5	<C5	Total	
Chalcopyrite	1.72	3.21	4.54	1.04	2.80	2.77
Bornite	0.26	0.55	0.83	0.13	0.48	0.47
Chalcocite	0.52	0.70	1.11	0.10	0.65	0.63
Covellite	0.08	0.06	0.15	0.15	0.10	0.11
Enargite/Tennantite	0.02	0.01	0.06	0.02	0.03	0.02
Native Copper/Cuprite	0.00	0.07	0.01	0.00	0.02	0.02
Molybdenite	0.01	0.04	0.01	0.06	0.03	0.03
Sphalerite	0.04	0.09	0.03	0.05	0.06	0.06
Pyrite	9.59	10.8	6.06	0.38	7.39	7.63
Iron Oxides	0.35	0.32	0.70	0.45	0.45	0.45
Quartz	55.0	56.8	39.5	15.1	44.2	44.1
Micas	26.4	20.6	36.2	66.7	34.5	34.4
Feldspars	2.24	2.34	4.10	4.96	3.25	3.25
Carbonates	0.12	0.33	0.32	0.05	0.23	0.23
Chlorite	0.17	0.30	0.81	1.64	0.65	0.65
Apatite	0.29	0.48	0.60	0.57	0.48	0.48
Rutile/Anatase	0.86	1.05	1.93	0.67	1.16	1.16
Kaolinite (clay)	1.53	1.49	2.18	6.22	2.57	2.56
Talc	0.17	0.23	0.22	0.20	0.21	0.21
Amphibole	0.44	0.28	0.27	0.46	0.35	0.35
Fluorite	0.09	0.07	0.10	0.02	0.08	0.08
Others	0.07	0.09	0.27	1.01	0.30	0.30
Total	100	100	100	100	100	100

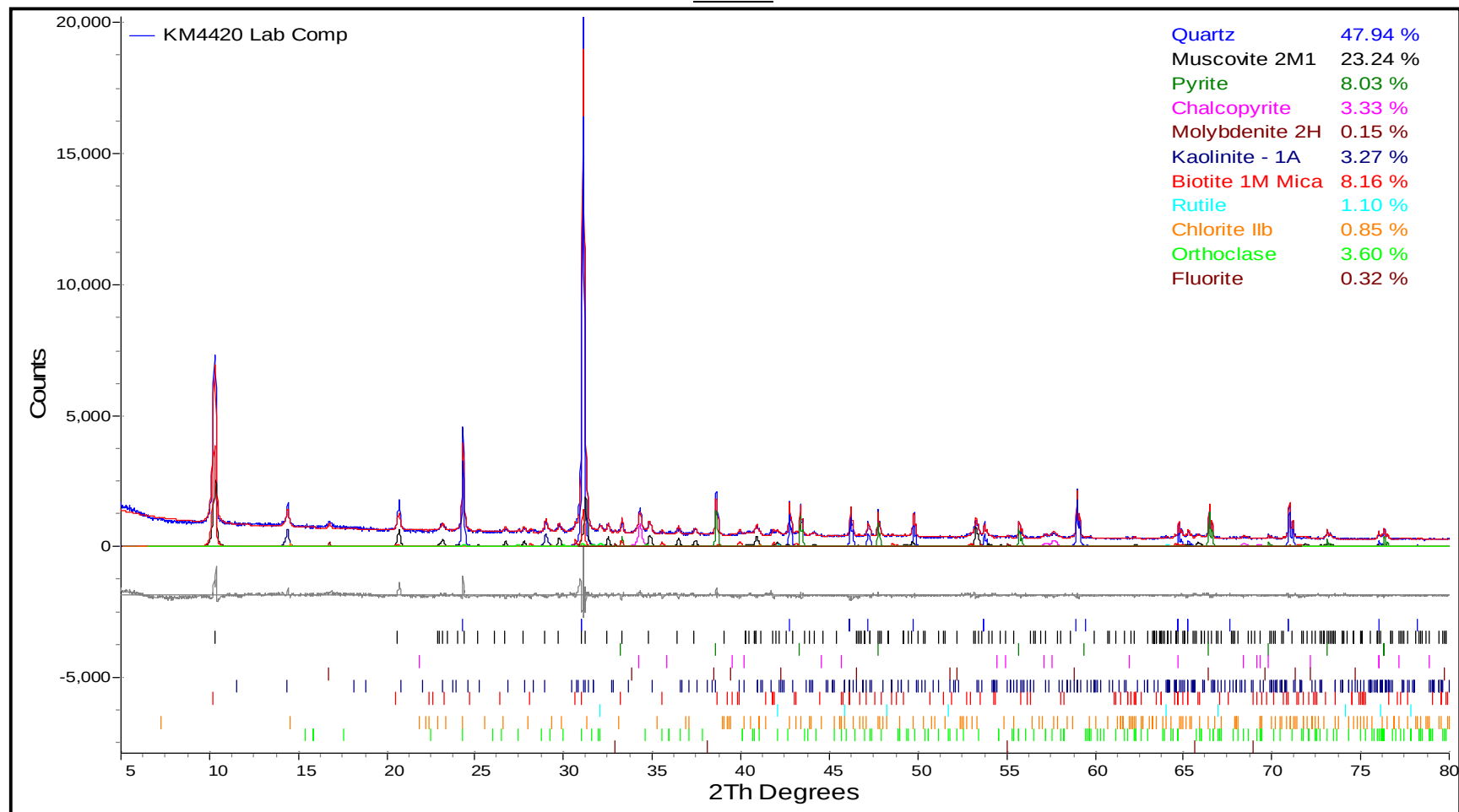
Note: 1) Iron Oxides includes Magnetite, Hematite, Limonite and Goethite.
2) Micas includes Muscovite and Biotite/Phlogopite.
3) Feldspars includes Feldspar-Albite, K-Feldspar, Plagioclase Feldspar and Alkali Feldspar.
4) Carbonates includes Calcite, Dolomite and Ankerite.
5) Chlorite includes trace amounts of Epidote.
6) Ti Minerals includes Rutile/Anatase and trace amounts of Sphene..
7) Others includes Sillimanite and trace amounts of unresolved mineral species.
8) .The Normalized Distribution is the redistribution of the mineral composition based on Table C total mineral chemical assay values.

TABLE 2
MINERAL CONTENTS OF RESOLUTION COPPER DEPOSIT SAMPLE
SEMI-QUANTITATIVE PHASE ANALYSIS (WT.%) USING XRD-RIETVELD METHOD
KM4420

Minerals	Lab Composite
Chalcopyrite	3
Pyrite	8
Molybdenite	<1
Quartz	48
Muscovite	23
Biotite	8
Feldspar (K-Feldspar)	4
Kaolinite	3
Chlorite	1
Ti-Minerals	1
Fluorite	<1
Total	100

- Note: 1) Samples were pulverized and then ground under ethyl alcohol in a vibratory McCrone Micronizing Mill for 7 minutes.
- 2) Step-scan X-ray powder diffraction data were collected over range of 5-80 °2θ with CoKa radiation using a Bruker XRD D4 diffractometer.
- 3) X-ray powder diffraction data were analyzed using search-match software by Bruker and refined using Rietveld program Topas 4.2 (Bruker AXS) and structures from the Topas Database and the ICDD PDF-4 Minerals Database.
- 4) Minerals, weight percent less than 1%, were mostly unidentified.
- 5) The mineral content reported represents the relative amounts of crystalline phases normalized to 100%.
- 6) Feldspar (K-Feldspar) includes Orthoclase.
- 7) Muscovite includes Muscovite 2M1.
- 8) Ti-Minerals includes Rutile.

FIGURE 1
RIETVELD REFINEMENT PLOT - LAB COMPOSITE
KM4420



Note:

- 1) Blue Line - Measured Intensity Peaks at Different Angles.
- 2) Red Line - Calculated Patterns Using TOPAS Rietveld Programs Based on Mineral Crystalline Structures.
- 3) Solid Grey Line - Differences Between Measured and Calculated Intensities.
- 4) Vertical Bars - Positions of All Bragg reflections.
- 5) Coloured lines are individual diffraction patterns of all phases.

TABLE 3A
SUMMARY OF PERCENT LIBERATION BY SIZE AND CLASS
P4 WSA Bulk Rougher Tailing
KM4420

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	26.3	0.1	0.0	0.0	3.9	29.8	2.9	1.7	5.6	11.0	22.3
Binary - Cp		0.0	0.0	0.0	0.3		0.0	0.0	0.0	0.1		0.9	1.1	0.0	0.0
Binary - Bn	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.1		0.4	0.0	0.0
Binary - Ch	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.2		0.0	0.0
Binary - Py	0.0	0.0	0.0		0.1	0.0	0.0	0.0		0.0	0.0	0.9	2.2		0.0
Binary - Gn	42.4	36.6	46.4	23.2		15.6	36.0	8.6	15.7		1.7	4.3	10.8	3.5	
Multiphase	3.1	3.3	12.8	3.2	0.1	0.5	0.0	1.7	3.1	0.0	0.0	0.0	1.1	0.0	0.0
Total	45.5	40.0	59.2	26.5	26.9	16.2	36.0	10.3	22.8	29.9	4.7	7.9	21.3	14.5	22.4

SUMMARY OF MINERAL DISTRIBUTION BY CLASS OF ASSOCIATION

Size Range	<C5					Mineral Liberation-2 Dimensions					Mineral Liberation-3 Dimensions				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	31.3	11.7	6.3	34.5	20.8	34.3	13.4	11.9	49.4	99.3	17.9	0.0	0.0	36.7	99.1
Binary - Cp		1.5	1.8	0.0	0.0		2.3	2.9	0.0	0.4		2.7	3.3	0.0	0.5
Binary - Bn	0.1		0.2	0.0	0.0	0.2		0.6	0.0	0.0	0.3		0.6	0.0	0.0
Binary - Ch	1.0	1.5		0.0	0.0	1.0	1.7		0.0	0.1	1.2	1.9		0.0	0.1
Binary - Py	0.0	0.0	0.0		0.0	0.0	0.9	2.2		0.1	0.0	1.0	2.5		0.2
Binary - Gn	1.1	1.5	1.0	1.7		60.7	78.4	66.8	44.2		75.9	90.5	75.8	55.3	
Multiphase	0.1	0.0	0.0	0.0	0.0	3.8	3.3	15.6	6.4	0.1	4.7	3.8	17.7	8.0	0.1
Total	33.6	16.1	9.3	36.2	20.8	100	100	100	100	100	100	100	100	100	100

Notes 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite,
Py-Pyrite, Molybdenite and Sphalerite, Gn-Non-Sulphide Minerals.

2) 0.0 Indicates these minerals were not observed during the counting procedure.

3) The 150 and 53µm sizing fractions correspond to the Tyler 100 and 270 mesh sieves.

C1 to C5 indicates cyclones 1 to 5 on the cyclosizer.

4) The Total line is the distribution of mineral in the size fraction. Original data is from the size by assay and distribution tables.

5) The calculated liberation of the unsized product as measured in two dimensions has been converted to three dimensions using correction factors developed by ALS Metallurgy Kamloops.

6) The three dimension liberation is zero if the liberation in two dimensions is less than 20 percent.

7) Mineral liberation was achieved using QEMSCAN and checked and adjusted using optical methods as necessary.

TABLE 3B
SIZE BY ASSAY AND DISTRIBUTION BASED ON METAL CONTENT
P4 WSA Bulk Rougher Tailing

Size Fraction	Mass %	Assays-percent					Distribution				
		Cu	Fe	S			Cu	Fe	S		
>150µm	26.9	0.19	1.28	0.24			47.1	22.3	29.8		
<150>53µm	29.9	0.07	1.10	0.15			19.2	21.3	21.4		
<53µm>C5	22.3	0.04	1.84	0.14			8.5	26.6	14.0		
<C5	20.9	0.13	2.20	0.36			25.1	29.8	34.8		
Total	100	0.11	1.54	0.21			100	100	100		

Notes: 1) The assays shown in this table are utilized to determine the mineralogical distribution shown in Table C

TABLE 3C
SIZE BY ASSAY AND DISTRIBUTION BASED ON MINERAL CONTENT
P4 WSA Bulk Rougher Tailing

Size Fraction	Mass %	Assays-percent					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	26.9	0.32	0.05	0.06	0.20	99.4	45.5	40.0	59.2	26.5	26.9
<150>53µm	29.9	0.10	0.04	0.01	0.15	99.7	16.2	36.0	10.3	22.8	29.9
<53µm>C5	22.3	0.04	0.01	0.02	0.13	99.8	4.7	7.9	21.3	14.5	22.4
<C5	20.9	0.30	0.03	0.01	0.35	99.3	33.6	16.1	9.3	36.2	20.8
Total	100	0.19	0.04	0.03	0.20	99.5	100	100	100	100	100

Notes: 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite, Py-Pyrite, Molybdenite and Sphalerite, Gn-Non-Sulphide Minerals.

2) Mineral assays are based on gravimetric factors to convert the metal to the pure mineral.

3) See appendix I for details of gravimetric factors.

4) An assay value of "0" indicates the assay value is less than the detection limit.

TABLE 3D
ESTIMATED RELATIVE PROPORTION AND COMPOSITION OF MINERAL GRAINS
P4 WSA Bulk Rougher Tailing

Binary Component	Proportion by Weight-2D					Proportion by Weight-3D					Composition of Grains				
	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.06	0.00	0.00	0.10	98.8	0.03	0.00	0.00	0.07	98.6	100	100	100	100	100
Binary - Cp		0.00	0.00	0.00	0.4		0.00	0.00	0.00	0.5		67	26	0	79
Binary - Bn	0.00		0.00	0.00	0.0	0.00		0.00	0.00	0.0	33		19	1	49
Binary - Ch	0.00	0.00		0.00	0.1	0.00	0.00		0.00	0.1	74	81		1	80
Binary - Py	0.00	0.00	0.00		0.1	0.00	0.00	0.00		0.2	0	99	99		60
Binary - Gn	0.11	0.03	0.02	0.09		0.14	0.03	0.02	0.11		21	51	20	40	
Multiphase	0.01	0.00	0.00	0.01	0.1	0.01	0.00	0.00	0.02	0.1	6	1	3	12	78
Average Composition	0.19	0.04	0.03	0.20	99.5	0.19	0.04	0.03	0.20	99.5	22	18	10	41	100

Notes 1) The two-dimensional proportion of minerals is a weighted estimate which is based on the liberation and the mineral content of the unsized sample.

2) The three-dimensional data is based on converting the two dimensional liberation data using ALS Metallurgy Kamloops correction factors.

3) Composition values of "0" represents values <2% and "100" represents values >98%.

TABLE 3E
DISTRIBUTION BY SIZE RANGE OF COPPER AND IRON BEARING MINERALS
P4 WSA Bulk Rougher Tailing

Size Fraction	Mass %	% Copper Bearing Minerals						% Copper of Total Copper						% Iron of Total Iron			
		Cp	Bn	Ch	Cv	En	NCu	Cp	Bn	Ch	Cv	En	NCu	Cs	Py	FeOx	Gn
>150µm	26.9	74.3	12.6	12.6	0.36	0.13	0.03	60.9	19.0	19.4	0.56	0.14	0.05	6.41	5.70	0.34	87.6
<150>53µm	29.9	66.0	28.3	2.8	2.40	0.48	0.00	52.7	41.3	1.7	3.67	0.53	0.00	3.43	5.54	2.81	88.2
<53µm>C5	22.3	51.3	16.9	31.5	0.20	0.10	0.00	36.2	21.8	41.7	0.27	0.10	0.00	0.97	2.38	4.07	92.6
<C5	20.9	88.5	8.2	1.5	0.31	1.52	0.00	83.5	14.2	0.0	0.56	1.77	0.00	3.75	6.99	1.39	87.9
Total	100	75.2	14.6	8.9	0.71	0.59	0.01	62.9	22.3	13.0	1.14	0.62	0.02	3.53	5.17	2.17	89.1

Notes 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite, Cv-Covellite, En-Enargite/Tennantite, NCu-Native Copper/Cuprite.

Cs-Chalcopyrite and Bornite, Py-Pyrite, FeOx-Magnetite, Hematite, Goethite and Limonite, Gn-Non Sulphide Minerals

TABLE 3F
COMPARATIVE ASSAY TABLE
P4 WSA Bulk Rougher Tailing

Methods	Cu	Fe	S
QEMSCAN	0.1	1.7	0.2
Chemical	0.1	1.5	0.2

Notes 1) This table compares the chemical composition of the samples determined by chemical analysis with the composition determined by QEMSCAN analysis.

TABLE 3G
THE WEIGHT OF THE OBSERVED MINERALS
P4 WSA Bulk Rougher Tailing

Mineral	Mineral Assays (percent)					Normalized Distribution
	>150µm	<150>53µm	<53µm>C5	<C5	Total	
Chalcopyrite	0.27	0.10	0.06	0.31	0.18	0.19
Bornite	0.05	0.04	0.02	0.03	0.04	0.04
Chalcocite	0.05	0.00	0.04	0.01	0.02	0.02
Covellite	0.00	0.00	0.00	0.00	0.00	0.00
Enargite/Tennantite	0.00	0.00	0.00	0.01	0.00	0.00
Native Copper/Cuprite	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenite	0.03	0.03	0.00	0.00	0.02	0.02
Sphalerite	0.01	0.00	0.01	0.02	0.01	0.01
Pyrite	0.16	0.1	0.10	0.38	0.18	0.20
Iron Oxides	0.01	0.04	0.11	0.04	0.05	0.05
Quartz	59.4	67.3	53.9	15.6	51.4	51.4
Micas	33.1	24.9	35.4	70.6	39.0	39.0
Feldspars	2.77	3.09	3.77	3.73	3.29	3.29
Carbonates	0.18	0.35	0.11	0.10	0.20	0.20
Chlorite	0.32	0.22	0.59	1.16	0.53	0.53
Apatite	0.30	0.50	0.56	0.74	0.51	0.51
Rutile/Anatase	0.95	0.93	1.98	0.72	1.13	1.13
Kaolinite (clay)	1.70	1.69	2.04	5.57	2.58	2.58
Talc	0.13	0.17	0.11	0.06	0.12	0.12
Amphibole	0.38	0.24	0.32	0.29	0.31	0.31
Fluorite	0.06	0.09	0.21	0.09	0.11	0.11
Others	0.17	0.19	0.63	0.51	0.35	0.35
Total	100	100	100	100	100	100

Notes: 1) Iron Oxides includes Hematite, Limonite, Goethite, Magnetite.

2) Micas includes Muscovite and Biotite/Phlogopite.

3) Feldspars includes K-Feldspar, Alkali Feldspar, Feldspar-Albite, and Plagioclase Feldspar.

4) Carbonates includes Calcite, Dolomite, and Ankerite.

5) Chlorite includes Serpentine.

6) Rutile/Anatase includes trace amounts of Sphene and Ilmenite.

7) Kaolinite (clay) includes Alunite.

8) Others includes Sillimanite, Andalusite, Barite, Garnet Group Minerals, and unresolved mineral species.

9) The Normalized Distribution is the redistribution of the mineral composition based on Table C total mineral chemical assay values.

TABLE 4A
SUMMARY OF PERCENT LIBERATION BY SIZE AND CLASS
P4 WSA Bulk Cleaner Scavenger Tailing
KM4420

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	0.0	2.4	0.0	1.2	23.1	7.7	5.5	0.0	1.8	57.2	25.2
Binary - Cp		0.0	0.0	0.0	0.0		1.8	0.5	0.3	0.3		1.2	0.0	0.0	0.1
Binary - Bn	0.0		0.0	0.0	0.0	0.5		0.7	0.3	0.0	0.0		0.0	0.0	0.0
Binary - Ch	0.0	0.0		0.0	0.0	0.3	1.5		0.2	0.0	0.0	3.2		0.0	0.0
Binary - Py	0.0	0.0	0.0		0.0	5.3	44.7	36.9		1.5	4.8	6.0	8.0		1.5
Binary - Gn	0.0	0.0	0.0	0.0		33.2	13.9	14.7	2.3		2.2	1.6	1.3	3.7	
Multiphase	0.0	0.0	0.0	0.0	0.0	3.0	6.2	11.5	0.9	0.2	1.1	0.0	0.2	0.1	0.0
Total	0.0	0.0	0.0	0.0	0.0	44.7	68.2	65.5	27.2	9.8	13.6	12.1	11.3	61.0	26.8

SUMMARY OF MINERAL DISTRIBUTION BY CLASS OF ASSOCIATION

Size Range	<C5					Mineral Liberation-2 Dimensions					Mineral Liberation-3 Dimensions				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	37.9	10.8	12.9	11.2	62.7	45.8	10.8	15.9	91.5	95.6	32.2	0.0	0.0	89.4	94.5
Binary - Cp		3.6	6.1	0.0	0.0		6.6	6.6	0.4	0.4		7.4	7.9	0.5	0.5
Binary - Bn	0.1		0.8	0.0	0.0	0.6		1.6	0.4	0.0	0.8		1.9	0.4	0.0
Binary - Ch	1.3	5.4		0.0	0.0	1.6	10.2		0.2	0.0	2.0	11.4		0.2	0.1
Binary - Py	0.5	0.0	1.6		0.7	10.6	50.7	46.5		3.8	13.2	56.8	55.2		4.7
Binary - Gn	1.5	0.0	1.5	0.6		36.9	15.6	17.5	6.6		46.2	17.4	20.8	8.2	
Multiphase	0.3	0.0	0.3	0.0	0.0	4.5	6.2	12.0	1.0	0.2	5.6	6.9	14.2	1.3	0.2
Total	41.7	19.7	23.2	11.8	63.5	100	100	100	100	100	100	100	100	100	100

Notes 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite,
Py-Pyrite, Molybdenite and Sphalerite, Gn-Non-Sulphide Minerals.

2) 0.0 Indicates these minerals were not observed during the counting procedure.

3) The 150 and 53µm sizing fractions correspond to the Tyler 100 and 270 mesh sieves.

C1 to C5 indicates cyclones 1 to 5 on the cyclosizer.

4) The Total line is the distribution of mineral in the size fraction. Original data is from the size by assay and distribution tables.

5) The calculated liberation of the unsized product as measured in two dimensions has been converted to three dimensions using correction factors developed by ALS Metallurgy Kamloops.

6) The three dimension liberation is zero if the liberation in two dimensions is less than 20 percent.

7) Mineral liberation was achieved using QEMSCAN and checked and adjusted using optical methods as necessary.

TABLE 4B
SIZE BY ASSAY AND DISTRIBUTION BASED ON METAL CONTENT
P4 WSA Bulk Cleaner Scavenger Tailing

Size Fraction	Mass %	Assays-percent					Distribution				
		Cu	Fe	S			Cu	Fe	S		
>150µm	0.0	0.00	0.0	0.0			0.0	0.0	0.0		
<150>53µm	17.0	1.45	28.8	34.5			55.5	26.0	27.1		
<53µm>C5	40.1	0.14	27.1	32.1			12.6	57.6	59.5		
<C5	42.9	0.33	7.2	6.7			31.9	16.4	13.4		
Total	100	0.44	18.9	21.6			100	100	100		

Notes: 1) The assays shown in this table are utilized to determine the mineralogical distribution shown in Table C

TABLE 4C
SIZE BY ASSAY AND DISTRIBUTION BASED ON MINERAL CONTENT
P4 WSA Bulk Cleaner Scavenger Tailing

Size Fraction	Mass %	Assays-percent					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<150>53µm	17.0	1.78	0.49	0.66	62.7	34.3	44.7	68.2	65.5	27.2	9.8
<53µm>C5	40.1	0.23	0.04	0.05	59.8	39.9	13.6	12.1	11.3	61.0	26.8
<C5	42.9	0.66	0.06	0.09	10.8	88.4	41.7	19.7	23.2	11.8	63.5
Total	100	0.68	0.12	0.17	39.2	59.8	100	100	100	100	100

Notes: 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite, Py-Pyrite, Molybdenite and Sphalerite, Gn-Non-Sulphide Minerals.

2) Mineral assays are based on gravimetric factors to convert the metal to the pure mineral.

3) See appendix I for details of gravimetric factors.

4) An assay value of "0" indicates the assay value is less than the detection limit.

TABLE 4D
ESTIMATED RELATIVE PROPORTION AND COMPOSITION OF MINERAL GRAINS
P4 WSA Bulk Cleaner Scavenger Tailing

Binary Component	Proportion by Weight-2D					Proportion by Weight-3D					Composition of Grains				
	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.31	0.01	0.03	35.9	57.1	0.22	0.00	0.00	35.1	56.5	100	100	100	100	100
Binary - Cp		0.01	0.01	0.1	0.2		0.01	0.01	0.2	0.3		63	50	67	49
Binary - Bn	0.00		0.00	0.1	0.0	0.01		0.00	0.2	0.0	37		19	71	35
Binary - Ch	0.01	0.01		0.1	0.0	0.01	0.01		0.1	0.0	50	81		50	49
Binary - Py	0.07	0.06	0.08		2.2	0.09	0.07	0.09		2.8	33	29	50		47
Binary - Gn	0.25	0.02	0.03	2.6		0.31	0.02	0.04	3.2		51	65	51	53	
Multiphase	0.03	0.01	0.02	0.4	0.1	0.04	0.01	0.02	0.5	0.1	5	1	3	69	21
Average Composition	0.68	0.12	0.17	39.2	59.8	0.68	0.12	0.17	39.2	59.8	36	12	17	92	93

Notes 1) The two-dimensional proportion of minerals is a weighted estimate which is based on the liberation and the mineral content of the unsized sample.

2) The three-dimensional data is based on converting the two dimensional liberation data using ALS Metallurgy Kamloops correction factors.

3) Composition values of "0" represents values <2% and "100" represents values >98%.

TABLE 4E
DISTRIBUTION BY SIZE RANGE OF COPPER AND IRON BEARING MINERALS
P4 WSA Bulk Cleaner Scavenger Tailing

Size Fraction	Mass %	% Copper Bearing Minerals						% Copper of Total Copper						% Iron of Total Iron			
		Cp	Bn	Ch	Cv	En	NCu	Cp	Bn	Ch	Cv	En	NCu	Cs	Py	FeOx	Gn
>150µm	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.00	0.0
<150>53µm	17.0	60.7	16.8	20.4	1.81	0.19	0.06	42.6	21.6	33.1	2.4	0.17	0.11	2.02	96.3	0.72	1.0
<53µm>C5	40.1	72.9	11.8	11.6	3.65	0.00	0.00	56.9	16.8	20.9	5.5	0.00	0.00	0.25	96.0	0.71	3.1
<C5	42.9	81.6	7.0	4.5	6.56	0.40	0.00	69.2	10.9	8.7	10.7	0.47	0.00	2.57	69.5	5.13	22.8
Total	100	69.7	12.7	13.6	3.74	0.24	0.03	52.9	17.6	23.8	5.5	0.25	0.06	1.09	91.7	1.44	5.8

Notes 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite, Cv-Covellite, En-Enargite/Tennantite, NCu-Native Copper/Cuprite.

Cs-Chalcopyrite and Bornite, Py-Pyrite, FeOx-Magnetite, Hematite, Goethite and Limonite, Gn-Non Sulphide Minerals

TABLE 4F
COMPARATIVE ASSAY TABLE
P4 WSA Bulk Cleaner Scavenger Tailing

Methods	Cu	Fe	S
QEMSCAN	0.4	19.5	20.9
Chemical	0.4	18.9	21.6

Notes 1) This table compares the chemical composition of the samples determined by chemical analysis with the composition determined by QEMSCAN analysis.

TABLE 4G
THE WEIGHT OF THE OBSERVED MINERALS
P4 WSA Bulk Cleaner Scavenger Tailing

Mineral	Mineral Assays (percent)					Normalized Distribution
	>150µm	<150>53µm	<53µm>C5	<C5	Total	
Chalcopyrite	0.00	1.89	0.21	0.59	0.66	0.68
Bornite	0.00	0.52	0.03	0.05	0.12	0.12
Chalcocite	0.00	0.63	0.03	0.03	0.14	0.13
Covellite	0.00	0.06	0.01	0.05	0.03	0.04
Enargite/Tennantite	0.00	0.01	0.00	0.00	0.00	0.00
Native Copper/Cuprite	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenite	0.00	0.02	0.00	0.01	0.01	0.01
Sphalerite	0.00	0.02	0.06	0.00	0.03	0.03
Pyrite	0.00	64.2	56.8	10.6	38.2	39.2
Iron Oxides	0.00	0.33	0.27	0.53	0.39	0.39
Quartz	0.00	20.4	20.9	20.7	20.7	20.4
Micas	0.00	8.82	16.6	51.1	30.1	29.6
Feldspars	0.00	1.04	1.56	6.50	3.59	3.53
Carbonates	0.00	0.15	0.08	0.48	0.26	0.26
Chlorite	0.00	0.17	0.31	1.08	0.62	0.61
Apatite	0.00	0.19	0.38	0.54	0.42	0.41
Rutile/Anatase	0.00	0.71	1.14	0.99	1.00	0.98
Kaolinite (clay)	0.00	0.55	0.83	4.48	2.35	2.31
Talc	0.00	0.07	0.14	0.25	0.18	0.17
Amphibole	0.00	0.04	0.30	0.61	0.39	0.38
Fluorite	0.00	0.03	0.07	0.05	0.06	0.05
Others	0.00	0.10	0.29	1.36	0.72	0.71
Total	0.00	100	100	100	100	100

- Notes: 1) Iron Oxides includes Hematite, Limonite, Goethite, Magnetite.
2) Micas includes Muscovite and Biotite/Phlogopite.
3) Feldspars includes K-Feldspar, Alkali Feldspar, Feldspar-Albite, and Plagioclase Feldspar.
4) Carbonates includes Calcite, Dolomite, and Ankerite.
5) Chlorite includes Serpentine.
6) Rutile/Anatase includes trace amounts of Sphene and Ilmenite.
7) Kaolinite (clay) includes Alunite.
8) Others includes Sillimanite, Andalusite, Barite, Garnet Group Minerals, and unresolved mineral species.
9) The Normalized Distribution is the redistribution of the mineral composition based on Table C total mineral chemical assay values.

TABLE 5A
SUMMARY OF PERCENT LIBERATION BY SIZE AND CLASS
P4 WSA Bulk Final Concentrate
KM4420

Size Range	>150µm						<150>53µm						<53µm>C5					
Mineral Status	Cp	Bn	Ch	Md	Py	Gn	Cp	Bn	Ch	Md	Py	Gn	Cp	Bn	Ch	Md	Py	Gn
Liberated	0.0	0.0	0.0	0.0	0.0	0.0	8.3	2.9	3.9	22.4	14.7	4.9	57.5	30.9	31.9	54.3	43.9	25.3
Binary - Cp		0.0	0.0	0.0	0.0	0.0		1.1	0.6	0.8	6.7	4.0		7.9	5.3	1.2	11.7	10.3
Binary - Bn	0.0		0.0	0.0	0.0	0.0	1.2		0.7	0.0	0.8	0.8	3.2		4.3	0.0	1.7	2.9
Binary - Ch	0.0	0.0		0.0	0.0	0.0	0.3	1.6		0.2	2.2	1.9	3.7	12.9		0.2	5.0	7.7
Binary - Md	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.1		0.0	0.3	0.1	0.0	0.2		0.1	1.6
Binary - Py	0.0	0.0	0.0	0.0		0.0	0.4	1.9	6.9	0.4		0.6	2.9	8.0	20.9	0.7		1.9
Binary - Gn	0.0	0.0	0.0	0.0	0.0		1.7	1.3	2.4	2.2	0.4		1.8	2.5	3.1	1.7	0.6	
Multiphase	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.4	0.7	0.6	1.0	0.8	0.4	0.6	0.7	0.8	2.8
Total	0.0	0.0	0.0	0.0	0.0	0.0	12.1	8.9	14.9	26.8	25.4	13.5	70.0	62.6	66.1	58.8	63.9	52.4

SUMMARY OF MINERAL DISTRIBUTION BY CLASS OF ASSOCIATION

Mineral Status	<C5						Mineral Liberation-2 Dimensions						Mineral Liberation-3 Dimensions					
	Cp	Bn	Ch	Md	Py	Gn	Cp	Bn	Ch	Md	Py	Gn	Cp	Bn	Ch	Md	Py	Gn
Liberated	16.6	14.6	9.2	13.3	8.7	28.0	82.4	48.4	45.0	90.0	67.3	58.1	78.0	35.5	31.3	87.5	59.1	47.6
Binary - Cp		5.2	5.9	0.5	1.4	3.1		14.3	11.7	2.5	19.9	17.5		17.8	14.7	3.2	24.9	21.9
Binary - Bn	0.1		1.1	0.0	0.0	0.3	4.6		6.1	0.0	2.5	3.9	5.7		7.6	0.0	3.1	4.9
Binary - Ch	0.6	7.7		0.1	0.2	1.4	4.6	22.2		0.6	7.5	11.0	5.8	27.8		0.7	9.3	13.7
Binary - Md	0.0	0.0	0.0		0.0	0.4	0.1	0.0	0.3		0.1	2.2	0.1	0.0	0.3		0.1	2.8
Binary - Py	0.3	0.3	2.0	0.0		0.5	3.6	10.2	29.8	1.2		3.0	4.5	12.8	37.2	1.5		3.7
Binary - Gn	0.2	0.6	0.7	0.1	0.2		3.6	4.4	6.2	4.0	1.2		4.6	5.5	7.7	5.0	1.5	
Multiphase	0.1	0.1	0.0	0.2	0.1	0.4	1.1	0.5	1.0	1.7	1.5	4.2	1.3	0.7	1.2	2.1	1.9	5.3
Total	17.9	28.5	19.0	14.3	10.6	34.1	100	100	100	100	100	100	100	100	100	100	100	100

Notes 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite, Md-Molybdenite, Py-Pyrite and Sphalerite, Gn-Non-Sulphide Minerals.

2) 0.0 Indicates these minerals were not observed during the counting procedure.

3) The 150 and 53µm sizing fractions correspond to the Tyler 100 and 270 mesh sieves.

C1 to C5 indicates cyclones 1 to 5 on the cyclosizer.

4) The Total line is the distribution of mineral in the size fraction. Original data is from the size by assay and distribution tables.

5) The calculated liberation of the unsized product as measured in two dimensions has been converted to three dimensions using correction factors developed by ALS Metallurgy Kamloops.

6) The three dimension liberation is zero if the liberation in two dimensions is less than 20 percent.

7) Mineral liberation was achieved using QEMSCAN and checked and adjusted using optical methods as necessary.

TABLE 5B
SIZE BY ASSAY AND DISTRIBUTION BASED ON METAL CONTENT
P4 WSA Bulk Final Concentrate

Size Fraction	Mass %	Assays-percent						Distribution					
		Cu	Fe	S	Mo			Cu	Fe	S	Mo		
>150µm	0.0	0.0	0.0	0.0	0.00			0.0	0.0	0.0	0.0		
<150>53µm	17.2	18.9	31.6	41.5	0.76			12.4	19.0	18.8	26.8		
<53µm>C5	65.3	27.0	29.4	39.1	0.44			67.4	67.3	67.2	58.8		
<C5	17.5	30.2	22.3	30.4	0.40			20.2	13.7	14.0	14.3		
Total	100	26.2	28.5	38.0	0.49			100	100	100	100		

Notes: 1) The assays shown in this table are utilized to determine the mineralogical distribution shown in Table C

TABLE 5C
SIZE BY ASSAY AND DISTRIBUTION BASED ON MINERAL CONTENT
P4 WSA Bulk Final Concentrate

Size Fraction	Mass %	Assays-percent						Distribution					
		Cp	Bn	Ch	Md	Py	Gn	Cp	Bn	Ch	Md	Py	Gn
>150µm	0.0	0.0	0.00	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<150>53µm	17.2	25.1	4.72	9.1	1.27	54.0	5.8	12.1	8.9	14.9	26.8	25.4	13.5
<53µm>C5	65.3	38.2	8.72	10.7	0.73	35.7	5.9	70.0	62.6	66.1	58.8	63.9	52.4
<C5	17.5	36.5	14.80	11.5	0.67	22.2	14.4	17.9	28.5	19.0	14.3	10.6	34.1
Total	100	35.7	9.09	10.5	0.81	36.5	7.4	100	100	100	100	100	100

Notes: 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite, Md-Molybdenite, Py-Pyrite and Sphalerite, Gn-Non-Sulphide Minerals.

2) Mineral assays are based on gravimetric factors to convert the metal to the pure mineral.

3) See appendix I for details of gravimetric factors.

4) An assay value of "0" indicates the assay value is less than the detection limit.

TABLE 5D
ESTIMATED RELATIVE PROPORTION AND COMPOSITION OF MINERAL GRAINS
P4 WSA Bulk Final Concentrate

Binary Component	Proportion by Weight-2D						Proportion by Weight-3D						Composition of Grains					
	Cp	Bn	Ch	Md	Py	Gn	Cp	Bn	Ch	Md	Py	Gn	Cp	Bn	Ch	Md	Py	Gn
Liberated	29.4	4.40	4.7	0.73	24.6	4.29	27.8	3.23	3.3	0.71	21.6	3.51	100	100	100	100	100	100
Binary - Cp		1.30	1.2	0.02	7.3	1.29		1.62	1.5	0.03	9.1	1.61		44	43	48	85	50
Binary - Bn	1.6		0.6	0.00	0.9	0.29	2.1		0.8	0.00	1.1	0.36	56		24	0	50	42
Binary - Ch	1.6	2.02		0.00	2.7	0.81	2.1	2.53		0.01	3.4	1.01	57	76		14	46	55
Binary - Md	0.0	0.00	0.0		0.0	0.17	0.0	0.00	0.0		0.1	0.21	52	0	86		82	84
Binary - Py	1.3	0.93	3.1	0.01		0.22	1.6	1.16	3.9	0.01		0.28	15	50	54	18		33
Binary - Gn	1.3	0.40	0.7	0.03	0.4		1.6	0.50	0.8	0.04	0.5		50	58	45	16	67	
Multiphase	0.4	0.05	0.1	0.01	0.6	0.31	0.5	0.06	0.1	0.02	0.7	0.39	27	4	7	1	39	22
Average Composition	35.7	9.09	10.5	0.81	36.5	7.38	35.7	9.09	10.5	0.81	36.5	7.38	70	60	50	28	82	60

Notes 1) The two-dimensional proportion of minerals is a weighted estimate which is based on the liberation and the mineral content of the unsized sample.

2) The three-dimensional data is based on converting the two dimensional liberation data using ALS Metallurgy Kamloops correction factors.

3) Composition values of "0" represents values <2% and "100" represents values >98%.

TABLE 5E
DISTRIBUTION BY SIZE RANGE OF COPPER AND IRON BEARING MINERALS
P4 WSA Bulk Final Concentrate

Size Fraction	Mass %	% Copper Bearing Minerals						% Copper of Total Copper						% Iron of Total Iron			
		Cp	Bn	Ch	Cv	En	NCu	Cp	Bn	Ch	Cv	En	NCu	Cs	Py	FeOx	Gn
>150µm	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.00	0.00
<150>53µm	17.2	64.4	12.1	21.3	1.91	0.21	0.10	46.1	15.8	35.1	2.62	0.21	0.20	25.6	74.0	0.16	0.27
<53µm>C5	65.3	66.3	15.1	14.8	3.38	0.30	0.05	49.0	20.5	25.3	4.80	0.31	0.09	45.9	53.8	0.18	0.14
<C5	17.5	58.2	23.6	7.3	10.40	0.56	0.00	41.9	31.1	12.1	14.38	0.52	0.00	54.3	44.6	0.54	0.55
Total	100	64.6	16.3	14.3	4.46	0.34	0.05	47.2	22.0	23.9	6.46	0.34	0.08	43.2	56.4	0.22	0.22

Notes 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite, Cv-Covellite, En-Enargite/Tennantite, NCu-Native Copper/Cuprite.

Cs-Chalcopyrite and Bornite, Py-Pyrite, FeOx-Magnetite, Hematite, Goethite and Limonite, Gn-Non Sulphide Minerals

TABLE 5F
COMPARATIVE ASSAY TABLE
P4 WSA Bulk Final Concentrate

Methods	Cu	Fe	S	Mo
QEMSCAN	27.2	28.6	36.8	0.50
Chemical	26.2	28.5	38.0	0.49

Notes 1) This table compares the chemical composition of the samples determined by chemical analysis with the composition determined by QEMSCAN analysis.

TABLE 5G
THE WEIGHT OF THE OBSERVED MINERALS
P4 WSA Bulk Final Concentrate

Mineral	Mineral Assays (percent)					Normalized Distribution
	>150µm	<150>53µm	<53µm>C5	<C5	Total	
Chalcopyrite	0.00	25.1	40.3	37.1	37.1	37.1
Bornite	0.00	4.71	9.20	15.0	9.45	9.45
Chalcocite	0.00	8.29	9.02	4.65	8.13	7.81
Covellite	0.00	0.74	2.05	6.63	2.63	2.54
Enargite/Tennantite	0.00	0.08	0.18	0.36	0.20	0.19
Copper/Cuprite	0.00	0.04	0.03	0.00	0.03	0.02
Molybdenite	0.00	0.97	0.78	0.87	0.83	0.81
Sphalerite	0.00	0.28	0.58	1.50	0.69	0.53
Pyrite	0.00	50.4	33.3	22.7	34.4	36.5
Iron Oxides	0.00	0.07	0.07	0.16	0.09	0.07
Quartz	0.00	5.29	2.04	3.91	2.93	2.24
Micas	0.00	2.20	0.64	1.68	1.09	0.84
Feldspars	0.00	0.21	0.17	0.65	0.26	0.20
Carbonates	0.00	0.07	0.08	0.12	0.09	0.07
Chlorite	0.00	0.10	0.08	0.14	0.09	0.07
Apatite	0.00	0.11	0.09	0.08	0.09	0.07
Rutile/Anatase	0.00	0.29	0.21	0.25	0.23	0.18
Kaolinite (clay)	0.00	0.29	0.14	0.22	0.18	0.14
Talc	0.00	0.52	0.84	2.60	1.10	0.84
Amphibole	0.00	0.06	0.09	0.47	0.15	0.12
Fluorite	0.00	0.02	0.04	0.01	0.03	0.02
Others	0.00	0.07	0.08	0.79	0.20	0.15
Total	0.00	100	100	100	100	100

Notes: 1) Iron Oxides includes Hematite, Limonite, Goethite, Magnetite.

2) Micas includes Muscovite and Biotite/Phlogopite.

3) Feldspars includes K-Feldspar, Alkali Feldspar, Feldspar-Albite, and Plagioclase Feldspar.

4) Carbonates includes Calcite, Dolomite, and Ankerite.

5) Chlorite includes Serpentine.

6) Rutile/Anatase includes trace amounts of Sphene and Ilmenite.

7) Kaolinite (clay) includes Alunite.

8) Others includes Sillimanite, Andalusite, Barite, Garnet Group Minerals, and unresolved mineral species.

9) The Normalized Distribution is the redistribution of the mineral composition based on Table C total

TABLE 6A
LIBERATION UNITS TABLE BY STREAM AND SIZE RANGE AND MINERAL CLASS FOR P4 WSA OVERALL SUMMARY
KM4420

WSA Bulk Rougher Tailing

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	23.8	0.0	0.0	0.0	0.1	26.9	0.1	0.1	0.1	0.2	20.2
Binary - Cp		0.0	0.0	0.0	0.3		0.0	0.0	0.0	0.1		0.0	0.0	0.0	0.0
Binary - Bn	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Binary - Ch	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0
Binary - Py	0.0	0.0	0.0		0.1	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Binary - Gn	2.0	1.3	1.0	0.4		0.7	1.3	0.2	0.3		0.1	0.2	0.2	0.1	
Multiphase	0.1	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total	2.1	1.5	1.3	0.5	24.3	0.8	1.3	0.2	0.4	27.1	0.2	0.3	0.5	0.3	20.2

Size Range	<C5					WSA Bulk Rougher Tailing				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	1.5	0.4	0.1	0.6	18.8	1.6	0.5	0.3	0.9	89.7
Binary - Cp		0.1	0.0	0.0	0.0		0.1	0.1	0.0	0.4
Binary - Bn	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Binary - Ch	0.0	0.1		0.0	0.0	0.0	0.1		0.0	0.1
Binary - Py	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.1
Binary - Gn	0.1	0.1	0.0	0.0		2.9	2.9	1.5	0.8	
Multiphase	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.3	0.1	0.1
Total	1.6	0.6	0.2	0.6	18.8	4.7	3.7	2.2	1.8	90.4

WSA Bulk Cleaner Scavenger Tailing

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	15.8	0.7	0.2	0.0	0.0	39.0	2.3
Binary - Cp		0.0	0.0	0.0	0.0		0.0	0.0	0.2	0.0		0.0	0.0	0.0	0.0
Binary - Bn	0.0		0.0	0.0	0.0	0.0		0.0	0.2	0.0	0.0		0.0	0.0	0.0
Binary - Ch	0.0	0.0		0.0	0.0	0.0	0.0		0.1	0.0	0.0	0.1		0.0	0.0
Binary - Py	0.0	0.0	0.0		0.0	0.2	1.0	1.0		0.1	0.1	0.1	0.2		0.1
Binary - Gn	0.0	0.0	0.0	0.0		1.0	0.3	0.4	1.6		0.1	0.0	0.0	2.5	
Multiphase	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.6	0.0	0.0	0.0	0.0	0.1	0.0
Total	0.0	0.0	0.0	0.0	0.0	1.3	1.5	1.7	18.5	0.9	0.4	0.3	0.3	41.6	2.4

Size Range	<C5					WSA Bulk Cleaner Scavenger Tailing				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	1.1	0.2	0.3	7.6	5.7	1.4	0.2	0.4	62.4	8.7
Binary - Cp		0.1	0.2	0.0	0.0		0.1	0.2	0.3	0.0
Binary - Bn	0.0		0.0	0.0	0.0	0.0		0.0	0.2	0.0
Binary - Ch	0.0	0.1		0.0	0.0	0.0	0.2		0.1	0.0
Binary - Py	0.0	0.0	0.0		0.1	0.3	1.1	1.2		0.3
Binary - Gn	0.0	0.0	0.0	0.4		1.1	0.3	0.5	4.5	
Multiphase	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.7	0.0
Total	1.3	0.4	0.6	8.0	5.8	3.0	2.2	2.6	68.2	9.1

WSA Bulk Final Concentrate

TABLE 6A

CONTINUED

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	0.0	7.6	2.7	3.7	4.5	0.0	53.1	29.1	30.4	13.3	0.1
Binary - Cp		0.0	0.0	0.0	0.0		1.0	0.6	2.0	0.0		7.5	5.0	3.5	0.1
Binary - Bn	0.0		0.0	0.0	0.0	1.1		0.7	0.2	0.0	3.0		4.1	0.5	0.0
Binary - Ch	0.0	0.0		0.0	0.0	0.3	1.5		0.7	0.0	3.4	12.1		1.5	0.0
Binary - Py	0.0	0.0	0.0		0.0	0.4	1.8	6.7		0.0	2.7	7.5	20.0		0.0
Binary - Gn	0.0	0.0	0.0	0.0		1.5	1.2	2.3	0.1		1.6	2.3	2.9	0.2	
Multiphase	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.4	0.2	0.0	0.7	0.4	0.5	0.2	0.0
Total	0.0	0.0	0.0	0.0	0.0	11.2	8.4	14.2	7.6	0.1	64.6	58.9	62.9	19.2	0.3

Size Range	<C5					WSA Bulk Final Concentrate				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	15.3	13.7	8.8	2.6	0.1	76.0	45.5	42.8	20.4	0.3
Binary - Cp		4.9	5.6	0.4	0.0		13.4	11.2	5.9	0.1
Binary - Bn	0.1		1.0	0.0	0.0	4.2		5.8	0.7	0.0
Binary - Ch	0.5	7.3		0.1	0.0	4.2	20.9		2.2	0.1
Binary - Py	0.3	0.3	1.9		0.0	3.4	9.6	28.6		0.0
Binary - Gn	0.2	0.6	0.7	0.1		3.4	4.1	5.9	0.4	
Multiphase	0.1	0.1	0.0	0.0	0.0	1.0	0.5	0.9	0.5	0.0
Total	16.5	26.8	18.1	3.2	0.2	92.3	94.2	95.1	30.0	0.6

Recalculated Flotation Feed

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	23.8	7.7	2.7	3.7	20.3	27.6	53.4	29.2	30.5	52.5	22.6
Binary - Cp		0.0	0.0	0.0	0.3		1.1	0.6	2.2	0.1		7.5	5.0	3.5	0.1
Binary - Bn	0.0		0.0	0.0	0.0	1.1		0.7	0.5	0.0	3.0		4.1	0.5	0.0
Binary - Ch	0.0	0.0		0.0	0.0	0.3	1.5		0.8	0.0	3.4	12.2		1.5	0.1
Binary - Py	0.0	0.0	0.0		0.1	0.6	2.8	7.6		0.2	2.9	7.7	20.3		0.2
Binary - Gn	2.0	1.3	1.0	0.4		3.3	2.8	2.8	2.0		1.8	2.5	3.2	2.8	
Multiphase	0.1	0.1	0.3	0.1	0.0	0.3	0.2	0.7	0.9	0.0	0.8	0.4	0.6	0.3	0.0
Total	2.1	1.5	1.3	0.5	24.3	13.3	11.2	16.1	26.6	28.0	65.2	59.5	63.6	61.1	22.9

Size Range	<C5					Recalculated Flotation Feed				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	18.0	14.4	9.3	10.9	24.7	79.0	46.3	43.5	83.7	98.7
Binary - Cp		5.1	5.8	0.4	0.0		13.7	11.4	6.1	0.5
Binary - Bn	0.1		1.1	0.0	0.0	4.3		5.8	1.0	0.0
Binary - Ch	0.6	7.4		0.1	0.0	4.3	21.2		2.3	0.1
Binary - Py	0.3	0.3	2.0		0.1	3.7	10.8	29.9		0.5
Binary - Gn	0.3	0.6	0.7	0.5		7.3	7.3	7.8	5.6	
Multiphase	0.1	0.1	0.0	0.0	0.0	1.3	0.8	1.6	1.3	0.1
Total	19.4	27.8	18.9	11.9	24.8	100	100	100	100	100

TABLE 6B
DISTRIBUTION BY SIZE RANGE AND MINERAL CLASS FOR P4 WSA OVERALL SUMMARY
KM4420

WSA Bulk Rougher Tailing

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	24.1	0.0	0.0	0.0	0.1	27.3	0.2	0.1	0.3	0.2	20.4
Binary - Cp		0.0	0.0	0.0	58.3		0.0	0.0	0.0	10.2		0.2	0.2	0.0	4.0
Binary - Bn	0.0		0.0	0.0	36.9	0.0		0.0	0.0	8.0	0.1		0.1	0.0	2.1
Binary - Ch	0.0	0.0		0.0	27.8	0.0	0.0		0.0	12.1	0.0	0.0		0.0	4.8
Binary - Py	0.0	0.0	0.0		13.1	0.0	0.0	0.0		7.6	0.0	0.3	0.2		2.2
Binary - Gn	27.2	18.3	13.2	7.2		10.0	18.0	2.4	4.9		1.1	2.1	3.1	1.1	
Multiphase	11.4	15.8	18.0	4.5	39.0	1.9	0.0	2.4	4.4	21.7	0.0	0.0	1.6	0.0	4.1

Size Range	<C5					WSA Bulk Rougher Tailing				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	1.9	0.9	0.3	0.7	19.1	2.0	1.1	0.6	1.0	90.9
Binary - Cp		0.4	0.3	0.0	0.9		0.6	0.6	0.0	73.4
Binary - Bn	0.1		0.1	0.0	1.6	0.2		0.2	0.0	48.7
Binary - Ch	1.0	0.3		0.0	1.2	1.1	0.3		0.0	45.9
Binary - Py	0.0	0.0	0.0		1.5	0.0	0.3	0.2		24.4
Binary - Gn	0.7	0.7	0.3	0.5		39.0	39.2	19.0	13.8	
Multiphase	0.4	0.0	0.0	0.0	0.3	13.7	15.8	22.0	8.9	65.1

WSA Bulk Cleaner Scavenger Tailing

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	18.8	0.7	0.2	0.0	0.1	46.6	2.3
Binary - Cp		0.0	0.0	0.0	0.0		0.3	0.1	3.5	5.8		0.2	0.0	0.5	1.0
Binary - Bn	0.0		0.0	0.0	0.0	0.4		0.3	23.8	2.3	0.0		0.0	1.0	0.7
Binary - Ch	0.0	0.0		0.0	0.0	0.2	0.2		4.6	1.9	0.0	0.3		1.0	0.2
Binary - Py	0.0	0.0	0.0		0.0	4.3	9.1	3.3		28.1	3.9	1.2	0.7		27.8
Binary - Gn	0.0	0.0	0.0	0.0		13.6	4.2	5.0	27.9		0.9	0.5	0.4	44.7	
Multiphase	0.0	0.0	0.0	0.0	0.0	6.9	17.6	19.1	50.4	13.3	2.6	0.0	0.4	4.2	1.1

Size Range	<C5					WSA Bulk Cleaner Scavenger Tailing				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	1.4	0.5	0.8	9.1	5.8	1.7	0.5	1.0	74.6	8.8
Binary - Cp		0.6	1.4	0.1	0.5		1.1	1.5	4.1	7.2
Binary - Bn	0.1		0.4	0.0	0.0	0.4		0.7	24.8	3.0
Binary - Ch	0.9	0.6		0.0	1.3	1.1	1.0		5.6	3.4
Binary - Py	0.4	0.0	0.1		13.6	8.6	10.3	4.1		69.5
Binary - Gn	0.6	0.0	0.5	7.0		15.1	4.7	5.9	79.5	
Multiphase	0.8	0.0	0.5	0.2	0.5	10.4	17.6	19.9	54.8	14.9

WSA Bulk Final Concentrate

TABLE 6B

CONTINUED

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	0.0	9.7	5.9	8.4	5.3	0.0	67.1	63.0	69.8	15.9	0.1
Binary - Cp		0.0	0.0	0.0	0.0		7.7	4.9	32.4	4.8		54.5	43.9	56.6	11.4
Binary - Bn	0.0		0.0	0.0	0.0	26.2		11.2	23.5	10.5	70.1		69.9	51.1	34.7
Binary - Ch	0.0	0.0		0.0	0.0	7.0	7.1		28.4	9.2	78.8	57.3		63.7	35.4
Binary - Py	0.0	0.0	0.0		0.0	11.0	17.0	22.3		1.1	73.2	69.9	67.0		4.0
Binary - Gn	0.0	0.0	0.0	0.0		20.8	16.4	28.9	2.2		22.2	32.0	37.4	3.5	
Multiphase	0.0	0.0	0.0	0.0	0.0	15.7	13.1	22.6	14.1	5.0	56.3	45.4	33.1	19.5	13.1

Size Range	<C5					WSA Bulk Final Concentrate				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	19.4	29.6	20.2	3.1	0.1	96.2	98.4	98.4	24.4	0.3
Binary - Cp		36.1	49.2	6.9	3.2		98.3	97.9	95.9	19.4
Binary - Bn	3.1		18.0	0.5	3.0	99.3		99.1	75.2	48.3
Binary - Ch	12.0	34.3		2.3	6.1	97.8	98.7		94.4	50.7
Binary - Py	7.3	2.6	6.5		0.9	91.4	89.4	95.7		6.1
Binary - Gn	2.9	7.8	8.8	1.0		45.9	56.2	75.1	6.7	
Multiphase	3.9	8.2	2.3	2.7	2.0	75.9	66.7	58.1	36.4	20.0

TABLE 6C
RECOVERY BY MINERAL CLASS BY SIZE RANGE FOR P4 WSA OVERALL SUMMARY
KM4420

>150µm Recovery Table

Product	WSA Bulk Rougher Tailing					WSA Bulk Cleaner Scavenger Tailing					WSA Bulk Final Concentrate				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Binary - Cp		0.0	0.0	0.0	100		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Binary - Bn	0.0		0.0	0.0	100	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Binary - Ch	0.0	0.0		0.0	100	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0
Binary - Py	0.0	0.0	0.0		100	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Binary - Gn	100	100	100	100		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Multiphase	100	100	100	100	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

<150>53µm Recovery Table

Product	WSA Bulk Rougher Tailing					WSA Bulk Cleaner Scavenger Tailing					WSA Bulk Final Concentrate				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.1	0.0	0.0	0.3	97.4	0.9	0.0	0.9	77.7	2.5	99.0	100	99.1	22.0	0.1
Binary - Cp		0.0	0.0	0.0	49.0		3.6	2.3	9.8	27.8		96.4	97.7	90.2	23.2
Binary - Bn	0.0		0.0	0.0	38.5	1.4		2.9	50.3	11.0	98.6		97.1	49.7	50.5
Binary - Ch	0.0	0.0		0.0	52.1	2.9	2.2		13.8	8.3	97.1	97.8		86.2	39.6
Binary - Py	0.0	0.0	0.0		20.7	28.1	34.8	12.8		76.2	71.9	65.2	87.2		3.1
Binary - Gn	22.5	46.7	6.7	14.0		30.7	10.8	13.6	79.6		46.8	42.5	79.7	6.4	
Multiphase	7.7	0.0	5.4	6.3	54.2	28.4	57.3	43.3	73.2	33.3	63.9	42.7	51.3	20.5	12.5

<53µm>C5 Recovery Table

Product	WSA Bulk Rougher Tailing					WSA Bulk Cleaner Scavenger Tailing					WSA Bulk Final Concentrate				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.3	0.2	0.4	0.4	89.2	0.3	0.0	0.2	74.3	10.1	99.4	99.8	99.4	25.4	0.6
Binary - Cp		0.4	0.5	0.0	24.7		0.4	0.0	1.0	5.9		99.2	99.5	99.0	69.4
Binary - Bn	0.1		0.2	0.0	5.7	0.0		0.0	2.0	1.8	99.9		99.8	98.0	92.5
Binary - Ch	0.1	0.1		0.0	11.9	0.0	0.6		1.6	0.5	99.9	99.4		98.4	87.6
Binary - Py	0.0	0.4	0.2		6.5	5.0	1.7	1.0		81.7	95.0	97.9	98.7		11.8
Binary - Gn	4.4	6.2	7.5	2.2		3.7	1.4	1.1	90.7		91.9	92.4	91.4	7.0	
Multiphase	0.0	0.0	4.5	0.0	22.4	4.5	0.0	1.1	17.8	6.3	95.5	100	94.5	82.2	71.4

<C5 Recovery Table

Product	WSA Bulk Rougher Tailing					WSA Bulk Cleaner Scavenger Tailing					WSA Bulk Final Concentrate				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	8.2	3.0	1.5	5.6	76.3	6.4	1.6	3.7	70.3	23.1	85.4	95.4	94.8	24.1	0.6
Binary - Cp		1.1	0.7	0.0	19.3		1.5	2.8	1.2	10.3		97.4	96.5	98.8	70.3
Binary - Bn	4.0		0.4	0.0	35.0	1.9		2.1	0.0	0.0	94.1		97.5	100	65.0
Binary - Ch	7.4	0.7		0.0	14.3	6.4	1.6		1.5	14.8	86.2	97.7		98.5	70.9
Binary - Py	0.0	0.0	0.0		9.2	5.4	0.0	2.2		85.1	94.6	100	97.8		5.7
Binary - Gn	16.2	8.5	2.9	6.4		14.9	0.0	5.1	81.5		68.8	91.5	91.9	12.1	
Multiphase	8.4	0.0	0.0	0.2	11.4	15.4	0.0	16.7	5.7	17.2	76.2	100	83.3	94.1	71.4

TABLE 6D
SIZE BY ASSAY AND DISTRIBUTION FOR P4 WSA OVERALL SUMMARY
KM4420

WSA Bulk Rougher Tailing

Size Fraction	Mass %	Metal Assays				Distribution			
		Cu	Fe	S		Cu	Fe	S	
>150µm	21.23	0.17	1.37	0.23		1.76	4.76	0.79	
<150>53µm	23.60	0.06	1.18	0.15		0.72	4.55	0.56	
<53µm>C5	17.60	0.04	1.97	0.13		0.32	5.67	0.37	
<C5	16.50	0.12	2.35	0.34		0.94	6.35	0.92	
Total	78.94	0.10	1.65	0.20		3.74	21.33	2.64	

Size Fraction	Mass %	Mineral Assays					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	21.23	0.29	0.05	0.05	0.19	99.41	2.15	1.46	1.32	0.47	24.26
<150>53µm	23.60	0.09	0.04	0.01	0.15	99.73	0.77	1.31	0.23	0.40	27.06
<53µm>C5	17.60	0.04	0.01	0.02	0.13	99.83	0.22	0.29	0.47	0.25	20.20
<C5	16.50	0.27	0.03	0.01	0.33	99.34	1.58	0.59	0.21	0.64	18.84
Total	78.94	0.17	0.03	0.02	0.19	99.58	4.71	3.65	2.23	1.76	90.36

WSA Bulk Cleaner Scavenger Tailing

Size Fraction	Mass %	Metal Assays				Distribution			
		Cu	Fe	S		Cu	Fe	S	
>150µm	0.00	0.00	0.00	0.00		0.00	0.00	0.00	
<150>53µm	2.37	1.31	30.71	37.28		1.51	11.91	14.41	
<53µm>C5	5.59	0.13	28.89	34.68		0.34	26.43	31.63	
<C5	5.98	0.30	7.68	7.28		0.87	7.51	7.11	
Total	13.93	0.40	20.10	23.37		2.72	45.85	53.15	

Size Fraction	Mass %	Mineral Assays					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<150>53µm	2.37	1.61	0.44	0.59	67.78	32.57	1.35	1.49	1.73	18.53	0.89
<53µm>C5	5.59	0.21	0.03	0.04	64.56	37.89	0.41	0.26	0.30	41.63	2.43
<C5	5.98	0.59	0.05	0.08	11.65	83.89	1.25	0.43	0.61	8.03	5.76
Total	13.93	0.61	0.11	0.15	42.41	56.72	3.01	2.19	2.64	68.20	9.08

WSA Bulk Final Concentrate

TABLE 6D

CONTINUED

Size Fraction	Mass %	Metal Assays				Distribution			
		Cu	Fe	S		Cu	Fe	S	
>150µm	0.00	0.00	0.00	0.00		0.00	0.00	0.00	
<150>53µm	1.23	19.37	31.12	41.46		11.62	6.25	8.31	
<53µm>C5	4.66	27.68	28.95	39.06		63.02	22.08	29.71	
<C5	1.25	30.96	21.96	30.37		18.89	4.49	6.19	
Total	7.13	26.82	28.10	37.95		93.54	32.83	44.21	

Size Fraction	Mass %	Mineral Assays					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<150>53µm	1.23	25.77	4.84	9.35	53.92	5.89	11.19	8.40	14.16	7.64	0.08
<53µm>C5	4.66	39.17	8.94	10.94	35.71	5.56	64.56	58.94	62.87	19.21	0.30
<C5	1.25	37.43	15.17	11.75	22.17	12.55	16.53	26.82	18.10	3.20	0.18
Total	7.13	36.56	9.32	10.81	36.47	6.84	92.28	94.16	95.13	30.04	0.56

Recalculated Flotation Feed

Size Fraction	Mass %	Metal Assays				Distribution			
		Cu	Fe	S		Cu	Fe	S	
>150µm	21.23	0.17	1.37	0.23		1.76	4.76	0.79	
<150>53µm	27.20	1.04	5.10	5.24		13.85	22.70	23.28	
<53µm>C5	27.85	4.68	11.88	13.57		63.69	54.18	61.72	
<C5	23.72	1.79	4.73	3.67		20.70	18.36	14.21	
Total	100	2.05	6.11	6.12		100	100	100	

Size Fraction	Mass %	Mineral Assays					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	21.23	0.29	0.05	0.05	0.19	99.41	2.15	1.46	1.32	0.47	24.26
<150>53µm	27.20	1.38	0.29	0.48	8.46	89.64	13.30	11.21	16.12	26.57	28.03
<53µm>C5	27.85	6.62	1.51	1.85	19.00	71.63	65.19	59.49	63.64	61.10	22.93
<C5	23.72	2.31	0.83	0.65	4.33	90.88	19.37	27.84	18.92	11.87	24.78
Total	100	2.83	0.71	0.81	8.66	87.00	100	100	100	100	100

TABLE 7A
SUMMARY OF PERCENT LIBERATION BY SIZE AND CLASS
P8 WSB Flotation Feed
KM4420

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	1.1	0.0	1.0	8.3	23.4	12.3	2.1	4.8	30.7	26.7	25.5	21.9	15.0	18.7	24.9
Binary - Cp		0.7	0.0	1.7	0.9		2.4	0.4	4.8	0.5		5.4	0.0	0.8	0.2
Binary - Bn	0.0		0.3	0.0	0.0	0.3		5.7	0.1	0.0	0.7		4.6	0.0	0.0
Binary - Ch	0.3	1.6		1.9	0.4	2.9	4.8		3.6	0.3	0.8	7.7		0.7	0.0
Binary - Py	3.3	6.3	5.2		0.8	4.1	8.0	13.2		0.5	1.6	2.8	7.4		0.1
Binary - Gn	12.8	9.6	6.0	8.3		14.9	12.5	15.4	10.6		3.0	4.0	1.0	1.3	
Multiphase	1.4	3.4	6.3	3.4	0.4	3.2	1.8	11.5	2.8	0.2	0.4	0.6	0.2	0.3	0.0
Total	18.9	21.5	18.7	23.6	25.8	37.7	31.5	51.1	52.6	28.2	32.0	42.4	28.2	21.7	25.2

Size Range	<C5				
Mineral Status	Cp	Bn	Ch	Py	Gn
Liberated	11.1	2.9	1.2	1.9	20.5
Binary - Cp		0.4	0.3	0.0	0.1
Binary - Bn	0.2		0.3	0.0	0.0
Binary - Ch	0.0	0.8		0.0	0.0
Binary - Py	0.0	0.0	0.0		0.0
Binary - Gn	0.1	0.6	0.2	0.1	
Multiphase	0.0	0.0	0.0	0.0	0.0
Total	11.4	4.6	1.9	2.1	20.7

SUMMARY OF MINERAL DISTRIBUTION BY CLASS OF ASSOCIATION

Mineral Status	Mineral Liberation-2 Dimensions					Mineral Liberation-3 Dimensions				
	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	50.0	26.9	22.0	59.5	95.5	37.4	8.6	2.5	49.4	94.4
Binary - Cp		8.8	0.8	7.3	1.7		11.0	1.0	9.2	2.2
Binary - Bn	1.2		10.9	0.2	0.0	1.6		13.6	0.2	0.0
Binary - Ch	4.0	14.8		6.2	0.7	5.1	18.5		7.8	0.9
Binary - Py	9.1	17.1	25.8		1.5	11.3	21.4	32.3		1.8
Binary - Gn	30.8	26.7	22.6	20.3		38.5	33.3	28.2	25.3	
Multiphase	4.9	5.7	18.0	6.5	0.5	6.1	7.2	22.5	8.1	0.7
Total	100	100	100	100	100	100	100	100	100	100

Notes 1) Cp-Chalcocopyrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite,
Py-Pyrite, Molybdenite and Sphalerite, Gn-Non-Sulphide Minerals.

2) 0.0 Indicates these minerals were not observed during the counting procedure.

3) The 150 and 53µm sizing fractions correspond to the Tyler 100 and 270 mesh sieves.
C1 to C5 indicates cyclones 1 to 5 on the cyclosizer.

4) The Total line is the distribution of mineral in the size fraction. Original data is from the size by assay and distribution tables.

5) The calculated liberation of the unsized product as measured in two dimensions has been converted to three dimensions using correction factors developed by ALS Metallurgy Kamloops.

6) The three dimension liberation is zero if the liberation in two dimensions is less than 20 percent.

7) Mineral liberation was achieved using QEMSCAN and checked and adjusted using optical methods as necessary.

TABLE 7B
SIZE BY ASSAY AND DISTRIBUTION BASED ON METAL CONTENT
P8 WSB Flotation Feed

Size Fraction	Mass %	Assays-percent					Distribution				
		Cu	Fe	S			Cu	Fe	S		
>150µm	25.3	1.64	6.20	5.8			19.2	23.5	22.5		
<150>53µm	31.0	2.85	9.60	10.4			40.9	44.7	49.1		
<53µm>C5	25.3	2.75	6.10	6.3			32.2	23.1	24.2		
<C5	18.5	0.91	3.11	1.5			7.8	8.6	4.2		
Total	100	2.16	6.66	6.6			100	100	100		

Notes: 1) The assays shown in this table are utilized to determine the mineralogical distribution shown in Table C

TABLE 7C
SIZE BY ASSAY AND DISTRIBUTION BASED ON MINERAL CONTENT
P8 WSB Flotation Feed

Size Fraction	Mass %	Assays-percent					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	25.3	2.71	0.38	0.58	8.5	87.8	18.9	21.5	18.7	23.6	25.8
<150>53µm	31.0	4.41	0.45	1.30	15.5	78.3	37.7	31.5	51.1	52.6	28.2
<53µm>C5	25.3	4.60	0.74	0.88	7.9	85.9	32.0	42.4	28.2	21.7	25.2
<C5	18.5	2.24	0.11	0.08	1.0	96.5	11.4	4.6	1.9	2.1	20.7
Total	100	3.63	0.44	0.79	9.1	86.0	100	100	100	100	100

Notes: 1) Cp-Chalcopryite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite, Py-Pyrite, Molybdenite and Sphalerite, Gn-Non-Sulphide Minerals.

2) Mineral assays are based on gravimetric factors to convert the metal to the pure mineral.

3) See appendix I for details of gravimetric factors.

4) An assay value of "0" indicates the assay value is less than the detection limit.

TABLE 7D
ESTIMATED RELATIVE PROPORTION AND COMPOSITION OF MINERAL GRAINS
P8 WSB Flotation Feed

Binary Component	Proportion by Weight-2D					Proportion by Weight-3D					Composition of Grains				
	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	1.81	0.12	0.17	5.44	82.2	1.36	0.04	0.02	4.52	81.2	100	100	100	100	100
Binary - Cp		0.04	0.01	0.67	1.5		0.05	0.01	0.84	1.9		46	4	67	57
Binary - Bn	0.05		0.09	0.02	0.0	0.06		0.11	0.02	0.0	54		57	17	17
Binary - Ch	0.15	0.07		0.57	0.6	0.18	0.08		0.71	0.8	96	43		74	77
Binary - Py	0.33	0.08	0.20		1.2	0.41	0.09	0.25		1.6	33	83	26		40
Binary - Gn	1.12	0.12	0.18	1.85		1.40	0.15	0.22	2.31		43	83	23	60	
Multiphase	0.18	0.03	0.14	0.59	0.5	0.22	0.03	0.18	0.74	0.6	13	2	10	42	33
Average Composition	3.63	0.44	0.79	9.14	86.0	3.63	0.44	0.79	9.14	86.0	46	19	19	73	94

Notes 1) The two-dimensional proportion of minerals is a weighted estimate which is based on the liberation and the mineral content of the unsized sample.

2) The three-dimensional data is based on converting the two dimensional liberation data using ALS Metallurgy Kamloops correction factors.

3) Composition values of "0" represents values <2% and "100" represents values >98%.

TABLE 7E
DISTRIBUTION BY SIZE RANGE OF COPPER AND IRON BEARING MINERALS
P8 WSB Flotation Feed

Size Fraction	Mass %	% Copper Bearing Minerals						% Copper of Total Copper						% Iron of Total Iron			
		Cp	Bn	Ch	Cv	En	NCu	Cp	Bn	Ch	Cv	En	NCu	Cs	Py	FeOx	Gn
>150µm	25.3	73.8	10.3	14.7	1.0	0.2	0.0	58.8	14.9	24.5	1.5	0.2	0.1	15.2	63.4	4.4	17.0
<150>53µm	31.0	71.6	7.3	20.7	0.1	0.2	0.1	55.6	10.4	33.5	0.2	0.2	0.1	15.5	73.0	3.9	7.6
<53µm>C5	25.3	73.9	12.0	12.1	1.7	0.2	0.0	58.0	17.2	21.9	2.6	0.3	0.1	19.5	51.9	7.1	21.5
<C5	18.5	92.1	4.5	2.4	0.6	0.4	0.1	85.6	7.7	5.0	1.1	0.5	0.1	20.0	13.0	13.6	53.4
Total	100	74.7	9.1	15.1	0.9	0.2	0.0	59.3	13.2	25.8	1.3	0.2	0.1	16.7	60.7	5.6	17.0

Notes 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite, Cv-Covellite, En-Enargite/Tennantite, NCu-Native Copper/Cuprite.

Cs-Chalcopyrite and Bornite, Py-Pyrite, FeOx-Magnetite, Hematite, Goethite and Limonite, Gn-Non Sulphide Minerals

TABLE 7F
COMPARATIVE ASSAY TABLE
P8 WSB Flotation Feed

Methods	Cu	Fe	S
QEMSCAN	2.2	7.1	6.6
Chemical	2.2	6.7	6.6

Notes 1) This table compares the chemical composition of the samples determined by chemical analysis with the composition determined by QEMSCAN analysis.

TABLE 7G
THE WEIGHT OF THE OBSERVED MINERALS
P8 WSB Flotation Feed

Mineral	Mineral Assays (percent)					Normalized Distribution
	>150µm	<150>53µm	<53µm>C5	<C5	Total	
Chalcopyrite	2.78	4.62	4.50	2.29	3.70	3.63
Bornite	0.39	0.47	0.73	0.11	0.45	0.44
Chalcocite	0.55	1.34	0.74	0.06	0.75	0.73
Covellite	0.04	0.01	0.11	0.02	0.04	0.04
Enargite/Tennantite	0.01	0.01	0.01	0.01	0.01	0.01
Native Copper/Cuprite	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenite	0.03	0.02	0.16	0.05	0.06	0.06
Sphalerite	0.04	0.05	0.14	0.07	0.07	0.07
Pyrite	8.21	15.4	8.30	0.99	9.12	9.14
Iron Oxides	0.39	0.55	0.76	0.72	0.59	0.59
Quartz	51.8	51.9	43.4	16.5	43.2	43.2
Micas	28.5	19.3	30.8	63.1	32.6	32.7
Feldspars	2.79	2.46	3.24	4.39	3.10	3.10
Carbonates	0.24	0.24	0.27	0.66	0.33	0.33
Chlorite	0.32	0.35	0.63	1.29	0.59	0.59
Apatite	0.36	0.47	0.63	0.72	0.53	0.53
Rutile/Anatase	1.19	0.82	2.00	0.91	1.23	1.23
Kaolinite (clay)	1.62	1.39	2.31	6.50	2.62	2.63
Talc	0.13	0.17	0.33	0.16	0.20	0.20
Amphibole	0.31	0.20	0.43	0.48	0.34	0.34
Fluorite	0.05	0.08	0.10	0.03	0.07	0.07
Others	0.19	0.20	0.39	0.98	0.39	0.39
Total	100	100	100	100	100	100

Notes: 1) Iron Oxides includes Magnetite, Hematite, Limonite and Goethite.

2) Micas includes Muscovite and Biotite/Phlogopite.

3) Feldspars includes K-Feldspar, Alkali Feldspar, Plagioclase Feldspar, and Feldspar Albite.

4) Carbonates includes Calcite, Dolomite and Ankerite.

5) Chlorite includes trace amounts of Epidote.

6) Ti Minerals includes Rutile/Anatase and trace amounts of Sphene.

7) Others includes Sillimanite, Garnet group minerals, and trace amounts of unresolved mineral species.

8) The Normalized Distribution is the redistribution of the mineral composition based on Table C total mineral chemical assay values.

TABLE 8A
SUMMARY OF PERCENT LIBERATION BY SIZE AND CLASS
P8 WSB Cleaner Scavenger Tailing
KM4420

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	15.7	6.5	4.0	0.9	1.7	58.0	27.1
Binary - Cp		0.0	0.0	0.0	0.0		0.0	0.0	0.5	0.2		0.0	6.4	0.8	0.1
Binary - Bn	0.0		0.0	0.0	0.0	0.0		0.0	0.1	0.0	0.0		2.6	0.0	0.0
Binary - Ch	0.0	0.0		0.0	0.0	0.0	0.0		1.8	0.1	0.2	0.0		0.4	0.0
Binary - Py	0.0	0.0	0.0		0.0	0.3	7.3	27.3		0.6	2.4	14.1	18.4		1.0
Binary - Gn	0.0	0.0	0.0	0.0		11.9	4.5	7.4	2.0		11.7	9.3	7.7	3.7	
Multiphase	0.0	0.0	0.0	0.0	0.0	0.4	2.3	8.2	0.5	0.1	1.0	1.8	1.3	0.1	0.0
Total	0.0	0.0	0.0	0.0	0.0	12.6	14.3	43.7	20.6	7.4	19.3	26.0	38.0	63.2	28.2

Size Range	<C5				
Mineral Status	Cp	Bn	Ch	Py	Gn
Liberated	65.1	44.1	12.0	15.3	62.2
Binary - Cp		1.3	2.8	0.0	0.3
Binary - Bn	2.4		2.3	0.0	0.0
Binary - Ch	0.0	11.7		0.0	0.0
Binary - Py	0.5	1.3	0.2		1.8
Binary - Gn	0.0	1.3	0.9	0.8	
Multiphase	0.0	0.0	0.0	0.0	0.0
Total	68.0	59.7	18.2	16.2	64.4

SUMMARY OF MINERAL DISTRIBUTION BY CLASS OF ASSOCIATION

Mineral Status	Mineral Liberation-2 Dimensions					Mineral Liberation-3 Dimensions				
	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	69.1	45.1	14.5	89.1	95.8	61.4	31.4	0.0	86.3	94.8
Binary - Cp		1.3	9.2	1.4	0.5		1.6	10.8	1.7	0.6
Binary - Bn	2.4		4.9	0.1	0.0	3.0		5.7	0.1	0.0
Binary - Ch	0.2	11.7		2.2	0.2	0.2	14.6		2.8	0.2
Binary - Py	3.2	22.7	45.9		3.3	4.0	28.4	53.7		4.2
Binary - Gn	23.6	15.1	16.0	6.5		29.5	18.9	18.7	8.2	
Multiphase	1.4	4.1	9.5	0.7	0.1	1.8	5.1	11.1	0.9	0.2
Total	100	100	100	100	100	100	100	100	100	100

Notes 1) Cp-Chalcopryrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite, Py-Pyrite, Molybdenite and Sphalerite, Gn-Non-Sulphide Minerals.

2) 0.0 Indicates these minerals were not observed during the counting procedure.

3) The 150 and 53µm sizing fractions correspond to the Tyler 100 and 270 mesh sieves. C1 to C5 indicates cyclones 1 to 5 on the cyclosizer.

4) The Total line is the distribution of mineral in the size fraction. Original data is from the size by assay and distribution tables.

5) The calculated liberation of the unsized product as measured in two dimensions has been converted to three dimensions using correction factors developed by ALS Metallurgy Kamloops.

6) The three dimension liberation is zero if the liberation in two dimensions is less than 20 percent.

7) Mineral liberation was achieved using QEMSCAN and checked and adjusted using optical methods as necessary.

TABLE 8B
SIZE BY ASSAY AND DISTRIBUTION BASED ON METAL CONTENT
P8 WSB Cleaner Scavenger Tailing

Size Fraction	Mass %	Assays-percent					Distribution				
		Cu	Fe	S			Cu	Fe	S		
>150µm	0.0	0.00	0.00	0.00			0.0	0.0	0.0		
<150>53µm	10.7	0.73	21.5	25.4			21.1	18.3	20.2		
<53µm>C5	36.6	0.25	19.6	22.5			24.7	57.0	61.3		
<C5	52.7	0.38	5.9	4.7			54.1	24.7	18.4		
Total	100	0.37	12.6	13.4			100	100	100		

Notes: 1) The assays shown in this table are utilized to determine the mineralogical distribution shown in Table C

TABLE 8C
SIZE BY ASSAY AND DISTRIBUTION BASED ON MINERAL CONTENT
P8 WSB Cleaner Scavenger Tailing

Size Fraction	Mass %	Assays-percent					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<150>53µm	10.7	0.85	0.05	0.51	46.5	52.1	12.6	14.3	43.7	20.6	7.4
<53µm>C5	36.6	0.38	0.03	0.13	41.6	57.8	19.3	26.0	38.0	63.2	28.2
<C5	52.7	0.93	0.04	0.04	7.4	91.6	68.0	59.7	18.2	16.2	64.4
Total	100	0.72	0.04	0.12	24.1	75.0	100	100	100	100	100

Notes: 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite, Py-Pyrite, Molybdenite and Sphalerite, Gn-Non-Sulphide Minerals.

2) Mineral assays are based on gravimetric factors to convert the metal to the pure mineral.

3) See appendix I for details of gravimetric factors.

4) An assay value of "0" indicates the assay value is less than the detection limit.

TABLE 8D
ESTIMATED RELATIVE PROPORTION AND COMPOSITION OF MINERAL GRAINS
P8 WSB Cleaner Scavenger Tailing

Binary Component	Proportion by Weight-2D					Proportion by Weight-3D					Composition of Grains				
	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.50	0.02	0.02	21.5	71.9	0.44	0.01	0.00	20.8	71.1	100	100	100	100	100
Binary - Cp		0.00	0.01	0.3	0.4		0.00	0.01	0.4	0.5		3	90	93	69
Binary - Bn	0.02		0.01	0.0	0.0	0.02		0.01	0.0	0.0	97		55	75	20
Binary - Ch	0.00	0.00		0.5	0.1	0.00	0.01		0.7	0.2	10	45		91	88
Binary - Py	0.02	0.01	0.06		2.5	0.03	0.01	0.07		3.1	7	25	9		61
Binary - Gn	0.17	0.01	0.02	1.6		0.21	0.01	0.02	2.0		31	80	12	39	
Multiphase	0.01	0.00	0.01	0.2	0.1	0.01	0.00	0.01	0.2	0.1	3	1	4	56	36
Average Composition	0.72	0.04	0.12	24.1	75.0	0.72	0.04	0.12	24.1	75.0	36	8	9	88	97

Notes 1) The two-dimensional proportion of minerals is a weighted estimate which is based on the liberation and the mineral content of the unsized sample.

2) The three-dimensional data is based on converting the two dimensional liberation data using ALS Metallurgy Kamloops correction factors.

3) Composition values of "0" represents values <2% and "100" represents values >98%.

TABLE 8E
DISTRIBUTION BY SIZE RANGE OF COPPER AND IRON BEARING MINERALS
P8 WSB Cleaner Scavenger Tailing

Size Fraction	Mass %	% Copper Bearing Minerals						% Copper of Total Copper						% Iron of Total Iron			
		Cp	Bn	Ch	Cv	En	NCu	Cp	Bn	Ch	Cv	En	NCu	Cs	Py	FeOx	Gn
>150µm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<150>53µm	10.7	60.2	3.7	34.1	1.7	0.3	0.0	42.8	4.8	49.7	2.4	0.2	0.0	1.4	94.3	1.7	2.6
<53µm>C5	36.6	70.7	5.2	20.4	3.4	0.3	0.0	56.4	7.6	30.6	5.2	0.3	0.0	0.6	91.2	2.1	6.2
<C5	52.7	91.2	4.4	0.3	3.2	0.7	0.2	84.9	7.4	0.6	5.8	0.9	0.4	4.5	53.2	11.5	30.8
Total	100	81.4	4.4	10.6	3.0	0.5	0.1	68.9	6.9	18.4	4.9	0.6	0.2	1.7	82.4	4.3	11.6

Notes 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite, Cv-Covellite, En-Enargite/Tennantite, NCu-Native Copper/Cuprite.

Cs-Chalcopyrite and Bornite, Py-Pyrite, FeOx-Magnetite, Hematite, Goethite and Limonite, Gn-Non Sulphide Minerals

TABLE 8F
COMPARATIVE ASSAY TABLE
P8 WSB Cleaner Scavenger Tailing

Methods	Cu	Fe	S
QEMSCAN	0.4	13.2	13.0
Chemical	0.4	12.6	13.4

Notes 1) This table compares the chemical composition of the samples determined by chemical analysis with the composition determined by QEMSCAN analysis.

TABLE 8G
THE WEIGHT OF THE OBSERVED MINERALS
P8 WSB Cleaner Scavenger Tailing

Mineral	Mineral Assays (percent)					Normalized Distribution
	>150µm	<150>53µm	<53µm>C5	<C5	Total	
Chalcopyrite	0.00	0.89	0.38	0.90	0.71	0.72
Bornite	0.00	0.06	0.03	0.04	0.04	0.04
Chalcocite	0.00	0.51	0.11	0.00	0.10	0.09
Covellite	0.00	0.03	0.02	0.03	0.03	0.03
Enargite/Tennantite	0.00	0.00	0.00	0.01	0.00	0.00
Native Copper/Cuprite	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenite	0.00	0.01	0.00	0.01	0.01	0.01
Sphalerite	0.00	0.02	0.01	0.01	0.01	0.01
Pyrite	0.00	42.6	41.1	7.05	23.3	24.1
Iron Oxides	0.00	0.49	0.62	1.09	0.85	0.84
Quartz	0.00	36.7	25.9	19.1	23.5	23.2
Micas	0.00	14.0	23.8	55.1	39.3	38.9
Feldspars	0.00	1.58	1.98	5.36	3.72	3.68
Carbonates	0.00	0.18	0.34	0.83	0.58	0.57
Chlorite	0.00	0.20	0.46	1.03	0.73	0.73
Apatite	0.00	0.35	0.60	0.70	0.63	0.62
Rutile/Anatase	0.00	0.91	1.48	1.19	1.27	1.25
Kaolinite (clay)	0.00	1.00	1.70	4.85	3.29	3.25
Talc	0.00	0.06	0.20	0.28	0.23	0.22
Amphibole	0.00	0.11	0.54	0.94	0.70	0.70
Fluorite	0.00	0.02	0.04	0.09	0.07	0.07
Others	0.00	0.26	0.68	1.30	0.96	0.95
Total	0.00	100	100	100	100	100

- Notes: 1) Iron Oxides includes Magnetite, Hematite, Limonite and Goethite.
2) Micas includes Muscovite and Biotite/Phlogopite.
3) Feldspars includes K-Feldspar, Alkali Feldspar, Plagioclase Feldspar, and Feldspar Albite.
4) Carbonates includes Calcite, Dolomite and Ankerite.
5) Chlorite includes trace amounts of Epidote.
6) Ti Minerals includes Rutile/Anatase and trace amounts of Sphene.
7) Others includes Sillimanite, Garnet group minerals, and trace amounts of unresolved mineral species.
8) The Normalized Distribution is the redistribution of the mineral composition based on Table C total mineral chemical assay values.

TABLE 9A
SUMMARY OF PERCENT LIBERATION BY SIZE AND CLASS
P8 WSB Bulk Pyrite Rougher Concentrate
KM4420

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	11.0	4.2	0.6	0.8	0.2	39.4	2.5	3.8	1.2	1.4	26.3	30.8
Binary - Cp		0.5	0.0	1.4	0.5		0.4	0.0	1.4	0.1		0.8	0.1	0.1	0.0
Binary - Bn	0.1		1.4	0.0	0.0	0.2		0.3	0.1	0.0	0.6		0.2	0.0	0.0
Binary - Ch	0.2	2.6		0.5	0.2	0.0	0.2		0.6	0.0	0.4	0.2		0.0	0.0
Binary - Py	8.5	9.8	10.0		2.5	5.3	17.5	8.5		1.0	2.1	6.1	3.7		0.5
Binary - Gn	21.1	22.1	23.0	4.2		11.3	10.2	5.5	6.5		4.3	0.8	1.9	1.7	
Multiphase	11.4	13.9	12.0	1.7	0.3	5.3	3.6	4.2	1.5	0.1	0.7	0.2	0.8	0.0	0.0
Total	41.3	48.8	46.4	18.8	7.6	22.6	32.8	18.6	49.5	3.7	11.8	9.3	8.0	28.1	31.4

Size Range	<C5				
Mineral Status	Cp	Bn	Ch	Py	Gn
Liberated	23.4	5.1	17.2	3.5	57.1
Binary - Cp		0.0	3.3	0.0	0.0
Binary - Bn	0.4		4.9	0.0	0.0
Binary - Ch	0.2	2.7		0.0	0.0
Binary - Py	0.2	0.7	0.7		0.2
Binary - Gn	0.2	0.7	1.0	0.1	
Multiphase	0.0	0.0	0.0	0.0	0.0
Total	24.3	9.2	27.0	3.6	57.4

SUMMARY OF MINERAL DISTRIBUTION BY CLASS OF ASSOCIATION

Mineral Status	Mineral Liberation-2 Dimensions					Mineral Liberation-3 Dimensions				
	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	27.8	7.1	18.8	80.2	94.6	9.7	0.0	0.0	75.2	93.3
Binary - Cp		1.7	3.3	3.0	0.7		1.8	4.1	3.7	0.9
Binary - Bn	1.1		6.7	0.1	0.0	1.4		8.3	0.2	0.0
Binary - Ch	0.8	5.7		1.1	0.2	1.0	6.1		1.4	0.3
Binary - Py	16.0	34.0	22.8		4.1	20.0	36.6	28.1		5.2
Binary - Gn	36.9	33.8	31.3	12.4		46.2	36.4	38.6	15.5	
Multiphase	17.3	17.7	17.0	3.3	0.3	21.7	19.0	20.9	4.1	0.4
Total	100	100	100	100	100	100	100	100	100	100

Notes 1) Cp-Chalcopryrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite,
Py-Pyrite, Molybdenite and Sphalerite, Gn-Non-Sulphide Minerals.

2) 0.0 Indicates these minerals were not observed during the counting procedure.

3) The 150 and 53µm sizing fractions correspond to the Tyler 100 and 270 mesh sieves.
C1 to C5 indicates cyclones 1 to 5 on the cyclosizer.

4) The Total line is the distribution of mineral in the size fraction. Original data is from the size by assay and distribution tables.

5) The calculated liberation of the unsized product as measured in two dimensions has been converted to three dimensions using correction factors developed by ALS Metallurgy Kamloops.

6) The three dimension liberation is zero if the liberation in two dimensions is less than 20 percent.

7) Mineral liberation was achieved using QEMSCAN and checked and adjusted using optical methods as necessary.

TABLE 9B
SIZE BY ASSAY AND DISTRIBUTION BASED ON METAL CONTENT
P8 WSB Bulk Pyrite Rougher Concentrate

Size Fraction	Mass %	Assays-percent					Distribution				
		Cu	Fe	S			Cu	Fe	S		
>150µm	11.5	1.28	24.1	29.6			44.3	17.8	19.1		
<150>53µm	18.9	0.41	38.1	46.4			23.2	46.1	49.0		
<53µm>C5	30.1	0.11	14.0	16.5			10.0	27.0	27.8		
<C5	39.5	0.19	3.6	1.9			22.5	9.1	4.1		
Total	100	0.33	15.6	17.9			100	100	100		

Notes: 1) The assays shown in this table are utilized to determine the mineralogical distribution shown in Table C

TABLE 9C
SIZE BY ASSAY AND DISTRIBUTION BASED ON MINERAL CONTENT
P8 WSB Bulk Pyrite Rougher Concentrate

Size Fraction	Mass %	Assays-percent					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	11.5	1.71	0.41	0.54	53.6	43.7	41.3	48.8	46.4	18.8	7.6
<150>53µm	18.9	0.57	0.17	0.13	86.2	13.0	22.6	32.8	18.6	49.5	3.7
<53µm>C5	30.1	0.19	0.03	0.04	30.6	69.1	11.8	9.3	8.0	28.1	31.4
<C5	39.5	0.30	0.02	0.09	3.0	96.6	24.3	9.2	27.0	3.6	57.4
Total	100	0.48	0.10	0.14	32.9	66.4	100	100	100	100	100

Notes: 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite, Py-Pyrite, Molybdenite and Sphalerite, Gn-Non-Sulphide Minerals.

2) Mineral assays are based on gravimetric factors to convert the metal to the pure mineral.

3) See appendix I for details of gravimetric factors.

4) An assay value of "0" indicates the assay value is less than the detection limit.

TABLE 9D
ESTIMATED RELATIVE PROPORTION AND COMPOSITION OF MINERAL GRAINS
P8 WSB Bulk Pyrite Rougher Concentrate

Binary Component	Proportion by Weight-2D					Proportion by Weight-3D					Composition of Grains				
	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.13	0.01	0.03	26.3	62.8	0.05	0.00	0.00	24.7	62.0	100	100	100	100	100
Binary - Cp		0.00	0.00	1.0	0.5		0.00	0.01	1.2	0.6		21	53	93	72
Binary - Bn	0.01		0.01	0.0	0.0	0.01		0.01	0.1	0.0	79		66	62	34
Binary - Ch	0.00	0.01		0.4	0.1	0.00	0.01		0.4	0.2	47	34		92	77
Binary - Py	0.08	0.03	0.03		2.8	0.10	0.04	0.04		3.4	7	38	8		40
Binary - Gn	0.18	0.03	0.04	4.1		0.22	0.04	0.05	5.1		28	66	23	60	
Multiphase	0.08	0.02	0.02	1.1	0.2	0.10	0.02	0.03	1.3	0.3	6	1	2	76	15
Average Composition	0.48	0.10	0.14	32.9	66.4	0.48	0.10	0.14	32.9	66.4	12	5	5	89	91

Notes 1) The two-dimensional proportion of minerals is a weighted estimate which is based on the liberation and the mineral content of the unsized sample.

2) The three-dimensional data is based on converting the two dimensional liberation data using ALS Metallurgy Kamloops correction factors.

3) Composition values of "0" represents values <2% and "100" represents values >98%.

TABLE 9E
DISTRIBUTION BY SIZE RANGE OF COPPER AND IRON BEARING MINERALS
P8 WSB Bulk Pyrite Rougher Concentrate

Size Fraction	Mass %	% Copper Bearing Minerals						% Copper of Total Copper						% Iron of Total Iron			
		Cp	Bn	Ch	Cv	En	NCu	Cp	Bn	Ch	Cv	En	NCu	Cs	Py	FeOx	Gn
>150µm	11.5	64.3	15.3	18.7	1.5	0.3	0.0	47.2	20.5	29.9	2.1	0.3	0.1	2.4	94.1	1.4	2.1
<150>53µm	18.9	65.6	19.1	14.1	0.9	0.3	0.0	48.8	25.9	23.7	1.3	0.3	0.0	0.5	98.9	0.3	0.3
<53µm>C5	30.1	74.8	11.8	12.3	0.3	0.8	0.0	60.9	17.6	20.3	0.5	0.7	0.0	0.4	85.4	2.6	11.6
<C5	39.5	71.9	5.5	21.7	0.8	0.0	0.0	54.4	7.6	36.8	1.2	0.0	0.0	2.3	38.5	6.5	52.6
Total	100	67.5	13.6	17.6	1.1	0.3	0.0	50.5	18.6	29.1	1.5	0.3	0.0	1.0	88.9	1.7	8.4

Notes 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite, Cv-Covellite, En-Enargite/Tennantite, NCu-Native Copper/Cuprite.

Cs-Chalcopyrite and Bornite, Py-Pyrite, FeOx-Magnetite, Hematite, Goethite and Limonite, Gn-Non Sulphide Minerals

TABLE 9F
COMPARATIVE ASSAY TABLE
P8 WSB Bulk Pyrite Rougher Concentrate

Methods	Cu	Fe	S
QEMSCAN	0.3	16.6	17.3
Chemical	0.3	15.6	17.9

Notes 1) This table compares the chemical composition of the samples determined by chemical analysis with the composition determined by QEMSCAN analysis.

TABLE 9G
THE WEIGHT OF THE OBSERVED MINERALS
P8 WSB Bulk Pyrite Rougher Concentrate

Mineral	Mineral Assays (percent)					Normalized Distribution
	>150µm	<150>53µm	<53µm>C5	<C5	Total	
Chalcopyrite	1.79	0.60	0.20	0.27	0.49	0.48
Bornite	0.43	0.18	0.03	0.02	0.10	0.10
Chalcocite	0.52	0.13	0.03	0.08	0.13	0.13
Covellite	0.04	0.01	0.00	0.00	0.01	0.01
Enargite/Tennantite	0.01	0.00	0.00	0.00	0.00	0.00
Native Copper/Cuprite	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenite	0.01	0.00	0.00	0.00	0.00	0.00
Sphalerite	0.01	0.00	0.00	0.01	0.00	0.00
Pyrite	51.7	86.5	27.8	3.04	31.9	32.9
Iron Oxides	0.50	0.16	0.52	0.33	0.38	0.37
Quartz	24.1	7.53	30.8	16.5	20.0	19.7
Micas	16.7	3.31	32.9	63.1	37.4	36.8
Feldspars	1.35	0.40	2.76	4.35	2.78	2.74
Carbonates	0.08	0.04	0.14	0.55	0.27	0.27
Chlorite	0.22	0.09	0.56	1.28	0.71	0.70
Apatite	0.23	0.17	0.59	0.63	0.48	0.48
Rutile/Anatase	0.72	0.27	1.34	0.91	0.90	0.88
Kaolinite (clay)	1.29	0.39	1.39	7.18	3.47	3.42
Talc	0.08	0.04	0.06	0.04	0.05	0.05
Amphibole	0.08	0.07	0.29	0.40	0.27	0.26
Fluorite	0.09	0.03	0.09	0.05	0.06	0.06
Others	0.15	0.10	0.41	1.22	0.64	0.63
Total	100	100	100	100	100	100

Notes: 1) Iron Oxides includes Magnetite, Hematite, Limonite and Goethite.

2) Micas includes Muscovite and Biotite/Phlogopite.

3) Feldspars includes K-Feldspar, Alkali Feldspar, Plagioclase Feldspar, and Feldspar Albite.

4) Carbonates includes Calcite, Dolomite and Ankerite.

5) Chlorite includes trace amounts of Epidote.

6) Ti Minerals includes Rutile/Anatase and trace amounts of Sphene.

7) Others includes Sillimanite, Garnet group minerals, and trace amounts of unresolved mineral species.

8) The Normalized Distribution is the redistribution of the mineral composition based on Table C total mineral chemical assay values.

TABLE 10A
SUMMARY OF PERCENT LIBERATION BY SIZE AND CLASS
P8 WSB Bulk Pyrite Rougher Tailing
KM4420

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.2	22.7	0.0	0.0	0.0	2.4	34.5	3.2	2.2	3.9	31.3	24.7
Binary - Cp		0.0	0.0	0.0	0.2		0.0	0.0	0.2	0.1		1.5	3.9	0.7	0.0
Binary - Bn	0.0		0.0	0.0	0.0	0.0		0.3	0.0	0.0	0.4		0.0	0.4	0.0
Binary - Ch	0.0	0.0		0.0	0.0	0.1	2.1		0.2	0.0	0.4	0.0		0.4	0.0
Binary - Py	0.0	0.0	0.0		0.1	0.5	1.1	0.1		0.0	0.6	0.7	1.9		0.0
Binary - Gn	45.9	30.8	47.0	6.7		25.5	34.2	7.6	19.6		5.4	5.8	13.6	4.7	
Multiphase	2.2	4.0	17.1	2.3	0.0	0.5	0.0	1.3	2.7	0.0	0.0	0.0	0.0	0.4	0.0
Total	48.1	34.8	64.1	9.2	23.1	26.6	37.4	9.3	25.1	34.6	9.9	10.2	23.4	37.8	24.8

Size Range	<C5				
Mineral Status	Cp	Bn	Ch	Py	Gn
Liberated	14.4	15.3	2.4	26.4	17.5
Binary - Cp		1.1	0.0	0.0	0.0
Binary - Bn	0.0		0.4	0.0	0.0
Binary - Ch	0.0	0.6		0.0	0.0
Binary - Py	0.2	0.6	0.2		0.0
Binary - Gn	0.7	0.0	0.2	1.6	
Multiphase	0.0	0.0	0.0	0.0	0.0
Total	15.3	17.6	3.2	28.0	17.5

SUMMARY OF MINERAL DISTRIBUTION BY CLASS OF ASSOCIATION

Mineral Status	Mineral Liberation-2 Dimensions					Mineral Liberation-3 Dimensions				
	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	17.6	17.5	6.3	60.3	99.4	0.0	0.0	0.0	50.4	99.3
Binary - Cp		2.6	3.9	0.9	0.3		3.1	4.2	1.2	0.4
Binary - Bn	0.4		0.7	0.4	0.0	0.5		0.7	0.4	0.0
Binary - Ch	0.5	2.7		0.6	0.1	0.6	3.3		0.7	0.1
Binary - Py	1.3	2.4	2.3		0.2	1.6	2.9	2.4		0.2
Binary - Gn	77.6	70.8	68.5	32.5		94.2	85.8	73.0	40.7	
Multiphase	2.7	4.0	18.4	5.3	0.0	3.2	4.9	19.6	6.6	0.0
Total	100	100	100	100	100	100	100	100	100	100

Notes 1) Cp-Chalcopryrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite, Py-Pyrite, Molybdenite and Sphalerite, Gn-Non-Sulphide Minerals.

2) 0.0 Indicates these minerals were not observed during the counting procedure.

3) The 150 and 53µm sizing fractions correspond to the Tyler 100 and 270 mesh sieves. C1 to C5 indicates cyclones 1 to 5 on the cyclosizer.

4) The Total line is the distribution of mineral in the size fraction. Original data is from the size by assay and distribution tables.

5) The calculated liberation of the unsized product as measured in two dimensions has been converted to three dimensions using correction factors developed by ALS Metallurgy Kamloops.

6) The three dimension liberation is zero if the liberation in two dimensions is less than 20 percent.

7) Mineral liberation was achieved using QEMSCAN and checked and adjusted using optical methods as necessary.

TABLE 10B
SIZE BY ASSAY AND DISTRIBUTION BASED ON METAL CONTENT
P8 WSB Bulk Pyrite Rougher Tailing

Size Fraction	Mass %	Assays-percent					Distribution				
		Cu	Fe	S			Cu	Fe	S		
>150µm	23.1	0.11	1.30	0.17			47.5	19.7	20.7		
<150>53µm	34.6	0.04	1.07	0.15			26.7	24.4	26.4		
<53µm>C5	24.8	0.02	1.89	0.23			10.9	30.9	28.8		
<C5	17.5	0.05	2.17	0.27			14.8	25.0	24.0		
Total	100	0.05	1.52	0.19			100	100	100		

Notes: 1) The assays shown in this table are utilized to determine the mineralogical distribution shown in Table C

TABLE 10C
SIZE BY ASSAY AND DISTRIBUTION BASED ON MINERAL CONTENT
P8 WSB Bulk Pyrite Rougher Tailing

Size Fraction	Mass %	Assays-percent					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	23.1	0.23	0.02	0.02	0.09	99.6	48.1	34.8	64.1	9.2	23.1
<150>53µm	34.6	0.08	0.02	0.00	0.17	99.7	26.6	37.4	9.3	25.1	34.6
<53µm>C5	24.8	0.04	0.01	0.01	0.35	99.6	9.9	10.2	23.4	37.8	24.8
<C5	17.5	0.10	0.02	0.00	0.37	99.5	15.3	17.6	3.2	28.0	17.5
Total	100	0.11	0.02	0.01	0.23	99.6	100	100	100	100	100

Notes: 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite, Py-Pyrite, Molybdenite and Sphalerite, Gn-Non-Sulphide Minerals.

2) Mineral assays are based on gravimetric factors to convert the metal to the pure mineral.

3) See appendix I for details of gravimetric factors.

4) An assay value of "0" indicates the assay value is less than the detection limit.

TABLE 10D
ESTIMATED RELATIVE PROPORTION AND COMPOSITION OF MINERAL GRAINS
P8 WSB Bulk Pyrite Rougher Tailing

Binary Component	Proportion by Weight-2D					Proportion by Weight-3D					Composition of Grains				
	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.02	0.00	0.00	0.14	99.1	0.00	0.00	0.00	0.12	98.9	100	100	100	100	100
Binary - Cp		0.00	0.00	0.00	0.3		0.00	0.00	0.00	0.4		51	33	61	79
Binary - Bn	0.00		0.00	0.00	0.0	0.00		0.00	0.00	0.0	49		9	69	57
Binary - Ch	0.00	0.00		0.00	0.1	0.00	0.00		0.00	0.1	67	91		90	93
Binary - Py	0.00	0.00	0.00		0.2	0.00	0.00	0.00		0.2	39	31	10		67
Binary - Gn	0.09	0.01	0.01	0.08		0.10	0.01	0.01	0.09		21	43	7	33	
Multiphase	0.00	0.00	0.00	0.01	0.0	0.00	0.00	0.00	0.02	0.0	8	2	3	36	51
Average Composition	0.11	0.02	0.01	0.23	99.6	0.11	0.02	0.01	0.23	99.6	20	21	6	51	100

Notes 1) The two-dimensional proportion of minerals is a weighted estimate which is based on the liberation and the mineral content of the unsized sample.

2) The three-dimensional data is based on converting the two dimensional liberation data using ALS Metallurgy Kamloops correction factors.

3) Composition values of "0" represents values <2% and "100" represents values >98%.

TABLE 10E
DISTRIBUTION BY SIZE RANGE OF COPPER AND IRON BEARING MINERALS
P8 WSB Bulk Pyrite Rougher Tailing

Size Fraction	Mass %	% Copper Bearing Minerals						% Copper of Total Copper						% Iron of Total Iron			
		Cp	Bn	Ch	Cv	En	NCu	Cp	Bn	Ch	Cv	En	NCu	Cs	Py	FeOx	Gn
>150µm	23.1	83.2	9.1	7.4	0.3	0.0	0.0	71.5	14.2	13.8	0.5	0.0	0.0	5.0	2.1	21.4	71.5
<150>53µm	34.6	80.9	17.1	0.2	1.5	0.3	0.0	69.9	27.0	0.4	2.5	0.3	0.0	2.2	5.0	22.6	70.2
<53µm>C5	24.8	75.9	11.7	1.7	6.4	4.3	0.0	63.9	18.0	2.7	10.3	5.1	0.0	0.7	6.7	16.1	76.5
<C5	17.5	83.5	14.4	1.2	0.0	0.0	0.9	73.2	23.0	1.6	0.0	0.0	2.2	1.1	7.4	9.8	81.7
Total	100	81.9	12.3	3.9	1.2	0.6	0.1	70.5	19.3	7.2	2.0	0.7	0.3	2.0	5.6	17.2	75.3

Notes 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite, Cv-Covellite, En-Enargite/Tennantite, NCu-Native Copper/Cuprite.

Cs-Chalcopyrite and Bornite, Py-Pyrite, FeOx-Magnetite, Hematite, Goethite and Limonite, Gn-Non Sulphide Minerals

TABLE 10F
COMPARATIVE ASSAY TABLE
P8 WSB Bulk Pyrite Rougher Tailing

Methods	Cu	Fe	S
QEMSCAN	<0.1	1.8	0.2
Chemical	<0.1	1.5	0.2

Notes 1) This table compares the chemical composition of the samples determined by chemical analysis with the composition determined by QEMSCAN analysis.

TABLE 10G
THE WEIGHT OF THE OBSERVED MINERALS
P8 WSB Bulk Pyrite Rougher Tailing

Mineral	Mineral Assays (percent)					Normalized Distribution
	>150µm	<150>53µm	<53µm>C5	<C5	Total	
Chalcopyrite	0.22	0.08	0.05	0.09	0.11	0.11
Bornite	0.02	0.02	0.01	0.02	0.02	0.02
Chalcocite	0.02	0.00	0.00	0.00	0.00	0.01
Covellite	0.00	0.00	0.00	0.00	0.00	0.00
Enargite/Tennantite	0.00	0.00	0.00	0.00	0.00	0.00
Native Copper/Cuprite	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenite	0.01	0.00	0.00	0.00	0.00	0.00
Sphalerite	0.00	0.00	0.00	0.01	0.00	0.00
Pyrite	0.06	0.13	0.33	0.40	0.21	0.23
Iron Oxides	0.42	0.39	0.52	0.37	0.42	0.42
Quartz	62.2	68.0	53.8	16.2	54.1	54.1
Micas	29.8	24.0	34.3	67.0	35.4	35.4
Feldspars	2.90	3.06	4.39	3.37	3.41	3.41
Carbonates	0.17	0.28	0.25	1.14	0.40	0.40
Chlorite	0.28	0.33	0.56	1.53	0.58	0.58
Apatite	0.42	0.46	0.79	0.76	0.58	0.58
Rutile/Anatase	1.14	0.92	2.14	0.72	1.24	1.24
Kaolinite (clay)	1.65	1.61	2.08	6.56	2.60	2.60
Talc	0.14	0.15	0.04	0.06	0.10	0.10
Amphibole	0.35	0.27	0.24	0.28	0.28	0.28
Fluorite	0.05	0.05	0.10	0.06	0.06	0.06
Others	0.13	0.24	0.37	1.43	0.46	0.46
Total	100	100	100	100	100	100

Notes: 1) Iron Oxides includes Magnetite, Hematite, Limonite and Goethite.

2) Micas includes Muscovite and Biotite/Phlogopite.

3) Feldspars includes K-Feldspar, Alkali Feldspar, Plagioclase Feldspar, and Feldspar Albite.

4) Carbonates includes Calcite, Dolomite and Ankerite.

5) Chlorite includes trace amounts of Epidote.

6) Ti Minerals includes Rutile/Anatase and trace amounts of Sphene.

7) Others includes Sillimanite, Garnet group minerals, and trace amounts of unresolved mineral species.

8) The Normalized Distribution is the redistribution of the mineral composition based on Table C total mineral chemical assay values.

TABLE 11A
SUMMARY OF PERCENT LIBERATION BY SIZE AND CLASS
P8 WSB Bulk Final Concentrate
KM4420

Size Range	>150µm						<150>53µm						<53µm>C5					
Mineral Status	Cp	Bn	Ch	Md	Py	Gn	Cp	Bn	Ch	Md	Py	Gn	Cp	Bn	Ch	Md	Py	Gn
Liberated	0.0	0.0	0.0	0.0	0.0	0.0	11.6	3.1	3.7	19.9	14.8	10.3	50.4	17.1	29.3	52.0	31.6	31.7
Binary - Cp		0.0	0.0	0.0	0.0	0.0		4.1	0.7	1.1	5.9	7.8		14.3	4.7	1.3	3.0	8.4
Binary - Bn	0.0		0.0	0.0	0.0	0.0	0.7		2.6	0.0	0.8	0.5	2.6		18.1	0.0	7.7	0.1
Binary - Ch	0.0	0.0		0.0	0.0	0.0	0.4	2.3		0.4	7.4	4.0	2.3	21.5		2.5	18.4	7.1
Binary - Md	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.1		0.1	0.2	0.0	0.0	0.3		0.0	0.2
Binary - Py	0.0	0.0	0.0	0.0		0.0	1.9	1.5	7.3	0.6		2.6	4.9	10.9	11.0	1.3		1.8
Binary - Gn	0.0	0.0	0.0	0.0	0.0		3.5	3.3	4.0	3.1	2.4		2.1	2.7	3.8	1.9	0.4	
Multiphase	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.9	0.8	0.6	1.8	2.2	0.3	0.5	0.5	1.6	0.9	2.2
Total	0.0	0.0	0.0	0.0	0.0	0.0	18.5	15.3	19.3	25.8	33.2	27.6	62.6	66.9	67.8	60.5	61.9	51.4

SUMMARY OF MINERAL DISTRIBUTION BY CLASS OF ASSOCIATION

Mineral Status	<C5						Mineral Liberation-2 Dimensions						Mineral Liberation-3 Dimensions					
	Cp	Bn	Ch	Md	Py	Gn	Cp	Bn	Ch	Md	Py	Gn	Cp	Bn	Ch	Md	Py	Gn
Liberated	16.7	12.9	10.1	13.5	4.0	17.7	78.8	33.1	43.1	85.4	50.4	59.7	73.4	16.3	28.9	81.7	38.0	49.6
Binary - Cp		1.7	0.9	0.1	0.6	2.4		20.0	6.3	2.5	9.5	18.6		25.1	7.9	3.1	11.8	23.2
Binary - Bn	0.4		0.5	0.1	0.0	0.0	3.6		21.3	0.1	8.5	0.6	4.5		26.6	0.2	10.6	0.7
Binary - Ch	0.5	2.8		0.0	0.1	0.4	3.1	26.6		2.9	25.9	11.5	3.9	33.2		3.6	32.4	14.4
Binary - Md	0.0	0.0	0.0		0.0	0.0	0.1	0.0	0.4		0.1	0.4	0.1	0.0	0.5		0.2	0.5
Binary - Py	0.8	0.3	1.3	0.0		0.3	7.6	12.8	19.7	1.9		4.7	9.5	15.9	24.6	2.4		5.9
Binary - Gn	0.4	0.2	0.0	0.0	0.1		6.0	6.2	7.9	5.0	2.9		7.6	7.7	9.9	6.3	3.7	
Multiphase	0.1	0.0	0.0	0.0	0.1	0.2	0.8	1.4	1.4	2.2	2.7	4.6	1.0	1.7	1.7	2.8	3.4	5.7
Total	18.9	17.8	12.9	13.7	4.9	21.0	100	100	100	100	100	100	100	100	100	100	100	100

Notes 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite, Md-Molybdenite, Py-Pyrite and Sphalerite, Gn-Non-Sulphide Minerals.

2) 0.0 Indicates these minerals were not observed during the counting procedure.

3) The 150 and 53µm sizing fractions correspond to the Tyler 100 and 270 mesh sieves.
C1 to C5 indicates cyclones 1 to 5 on the cyclosizer.

4) The Total line is the distribution of mineral in the size fraction. Original data is from the size by assay and distribution tables.

5) The calculated liberation of the unsized product as measured in two dimensions has been converted to three dimensions using correction factors developed by ALS Metallurgy Kamloops.

6) The three dimension liberation is zero if the liberation in two dimensions is less than 20 percent.

7) Mineral liberation was achieved using QEMSCAN and checked and adjusted using optical methods as necessary.

TABLE 11B
SIZE BY ASSAY AND DISTRIBUTION BASED ON METAL CONTENT
P8 WSB Bulk Final Concentrate

Size Fraction	Mass %	Assays-percent						Distribution					
		Cu	Fe	S	Mo			Cu	Fe	S	Mo		
>150µm	0.0	0.00	0.0	0.00	0.00			0.0	0.0	0.0	0.0		
<150>53µm	23.4	22.6	25.5	35.4	0.52			18.4	24.1	24.0	25.8		
<53µm>C5	62.0	30.4	25.5	35.7	0.46			65.4	63.9	64.0	60.5		
<C5	14.6	32.0	20.3	28.4	0.44			16.2	12.0	12.0	13.7		
Total	100	28.8	24.7	34.6	0.47			100	100	100	100		

Notes: 1) The assays shown in this table are utilized to determine the mineralogical distribution shown in Table C

TABLE 11C
SIZE BY ASSAY AND DISTRIBUTION BASED ON MINERAL CONTENT
P8 WSB Bulk Final Concentrate

Size Fraction	Mass %	Assays-percent						Distribution					
		Cp	Bn	Ch	Md	Py	Gn	Cp	Bn	Ch	Md	Py	Gn
>150µm	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<150>53µm	23.4	31.0	5.39	10.6	0.9	37.1	15.0	18.5	15.3	19.3	25.8	33.2	27.6
<53µm>C5	62.0	39.6	8.92	14.1	0.8	26.1	10.6	62.6	66.9	67.8	60.5	61.9	51.4
<C5	14.6	50.6	10.1	11.4	0.7	8.8	18.3	18.9	17.8	12.9	13.7	4.9	21.0
Total	100	39.2	8.26	12.9	0.8	26.1	12.7	100	100	100	100	100	100

- Notes: 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite/Covellite and Enargite/Tennantite, Md-Molybdenite, Py-Pyrite and Sphalerite, Gn-Non-Sulphide Minerals.
2) Mineral assays are based on gravimetric factors to convert the metal to the pure mineral.
3) See appendix I for details of gravimetric factors.
4) An assay value of "0" indicates the assay value is less than the detection limit.

TABLE 11D
ESTIMATED RELATIVE PROPORTION AND COMPOSITION OF MINERAL GRAINS
P8 WSB Bulk Final Concentrate

Binary Component	Proportion by Weight-2D						Proportion by Weight-3D						Composition of Grains					
	Cp	Bn	Ch	Md	Py	Gn	Cp	Bn	Ch	Md	Py	Gn	Cp	Bn	Ch	Md	Py	Gn
Liberated	30.9	2.73	5.6	0.7	13.2	7.6	28.8	1.35	3.7	0.6	9.9	6.3	100	100	100	100	100	100
Binary - Cp		1.66	0.8	0.0	2.5	2.4		2.07	1.0	0.0	3.1	3.0		54	40	37	45	50
Binary - Bn	1.4		2.7	0.0	2.2	0.1	1.8		3.4	0.0	2.8	0.1	46		56	69	68	13
Binary - Ch	1.2	2.20		0.0	6.8	1.5	1.5	2.75		0.0	8.5	1.8	60	44		31	73	59
Binary - Md	0.0	0.00	0.1		0.0	0.1	0.0	0.00	0.1		0.0	0.1	63	31	69		70	57
Binary - Py	3.0	1.05	2.5	0.0		0.6	3.7	1.32	3.2	0.0		0.8	55	32	27	30		44
Binary - Gn	2.4	0.51	1.0	0.0	0.8		3.0	0.64	1.3	0.0	1.0		50	87	41	43	56	
Multiphase	0.3	0.11	0.2	0.0	0.7	0.6	0.4	0.14	0.2	0.0	0.9	0.7	16	6	9	1	37	30
Average Composition	39.2	8.26	12.9	0.8	26.1	12.7	39.2	8.26	12.9	0.8	26.1	12.7	78	44	44	23	71	63

Notes 1) The two-dimensional proportion of minerals is a weighted estimate which is based on the liberation and the mineral content of the unsized sample.

2) The three-dimensional data is based on converting the two dimensional liberation data using ALS Metallurgy Kamloops correction factors.

3) Composition values of "0" represents values <2% and "100" represents values >98%.

TABLE 11E
DISTRIBUTION BY SIZE RANGE OF COPPER AND IRON BEARING MINERALS
P8 WSB Bulk Final Concentrate

Size Fraction	Mass %	% Copper Bearing Minerals						% Copper of Total Copper						% Iron of Total Iron			
		Cp	Bn	Ch	Cv	En	NCu	Cp	Bn	Ch	Cv	En	NCu	Cs	Py	FeOx	Gn
>150µm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<150>53µm	23.4	65.9	11.4	21.2	1.2	0.3	0.1	47.7	15.1	35.1	1.6	0.3	0.2	37.4	60.3	1.7	0.6
<53µm>C5	62.0	63.1	14.2	19.3	2.8	0.4	0.1	45.3	18.6	31.6	3.8	0.4	0.2	54.0	44.7	0.9	0.3
<C5	14.6	70.2	14.0	5.4	10.0	0.5	0.0	55.0	20.0	9.5	15.0	0.5	0.0	80.5	17.5	1.1	0.8
Total	100	65.0	13.7	17.0	3.8	0.4	0.1	47.3	18.2	28.7	5.2	0.4	0.2	53.2	45.2	1.1	0.4

Notes 1) Cp-Chalcopyrite, Bn-Bornite, Ch-Chalcocite, Cv-Covellite, En-Enargite/Tennantite, NCu-Native Copper/Cuprite.

Cs-Chalcopyrite and Bornite, Py-Pyrite, FeOx-Magnetite, Hematite, Goethite and Limonite, Gn-Non Sulphide Minerals

TABLE 11F
COMPARATIVE ASSAY TABLE
P8 WSB Bulk Final Concentrate

Methods	Cu	Fe	S	Mo
QEMSCAN	30.2	25.5	33.6	0.5
Chemical	28.8	24.7	34.6	0.5

Notes 1) This table compares the chemical composition of the samples determined by chemical analysis with the composition determined by QEMSCAN analysis.

TABLE 11G
THE WEIGHT OF THE OBSERVED MINERALS
P8 WSB Bulk Final Concentrate

Mineral	Mineral Assays (percent)					Normalized Distribution
	>150µm	<150>53µm	<53µm>C5	<C5	Total	
Chalcopyrite	0.00	31.4	42.3	52.2	41.2	41.2
Bornite	0.00	5.46	9.53	10.4	8.70	8.70
Chalcocite	0.00	10.1	12.9	4.01	11.0	10.4
Covellite	0.00	0.55	1.87	7.41	2.37	2.26
Enargite/Tennantite	0.00	0.12	0.25	0.34	0.23	0.22
Copper/Cuprite	0.00	0.05	0.09	0.00	0.07	0.06
Molybdenite	0.00	0.72	0.84	0.91	0.82	0.79
Sphalerite	0.00	0.41	0.41	2.00	0.64	0.61
Pyrite	0.00	35.4	24.9	7.98	24.8	26.1
Iron Oxides	0.00	0.69	0.35	0.34	0.43	0.41
Quartz	0.00	8.45	2.83	4.83	4.44	4.21
Micas	0.00	4.16	1.23	2.38	2.09	1.98
Feldspars	0.00	0.45	0.13	0.93	0.32	0.30
Carbonates	0.00	0.14	0.18	0.14	0.16	0.15
Chlorite	0.00	0.19	0.15	0.41	0.20	0.19
Apatite	0.00	0.17	0.05	0.14	0.09	0.09
Rutile/Anatase	0.00	0.40	0.28	0.25	0.30	0.29
Kaolinite (clay)	0.00	0.45	0.27	0.42	0.33	0.32
Talc	0.00	0.43	1.01	2.85	1.15	1.09
Amphibole	0.00	0.10	0.25	0.87	0.30	0.29
Fluorite	0.00	0.03	0.06	0.03	0.05	0.05
Others	0.00	0.11	0.15	1.18	0.29	0.28
Total	0.00	100	100	100	100	100

- Notes: 1) Iron Oxides includes Magnetite, Hematite, Limonite and Goethite.
2) Micas includes Muscovite and Biotite/Phlogopite.
3) Feldspars includes K-Feldspar, Alkali Feldspar, Plagioclase Feldspar, and Feldspar Albite.
4) Carbonates includes Calcite, Dolomite and Ankerite.
5) Chlorite includes trace amounts of Epidote.
6) Ti Minerals includes Rutile/Anatase and trace amounts of Sphene.
7) Others includes Sillimanite, Garnet group minerals, and trace amounts of unresolved mineral species.
8) The Normalized Distribution is the redistribution of the mineral composition based on Table C total mineral chemical assay values.

TABLE 12A
LIBERATION UNITS TABLE BY STREAM AND SIZE RANGE AND MINERAL CLASS FOR P8 WSB OVERALL SUMMARY
KM4420

Pyrite Rougher Concentrate

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	5.5	0.4	0.0	0.0	0.0	19.9	0.3	0.1	0.0	0.0	13.3	3.3
Binary - Cp		0.0	0.0	0.7	0.1		0.0	0.0	0.7	0.0		0.0	0.0	0.0	0.0
Binary - Bn	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Binary - Ch	0.0	0.1		0.2	0.0	0.0	0.0		0.3	0.0	0.0	0.0		0.0	0.0
Binary - Py	0.2	0.2	0.2		0.3	0.1	0.4	0.2		0.1	0.0	0.1	0.1		0.1
Binary - Gn	0.4	0.5	0.4	2.1		0.2	0.2	0.1	3.3		0.1	0.0	0.0	0.8	
Multiphase	0.2	0.3	0.2	0.9	0.0	0.1	0.1	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.9	1.0	0.9	9.5	0.8	0.5	0.7	0.3	25.0	0.4	0.2	0.2	0.1	14.2	3.3

Size Range	<C5					Pyrite Rougher Concentrate				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.5	0.1	0.3	1.8	6.1	0.6	0.1	0.4	40.5	10.1
Binary - Cp		0.0	0.1	0.0	0.0		0.0	0.1	1.5	0.1
Binary - Bn	0.0		0.1	0.0	0.0	0.0		0.1	0.1	0.0
Binary - Ch	0.0	0.1		0.0	0.0	0.0	0.1		0.6	0.0
Binary - Py	0.0	0.0	0.0		0.0	0.3	0.7	0.4		0.4
Binary - Gn	0.0	0.0	0.0	0.0		0.8	0.7	0.6	6.3	
Multiphase	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.3	1.7	0.0
Total	0.5	0.2	0.5	1.8	6.1	2.1	2.1	1.9	50.6	10.7

Pyrite Rougher Tailing

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	18.3	0.0	0.0	0.0	0.0	27.7	0.1	0.0	0.0	0.5	19.9
Binary - Cp		0.0	0.0	0.0	0.2		0.0	0.0	0.0	0.1		0.0	0.0	0.0	0.0
Binary - Bn	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Binary - Ch	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0
Binary - Py	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Binary - Gn	1.1	0.6	0.3	0.1		0.6	0.6	0.0	0.3		0.1	0.1	0.1	0.1	
Multiphase	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	1.2	0.6	0.3	0.1	18.6	0.7	0.7	0.1	0.4	27.9	0.2	0.2	0.1	0.6	19.9

Size Range	<C5					Pyrite Rougher Tailing				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.4	0.3	0.0	0.4	14.1	0.4	0.3	0.0	0.9	80.0
Binary - Cp		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.2
Binary - Bn	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Binary - Ch	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0
Binary - Py	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.1
Binary - Gn	0.0	0.0	0.0	0.0		1.9	1.3	0.4	0.5	
Multiphase	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0
Total	0.4	0.3	0.0	0.4	14.1	2.5	1.8	0.5	1.5	80.4

Bulk Cleaner Scavenger Tailing

TABLE 12A

CONTINUED

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.5	0.1	0.0	0.0	15.6	2.1
Binary - Cp		0.0	0.0	0.0	0.0		0.0	0.0	0.1	0.0		0.0	0.1	0.2	0.0
Binary - Bn	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Binary - Ch	0.0	0.0		0.0	0.0	0.0	0.0		0.5	0.0	0.0	0.0		0.1	0.0
Binary - Py	0.0	0.0	0.0		0.0	0.0	0.0	0.3		0.0	0.1	0.1	0.2		0.1
Binary - Gn	0.0	0.0	0.0	0.0		0.2	0.0	0.1	0.5		0.2	0.1	0.1	1.0	
Multiphase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.5	5.5	0.6	0.4	0.1	0.4	17.0	2.2

Size Range	<C5					Bulk Cleaner Scavenger Tailing				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	1.4	0.2	0.1	3.9	4.9	1.4	0.3	0.2	23.7	7.5
Binary - Cp		0.0	0.0	0.0	0.0		0.0	0.1	0.4	0.0
Binary - Bn	0.1		0.0	0.0	0.0	0.1		0.1	0.0	0.0
Binary - Ch	0.0	0.1		0.0	0.0	0.0	0.1		0.6	0.0
Binary - Py	0.0	0.0	0.0		0.1	0.1	0.1	0.5		0.3
Binary - Gn	0.0	0.0	0.0	0.4		0.5	0.1	0.2	2.0	
Multiphase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0
Total	1.4	0.3	0.2	4.3	5.0	2.1	0.6	1.1	26.8	7.8

Bulk Final Concentrate

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	0.0	10.8	2.9	3.5	3.2	0.1	47.0	16.3	28.2	6.8	0.3
Binary - Cp		0.0	0.0	0.0	0.0		3.9	0.7	1.2	0.1		13.6	4.6	0.6	0.1
Binary - Bn	0.0		0.0	0.0	0.0	0.6		2.5	0.2	0.0	2.4		17.5	1.6	0.0
Binary - Ch	0.0	0.0		0.0	0.0	0.4	2.2		1.5	0.0	2.1	20.6		3.8	0.1
Binary - Py	0.0	0.0	0.0		0.0	1.8	1.5	7.2		0.0	4.6	10.4	10.9		0.0
Binary - Gn	0.0	0.0	0.0	0.0		3.3	3.2	3.9	0.5		2.0	2.5	3.7	0.1	
Multiphase	0.0	0.0	0.0	0.0	0.0	0.4	0.9	0.8	0.4	0.0	0.3	0.4	0.5	0.2	0.0
Total	0.0	0.0	0.0	0.0	0.0	17.3	14.6	18.6	7.0	0.3	58.4	64.0	65.4	13.1	0.5

Size Range	<C5					Bulk Final Concentrate				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	15.6	12.3	9.8	0.9	0.2	73.5	31.6	41.6	10.9	0.6
Binary - Cp		1.6	0.9	0.1	0.0		19.2	6.1	2.0	0.2
Binary - Bn	0.3		0.5	0.0	0.0	3.4		20.5	1.7	0.0
Binary - Ch	0.4	2.6		0.0	0.0	2.9	25.4		5.3	0.1
Binary - Py	0.8	0.3	1.3		0.0	7.2	12.2	19.3		0.1
Binary - Gn	0.4	0.2	0.0	0.0		5.6	5.9	7.6	0.6	
Multiphase	0.1	0.0	0.0	0.0	0.0	0.7	1.3	1.3	0.6	0.0
Total	17.6	17.0	12.5	1.0	0.2	93.3	95.6	96.4	21.1	1.0

Recalculated Flotation Feed

TABLE 12A

CONTINUED

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	5.5	18.7	10.8	3.0	3.6	27.4	28.6	47.3	16.4	28.3	36.1	25.6
Binary - Cp		0.0	0.0	0.7	0.2		3.9	0.7	2.1	0.2		13.7	4.7	0.9	0.1
Binary - Bn	0.0		0.0	0.0	0.0	0.6		2.5	0.2	0.0	2.4		17.5	1.6	0.0
Binary - Ch	0.0	0.1		0.2	0.0	0.4	2.2		2.3	0.1	2.1	20.6		3.9	0.1
Binary - Py	0.2	0.2	0.2		0.3	1.9	1.9	7.7		0.2	4.8	10.7	11.1		0.2
Binary - Gn	1.6	1.0	0.7	2.2		4.4	4.0	4.1	4.6		2.4	2.7	3.9	2.0	
Multiphase	0.3	0.4	0.3	0.9	0.0	0.6	0.9	1.0	1.3	0.0	0.3	0.5	0.6	0.2	0.0
Total	2.1	1.6	1.2	9.6	19.4	18.7	16.0	19.5	37.9	29.1	59.3	64.5	66.1	44.8	26.0

Size Range	<C5					Recalculated Flotation Feed				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	17.8	13.0	10.2	6.9	25.2	75.9	32.3	42.1	76.0	98.2
Binary - Cp		1.6	1.0	0.1	0.0		19.2	6.3	3.8	0.6
Binary - Bn	0.4		0.6	0.0	0.0	3.5		20.7	1.8	0.0
Binary - Ch	0.4	2.8		0.0	0.0	2.9	25.6		6.5	0.2
Binary - Py	0.8	0.3	1.3		0.2	7.6	13.1	20.3		0.9
Binary - Gn	0.4	0.2	0.0	0.5		8.8	8.0	8.7	9.3	
Multiphase	0.1	0.0	0.0	0.0	0.0	1.2	1.8	1.9	2.5	0.1
Total	19.9	17.9	13.2	7.6	25.5	100	100	100	100	100

TABLE 12B
DISTRIBUTION BY SIZE RANGE AND MINERAL CLASS FOR P8 WSB OVERALL SUMMARY
KM4420

Pyrite Rougher Concentrate

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	7.3	0.5	0.0	0.1	0.0	26.2	0.3	0.1	0.1	0.1	17.5	3.3
Binary - Cp		0.1	0.0	18.9	10.2		0.0	0.0	18.9	2.0		0.1	0.0	1.1	0.7
Binary - Bn	0.0		0.1	0.5	6.9	0.1		0.0	2.3	4.3	0.3		0.0	0.2	0.0
Binary - Ch	0.2	0.2		3.8	7.9	0.0	0.0		4.4	1.8	0.3	0.0		0.2	0.9
Binary - Py	2.4	1.5	0.9		29.8	1.5	2.8	0.8		11.5	0.6	1.0	0.3		5.9
Binary - Gn	5.1	5.7	4.9	22.6		2.7	2.7	1.2	35.1		1.0	0.2	0.4	9.0	
Multiphase	19.9	16.1	12.1	35.2	26.1	9.2	4.2	4.2	30.3	5.2	1.2	0.2	0.8	0.6	0.8

Size Range	<C5					Pyrite Rougher Concentrate				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.7	0.3	0.8	2.4	6.2	0.8	0.5	0.8	53.3	10.3
Binary - Cp		0.0	1.0	0.0	0.4		0.2	1.0	39.0	13.3
Binary - Bn	0.2		0.4	0.9	0.0	0.7		0.6	3.8	11.2
Binary - Ch	0.1	0.2		0.0	0.1	0.6	0.5		8.5	10.7
Binary - Py	0.0	0.1	0.1		2.9	4.4	5.4	2.1		50.1
Binary - Gn	0.0	0.2	0.2	0.3		8.8	8.8	6.7	67.0	
Multiphase	0.0	0.0	0.0	0.0	0.1	30.4	20.5	17.1	66.2	32.3

Pyrite Rougher Tailing

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	18.6	0.0	0.0	0.0	0.0	28.2	0.1	0.1	0.1	0.6	20.3
Binary - Cp		0.0	0.0	0.0	31.9		0.0	0.0	0.1	11.0		0.1	0.3	0.3	1.7
Binary - Bn	0.0		0.0	0.0	41.7	0.0		0.0	0.0	16.9	0.3		0.0	0.3	0.0
Binary - Ch	0.0	0.0		0.0	11.2	0.1	0.2		0.0	11.1	0.3	0.0		0.1	1.5
Binary - Py	0.0	0.0	0.0		4.9	0.2	0.1	0.0		3.7	0.2	0.1	0.1		4.0
Binary - Gn	12.9	7.0	2.9	1.0		7.2	7.8	0.5	3.1		1.5	1.3	0.8	0.7	
Multiphase	4.4	4.1	5.0	1.3	2.7	1.1	0.0	0.4	1.6	9.7	0.0	0.0	0.0	0.2	0.7

Size Range	<C5					Pyrite Rougher Tailing				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.5	0.9	0.0	0.5	14.3	0.6	1.0	0.1	1.2	81.4
Binary - Cp		0.1	0.0	0.0	0.2		0.2	0.3	0.4	44.8
Binary - Bn	0.0		0.0	0.0	0.0	0.3		0.0	0.3	58.6
Binary - Ch	0.0	0.0		0.0	0.2	0.4	0.2		0.1	23.9
Binary - Py	0.1	0.1	0.0		1.6	0.4	0.3	0.1		14.2
Binary - Gn	0.2	0.0	0.0	0.2		21.9	16.2	4.3	5.1	
Multiphase	0.0	0.0	0.0	0.0	0.0	5.5	4.1	5.4	3.1	13.1

Bulk Cleaner Scavenger Tailing

TABLE 12B

CONTINUED

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.5	0.1	0.0	0.0	20.5	2.2
Binary - Cp		0.0	0.0	0.0	0.0		0.0	0.0	3.4	2.2		0.0	1.2	5.9	1.2
Binary - Bn	0.0		0.0	0.0	0.0	0.0		0.0	1.6	0.8	0.0		0.1	0.0	0.0
Binary - Ch	0.0	0.0		0.0	0.0	0.0	0.0		7.4	3.6	0.1	0.0		1.8	1.6
Binary - Py	0.0	0.0	0.0		0.0	0.1	0.3	1.5		5.0	0.7	0.6	1.0		8.7
Binary - Gn	0.0	0.0	0.0	0.0		2.8	0.3	1.0	5.7		2.8	0.6	1.0	10.7	
Multiphase	0.0	0.0	0.0	0.0	0.0	0.7	0.7	5.0	5.8	5.8	1.8	0.6	0.8	1.6	2.1

Size Range	<C5					Bulk Cleaner Scavenger Tailing				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	1.8	0.8	0.3	5.1	5.0	1.9	0.8	0.4	31.2	7.7
Binary - Cp		0.0	0.5	0.3	3.7		0.0	1.7	9.6	7.2
Binary - Bn	1.5		0.1	0.0	0.0	1.5		0.3	1.7	0.8
Binary - Ch	0.0	0.3		0.0	1.7	0.1	0.3		9.2	6.9
Binary - Py	0.1	0.1	0.0		16.0	0.9	1.0	2.6		29.7
Binary - Gn	0.0	0.1	0.1	4.7		5.6	1.1	2.1	21.1	
Multiphase	0.0	0.0	0.0	0.2	2.6	2.5	1.3	5.8	7.6	10.5

Bulk Final Concentrate

Size Range	>150µm					<150>53µm					<53µm>C5				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	0.0	0.0	14.3	9.1	8.4	4.2	0.1	61.9	50.6	67.1	9.0	0.3
Binary - Cp		0.0	0.0	0.0	0.0		20.4	10.4	31.7	14.5		70.8	72.4	16.2	15.8
Binary - Bn	0.0		0.0	0.0	0.0	17.9		12.1	8.5	25.2	69.7		84.6	85.6	3.2
Binary - Ch	0.0	0.0		0.0	0.0	12.1	8.6		23.6	20.2	72.0	80.2		58.2	36.2
Binary - Py	0.0	0.0	0.0		0.0	23.5	11.3	35.5		3.3	60.9	79.9	53.5		2.4
Binary - Gn	0.0	0.0	0.0	0.0		36.9	40.1	44.6	5.6		22.1	31.9	42.4	1.1	
Multiphase	0.0	0.0	0.0	0.0	0.0	34.9	48.2	43.6	14.9	21.1	21.5	25.1	28.1	7.4	21.3

Size Range	<C5					Bulk Final Concentrate				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	20.5	38.1	23.2	1.1	0.2	96.7	97.8	98.7	14.3	0.6
Binary - Cp		8.4	14.2	3.1	4.4		99.5	97.0	51.1	34.7
Binary - Bn	9.9		2.5	0.2	1.0	97.6		99.1	94.3	29.5
Binary - Ch	14.8	10.3		0.4	2.0	98.9	99.1		82.1	58.5
Binary - Py	9.9	2.2	6.3		0.4	94.3	93.3	95.3		6.0
Binary - Gn	4.6	2.0	0.0	0.2		63.7	74.0	86.9	6.8	
Multiphase	5.2	0.7	0.0	0.8	1.7	61.6	74.1	71.7	23.2	44.2

TABLE 12C
RECOVERY BY MINERAL CLASS BY SIZE RANGE FOR P8 WSB OVERALL SUMMARY
KM4420

>150µm Recovery Table

Product	Pyrite Rougher Concentrate					Pyrite Rougher Tailing					Bulk Cleaner Scavenger Tailing					Bulk Final Concentrate				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.0	0.0	0.0	100	2.4	0.0	0.0	0.0	0.0	97.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Binary - Cp		100	0.0	100	24.3		0.0	0.0	0.0	75.7		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Binary - Bn	100		100	100	14.2	0.0		0.0	0.0	85.8	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Binary - Ch	100	100		100	41.4	0.0	0.0		0.0	58.6	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0
Binary - Py	100	100	100		85.9	0.0	0.0	0.0		14.1	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Binary - Gn	28.1	44.8	62.8	95.6		71.9	55.2	37.2	4.4		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Multiphase	81.7	79.5	70.8	96.3	90.7	18.3	20.5	29.2	3.7	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

<150>53µm Recovery Table

Product	Pyrite Rougher Concentrate					Pyrite Rougher Tailing					Bulk Cleaner Scavenger Tailing					Bulk Final Concentrate				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.1	0.6	0.1	72.7	0.9	0.0	0.0	0.0	0.1	96.9	0.0	0.0	0.3	15.4	1.8	99.9	99.4	99.7	11.7	0.4
Binary - Cp		0.2	0.0	34.9	6.8		0.0	0.0	0.1	36.8		0.0	0.0	6.3	7.5		99.8	100	58.6	48.8
Binary - Bn	0.6		0.2	18.4	9.1	0.0		0.1	0.0	35.8	0.0		0.0	13.1	1.6	99.4		99.7	68.5	53.5
Binary - Ch	0.0	0.2		12.5	4.8	0.7	1.7		0.1	30.2	0.0	0.0		20.9	9.8	99.3	98.1		66.5	55.2
Binary - Py	5.8	19.1	2.1		49.0	0.7	1.0	0.0		15.9	0.3	2.1	4.1		21.2	93.2	77.7	93.9		13.9
Binary - Gn	5.4	5.2	2.5	70.9		14.5	15.4	1.0	6.2		5.7	0.6	2.0	11.5		74.4	78.7	94.5	11.3	
Multiphase	20.1	7.9	7.9	57.7	12.5	2.3	0.0	0.7	3.0	23.3	1.5	1.4	9.4	10.9	13.8	76.1	90.7	82.0	28.4	50.5

<53µm>C5 Recovery Table

Product	Pyrite Rougher Concentrate					Pyrite Rougher Tailing					Bulk Cleaner Scavenger Tailing					Bulk Final Concentrate				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	0.2	0.1	0.1	36.7	12.8	0.2	0.2	0.1	1.3	77.6	0.2	0.0	0.1	43.1	8.3	99.5	99.6	99.8	18.9	1.3
Binary - Cp		0.1	0.0	4.8	3.5		0.2	0.5	1.2	9.0		0.0	1.6	25.1	6.2		99.7	97.9	69.0	81.3
Binary - Bn	0.5		0.0	0.2	0.0	0.4		0.0	0.3	0.0	0.0		0.2	0.0	0.0	99.1		99.8	99.5	100
Binary - Ch	0.4	0.0		0.4	2.3	0.4	0.0		0.1	3.6	0.2	0.0		3.0	4.1	99.0	100		96.4	90.0
Binary - Py	0.9	1.2	0.6		28.1	0.3	0.1	0.1		18.9	1.1	0.7	1.9		41.5	97.7	98.0	97.4		11.4
Binary - Gn	3.7	0.6	0.9	41.9		5.6	3.9	1.9	3.4		10.1	1.9	2.2	49.7		80.6	93.6	95.0	4.9	
Multiphase	5.0	0.9	2.7	6.3	3.3	0.0	0.0	0.0	2.2	2.8	7.4	2.1	2.6	16.0	8.3	87.6	97.0	94.7	75.6	85.5

<C5 Recovery Table

Product	Pyrite Rougher Concentrate					Pyrite Rougher Tailing					Bulk Cleaner Scavenger Tailing					Bulk Final Concentrate				
Mineral Status	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
Liberated	2.8	0.8	3.2	25.8	24.1	2.0	2.2	0.1	5.6	55.8	7.7	1.9	1.3	56.2	19.4	87.6	95.1	95.4	12.4	0.7
Binary - Cp		0.0	6.2	0.0	4.1		1.3	0.0	0.0	2.1		0.4	3.3	8.5	43.1		98.3	90.6	91.5	50.7
Binary - Bn	1.9		14.5	76.1	0.0	0.0		0.4	0.0	0.0	12.6		4.1	3.1	0.0	85.5		81.0	20.8	100
Binary - Ch	0.9	2.0		0.0	1.5	0.0	0.4		0.0	4.1	0.0	2.3		2.8	42.3	99.1	95.2		97.2	52.0
Binary - Py	0.5	4.4	0.9		14.0	0.7	3.2	0.1		7.6	1.3	2.2	0.2		76.7	97.5	90.2	98.8		1.8
Binary - Gn	0.9	7.8	61.9	6.3		3.9	0.0	4.0	4.5		0.0	4.0	34.1	86.2		95.2	88.2	0.0	2.9	
Multiphase	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.8	59.1	100	100	0.0	77.2	38.3

TABLE 12D
SIZE BY ASSAY AND DISTRIBUTION FOR P8 WSB OVERALL SUMMARY
KM4420

Pyrite Rougher Concentrate

Size Fraction	Mass %	Metal Assays				Distribution			
		Cu	Fe	S		Cu	Fe	S	
>150µm	1.59	1.23	26.11	29.35		0.90	6.46	7.33	
<150>53µm	2.61	0.39	41.28	46.01		0.47	16.71	18.81	
<53µm>C5	4.17	0.11	15.17	16.36		0.20	9.81	10.68	
<C5	5.46	0.18	3.88	1.83		0.46	3.29	1.57	
Total	13.83	0.32	16.90	17.72		2.03	36.27	38.39	

Size Fraction	Mass %	Mineral Assays					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	1.59	1.65	0.39	0.52	53.16	43.93	0.87	1.01	0.87	9.51	0.81
<150>53µm	2.61	0.55	0.16	0.13	85.45	13.01	0.48	0.68	0.35	25.02	0.39
<53µm>C5	4.17	0.18	0.03	0.03	30.35	69.46	0.25	0.19	0.15	14.19	3.35
<C5	5.46	0.28	0.02	0.09	3.00	97.01	0.51	0.19	0.51	1.83	6.12
Total	13.83	0.46	0.09	0.13	32.58	66.74	2.11	2.07	1.88	50.56	10.67

Pyrite Rougher Tailing

Size Fraction	Mass %	Metal Assays				Distribution			
		Cu	Fe	S		Cu	Fe	S	
>150µm	16.10	0.11	1.39	0.14		0.81	3.49	0.35	
<150>53µm	24.15	0.04	1.15	0.12		0.46	4.30	0.45	
<53µm>C5	17.31	0.02	2.03	0.18		0.19	5.45	0.49	
<C5	12.24	0.05	2.33	0.21		0.25	4.42	0.41	
Total	69.81	0.05	1.63	0.16		1.71	17.66	1.71	

Size Fraction	Mass %	Mineral Assays					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	16.10	0.22	0.02	0.02	0.07	99.68	1.20	0.63	0.35	0.13	18.56
<150>53µm	24.15	0.08	0.02	0.00	0.14	99.78	0.66	0.68	0.05	0.37	27.86
<53µm>C5	17.31	0.04	0.01	0.01	0.28	99.64	0.25	0.19	0.13	0.55	19.94
<C5	12.24	0.09	0.02	0.00	0.30	99.56	0.38	0.32	0.02	0.41	14.09
Total	69.81	0.11	0.02	0.01	0.19	99.68	2.49	1.82	0.54	1.46	80.45

Bulk Cleaner Scavenger TailingTABLE 12DCONTINUED

Size Fraction	Mass %	Metal Assays				Distribution			
		Cu	Fe	S		Cu	Fe	S	
>150µm	0.00	0.00	0.00	0.00		0.00	0.00	0.00	
<150>53µm	0.99	0.69	20.67	27.21		0.31	3.18	4.22	
<53µm>C5	3.39	0.24	18.85	24.11		0.37	9.91	12.80	
<C5	4.88	0.36	5.67	5.04		0.81	4.30	3.85	
Total	9.26	0.35	12.10	14.39		1.49	17.39	20.87	

Size Fraction	Mass %	Mineral Assays					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<150>53µm	0.99	0.80	0.05	0.48	49.83	50.92	0.26	0.08	0.50	5.54	0.58
<53µm>C5	3.39	0.36	0.03	0.12	44.62	56.52	0.40	0.14	0.43	16.97	2.21
<C5	4.88	0.88	0.04	0.04	7.93	89.54	1.42	0.33	0.21	4.34	5.05
Total	9.26	0.68	0.04	0.12	25.84	73.32	2.09	0.56	1.14	26.85	7.85

Bulk Final Concentrate

Size Fraction	Mass %	Metal Assays				Distribution			
		Cu	Fe	S		Cu	Fe	S	
>150µm	0.00	0.00	0.00	0.00		0.00	0.00	0.00	
<150>53µm	1.66	22.79	26.80	35.91		17.40	6.92	9.35	
<53µm>C5	4.40	30.66	26.80	36.21		62.01	18.32	25.00	
<C5	1.04	32.27	21.33	28.81		15.37	3.44	4.68	
Total	7.10	29.05	26.00	35.06		94.77	28.68	39.03	

Size Fraction	Mass %	Mineral Assays					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<150>53µm	1.66	31.28	5.44	10.73	37.59	14.86	17.28	14.58	18.61	7.01	0.29
<53µm>C5	4.40	39.91	8.99	14.22	26.46	10.58	58.41	63.95	65.37	13.08	0.54
<C5	1.04	51.07	10.17	11.51	8.92	17.82	17.60	17.02	12.46	1.04	0.21
Total	7.10	39.52	8.33	13.01	26.50	12.64	93.30	95.56	96.44	21.13	1.04

Recalculated Flotation Feed

TABLE 12D

CONTINUED

Size Fraction	Mass %	Metal Assays				Distribution			
		Cu	Fe	S		Cu	Fe	S	
>150µm	17.70	0.21	3.62	2.77		1.71	9.95	7.69	
<150>53µm	29.42	1.38	6.81	7.12		18.64	31.11	32.84	
<53µm>C5	29.27	4.67	9.57	10.68		62.76	43.50	48.97	
<C5	23.61	1.56	4.21	2.84		16.89	15.44	10.51	
Total	100.00	2.18	6.44	6.38		100	100	100	

Size Fraction	Mass %	Mineral Assays					Distribution				
		Cp	Bn	Ch	Py	Gn	Cp	Bn	Ch	Py	Gn
>150µm	17.70	0.35	0.06	0.07	4.86	94.66	2.07	1.64	1.22	9.65	19.37
<150>53µm	29.42	1.91	0.34	0.64	11.49	85.64	18.69	16.02	19.51	37.94	29.12
<53µm>C5	29.27	6.10	1.36	2.16	13.63	76.95	59.32	64.47	66.08	44.79	26.04
<C5	23.61	2.54	0.47	0.54	2.88	93.31	19.93	17.86	13.19	7.62	25.47
Total	100.00	3.01	0.62	0.96	8.91	86.50	100	100	100	100	100

TABLE 13A
MINERAL COMPOSITION OF MOLYBDENUM CONCENTRATE
Test 22 KM4420

Minerals	Mineral Content (wt.%)
Chalcopyrite	0.8
Bornite	0.1
Chalcocite	0.1
Covellite	0.1
Enargite/Tennantite	0.0
Native Copper/Cuprite	0.0
Molybdenite	49.1
Sphalerite	<0.1
Pyrite	0.4
Iron Oxides	1.0
Quartz	3.4
Micas	0.4
Feldspars	0.2
Carbonates	0.3
Chlorite	1.6
Apatite	0.1
Rutile/Anatase	0.1
Kaolinite (clay)	0.2
Talc	37.9
Amphibole	1.2
Fluorite	<0.1
Others	3.0
Total	100

Note: 1) Iron Oxides includes Magnetite, Hematite, Limonite and Goethite.
2) Micas includes Muscovite and Biotite/Phlogopite.
3) Feldspars includes Feldspar-Albite, K-Feldspar, Plagioclase Feldspar and Alkali Feldspar.
4) Carbonates includes Calcite, Dolomite and Ankerite.
5) Chlorite includes trace amounts of Epidote.
6) Ti Minerals includes Rutile/Anatase and trace amounts of Sphene.
7) Others includes Sillimanite and trace amounts of unresolved mineral species.

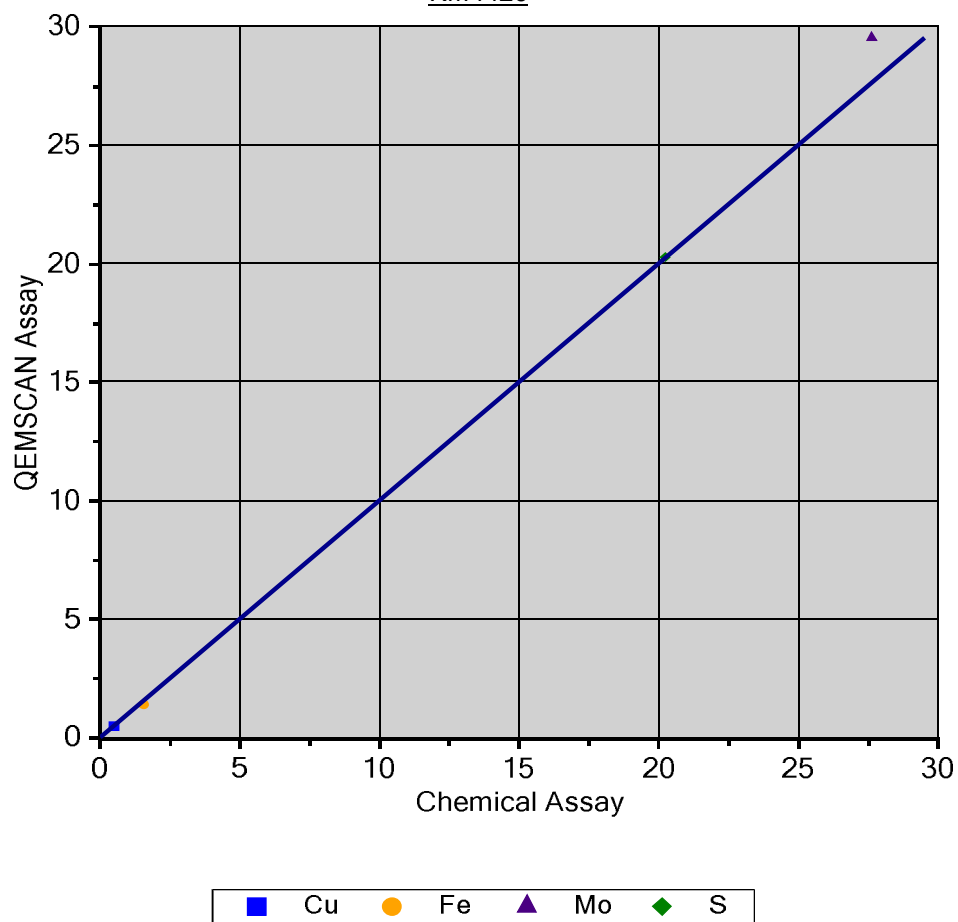
TABLE 13B
DISTRIBUTION OF COPPER BEARING MINERALS
Test 22 Molybdenum Concentrate

Mineral	Assays Wt. %	% Copper Bearing Mineral	% Copper Bearing Mineral of Total Copper
Chalcopyrite	0.8	70.1	53.9
Bornite	0.1	11.3	15.8
Chalcocite	0.1	10.9	18.8
Covellite	0.1	7.7	11.4
Enargite/Tennantite	0.0	0.0	0.0
Native Copper/Cuprite	0.0	0.0	0.0
Total	1.2	100	100

TABLE 13C
CHEMICAL COMPOSITION OF MOLYBDENUM CONCENTRATE
Test 22 KM4420

Element	Assay Methods	Assay Percent
Cu	QEMSCAN	0.53
	Chemical	0.52
Fe	QEMSCAN	1.49
	Chemical	1.56
Mo	QEMSCAN	29.4
	Chemical	27.6
S	QEMSCAN	20.3
	Chemical	20.2

FIGURE 2
ASSAY RECONCILIATION
KM4420



APPENDIX VI – KM4420

PILOT PLANT DATA

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TABLE VI-1A
SUMMARY OF GRINDING CONDITIONS
KM4420-P1 Pilot Plant Feed

Time	Rod Mill			Water Usage		Flotation Feed	
	Mass kg/hr	Discharge Density	Critical Speed %	Feed H ₂ O L/min	Pumpbox H ₂ O L/min	Flot Feed Density	Size µm K ₈₀
Target	70	65		0.6	1.5	35	160
7:00							
7:30	-	-	-	-	-	-	-
8:00	70	-	-	-	-	-	-
8:30	78	-	-	-	1.6	-	-
9:00	74	-	-	-	-	-	-
9:30	-	-	50	-	-	-	159
10:00	69	71	-	-	-	35	-
10:30	68	-	-	-	-	-	162
11:00	76	71	-	-	-	39	-
11:30	74	-	50	-	-	-	-
12:00	67	70	-	-	-	34	-
12:30	67	-	-	-	-	-	186
13:00	71	70	-	-	-	37	-
13:30	81	-	55	-	-	-	-
14:00	82	73	-	-	-	40	177
14:30	77	-	-	-	-	-	-
15:00	72	71	-	0.6	1.6	35	180
15:30	-	-	-	-	-	-	-
Average	73	71	52	0.6	1.6	37	173

Mass Start 1023 kg
Mass Finish 422 kg
Hopper 60 kg
Total Feed 541 kg
Feed Rate 73 kg/hr

Time Start 8:03 am
Time Finish 15:30 pm
Time Run 7.5 hrs
Moisture 0.2 %

- Notes:
1. Float Feed Density taken with Marcy Cup and Scale.
 2. Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Rod Mill 1
Mill Dimensions	20" dia x 30" Mild
Motor HP	3
No Load Power (amps)	Varies with speed
Starting Mill Charge (kg)	140kg mild steel rods

- Notes:
1. The primary grinding circuit was operated in closed circuit with a 500 µm screen
 2. Fresh water used in grinding circuit.

TABLE VI-1B
SUMMARY OF REGRINDING CONDITIONS
KM4420-P1 Pilot Plant Feed

Time	Bulk Ro Con			Bulk Final Con Mass Pull (%)
	Mass Pull (%)	Regrind		
		Speed (rpm)	size-µm K80	
9:45	14.4	1600	54	7.54
10:00	17.7	1700	-	-
10:30	23.6	1700	-	-
10:40	23.0	-	-	-
10:45	20.3	-	35	-
11:40	16.7	1700	29	6.23
12:10	17.7	-	-	-
12:15	19.0	-	41	3.44
13:15	26.2	1700	-	-
13:20	22.3	-	-	4.10
14:10	22.3	-	-	4.59
14:45	20.0	1750	43	-
Average	20.3	1692	40	5.2

Note: Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Bulk Ro Con Regrind
Mill Type	Stirred Mill
Motor HP	1
No Load Power (amps)	Varies on Speed
Mill Charge	1800g of 2.8mm Ceramic Beads

TABLE VI-1C
SUMMARY OF STREAM SIZING DATA
KM4420-P1 Pilot Plant Feed

Time	Particle Size - microns K ₈₀		
	Flotation Feed	Bulk Regrind Discharge	Bulk Final Con
WSA 12:30-14:30	174	44	57

Note: Sizings conducted on Survey Samples.

TABLE VI-1D
SUMMARY OF REAGENT ADDITIONS
KM4420-P1 Pilot Plant Feed

Time	pH							
	PG	Bulk Ro	Bulk Ro Con	Bulk RG	Bulk Cl1	Bulk Cl2	Bulk Clnr 3	Bulk cl Scav
7:30	-	-	-	-	-	-	-	-
8:00	-	-	-	-	-	-	-	-
8:30	-	-	-	-	-	-	-	-
9:00	-	-	-	-	-	-	-	-
9:30	7.5	7.7	7.8	11.1	-	-	-	-
10:00	-	-	-	10.9	-	-	-	-
10:30	7.3	7.5	7.6	11.3	10.8	9.0	9.5	-
11:00	-	-	-	11.5	11.0	-	11.0	-
11:30	7.3	7.7	7.7	11.6	11.2	10.5	10.6	9.9
12:00	-	-	-	11.7	11.3	10.6	11.2	11.1
12:30	7.6	7.8	7.8	11.5	11.4	11.1	11.1	11.1
13:00	-	-	-	-	11.5	10.9	11.1	10.7
13:30	7.5	7.7	7.7	11.6	11.4	10.8	11.0	11.0
14:00	-	-	-	-	-	-	-	-
14:30	7.6	7.8	7.8	11.7	11.3	10.8	10.8	10.8
15:00	-	-	-	-	-	-	-	-
15:30	7.6	7.8	7.8	11.8	11.4	10.9	-	11.1
16:00								
16:30								
17:00								
17:30								
Average	7.5	7.7	7.7	11.5	11.3	10.6	10.8	10.8

TABLE VI-1D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P1 Pilot Plant Feed

Time	g/tonne						
	PG F.O	Bulk Ro Bank 1 MIBC	Bulk Ro Bank 1 SIPX	Bulk Ro Bank 2 SIPX	Bulk Rgd Lime	Bulk Rgd F.O	Bulk Rgd Dis SIPX
7:30	-	-	-	-	-	-	-
8:00	-	-	-	-	-	-	-
8:30	-	-	-	-	-	-	-
9:00	9	40	8	8	207	9	-
9:30	-	-	-	-	310	-	-
10:00	9	66	8	7	413	9	1
10:30	-	-	-	-	454	-	-
11:00	9	30	8	7	454	9	1
11:30	-	-	-	-	496	-	-
12:00	9	40	8	8	496	9	1
12:30	-	-	-	-	-	-	-
13:00	9	40	8	8	496	9	1
13:30	-	-	-	-	-	-	-
14:00	9	40	8	8	496	9	1
14:30	-	-	-	-	-	-	1
15:00	9	40	8	8	496	9	1
15:30	-	-	-	-	-	-	-
16:00							
16:30							
17:00							
17:30							
Average	9	42	8	8	432	9	1

Reagents	Solution Strength		Location
Lime	0.0500	g/ml	PG
Lime	0.0500	g/ml	Regrind
Lime	0.0100	g/ml	Cleaner 3
MIBC	0.0120	g/drop	All
SIPX	0.0005	g/ml	Rougher
SIPX	0.00015	g/ml	Cleaners
Floc	0.0005	g/ml	Thickener
F.O	0.8700	g/ml	All

TABLE VI-1D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P1 Pilot Plant Feed

Time	g/tonne						
	Bulk Clnr 1 MIBC	Bulk Clnr 2 SIPX	Bulk Clnr 3 SIPX	Bulk Clnr Scav SIPX	Bulk Clnr 3 Lime	Ro TI Thickener Floc	Clnr Thickener Floc
7:30	-	-	-	-	-	-	-
8:00	-	-	-	-	-	-	-
8:30	-	-	-	-	-	-	-
9:00	-	-	-	-	-	-	-
9:30	-	-	-	-	-	-	-
10:00	9	1	0.0	1	41	4	2
10:30	-	-	-	-	-	-	-
11:00	10	1	0.0	1	33	4	2
11:30	-	-	-	-	-	-	-
12:00	9	1	0.5	1	33	4	2
12:30	-	-	-	-	-	-	-
13:00	10	1	0.5	1	45	4	2
13:30	-	-	-	-	-	-	-
14:00	10	1	0.5	1	45	4	2
14:30	-	-	-	-	-	-	-
15:00	7	1	0.5	1	41	4	2
15:30	-	-	-	-	-	-	-
16:00							
16:30							
17:00							
17:30							
Average	9	1	0.3	1	40	4	2

TABLE VI-1E
KM4420-P1 Pilot Plant Feed
Raw Data - Sample Survey 12:30-14:30

Product	Mass Dry - g	Assay - percent or g/tonne					Time s	Mass kg/hr	Wet Wt g	Density percent
		Cu	Mo	Fe	S	S(s)				
Float Feed	555.2	1.95	0.038	5.80	5.57		25	79.9	1619	34.3
Bulk Ro Con	251.0	9.60	0.149	22.5	28.2		75	12.0	1401	17.9
Bulk Rgd Dis	128.4	10.2	0.159	23.2	31.4		50	9.2	994	12.9
Bulk Ro Tls	445.7	0.07	0.008	1.21	0.20	0.16	25	64.2	1084	41.1
Bulk Clnr Scav Tls	131.8	1.79	0.016	18.3	23.0		50	9.5	1245	10.6
Bulk Final Con	331.9	30.4	0.611	27.2	37.6		150	7.97	559	59.4

TABLE VI-1F
KM4420-P1 Pilot Plant Feed
Metallurgical Balance - Sample Survey 12:30-14:30

Product	Mass percent	Assay - percent or g/tonne				Distribution - percent			
		Cu	Mo	Fe	S	Cu	Mo	Fe	S
Float Feed	100	1.94	0.037	5.2	5.56	100	100	100	100
Bulk Ro Con	19.0	9.90	0.163	22.2	28.3	97	83	81	97
Bulk Rgd Dis	19.0	9.90	0.163	22.2	28.3	97	83	81	97
Bulk Ro Tls	81.0	0.07	0.008	1.2	0.20	3	17	19	3
Bulk Clnr 1 Tls	13.6	1.79	0.015	19.7	24.2	13	6	51	59
Bulk Con	5.40	30.4	0.534	28.4	38.8	84	77	29	38

TABLE VI-2A
SUMMARY OF GRINDING CONDITIONS
KM4420-P2 Pilot Plant Feed

Time	Rod Mill			Water Usage		Flotation Feed	
	Mass kg/hr	Discharge Density	Critical Speed %	Feed H ₂ O L/min	Pumpbox H ₂ O L/min	Flot Feed Density	Size µm K ₈₀
Target	70	65		0.6	1.5	35	160
7:00							
7:30	62	-	-	-	-	-	155
8:00	72	69	-	-	-	35	-
8:30	69	-	-	-	-	-	138
9:00	74	69	-	-	-	36	-
9:30	69	-	60	-	-	-	-
10:00	74	69	-	-	-	32	-
10:30	62	-	-	-	-	-	142
11:00	71	68	-	-	-	34	-
11:30	-	-	60	0.6	1.6	-	160
Average	69	69	60	0.6	1.6	34	149

Mass Start	<u>422</u>	kg	Time Start	<u>6:46</u>	am
Mass Finish	<u>104</u>	kg	Time Finish	<u>11:32</u>	pm
Total Feed	<u>318</u>	kg	Time Run	<u>4.8</u>	hrs
Feed Rate	<u>67</u>	kg/hr	Moisture	<u>0.04</u>	%

- Notes:
1. Float Feed Density taken with Marcy Cup and Scale.
 2. Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Rod Mill 1
Mill Dimensions	20" dia x 30" Mild
Motor HP	3
No Load Power (amps)	Varies with speed
Starting Mill Charge (kg)	140kg mild steel rods

- Notes:
1. The primary grinding circuit was operated in closed circuit with a 500 µm screen
 2. Fresh water used in grinding circuit.

TABLE VI-2B
SUMMARY OF REGRINDING CONDITIONS
KM4420-P2 Pilot Plant Feed

Time	Bulk Ro Con				Bulk Final Con
	Mass Pull (%)	Regrind 1	Regrind 2	Size	Mass Pull (%)
		Speed (rpm)	Speed (rpm)	µm K80	
7:20	24.0	1400	1600	27	-
8:10	19.8	1300	1500	28	-
9:00	21.2	1150	0	35	6.44
9:35	20.5	1150	-	-	4.18
10:10	19.8	1150	-	31	5.22
10:25	22.3	1150	-	-	6.27
10:40	-	1050	-	-	6.79
10:50	-	1000	-	-	-
11:05	-	1000	-	23	6.27
11:10	-	1000	-	-	7.83
11:25	-	980	-	29	9.14
Average	21.3	1121	1033	29	6.5

Note: Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Bulk Ro Con Regrind
Mill Type	Stirred Mill
Motor HP	1
No Load Power (amps)	Varies on Speed
Mill Charge Regrind 1	1800g of 5mm/3.5mm Ceramic Beads
Mill Charge Regrind 2	1800g of 2.8mm Ceramic Beads

TABLE VI-2C
SUMMARY OF STREAM SIZING DATA
KM4420-P2 Pilot Plant Feed

Time	Particle Size - microns K_{80}		
	Flotation Feed	Bulk Regrind Discharge	Bulk Final Con
WSA 9:30-11:30	144	33	45

Note: Sizings conducted on Survey Samples.

TABLE VI-2D
SUMMARY OF REAGENT ADDITIONS
KM4420-P2 Pilot Plant Feed

Time	pH							
	PG	Bulk Ro	Bulk Ro Con	Bulk RG	Bulk Cl1	Bulk Cl2	Bulk Clnr 3	Bulk cl Scav
7:30	-	-	-	-	-	-	-	-
8:00	7.6	7.8	7.8	11.4	10.8	10.2	11.0	10.4
8:30	7.6	7.7	7.7	11.5	10.9	10.6	-	-
9:00	-	-	-	-	-	-	-	-
9:30	7.6	7.8	7.8	11.7	11.4	11.2	11.0	10.6
10:00	-	-	-	-	-	-	-	-
10:30	7.6	7.8	7.8	11.7	11.5	11.3	11.2	11.2
11:00	-	-	-	-	-	-	-	-
11:30	7.6	7.8	7.8	11.6	11.1	10.4	10.7	10.7
12:00								
12:30								
13:00								
13:30								
14:00								
14:30								
15:00								
15:30								
16:00								
16:30								
17:00								
17:30								
Average	7.6	7.8	7.8	11.6	11.1	10.7	11.0	10.7

TABLE VI-2D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P2 Pilot Plant Feed

Time	g/tonne								
	PG F.O	Bulk Ro Bank 1 MIBC	Bulk Ro Bank 1 SIPX	Bulk Ro Bank 2 SIPX	Bulk Rgd Lime	Bulk Rgd F.O	Bulk Rgd Dis SIPX	Bulk Clnr 2 SIPX	Bulk Clnr 3 SIPX
7:00	10	50	9	9	540	10	1	1	-
7:30	-	54	-	-	-	-	-	-	-
8:00	10	65	9	9	540	10	1	1	0.5
8:30	-	-	-	-	630	-	-	-	-
9:00	10	-	9	9	809	10	1	1	0.5
9:30	-	93	-	-	-	-	-	-	-
10:00	10	94	9	9	630	10	1	1	0.5
10:30	-	-	-	-	-	-	-	-	-
11:00	10	95	9	9	-	10	1	1	0.5
11:30	-	-	-	-	-	-	-	-	-
12:00									
12:30									
13:00									
13:30									
14:00									
14:30									
15:00									
15:30									
16:00									
16:30									
17:00									
Average	10	75	9	9	630	10	1	1	0.5

Reagents	Solution Strength		Location
Lime	0.0500	g/ml	PG
Lime	0.0500	g/ml	Regrind
Lime	0.0100	g/ml	Cleaner 3
MIBC	0.0120	g/drop	All
SIPX	0.0005	g/ml	Rougher
SIPX	0.00015	g/ml	Cleaner
Floc	0.0005	g/ml	Thickener
F.O	0.8700	g/ml	All

TABLE VI-2D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P2 Pilot Plant Feed

Time	g/tonne			
	Bulk Clnr Scav SIPX	Bulk Clnr 3 Lime	Ro TI Thickener Floc	Clnr Thickener Floc
7:00	1	54	5	2
7:30	-	-	-	-
8:00	1	54	5	2
8:30	-	-	-	-
9:00	1	-	5	2
9:30	-	81	-	-
10:00	1	72	5	2
10:30	-	108	-	-
11:00	1	-	5	2
11:30	-	-	-	-
12:00				
12:30				
13:00				
13:30				
14:00				
14:30				
15:00				
15:30				
16:00				
16:30				
17:00				
Average	1	74	5	2

TABLE VI-2E
 KM4420-P2 Pilot Plant Feed
 Raw Data - Sample Survey WSA 09:30-11:30

Product	Mass Dry - g	Assay - percent or g/tonne					Time s	Mass kg/hr	Wet Wt g	Density percent
		Cu	Mo	Fe	S	S(s)				
Float Feed	525.7	1.85	0.045	5.4	5.68		25	75.7	1658	31.7
Bulk Ro Con	309.8	8.90	0.166	20.3	29.2		75	14.9	1474	21.0
Bulk Rgd Dis	210.3	9.40	0.177	21.0	28.0		50	15.1	1027	20.5
Bulk Ro Tls	390.7	0.08	0.006	1.3	0.21	0.18	25	56.3	989	39.5
Bulk Clnr Scav Tls	148.5	1.43	0.016	21.9	28.6		50	10.7	828	17.9
Bulk Final Con	191.3	29.7	0.634	25.4	35.4		150	4.59	1343	14.2

TABLE VI-2F
KM4420-P2 Pilot Plant Feed
Metallurgical Balance - Sample Survey WSA 09:30-11:30

Product	Mass percent	Assay - percent or g/tonne				Distribution - percent			
		Cu	Mo	Fe	S	Cu	Mo	Fe	S
Float Feed	100	1.88	0.041	5.3	5.97	100	100	100	100
Bulk Ro Con	20.0	9.07	0.179	21.6	29.0	97	88	81	97
Bulk Rgd Dis	20.0	9.07	0.179	21.6	29.0	97	88	81	97
Bulk Ro Tls	80.0	0.08	0.006	1.3	0.21	3	12	19	3
Bulk Clnr 1 Tls	14.6	1.43	0.016	20.5	26.9	11	6	56	66
Bulk Con	5.43	29.6	0.619	24.7	34.5	86	82	25	31

TABLE VI-3A
SUMMARY OF GRINDING CONDITIONS
KM4420-P3 Pilot Plant Feed

Time	Rod Mill			Water Usage		Flotation Feed	
	Mass kg/hr	Discharge Density	Critical Speed %	Feed H ₂ O L/min	Pumpbox H ₂ O L/min	Flot Feed Density	Size µm K ₈₀
Target	70	65		0.6	1.5	35	160
7:00							
7:30	62	65	-	-	-	38	-
8:00	72	63	-	-	-	36	-
8:30	68	-	-	-	-	-	144
9:00	66	61	-	-	-	31	-
9:30	66	-	60	-	-	-	-
10:00	69	59	-	-	-	31	-
10:30	63	-	-	-	-	-	122
11:00	68	61	-	-	-	31	-
11:30	65	-	-	-	-	-	-
12:00	76	-	60	-	-	35	-
12:30	74	-	55	-	-	-	131
13:00	69	62	-	-	-	-	-
13:30	73	-	50	-	-	-	-
14:00	73	-	50	-	-	33	-
14:30	66	-	45	-	-	-	147
15:00	85	61	40	-	-	-	-
15:30	-	-	-	0.7	1.6	-	-
Average	70	62	51	0.7	1.6	33	136

Mass Start 1019.5 kg
Mass Finish 457.0 kg
Total Feed 562.5 kg
Feed Rate 69 kg/hr

Time Start 7:20 am
Time Finish 15:28 pm
Time Run 8.1 hrs
Moisture N/A %

Notes: 1. Float Feed Density taken with Marcy Cup and Scale.
2. Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Rod Mill 1
Mill Dimensions	20" dia x 30" Mild
Motor HP	3
No Load Power (amps)	Varies with speed
Starting Mill Charge (kg)	140kg mild steel rods

Notes: 1. The primary grinding circuit was operated in closed circuit with a 500 µm screen
2. Recycle water used in grinding circuit.

TABLE VI-3B
SUMMARY OF REGRINDING CONDITIONS
KM4420-P3 Pilot Plant Feed

Time	Bulk Ro Con			Bulk Final Con Mass Pull (%)
	Mass Pull (%)	Regrind		
		Speed (rpm)	size-µm K80	
7:45	24.1	1000	-	7.1
8:00	-	-	57	-
8:15	-	-	26	-
8:30	-	-	40	-
9:15	23.8	1150	58	6.9
10:00	-	-	73	-
10:30	23.3	-	36	5.2
11:40	21.4	1100	39	6.2
12:00	-	-	39	-
13:00	21.4	-	35	7.4
14:00	-	-	38	-
14:30	-	-	-	7.4
Average	22.8	1083	44	6.7

Note: Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Bulk Ro Con Regrind
Mill Type	Stirred Mill
Motor HP	1
No Load Power (amps)	Varies on Speed
Mill Charge	1600g of 5.0/3.5 mm Ceramic Beads

TABLE VI-3C
SUMMARY OF STREAM SIZING DATA
KM4420-P3 Pilot Plant Feed

Time	Particle Size - microns K_{80}				
	Flotation Feed	Bulk Ro Con	Bulk Re grind Discharge	Bulk Cleaner Scav Fd	Bulk Final Con
WSA 10:30-13:00	136	-	36	-	67
WSB 13:00-15:30	150	126	35	30	64

Note: Sizings conducted on Survey Samples.

TABLE VI-3D
SUMMARY OF REAGENT ADDITIONS
KM4420-P3 Pilot Plant Feed

Time	pH							
	PG	Bulk Ro	Bulk Ro Con	Bulk RG	Bulk Cl1	Bulk Cl2	Bulk Clnr 3	Bulk cl Scav
7:30	-	-	-	-	-	-	-	-
8:00	-	-	-	-	-	-	-	-
8:30	7.6	7.7	7.8	11.9	11.4	11.3	11.6	11.7
9:00	-	-	-	-	-	-	-	-
9:30	7.6	7.7	7.8	11.5	11.2	11.2	11.1	10.7
10:00	-	-	-	-	-	-	-	-
10:30	7.6	7.8	7.8	11.7	11.3	11.3	11.4	11.1
11:00	-	-	-	-	-	-	-	-
11:30	7.7	7.8	7.8	11.6	11.4	11.4	11.4	11.2
12:00	-	-	-	-	-	-	-	-
12:30	7.8	7.8	7.8	11.7	11.4	11.5	11.6	11.4
13:00	-	-	-	-	-	-	-	-
13:30	7.8	7.8	7.8	11.9	11.6	11.6	11.8	11.5
14:00	-	-	-	-	-	-	-	-
14:30	7.6	7.7	7.8	11.8	11.4	11.3	11.4	11.4
15:00	-	-	-	-	-	-	-	-
15:30	-	-	-	-	-	-	-	-
16:00								
16:30								
17:00								
17:30								
Average	7.7	7.8	7.8	11.7	11.4	11.4	11.5	11.3

TABLE VI-3D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P3 Pilot Plant Feed

Time	g/tonne							
	PG F.O	Bulk Ro Bank 1 MIBC	Bulk Ro Bank 1 SIPX	Bulk Ro Bank 2 SIPX	Bulk Rgd Lime	Bulk Rgd F.O	Bulk Rgd Dis SIPX	Bulk Clnr 1 MIBC
7:00	10	83	8	8	607	10	1	66
7:30	-	-	-	-	-	-	-	-
8:00	10	92	8	8	586	10	1	20
8:30	-	-	-	-	-	-	-	-
9:00	15	73	8	8	564	10	1	19
9:30	-	-	-	-	-	-	-	-
10:00	15	135	8	8	564	10	1	19
10:30	-	-	-	-	-	-	-	-
11:00	15	135	8	8	607	10	1	17
11:30	-	-	-	-	-	-	-	-
12:00	15	127	8	8	564	10	1	14
12:30	-	-	-	-	-	-	-	-
13:00	15	133	8	8	564	10	1	22
13:30	-	-	-	-	-	-	-	-
14:00	15	142	8	8	564	10	1	22
14:30	-	-	-	-	-	-	-	-
15:00	15	140	8	8	564	10	1	-
15:30								
16:30								
17:30								
Average	14	118	8	8	576	10	1	25

Reagents	Solution Strength		Location
Lime	0.0500	g/ml	PG
Lime	0.0500	g/ml	Regrind
Lime	0.0100	g/ml	Cleaner 3
MIBC	0.0120	g/drop	All
SIPX	0.0005	g/ml	Rougher
SIPX	0.00015	g/ml	Cleaner
Floc	0.0005	g/ml	Thickener
F.O	0.8700	g/ml	All

TABLE VI-3D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P3 Pilot Plant Feed

Time	g/tonne						
	Bulk Clnr 2 SIPX	Bulk Clnr 3 SIPX	Bulk Clnr Scav SIPX	Bulk Clnr 3 Lime	Bulk Clnr 3 MIBC	Ro TI Thickener Floc	Clnr Thickener Floc
7:00	1	0.5	1	104	-	5	2
7:30	-	-	-	-	-	-	-
8:00	1	0.5	2	121	20	5	3
8:30	-	-	-	-	-	-	-
9:00	1	0.5	2	130	19	5	3
9:30	-	-	-	78	-	-	-
10:00	1	0.5	2	121	19	0	0
10:30	-	-	-	104	-	-	-
11:00	1	0.5	2	130	15	6	3
11:30	-	-	-	-	-	-	-
12:00	1	0.5	2	130	15	6	3
12:30	-	-	-	-	-	-	-
13:00	1	0.5	2	130	15	6	3
13:30	-	-	-	-	-	-	-
14:00	1	0.5	2	78	15	6	3
14:30	-	-	-	-	-	-	-
15:00	1	0.5	2	69	15	5	3
15:30							
16:30							
17:30							
Average	1	0.5	2	109	16	5	3

TABLE VI-3E
KM4420-P3 Pilot Plant Feed
Raw Data - Sample Survey WSA 10:30-13:00

Product	Mass Dry - g	Assay - percent or g/tonne					Time s	Mass kg/hr	Wet Wt g	Density percent
		Cu	Mo	Fe	S	S(s)				
Float Feed	475.2	1.97	0.044	5.8	5.75		25	68.4	1602	29.7
Bulk Ro Con 1+2	97.9	14.3	0.460	17.6	22.2		75	4.7	696	14.1
Bulk Ro Con 3+4	159.3	8.20	0.017	29.9	36.8		75	7.6	523	30.5
Bulk Ro Con	290.4	9.40	0.177	22.4	28.4		75	13.9	1496	19.4
Bulk Rgd Dis	197.2	8.60	0.172	20.2	24.9		50	14.2	1166	16.9
Bulk Ro Tls	399.7	0.06	0.006	1.3	0.19	0.15	25	57.6	1013	39.5
Bulk Clnr Scav Tls	118.9	0.89	0.013	15.2	17.8		50	8.6	707	16.8
Bulk Final Con	248.1	20.2	0.423	25.4	39.7		150	6.0	1197	20.7

TABLE VI-3E Continued
KM4420-P3 Pilot Plant Feed
Raw Data - Sample Survey WSB 13:00-15:00

Product	Mass Dry - g	Assay - percent or g/tonne					Time s	Mass kg/hr	Wet Wt g	Density percent
		Cu	Mo	Fe	S	S(s)				
Float Feed	511.6	2.10	0.043	7.0	6.83		25	73.7	1544.0	33.1
Bulk Ro Con	306.6	9.50	0.174	22.1	28.3		75	14.7	1559.4	19.7
Bulk Rgd Dis	209.2	9.70	0.187	18.4	23.1		50	15.1	1194.9	17.5
Bulk Ro Tls	419.8	0.07	0.006	1.3	0.21	0.17	25	60.5	1076.3	39.0
Bulk 1st Clnr Feed	118.7	7.50	0.111	16.2	20.3		25	17.1	1182.8	10.0
Bulk 1st Clnr Con	149.9	17.8	0.437	23.8	31.4		75	7.2	1424.1	10.5
Bulk Clnr Scav Feed	219.0	3.69	0.014	18.1	22.6		50	15.8	1597.6	13.7
Bulk Clnr Scav Con	145.5	6.80	0.022	17.6	22.1		150	3.5	1381.8	10.5
Bulk Clnr scav Tls	121.3	1.36	0.011	17.5	20.5		50	8.7	700.7	17.3
Bulk 2nd Clnr Con	96.5	21.5	0.510	27.3	36.4		75	4.6	848.5	11.4
Bulk 2nd Clnr Tail	34.1	1.60	0.051	13.3	14.4		25	4.9	874.9	3.9
Bulk 3rd Clnr Tail	21.9	3.79	0.177	16.9	18.9		150	0.5	898.2	2.4
Bulk Final Con	223.2	23.0	0.493	28.5	39.0		150	5.4	926.9	24.1

TABLE VI-3F
KM4420-P3 Pilot Plant Feed
Metallurgical Balance - Sample Survey WSA 10:30-13:00

Product	Mass percent	Assay - percent or g/tonne				Distribution - percent			
		Cu	Mo	Fe	S	Cu	Mo	Fe	S
Float Feed	100	1.98	0.043	5.4	5.89	100	100	100	100
Bulk Ro Con	21.7	8.90	0.178	20.5	26.4	97	89	82	98
Bulk Rgd Dis	21.7	8.90	0.178	20.5	26.4	97	89	82	98
Bulk Ro Tls	78.3	0.06	0.006	1.3	0.19	3	11	18	2
Bulk Clnr 1 Tls	12.8	0.89	0.013	16.0	17.6	6	4	38	38
Bulk Con	8.95	20.3	0.413	26.9	39.1	92	85	44	59

TABLE VI-3F Continued
KM4420-P3 Pilot Plant Feed
Metallurgical Balance - Sample Survey WSB 13:00-15:00

Product	Mass percent	Assay - percent or g/tonne				Distribution - percent			
		Cu	Mo	Fe	S	Cu	Mo	Fe	S
Float Feed	100.0	2.15	0.047	5.8	6.23	100	100	100	100
Bulk Ro Con	23.2	9.05	0.184	20.9	26.2	98	90	83	97
Bulk Rgd Dis	23.2	9.05	0.184	20.9	26.2	98	90	83	97
Bulk Ro Tls	76.8	0.07	0.006	1.3	0.21	2	10	17	3
Bulk 1st Clnr Feed	39.5	7.64	0.118	18.8	23.6	140	99	128	150
Bulk 1st Clnr Con	10.8	17.9	0.393	24.0	31.7	90	90	45	55
Bulk Clnr Scav Feed	28.7	3.77	0.015	16.8	20.6	50	9	83	95
Bulk Clnr Scav Con	13.6	6.42	0.020	16.5	21.1	41	6	39	46
Bulk Clnr scav Tls	15.0	1.36	0.011	17.1	20.1	10	3	44	48
Bulk 2nd Clnr Con	8.8	21.8	0.479	26.9	36.0	89	89	41	51
Bulk 2nd Clnr Tail	2.6	1.60	0.052	12.7	13.9	2	3	6	6
Bulk 3rd Clnr Tail	0.7	3.79	0.179	17.0	18.9	1	2	2	2
Bulk Final Con	8.1	23.2	0.503	27.7	37.4	88	87	39	49

TABLE VI-4A
SUMMARY OF GRINDING CONDITIONS
KM4420-P4 Pilot Plant Feed

Time	Rod Mill			Water Usage		Flotation Feed	
	Mass kg/hr	Discharge Density	Critical Speed %	Feed H ₂ O L/min	Pumpbox H ₂ O L/min	Flot Feed Density	Size µm K ₈₀
Target	70	65		0.6	1.5	35	160
7:00							
7:30	89	-	40	0.6	1.6	-	-
8:00	73	64	-	-	-	35	-
8:30	64	-	-	-	-	-	151
9:00	79	-	-	-	-	-	-
9:30	60	-	40	-	-	-	-
10:00	73	-	-	-	-	35	-
10:30	73	-	-	-	-	-	178
11:00	76	-	-	-	-	-	-
11:30	74	-	45	-	-	-	-
12:00	72	68	-	-	-	37	-
12:30	-	-	-	-	-	-	181
13:00	79	-	-	-	-	-	-
13:30	59	-	45	-	-	-	-
14:00	75	-	-	-	-	35	156
14:30	74	-	-	-	-	-	-
15:00	70	-	-	-	-	-	-
15:30	-	-	-	0.7	1.6	-	-
Average	73	66	43	0.6	1.6	36	167

Mass Start 1394.0 kg
Mass Finish 827.0 kg
Total Feed 567.0 kg
Feed Rate 70 kg/hr

Time Start 7:22 am
Time Finish 15:30 pm
Time Run 8.1 hrs
Moisture 0.20 %

Notes: 1. Float Feed Density taken with Marcy Cup and Scale.
2. Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Rod Mill 1
Mill Dimensions	20" dia x 30" Mild
Motor HP	3
No Load Power (amps)	Varies with speed
Starting Mill Charge (kg)	130.0kg mild steel rods

Notes: 1. The primary grinding circuit was operated in closed circuit with a 500 µm screen
2. Recycled water used in grinding circuit.

TABLE VI-4B
SUMMARY OF REGRINDING CONDITIONS
KM4420-P4 Pilot Plant Feed

Time	Bulk Ro Con			Bulk Final Con Mass Pull (%)
	Mass Pull (%)	Regrind		
		Speed (rpm)	size-µm K80	
7:45	22.5	1200	-	6.28
8:00	-	-	33	-
8:50	20.1	1200	28	6.44
9:50	23.1	1150	24	6.94
10:40	-	-	39	
11:30	20.1	1175	30	6.28
11:45	-	-	37	
13:00	22.1	1175	-	5.28
13:30	-	-	35	-
15:00	22.8	1175	-	7.27
Average	21.8	1179	32	6.4

Note: Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Copper Ro Con Regrind
Mill Type	Stirred Mill
Motor HP	1
No Load Power (amps)	Varies on Speed
Mill Charge	1600g of 5.0/3.5 mm Ceramic Beads

TABLE VI-4C
SUMMARY OF STREAM SIZING DATA
KM4420-P4 Pilot Plant Feed

Time	Particle Size - microns K ₈₀				
	Flotation Feed	Bulk Ro Con	Bulk Regrind Discharge	Bulk Cleaner Scav Fd	Bulk Final Con
WSA 10:30-13:00	185	-	40	-	58
WSB 13:00-15:30	172	130	35	28	57

Note: Sizings conducted on Survey Samples.

TABLE VI-4D
SUMMARY OF REAGENT ADDITIONS
KM4420-P4 Pilot Plant Feed

Time	pH							
	PG	Bulk Ro	Bulk Ro Con	Bulk RG	Bulk Cl1	Bulk Cl2	Bulk Clnr 3	Bulk cl Scav
7:30	-	-	-	-	-	-	-	-
8:00	-	-	-	-	-	-	-	-
8:30	7.8	7.9	7.9	11.8	11.4	10.8	11.2	11.0
9:00	-	-	-	-	-	-	-	-
9:30	7.8	7.9	7.9	11.5	11.3	11.1	11.2	10.8
10:00	-	-	-	-	-	-	-	-
10:30	7.8	7.7	7.8	11.8	11.2	11.0	11.1	11.1
11:00	-	-	-	-	-	-	-	-
11:30	7.8	7.7	7.8	11.8	11.4	11.3	11.4	11.4
12:00	-	-	-	-	-	-	-	-
12:30	7.8	7.8	7.8	11.8	11.4	11.2	11.4	11.2
13:00	-	-	-	-	-	-	-	-
13:30	7.8	7.9	7.9	11.8	11.4	11.4	11.7	11.3
14:00	-	-	-	-	-	-	-	-
14:30	7.8	7.9	7.9	11.9	11.6	11.5	11.8	11.4
15:00	-	-	-	-	-	-	-	-
15:30								
16:00								
16:30								
17:00								
17:30								
Average	7.8	7.8	7.9	11.8	11.4	11.2	11.4	11.2

TABLE VI-4D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P4 Pilot Plant Feed

Time	g/tonne							
	PG F.O	Bulk Ro Bank 1 MIBC	Bulk Ro Bank 1 SIPX	Bulk Ro Bank 2 SIPX	Bulk Rgd Lime	Bulk Rgd F.O	Bulk Rgd Dis SIPX	Bulk Clnr 1 MIBC
7:00	-	-	-	-	-	-	-	-
7:30	-	-	-	-	-	-	-	-
8:00	15	133	8	8	559	10	2	24
8:30	-	-	-	-	-	-	-	-
9:00	15	129	8	8	559	10	2	28
9:30	-	-	-	-	-	-	-	-
10:00	15	134	8	8	559	10	1	28
10:30	-	-	-	-	-	-	-	-
11:00	15	129	8	8	581	10	1	29
11:30	-	-	-	-	-	-	-	-
12:00	15	124	8	8	559	10	1	27
12:30	-	-	-	-	-	-	-	-
13:00	15	124	8	8	559	10	1	27
13:30	-	-	-	-	-	-	-	-
14:00	15	114	8	8	581	10	1	28
14:30	-	-	-	-	-	-	-	-
15:00	15	101	8	8	559	10	1	24
15:30								
16:00								
16:30								
17:00								
Average	15	124	8	8	565	10	1	27

Reagents	Solution Strength		Location
Lime	0.0500	g/ml	PG
Lime	0.0500	g/ml	Regrind
Lime	0.0100	g/ml	Cleaner 3
MIBC	0.0120	g/drop	All
SIPX	0.0005	g/ml	Rougher
SIPX	0.00015	g/ml	Cleaner
Floc	0.0005	g/ml	Thickener
F.O	0.8700	g/ml	All

TABLE VI-4D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P4 Pilot Plant Feed

Time	g/tonne						
	Bulk Clnr 2 SIPX	Bulk Clnr 3 SIPX	Bulk Clnr Scav SIPX	Bulk Clnr 3 Lime	Bulk Clnr 3 MIBC	Ro TI Thickener Floc	Clnr Thickener Floc
7:00	-	-	-	-	-	-	-
7:30	-	-	-	-	-	-	-
8:00	1	-	1	95	15	5	-
8:30	-	0.3	-	-	-	-	3
9:00	1	-	1	95	18	5	-
9:30	-	0.3	-	-	-	-	3
10:00	1	-	1	95	11	5	-
10:30	-	0.3	-	-	-	-	3
11:00	1	-	1	95	10	5	-
11:30	-	0.4	-	-	-	-	3
12:00	1	-	1	95	21	5	-
12:30	-	0.3	-	-	-	-	3
13:00	1	-	1	95	21	5	-
13:30	-	0.3	-	-	-	-	3
14:00	1	-	1	77	21	-	-
14:30	-	0.3	-	-	-	-	3
15:00	1	-	1	52	-	-	-
15:30							
16:00							
16:30							
17:00							
	1	0.3	1	87	17	5	3

TABLE VI-4E
KM4420-P4 Pilot Plant Feed
Raw Data - Sample Survey WSA 10:30-13:00

Product	Mass Dry - g	Assay - percent or g/tonne						Time s	Mass kg/hr	Wet Wt g	Density percent
		Cu	Mo	Fe	Fe(t)	S	S(s)				
Float Feed	530.6	2.00	0.043	6.9		7.00		25	76.4	1426.4	37.2
Bulk Ro Con	324.8	9.30	0.177	23.3		28.4		75	15.6	1382.8	23.5
Bulk Rgd Dis	214.2	9.90	0.172	24.0		28.4		50	15.4	939.8	22.8
Bulk Ro Tls	409.4	0.10	0.008	1.3	1.7	0.20	0.17	25	59.0	1020.2	40.1
Bulk Clnr Scav Tls	145.2	0.40	0.007	19.2	20.1	22.1		50	10.5	814.2	17.8
Bulk Final Con	215.1	26.9	0.504	28.1	28.1	36.8		150	5.2	519.1	41.4

TABLE VI-4E Continued
KM4420-P4 Pilot Plant Feed
Raw Data - Sample Survey WSB 13:00-15:00

Product	Mass Dry - g	Assay - percent or g/tonne					Time s	Mass kg/hr	Wet Wt g	Density percent
		Cu	Mo	Fe	S	S(s)				
Float Feed	568.4	1.99	0.043	6.0	6.06		25	81.8	1648.8	34.5
Bulk Ro 1+2	61.2	16.6	0.783	16.1	19.7		75	2.9	396.7	15.4
Bulk Ro 3+4	209.8	7.40	0.024	24.3	30.1		75	10.1	820.7	25.6
Bulk Ro 5+6	60.8	2.01	0.013	6.0	5.95		75	2.9	460.3	13.2
Bulk Ro Con	343.8	8.30	0.153	19.7	23.3		75	16.5	1741.4	19.7
Bulk Rgd Dis	250.7	8.40	0.150	21.1	25.6		50	18.1	1177.3	21.3
Bulk Ro Tls	439.2	0.10	0.007	1.3	0.29	0.25	25	63.2	1113	39.5
Bulk 1st Clnr Feed	158.5	7.30	0.135	21.2	25.9		25	22.8	1055.3	15.0
Bulk 1st Clnr Con	142.9	22.3	0.366	26.3	33.8		75	6.9	971.3	14.7
Bulk Clnr Scav Feed	232.9	0.68	0.015	19.4	21.9		50	16.8	1682.7	13.8
Bulk Clnr Scav Con	117.7	1.27	0.030	18.5	21.5		150	2.8	1214.2	9.7
Bulk Clnr scav Tls	152.7	0.31	0.007	18.4	21.9		50	11.0	843.5	18.1
Bulk 2nd Clnr Con	93.8	26.4	0.472	27.7	35.9		75	4.5	333.2	28.2
Bulk 2nd Clnr Tail	28.7	1.30	0.083	19.9	23.1		25	4.1	597.7	4.8
Bulk 3rd Clnr Tail	15.1	4.82	0.365	27.6	33.9		150	0.4	313.8	4.8
Bulk Final Con	195.5	26.7	0.465	28.1	37.2		150	4.7	461.3	42.4

TABLE VI-4F
KM4420-P4 Pilot Plant Feed
Metallurgical Balance - Sample Survey WSA 10:30-13:00

Product	Mass percent	Assay - percent or g/tonne					Distribution - percent				
		Cu	Mo	Fe	Fe(t)	S	Cu	Mo	Fe	Fe(t)	S
Float Feed	100	2.05	0.043	5.8	6.1	6.12	100	100	100	100	100
Bulk Ro Con	21.1	9.35	0.175	22.4	22.8	28.3	96	85	81	79	97
Bulk Rgd Dis	21.1	9.35	0.175	22.4	22.8	28.3	96	85	81	79	97
Bulk Ro Tls	78.9	0.10	0.008	1.41	1.65	0.20	4	15	19	21	3
Bulk Clnr Scav Tls	13.9	0.40	0.007	19.4	20.1	23.4	3	2	46	46	53
Bulk Con	7.1	26.8	0.503	28.2	28.1	38.0	94	83	34	33	44

TABLE VI-4F Continued
KM4420-P4 Pilot Plant Feed
Metallurgical Balance - Sample Survey WSB 13:00-15:00

Product	Mass percent	Assay - percent or g/tonne				Distribution - percent			
		Cu	Mo	Fe	S	Cu	Mo	Fe	S
Float Feed	100.0	1.96	0.039	5.8	6.06	100	100	100	100
Bulk Ro 1+2	3.9	16.9	0.756	16.3	19.9	34	75	11	13
Bulk Ro 3+4	15.0	7.65	0.024	25.9	32.2	59	9	67	80
Bulk Ro 5+6	3.7	2.01	0.013	6.0	5.97	4	1	4	4
Bulk Ro Con	22.7	8.31	0.148	21.0	25.7	96	86	82	96
Bulk Rgd Dis	22.7	8.31	0.148	21.0	25.7	96	86	82	96
Bulk Ro Tls	77.3	0.10	0.007	1.3	0.29	4	14	18	4
Bulk 1st Clnr Feed	30.4	6.54	0.125	20.7	25.0	101	97	109	126
Bulk 1st Clnr Con	10.3	18.2	0.344	25.3	32.2	96	91	45	55
Bulk Clnr Scav Feed	20.1	0.53	0.012	18.2	21.3	5	6	63	71
Bulk Clnr Scav Con	4.1	1.38	0.032	18.8	21.7	3	3	13	15
Bulk Clnr scav Tls	16.0	0.31	0.007	18.1	21.3	3	3	50	56
Bulk 2nd Clnr Con	7.1	26.1	0.479	27.9	36.4	95	88	34	43
Bulk 2nd Clnr Tail	3.7	1.32	0.085	20.7	24.3	2	8	13	15
Bulk 3rd Clnr Tail	0.5	4.82	0.364	27.6	33.8	1	5	2	3
Bulk Final Con	6.6	27.6	0.488	27.9	36.6	93	83	32	40

TABLE VI-5A
SUMMARY OF GRINDING CONDITIONS
KM4420-P5 Pilot Plant Feed

Time	Rod Mill			Water Usage		Flotation Feed	
	Mass kg/hr	Discharge Density	Critical Speed %	Feed H ₂ O L/min	Pumpbox H ₂ O L/min	Flot Feed Density	Size μm K ₈₀
Target	70	65		0.6	1.5	35	160
7:00							
7:30	72	-	45	0.6	1.5	-	-
8:00	71	67	-	-	-	33	-
8:30	75	-	-	-	-	-	166
9:00	68	-	-	-	-	35	-
9:30	59	-	45	-	-	-	-
10:00	75	65	-	-	-	-	-
10:30	75	-	-	-	-	-	159
11:00	76	-	-	-	-	-	-
11:30	76	-	45	-	-	-	182
12:00	-	-	45	0.6	1.6	-	-
Average	72	66	45	0.6	1.6	34	169

Mass Start	<u>778.5</u>	kg	Time Start	<u>7:14</u>	am
Mass Finish	<u>474.0</u>	kg	Time Finish	<u>11:43</u>	pm
Total Feed	<u>304.5</u>	kg	Time Run	<u>4.5</u>	hrs
Feed Rate	<u>68</u>	kg/hr	Moisture	<u>-</u>	%

- Notes:
1. Float Feed Density taken with Marcy Cup and Scale.
 2. Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Rod Mill 1
Mill Dimensions	20" dia x 30" Mild
Motor HP	3
No Load Power (amps)	Varies with speed
Starting Mill Charge (kg)	130.0kg mild steel rods

- Notes:
1. The primary grinding circuit was operated in closed circuit with a 500 μm screen
 2. Recycled water used in grinding circuit.

TABLE VI-5B
SUMMARY OF REGRINDING CONDITIONS
KM4420-P5 Pilot Plant Feed

Time	Bulk Ro Con			Bulk Final Con
	Mass Pull (%)	Regrind		Mass Pull (%)
		Speed (rpm)	size-µm K80	
8:30	18.4	1100	17	-
8:40	21.1	-	-	6.02
9:30	22.4	1000	29	-
10:00	-	-	-	7.53
10:20	19.4	-	-	7.11
10:30	-	-	30	-
10:45	23.1	-	-	6.02
11:00	-	950	-	6.36
Average	20.9	1017	25	6.6

Note: Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Copper Ro Con Regrind
Mill Type	Stirred Mill
Motor HP	1
No Load Power (amps)	Varies on Speed
Mill Charge	1600g of 5.0/3.5 mm Ceramic Beads

TABLE VI-5C
SUMMARY OF STREAM SIZING DATA
KM4420-P5 Pilot Plant Feed

Time	Particle Size - microns K ₈₀			
	Flotation Feed	Bulk Ro Con	Bulk Regrind Discharge	Bulk Final Con
WSA 10:30-11:30	186	155	95	86

Note: Sizings conducted on Survey Samples.

TABLE VI-5D
SUMMARY OF REAGENT ADDITIONS
KM4420-P5 Pilot Plant Feed

Time	pH							
	PG	Bulk Ro	Bulk Ro Con	Bulk RG	Bulk Cl1	Bulk Cl2	Bulk Clnr 3	Bulk cl Scav
7:30	-	-	-	-	-	-	-	-
8:00	7.8	7.8	7.8	11.8	11.5	11.3	11.5	11.3
8:30	-	-	-	-	-	-	-	-
9:00	7.8	7.9	7.9	11.8	11.5	11.4	11.7	11.4
9:30	-	-	-	-	-	-	-	-
10:00	7.8	7.9	7.9	11.8	11.5	11.4	11.1	11.3
10:30	-	-	-	-	-	-	-	-
11:00	7.8	7.9	7.9	11.8	11.5	11.4	11.2	11.3
11:30	-	-	-	-	-	-	-	-
12:00	-	-	-	-	-	-	-	-
12:30								
13:00								
13:30								
14:00								
14:30								
15:00								
15:30								
16:00								
16:30								
17:00								
17:30								
Average	7.8	7.9	7.9	11.8	11.5	11.4	11.4	11.3

TABLE VI-5D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P5 Pilot Plant Feed

Time	g/tonne							
	PG F.O	Bulk Ro Bank 1 MIBC	Bulk Ro Bank 1 SIPX	Bulk Ro Bank 3 SIPX	Bulk Rgd Lime	Bulk Rgd F.O	Bulk Rgd Dis SIPX	Bulk Clnr 1 MIBC
7:00	-	-	-	-	-	-	-	-
7:30	-	-	-	-	-	-	-	-
8:00	15	91	8	8	574	-	1	16
8:30	-	-	-	-	-	-	-	-
9:00	15	127	8	8	574	10	1	16
9:30	-	-	-	-	-	-	-	-
10:00	15	118	8	8	574	10	1	27
10:30	-	-	-	-	-	-	-	-
11:00	-	109	8	8	574	10	1	27
11:30	-	-	-	-	-	-	-	-
12:00	-	-	-	-	-	-	-	-
12:30								
13:00								
13:30								
14:00								
14:30								
15:00								
15:30								
16:30								
17:30								
0:00								
Average	15	111	8	8	574	10	1	21

Reagents	Solution Strength		Location
Lime	0.0500	g/ml	PG
Lime	0.0500	g/ml	Regrind
Lime	0.0100	g/ml	Cleaner 3
MIBC	0.0120	g/drop	All
SIPX	0.0005	g/ml	Rougher
SIPX	0.00015	g/ml	Cleaner
Floc	0.0005	g/ml	Thickener
F.O	0.8700	g/ml	All

TABLE VI-5D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P5 Pilot Plant Feed

Time	g/tonne					
	Bulk Clnr 2 SIPX	Bulk Clnr Scav SIPX	Bulk Clnr 3 Lime	Bulk Clnr 3 MIBC	Ro TI Thickener Floc	Clnr Thickener Floc
7:00	-	-	-	-	-	-
7:30	-	-	-	-	-	-
8:00	1	1	57	32	-	-
8:30	-	-	-	-	-	-
9:00	1	1	57	32	5	4
9:30	-	-	-	-	-	-
10:00	1	1	-	11	5	4
10:30	-	-	-	-	-	-
11:00	-	1	35	11	-	-
11:30	-	-	-	-	-	-
12:00	-	-	-	-	-	-
12:30						
13:00						
13:30						
14:00						
14:30						
15:00						
15:30						
16:30						
17:30						
Average	1	1	50	21	5	4

TABLE VI-5E
 KM4420-P5 Pilot Plant Feed
 Raw Data - Sample Survey WSA 10:30-11:30

Product	Mass Dry - g	Assay - percent or g/tonne					Time s	Mass kg/hr	Wet Wt g	Density percent
		Cu	Mo	Fe	S	S(s)				
Float Feed	543.6	2.26	0.045	6.70	6.67		25	78.3	1528.2	35.6
Bulk Ro 1+2	114.8	16.9	0.483	18.20	22.3		75	5.5	793.3	14.5
Bulk Ro 3+4	212.6	5.51	0.014	26.00	31.4		75	10.2	746.5	28.5
Bulk Ro 5+6	48.8	1.14	0.013	4.70	3.87		75	2.3	345.7	14.1
Bulk Ro Con	380.3	8.70	0.156	20.20	25.2		75	18.3	1939.8	19.6
Bulk Rgd Dis	624.6	8.30	0.120	26.80	34.5		50	45.0	1728.2	36.1
Bulk Ro Tls	380.2	0.07	0.007	16.2	0.16	0.12	25	54.7	861.6	44.1
Bulk 1st Clnr Feed	124.5	7.50	0.150	18.0	23.0		25	17.9	1046.1	11.9
Bulk 1st Clnr Con	221.3	15.2	0.257	30.5	38.6		75	10.6	1215.2	18.2
Bulk Clnr Scav Feed	131.9	0.68	0.017	9.60	10.0		50	9.5	1554.2	8.5
Bulk Clnr Scav Con	32.7	2.69	0.045	14.1	16.4		150	0.8	592.8	5.5
Bulk Clnr scav Tls	109	0.30	0.011	10.5	8.15		50	7.8	1157.7	9.4
Bulk 2nd Clnr Con	248.1	16.5	0.327	32.1	40.0		75	11.9	564.6	43.9
Bulk 2nd Clnr Tail	47.5	2.54	0.058	27.1	32.7		25	6.8	842.9	5.6
Bulk 3rd Clnr Tail	134.1	9.10	0.260	31.8	39.2		150	3.2	623.2	21.5
Bulk Final Con	153.1	21.0	0.431	39.4	39.5		150	3.7	325.3	47.1

TABLE VI-5F
KM4420-P5 Pilot Plant Feed
Metallurgical Balance - Sample Survey WSA 10:30-11:30

Product	Mass percent	Assay - percent or g/tonne				Distribution - percent			
		Cu	Mo	Fe	S	Cu	Mo	Fe	S
Float Feed	100.0	2.25	0.046	6.5	6.14	100	100	100	100
Bulk Ro 1+2	8.1	17.1	0.476	18.3	21.7	61	83	23	29
Bulk Ro 3+4	14.0	5.55	0.014	26.3	29.5	35	4	56	67
Bulk Ro 5+6	3.4	1.14	0.013	4.7	3.86	2	1	2	2
Bulk Ro Con	25.5	8.62	0.160	20.9	23.6	98	89	81	98
Bulk Rgd Dis	25.5	8.62	0.160	20.9	23.6	98	89	81	98
Bulk Ro Tls	74.5	0.07	0.007	1.6	0.16	2	11	19	2
Bulk 1st Clnr Feed	32.7	7.30	0.137	20.9	24.6	106	97	105	131
Bulk 1st Clnr Con	15.8	14.5	0.267	32.9	38.0	102	92	80	98
Bulk Clnr Scav Feed	16.9	0.58	0.015	9.7	12.1	4	6	25	33
Bulk Clnr Scav Con	1.6	2.84	0.046	14.0	15.8	2	2	4	4
Bulk Clnr scav Tls	15.2	0.34	0.012	9.2	11.6	2	4	21	29
Bulk 2nd Clnr Con	15.5	16.9	0.338	35.3	40.6	116	114	84	102
Bulk 2nd Clnr Tail	5.5	2.56	0.059	23.1	31.5	6	7	20	28
Bulk 3rd Clnr Tail	5.2	9.00	0.255	29.4	38.8	21	29	24	33
Bulk Final Con	10.2	21.0	0.380	38.2	41.5	95	85	60	69

TABLE VI-6A
SUMMARY OF GRINDING CONDITIONS
KM4420-P6 Pilot Plant Feed

Time	Rod Mill			Water Usage		Flotation Feed	
	Mass kg/hr	Discharge Density	Critical Speed %	Feed H ₂ O L/min	Pumpbox H ₂ O L/min	Flot Feed Density	Size µm K ₈₀
Target	70	65		0.6	1.5	35	160
7:00							
7:30	-	-	-	-	-	-	-
8:00	-	-	-	-	-	-	-
8:30	69	-	45	0.7	-	-	-
9:00	64	66	-	-	1.5	33	-
9:30	70	-	45	-	-	-	161
10:00	-	-	-	-	-	-	-
10:30	77	-	-	-	-	36	170
11:00	74	69	-	-	-	-	-
11:30	75	-	45	-	-	-	-
12:00	73	68	-	-	-	38	-
12:30	72	-	-	-	-	-	178
13:00	74	66	-	-	-	35	-
13:30	73	-	45	-	-	-	-
14:00	-	-	50	-	-	-	-
14:30	70	60	-	-	-	34	152
15:00	60	-	50	-	-	-	-
15:30	-	-	-	0.8	1.5	-	-
Average	71	66	47	0.7	1.5	35	165

Mass Start 1375.0 kg
Mass Finish 859.5 kg
Total Feed 515.5 kg
Feed Rate 73 kg/hr

Time Start 8:23 am
Time Finish 15:29 pm
Time Run 7.1 hrs
Moisture - %

Notes: 1. Float Feed Density taken with Marcy Cup and Scale.
2. Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Rod Mill 1
Mill Dimensions	20" dia x 30" Mild
Motor HP	3
No Load Power (amps)	Varies with speed
Starting Mill Charge (kg)	130.0kg mild steel rods

Notes: 1. The primary grinding circuit was operated in closed circuit with a 400 µm screen
2. Recycled water used in grinding circuit.

TABLE VI-6B
SUMMARY OF REGRINDING CONDITIONS
KM4420-P6 Pilot Plant Feed

Time	Bulk Ro Con			Bulk Final Con
	Mass Pull (%)	Regrind		Mass Pull (%)
		Speed (rpm)	size-µm K80	
9:20	16.6	950	27	-
10:00	16.6	910	-	5.58
10:40	-	940	27	7.45
11:20	22.0	920	-	-
11:45	20.3	-	29	5.41
12:40	17.9	-	-	-
13:30	17.9	920	-	-
14:30	20.3	-	31	4.57
15:20	-	-	-	5.08
Average	18.8	928	29	5.6

Note: Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Copper Ro Con Regrind
Mill Type	Stirred Mill
Motor HP	1
No Load Power (amps)	Varies on Speed
Mill Charge	1600g of 5.0/3.5 mm Ceramic Beads

TABLE VI-6C
SUMMARY OF STREAM SIZING DATA
KM4420-P6 Pilot Plant Feed

Time	Particle Size - microns K ₈₀			
	Flotation Feed	Bulk Ro Con	Bulk Regrind Discharge	Bulk Final Con
WSA 12:30-15:30	189	152	34	60

Note: Sizings conducted on Survey Samples.

TABLE VI-6D
SUMMARY OF REAGENT ADDITIONS
KM4420-P6 Pilot Plant Feed

Time	pH							
	PG	Bulk Ro	Bulk Ro Con	Bulk RG	Bulk Cl1	Bulk Cl2	Bulk Clnr 3	Bulk cl Scav
7:30	-	-	-	-	-	-	-	-
8:00	-	-	-	-	-	-	-	-
8:30	-	-	-	-	-	-	-	-
9:00	8.1	7.9	8.0	-	-	-	-	-
9:30	-	-	-	11.3	10.5	9.3	9.4	10.9
10:00	-	-	-	-	-	-	-	-
10:30	8.8	8.2	8.3	11.3	10.6	9.9	9.4	10.9
11:00	-	-	-	11.3	11.0	11.0	11.2	11.0
11:30	9.2	8.4	8.5	11.8	11.0	10.5	11.1	11.1
12:00	9.8	8.8	-	11.5	11.0	11.0	11.2	11.1
12:30	10.4	9.0	8.8	11.5	11.1	11.1	11.5	11.0
13:00	10.4	9.1	8.8	11.6	11.1	11.0	10.9	10.9
13:30	10.5	9.1	8.9	11.4	11.0	10.9	11.1	10.9
14:00	-	-	-	11.8	11.2	11.2	11.4	11.1
14:30	10.2	9.1	8.9	11.4	11.0	11.0	11.2	11.1
15:00	-	-	-	-	-	-	-	-
15:30	-	-	-	-	-	-	-	-
16:00	-	-	-	-	-	-	-	-
16:30	-	-	-	-	-	-	-	-
17:00	-	-	-	-	-	-	-	-
17:30	-	-	-	-	-	-	-	-
Average	9.7	8.7	8.6	11.5	11.0	10.7	10.8	11.0

TABLE VI-6D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P6 Pilot Plant Feed

Time	g/tonne							
	PG F.O	PG Lime	Bulk Ro Bank 1 MIBC	Bulk Ro Bank 1 8989	Py Ro Bank 1 SIPX	Bulk Rgd Lime	Bulk Rgd F.O	Bulk Rgd Dis 8989
7:00	-		-	-	-	-	-	-
7:30	-		-	-	-	-	-	-
8:00	19	149	-	8	7	-	-	-
8:30	-	-	-	-	-	-	-	-
9:00	-	-	-	-	-	-	-	3
9:30	19	-	-	-	7	140	9	-
10:00	-	124	139	8	-	174	-	3
10:30	-	149	-	-	-	215	-	-
11:00	19	149	119	8	7	215	9	3
11:30	-	174	107	-	-	-	-	-
12:00	-	256	112	8	8	215	9	3
12:30	19	297	-	14	-	-	-	-
13:00	-	306	117	14	7	215	9	3
13:30	19	-	-	-	-	-	-	-
14:00	-	297	119	14	7	215	9	3
14:30	19	-	-	-	-	-	-	-
15:00	-	-	119	14	7	215	9	3
15:30								
16:30								
17:30								
0:00								
Average	19	211	119	11	7	200	9	3

Reagents	Solution Strength		Location
Lime	0.0100	g/ml	PG
Lime	0.0100	g/ml	Regrind
Lime	0.0100	g/ml	Cleaner 3
MIBC	0.0120	g/drop	All
8989	0.0005	g/ml	Rougher
8989	0.00015	g/ml	Cleaner
Floc	0.001	g/ml	Thickener
F.O	0.8700	g/ml	All
SIPX	0.0010	g/ml	Py Rougher

TABLE VI-6D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P6 Pilot Plant Feed

Time	g/tonne					
	Bulk Clnr 1 MIBC	Bulk Clnr 2 8989	Bulk Clnr Scav 8989	Bulk Clnr 3 Lime	Ro TI Thickener Floc	Clnr Thickener Floc
7:30	-	-	-	-	-	-
8:00	-	-	-	-	-	-
8:30	-	-	-	-	-	-
9:00	-	-	-	-	-	-
9:30	-	-	-	-	5	10
10:00	31	1	2	-	-	-
10:30	-	1	2	41	5	10
11:00	-	-	-	-	-	-
11:30	29	1	2	45	-	-
12:00	-	1	-	-	-	-
12:30	27	1	2	45	-	-
13:00	-	-	2	29	-	-
13:30	23	1	2	33	-	-
14:00	-	-	-	-	-	-
14:30	26	1	2	25	-	-
15:00	-	-	-	-	5	10
15:30	25	1	2	25	-	10
16:00						
16:30						
17:00						
17:30						
Average	27	1	2	35	5	10

TABLE VI-6E
 KM4420-P6 Pilot Plant Feed
 Raw Data - Sample Survey WSA 12:30-15:20

Product	Mass Dry - g	Assay - percent or g/tonne						Time s	Mass kg/hr	Wet Wt g	Density percent
		Cu	Mo	Fe	S	S(s)	MgO				
Float Feed	538.1	2.19	0.04	6.7	6.98			25	77.5	1566.4	34.4
Bulk Ro Con	154.0	11.8	0.22	18.8	24.9			75	7.4	730.6	21.1
Bulk Rgd Dis	97.7	11.7	0.21	18.1	22.2			50	7.0	836.9	11.7
Bulk Ro Tls	438.4	0.29	0.0	3.7	3.39			25	63.1	1350.7	32.5
Py Ro Con	246.5	1.24	0.0	14.8	17.7			75	11.8	1350.7	18.2
Py Ro Tls	217.9	0.06	0.0	1.2	0.17	0.13		25	31.4	877.6	24.8
Bulk 1st Clnr Feed	129.5	10.6	0.2	19.5	24.7			25	18.6	1259	10.3
Bulk 1st Clnr Con	146.9	20.6	0.4	24.7	33.3			75	7.1	837.2	17.5
Bulk Clnr Scav Feed	62.1	1.80	0.0	15.2	18.2			50	4.5	1128.9	5.5
Bulk Clnr Scav Con	245.5	4.41	0.1	20.8	25.1			150	5.9	1391.2	17.6
Bulk Clnr scav Tls	91.8	0.36	0.0	11.7	13.5			50	6.6	942.9	9.7
Bulk 2nd Clnr Con	368.4	27.9	0.5	24.9	34.5			75	17.7	1373.7	26.8
Bulk 2nd Clnr Tail	119.7	11.5	0.2	24.1	30.2			75	5.7	1026.9	11.7
Bulk 3rd Clnr Tail	133.4	22.2	0.3	24.0	33.1			150	3.2	909.3	14.7
Bulk Final Con	154.3	30.5	0.6	25.1	34.7		0.56	150	3.7	322.9	47.8

TABLE VI-6F
KM4420-P6 Pilot Plant Feed
Metallurgical Balance - Sample Survey WSA 12:30-15:30

Product	Mass percent	Assay - percent or g/tonne				Distribution - percent			
		Cu	Mo	Fe	S	Cu	Mo	Fe	S
Float Feed	100.0	2.20	0.044	6.1	6.62	100	100	100	100
Bulk Ro Con	16.6	11.9	0.220	17.6	22.5	89	82	48	56
Bulk Rgd Dis	16.6	11.9	0.220	17.6	22.5	89	82	48	56
Bulk Ro Tls	83.4	0.28	0.010	3.8	3.46	11	18	52	44
Py Ro Con	15.6	1.25	0.034	15.0	17.7	9	12	39	42
Py Ro Tls	67.8	0.06	0.004	1.2	0.17	2	6	14	2
Bulk 1st Clnr Feed	29.0	10.4	0.191	19.7	24.9	137	125	94	109
Bulk 1st Clnr Con	13.4	20.5	0.381	24.9	33.1	124	114	55	67
Bulk Clnr Scav Feed	15.7	1.78	0.029	15.2	17.9	13	10	39	42
Bulk Clnr Scav Con	5.5	4.45	0.067	20.7	25.2	11	8	19	21
Bulk Clnr scav Tls	10.2	0.36	0.009	12.3	14.1	2	2	21	22
Bulk 2nd Clnr Con	9.0	28.0	0.495	25.4	35.2	114	100	38	48
Bulk 2nd Clnr Tail	7.0	11.6	0.220	23.9	30.2	37	35	28	32
Bulk 3rd Clnr Tail	2.6	22.2	0.341	23.9	32.9	26	20	10	13
Bulk Final Con	6.3	30.3	0.559	26.1	36.2	88	80	27	35

TABLE VI-7A
SUMMARY OF GRINDING CONDITIONS
KM4420-P7 Pilot Plant Feed

Time	Rod Mill			Water Usage		Flotation Feed	
	Mass kg/hr	Discharge Density	Critical Speed %	Feed H ₂ O L/min	Pumpbox H ₂ O L/min	Flot Feed Density	Size µm K ₈₀
Target	70	65		0.6	1.5	35	160
7:00							
7:30	69	61	50	0.6	1.5	32	-
8:00	69	61	-	-	-	35	127
8:30	70	-	45	-	-	33	135
9:00	71	-	-	-	-	-	-
9:30	69	-	45	-	-	42	141
10:00	73	67	-	-	-	-	151
10:30	66	-	-	-	-	35	152
11:00	74	-	-	-	-	-	165
11:30	73	-	-	-	-	-	-
12:00	78	70	-	-	-	33	163
12:30	65	-	-	-	-	-	-
13:00	64	-	48	-	-	-	-
13:30	65	-	48	-	-	-	165
14:00	76	-	-	-	-	36	174
14:30	69	-	50	-	-	-	-
15:00	71	-	-	-	-	31	-
15:30	-	-	50	0.6	1.5	32	154
Average	70	65	48	0.6	1.5	34	153

Mass Start 811.5 kg
Mass Finish 269.5 kg
Total Feed 542.0 kg
Feed Rate 66 kg/hr

Time Start 7:20 am
Time Finish 15:30 pm
Time Run 8.2 hrs
Moisture 0.5 %

- Notes:
1. Float Feed Density taken with Marcy Cup and Scale.
 2. Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Rod Mill 1
Mill Dimensions	20" dia x 30" Mild
Motor HP	3
No Load Power (amps)	Varies with speed
Starting Mill Charge (kg)	130.0kg mild steel rods

- Notes:
1. The primary grinding circuit was operated in closed circuit with a 400 µm screen
 2. Recycled water used in grinding circuit.

TABLE VI-7B
SUMMARY OF REGRINDING CONDITIONS
KM4420-P7 Pilot Plant Feed

Time	Bulk Ro Con			Bulk Final Con Mass Pull (%)
	Mass Pull (%)	Regrind		
		Speed (rpm)	size-µm K80	
8:30	18.1	920	-	7.53
9:30	18.5	920	28	6.50
10:30	-	920	-	5.48
11:30	19.9	920	33	-
12:30	19.2	920	-	8.56
13:30	19.2	920	31	-
14:30	17.5	920	-	-
Average	18.7	920	31	7.0

Note: Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Copper Ro Con Regrind
Mill Type	Stirred Mill
Motor HP	1
No Load Power (amps)	Varies on Speed
Mill Charge	1600g of 5.0/3.5 mm Ceramic Beads

TABLE VI-7C
SUMMARY OF STREAM SIZING DATA
KM4420-P7 Pilot Plant Feed

Time	Particle Size - microns K ₈₀			
	Flotation Feed	Bulk Ro Con	Bulk Regrind Discharge	Bulk Final Con
WSA 10:30-13:00	168	140	32	82
WSA 10:30-13:00	171	139	32	70

Note: Sizings conducted on Survey Samples.

TABLE VI-7D
SUMMARY OF REAGENT ADDITIONS
KM4420-P7 Pilot Plant Feed

Time	pH							
	PG	Bulk Ro	Bulk Ro Con	Bulk RG	Bulk Cl1	Bulk Cl2	Bulk Clnr 3	Bulk cl Scav
7:30	-	-	-	-	-	-	-	-
8:00	-	-	-	-	-	-	-	-
8:30	10.6	8.9	8.5	11.7	10.6	9.6	9.5	9.7
9:00	10.5	8.8	8.8	11.2	10.0	-	-	-
9:30	10.7	9.0	8.8	11.3	10.7	11.0	11.5	10.9
10:00	-	-	-	11.5	10.7	-	-	-
10:30	10.8	9.3	8.9	11.7	11.0	11.2	11.7	10.7
11:00	-	-	-	-	-	-	-	-
11:30	10.5	9.2	9.1	11.2	10.8	11.0	11.5	10.7
12:00	-	-	-	-	-	-	-	-
12:30	10.5	9.1	9.0	11.5	11.0	11.0	11.4	10.9
13:00	-	-	-	-	-	-	-	-
13:30	10.7	9.1	9.1	11.5	11.0	11.0	11.2	11.0
14:00	-	-	-	-	-	-	-	-
14:30	10.8	9.4	9.2	11.6	11.3	11.4	11.7	11.3
15:00	-	-	-	-	-	-	-	-
15:30	-	-	-	-	-	-	-	-
16:00								
16:30								
17:00								
17:30								
Average	10.6	9.1	8.9	11.5	10.8	10.9	11.2	10.7

TABLE VI-7D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P7 Pilot Plant Feed

Time	g/tonne							
	PG F.O	PG Lime	Bulk Ro Bank 1 MIBC	Bulk Ro Bank 1 8989	Py Ro Bank 1 SIPX	Py Ro Bank 1 MIBC	Bulk Rgd Lime	Bulk Rgd F.O
7:00	-		-	-	-	-	-	-
7:30	21	325	130	15	-	-	-	-
8:00	21	316	73	15	8	-	235	10
8:30	-	-	-	-	-	-	-	-
9:00	21	344	123	14	8	-	262	10
9:30	-	-	-	-	-	36	-	-
10:00	21	362	123	14	8	-	271	10
10:30	-	-	-	-	-	54	-	-
11:00	21	362	250	14	9	53	271	10
11:30	-	-	-	-	-	-	-	-
12:00	-	362	250	14	9	53	280	10
12:30	21	-	-	-	-	-	-	-
13:00	-	344	244	14	9	49	289	10
13:30	21	-	-	-	-	-	-	-
14:00	-	344	217	14	9	48	289	10
14:30	21	-	-	-	-	-	-	-
15:00	-	344	217	14	8	50	280	10
15:30								
16:30								
17:30								
Average	21	345	181	14	8	49	272	10

Reagents	Solution Strength		Location
Lime	0.0100	g/ml	PG
Lime	0.0100	g/ml	Regrind
Lime	0.0100	g/ml	Cleaner 3
MIBC	0.0120	g/drop	All
8989	0.0005	g/ml	Rougher
8989	0.00015	g/ml	Cleaner
Floc	0.001	g/ml	Thickener
F.O	0.8700	g/ml	All
SIPX	0.0010	g/ml	Py Rougher

TABLE VI-7D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P7 Pilot Plant Feed

Time	g/tonne						
	Bulk Rgd Dis 8989	Bulk Clnr 1 MIBC	Bulk Clnr 2 8989	Bulk Clnr Scav 8989	Bulk Clnr 3 Lime	Ro TI Thickener Floc	Clnr Thickener Floc
7:00	-	-	-	-	-	-	-
7:30	-	-	-	-	-	-	-
8:00	3	44	1	2	45	6	11
8:30	-	-	-	-	-	-	-
9:00	3	73	1	2	-	6	11
9:30	-	-	-	-	-	-	-
10:00	3	67	1	2	72	6	11
10:30	-	-	-	-	-	-	-
11:00	3	69	1	1	63	6	11
11:30	-	-	-	-	-	9	6
12:00	3	66	1	1	59	9	6
12:30	-	-	-	-	-	-	-
13:00	3	66	1	1	50	9	6
13:30	-	-	-	-	-	-	-
14:00	3	65	1	1	50	9	6
14:30	-	-	-	-	-	-	-
15:00	3	65	1	1	36	9	-
15:30							
16:30							
17:30							
Average	3	65	1	2	54	8	9

TABLE VI-7E
KM4420-P7 Pilot Plant Feed
Raw Data - Sample Survey WSA 10:30-13:00

Product	Mass Dry - g	Assay - percent or g/tonne					Time s	Mass kg/hr	Wet Wt g	Density percent
		Cu	Mo	Fe	S	S(s)				
Float Feed	487.9	2.04	0.040	6.1	6.78		25	70.3	1422.5	34.3
Bulk Ro Con	290.6	10.3	0.187	15.2	19.8		75	13.9	1609.4	18.1
Bulk Rgd Dis	203.3	9.80	0.182	14.4	18.5		50	14.6	1186	17.1
Bulk Ro Tls	486	0.12	0.005	3.5	3.4		25	70.0	1045.3	46.5
Py Ro Con	315.7	0.28	0.004	10.9	13.0		75	15.2	990.1	31.9
Py Ro Tls	452.1	0.09	0.005	1.2	0.20	0.16	25	65.1	824.6	54.8
Bulk Clnr scav Tls	256.0	0.26	0.006	8.1	9.48		100	9.2	2248.7	11.4
Bulk Final Con	217.8	26.0	0.463	25.0	34.5		150	5.2	463.6	47.0

TABLE VI-7E Continued
KM4420-P7 Pilot Plant Feed
Raw Data - Sample Survey WSB 13:00-15:30

Product	Mass Dry - g	Assay - percent or g/tonne					Time s	Mass kg/hr	Wet Wt g	Density percent
		Cu	Mo	Fe	S	S(s)				
Float Feed	475.5	2.02	0.039	5.7	6.07		25	68.5	1477.2	32.2
Bulk Ro Con 1+2	217.1	14.4	0.062	20.1	27.6		75	10.4	1032.6	21.0
Bulk Ro Con 3+4	78.8	0.9	0.014	4.1	3.64		75	3.8	703.6	11.2
Bulk Ro Con	295.1	10.0	0.181	14.6	20.2		75	14.2	1793.5	16.5
Bulk Rgd Dis	193.0	10.0	0.194	14.4	19.2		50	13.9	1228.6	15.7
Bulk Ro Tls	378.2	0.1	0.005	3.1	2.92		25	54.5	851.8	44.4
Pyrite Ro Con	429.5	0.24	0.008	7.4	8.72		75	20.6	1383	31.1
Pyrite Ro Tls	312.5	0.06	0.004	1.1	0.14	0.09	25	45.0	549.5	56.9
Bulk Clnr scav Tls	197.4	0.3	0.006	9.0	10.4		100	7.1	2004.7	9.8
Bulk Final Con	210.6	26.1	0.470	24.4	35.1		150	5.1	418.3	50.3

TABLE VI-7F
KM4420-P7 Pilot Plant Feed
Metallurgical Balance - Sample Survey WSA 10:30-13:00

Product	Mass percent	Assay - percent or g/tonne				Distribution - percent			
		Cu	Mo	Fe	S	Cu	Mo	Fe	S
Float Feed	100.0	2.06	0.040	5.8	6.53	100	100	100	100
Bulk Ro Con	19.5	10.0	0.184	14.9	19.3	95	91	50	58
Bulk Rgd Dis	19.5	10.0	0.184	14.9	19.3	95	91	50	58
Bulk Ro Tls	80.5	0.13	0.005	3.6	3.44	5	9	50	42
Py Ro Con	20.5	0.27	0.004	10.9	12.9	3	2	38	41
Py Ro Tls	60.0	0.08	0.005	1.2	0.19	2	7	12	2
Bulk Clnr scav Tls	12.4	0.26	0.006	8.4	9.65	2	2	18	18
Bulk Final Con	7.2	26.8	0.492	26.1	35.8	93	89	32	39

TABLE VI-7F Continued
KM4420-P7 Pilot Plant Feed
Metallurgical Balance - Sample Survey WSB 13:00-15:30

Product	Mass percent	Assay - percent or g/tonne				Distribution - percent			
		Cu	Mo	Fe	S	Cu	Mo	Fe	S
Float Feed	100.0	2.17	0.042	5.6	6.46	100	100	100	100
Bulk Ro Con 1+2	16.4	12.4	0.229	17.7	24.4	94	89	52	62
Bulk Ro Con 3+4	5.0	0.87	0.015	4.1	3.62	2	2	4	3
Bulk Ro Con	21.5	9.69	0.179	14.5	19.5	96	91	56	65
Bulk Rgd Dis	21.5	9.69	0.179	14.5	19.5	96	91	56	65
Bulk Ro Tls	78.5	0.11	0.005	3.1	2.89	4	9	44	35
Pyrite Ro Con	25.5	0.23	0.007	7.3	8.61	3	4	34	34
Pyrite Ro Tls	53.1	0.05	0.004	1.1	0.14	1	5	11	1
Bulk Clnr scav Tls	14.4	0.28	0.009	9.5	11.4	2	3	25	25
Bulk Final Con	7.1	28.7	0.522	24.6	35.8	94	88	31	39

TABLE VI-8A
SUMMARY OF GRINDING CONDITIONS
KM4420-P8 Pilot Plant Feed

Time	Rod Mill			Water Usage		Flotation Feed	
	Mass kg/hr	Discharge Density	Critical Speed %	Feed H ₂ O L/min	Pumpbox H ₂ O L/min	Flot Feed Density	Size µm K ₈₀
Target	70	65		0.6	1.5	35	160
7:00							
7:30	66	65	50	0.6	1.6	33	-
8:00	70	-	-	-	-	-	147
8:30	68	64	45	-	-	36	147
9:00	66	62	-	-	-	34	-
9:30	71	-	45	-	-	-	155
10:00	66	-	-	-	-	32	-
10:30	70	-	-	-	-	-	142
11:00	75	-	-	-	-	31	-
11:30	69	-	43	-	-	34	146
12:00	74	63	-	-	-	-	-
12:30	73	-	-	-	-	-	150
13:00	72	-	-	-	-	36	-
13:30	75	-	41	-	-	-	-
14:00	71	-	43	-	-	33	164
14:30	66	-	-	-	-	-	-
15:00	74	65	43	0.6	1.3	36	171
Average	70	64	44	0.6	1.4	34	153

Mass Start	<u>1183.0</u>	kg	Time Start	<u>7:30</u>	am
Mass Finish	<u>629.5</u>	kg	Time Finish	<u>15:30</u>	pm
Total Feed	<u>553.5</u>	kg	Time Run	<u>8.0</u>	hrs
Feed Rate	<u>69</u>	kg/hr	Moisture	<u>0.2</u>	%

Notes: 1. Float Feed Density taken with Marcy Cup and Scale.
2. Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Rod Mill 1
Mill Dimensions	20" dia x 30" Mild
Motor HP	3
No Load Power (amps)	Varies with speed
Starting Mill Charge (kg)	130.0kg mild steel rods

Notes: 1. The primary grinding circuit was operated in closed circuit with a 400 µm screen
2. Recycled water used in grinding circuit.

TABLE VI-8B
SUMMARY OF REGRINDING CONDITIONS
KM4420-P8 Pilot Plant Feed

Time	Bulk Ro Con			Bulk Final Con Mass Pull (%)
	Mass Pull (%)	Regrind		
		Speed (rpm)	size-µm K80	
8:15	19.1	920	-	5.8
9:00	-	-	37	-
9:20	18.1	-	-	6.3
10:20	17.7	940	-	6.0
10:45	-	-	34	-
11:30	18.4	980	-	7.5
12:00	-	-	33	-
12:30	18.8	1025	-	6.0
13:15	-	-	35	-
13:45	-	-	-	7.0
14:30	17.7	1080	-	6.1
15:00	-	-	41	-
Average	18.3	989	36	6.4

Note: Sizings reported above are on Operational grab samples.

Grinding Mill Data

Parameters	Copper Ro Con Regrind
Mill Type	Stirred Mill
Motor HP	1
No Load Power (amps)	Varies on Speed
Mill Charge	1600g of 5.0/3.5 mm Ceramic Beads

TABLE VI-8C
SUMMARY OF STREAM SIZING DATA
KM4420-P8 Pilot Plant Feed

Time	Particle Size - microns K ₈₀			
	Flotation Feed	Bulk Ro Con	Bulk Regrind Discharge	Bulk Final Con
WSA 10:30-13:00	162	-	35	69
WSB 13:00-15:30	175	160	42	71

Note: Sizings conducted on Survey Samples.

TABLE VI-8D
SUMMARY OF REAGENT ADDITIONS
KM4420-P8 Pilot Plant Feed

Time	pH							
	PG	Bulk Ro	Bulk Ro Con	Bulk RG	Bulk Cl1	Bulk Cl2	Bulk Clnr 3	Bulk cl Scav
7:30	-	-	-	-	-	-	-	-
8:00	10.8	9.3	9.0	11.6	11.1	11.0	10.9	11.1
8:30	10.7	9.3	9.1	11.6	11.0	10.9	10.9	11.0
9:00	-	-	-	-	-	-	-	-
9:30	10.8	9.3	9.1	11.5	11.3	11.1	11.0	11.1
10:00	-	-	-	-	-	-	-	-
10:30	10.8	9.2	9.0	11.6	11.0	10.8	10.8	10.8
11:00	-	-	-	-	-	-	-	-
11:30	10.8	9.3	9.0	11.5	11.1	11.0	10.8	11.2
12:00	-	-	-	-	-	-	-	-
12:30	10.7	9.4	9.1	11.6	11.3	11.2	11.1	11.2
13:00	-	-	-	-	-	-	-	-
13:30	10.8	9.4	9.3	11.5	11.3	11.2	11.3	11.2
14:00	-	-	-	-	-	-	-	-
14:30	10.8	9.3	9.4	11.7	11.5	11.4	11.5	11.3
15:00	-	-	-	-	-	-	-	-
15:30	-	-	-	-	-	-	-	-
16:00	-	-	-	-	-	-	-	-
16:30	-	-	-	-	-	-	-	-
17:00	-	-	-	-	-	-	-	-
17:30	-	-	-	-	-	-	-	-
Average	10.8	9.3	9.1	11.6	11.2	11.1	11.0	11.1

TABLE VI-8D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P8 Pilot Plant Feed

Time	g/tonne						
	PG F.O	PG Lime	Bulk Ro Bank 1 MIBC	Bulk Ro Bank 1 8989	Py Ro Bank 1 SIPX	Py Ro Bank 1 MIBC	Bulk Rgd Lime
7:00	-		-	-	-	-	-
7:30	-	330	208	14	8	-	269
8:00	20	330	208	14	8	48	269
8:30	-	-	-	-	-	-	-
9:00	20	347	208	14	10	50	269
9:30	-	-	-	-	-	-	-
10:00	20	338	208	13	10	44	264
10:30	-	-	-	-	-	-	-
11:00	20	338	208	13	10	44	269
11:30	-	-	-	-	-	-	-
12:00	-	338	208	13	11	57	269
12:30	20	-	-	-	-	-	-
13:00	-	330	208	13	10	61	269
13:30	20	-	-	-	-	-	-
14:00	-	330	208	13	10	47	278
14:30	20	-	-	-	-	-	-
15:00	-	330	156	13	10	60	269
15:30							
16:30							
17:30							
0:00							
Average	20	334	202	14	10	51	269

Reagents	Solution Strength		Location
Lime	0.0100	g/ml	PG
Lime	0.0100	g/ml	Regrind
Lime	0.0100	g/ml	Cleaner 3
MIBC	0.0120	g/drop	All
8989	0.0005	g/ml	Rougher
8989	0.00015	g/ml	Cleaner
Floc	0.001	g/ml	Thickener
F.O	0.8700	g/ml	All
SIPX	0.0010	g/ml	Py Rougher

TABLE VI-8D Continued
SUMMARY OF REAGENT ADDITIONS
KM4420-P8 Pilot Plant Feed

Time								
	Bulk Rgd F.O	Bulk Rgd Dis 8989	Bulk Clnr 1 MIBC	Bulk Clnr 2 8989	Bulk Clnr Scav 8989	Bulk Clnr 3 Lime	Ro TI Thickener Floc	Clnr Thickener Floc
7:30	-	-	-	-	-	-	-	-
8:00	10	3	62	1	1	78	9	6
8:30	10	3	60	1	1	78	-	-
9:00	-	-	-	-	-	87	-	-
9:30	10	3	61	1	1	87	-	-
10:00	-	-	-	-	-	-	-	-
10:30	10	3	67	1	1	87	-	-
11:00	-	-	-	-	-	-	-	-
11:30	10	3	70	1	1	87	-	-
12:00	-	-	-	-	-	-	-	-
12:30	10	3	67	0	1	121	-	-
13:00	-	-	-	-	-	-	-	-
13:30	10	2	66	0	1	130	-	-
14:00	-	-	-	-	-	-	-	-
14:30	10	2	66	0	1	126	9	6
15:00	-	-	-	-	-	-	-	-
15:30	10	2	66	0	1	126	9	-
16:00								
16:30								
17:00								
17:30								
Average	10	3	65	1	1	101	9	6

TABLE VI-8E
KM4420-P8 Pilot Plant Feed
Raw Data - Sample Survey WSA 10:30-13:00

Product	Mass Dry - g	Assay - percent or g/tonne					Time s	Mass kg/hr	Wet Wt g	Density percent
		Cu	Mo	Fe	S	S(s)				
Float Feed	496.4	2.25	0.044	6.70	6.74		25	71.5	1494.1	33.2
Bulk Ro Con	200.8	12.4	0.232	17.4	22.5		75	9.6	1258.7	16.0
Bulk Rgd Dis	143.1	12.5	0.222	17.2	22.6		50	10.3	906.7	15.8
Bulk Ro Tls	414.5	0.10	0.005	3.4	3.05	0.10	25	59.7	1038.8	39.9
Py Ro Con	150.1	0.37	0.005	17.5	21.7		75	7.2	761.7	19.7
Py Ro Tls	259.4	0.06	0.004	1.1	0.14		25	37.4	534.8	48.5
Bulk Clnr scav Tls	159.5	0.43	0.009	10.8	12.5		100	5.7	2082.9	7.7
Bulk Final Con	130.4	29.5	0.549	23.9	33.5		150	3.1	553.2	23.6

TABLE VI-8E Continued
KM4420-P8 Pilot Plant Feed
Raw Data - Sample Survey WSB 13:00-15:30

Product	Mass Dry - g	Assay - percent or g/tonne						Time s	Mass kg/hr	Wet Wt g	Density percent
		Cu	Mo	Fe	Fe(t)	S	S(s)				
Float Feed	484.2	2.17	0.041	5.8	6.3	6.45		25	69.7	1393	34.8
Bulk Ro Con	246.9	13.0	0.237	18.0		25.2		75	11.9	1325.9	18.6
Bulk Rgd Dis	175	12.3	0.218	17.6		23.8		50	12.6	978.8	17.9
Bulk Ro Tls	393.1	0.10	0.006	3.1		3.05		25	56.6	960.1	40.9
Pyrite Ro Con	191.1	0.32	0.005	14.0	16.9	17.7		75	9.2	869.9	22.0
Pyrite Ro Tail	458.2	0.05	0.004	1.1	1.6	0.16	0.12	25	66.0	950.1	48.2
Bulk 1st Clnr Feed	120.3	11.4	0.208	19.2		24.8		25	17.3	952	12.6
Bulk 1st Clnr Con	211.6	18.4	0.352	23.9		32.7		75	10.2	1158.4	18.3
Bulk Clnr Scav Feed	85.1	1.29	0.027	13.2		16.7		50	6.1	1045.4	8.1
Bulk Clnr Scav Con	29.4	5.65	0.108	19.2		25.9		150	0.7	553.2	5.3
Bulk Clnr scav Tls	150.5	0.35	0.008	11.8	12.1	13.9		100	5.4	1661.5	9.1
Bulk 2nd Clnr Con	137.4	24.4	0.419	23.5		33.6		75	6.6	502.4	27.3
Bulk 2nd Clnr Tail	51.2	8.40	0.187	23.4		31.1		75	2.5	668.6	7.7
Bulk 3rd Clnr Tail	88.9	15.3	0.238	23.4		32.1		150	2.1	724.8	12.3
Bulk Final Con	193.6	29.5	0.500	23.6	26.0	33.9		150	4.6	391.0	49.5

TABLE VI-8F
KM4420-P8 Pilot Plant Feed
Metallurgical Balance - Sample Survey WSA 10:30-13:00

Product	Mass percent	Assay - percent or g/tonne				Distribution - percent			
		Cu	Mo	Fe	S	Cu	Mo	Fe	S
Float Feed	100.0	2.04	0.040	5.4	6.01	100	100	100	100
Bulk Ro Con	15.6	12.5	0.230	16.8	21.9	96	90	48	57
Bulk Rgd Dis	15.6	12.5	0.230	16.8	21.9	96	90	48	57
Bulk Ro Tls	84.4	0.10	0.004	3.3	3.06	4	10	52	43
Py Ro Con	11.3	0.37	0.005	17.7	21.8	2	1	37	41
Py Ro Tls	73.1	0.06	0.004	1.1	0.14	2	8	15	2
Bulk Clnr scav Tls	9.1	0.43	0.009	11.1	12.8	2	2	19	19
Bulk Final Con	6.5	29.6	0.541	24.9	34.9	94	88	30	38

TABLE VI-8F Continued
KM4420-P8 Pilot Plant Feed
Metallurgical Balance - Sample Survey WSB 13:00-15:30

Product	Mass percent	Assay - percent or g/tonne					Distribution - percent				
		Cu	Mo	Fe	Fe(t)	S	Cu	Mo	Fe	Fe(t)	S
Float Feed	100.0	2.18	0.041	5.5	6.4	6.38	100	100	100	100	100
Bulk Ro Con	16.4	12.8	0.226	17.3	18.1	23.4	96	90	51	46	60
Bulk Rgd Dis	16.4	12.8	0.226	17.3	18.1	23.4	96	90	51	46	60
Bulk Ro Tls	83.6	0.10	0.005	3.2	4.2	3.06	4	10	49	54	40
Pyrite Ro Con	13.8	0.32	0.005	14.0	16.9	17.7	2	2	35	36	38
Pyrite Ro Tail	69.8	0.05	0.005	1.1	1.6	0.16	2	8	14	18	2
Bulk 1st Clnr Feed	25.7	11.0	0.206	19.2		25.6	130	129	89		103
Bulk 1st Clnr Con	14.4	18.6	0.347	23.8		32.8	123	122	62		74
Bulk Clnr Scav Feed	11.2	1.29	0.026	13.3		16.4	7	7	27		29
Bulk Clnr Scav Con	2.0	5.66	0.109	19.2		25.9	5	5	7		8
Bulk Clnr scav Tls	9.3	0.35	0.008	12.1	12.1	14.4	1	2	20	17	21
Bulk 2nd Clnr Con	10.7	24.4	0.418	23.9		34.0	120	109	46		57
Bulk 2nd Clnr Tail	7.3	8.44	0.188	23.4		30.7	28	34	31		35
Bulk 3rd Clnr Tail	3.6	15.3	0.238	23.3		32.0	26	21	15		18
Bulk Final Con	7.1	29.1	0.510	24.2	26.0	35.1	95	88	31	29	39