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OMIP APPLICATION FOR GRANT

An Introduction to Arriscraft Corporation

An all Canadian company founded in 1949, Arriscraft Corporation, then known as Angelstone Limited, was formed to supply masonry to a market experiencing serious shortages. The first products were cast concrete units used in house construction in the Hamilton area. In 1956 the company outgrew its facilities and moved to the location still occupied by the corporate head office in Cambridge, Ontario.

A new process for making stone was developed at that time, and it is that process which has supported the start of the ambitious exploration program undertaken to find suitable quarried material. That program continues to this day.

In the early 1960's limitations on the manufactured products made it desirable to complete product lines by offering larger masonry units than those produced using existing technology. A search was undertaken to find quarry products for distribution to an ever growing dealer network.

Existing suppliers were unable to meet market demands at that time and contracts for orders were left unfilled. Customer and corporate frustration forced the company to locate a reliable source of product. Initiatives were undertaken to locate a Canadian stone deposit that could supply the market.

Prospecting for stone took personnel all around the southern parts of the province. A deposit was located in Bruce County near Hope Bay. It was at that site that this company began to quarry successfully the Adair® stone which has become an industry leader in this country. Equipment design and training of people which had started in Eastern Ontario continued. Eventually in the latter part of the 1970's the Hope Bay Quarry was a limited success.

Work has continued in the same formation and some new properties have been acquired. It is on these properties we wish to explore for new commodities.

The OMIP Grant

This document is the final report on work performed by and for Arriscraft Corporation in support of an approved grant under the Ontario Mineral Incentives Program.

The goal of this project is to establish other profitable products in our quarry operations. From the dimension stone block extraction which has taken place, it appears that a very consistent material can be found on the Arriscraft Corporation dolomite reserves.

It was originally planned that work should be performed on three land parcels. As work commenced, it soon became apparent that we would be unable to complete such an ambitious program, and the work should be concentrated on one area where progress could most economically and practically proceed.

Arriscraft Corporation would like to thank Mr. Mike Campbell, senior planner for the County of Bruce; Mr. Frank Coulter, of Sprucedale Agromart and Terra Chemicals; and Mr. Gord Unger of PPG for their assistance and free advice and guidance in the performance of this project.

Property Description and Location Map

The area worked was concession 8 EBR, part lot 2, lot 3, and part lot 4, about 210 acres. The site is located on the map below.



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The Stripping Program

Objectives

Stripping areas of the subject property were for two main purposes: test holes for drilling so that the quality of the material can be confirmed as consistent, and a large area for bulk samples so that test material may be produced.

Work was performed by a John Deere 890 excavator, a Clarke 275 C loader, a Clarke 275 loader, a Caterpillar D8 dozer, and a caterpillar D6 dozer. See attached map for locations.

The Stripping

The test pit was stripped first. The till overlying the bedrock showed in outcrop in several areas, and it was anticipated that all of this material would be removed very easily. The rock dipped down to ten feet below the surface in the field we chose to work.

The glacial scouring left a very uneven bedrock surface and several areas of broken cap rock. The stone required an excavator, the bulldozers and the small loaders to scrape the rock.

The first hole was not clean enough so another section was required to be stripped, scraped with the smaller machines and then cleaned with a blowpipe to remove clay from the rough and uneven areas.

Test pits were excavated and two have been left open for further development. Both cleaned off very quickly with just a dozer and would have been excellent areas to blast samples; however, the extra road building would have made this test too expensive at this time.

Conclusion

The stripping of the main bulk sample area required much more work than originally intended. More and smaller testing pits should be established before further mass overburden areas are removed if any reasonably accurate budget is to prepared.

The smaller test pits indicate overburden from .25 metres to 2.75 metres. It will be very difficult to clean the surface properly in some areas in order to produce chemical grade dolomite.

The Drilling Program

An intensive drilling program was undertaken between August 22 and September 24, 1994. Arriscraft Corporation equipment and employees were used exclusively to perform this work. All work was performed on previously stripped rock or outcrops.

Objectives

The drilling was undertaken in order to both estimate the quantity and the quality of the material available for extraction. It was decided that if the initial results would justify a small operation over the next 20 years, further testing of the entire properties could be postponed until market reaction and laboratory testing indicate that more work is required.

The Drilling

The commodity we are examining for production is an industrial mineral from what is considered a homogenous formation. A mobile pneumatic drill and compressor travelled around the property drilling 3.5 inch holes.

Before drilling, the rock was exposed and washed down to ensure no contamination. As the drill bit penetrated the rock, cuttings were collected and separated in five foot intervals. The samples were washed and then further segregated into sample bags. Half the material was stored for future tests. The remaining half was sent to a special laboratory in the United States for evaluation.

Hole depth varied according to the appearance of contaminants in the rock. It must be noted when slips and jointing interfered, the hole required redrilling.

Core Sample Processing

After collection, crushed core was washed free of all fines and mixed in five foot lot segments and subdivided into parcels for analysis in the laboratory. These samples were sent to Dow Laboratories in Michigan for analysis by x-ray flourescents.

For the entire hole sampling, equal quantities of material were mixed over the entire length of the hole. These tests were performed by XRAL Laboratories.





The Marketing Study

For the purposes of this project two main areas of usage of the crushed dolime were studied. The first was the glass industry, much of it concentrated in the Owen Sound, Georgian Bay area. The second obvious sales potential is in the agricultural markets of Grey and Bruce County.

Glass Production

Due to the proximity of glass plants in Owen Sound and Collingwood, a market for high purity dolomite exists in the area. Both Pittsburg Plate Glass and IOF have shown interest in a reliable, consistent supply of dolomite.

Response to the chemical analysis of the crushed drill core indicates great interest in the bulk samples. These two users represent approximately 50,000 tonnes per year.

While there is excess capacity from all of the test results to date, this property represents a very good and consistent source of supply. Dolostone used in the manufacture of glass must be at least below 0.06% FeO. Results from both of the testing labs show Fe2O3 at less than 0.01%.

Besides the FeO content, uniformity in gradation and chemical composition must be emphasized. Sulphur and phosphorous should be low but if consistent, present no problems.

The function of carbonates in the glass process it to render the glass more insoluble, to improve the mechanical properties making it less brittle and stronger and to improve its appearance by providing more lustre. Insoluble glass is required for prolonged contact with water and chemical solutions. High MgO content glass possesses greater resistance to etching from chemical solvents and acids and is preferred because of improved resistance to heat shock and better fluidity during the melt.

Gradation is very important. Very precise specifications are given such as 100% passing a No. 10 sieve and 96% to 100% retained on a No. 100 sieve. Other gradations will depend on the individual plant and the sizes of the sand in use. Material coarser than No. 8 sieve or finer than 200 mesh cannot be permitted. Gradations between the two extremes require stringent screening to meet the individual plant needs.

No organic matter is acceptable and if present, the dolomite will require washing.

Agricultural Production

Growers of all crops have begun paying more attention to soil testing and crop monitoring. In any monitoring process testing the PH levels of the soil is a key component. In the past soil test results have ignored the PH levels because it is not counted as direct nutrient input. It is, however, very important because it directly affects soil chemistry and soil plant interactions.

Although in the case of the Bruce Peninsula, much of the subsoil parent material is calcareous. The basic cations of Ca2 and Mg2 have been removed by leaching or crop harvesting. In many cases glacial deposition is very thick and may contain a great deal of acidic materials.

Acid soils become toxic to plants due to the increased availability of certain nutrients; however, the important role the Ca plays in plant nutrition also includes the way the plant is encouraged to take up nitrogen. It has been found as well that Ca plays an important part in root growth and meristematic or root hair tissue and cell elongation. Therefore too high a PH will limit root development and inhibit the crop plant's ability to take up both water and necessary nutrients.

The Fertilizer Institute of Ontario reports that one of the key factors affecting neutralization effectiveness of Ca2 is the fineness of the application material. Obviously particle size may vary greatly and the finer the "liming" material, the faster the neutralizing effect will be.

In the opinion of Mr. Frank Coulter of the Sprucedale Agromart, a major fertilizer processor and supplier in the Grey-Bruce area, the samples of the processed material he has seen will make an ideal material. It is void of any impurities such as silt and clay which has been a problem when calculating the "Total Neutralizing Value" in the past.

Mr. Coulter also discussed the continuing concern over the balance of calcium and magnesium in the soil and the need to adjust these nutrients. Too much magnesium may induce a potassium deficiency; however, testing at Ohio State University indicates that particularly grass crops grown for forage require increased levels of magnesium to prevent grass tetany.

Conclusions

Both the glass and fertilizer industries require carefully screened and dry material for their processes. All people interviewed have expressed great interest in the quarried material and feel it will be excellent for their products.

The market potential will be controlled by the cost of the end products, and it will be difficult to estimate the final numbers until pilot plant studies have been performed. This work should be completed when time and financing is available.

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CONCLUSION

The study has been a success. Arriscraft Corporation has been able to prove the potential of its deposit and the characteristics of this deposit over a wide area. This is absolutely critical to the continuing investigation into alternative markets for the stone. Quantities demanded by the various markets are far in excess of those required for dimension stone. In addition, we now have a supply of stone to provide to users so they can run their own tests.

We point out that success in finding alternative markets only enhances the potential for our dimension stone. Sound stone can be saved for dimension stone and stone of lesser quality can be allocated to other purposes.

With the current results in hand, Arriscraft Corporation can now look to more detailed studies within the deposit with a reasonable degree of assurance that sufficient high quality stone exists to justify further work.

A pilot plant is under consideration. We are in negotiations with a major American user of stone. Should the more detailed studies confirm current expectations, the pilot plant will be needed to satisfy potential customers of our ability to supply high quality materials.

Ultimately, success in this venture will enhance the viability of our dimension stone operation as well as creating more growth and new jobs from investment in alternate uses for the stone.

APPENDIX A



XRAL Laboratories A Division of SGS Canada Inc.

1885 Leslie Street Don Mills, Ont. Canada M3B 3J4 Telephone (416) 445-5755 Fax (416) 445-4152

CERTIFICATE OF ANALYSIS REPORT 30511

TO: ARRISCRAFT ATTN: KATHY MUTTI P.O. BOX 3190 875 SPEEDSVILLE ROAD -- -CAMBRIDGE, ONTARIO N3H 4S8

CUSTOMER No. 2691

DATE SUBMITTED 15 - Nov - 94

WORKORDER 1929-V2

TOTAL PAGES 1

11 CRUSHED ROCKS P.O. 45206

	METHOD	DETECTION	METHOD
		LIMIT	CODE
WRMAJ %	XRF-F	.01	100

*** UNLESS INSTRUCTED OTHERWISE WE WILL DISCARD PULPS IN 90 DAYS * AND REJECTS IN 30 DAYS FROM THE DATE OF THIS REPORT

CERTIFIED BY

Jean H. Opdebeeck, General Manager

DATE 06-DEC-94

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SGS Member of the SGS Group (Société Générale de Surveillarice)



SAMPLE \ %	SI02	AL203	CAO	MGO	NA20	к20	FE203	MNO	T102	P205	CR203	LOI	SUM
#1	.26	<.01	30.2	22.5	.03	.01	<.01	.01	.002	<.01	<.01	47.0	100.0
#2	.14	<.01	30.2	22.6	.02	<.01	<.01	.01	.003	<.01	<.01	46.2	99.2
#3	.15	<.01	30.1	22.7	.04	<.01	<.01	.01	.004	<.01	<.01	47.2	100.2
#4	.19	<.01	30.3	21.8	.04	<.01	<.01	.01	.005	<.01	<.01	47.5	99.8
#5	.34	.03	30.7	21.7	.03	.02	<.01	.01	.010	<.01	<.01	47.1	99.9
# 6	.50	.05	30.2	21.8	.03	.03	<.01	.01	.010	<.01	<.01	47.2	99.8
# 7	.11	<.01	30.2	23.0	.03	<.01	<.01	.01	.003	<.01	<.01	46.9	100.3
#8	. 22	<.01	30.3	22.5	.03	<.01	<.01	.02	.004	<.01	<.01	47.2	100.3
# 9	.04	<.01	30.4	22.2	.03	<.01	<.01	.02	.001	<.01	<.01	47.4	100.1
#10	.04	<.01	30.3	22.6	.03	<.01	<.01	.01	.001	<.01	<.01	47.0	100.0
#11	.07	<.01	30.2	22.4	.03	<.01	<.01	.02	.004	<.01	<.01	47.3	100.0
) #1	.27	<.01	30.2	22.5	.03	.02	<.01	.01	.003	<.01	<.01	47.1	100.1

XRF - WHOLE ROCK ANALYSIS 06-DEC-94 REPORT 30511 WORKORDER 1929

D - QUALITY CONTROL DUPLICATE

*** XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES ***



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Date:	December 6, 1994
To:	Bevan Ratcliffe Randy White
File:	XVI-58
From:	Kathy Mutti
Subject:	XRAL Results on Core Samples

Samples compiled from the depth samples of drill holes numbered 1 to 11 were sent to XRAL Laboratories for major oxides analysis. This analysis gives results for calcium oxide, magnesium oxide and loss on ignition as well as many of the oxides tested by Dow.

XRAL results are reported under the Dow average results in the attached tables. The silica results for the two sets of test results are comparable for the holes with a lower silica variation. This shows that calibrations and samples were very close between the two sets of tests.

The last page attached gives a brief analysis of variation between the holes using the XRAL data only. The variation of the silica content is relatively high.

I have also shown on the last page, calculations for determination of dolomite and calcite in the samples. Based on this reasoning it appears as though all of the limestone is dolomitic. No calcite should be present.

SiO2	Cl	F	e2O3	AI2O3	MnO	K2O	MgO	CaO	LOI
#1	0.23	0.13	7.65E-04	4.75E-04	1.25E-04	4.15E-04	•		
	0.2	0.13	9.90E-04	9.60E-04	1.30E-04	3.60E-04			
	0.26	0.12	8.68E-04	5.58E-04	1.20E-04	4.35E-04			
	0.27	0.12	8.10E-04	5.25E-04	1.20E-04	4.35E-04			
	0.24	0.14	7.95E-04	4.40E-04	1.10E-04	3.90E-04			
	0.28	0.11	1.09E-03	5.15E-04	1.20E-04	4.00E-04			
	0.32	0.1	1.17E-03	5.25E-04	1.35E-04	4.45E-04			
DOW	0.26	0.12	0.00	0.00	0.00	0.00			
XRAL	0.26		<0.01	<0.01	0.01	0.01	22.50	30.20	47.00
#2	0.082	0.15	6.45E-04	1.60E-04	1.25E-04	1.80E-04			
	0.13	0.17	5.80E-04	3.05E-04	1.20E-04	2.60E-04			
	0.16	0.16	5.85E-04	3.28E-04	1.20E-04	2.50E-04			
	0.32	0.13	8.30E-04	7.15E-04	1.20E-04	5.35E-04			
	0.18	0.15	7.85E-04	4.00E-04	1.20E-04	3.25E-04			
	0.22	0.12	1.03E-03	4.95E-04	1.30E-04	3.65E-04			
DOW	0.18	0.15	0.00	0.00	0.00	0.00			
XRAL	0.14		<0.01	<0.01	1 0.01	<0.01	22.60	30.20	46.20
#3	0,098	0.18	6.15E-04	2.00E-04	1.70E-04	2.15E-04			
	0.34	0.14	8.50E-04	7.20E-04	1.55E-04	5.90E-04			
	0.14	0.16	6.85E-04	3.55E-04	1.25E-04	2.65E-04			
	0.16	0.16	6.55E-04	2.40E-04	1.40E-04	2.90E-04			
	0.22	0.14	6.85E-04	3.90E-04	1.40E-04	3.90E-04			
	0.24	0.17	7.80E-04	4.00E-04	1.40E-04	3.95E-04			
	0.32	0.14	9.55E-04	5.00E-04	1.30E-04	4.35E-04			
DOM	0.22	0.16	0.00	0.00	0.00	0.00			
XRAL	0.15		<0.01	<0.0	1 0.01	<0.0*	1 22.70	30.10	47.20
#4	0.012	0.17	6.80E-04	1.90E-04	1.70E-04	2.40E-04	÷		
	0.19	0.13	8.55E-04	3.50E-04	1.70E-04	3.20E-04			•
	0.24	0.12	7.65E-04	5.10E-04	1.10E-04	4.00E-04	•		
	0.26	0.15	7.65E-04	5.30E-04	1.35E-04	4.35E-04	ļ		
	0.26	0.15	7.30E-04	4.00E-04	1.55E-04	1 3.85E-04	ļ		
DOW	- 0.19	0.14	0.00	0.00	0.00	0.00			
XRAL	0.19		<0.01	<0.0	1 0.01	≺0.0	1 21.80) 30.3(47.50
#5	0.14	0.19	7.70E-04	2.30E-04	1.40E-04	1 2.85E-04	ļ		
	0.3	0.13	1.05E-03	5.80E-04	1.25E-04	1 5.00E-04	ļ		
	0.48	0.1	8.70E-04	1.13E-03	3 1.10E-04	4 7.55E-04	ļ		
DOW	0.31	0.14	0.00	0.00) 0.00) 0.00)		
XRAL	0.34		<0.01	1 0.03	3 0.0 ⁻	0.02	21.70	30.7	0 47.10
#ŝ	0.16	0.18	6.60E-04	2.55E-04	4 1.65E-04	4 2.75E-04	1		
	0.25	0.17	7.45E-04	5.10E-0-	4 1.50E-04	4 4.25E-04	1		

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	0.16 0.41	0.15 0.13	9.35E-04 8.20E-04	3.65E-04 6.90E-04	1.20E-04	3.05E-04 6.45E-04			
	1.14	0.11	1.23E-03	2.01E-03	1.15E-04	1.62E-03			
DCW	0.42	0.15	0.00	0.00	0.00	0.00			
XRAL	0.50		<0.01	0.05	0.01	0.03	21.80	30.20	47.20
#7	0.19	0.17	0.00066	0.000285	0.00014	0.00032			
	0.23	0.19	0.000755	0.00043	0.00016	0.00035			
	0.18	0.2	0.00075	0.000345	0.000125	0.00028			
DOW	0.20	0.19	0.00	0.00	0.00	0.00			
XRAL	0.11		<0.01	<0.01		<0.01	23.00	30.20	46.90
#3	0.24	0.14	9.35E-04	4.10E-04	1.75E-04	3.70E-04			
	0.21	0.17	8.45E-04	3.75E-04	1.90E-04	3.55E-04			
	0.2	0.16	6.75E-04	3.75E-04	1.30E-04	3.20E-04			
	0.19	⁻ 0.17	1.06E-03	3.20E-04	1.75E-04	3.50E-04			
DOW	0.21	0.16	0.00	0.00	0.00	0.00			
XRAL	0.22		<0.01	<0.01	0.02	<0.01	22.50	30.30	47.20
#S	0.13	0.13	6.65E-04	2.90E-04	1.30E-04	2.00E-04			
	0.14	0.14	7.00E-04	2.10E-04	1.35E-04	2.10E-04			
	0.066	0.17	6.20E-04	1.60E-04	1.35E-04	1.55E-04			
	0.1	0.14	6.90E-04	1.80E-04	1.25E-04	1.80E-04			
	0.075	0.17	6.05E-04	1.70E-04	1.20E-04	1.70E-04			
	0.15	0.15	6.60E-04	2.90E-04	1.20E-04	2.60E-04			
	0.22	0.14	8.10E-04	4.45E-04	1.25E-04	3.55E-04			
DOM	0.13	0.15	0.00	0.00	0.00	0.00			
XRAL	0.04		<0.01	<0.01	0.02	<0.01	22.20	30.40	47,40
#10	0.068	0.13	6.60E-04	1.20E-04	1.25E-04	1.25E-04			
	0.073	0.14	6.00E-04	1.20E-04	1.10E-04	1.40E-04			
	0.09	0.16	6.70E-04	1.70E-04	1.25E-04	1.65E-04			
	0.065	0.17	5.90E-04	1.05E-04	1.25E-04	1.60E-04			
	0.09	0.17	5.60E-04	1.80E-04	1.20E-04	2.00E-04			
	0.17	0.14	7.70E-04	3.60E-04	1.30E-04	2.90E-04			
	0.15	0.15	6.85E-04	3.40E-04	1.30E-04	2.65E-04			
DOM	0.10	0.15	0.00	0.00	0.00	0.00			
XRAL	0.04		<0.01	<0.01	0.01	<0.01	22.60	30.30	47.00
#11	0.2	0.15	6.60E-04	3.75E-04	1.30E-04	3.40E-04			
	0.095	0.21	5.40E-04	2.05E-04	1.20E-04	2.30E-04			
	0.18	0.17	5.98E-04	4.05E-04	1.15E-04	3.30E-04			
DOW	0.16	0.18	0.00	0.00	0.00	0.00			
XRAL	0.07		<0.01	<0.01	0.02	<0.01	22.40	30.20	47.30

· :-:

			Average	Scatter	COV%	
Between hole variation:		MgO%:	22.3	0.42	2	
		SIO2%	0.19	0.135	70 -high vari	lation
		CaO%	30.3	0.15	1	
		LOI%	47.1	0.34	1	
Formula	Name	Mol.Wt	. %CaQ	%MgO%	CO2 (LOI)	
CaCO3	calcite	100.08	56	Ö	44	
CaCO3.MgCO3	dolomite	184.4	30.4	21.8	47.8	

Assume all MgO in samples is present as dolomite:

Then, %CaO combined as dolomite = Actual %MgO * %CaO/%MgO = 22.3*30.4/21.8 =31.09 and, %CO2 (LOI) combined as dolomite = 22.3*47.8/21.8=48.9

These numbers are very close to the actual CaO and LOI and thus we can conclude that the samples are pure dolomitic limestone with no calcite present.

APPENDIX B

GEOLOGY

The following geological description is taken from "Limestone Industries of Ontario, Volume III - Limestone Industries and Resources of Central and Southwestern Ontario" pages 122 and 123.

GEOLOGY

This quarry consists of three excavations, which expose a total of approximately 7 m of the Wiarton/Colpoy Bay Member of the Middle Silurian Amabel Formation. The bedrock surface is irregular, glacially scoured and fluted (fluting may in part follow irregular bedding planes), and therefore overburden varies in thickness from 0 to 3 m. Large mill blocks (approximately 4 cu. m) are drilled off in approximately three lifts, each up to 2 m thick. Lifts are taken along natural bedding planes which are planar to undulating.

The Wiarton/Colpoy Bay Member, as exposed in this quarry, is a light grey to white, fine- to coarse-crystalline dolostone with attractive blue-grey mottles, and local vuggy zones. Blocks containing concentrations of vugs are generally discarded. Shale partings and disseminated pyrite crystals are virtually absent. Occasional stylolites may form lines of weakness. Large areas are virtually free of joints, but scattered vertical east-west jointing is present at intervals of 3 m to 5 m.

The Wiarton/Colpoy Bay Member was not subdivided into further units in this quarry. The lithology is

similar to that exposed in the two inactive Arriscraft quarries in the area.

Geological Section

Thickness

UNIT 1 Amabel Formation, Wiarton/Colpoy Bay Member 7.0m

Dolostone: white to light grey with blue-grey mottles, weathers light grey; fine to coarse crystalline; medium to thick bedded, with planar to undulating contacts; abundant fossil fragments (crinoids, corals); vugs (up to 5 cm in diameter) occur scattered throughout or concentrated in vuggy zones and are usually calcite rimmed or filled; mottles vary in abundance (5 - 50%) and vary in shape from irregular to planar and parallel to bedding; fluted, glacially scoured subcrop surface.

Total thickness