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Snake Bay Project

To: BC Research

1523 WEST 3rd AVENUE, VANCOUVER, B.C. V6J 1J8 • TELEPHONE (604) 734-7278 • TELEX 04-54210

PLASMA SPECTROGRAPHIC ANALYSIS CERTIFICATE

File No. 5312 G

Date Oct 19, 1987

Attention: Mr. R.O. McElroy

Page 1

We hereby Certify that the following are the results of plasma spectrographic analysis made on Mineral samples submitted.

Sample Identification	5312-1 AT-1 NM3	5312-2 AT-2 NM3	5312-3 BT1 NM3	5312-4 BT2 NM3	5312-5 CT1 NM3	
MAJOR COMPONENTS	Percent (%)					
Silica SiO ₂	48.5 48.1	47.8	48.8	49.7 49.9	49.4	
Alumina Al ₂ O ₃	2.16 1.91	2.53	1.53	1.41 1.59	1.32	
Iron Fe ₂ O ₃	0.94 0.88	1.00	0.89	0.75 0.76	0.66	
Calcium CaO	49.0 49.1	48.6	49.2	49.5 50.0	50.1	
Magnesium MgO	0.35 0.33	0.38	0.29	0.28 0.28	0.22	
Sodium Na ₂ O	0.02	0.02	0.02	0.02	0.02	
Potassium K ₂ O	0.01	0.01	0.01	0.01	0.01	
Sulphur SO ₃						
Loss On Ignition L.O.I.						
TRACE COMPONENTS	Parts Per Million (P.P.M.)					
Antimony Sb						
As						
Barium Ba	50.	40.	25.	50	100	
Beryllium Be						
Bismuth Bi						
Boron B						
Cadmium Cd						
Chromium Cr						
Cobalt Co						
Copper Cu	200.	175.	100.	250.	450	
Lead Pb						
Manganese Mn	720.	660.	690.	700.	700	
Molybdenum Mo						
Nickel Ni						
Phosphorus P ₂ O ₅	4000.	5400.	2200.	2800.	4300.	
Silver Ag						
Strontium Sr	50.	60.	40.	50.	65	
Tin Sn						
Titanium Ti	800.	970.	730.	540.	590.	
Tungsten W						
Uranium U						
Vanadium V						
Zn						

L = less than.

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Page 2

We hereby Certify that the following are the results of plasma spectrographic analysis made on mineral samples submitted.

Sample Identification		5312-6 CT2 NM3	5312-7 DT1 NM3	5312-8 DT2 NM3	5312-9 ET1 NM3	5312-10 ET2 NM3	
MAJOR COMPONENTS	Percent (%)						
Silica	SiO ₂	49.5	50.0 50.3	49.8	49.5	48.8 49.7	
Alumina	Al ₂ O ₃	1.12	0.91 1.03	0.78	0.99	1.16 1.08	
Iron	Fe ₂ O ₃	0.60	0.56 0.56	0.67	0.86	0.65 0.63	
Calcium	CaO	50.0	50.0 48.5	48.4	48.5	48.3 48.4	
Magnesium	MgO	0.21	0.18 0.18	0.16	0.17	0.18 0.19	
Sodium	Na ₂ O	0.02	0.02	0.02	0.02	0.02	
Potassium	K ₂ O	0.01	0.01	0.01	0.01	0.01	
Sulphur	SO ₃						
Loss On Ignition	L.O.I.						
TRACE COMPONENTS	Parts Per Million (P.P.M.)						
Antimony	Sb						
enic	As						
Barium	Ba	85.	75.	75.	75.	75.	
Beryllium	Be						
Bismuth	Bi						
Boron	B						
Cadmium	Cd						
Chromium	Cr						
Cobalt	Co						
Copper	Cu	350.	300.	400.	400.	425.	
Lead	Pb						
Manganese	Mn	700.	700.	680.	710.	700.	
Molybdenum	Mo						
Nickel	Ni						
Phosphorus P ₂ O ₅	P ₂ O ₅	3100.	2500.	3400.	5600.	6500.	
Silver	Ag						
Strontium	Sr	50.	50.	50.	50.	50.	
Tin	Sn						
Titanium	Ti	440.	450.	350.	550.	610.	
Tungsten	W						
Uranium	U						
Vanadium	V						
c	Zn						

L = less than.

Plasma - 3

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File No. 5312 G

Date Oct 19, 1987

Attention: Mr. R.O. McElroy

Page 3

We hereby Certify that the following are the results of plasma spectrographic analysis made on Mineral samples submitted.

Sample Identification	532-11 MA 1-1	532-12 MA 2-1	532-13 MB 1-1	532-14 MB 2-1	532-15 MC 1-1	
MAJOR COMPONENTS	Percent (%)					
Silica SiO ₂	43.0	43.0	42.0 41.0	43.6	42.7	
Alumina Al ₂ O ₃	7.31	7.13	8.06 7.82	5.45	6.62	
Iron Fe ₂ O ₃	2.78	2.32	3.55 3.45	2.09	3.07	
Calcium CaO	39.4	40.1	37.6 36.1	42.3	40.6	
Magnesium MgO	0.82	0.74	1.10 1.07	0.84	1.31	
Sodium Na ₂ O	0.02	0.02	0.03	0.03	0.02	
Potassium K ₂ O	0.02	0.02	0.02	0.02	0.02	
Sulphur SO ₃						
Loss On Ignition L.O.I.						
TRACE COMPONENTS	Parts Per Million (P.P.M.)					
Antimony Sb						
Arctic As						
Barium Ba	100.	75.	50.	80.	90.	
Beryllium Be						
Bismuth Bi						
Boron B						
Cadmium Cd						
Chromium Cr						
Cobalt Co						
Copper Cu	500.	390.	210.	400.	470.	
Lead Pb						
Manganese Mn	1000.	800.	1100.	740.	880.	
Molybdenum Mo						
Nickel Ni						
Phosphorus P ₂ O ₅ RO ₄	1.57%	1.87%	1.41%	1.63%	1.69%	
Silver Ag						
Strontium Sr	100.	100.	75	80.	84.	
Tin Sn						
Titanium Ti	2500.	2200.	2800.	1980.	2530.	
Tungsten W						
Uranium U						
Vanadium V						
Zn						

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We hereby Certify that the following are the results of plasma spectrographic analysis made on Mineral samples submitted.

Sample Identification	5312-16 MC 2-1	5312-17 MD 1-1	5312-18 MD 2-1	5312-19 ME 1-1	5312-20 ME 2-1	
MAJOR COMPONENTS	Percent (%)					
Silica SiO ₂	45.1 45.8	46.0 46.9	46.0	33.7 33.6	45.0	
Alumina Al ₂ O ₃	4.59 4.66	4.60 4.75	4.01	3.19 3.20	3.45	
Iron Fe ₂ O ₃	1.83 1.89	2.73 2.76	2.23	2.24 2.21	2.63	
Calcium CaO	43.1 44.0	45.0 45.5	46.0	31.7 31.6	44.1	
Magnesium MgO	0.72 0.77	1.28 1.28	1.05	0.96 0.99	1.24	
Sodium Na ₂ O	0.02	0.02	0.02	0.02	0.02	
Potassium K ₂ O	0.02	0.02	0.02	0.02	0.02	
Sulphur SO ₃						
Loss On Ignition L.O.I.						
TRACE COMPONENTS	Parts Per Million (P.P.M.)					
Antimony Sb						
As						
Barium Ba	110.	90.	100.	110.	90.	
Beryllium Be						
Bismuth Bi						
Boron B						
Cadmium Cd						
Chromium Cr						
Cobalt Co						
Copper Cu	400.	470.	490.	450.	480.	
Lead Pb						
Manganese Mn	470.	900.	820.	720.	890.	
Molybdenum Mo						
Nickel Ni						
Phosphorus P ₂ O ₅	1.42% 1.31%	1.23%	1.25%	0.98%	1.16%	
Silver Ag						
Strontium Sr	70.	70.	70.	50.	75.	
Tin Sn						
Titanium Ti	1500.	1960.	1720.	1300.	2100.	
Tungsten W						
Uranium U						
Vanadium V						
Zn						
				Note: Contaminated by Ceramic Pulverizer		

L = less than.

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EXHIBIT 1

MAGNETIC SEPARATION TEST NO 1

PURPOSE: To remove the contaminates from sized wollastonite material.

SAMPLE: Approximately 1250 gr of OSNA Sample #87087 C, 18 X 30.

PROCEDURE: The sample was treated on a permanent-magnetic roll separator at the following conditions.

	!Pass 1 !	!Pass 2 !	!Pass 3 !
Feed Rate, T/Hr/M	4.8	4.8	5.0
Roll Type	Nd 4:1, 71.5mm		
Belt Type	GIK		
Roll Speed, RPM	200	180	160
Splitter Position	8	8	11
Feeder Setting	58	58	58
Feed to Pass	!Feed	!Nonmag	!Nonmag
	!Pass 1	!Pass 2	

Results:

Product	Weight %	Chemical Analysis		Percent Distribution	
Feed (Analyzed)					
Feed (calculated)	100.00				
Magnetics, Pass 1	8.74				
Magnetics, Pass 2	8.00				
Magnetics, Pass 3	6.34				
Nonmag, Pass 3	76.92				

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TABLE: WHOLE ROCK ANALYSIS DATA FOR MAGNETIC SEPARATION OF 30 x 48 mesh WOLLASTONITE ORE

COMPONENT	FEED (%)	TEST #1 ⁽¹⁾			TEST #2 ⁽²⁾			NOTES	
		Magnetics (%)			Non-magnetics	Magnetics (%)			Non-magnetics
		#1	#2	#3	(%)	#1	#2	#3	(%)
CaO	47.2	45.25			49.25	46.0			48.4
SiO ₂	<u>51.1</u>	<u>46.45</u>			<u>50.15</u>	<u>46.0</u>			<u>49.8</u>
Subtotal	98.3	92.7			99.4	92.0			98.2
Al ₂ O ₃	1.50	4.68			0.97	4.01			0.78
Fe ₂ O ₃	0.95	2.74			0.56	2.23			0.67
MgO	0.35	0.75			0.18	1.05			0.16
Mn	0.07	0.047			0.07	0.82			0.07
P ₂ O ₅	0.24	1.36			0.34	1.25			0.56
Ti	0.06	0.15			0.035	0.17			0.055

(1) Magnetics 1, 2, 3 respectively 9.21%, 5.74%, 4.08%; non-magnetics = 80.97% of feed.

(2) Magnetics 1, 2, 3 respectively 17.84%, 5.88%, 4.48%; non-magnetics = 71.8% of feed.

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TABLE: WHOLE ROCK ANALYSIS DATA FOR MAGNETIC SEPARATION OF 18 x 30 mesh WOLLASTONITE ORE

COMPONENT	FEED (%)	TEST #1 ⁽¹⁾				TEST #2 ⁽²⁾				NOTES
		Magnetics (%)			Non-magnetics (%)	Magnetics (%)			Non-magnetics (%)	
		#1	#2	#3		#1	#2	#3		
CaO	50.3	40.6			50.1	43.55			50.0	
SiO ₂	<u>45.7</u>	<u>42.7</u>			<u>49.4</u>	<u>45.45</u>			<u>49.5</u>	
Subtotal	96.0	83.3			99.5	89.0			99.5	
Al ₂ O ₃	2.05	6.62			1.32	4.63			1.12	
Fe ₂ O ₃	1.05	3.07			0.66	1.86			0.60	
MgO	0.38	1.31			0.22	0.75			0.21	
Mn	0.068	0.088			0.07	0.047			0.07	
P ₂ O ₅	0.3	1.69			0.43	1.36			0.31	
Ti	0.063	0.253			0.06	0.15			0.044	

(1) Magnetics 1, 2, 3 respectively 8.74%, 8.00%, 6.34%; non-magnetics = 76.92% of feed.

(2) Magnetics 1, 2, 3 respectively 23.03%, 7.81%, 3.42%; non-magnetics = 65.74% of feed.

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TABLE: WHOLE ROCK ANALYSIS DATA FOR MAGNETIC SEPARATION OF 4 x 8 mesh WOLLASTONITE ORE

COMPONENT	FEED (%)	TEST #1 ⁽¹⁾			TEST #2 ⁽²⁾			NOTES
		Magnetics (%)			Non-magnetics (%)			
		#1	#2	#3	#1	#2	#3	
CaO	45.0	39.4		49.05	40.1		48.6	
SiO ₂	<u>49.1</u>	<u>43.0</u>		<u>48.3</u>	<u>43.0</u>		<u>47.8</u>	
Subtotal	94.1	82.4		97.35	83.1		96.4	
Al ₂ O ₃	2.85	7.31		2.04	7.13		2.53	
Fe ₂ O ₃	1.22	2.78		0.91	2.32		1.00	
MgO	0.39	0.82		0.34	0.74		0.38	
Mn	0.072	0.10		0.072	0.08		0.066	
P ₂ O ₅	0.2(?)	1.57		0.4	1.87		0.54	
Ti	0.115	0.25		0.08	0.22		0.097	

(1) Yields of magnetics 7.61%, 3.92% and 4.37% respectively; non-magnetics = 84.08% of feed.

(2) Yields of magnetics 14.1%, 7.78% and 5.37% respectively; non-magnetics = 72.75% of feed.

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TABLE: WHOLE ROCK ANALYSIS DATA FROM MAGNETIC SEPARATION OF 8 x 18 mesh WOLLASTONITE ORE

COMPONENT	FEED (%)	TEST #1 ⁽¹⁾				TEST #2 ⁽²⁾				NOTES
		Magnetics (%)			Non-magnetics (%)	Magnetics (%)			Non-magnetics (%)	
		#1	#2	#3		#1	#2	#3		
CaO	45.0	36.8			49.2	42.3			49.75	
SiO ₂	48.8	41.5			48.8	43.6			49.8	
Subtotal	93.3	78.3			98.0	85.9			99.55	
Al ₂ O ₃	2.75	7.94			1.53	5.45			1.5	
Fe ₂ O ₃	1.16	3.50			0.89	2.09			0.75	
MgO	0.38	1.08			0.29	0.84			0.28	
Mn	0.075	0.11			0.069	0.074			0.07	
P ₂ O ₅	0.28	1.41			0.22	1.63			0.28	
Ti	0.115	0.28			0.073	0.20			0.054	

(1) Magnetics 1, 2, 3 respectively 4.91%, 6.86%, 6.06% of feed; non-magnetics = 82.17% of feed.

(2) Magnetics 1, 3, 3 respectively 18.62%, 5.54%, 4.70% of feed; non-magnetics = 71.14% of feed.

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TABLE: CARBONATE (CO₂)⁽¹⁾ CONTENTS

SIZE FRACTION	RAW ORE	Wt% CO ₂					
		TEST 1			TEST 2		
		Magnetics		Non-magnetics	Magnetics		Non-magnetics
		1	2	3	1	2	3
+8 mesh ⁽²⁾	0.69			0.98			0.68
8 x 18 mesh ⁽²⁾	0.85			0.33			0.54
18 x 30 mesh				0.74			0.72
30 x 48 mesh				0.56			0.27
-48 mesh				0.52			0.43

(1) Determined by HCl acidification in CO₂ free air, sorption on ascarite and gravimetric measurement.

(2) Values are suspect for coarse (+18 mesh) materials due to incomplete breakup.

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TABLE: WHOLE ROCK ANALYSIS DATA FOR MAGNETIC SEPARATION OF 48 x 0 mesh WOLLASTONITE ORE

COMPONENT	FEED (%)	TEST #1 ⁽¹⁾				TEST #2 ⁽²⁾				NOTES
		Magnetics (%)			Non-magnetics (%)	Magnetics (%)			Non-magnetics (%)	
		#1 ⁽³⁾	#2	#3		#1	#2	#3		
CaO	47.3	31.65			48.5	44.1			48.35	
SiO ₂	50.5	33.65			49.5	45.0			49.25	
Subtotal	97.8	65.3			98.0	89.1			97.6	
Al ₂ O ₃	1.30	3.2			0.99	3.45			1.12	
Fe ₂ O ₃	0.97	2.23			0.86	2.63			0.64	
MgO	0.30	0.97			0.17	1.24			0.19	
Mn	0.07	0.07			0.07	0.089			0.07	
P ₂ O ₅	0.15	0.98			0.56	1.16			0.65	
Ti	0.065	0.13			0.055	0.21			0.061	

(1) Magnetics 1, 2, 3 respectively 9.44%, 7.99%, 5.63% of feed; non-magnetics = 76.94% of feed.

(2) Magnetics 1, 2, 3 respectively 8.93%, 4.89%, 3.06% of feed; non-magnetics = 83.12% of feed.

(3) Contaminated in analysis, see Appendix.



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407-419

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BC Research

PLASMA SPECTROGRAPHIC ANALYSIS CERTIFICATE

File No. 47066

Date Sep 02, 1987

Attention: Mr. R. McElroy

"Wollastonite"

We hereby Certify that the following are the results of plasma spectrographic analysis made on mineral samples submitted.

Sample Identification	4706-1 +8 MESH	4706-2 8-18 MESH	4706-3 18-30 MESH	4706-4 30-48 MESH	4706-5 MINUS 48 MESH	
MAJOR COMPONENTS	Percent (%)					
Silica SiO ₂	49.1	48.8	50.3	51.0	50.5	50.5
Alumina Al ₂ O ₃	2.85	2.75	2.05	1.50	1.30	
Iron Fe ₂ O ₃	1.22	1.16	1.05	0.95	0.97	NOTE LOW Fe
Calcium CaO	45.0	45.0	45.7	47.2	47.3	45.0
Magnesium MgO	0.39	0.38	0.38	0.35	0.30	
Sodium Na ₂ O	0.01	0.01	0.01	0.01	0.01	
Potassium K ₂ O	0.01	0.01	0.01	0.01	0.01	
Sulphur SO ₃						
Loss On Ignition L.O.I.						
TRACE COMPONENTS	Parts Per Million (P.P.M.)					
Antimony Sh						
Arsenic As						
Barium Ba						
Beryllium Be						
Bismuth Bi						
Boron B						
Cadmium Cd						
Chromium Cr						
Cobalt Co						
Copper Cu						
Lead Pb						
Manganese Mn	720.	750.	680.	690.	710.	
Molybdenum Mo						
Nickel Ni						
Phosphorus Present	2000.	2800.	3000.	2400.	2500.	
Silver Ag						
Strontium Sr	50.	50.	35.	20.	30.	
Tin Sn						
Titanium Ti	1150.	1150.	630.	620.	650.	
Tungsten W						
Uranium U						
Vanadium V						
Zinc Zn						

L = less than.

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