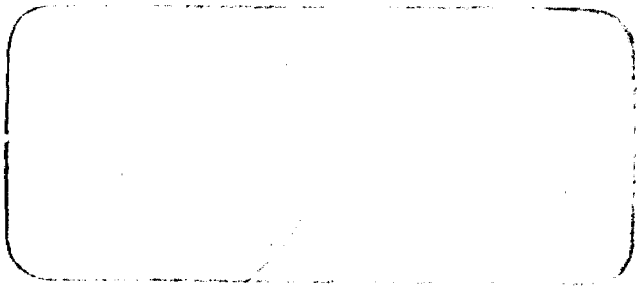
TEST REPORT

CONCENTRATION OF MAGNETITE
WET DRUM MAGNETIC SEPARATION
FOR
MARSHALL MINERALS
RR #82-253

CENTRAL TEST LABORATORY

Asbury Road at Airport, Erie, PA 16515, U.S.A.
Tel. 814/833-9881 Telex 91-4470



ERIEZ MAGNETICS AFFILIATES

ERIEZ MAGNETICS JAPAN CO., LTD.
No. 11-8 1-Chome, Kita-Kojiya,
Ohta-Ku, Tokyo 144, Japan

QUIPAMENTOS MAGNETICOS do BRASIL
Rua 15 de Novembro, 411
Sao Paulo 04709, Brasil

ERIEZ MAGNETICS PTY. LIMITED
6-8 Malua Street, P.O. Box 79
Reservoir, Victoria 3073, Australia

ERIEZ OF CANADA, LTD.
133 Oakdale Road
Downsview, (Toronto), Canada

ERIEZ MAGNETICS — UK
Wilson Industrial Estate
Caerphilly Mid-Glam CF8 3ED
Wales, United Kingdom

ERIEZ EQUIPOS MAGNETICOS, S.A.
Av. Ejercito Nacional No. 752
Mexico 5, D.F., Mexico

ERIEZ MAGNETICS SOUTH AFRICA (PTY.) LTD.
P.O. Box 391281
Bramley, Transvaal 2018, South Africa

CONCENTRATION OF MAGNETITE
BY WET DRUM MAGNETIC SEPARATION
FOR
MARSHALL MINERALS
RR #82-253

ERIEZ
ERIE, PENNSYLVANIA

CONTENTS

ERIEZ MAGNETICS®

Central Test Laboratory
REPORT OF TEST

Date: AUGUST 13, 1982 Research Request: #82-253

Test Made For: MARSHALL MINERALS

Address

City NIAGARA FALLS State NEW YORK

1.0 TITLE: Concentration of Magnetite by Wet Drum Magnetic Separation.

2.0 INTRODUCTION: Marshall Minerals owns the rights to a high grade magnetite ore body next to the Jones & Laughlin Adams Mine. Marshall Minerals intends to get into production quickly by entering the heavy media market. Later, while the initial investment is being recovered, they can explore the possibility of expanding into the specialty grade concentrate market.

2.1 Objective -- To determine the minimum cleaning requirements to produce an acceptable heavy media concentrate. Secondarily, to produce bulk concentrates for sample distribution.

2.2 Sample -- Two drums of ground magnetite ore were received. One drum had been ground dry, the other had been ground wet. Both samples were about 90% minus 325 mesh. Davis Tube testing of the samples showed that the dry sample was 63% magnetics and that the upper part of the wet sample was 34% magnetics.

2.3 Equipment Used -- Eriez Laboratory Wet Drum, Model L-8
Eriez Davis Tube Tester

3.0 TEST PROCEDURES:

3.1 Small Samples

About 1 kg each of the wet and dry samples were passed twice through

the laboratory wet drum using a magnetics repass scheme. A flowsheet for each test is given in Figure #1. Wet drum field strengths were adjusted to 500 gauss High Gradient Equivalent for all passes. Feed to the wet drums were maintained at approximately 10% solids. A small portion of the first pass magnetics were scooped from the bucket just prior to the second pass. This was to provide a rough measure of the first pass improvements. All products were then filtered, dried, weighed and split for various assays.

3.2 Large Samples

About 100 lbs. of the dry sample was processed through a double pass wet drum flowsheet as shown in the upper part of Figure #4. A flowrate of 6 GPM was set. The solids content fluctuated, but averaged about 22%. No sample was taken after the first pass. All products were allowed to settle and then were decanted, dried and weighed. A portion of the final magnetics was split out for assays.

The remainder of the wet and dry samples were processed through the same flowsheet as before. The feed rate was again 6 GPM, but the solids content was lowered, probably to around 18%. Sample handling was as in the 100 lb. sample, with the exception that Davis Tube assays were performed on each product. The weight splits are given in the flowsheet in the lower part of Figure #4.

4.0 EVALUATION

4.1 Assay

Samples were sent to Microbac Laboratories Inc., Erie Testing Laboratory Division, for chemical analyses. A copy of their Certificate of Analysis is attached to this report.

Davis Tube (DT) assays for magnetics were performed by Eriez personnel.

Magnetic iron (Mag Fe) is calculated by multiplying the DT magnetics percentage times the iron assay for that magnetic product. For example, sample (113) assayed 94.08% DT magnetics. The DT magnetics assayed 71.09% Fe (113 DT from the certificate); therefore the product, 66.9%, is the Mag Fe.

4.2 Results

The dry sample assayed 63% DT Mag, 45% Fe and 44% Mag Fe. A single pass on the wet drum upgraded the product to 80% DT Mag, (calculated), 61% Fe and 57% Mag Fe. The DT assay was rushed and weighed while still slightly wet. Therefore this value was recalculated from the balance sheet. The second pass improved the product even more to 94% DT mag, 66% Fe and 67% Mag Fe. Although the wet sample showed an even higher ratio of concentration, it was felt that the sample was non-representative inasmuch as the sample was taken from the top two inches of the drum.

Metallurgical Balance Sheets for the two tests were calculated and given in Figures 2 and 3. These balances show that while only 79% to 91% of the iron units were recovered, 98% of the magnetics and 99% of the magnetic iron were recovered. A similar balance on the large sample would show that nearly 99% of the DT magnetic units were recovered.

The large samples showed a slightly lower percentage of DT magnetics than the small samples. This was probably due to the carry-over of clays at the higher solids percentages used in the large tests.

Crushing coarse ore to approximately -10 mesh for microscopic observation shows a rough liberation at 50 to 100 mesh. Cleaning at a coarser grind, a standard iron-range practice, may improve the results obtained at 90% minus 325 mesh. Good liberation still requires grinding at least -270 mesh.

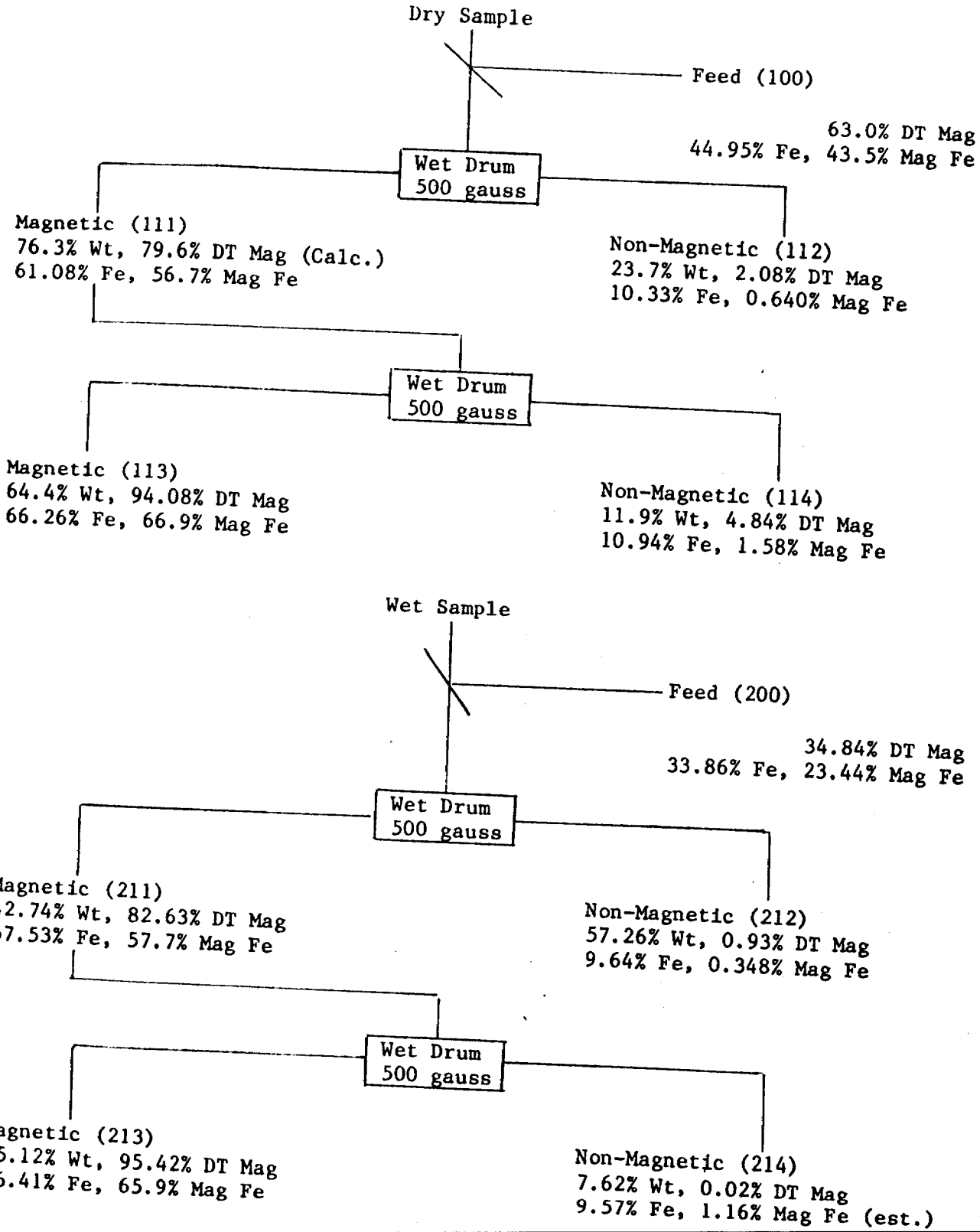
5.0 RECOMMENDATIONS: This sample upgrades to a high quality heavy media magnetite quite readily in a two-pass finisher drum circuit. To process 2000 LTPD at 15% solids, (2216 GPM) requires about 20 feet of double wet drums.

Joseph Wernham
Mineral Processing Engineer

JW/jaj

MARSHALL MINERALS
RR #82-253
FIGURE #1

FLOWSHEET



METALLURGICAL RESULTS

RR 82-253
FIG. #2

FRACTION	PERCENT WEIGHT	ASSAY% DT MAG	ASSAY% FE	ASSAY% MAG FE	UNITS DT MAG	UNITS FE	UNITS MAG FE	% DISTRIBUTION DT MAG	% DISTRIBUTION FE	% DISTRIBUTION MAG FE
NMAG 112	23.70	2.080	10.330	0.640	0.4930	2.4482	0.1517	0.80	5.27	0.35
NMAG 114	11.00	4.840	10.040	1.580	0.5760	1.3019	0.1080	0.93	2.80	0.43
MAG 113	64.40	94.080	66.260	66.880	60.5875	42.8714	43.0707	98.27	91.92	99.22
CALC. HEAD	100.00				61.6564	46.4215	43.4184	100.00	100.00	100.00
ASSAYED HEAD		63.00	44.95	43.52						

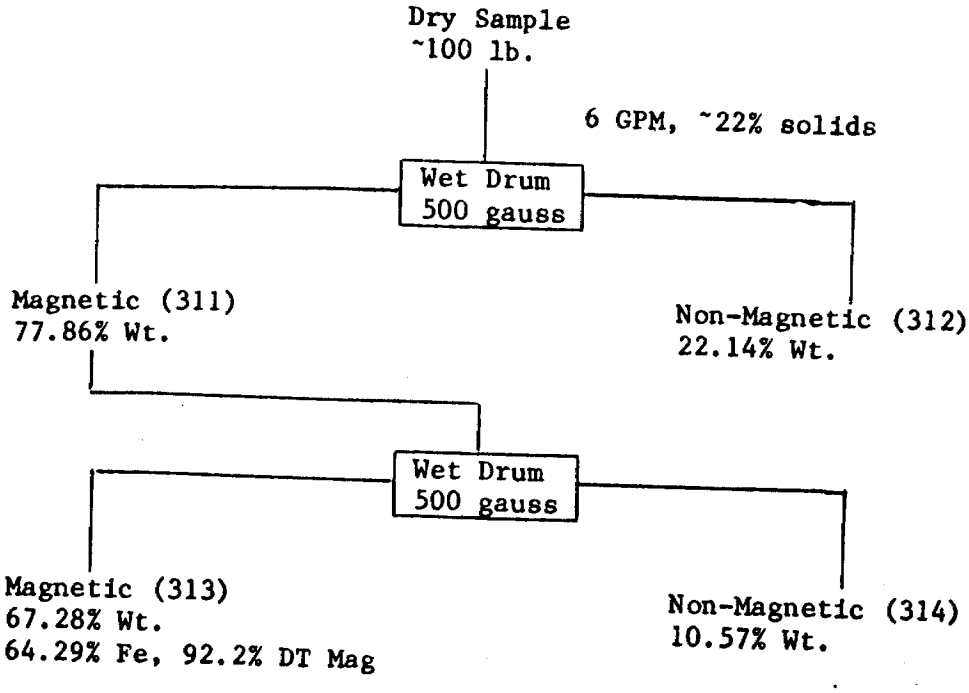
METALLURGICAL RESULTS

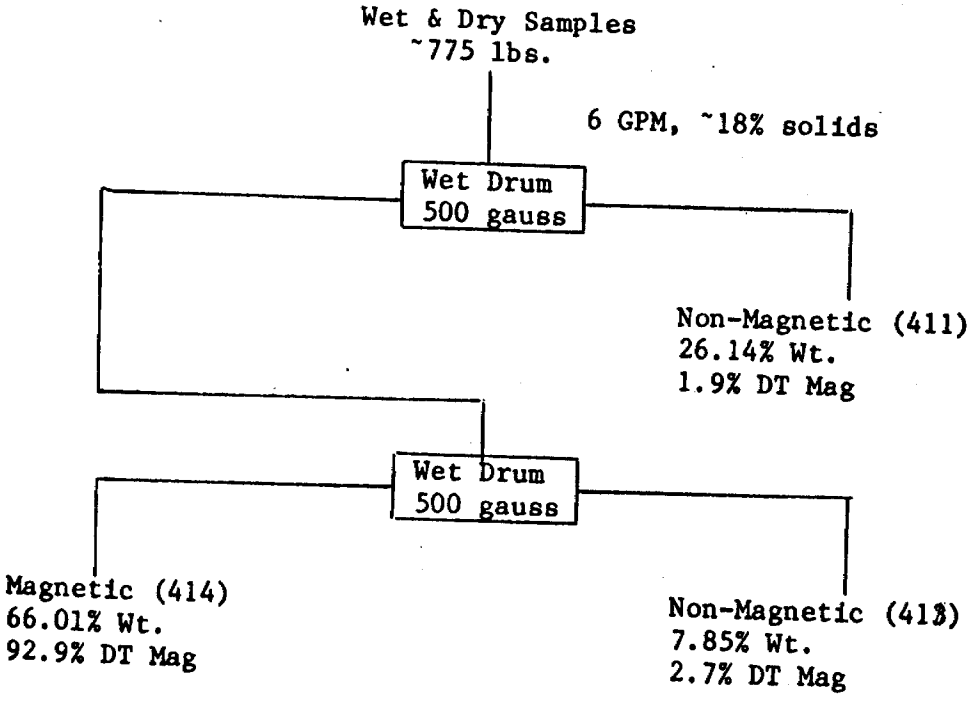
RR 82-253
FIG. #3

FRACTION	PERCENT WEIGHT	ASSAY% DT MAG	ASSAY% FE	ASSAY% MAG FE	UNITS DT MAG	UNITS FE	UNITS MAG FE	% DISTRIBUTION DT MAG	% DISTRIBUTION FE	% DISTRIBUTION MAG FE
NMAG 212	57.26	0.930	9.648	0.348	0.5325	5.5109	0.1993	1.56	18.67	0.85
NMAG 214	7.62	0.920	9.578	1.156	0.0815	0.7292	0.0881	0.00	2.47	0.38
MAG 213	35.12	95.420	66.410	65.916	33.5115	23.3232	23.1497	98.43	78.87	98.77
CALC. HEAD	100.00				34.0455	29.5723	23.4371	100.00	100.00	100.00
ASSAYED HEAD		34.84	33.86	23.44						

MARSHALL MINERALS
RR #82-253
FIGURE #4

FLOWSHEET





MICROBAC LABORATORIES, INC.

ERIE TESTING LABORATORY DIVISION
2401 West 26th Street, Erie, Pennsylvania 16506
814/833-4790

AIR • FUEL • WATER • FOOD • WASTES

Date Reported: August 3, 1982
Date Received: July 14, 1982
Sample No.: 195-267, 214-03093

Eriez Magnetics
Asbury Road @ Airport
Erie, PA 16505

Attention: Joe Wernham

CERTIFICATE OF ANALYSIS

Subject: Samples for total Iron by fusion. RR# 82-253

101 DT	69.30%, 68.86%, Av. 69.08%	100	44.95%
111 DT	71.21%	111	61.08%
112 DT	30.76%	112	10.33%
113 DT	71.09%	114	10.94%
114 DT	32.58%	200	33.86%
201 DT	67.28%	211	57.53%
211 DT	69.86%	212	9.64%
212 DT	37.39%	214	9.57%
213 DT	69.08%	113	66.16%, 66.35%
			Av. 66.26%
		213	66.41%
		313	64.29%

Assay samples 113, 213, and 313 for the following:

	113	213	313
Acid soluble iron	65.29%	65.32%	62.95%
Total iron (fusion)	66.26%	66.41%	64.29%
Sodium	0.008%	0.005%	0.009%
Potassium	<0.001%	<0.001%	<0.001%
CaO	0.084%	0.070%	0.098%
MgO	0.050%	0.050%	0.066%
Al_2O_3	<0.08%	<0.08%	<0.08%
P_2O_5	0.04%	0.03%	0.04%
Manganese	0.080%	0.080%	0.081%
Sulfur	0.04%	0.05%	0.05%
TiO_2	<0.07%	<0.07%	<0.07%
SiO_2	5.16%	4.94%	6.99%

Signed Robert H. Morgan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BOORUM
& PEASE
COMPANY
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Amberg
No. 57107

Magnetic Iron Ore Grinding and Concentration Tests

Marshall Minerals Corporation
Niagara Falls, Ontario

Final Report

ORF Investigation No. 75245

ONTARIO RESEARCH FOUNDATION

Magnetic Iron Ore Grinding and Concentration Tests

Marshall Minerals Corporation
Niagara Falls, Ontario

Final Report

ORF Investigation No. 75245

J. MELNBARDIS
V.I. LAKSHMANAN
DEPARTMENT OF ENGINEERING
AND METALLURGY

August 31, 1982

ONTARIO RESEARCH FOUNDATION

SHERIDAN PARK RESEARCH COMMUNITY

MISSISSAUGA, ONTARIO, CANADA L5K 1B3 • (416) 822-4111 • TELEX 06-982311

Page Number

Magnetic Iron Ore Grinding and Concentration Test

Marshall Minerals Corp.

Final Report

ORF Investigation No. 75245

1. INTRODUCTION

Based upon the discussions held between Mr. William Marshall, of Marshall Minerals and O.R.F. staff, a 500 kg bulk sample of magnetic iron ore was shipped by Marshall Minerals to O.R.F. in June, 1982. The primary objective of the test program was to produce ground products at 80 and 90% minus 325 mesh size for magnetic concentrations at Eriez Magnetics, Erie, Pa.

This report describes the results obtained from grinding and bench scale flotation test work to upgrade the magnetic concentrates.

2. SUMMARY

The head sample of the ore received assayed 46.9% total iron, 23.9% silica, 4.9% manganese, 3.9% lime and 0.1% titania.

The required 80% minus 325 mesh size product was produced by dry grinding the crushed product at 6 mesh, using 0.6 m diameter x 0.2 m Hardinge ball mill with 170 mesh Sweco 0.75 m diameter screen.

The finer product at 90% minus 325 mesh was produced by wet grinding in a closed circuit having a 200 mesh opening DSM Rapifine Screen.

At the completion of grinding 2 x 220 kg lots of wet (90% minus 325 mesh) and dry (80% minus 325 mesh) ground materials were shipped to Eriez Magnetics.

Bench scale Davis tube test to upgrade a feed containing 44.7% magnetic iron indicated 98.7% recovery to a concentrate assaying 68.7% acid soluble iron. The concentrate contained 2.5% SiO_2 and 0.7% MgO.

Further upgrading of the magnetic concentrates by flotation based on a limited number of tests was inconclusive. The results indicated that a low level of selectivity was attained in the removal of the residual gangue to flotation froth.

A concentrate assaying 70.8% acid soluble iron was produced in a preliminary flotation test, but the rejects then carried more than 23% of the magnetic concentrate weight that accounted for 32.5% of the iron in the feed. In subsequent tests with less weight and iron values removed as froth, the flotation concentrates assayed lower (68.9 - 69.1%) acid soluble iron. The magnetic iron recovery was less than 90%.

Hence it is recommended that further tests may be carried out to establish optimum conditions to produce higher grade concentrate.

3. TEST PROCEDURE AND RESULTS

3.1 Head Sample Data

The total 500 kg bulk sample received was first crushed to minus 6 mesh size using 20 x 35 cm and 8 x 11 cm jaw crushers and a 20 cm diameter rolls crusher.

A representative head sample was split out by coning, quatering and riffling. The results of assay and semi-quantitative spectrographic analyses are shown in Tables I and II.

3.2 Grinding

The required 80 and 90% minus 325 mesh size products were produced as shown in the flowsheet (Figure 1).

(1) The coarser product was obtained by dry batch grinding 80 kg lots of the -6 mesh feed in a 0.6 m dia. x 0.2 m Hardinge ball mill. The mill product was screened on 170 mesh Sweco 0.75 diameter screen. The oversize fraction was included with the subsequent mill feed batch.

(2) Since dry screening at a finer mesh size did not appear feasible, the same mill was used for continuous wet grinding in closed circuit with a 74μ opening DSM Rapifine screen to produce the finer product.

The samples of the two products showed the following structures:

Screen Mesh	Product Weight %	
	Dry Ground	Wet Ground
200	3.6	1.0
325	17.0	9.4
-325	79.4	89.6
TOTAL	100.0	100.0

3.3 Magnetic and Flotation Concentration

Samples of both the dry and wet ground materials were concentrated using a laboratory 20 x 10 cm Sala permanent magnet separator. A Davis tube test was also done on the wet ground material.

Further tests were carried out on the Sala magnetic concentrates to try and upgrade them by flotation of the still unliberated middling fraction. The flowsheet is shown in Figure 2.

As can be seen from the results shown in Table III the Davis Tube concentrate as produced from the finer (90% -325 mesh) feed assayed 68.7% acid soluble iron and 0.66% magnesia (MgO) and accounted for 98.7% of the feed acid soluble iron content with 64.25% weight recovery.

The MgO assays indicate that more than 92% of the feed magnesia content was rejected to tailings.

Similar magnetic iron recoveries but lower grades were attained with the Sala separator after 2 passes (the concentrates of the first pass were fed through for a second pass). The lower than Davis Tube concentrate grades indicate that less than complete dispersion and washing of the feed pulp was obtained during the two separation stages.

The role of flotation process to upgrade magnetic iron concentrates is to remove any middling fraction (still unliberated grains of minerals and gangue) that is sufficiently magnetic to be carried with the magnetic concentrate.

The flotation reagents used were Sherex Arosurf MG 98A a cationic silica collector at 0.058 - 0.086 kg per ton (1,000 kg) of original feed (or 0.095 - 0.134 kg/ton flotation feed) and Shell methylisolbutyl carbinol frother.

By observation the flotation response appeared sluggish and the concentrate grades produced were low. The samples assayed from 68.9 to 70.8% acid soluble iron.

As can be seen in Table III the amounts removed to flotation froth varied from 7.4 to 23.7% (90% -325 mesh feed) and 9.1% (80% -325 mesh feed) by weight of original feed. The froths rejected assayed from 50.6 to 59.0% acid soluble iron that accounted for up to 32.5% of the iron distribution.

The relatively high iron content of the flotation froth and the fact that the MgO level, in comparison with the Davis Tube concentrate was not lowered (0.66% MgO Davis Tube vs. 0.65% MgO in flotation concentrate of the same feed) is an indication of low flotation selectivity attained in the removal of residual gangue. It is most probable that the poor flotation response is due to the impurities being very finely disseminated and contained within a large fraction of the magnetic mineralization.

Another less probable reason may be that the silica flotation collector reagent used is not the best suited one for this application since the gangue constituents appear to be magnesium silicates rather than just silica. To investigate other reagents would require a number of additional tests to be carried out.

V. I. Lakshmanan, Ph.D.
Manager
Mineral Processing and
Hydrometallurgy Groups
Department of Engineering
and Metallurgy

J. Meinbardis
Senior Technologist
Department of Engineering
and Metallurgy

VIL
JM:aac

TABLE I

HEAD SAMPLE ANALYSES

Constituent	%
Iron Fe	46.9
Silica SiO_2	23.9
Alumina Al_2O_3	0.33
Calcium CaO	3.89
Magnesia MgO	4.94
Alkali Na_2O	0.59
K_2O	0.09
Manganese MnO	0.17
Titania TiO_2	0.10
Phosphorous P_2O_5	0.15
Chrome Cr_2O_3	0.01
Loss on ignition	-1.23 (gain)

TABLE II

X-RAY ASSAY LABORATORIES LIMITED

1885 LESLIE STREET, DON MILLS, ONTARIO M3B 3J4

PHONE 416-445-5755 TELEX 06-986947

CERTIFICATE OF ANALYSIS

REPORT 15123 REF. FILE 10876-A3 07-JUL-82

TO: ONTARIO RESEARCH FOUNDATION
ATTN: ALDO MARASCIO
SHERIDAN PARK
MISSISSAUGA, ONTARIO
L5K 1B3
4 PULPS PO# 16271

CUSTOME

DATE SUBMITTED
28-JUN-82

ELEMENT	SENS*	45-H	ELEMENT	SENS*	45-H
ANTIMONY	(4)	ND	MANGANESE	(1)	L
ARSENIC	(4)	ND	MERCURY	(4)	ND
BERYLLIUM	(2)	ND	MOLYBDENUM	(3)	FT
BISMUTH	(2)	ND	NICKEL	(1)	FT
CADMIUM	(4)	ND	SILVER	(1)	ND
CERIUM	(5)	ND	TANTALUM	(5)	ND
NIOBIUM	(4)	ND	THORIUM	(3)	ND
CHROMIUM	(4)	ND	TIN	(2)	FT
COBALT	(3)	ND	TITANIUM	(2)	T
COPPER	(1)	FT	TUNGSTEN	(4)	ND
GALLIUM	(2)	FT	URANIUM	(3)	ND
GERMANIUM	(1)	ND	VANADIUM	(2)	FT
IRON	(2)	H	YTTRIUM	(3)	ND
LEAD	(2)	FT	ZINC	(4)	T
LITHIUM	(4)	ND	ZIRCONIUM	(4)	ND

LEGEND

KEY TO SYMBOLS

H - 10% PLUS	L - 0.1-1%	
MH - 5-15%	TL - 0.05-0.5%	
M - 1-10%	T - 0.01-0.1%	
LM - 0.5-5%	FT - 0.01% OR LESS	
	ND - NOT DETECTED	

*SENSITIVITY (LIMIT OF DETECTION)

1 - 0.0005-0.001%
2 - 0.001-0.005%
3 - 0.005-0.01%
4 - 0.01-0.05%
5 - 0.05-0.1%

NOTE: BETTER SENSITIVITIES CAN BE OBTAINED WITH SPECIAL TECHNIQUES, IF AND WHEN REQUIRED.

TABLE III

CONCENTRATION RESULTS

Davis Tube Results

FEED PRODUCT	Weight %	Assay %		Distribution %	
		Acid sol.Fe	MgO	Acid sol.Fe	Mgo
Davis tube magnetic concentrate	64.25	68.70	0.66	98.7	7.8
Davis tube tailings	35.75	1.57	13.85	1.3	92.2
Wet Ground 90% -325 mesh feed	100.00	44.7	5.37	100.0	100.0

Magnetic and Flotation Concentration Results

	Weight %	Acid Sol. Fe		Assay %		
		Assay %	Dist.%	SiO_2	TiO_2	MgO
Dry Ground feed (80% -325 mesh)	100.0	42.0	100.0			
Magnetic separation (Sala) tailings	38.2	2.5	2.3			
Magnetic concentrate	61.8	66.4	97.7			
Flotation froth (middlings)	9.1	51.0	11.0			
Flotation underflow concentrate	52.7	69.1	86.7	2.55	0.05	
Wet ground feed (90% -325 mesh)	100.0	43.9	100.0			
Magnetic separation (Sala) tailings	35.6	2.5	2.0			
Magnetic concentration	64.4	67.1	98.0			
Flotation froth (middlings)	7.4	50.6	8.7			
Flotation concentrate	57.0	68.9	89.3	2.65	0.04	0.65
Dry ground 90% -325 mesh	100.0	43.0	100.0			
Magnetic separation (Sala) tailings	36.5	2.3	2.0			
Magnetic concentrates	63.5	66.4	98.0			
Flotation froth (middlings)	23.7	59.0	32.5			
Flotation concentrates	39.5	70.8	65.5			

Fig. 1

GRINDING FLOWSHEET

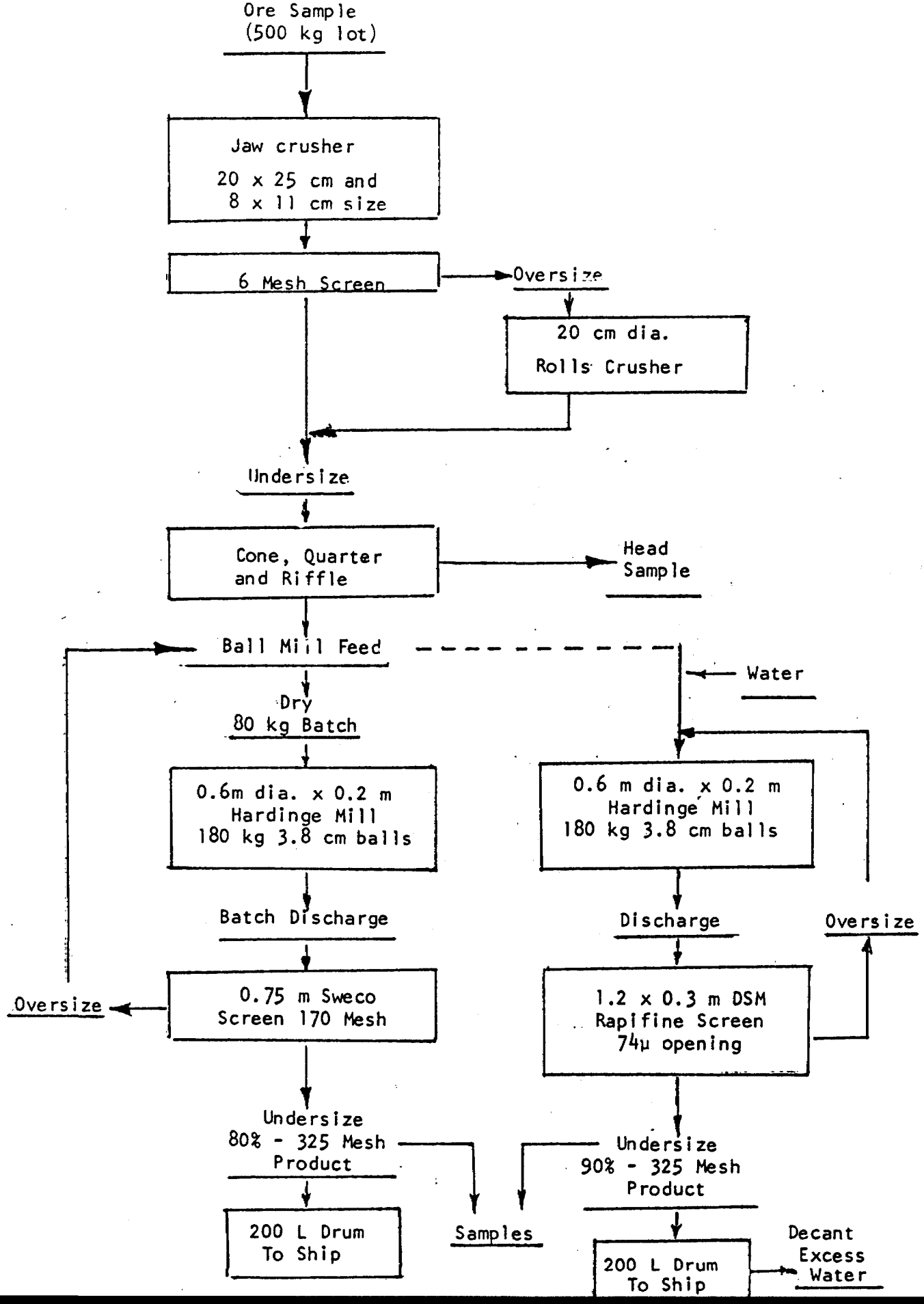
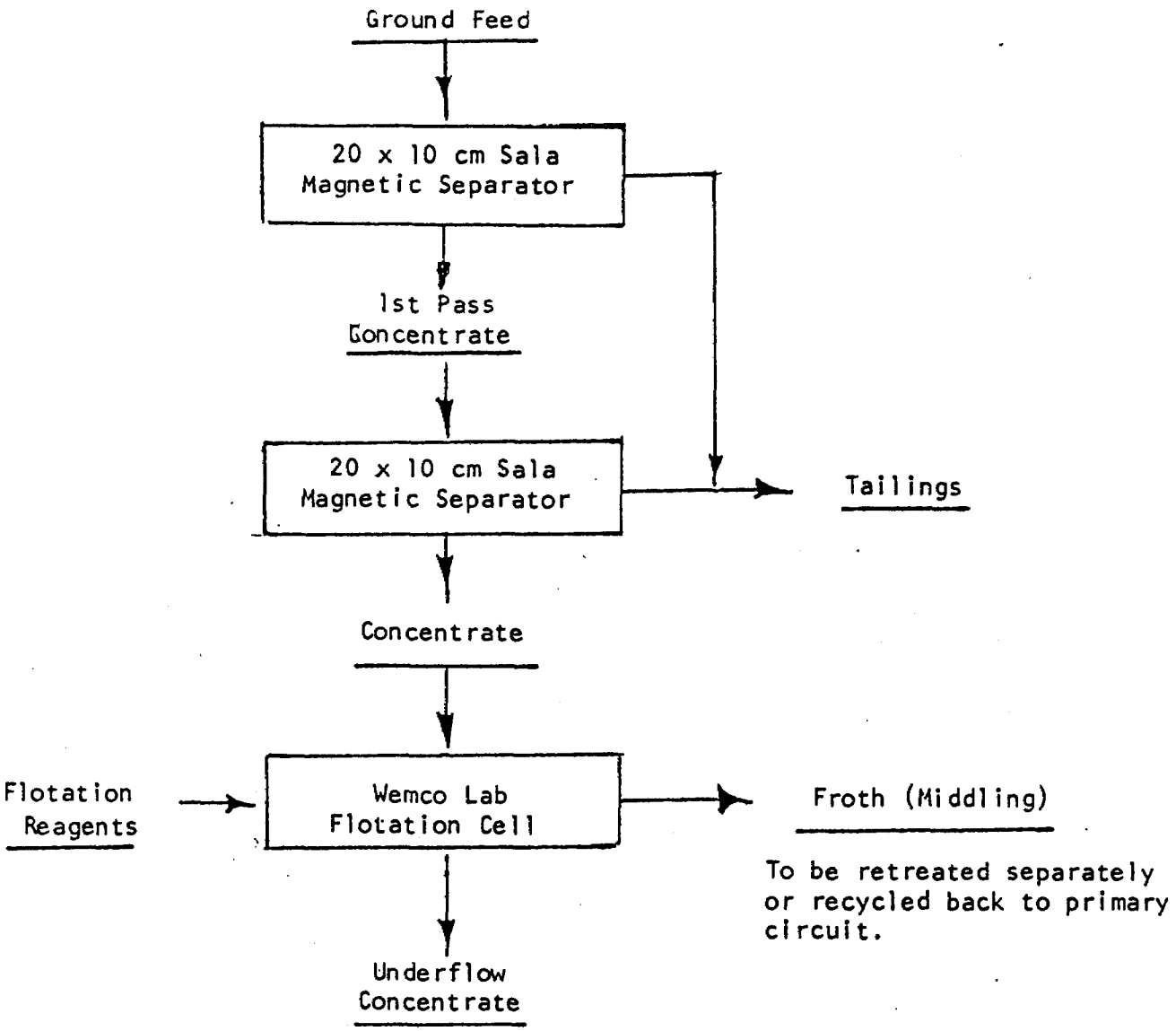


Fig. 2

BENCH TEST FLOWSHEET



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OM 81-6-C-131

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63.4113

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TELEPHONE: (705) 642-3244
ANALYTICAL CHEMISTS • ASSAYERS • CONSULTANTS

Certificate of Analysis

Certificate No. 53194 Date: April 7 1982

Received Mar. 26/82 5 Samples of Split core

Submitted by Marshall Minerals Ltd., Niagara Falls, Ontario Att'n: Mr. W. Marshall
3487 Portage, Niagara Falls, Ont.

SAMPLE NO.	GOLD Oz./ton	SILVER Oz./ton	COPPER PPM	ZINC PPM
825-1	Nil	0.01	128	44
-2	Nil	0.01	168	22
-3	Nil	Nil	73	13
-4	Nil	Trace	107	20
-5	Nil	0.01	336	68

Per G. Tebel
G. Tebel - Manager

ESTABLISHED 1928

Member Canadian Testing Association

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P.O. BOX 10, SWASTIKA, ONTARIO P0K 1T0
TELEPHONE: (705) 642-3244
ANALYTICAL CHEMISTS • ASSAYERS • CONSULTANTS

Certificate of Analysis

Certificate No. 53181 Date: April 2 1982

Received Mar.24/82 7 Samples of split core

Submitted by Marshall Minerals Ltd., Niagara Falls, Ontario Att'n: Mr. W. Marshall

SAMPLE NO.	GOLD Oz./ton	SILVER Oz./ton	COPPER PPM	ZINC PPM
824-1	0.002	Trace	70	84
-2	Nil	0.01	245	1700
-3	Nil	Trace	281	810
-4	Nil	Nil	---	---
-5	0.002	Nil	177	236
-6	Nil	0.01	202	364
-7	Nil	Trace	71	225

Per G. Lebel - Manager

ESTABLISHED 1928

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SWASTIKA LABORATORIES LIMITED

P.O. BOX 10, SWASTIKA, ONTARIO P0K 1T0
TELEPHONE: (705) 642-3244
ANALYTICAL CHEMISTS • ASSAYERS • CONSULTANTS

Certificate of Analysis

Certificate No. 53149 Date: March 26 1982

Received Mar.18/82 6 Samples of Split Core

Submitted by Marshall Minerals, Niagara Falls, Ontario Att'n: Mr. W. Marshall

SAMPLE NO.	GOLD Oz./ton	SILVER Oz./ton	COPPER PPM	ZINC PPM
823-1	Nil	0.02	131	1100
-2	Nil	0.01	188	1200
-3	0.002	0.01	52	472
-4	Nil	Nil	60	102
-5	Nil	Nil	48	74
-6	Nil	0.01	219	421

Per G. Lebel
G. Lebel - Manager

ESTABLISHED 1928

SWASTIKA LABORATORIES LIMITED

P.O. BOX 10, SWASTIKA, ONTARIO P0K 1T0
TELEPHONE: (705) 642-3244
ANALYTICAL CHEMISTS • ASSAYERS • CONSULTANTS

Certificate of Analysis

Certificate No. 53127 Date: March 22 1982

Received Mar.15/82 13 Samples of Split Core

Submitted by Marshall Minerals, Niagara Falls, Ontario Att'n: Mr. W. Marshall

SAMPLE NO.	GOLD Oz./ton	SILVER Oz./ton	COPPER PPM	ZINC PPM	LEAD PPM
822-1	0.002	0.03	61	2100	1200
2	0.002	0.01	69	150	---
3	Nil	0.01	84	382	---
4	Nil	0.01	59	1100	702
5	Nil	Trace	50	78	---
6	Nil	Trace	39	67	---
7	Nil	Trace	60	105	---
8	Nil	Trace	61	68	---
9	Nil	0.01	87	129	---
10	Nil	Trace	100	41	---
11	Nil	Trace	90	129	---
12	Nil	Nil	71	548	---
13	Nil	0.01	247	786	---

Per G. Lebel

G. Lebel - Manager

ESTABLISHED 1928

SWASTIKA LABORATORIES LIMITED

P.O. BOX 10, SWASTIKA, ONTARIO P0K 1T0
TELEPHONE: (705) 642-3244
ANALYTICAL CHEMISTS • ASSAYERS • CONSULTANTS

Certificate of Analysis

Certificate No. 53124 Date: March 19 1982

Received Mar. 15/82 16 Samples of Split core

Submitted by Marshall Minerals, Niagara Falls, Ontario Att'n: Mr. W. Marshall

SAMPLE NO.	GOLD Oz./ton	SILVER Oz./ton	COPPER PPM	LEAD PPM	ZINC PPM	
82E3-1	Nil	Nil	166	41	38	
-2	Nil	3.03	39	198	13000	8"
-3	Nil	0.01	---	---	---	
821-1	Nil	0.01	113	88	---	
-2	Nil	0.01	87	85	---	
-3	Nil	Trace	56	61	---	
-4	Nil	Trace	80	70	---	
-5	Nil	Trace	89	101	---	
-6	Nil	Trace	144	230	---	
-7	Nil	0.01	110	282	---	
-8	Nil	0.01	102	140	---	
821-8A	Nil	0.04	310	430	---	
-9	Nil	0.03	160	850	---	
-10	Nil	0.01	198	310	---	
-11	Nil	0.01	647	188	---	
-12	Nil	0.01	128	320	---	

Per G. Lebel
G. Lebel - Manager

ESTABLISHED 1928

SWASTIKA LABORATORIES LIMITED

P.O. BOX 10, SWASTIKA, ONTARIO P0K 1T0
TELEPHONE (705) 642-3244
ANALYTICAL CHEMISTS • ASSAYERS • CONSULTANTS

Certificate of Analysis

Certificate No. 53077 Date: March 9 1982

Received Mar.4/82 9 Samples of Split Core

Submitted by Marshall Minerals, Niagara Falls, Ontario Per: C. Marshall

SAMPLE NO.	GOLD Oz./ton	SILVER Oz./ton	COPPER PPM	LEAD PPM	ZINC PPM	
82E1-1	Nil	0.01	459	61	517	8'
-2	Nil	0.02	387	123	3400	7'
-3	Nil	0.02	414	40	287	4'
-4	Nil	0.01	386	47	122	3.5'
-5	Nil	Trace	432	33	266	8'
82E2-1	Nil	0.02	890	58	4100	5.5'
-2	Nil	0.02	766	69	3400	9.5'
-3	Nil	0.10	1250	840	1100	5'
-4	Nil	0.09	361	1020	2100	14'

Per G. Lebel

G. Lebel - Manager

ESTABLISHED 1928

SWASTIKA LABORATORIES LIMITED

P.O. BOX 10, SWASTIKA, ONTARIO P0K 1T0
TELEPHONE (705) 642-3244
ANALYTICAL CHEMISTS • ASSAYERS • CONSULTANTS

Certificate of Analysis

Certificate No. 53305 Date: May 12 1982

Received May 11/82 4 Samples of split core

Submitted by Marshall Minerals Limited, Niagara Falls, Ontario Att'n: Mr. W. Marshall

SAMPLE NO.	GOLD Oz./ton	SILVER Oz./ton	COPPER PPM	ZINC PPM	LEAD PPM
82H4-1	Nil	0.02	771	109	199
-2	Nil	0.02	202	49	70
-3	Nil	0.02	200	73	186
-4	Nil	0.01	259	142	501

Per G. Lebel

G. Lebel - Manager

ESTABLISHED 1928

SWASTIKA LABORATORIES LIMITED

P.O. BOX 10, SWASTIKA, ONTARIO P0K 1T0
TELEPHONE: (705) 642-3244
ANALYTICAL CHEMISTS • ASSAYERS • CONSULTANTS

Certificate of Analysis

Certificate No. 53317 Date: May 18 1982

Received May 13 1982 2 Samples of split core

Submitted by Marshall Minerals Limited, Niagara Falls, Ontario

SAMPLE NO.	GOLD Oz./ton	SILVER Oz./ton	COPPER PPM	LEAD PPM	ZINC PPM
H4-9	Nil	0.01	680	190	413
H4-10	Nil	0.03	501	2200	8600

Per G. Lebel
G. Lebel - Manager

ESTABLISHED 1928

SWASTIKA LABORATORIES LIMITED

P.O. BOX 10, SWASTIKA, ONTARIO P0K 1T0
TELEPHONE: (705) 642-3244
ANALYTICAL CHEMISTS • ASSAYERS • CONSULTANTS

Certificate of Analysis

Certificate No. 53310 Date: May 14 1982

Received May 12/82 11 Samples of split core

Submitted by Marshall Minerals Ltd., Niagara Falls, Ontario Att'n: Mr. W. Marshall

SAMPLE NO.	GOLD Oz./ton	SILVER Oz./ton	COPPER PPM	LEAD PPM	ZINC PPM
H1-1	Nil	0.03	579	29	321
-2	Nil	0.04	952	78	128
-3	Nil	0.02	428	202	605
-4	Nil	0.81	15000	1600	3100
-4A	Nil	0.03	1200	112	259
-5	Nil	0.01	310	40	63
-6	Nil	0.02	475	45	128
H4-5	Nil	0.02	230	1600	3500
-6	Nil	0.04	392	4600	17000
-7	Nil	0.01	282	268	850
-8	Nil	0.02	330	1100	3000

Per G. Lebel
G. Lebel - Manager

ESTABLISHED 1928

Summary Report

on

Diamond Drill Program

for

MARSHALL MINERALS CORPORATION

Boston Township Property

Kirkland Lake Area

Ontario

by

Frank P. Tagliamonte, P. Eng.

GEOLOGICAL ENGINEERING SERVICES
NORTH BAY, Ontario

April
1983

Property

Marshall Minerals Corporation
Boston township property
Larder Lake Mining Division
Kirkland Lake Area
Ontario

Description

44 contiguous claims.
NWest quadrant of Boston township.
2 patented.
41 leased.
1 staked.

Location

Boston township.
NWest quadrant.
Immediately North of Adams Mine.
Adjacent and East of Dane townsite.
9 miles South of Kirkland Lake.

Access

Highway #650 (Adams Mine Road) runs SEasterly adjacent to South boundary of claim group starting from Dane townsite.
Hamlet of Dane located 9 miles South of Kirkland Lake on highway #112.
Several bush and diamond drill roads lead into portions of the property from highway #650.

Topograph

Rock ridges separated by small lakes, bogs and gravel knolls.
Central portion of property traversed by gen-

erally N-S trending Boston Creek.
Elevations would not likely exceed 100'.

Forest cover comprises spruce, balsam and scattered poplar and birch.

History

Exploration work in the Boston township area where the Marshall claims are located proceeded intermittently over a period of many years under a variety of prospector owners. Most of this work was concerned with iron exploration.

Dominion Gulf worked the area during the 1950's.

From about 1964 to the present, exploration work such as trenching, geophysical surveying and diamond drilling have been carried out intermittently guided by a variety of engineers and consultants on the Marshall claims now held by Marshall Minerals Corporation. This latter work was concerned with iron, and base metal exploration.

Geology

The claims are underlain by Precambrian rocks comprising Basic and Intermediate volcanics - mainly basalt, andesite, dacite and some rhyolite.
The volcanics have been intruded by Syenites of the Lebel Syenite Stock.
Locally, diorite and metadiorite as well as diabase, mafic dykes, and feldspar porphyry intrude the Syenites and volcanics.

Tuffaceous rocks containing sulphides - pyrite, pyrrhotite; and oxides - magnetite; are intercalated with the volcanic units.

Bands of high grade magnetite iron formation as well as copper, zinc and silver-bearing sulphides are localized in the volcanic units. Some of the trenching done on the property expose mineralized occurrences containing these minerals.

Diamond Drill Program

Period: March - May 1982.

11 holes - 2558'

1) 82E series - 3 holes 748'

2) 82 series - 4 holes 1239'

3) 82H series - 4 holes 571'

Purpose of Diamond Drill Program

1) Test some VLF and max-min EM anomalies:

   DDH's #82-1, #82-2, #82-3, #82-4, #82H-1.

2) Undercut mineralization indicated in surface trenches:

   DDH's #82H-2, #H-3, #82E-3, #82-5.

3) Cross-section mineralized shear or fault structures:

   DDH's #82E-1, #E-2.

Diamond Drill Results

1) 82E Series

Anomalous copper, lead, zinc values (ppm) obtained in mineralized graphitic and cherty tuffs.

Best value:
DDH #82E-3 - 8" / 3.03 oz Ag, 1.3% zinc.

2) 82 Series

Anomalous copper, lead, zinc values (ppm) obtained in sulphide-bearing cherty and graphitic tuffs.

Best values:
DDH 82-1 - 3.5' / 647 ppm Cu.
DDH 82-2 - 5' / 2100 ppm Pb.

DDH #82-4 - 4.5' / 1700 ppm Zn.

3) 82H Series

Base metal values obtained in mineralized diorite and mineralized certy tuff.

Best values:
DDH #82H-1 - 1' / .81 oz Ag, 1.5% Cu, 16% Pb., .31% Zn.
DDH #82H-4 - 9' / .04 oz Ag, .04% Cu, .46% Pb., 1.7% Zn.

Conclusions

Sulphide-bearing tuffs in the property contain anomalous values in base metals.
These tuffaceous horizons respond to geophysics and are consequently traceable on the ground in most instances.
Areas where base metal enrichment above average background are indicated may warrant further drill testing.
A zone of chlorite enrichment in DDH #82-5 indicates a locus for possible base metal deposition warranting exploration investigations.
Areas for future exploration consideration indicated as a result of the current drill program are:

1) DDH #82E-2 area.
2) DDH #82E-3 & 82-5 area.
3) DDH #82H-1 & 82H-4 area.
(1300' length of VLF conductor has not been completed investigation).

Recommendations

Correlate all previous exploration work prior to carrying out further exploration investigations.
Proceed with exploration investigations as priorities and metal markets conditions indicate.

Data Attached (9 x 15 envelope)

Duplicate set of:

DDH logs and sections - 11
DDH plans - 2
Assay sheets - 9
Legend, sheet - 1
Claim Group Plan - 1

Respectfully submitted,

Frank P. Tagliamonte, P. Eng.
5 April 1983

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

GEOLGOCIAL ENGINEERING SERVICES
NORTH BAY, Ontario

om 81-6-C-131
63.4113

DIAMOND DRILL RECORD

LOGGED BY Frank P. Tagliamonte, P.Eng.

PROPERTY MARSHALL MINERALS INCORPORATED

D.D.H. No. 82-4 PAGE 1/4

GRID LATITUDE 4+10S BEARING OF HOLE Az 352° STARTED 18 March 1982

GRID DEPARTURE 1+50E DIP OF HOLE -42° COMPLETED 19 March 1982

ELEVATION ____ DIP TESTS ____ DEPTH 338'

CORE SIZE AQ DIAMOND DRILL CONTRACTOR ____

CLAIM No. L 579024

N ← DIRECTION AND DISTANCE FROM NE. CLAIM POST

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
0	12	CASING.					
12	95	Mafic Volcanic. Andesite. Patchy					
		Dark green fine grained groundmass.					
		Irregular, spongey pale gray fine grained spots and patches with discreet					
		fine grains of pyrrhotite.					
		30% ± spots and patches.					
		Random fragments of pumice and porphyry.					
		Numerous slips from 35-50°.					
		Variations as noted.					
		47 2" ± patch of fine disseminated pyrite. - 20% pyrite.					
		62 12" dark gray feldspar porphyry fragment.					
		77 - 86 Series of pale gray-green pumaceous fragments from 2" - 12" ±.					
95	114	FELDSPAR PORPHYRY DYKE					
		Fine porphyritic gray and pink feldspar porphyry dyke.					
		Charcoal gray fine grained groundmass, fine 1mm pearly white and pink semi angular					
		phenocrysts.					
		Chilled upper and lower contacts.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
114	140	MAFIC VOLCANICS · Andesite. Patchy.					
		Generally as above.					
140	160	FELDSPAR PORPHYRY DYKE					
		As above.					
160	228±	MAFIC VOLCANICS · Andesite. Patchy · Fragmental.					
		Dark green fine grained groundmass.					
		40%± pale ash gray "cloudy", stretched, irregular fragments and shards.					
		Locally magnetic.					
		Variations as noted:					
		167.5 6" irregular outline fragment with very fine grained pyrrhotite and pyrite.					
		Strongly magnetic.					
		175.5 - 172.5 Dark green fine grained groundmass with random irregular pale pink garnet patches.					
		Random disseminated fine pyrrhotite and thin seams of pyrite.					
		Noteably magnetic throughout.					
		172.5 - 181± Pale pink porphyritic (quartz eye) rhyolite fragment					
		Random small irregular patches of pyrrhotite and minor pyrite.					
		206± - 208± Thinly bedded tuff fragment - Bedding @ 35°±.					
		212± - 216.5± Finely bedded tuff - in part graphitic - Bedding from 25-35°±.					
		2%± fine hair-like pyritic seams.					
		Noteably magnetic					
		216.5± - 223 Random thin seams of pyrite in andesite with grey irregular patches - ½%± pyrite					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
160	228±	MAFIC VOLCANICS · Andesite, Patchy, Fragmental --- cont'd. --					
		226± – 228 Thinly bedded tuff fragment with random fine seams of pyrite. Bedding @ 40°±.					
228±	266±	DIORITE · Dyke?					
		Dark green fine grained granular diorite or granular andesite?					
		Random, irregular ash gray tuffaceous patches or fragments throughout.					
		232 – 238 Silicified diorite with very fine grained disseminated pyrite – 10% pyrite.					
		233 – 235 Salmon pink fine grained quartzite fragment with sparse fine pyrite – 1% pyrite.					
266±	338	TUFF · Variable, Bedded, Graphitic, Pyritic.					
		Variable thinly bedded, fragmented, and graphitic tuff.					
		Random zones of thinly bedded tuff containing thin seams of pyrite and pyrrhotite.					
		Variably magnetic throughout.					
		Variations as noted.					
		266 – 276 Thinly bedded pyritic tuff. Bedding @ 50°± · 3%± pyrite.					
		276 – 278 Lamprophyre dyke fragment.					
		278 – 281 Ash gray tuff fragment with seams of pyrite.					
		282 – 291 Mafic volcanic zone – or fragment.					
		291 – 310 Thinly bedded graphitic tuff. Multiple fine seams of pyrrhotite and pyrite. 5%± sulphides.					
		Magnetic. Bedding from 45-55°.					
		310 – 338 Fragmented tuff. Mixed ash gray, and charcoal gray, cherty, and porphyritic fragments.					
	338	END OF HOLE.					
		Casing removed. Frank P. Tagliamonte, P. Eng. 24 March 1982					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

Frank P. Tagliamonte, P. Eng.

D.D.H. NO. 82-4 PAGE 4/4

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	OZ ASSAY AU	OZ ASSAY Ag	ppm Cu	ppm Pb	ppm Zn
		SAMPLING.									
			824-1	173	182	9'	.002	Tr	70		84
			824-2	212	216.5	4.5'	Nil	.01	245		1700
			824-3	216.5	223	6.5'	"	Tr	281		810
			824-4	232	238	5'	"	Nil	—		—
			824-5	266	276	10'	.002	Nil	177		236
			824-6	290	300	10'	Nil	.01	202		364
			824-7	300	310	10'	"	Tr	71		225
						55'					

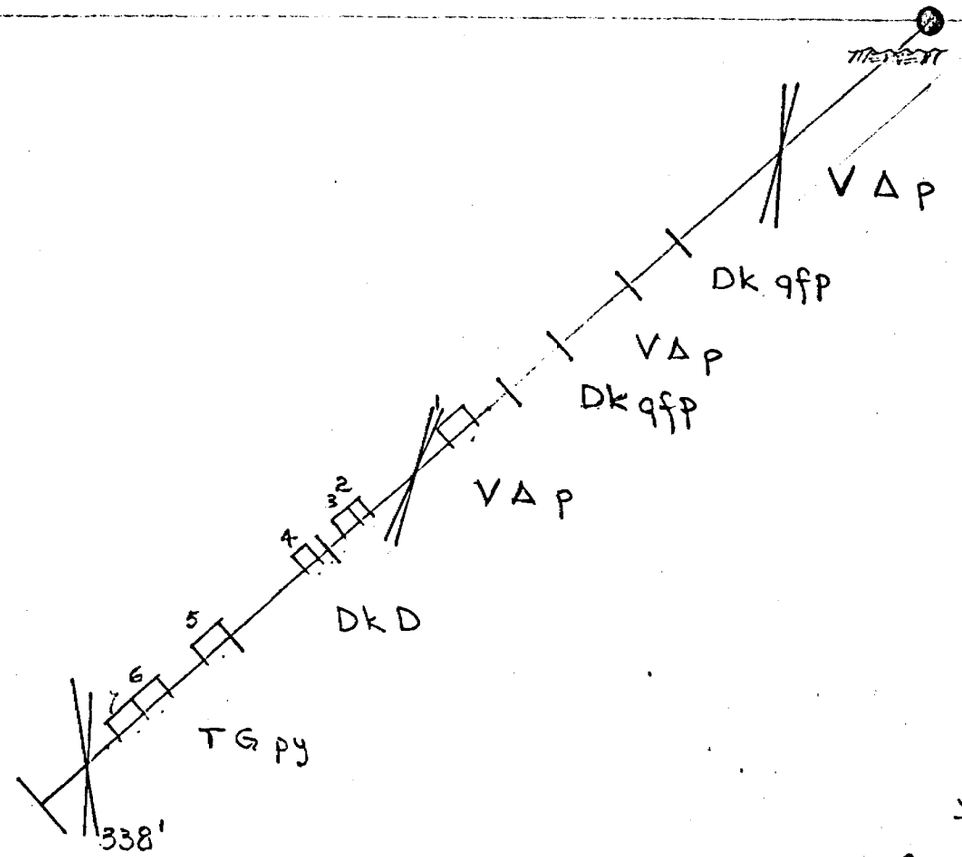
Frank P. Tagliamonte, P.Eng.
24 March 1982.

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

Az 352°

4+10S
1+50E

DDH# 82-4 -42° 338'



SAMPLING

NO.	Core Length	Au oz	Ag	Cu ppm	Pb	Zn
1	9'	.002	Tr	70		84
2	4.5'	Nil	.01	245		1700
3	6.5'	"	Tr	281		810
4	5'	.002	Nil	—		—
5	10'	.002	"	177		236
6	10'	Nil	.01	302		364
7	10'	"	Tr	71		225

MARSHAL MINERALS CORPORATION

BOSTON TOWNSHIP PROPERTY
KIRKLAND LAKE AREA, ONTARIO

DDH# 82-4 SECTION

SCALE: 1" = 50' F.P.T. MARCH 1982

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

OM81-6-C-131
63.4113

DIAMOND DRILL RECORD

LOGGED BY Frank P. Tagliamonte, P.Eng

PROPERTY MARSHALL MINERALS CORPORATION

D.D.H. No. 82-5 PAGE 1/4

GRID LATITUDE 12+00N BEARING OF HOLE Az 200° STARTED 20 March 1982

GRID DEPARTURE 5+80E DIP OF HOLE -42° COMPLETED 23 March 1982

ELEVATION ____ DIP TESTS ____ DEPTH 401'

CLAIM No. L-36693

N ← DIRECTION AND DISTANCE FROM NE. CLAIM POST

CORE SIZE AQ DIAMOND DRILL CONTRACTOR BARRON DIAMOND DRILLING, Haileybury, Ontario.

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
0	26	CASING.					
26	130	DIORITE.					
		Dark green. Very fine grained granular.					
		Contaminated by random epidote patches and seams.					
		Cut by random 1/8 - 1/4" seams of pyrrhotite and associated pyrite.					
		Random fragments containing seams of pyrrhotite and pyrite as noted.					
		Random 1-3" milk white quartz stringers.					
		Locally, variably magnetic throughout.					
		Variations as noted.					
		28 - 42 25% broken and fragmented core.					
		65 - 69.5 Sparse disseminated pyrite in granular diorite. - 2% pyrite. Weakly magnetic.					
		69.5 1/8" zone of pyrrhotite and pyrite seams - 20% sulphides. Strongly magnetic.					
		71± - 98± Multiple series of 1/8"± seams of pyrrhotite and pyrite at intervals along core @ 45°± in epidotized diorite.					
		Variably magnetic throughout.					
		96.5 14" zone with seams of pyrrhotite and pyrite. 30%± sulphides.					
		Strongly magnetic.					

REGISTERED PROFESSIONAL ENGINEER — MINING — F. P. TAGLIAMONTE — PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
26	130	DIORITE. ---cont'd.---					
		92± – 111± Fragmented diorite containing porphyritic fragments, fragmented pearly quartzose fragments and patches of pale green epidote. Minor pyrite and pyrrhotite.					
		111± – 120± Fragmented zone containing ash gray fragments and very fine disseminated pyrite and pyrrhotite and charcoal gray fragments with irregular seams of pyrrhotite and pyrite. 5%± sulphides. Magnetic throughout.					
		118 8"± patches of pyrrhotite and pyrite seams. 15%± sulphides. Strongly magnetic.					
		120 – 130± Fragmented as above (111± – 120±). No sulphides.					
130±	146	MAFIC VOLCANICS. Basalt. Dark green. Massive. Very fine grained. Sparse random pyrite. Variably magnetic.					
146	168±	LAMPROPHYRE DYKE. Dark green, uniformly fine grained granular biotite lamprophyre. Contains some basalt fragments with chilled contacts.					
168±	401	MAFIC VOLCANICS. Basalt. Magnetic. Generally as above. Sparse random irregular hairlike seams of sphalerite with fine grained galena. Variations as noted. NOTE: 168-240 spilled core. 3 boxes. Core Replaced. Variably magnetic throughout.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
168±	401	MAFIC VOLCANICS. Basalt. Magnetic. ---cont'd.---					
		169.5 12" ± zone containing irregular random hair-like seams of sphalerite with fine galena. Cut by numerous slips from 30-40°. Most @ 30° ±. Some slips have pyritic coatings. Some slips contain thin quartz-carbonate veing with sphalerite and minor galena.					
		255.5 1/4" ± carbonate seam along a slip @ 40° with thin seams of sphalerite and very fine disseminated galena.					
		235 ± – 261 ± Dark green massive chloritic andesite or basalt. Noteably magnetic. (a potentially interesting alteration mineral.)					
		295 ± – 308 Series of slips along core.					
	401	END OF HOLE. casing removed. Frank P. Tagliamonte, P. Eng. 25 March 1982					

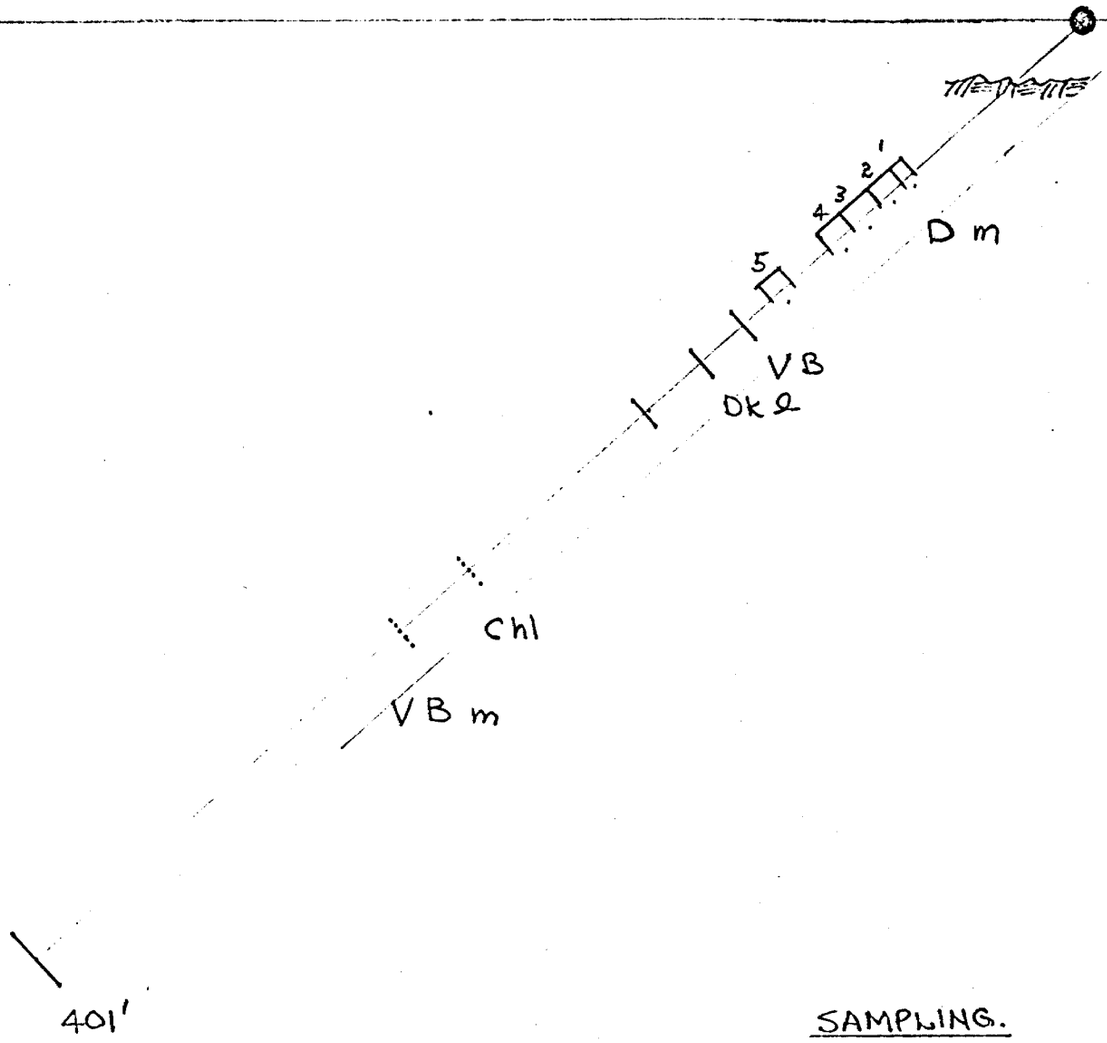
REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY oz Au	ASSAY oz Ag	ASSAY % Cu	ASSAY ppm Pb	ASSAY ppm Zn
		SAMPLING.									
			825-1	65	69.5	4.5'	Nil	.01	128		44
			825-2	69.5	79	9.5'	"	.01	168		22
			825-3	79	88.5	9.5'	"	Nil	73		13
			825-4	88.5	98	10.5'	"	Tr	107		20
			825-5	111.5	120	8.5'	"	.01	336		68
						42.5'					
		Frank P. Tagliamonte, P.Eng.									
		25 March 1982.									

Az 200°

12+00N
5+80E

DDH# 82-5 -45° 401'



SAMPLING.

NO	Core Length	Au oz	Ag	Cu ppm	Pb	In
1	4.5'	Nil	.01	128		44
2	9.5'	"	.01	168		22
3	9.5'	"	Nil	73		13
4	10.5'	"	Tr	107		20
5	8.5'	"	.01	336		68

MARSHAL MINERALS CORPORATION

BOSTON TOWNSHIP PROPERTY
KIRKLAND LAKE AREA, ONTARIO

DDH# 82-5 SECTION

SCALE. 1" = 50' F.P.T. MARCH 1982

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

OM 81-6-C-131
63.4113

DIAMOND DRILL RECORD

LOGGED BY Frank P Tagliamonte, P.Eng.

PROPERTY MARSHALL MINERALS INCORPORATED

D.D.H. No. 82E-1 PAGE 1/6

GRID LATITUDE 20+90N BEARING OF HOLE Az 84°± STARTED 1 March 1982

GRID DEPARTURE 1+50W DIP OF HOLE -40° COMPLETED 2 March 182

ELEVATION 40'± above lake DIP TESTS DEPTH 328'

CORE SIZE AQ DIAMOND DRILL CONTRACTOR BARRON DIAMOND DRILLING, Haileybury, Ontario.

N

CLAIM No. L-39083

DIRECTION AND DISTANCE FROM NE. CLAIM POST

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
0	14	CASING.					
14	16±	CHERT: Charcoal gray. Fine grained. Very hard, Finely banded. Banding from 30-50° Fine seams of pale pyrite - 10% fine pyrite. Notably magnetic.					
16	61.5±	CHERT: Fragmented Very fine grained, glassy, hard chert. Variably weakly magnetic. Random ash gray and pale green unsorted "coloform-like" and wispy fragments throughout. 10% ash gray fragments. Rare irregular gray fine granular leuco-diorite fragments with sparse fine pyrite.					
		16 - 19+ Massive glassy chert and gray-green coloform-like fragments. Fine disseminated pyrite and rare fine chalcopyrite.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
61.5±	75	**TUFF** Fragmented. Predominantly pale green, hard, fine grained matrix material intermixed with fine grained pale pink and cherty grey unsorted stretched and semi rounded lapilli-like fragments. Interspersed fine grained charcoal gray-black, semi-rounded, hard fragments. 20% black fragments. Locally banded from 45-65°±.					
75	77.5	**DYKE.** Lamprophyre Hard, uniformly fine grained granular biotite rich lamprophyre dyke. Sharp lower contact @ 40°					
77.5	84.5	**TUFF** Fragmented. generally as in 61.5-75					
84.5	89	**DYKE.** Siliceous. Very fine grained, hard, glassy dyke. Sparse, very fine pyrite throughout Sharp upper and lower contacts @ 30 & 45°.					
89	129	**TUFF** Fragmental. Pale pea green, fine grained, hard, heterogeneous intermixed tuff. Contains wispy hematitic pink strands, fragments and patches. Random small irregular dark purple carbonate fragments rimmed by hematitic red material and containing sparse fine pyrite. Random dark charcoal gray fine grained cherty fragments throughout					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
89	129	TUFF. Fragmental. ---cont'd.---					
		5% fragments.					
		89 - 92 Thinly banded pale gray and dark gray tuff @ 45°.					
129	135	TUFF. Quartzose					
		Milk white fine sugary grained, hard, irregular quartz fragments intermixed with dark gray fine grained chert and pale gray carbonate.					
135	151.5±	TUFF. Fragmental					
		Similar to 89-129 except for fragments.					
		15% dark green irregular, uniformly fine grained granular foliated fragments throughout.					
151.5±	169	TUFF. Quartzose					
		Similar to 129-135					
		Foliation generally @ 40°.					
169	217.5	TUFF. Fragmental.					
		Heterogeneous mixture of pale green and dark green fragments which tend to be foliated conformable to foliation of the unit which varies from 38-52°±.					
		169± - 189± 30% pale pink colored 'wispy', 'fuzzy' fragments.					
		189± - 217 Predominantly dark green fine grained generally massive fragments.					
		186.5 18" zone with 15%± disseminated pyrite in a predominantly dark green fine grained fragment.					
		212 - 217.5 40%± pale gray carbonate interfoliated with thin laminated dark green fragments. Foliation @ 40°±.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
169	217.5	TUFF. Fragmental --- cont. ---					
		4" pale pink bleached contact zone foliated @ 60°±.					
217.5	248.5	MINERALIZED ZONE.					
		217.5 – 233 Dense, variably weakly magnetic, hard, black, graphitic laminated chert. Interlaminated fine seams of pyrrhotite and pyrite from 35-47°±.					
		233 – 236.5 Thinly laminated light gray and pale green chert with fine interlaminated seams of pyrrhotite and pyrite. 15%± sulphides. Some seams cross-cut foliation. Laminations @ 45° along 8" at upper part of zone.					
		236.5 – 239.5 as between 217.5 – 233.					
		239.5 – 243.5 Pale gray contorted laminated chert with 30%± interlaminated irregular pink fragments. 5%± patchy disseminated pyrite and pyrrhotite.					
		243.5 – 245.5 55% massive patches and irregular seams of pyrrhotite and pyrite in dense black graphitic chert. Slips @ 40° at upper portion of zone.					
		245.5 – 248.5 30% patchy irregular seams of pyrrhotite and minor pyrite in contorted gray granular chert.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
248.5	297±	**TUFF. Fragmental.**					
		Similar to 135-151.5					
		60% dark gray-black uniformly fine grained irregular foliated fragments.					
		40% pale green fragments with irregular hematite pink fragments and ribbons usually forming the margins around pale gray carbonate.					
		288 - 293 Predominantly thinly laminated pale green tuff					
		Foliation @ 45°±.					
		293 - 296 40% pale gray carbonate and pale green tuff fragments vaguely foliated @ 45°.					
297±	300	**DYKE. Lamprophyre.**					
		Fine grained granular, biotite lamprophyre.					
		Sharp contacts @ 30° & 40°.					
300	313	**TUFF. Fragmental.**					
		Predominantly pale hematitic pink lappilli-like fragments intermixed with pale green chert and milk white quartz.					
		306 - 309 10% disseminated fine pyrite in hematitic cherty tuff.					
		309 6" - 2.0% seams of pyrite.					
		316 12" zone of 60% pale purple gray carbonate.					
313	328	**ANDESITIC TUFF**					
		Dark green, fine grained, thinly laminated @ 37°±					
		3% random irregular carbonate seams. Random fine disseminated pyrite.					
●	328	**END OF HOLE.**					
		casing removed					

Frank P. Tagliamonte, P.Eng.
3 March 1982.

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY oz Au	oz Ag	ppm Cu	ppm Pb	ppm Zn
		SAMPLING.									
			82E1-1	218	226	8'	Nil	.01	459	61	517
			82E1-2	226	233	7'	"	.02	387	123	3400
			82E1-3	233	237	4'	"	.02	414	40	287
			82E1-4	237	240.5	3.5'	"	.01	386	47	122
			82E1-5	240.5	248.5	8'	"	Tr	432	33	266
						30.5'					
		Frank P. Tagliamonte, P. Eng. 3 March 1982.									

REGISTERED PROFESSIONAL ENGINEER
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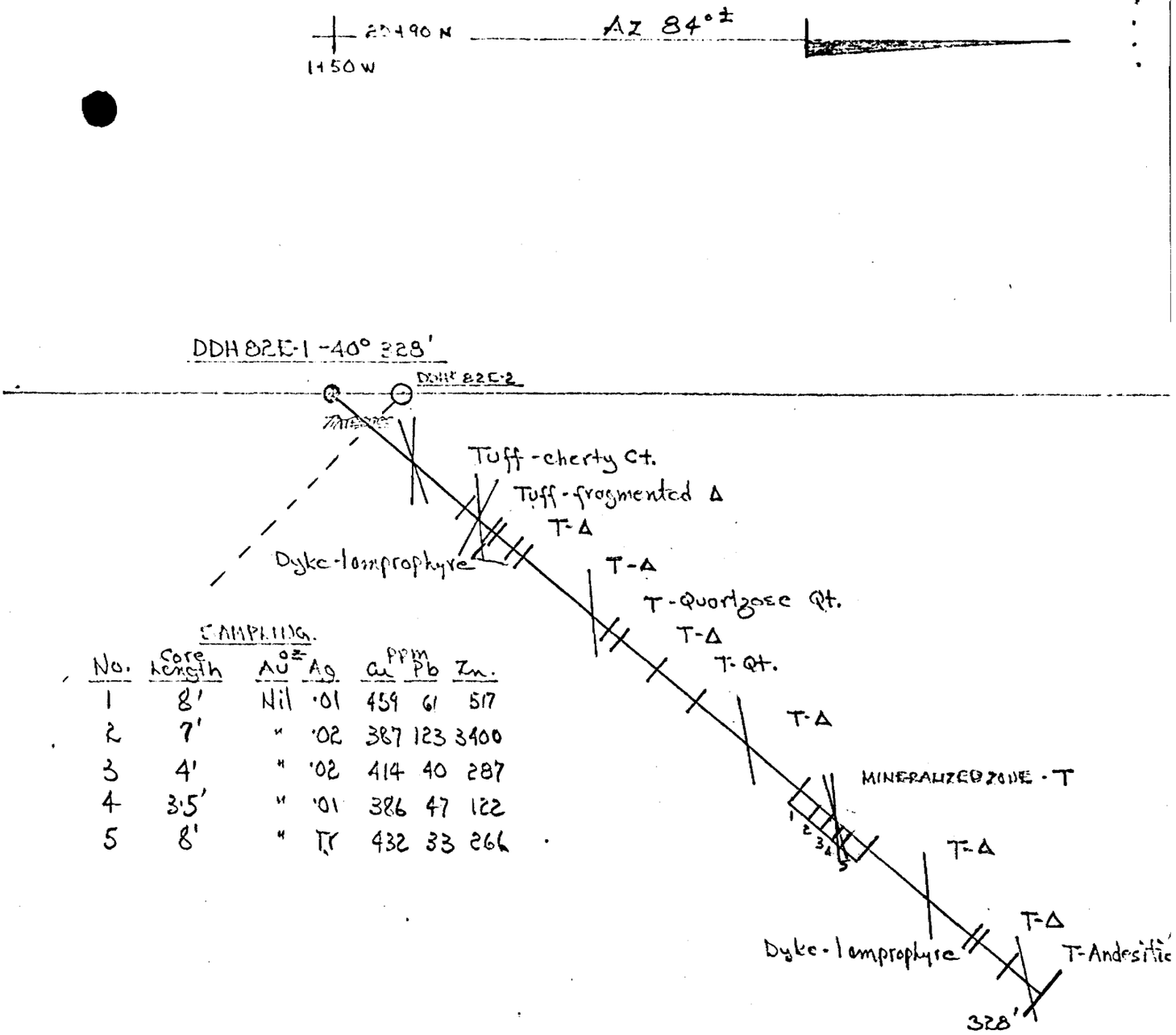
PROVINCE OF ONTARIO



SAMPLING.

No.	Core Length	Au oz	Ag	Cu ppm	Pb	Zn.
1	8'	Nil	.01	459	61	517
2	7'	"	.02	387	123	3400
3	4'	"	.02	414	40	287
4	3.5'	"	.01	386	47	122
5	8'	"	Tr	432	33	266

MARSHAL MINERALS CORPORATION

BOSTON TOWNSHIP PROPERTY
KIRKLAND LAKE AREA, ONTARIO

DDH# 82E-1 SECTION

SCALE · 1" = 50' MARCH 1982

F.P.T.

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

OM 81-6-C-131

DIAMOND DRILL RECORD

LOGGED BY Frank P. Tagliamonte, P. Eng.

PROPERTY MARSHALL MINERALS INCORPORATED

D.D.H. No. 82E-2 PAGE 1/3

GRID LATITUDE 21+15N BEARING OF HOLE Az 264° STARTED 2 March 1982

CLAIM No. L-39083

GRID DEPARTURE 1+30W DIP OF HOLE -45° COMPLETED 3 March 1982

DIRECTION AND DISTANCE FROM NE. CLAIM POST

ELEVATION 40' ± above lake DIP TESTS DEPTH 102'

CORE SIZE AQ DIAMOND DRILL CONTRACTOR BARRON DIAMOND DRILLING, Haileybury, Ontario.

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
0	10	CASING.					
10	18±	TUFF.					
		Dark green. Hard. Massive.					
18±	23±	MINERALIZED ZONE					
		Dense, Hard, black, graphitic, thinly laminated sugary chert.					
		Laminated @ 40° ±.					
		Weakly magnetic.					
		20% ± pyrite and pyrrhotite.					
23±	31.5	TUFF.					
		Gray-green, hard, cherty.					
		Thinly laminated fine sulphides - 10% ±.					
31.5	41	MINERALIZED ZONE.					
		as above.					
41	61	TUFF. Fragmental.					
		Intermixed pale green and charcoal gray fine grained cherty tuff fragments.					
		Random, irregular gray carbonate patches.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
61	70±	TUFF					
		Pale green. Hard. Massive					
		Locally thinly bedded @ 30°.					
70±	80±	QUARTZITE.					
		Pork gray granular sugary quartzite with 5% fine disseminated pyrite.					
		Weakly magnetic throughout.					
80±	87	DYKE. Lamprophyre.					
		Fine grained granular. Micaceous — muscovite?					
87	102	TUFF.					
		Gray green generally massive tuff. Hard. Cherty.					
		86 - 88 Slips from 40-50° — some with fine pyrite and disseminated grains of galena.					
		89 1/4" carbonate seam @ 25° along a slip with massive granular pyrite with minor galena.					
		40% broken core.					
		Hole Abandoned Due to Fault Problems.					
	102	END OF HOLE.					
		Casing removed.					

Frank P. Tagliamonte, P.Eng.

3 March 1982

REGISTERED PROFESSIONAL ENGINEER — MINING — F. P. TAGLIAMONTE — PROVINCE OF ONTARIO

Frank P. Tagliamonte, P. Eng.

D.D.H. NO. 82E-2 PAGE 3/3

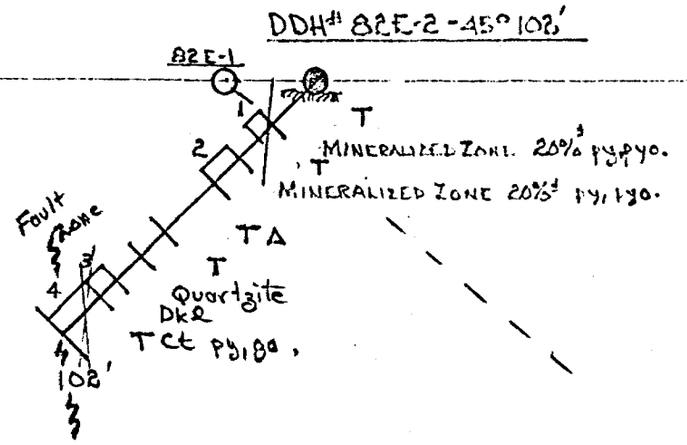
FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY oz Au	oz Ag	ppm Cu	ppm Pb	ppm Zn
		SAMPLING.	82E2-1	18	23.5	5.5'	Nil	.02	890	58	4100
			82E2-2	31.5	41	9.5'	"	.02	766	69	3400
			82E2-3	82	87	5'	"	.10	1250	840	1100
			82E2-4	87	102	14'	"	.09	361	1020	2100
						34'					
		Frank P. Tagliamonte, P.Eng.									
		3 March 1982.									

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

Az 264°

21+15N

1+30W



SAMPLING.

No	Core Length	Au oz	Ag	Cu	Pb ppm	Zn
1	5·5'	Nil	·02	890	58	4100
2	9·5'	Nil	·02	766	69	3400
3	5'	Nil	·10	1250	840	1100
4	14'	"	·09	361	1020	2100

MARSHAL MINERALS CORPORATION

BOSTON TOWNSHIP PROPERTY
KIRKLAND LAKE AREA, ONTARIO

DDH# 82 E-2 SECTION

SCALE · 1" = 50' MARCH 1982

F.P.T.

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

om 81-6-C-131

63.4113

DIAMOND DRILL RECORD

LOGGED BY Frank P. Tagliamonte, P.Eng.

PROPERTY MARSHALL MINERALS CORPORATION

D.D.H. No. 82-1 PAGE 1/4

GRID LATITUDE 12+00 N BEARING OF HOLE Az 350° STARTED 8 March 1982

GRID DEPARTURE 4+50W DIP OF HOLE -40° COMPLETED 10 March 1982

ELEVATION ____ DIP TESTS ____ DEPTH 288'

CORE SIZE AQ DIAMOND DRILL CONTRACTOR BARRON DIAMOND DRILLING. Haileybury, Ontario.

CLAIM No. L-39083

N

DIRECTION AND DISTANCE FROM NE. CLAIM POST

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
0	12	CASING.					
12	53	TUFF. Mixed Fragmental.					
		Black groundmass with pale grey "spongey", irregular, stretched, and wispy fragments.					
		Vaguely bedded at various angles to core.					
		Very hard. Cherty					
		40%± pale gray fragments.					
		Locally porphyritic.					
		Locally magnetic due to finely disseminated pyrrhotite.					
		Very heterogeneous in appearance.					
		31± - 37.5± Porphyritic zone.					
		Fine pearly "feldspar" pseudo phenocrysts in fine grained black groundmass.					
		Series of slips at lower contact @ 40°.					
53	151±	TUFF. MINERALIZED ZONE. Cherty					
		Variable pale gray and charcoal gray bedded and fragmented cherty tuff. Very hard.					
		Predominantly thinly bedded in uniform or contorted layers with local areas containing					
		interbedded semi-rounded irregular cherty, quartzye, and occasionally pale pink					
		ferruginous and feldspar fragments.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
53	151±	TUFF. MINERALIZED ZONE. Cherty					
		Variably mineralized with fine interbedded seams of pyrrhotite as well as irregular patches and disseminated grains.					
		Minor associated pyrite seams and disseminations.					
		Local, rare fine irregular patches and grains of chalcopyrite.					
		5%± disseminated sulphides.					
		Random grains and clusters of pale pink garnet. Minor random pale apple green apatite?					
		Fine patchy disseminated magnetite.					
		Locally strongly magnetic throughout.					
		130.5 ½" carbonate vein zone with seams of pyrite and fine beads of galena.					
		131± - 135± Bedding most commonly @ 40°±.					
		15%± sulphides - 10%± pyrite, 5%± pyrrhotite.					
		145.6 1" zone of pyrrhotite mineralization with fine grain clusters of sphalerite.					
151±	157±	DYKE: Lamprophyre.					
		Dark gray-black. Sugary grained granular - 50%± mica - biotite.					
		Gradational contacts.					
157±	177±	TUFF. MINERALIZED ZONE. Cherty.					
		Generally as above.					
		157 3" zone of liberally disseminated chalcopyrite.					
		157+ - 160 40% massive irregular pyrrhotite with random grains of chalcopyrite.					

REGISTERED PROFESSIONAL MINING ENGINEER F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
177±	193	DYKE. lamprophyre and Diorite					
		177± - 181± lamprophyre --- as above.					
		181± - 186± Fine grained uniformly granular diorite.					
		186± - 189± Andesite fragment.					
193	288	VOLCANIC BRECCIA. Andesite? Heterogeneous.					
		Dark green, very fine grained groundmass.					
		60%± irregular ash gray toff, milk white carbonate, pale green epidote, and pink granitic and quartzite fragments randomly distributed through the unit.					
		3%± irregular carbonate seams, bands and fragments.					
		195 18" ± lamprophyre fragment.					
		209.5 10" ± granitic fragment. Sharp contacts @ 50°.					
		261 9" pink quartzite fragment @ 45°.					
	288	END OF HOLE.					
		casing removed. Frank P. Tagliamonte, P.Eng. 13 March 1982.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY oz Au	ASSAY oz Ag	ASSAY ppm Cu	ASSAY ppm Pb	ASSAY ppm Zn
		SAMPLING									
			821-1	60	69	9'	Nil	.01	113	88	—
			821-2	69	79	10'	"	.01	87	85	—
			821-3	79	88	9'	"	Tr	56	61	—
			821-4	88	98	10'	"	"	80	70	—
			821-5	98	108	10'	"	"	89	101	—
			821-6	108	117	9'	"	"	144	230	—
			821-7	117	127	10'	"	.01	110	282	—
			821-8	127	131	4'	"	.01	102	140	—
			821-8A	131	136	5'	"	.04	310	430	—
			821-9	136	146	10'	"	.03	160	850	—
			821-10	146	151	5'	"	.01	198	310	—
			821-11	157	160.5	3.5'	"	.01	647	188	—
			821-12	165	175	10'	"	.01	128	320	—
						99'					

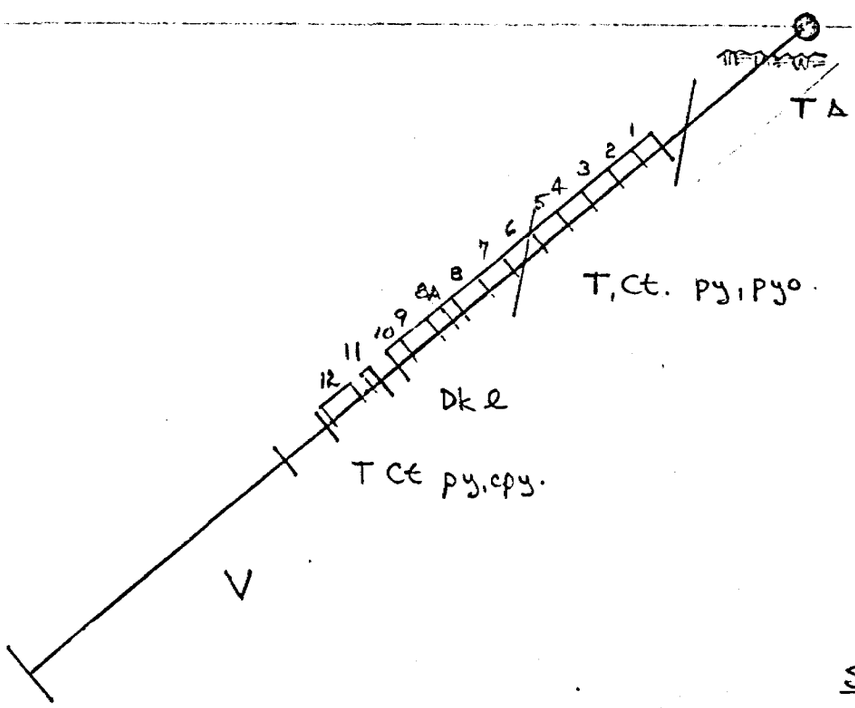
Frank P. Tagliamonte, P.Eng.
13 March 1982

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

Az 350°

12+00N
4+50W

DDH# 82-1 -40° 288'



SAMPLING.

NO	Core Length	Au oz	Ag	Cu	Pb ppm	Zn
1	9'	Nil	.01	113	88	
2	10'	"	.01	87	85	
3	9'	"	Tr	56	61	
4	10'	"	"	80	70	
5	10'	"	"	89	101	
6	9'	"	"	144	230	
7	10'	"	.01	110	282	
8	4'	"	.01	102	140	
8A	5'	"	.04	310	430	
9	10'	"	.03	160	850	
10	5'	"	.01	198	310	
11	3.5'	"	.01	647	188	
12	10'	"	.01	128	320	

MARSHAL MINERALS CORPORATION

BOSTON TOWNSHIP PROPERTY
KIRKLAND LAKE AREA, ONTARIO

DDH# 82-1 SECTION

SCALE · 1" = 50' MARCH 1982

F.P.T.

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

OM81-6-C-131
63.4113

DIAMOND DRILL RECORD

LOGGED BY Frank P. Tagliamonte, P.Eng

PROPERTY MARSHALL MINERALS CORPORATION

D.D.H. No. 82-2 PAGE 1/5

GRID LATITUDE 5+40N BEARING OF HOLE Az 132° STARTED 10 March 1982

GRID DEPARTURE 1+10E DIP OF HOLE -42° COMPLETED 12 March 1982

ELEVATION ____ DIP TESTS ____ DEPTH 363'

CLAIM No. L-36693

DIRECTION AND DISTANCE FROM NE. CLAIM POST

CORE SIZE AQ DIAMOND DRILL CONTRACTOR BARRON DIAMOND DRILLING, Haileybury Ontario

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
0	16	CASING.					
16	198.5	TUFF. Fragmental.					
		Variable, heterogeneous, mixed, pale gray and charcoal gray, vaguelly locally bedded and irregularily locally fragmented, hard, somewhat cherty mixed tuff.					
		Predominantly dark charcoal gray vagvely bedded groundmass with 40% ± mixture of pale gray, pearly white, faint pink and pale green indistinct fragments.					
		Local finely porphyritic zones and fragments from 2-12".					
		Variations as noted.					
		Bedding generally @ 45° ±. Numerous slips ± commonly @ 45° ±					
		Local zones containing fine pale pink garnet phenocrysts — 3-2" zones.					
198.5	203.5	DYKE. Lamprophyre.					
		as in previous holes.					
		202 - 203.5 Slips parallel to core with gouge.					
		Disseminated pyrite, random beads of fine galena and hair-like seams of white carbonate in gouge.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
203.5	346	TUFF. Fragmental. Cherty. Pyritic.					
		Fuzzy pearly gray, pearly white and pale pink cherty, stretched, contorted fragments intermixed with random, sometimes vuggy, irregular patches of pyrite and disseminated pyrite.					
		Charcoal gray groundmass — usually magnetic.					
		Variably but noteably magnetic throughout.					
		5% sulphides throughout, mainly pyrite with minor pyrrhotite					
		Variations as noted.					
		204 ½" veinlet with ¾" massive vuggy granular pyrite and associated galena @ 35° in pink foliated chert or rhyolite.					
		Minor disseminated pyrite on edges of veinlet zone.					
		226 Chloritic slip along 12" of core with disseminated galena.					
		232± - 236± 10% disseminated pyrite and minor pyrrhotite in foliated seams @ 50° as well as disseminations and spongey patches.					
		261± - 263 Random irregular patches of spongey and vuggy granular pyrite — 10% pyrite.					
		265± - 266.5 Fragmented quartz vein zone generally along core with disseminated pyrite.					
		307.5± - 310± Fragmented gray quartz zone with disseminated pyrite and minor pyrrhotite.					
		313.5 6" zone of patchy spongey pyrite - 60% pyrite.					
		315 ¼" stringer with massive granular pyrite fragments in a quartz veinlet @ 15° to core.					
		315 - 317 Pink quartzite fragment with random minor fine disseminated pyrite.					
		316.5 1" quartz stringer with massive fragments of granular pyrite.					
		318± - 324± Random patches containing fine pale pink garnet - 10% garnet.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
203.5	346	TUFF. Fragmental. Chorty. Pyritic. ---cont'd.---					
		324± - 337.5 Intermixed fragmented and bedded zone of very fine bedded grey chert and pearly white stretched and distorted small quartz fragments. Fine seams, random spongey patches and disseminated granular pyrite with minor associated pyrrhotite - 5% sulphides. Bedding generally @ 35°.					
		337.5 - 340± Thinly bedded, black, hard chert with minor carbonate. Very fine hairlike seams of pyrite - 2% pyrite.					
		340± - 346 Thinly bedded fine grained grey chert - Bedding @ 50° ±. Sparse fine pyrite. Lower slip contact @ 50°.					
346	348.5	DYKE: Diorite.					
		Ash gray fine grained granular diorite? dyke. Sharp slip contacts @ 50° ± 25°.					
348.5	363	CHERT: Bedded.					
		Ash gray and charcoal gray fine grained, hard, thinly bedded chert. Bedding @ 40° ±. Sparse fine pyrite. Locally weakly magnetic. 25% broken core. Numerous slips. Cut by fragmented quartz veins.					
		350.5 - 354 Fragmented quartz vein zone with random small massive patches of vuggy granular pyrite and minor pyrrhotite. 3% sulphides. Occasional speck of galena.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
348.5	363	CHERT: Bedded. ---cont'd. ---					
		360.5 2" quartz fragment with blebs of granular pyrite.					
		362 2" gouge seam.					
	363	END OF HOLE					
		casing removed. Frank P. Tagliamonte, P.Eng. 14 March 1982					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	oz ASSAY Au	oz ASSAY Ag	ppm ASSAY Cu	ppm ASSAY Pb	ppm ASSAY Zn
		SAMPLING									
			822-1	202	207	5'	.002	.03	61	2100	1200
			822-2	207	216	9'	.002	.01	69	150	—
			822-3	216	225	9'	Nil	.01	84	382	—
			822-4	225	234	9'	"	.01	59	1100	702
			822-5	234	244	10'	"	Tr	50	78	—
			822-6	244	254	10'	"	"	39	67	—
			822-7	254	264	10'	"	"	60	105	—
			822-8	264	273	9'	"	"	61	68	—
			822-9	273	283	10'	"	"	87	129	—
			822-10	306	316	10'	"	Tr	100	41	—
			822-11	325	335	10'	"	Tr	90	129	—
			822-12	335	346	11'	"	Nil	71	548	—
			822-13	350.5	354	3.5'	"	.01	247	786	—
						1155'					

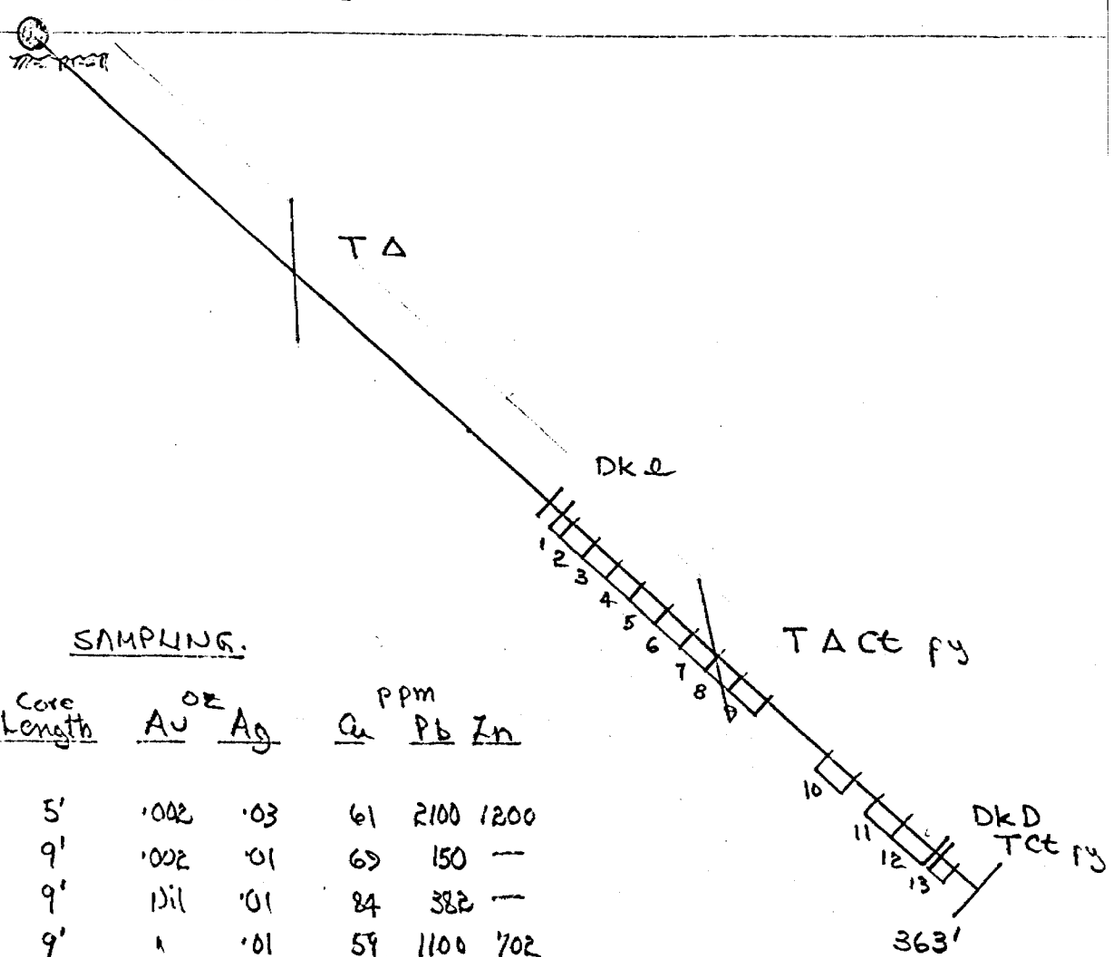
Frank P. Tagliamonte, P. Eng.
15 March 1982

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

5+40N. 1+10E

Az 132°

DDH# 82-2 -42° 363'



SAMPLING.

No.	Core Length	Au	OR Ag	ppm Cu	Pb	Zn	
1	5'	.002	.03	61	2100	1200	
2	9'	.002	.01	69	150	—	
3	9'	Nil	.01	84	382	—	
4	9'	"	.01	59	1100	702	
5	10'	"	Tr	50	78	—	
6	10'	"	"	39	67	—	
7	10'	"	"	60	105	—	
8	9'	"	"	61	68	—	
9	10'	"	"	87	129	—	
10	10'	"	Tr	100	41	—	
11	10'	"	Tr	90	129	—	
12	11'	"	Nil	71	518	—	
13	3.5'	"	.01	247	786	—	

MARSHAL MINERALS CORPORATION

BOSTON TOWNSHIP PROPERTY
KIRKLAND LAKE AREA, ONTARIO

DDH# 82-2 SECTION

SCALE 1" = 50' MARCH 1982

F.P.T.

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

OM 81-6-C-131
63.4113

DIAMOND DRILL RECORD

LOGGED BY Frank P. Tagliamonte, P. Eng.

PROPERTY MARSHALL MINERALS INCORPORATED.

D.D.H. No. 82E-3 PAGE 1/3

LATITUDE (GRID) 11+00 N BEARING OF HOLE Az 200° STARTED 4 March 1982

DEPARTURE (GRID) 5+30E DIP OF HOLE -50° COMPLETED 7 March 1982.

CLAIM No. L-36693

ELEVATION 40' ± above baseline DIP TESTS DEPTH 318'

DIRECTION AND DISTANCE FROM NE. CLAIM POST

CORE SIZE AQ. DIAMOND DRILL CONTRACTOR BARRON DIAMOND DRILLING, Haileybury, Ontario.

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
0	2.4	CASING.					
24	32.5	DIORITE. Sill? Dyke?					
		Dark gray-black. Siliceous. Fine grained. Hard.					
		Erratic disseminated fine pyrite.					
		Slips @ 30° and 45°.					
		24 - 26 Random patches of pale green epidote.					
		29.5 - 32.5 60% pale green epidote, random gray carbonate patches.					
32.5	54.5	DYKE. Lamprophyre					
		Dark green, uniformly fine grained granular					
		Predominantly micaceous - biotite.					
		Sharp contacts.					
		Random zones with fine disseminated pyrite.					
54.5	318	DIORITE. Sill? Dyke?					
		Dark gray-black. Hard. Fine grained granular.					
		Contaminated by pale green and pea green epidote bands, fragments, veinlets					
		and irregular patches. 50%± epidote contamination.					
		Random associated irregular patches of fine pyrite.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
54.5	318	DIORITE. Sill? Dyke?					
		Random 1/4" ± milk white quartz-carbonate stringers generally @ 50° ±					
		Quartz-carbonate stringers contain and are associated with local narrow 1-4" zones of fine disseminated pyrite. — 2% quartz+carbonate stringers.					
		Numerous slips from 30-55°. Most @ 45-55°.					
		Variations as noted.					
75	96	80% pea green epidote patches and fragments containing 20% irregular pale pink fragments with associated carbonate.					
		Random fine disseminated pyrite. Slips @ 45° ±.					
95		6" ± Fragmented quartz-carbonate zone with 2" of massive granular pyrite with fine specks of galena.					
133		1/2" quartz-carbonate stringer along slip @ 55° associated with disseminated pyrite.					
151.5±	161±	Random series of 15 - 1/8-1/4" quartz-carbonate veinlets @ 45° with fine disseminated pyrite					
208±	318	Predominantly dark green granular dioritic basalt with 10% ± pale green epidote fragments, bands and seams.					
		Rare random 1/8-1/4" quartz-carbonate veinlets.					
255.5		6" ± hematitic pink ferruginous very hard fragment with slip contacts @ 45°					
318		END OF HOLE.					
		casing removed.					

Frank P. Tagliamonte, P. Eng.
13 March 1982.

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

D.D.H. NO. 82E-3 PAGE 3/3

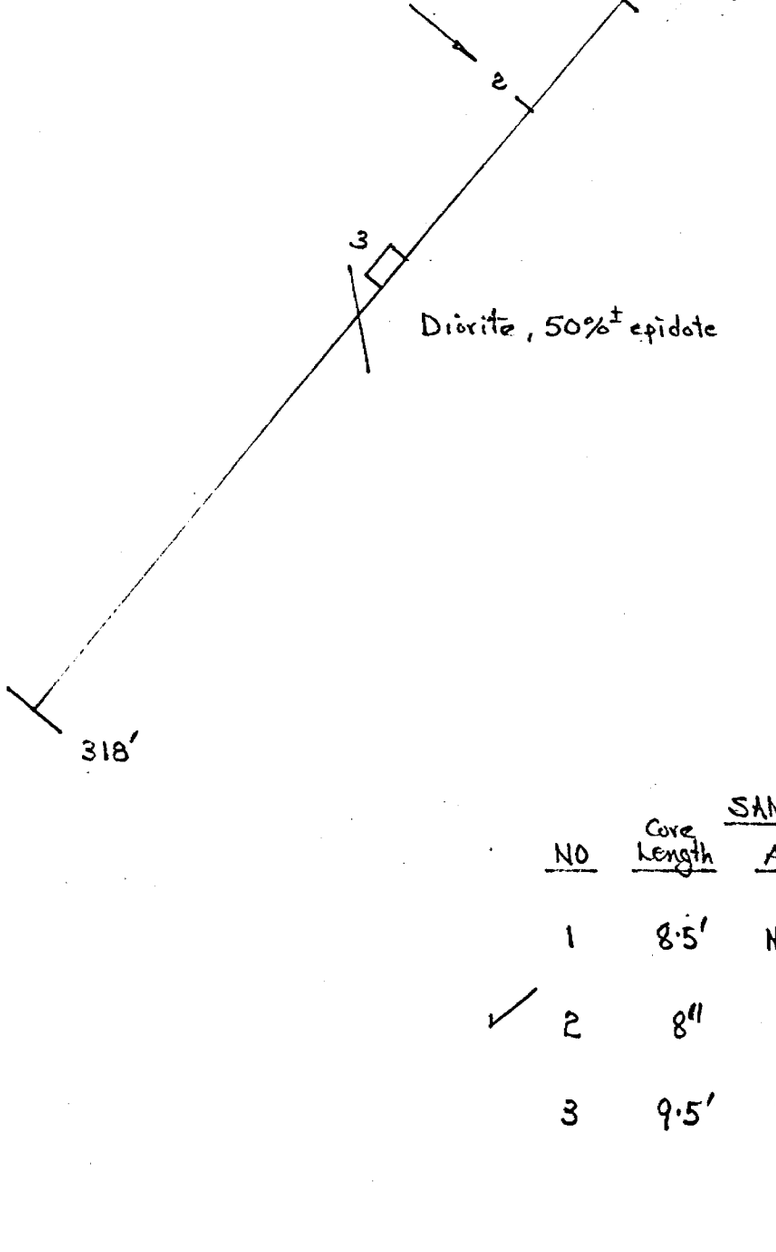
FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	OZ ASSAY Au	OZ ASSAY Ag	ppm ASSAY Cu	ppm ASSAY Pb	ppm ASSAY Zn
		SAMPLING.									
			82E3-1	24	32.5	8.5'	Nil	Nil	166	41	38
			82E3-2		@95	8"	"	3.03	39	198	13000
			82E3-3	151.5	161	9.5'	"	.01	—	—	—
						18' 8"					
		Frank P. Tagliamonte, P. Eng.									
		13 March 1982									

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

Az 200°

11400N
5+30E

DDH# 82E-3 -50° 318'



NO	Core Length	SAMPLING Au oz	Ag	Cu	ppm Pb	Zn
1	8·5'	Nil	Nil	166	41	38
✓ 2	8"	"	3·03	39	198	13000
3	9·5'	"	·01	—	—	—

MARSHAL MINERALS CORPORATION

BOSTON TOWNSHIP PROPERTY
KIRKLAND LAKE AREA, ONTARIO

DDH# 82 E-3 SECTION

SCALE · 1" = 50' MARCH 1982

F.P.T.

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

Om 81-6-C-131
63.4113

DIAMOND DRILL RECORD

LOGGED BY Frank P. Tagliamonte, P. Eng

PROPERTY MARSHALL MINERALS CORPORATION - BOSTON TOWNSHIP PROPERTY

D.D.H. No. 82H-1 PAGE 1/5

*GRID LATITUDE 5+00 N BEARING OF HOLE Az 016° STARTED 29 April 1982

*GRID DEPARTURE 2+32 W DIP OF HOLE -47°± COMPLETED 1 MAY 1982

CLAIM No. L-73991

ELEVATION 50'± above Bostic Creek DIP TESTS -0- DEPTH 307'

DIRECTION AND DISTANCE FROM NE. CLAIM POST

CORE SIZE B DIAMOND DRILL CONTRACTOR R. YOST DIAMOND DRILLING, Kirkland Lake, Ont.

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
0	29	CASING.					
28	307	DIORITE.					
		Main rock unit is a dark green, uniformly medium grained granular mafic diorite. Randomly impregnated by finely banded and laminated sulphide iron formation. Intruded by hematitic red syenite seams, bands and fragments.					
		Variations as noted.					
		28 - 66'± Mainly thinly banded sulphide iron formation					
		Thin seams of pyrite from 20-45° to core axis paralleling laminations of iron formation.					
		Variably but noteably magnetic throughout.					
		Interlaminated with diorite and hematitic pink and pale pink syenite seams and threads.					
		2%± pyrite.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

*GRID: April 1982 VLF-EM Survey Grid, M. Lealy.

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
28	307	DIORITE. ---cont'd.---					
		66± – 105± Predominantly uniformly medium grained granular diorite.					
		Variably but noteably magnetic.					
		Random slips mainly @ 55° ±.					
		1% disseminated pyrite.					
		105± – 147± Diorite contaminated by pale pink and salmon pink syenite and seams and patches					
		of pea green epidote.					
		Random seams of pyrite, locally foliated @ 40° but also contorted.					
		Locally strongly magnetic.					
		125± – 135± 70%± pale pink syenitic gneiss bands and dykes in fine grained diorite.					
		Gneissocity generally @ 40°±.					
		± Random thin seams pyrite in gneissic syenite.					
		135± – 139 Thinly laminated pink gneissic syenite with 40% pea green epidote					
		Interlaminated fine seams of magnetite and pyrite – 10%± pyrite.					
		139± – 141± Lamprophyre dyke, biotitic.					
		Mechanically broken core obliterates contacts.					
		141± – 146 Fine grained diorite interlaminated with pale pink fine gneissic syenite					
		bands.					
		Interlaminated fine seams pyrite and magnetite.					
		8%± pyrite.					
		Gneissocity @ 50° ± – also contorted zones.					
		146.5 6" irregular patch of lamprophyre.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
28	307	DIORITE. --- cont'd ---					
		147± - 168± Diorite. dark green uniformly fine grained granular.					
		Contains patchy fine grained magnetite — up to 30% magnetite locally.					
		Averages 10% ± magnetite.					
		Very strongly magnetic					
		Numerous slips from 25-50°, most from 30-45°.					
		168± - 171± Salmon pink syenite dyke.					
		171± - 175± Very fine grained diorite — 25% ± fine disseminated magnetite.					
		175± - 177.5± Fine grained diorite with interlaminated magnetite and pyrite.					
		Lower 12" laminated @ 45°					
		(176.5 - 177.5 - 12" 20% pyrite)					
		Strongly magnetic.					
		177.5± - 184 Massive magnetite and minor interstitial beads of pyrite and rare bead of					
		chalcopyrite.					
		90%± magnetite.					
		Strongly magnetic.					
		184 - 188 Fine grained diorite with minor magnetite and fine seams and dissemination					
		of pyrite.					
		Series of slips @ 40°.					
		Variations as noted:					
		184 12" massive pyrite with 2"± fragments of magnetite, and chalcopyrite — 80%± sulphi					
		165± - 186.5 5% ± disseminated pyrite.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
28	307	DIORITE. --- cont'd. ---					
		186.5 - 188 Mixture of finely laminated and contorted pearly tuff and diorite.					
		Laminations @ 35° ± but also contorted.					
		15% ± pyrite.					
		188 - 208 Dark green uniformly medium grained diorite with seams of fine grained					
		magnetite and random grains pyrite.					
		15% ± magnetite.					
		208 - 213 Pink porphyritic syenite dyke. Gradational upper contact. Sharp lower contact					
		213 - 248 Intermixed zone of fine diorite and thinly laminated pearly cherty tuff.					
		Random patches of pale green epidote.					
		Variably mineralized with fine grained magnetite and pyrite.					
		Specific variations as noted:					
		213 - 221 Pearly cherty tuff and diorite with minor pyrite.					
		221 - 222 Pea green epidote patch.					
		222 - 238.5 Laminated fine grained diorite and pearly cherty tuff.					
		5% fine seams and disseminated pyrite.					
		Variably magnetic.					
		25% mechanically broken core.					
		Slips from 30-65°. — most @ 50° ±.					
		231 6" patch pea green epidote.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

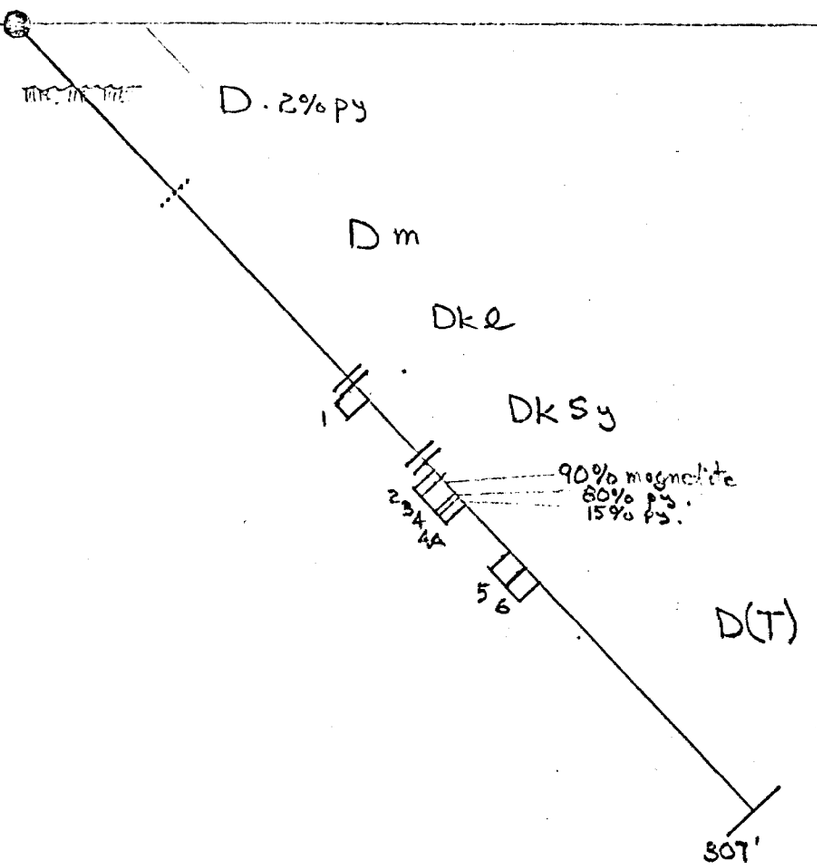
FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY oz/T Au	ASSAY oz/T Ag	ASSAY ppm Cu	ASSAY ppm Pb	ASSAY ppm Zn
22	307	DIORITE. ---cont'd. ---									
		232.5 - 307 Dark green uniformly grained granular diorite.									
		Strongly magnetic throughout.									
		Random porphyritic pink syenite dykes from 1/2" up to 24" - sharp contacts.									
		290 36" pink porphyritic syenite dyke - 40° contacts.									
	307	END OF HOLE.									
		Casing removed. Frank P. Tagliamonte, P. Eng.									
		1 May 1982.									
		SAMPLING									
			H1-1	142	147.5	5.5'	Nil	.03	579	29	321
			H1-2	175	177.5	2.5'	Nil	.04	952	78	128
			H1-3	177.5	184	5.5'	"	.02	428	202	605
		Nil Au, .81 g Ag, 1.5% Cu, .16% Pb, .31% Zn / 1'	H1-4	184	185	1'	"	.81	15000	1600	3100
			H1-4A	185	188	3'	"	.03	1200	112	259
			H1-5	226	232	7'	"	.01	310	40	63
			H1-6	232	238.5	6.5	"	.02	475	45	128
		Frank P. Tagliamonte, P. Eng.									

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

5+00N — Az 016°

2+32W

DDH# 82H-1 -47° Az 016° 307'



SAMPLING.

No	core length	Au oz	Ag	Cu ppm	Pb	Zn.
1	5·5	1/2	·03	579	29	321
2	2·5	"	·04	952	78	128
3	5·5	"	·02	428	202	605
4	1'	"	·81	15000	1600	3100
4A	3'	"	·03	1200	112	259
5	7'	"	·01	310	40	63
6	6·5'	"	·02	475	45	128

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

MARSHAL MINERALS CORPORATION

BOSTON TOWNSHIP PROPERTY
KIRKLAND LAKE AREA, ONTARIO

DDH# 82H-1 SECTION

SCALE · 1" = 50' MAY 1982

F.P.T.

OM 81-6-C-131
63.4113

DIAMOND DRILL RECORD

LOGGED BY Frank P. Tagliamonte, P. Eng

PROPERTY MARSHALL MINERALS CORPORATION – Boston township property

D.D.H. No. 82H-2 PAGE 1/1

*Grid LATITUDE 7+60±N BEARING OF HOLE Az 135° ± STARTED 3 May 1982

CLAIM No. L-73002

DEPARTURE 5+50±W DIP OF HOLE -42° COMPLETED 5 May 1982

DIRECTION AND DISTANCE FROM NE. CLAIM POST

ELEVATION 100'± above Bostic Crk. DIP TESTS DEPTH 25'

CORE SIZE B DIAMOND DRILL CONTRACTOR R. YOST DIAMOND DRILLING, Kirkland Lake, Ont.

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
0	4.	CASING.					
4	25	DIORITE.					
		Dark green, fine grained, gneissic diorite.					
		Impregnated by salmon pink syenite seams, bands, and fragments. 50%± syenite.					
		Variably magnetic.					
		Locally strongly magnetic due to small patches and clusters of fine grained magnetite.					
		23 2' band of pink syenite.					
		Slips @ 60°.					
		60%± mechanically broken core.					
	25	END OF HOLE.					
		Casing Removed. Frank P. Tagliamonte, P. Eng. 10 May 1982.					
		NOTE: hole abandoned due to blockey ground.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

GEOLOGICAL ENGINEERING SERVICES, 29 BEAVER CRESCENT, NORTH BAY, ONTARIO

*GRID: April 1982. VLF EM Survey Grid, M. Leahy

OM 81-6-C-131

DIAMOND DRILL RECORD

LOGGED BY Frank P. Tagliamonte, P. Eng

PROPERTY MARSHALL MINERALS CORPORATION - Boston township property.

D.D.H. No. 82H-3 PAGE 1/1

*GRID LATITUDE 1+60± N BEARING OF HOLE Az 135°± STARTED 6 May 1982

*GRID DEPARTURE 5+50± W DIP OF HOLE -47° COMPLETED 8 May 1982

CLAIM No. L-73002

ELEVATION 100' ± above Baxter Crk DIP TESTS DEPTH 39

DIRECTION AND DISTANCE FROM NE. CLAIM POST

CORE SIZE B DIAMOND DRILL CONTRACTOR R. YOST DIAMOND DRILLING, Kirkland Lake, Ont.

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
0	5	CASING.					
5	39	DIORITE.					
		Dark gray fine grained, porphyritic gneissic diorite.					
		Finely gneissic with 1mm± phenocrysts of pink feldspar throughout.					
		Thin seams and fine disseminated pyrite throughout.					
		5%± pyrite.					
		Gneissocity @ 35°±.					
		Locally weakly magnetic					
	20 - 25	lost core.					
	25 - 39	Dark green diorite. Fine grained. Variably foliated. — generally @ 35°±.					
		Random thin seams of pyrite.					
		Variably but generally strongly magnetic.					
		Random pink syenite threads.					
	26	10" band of pink syenite @ 38°±.					
	26.5	1/16" seam of pyrite with fine grains of chalcopyrite and galena.					
	39	END OF HOLE. Hole abandoned due to blocky ground and sand seams. Casing removed.					

Frank P. Tagliamonte 10 May 1982

REGISTERED PROFESSIONAL ENGINEER — MINING — E. P. TAGLIAMONTE — PROVINCE OF ONTARIO

*GRID: April 1982 VLF EM Survey Grid, M. Leahy.

om 81-6-C-131

63.4113

DIAMOND DRILL RECORD

LOGGED BY Frank P. Tagliamonte, P.Eng.

PROPERTY MARSHALL MINERALS CORPORATION - Boston township property

D.D.H. No. 82H-4 PAGE 1/5

LATITUDE 7+00± N (*Grid) BEARING OF HOLE 000° STARTED 10 May 1982

DEPARTURE 5+10± W (±Grid) DIP OF HOLE -45° COMPLETED 13 May 1982

ELEVATION 100'± above Porlon Crk DIP TESTS DEPTH 200'

CLAIM No. L-73002

N ↑ ← DIRECTION AND DISTANCE FROM NE. CLAIM POST

CORE SIZE B DIAMOND DRILL CONTRACTOR R. YOST DIAMOND DRILLING, Kirkland Lake, Ont.

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
0	5	CASING.					
5	53	DIORITE / SYENITE.					
		Intermixed zone of fine grained, somewhat gneissic diorite and seams, bands, and dykes of salmon pink porphyritic syenite.					
		70%± pink syenite.					
		5%± pea green epidote.					
		Locally strongly magnetic.					
		Variations as noted.					
	30± - 34	Coarsely porphyritic syenite. Strongly magnetic.					
		Feldspar phenocrysts up to 1/4"±					
	34	8" zone of foliated gneissic diorite and syenite.					
		Foliated @ 45°±.					
	43± - 47±	Thinly laminated bands of diorite, syenite, and cherty tuff.					
		Seams of fine pyrite and magnetite.					
		Strongly magnetic.					
		Laminations @ 35°±. 20%± pyrite.					

REGISTERED PROFESSIONAL ENGINEER — MINING — F. P. TAGLIAMONTE — PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
53	60	SYENITE PORPHYRY DYKE.					
		Pink, coarsely porphyritic syenite dyke.					
		Sharp contacts.					
		Noteably magnetic throughout.					
		60.5 1/2" seam of pink feldspar and grains of magnetite.					
60	97±	TUFF.					
		Mixed horizon of fine grained granular mafic tuff and siliceous grey quartzose tuff with fine seams and disseminations of pyrite.					
		Variably magnetic throughout.					
		Large patchy areas of epidote.					
		Locally foliated.					
		Variably mineralized with thin seams and disseminations of fine pyrite.					
		Multiple fractures — cross fractured.					
		25% ± mechanically broken core.					
	86 - 90	Massive fragment or patch of pea green epidote.					
	93	14" mafic porphyritic syenite fragment — very magnetic					
97±	150±	TUFF. Mineralized Zone.					
		Mixed horizon of banded mafic and quartzose and cherty tuff.					
		In part foliated, fragmented, and cut by numerous fractures.					
		Variably mineralized with thin seams and disseminated pyrite.					
		5% ± pyrite					
		Foliations generally @ 35° ±.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
97±	150±	TUFF. Mineralized Zone ---cont'd.---					
		70% core recovery – badly mechanically broken core.					
		Variations as noted:					
		122.5 Fragmented syenite dyke. 12" ± wide					
		122.5 - 150 Badly broken core. 75%± recovery					
		Finely banded and finely fragmented mafic and cherty tuff.					
		Irregular disseminations and fine seams of pyrite.					
		Occassional small grain of galena and small lath-like occurrences of sphalerite					
		Fine random hair-like seams of galena as well as random grains and thin plattings of galena along some slips and fractures.					
		Numerous X-fractures. Fracturing generally @ 35°.					
		Local jaspellite hair-like threads and seams					
		150 16" zone of granular porphyritic diorite.					
		142± - 150± Random patches of pale green epidote.					
150±	173±	DIORITE.					
		Dark green. Medium to coarse grained mafic.					
		5%± disseminated fine pink feldspar phenocrysts.					
		Random patches pale green epidote.					
		Random fragments? dyklets? from 1-4" ± of salmon pink syenite.					
		Variably magnetic.					
		60%+ mechanically broken core.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY
150±	173±	DIORITE. ---cont'd. ---					
		163± - 168± Fragmented siliceous tuff fragment with 3%± disseminated pyrite.					
173±	179±	SYENITE:					
		Salmon pink syenite dyke.					
		15% random patches and grains of dark green amphibole.					
		Random grains of magnetite.					
		Variably magnetic.					
		25%± mechanically broken core.					
179±	188±	TUFF.					
		Siliceous, cherty, gray, fragmental tuff					
		Random patches of pale green epidote.					
		Random irregular seams of fine pyrite.					
		Random hair-like seams of galena as well as random disseminated galena.					
		Flake galena along some slip surfaces					
		5%± pyrite.					
		Variably magnetic.					
		Fracturing generally @ 35°±.					
		180 - 182. Diorite fragment.					
188±	200	SYENITE.					
		Mafic syenite. Generally salmon pink with 50% dark green amphibole. Variably magnetic.					
	200	END OF HOLE. casing removed. Frank P. Tagliamonte, P. Eng. 13 May 1982.					

REGISTERED PROFESSIONAL ENGINEER MINING F. P. TAGLIAMONTE PROVINCE OF ONTARIO

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	ASSAY oz Au	oz Ag	ppm Cu	ppm Pb	ppm Zn
		SAMPLING.	H4-1	43	47	4'	Nil	.02	771	109	199
			H4-2	97	105	7'	"	.02	202	49	70
			H4-3	105	111	6'	"	.02	200	73	186
			H4-4	111	119	8'	"	.01	259	142	501
			H4-5	119	126	7'	"	.02	230	1600	3500
		Nil Au, .04 oz Ag, .04% Cu, .46% Pb, 1.7% Zn / 9'	H4-6	126	135	9'	"	.04	392	4600	17000
			H4-7	135	141.5	6.5'	"	.01	282	268	850
			H4-8	141.5	150	8.5'	"	.02	330	1100	3000
			H4-9	163	168	5'	"	.01	680	190	413
			H4-10	179	188	9'	"	.03	501	2200	8600

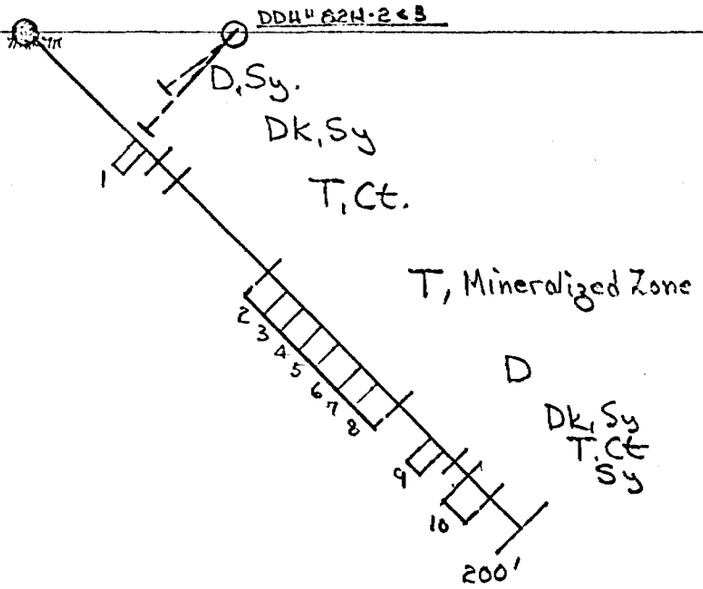
Frank P. Tagliamonte, P. Eng.
13 May 1982

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

7H00N
5+10W

Az 000°

DDH# 82H-4 -45° Az 000, 200'



SAMPLING.

No.	Core Length	Au oz	Ag	Cu ppm	Pb ppm	Zn.
1	4'	Nil	.02	271	109	199
2	7'	"	.02	202	49	70
3	6'	"	.02	200	73	186
4	8'	"	.01	259	142	501
5	7'	"	.02	230	1600	3500
6	9'	"	.04	392	4600	17000 (1.7%Zn
7	6.5'	"	.01	282	268	950
8	8.5'	"	.02	330	1100	3000
9	5'	"	.01	680	198	413
10	9'	"	.03	501	2200	8500

MARSHAL MINERALS CORPORATION

BOSTON TOWNSHIP PROPERTY
KIRKLAND LAKE AREA, ONTARIO

DDH# 82H-4 SECTION

SCALE: 1" = 50' MAY 1982

F.P.T.

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

040

August 10, 1982

CONFIDENTIAL

Mr. W. Marshall
President
Marshall Minerals Corporation
3487 Portage Road
Niagara Falls, Ontario L2J 2K5
CANADA

Dear Mr. Marshall:

This letter reports results of research conducted on one sample of processed magnetite identified as follows:

Marshall Magnetite Sample No. 1
Assigned BCR No. 5497

The sample was delivered in good condition to Bituminous Coal Research, Inc., by Mr. Alex Powell. Examination of the as-received material showed several light-colored agglomerates that easily separated when brushed on a fine screen.

As shown in the summary data presented as Table 1, the sample was fine in size, containing only 3.5 percent by weight coarser than 74 microns (>200 mesh). The minus 44 microns (<325 mesh) material represented 68.9 percent by weight of the as-received sample and showed a normal distribution around the 16 x 20 micron range. Specific gravity analyses of the as-received magnetite and selected separates showed the following:

Specific Gravity Analyses

As-received Sample (100.0 percent)	- 4.64
Minus 44 microns (<325 mesh) (68.9 percent)	- 4.60
2.95 Sink Fraction (99.7 percent)	- 4.65
Total Magnetics (98.1 percent)	- 4.89

Total magnetics were determined using magnetic attraction in an aqueous solution. The average of duplicate test runs showed 98.1 percent of the feed material to be strongly magnetic.

Analyses of the elemental ash, using atomic emission methodology, showed 76.8 percent Fe_3O_4 (87.9 percent normalized) with only 7.13 percent SiO_2 (8.16 percent normalized) as the principal contaminant. Plans to analyze the beneficiated 2.95 sink separate have been necessarily delayed due to inoperative equipment. These data will be forwarded as they become available.

In summary, this magnetite represents one of the purest magnetite products ever analyzed at BCR. Fully 98.1 percent of the material was actively magnetic showing a specific gravity of 4.89. Further beneficiation using gravity methods proved essentially non-productive since >99 percent of the feed sample reported to the 2.95 sink fraction.

Yours truly,

R. G. Moses
Manager, Petrography

RGM:blf
Attachment
2823

cc: Mr. Alex Powell
22402 Thomson Drive
Mt. Clemens, Michigan 48043

August 25, 1982

CONFIDENTIAL

Mr. W. Marshall, President
Marshall Minerals Corporation
3487 Portage Road
Niagara Falls, Ontario
CANADA L2J 2K5

Dear Mr. Marshall:

This letter supplements our letter of August 10, 1982 which forwarded data characterizing one sample of magnetite designated as Marshall Magnetite Sample No. 1 (BCR No. 5497).

New information details ash composition analyses on the beneficiated 2.95 sink fraction of this magnetite.

This evaluation showed a minor discrepancy in the standard used to calibrate the atomic emission apparatus. This slightly modified the elemental analysis of the reported "as-received" material.

As shown in the modified Table 1, washing at a 2.95 gravity level occasioned some reduction in silica but nothing of great significance. Since recovery represented 99.7 percent of the total sample, little deviation in composition was expected.

Yours truly,

R. G. Moses
Manager, Petrography

RGM:blf
Enclosure
2823

cc: Alex Powell

TABLE 1. SUMMARY DATA CHARACTERIZING MARSHALL MAGNETITE SAMPLE NO. 1 (BCR No. 5497)

Size Consist, As-received

	Percent, in size
Plus 149 microns (100 mesh)	trace
149 x 74 microns (200 mesh)	3.5
74 x 44 microns (325 mesh)	27.6
Minus 44 microns (325 mesh)	68.9

Coulter Counter Sizing -- Minus 44 Microns (325 mesh)

	Percent, in size	
Plus 40 microns	3.1	68.9 percent <44 microns (325 mesh)
40 x 32 microns	3.9	
32 x 25.4 microns	6.6	
25.4 x 20.2 microns	10.1	
20.2 x 16.0 microns	10.9	
16.0 x 12.7 microns	10.2	
12.7 x 10.1 microns	8.1	
10.1 x 8.0 microns	5.7	
8.0 x 6.4 microns	3.9	
6.4 x 5.0 microns	2.3	
5.0 x 4.0 microns	1.5	
4.0 x 2.0 microns	1.5	
<2.0 microns	1.1	

Total Magnetics, percent by weight

98.1 percent (Specific Gravity = 4.89)

Specific Gravity, g/cc

As-received - 4.64 Minus 325 mesh - 4.60

Elemental Analysis, Percent by Weight of Ignited Sample

	As-received	"Beneficiated" 2.95 Sink*
SiO_2	5.64	5.21
Al_2O_3	1.22	1.38
Fe_3O_4	87.4	87.4
MgO	1.54	1.51
CaO	1.08	1.10
TiO_2	0.06	0.07
MnO	0.10	0.10
P_2O_5	0.06	0.06
Na_2O	0.10	0.10
K_2O	trace	trace
Cl	trace	trace
SO_3	trace	trace

* 99.7 percent by weight of the as-received sample

Beneficiation Potential -- 2.95 Gravity Washing

	Float 2.95	Sink 2.95
Yield, percent	0.3	99.7
Specific Gravity	--	4.65

OM81-6-C-131

THIS SUBMITTAL CONSISTED OF VARIOUS REPORTS, SOME OF WHICH HAVE BEEN CULLED FROM THIS FILE. THE CULLED MATERIAL HAD BEEN PREVIOUSLY SUBMITTED UNDER THE FOLLOWING RECORD SERIES (THE DOCUMENTS CAN BE VIEWED IN THESE SERIES):

① Drill Hole # 82-3, Marshall Minerals Inc., March/82 ⇒ Toronto file: Boston Twp. D.D.R. # 32 Report of Work # 178-82

BITUMINOUS
COAL
RESEARCH, INC.

OM 81-6-C-131

63.4113

October 26, 1982

CONFIDENTIAL

Mr. Jerry Hedican
Marshall Minerals Corporation
137 Huron Heights Drive
Newmarket, Ontario
CANADA L3Y 476

Dear Mr. Hedican,

Thank you for telling us about your recent takeover of Marshall Minerals Corporation.

As requested during our telephone conversation of October 25, 1982, I am enclosing copies of the letter reports characterizing your magnetite deposit. Also included is a copy of our invoice which might possibly have been misplaced during the change over.

As you can see from the reports, your product appears exceptionally pure and should be well suited for heavy-media coal beneficiation.

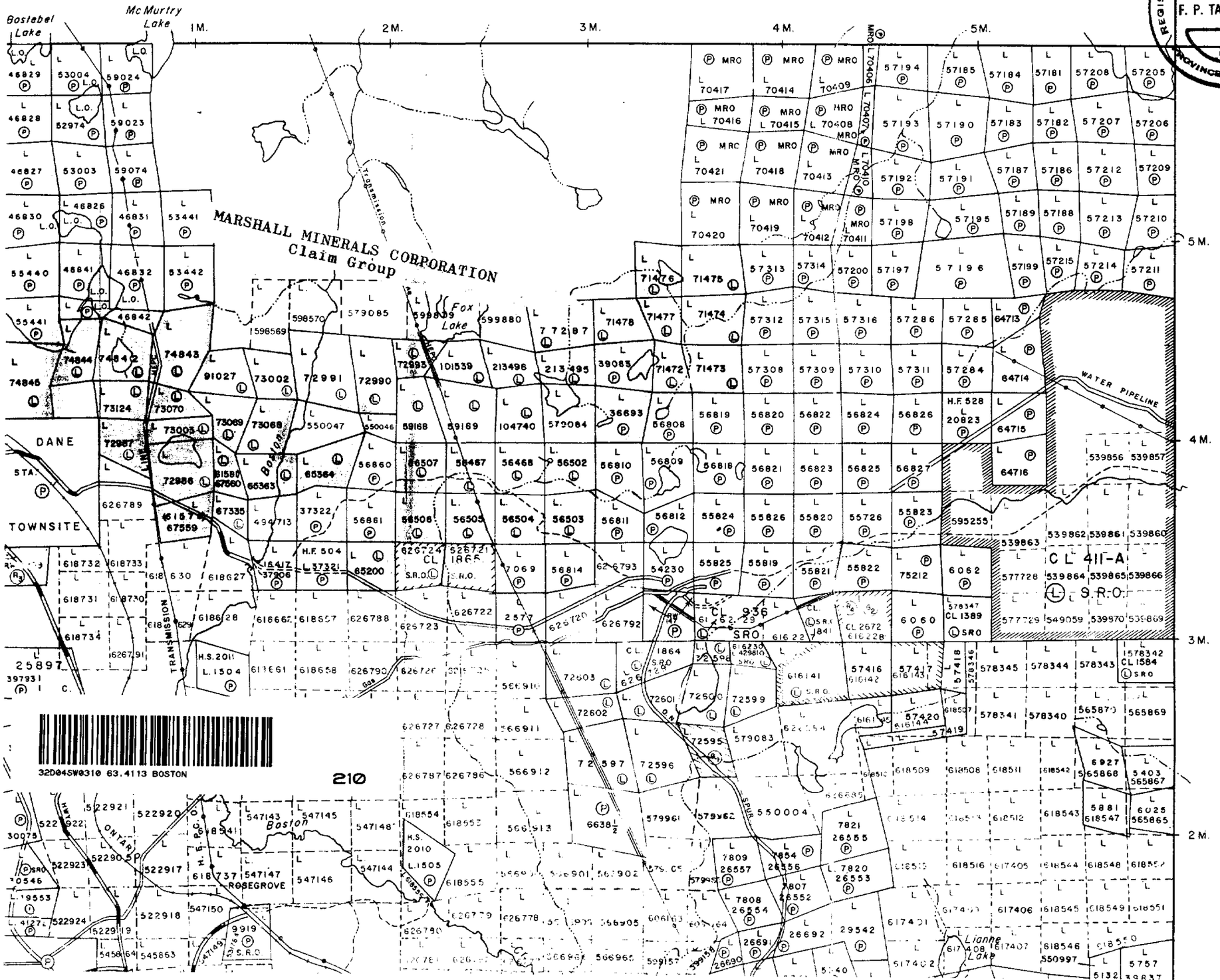
Yours truly,

R. G. Moses, Manager
Petrographic Research

RGM:blf
Enclosures
801S

350 Hochberg Road | P.O. Box 278, Monroeville, PA 15146 | Phone (412) 327-1600

Lebel Twp. M.359



32D04SW0310 63.4113 BOSTON

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

THE TOWNSHIP
OF
Part Of
BOSTON
PLAN NO. M-332
DISTRICT OF
TIMISKAMING
OM 81-6-C-131 63.4113
LARDER LAKE
MINING DIVISION

SCALE: 1-INCH=40 CHA

LEGEND

- PATENTED LAND
- CROWN LAND SALE
- LEASES
- LOCATED LAND
- LICENSE OF OCCUPATION
- MINING RIGHTS ONLY
- SURFACE RIGHTS ONLY
- ROADS
- IMPROVED ROADS
- KING'S HIGHWAYS
- RAILWAYS
- POWER LINES
- MARSH OR MUSKEG
- MINES
- CANCELLED

NOTES

400' Surface Rights Reservation ... y shores of all Lakes and Rivers.

AREAS WITHDRAWN FROM STAKING

S.R. – SURFACE RIGHTS M.R. – MINING RIGHT

Sec.	Order No.	Date	Disp'n
R3 43 (R.S.O. 1970)		18/4/73	M.R.
R4 43 (R. 1970)	NRW 36/79	30/5/79	S.R

DDH's # 82H-2 -42° 25'
82H-3 -47° 39'

DDH # 82H-4 -45° 200'

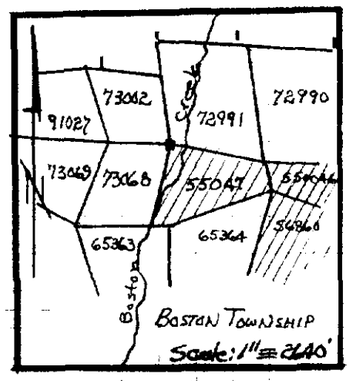
TL 6N

LONG LAKE FAULT
Boston Creek

DDH # 82H-1 -47° 307'

DDH # ?

L 6E



INDEX SKETCH

BLO

L-73012

L-72991

Survey Post

L-73068

L-55047

Survey Line
Az 098°

Survey Line
Az 188°

Grid Lines

SCALE: 1in = 200 ft.

REGISTERED PROFESSIONAL ENGINEER
MINING
F. P. TAGLIAMONTE
PROVINCE OF ONTARIO

32D04SW0310 63.4113 BOSTON

200

Note: Local magnetic attractions may distort compass observations.

Refrence: VLF-EM map by M. Leahy, April, 1982.

GEOLOGICAL ENGINEERING SERVICES

MARSHAL MINERALS CORPORATION

DIAMOND DRILL HOLE LOCATION PLAN 63.4113

BOSTON TWP. PROPERTY · Larder Lake Mining Div.

MAY 1982 · F.P. Tagliamonte, P. Eng.