

LOG NO:	0527	RD.
ACTION:		
FILE NO:		

Diamond Drilling Report  
Fireweed Property

Omineca Mining Division  
NTS 93M/1W

SUB-RECORDER RECEIVED	
MAY 21 1991	
M.R. #	\$
VANCOUVER, B.C.	

55° 01' N. Lat. 126° 25' W Long.

Owner: Minnova Inc.

Operator: Minnova Inc.

Claims:

FW 4  
FW 5  
FW 6  
FIREWEED 3

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**21,553**

Minnova Inc.  
Vancouver, B.C.

G. S. Wells  
May, 1991

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## Diamond Drilling Report

### Fireweed Property

#### 1. Introduction

Minnova optioned the Fireweed property in late 1990 from Mansfield Minerals (formerly Canadian United Minerals) to evaluate the extent of sulphide mineralization exposed on the claims. This report describes the results from four diamond drill holes (FW-80 - 84 incl.) which tested weak IP anomalies along strike and to the east of the known mineralization. The work was done during the period February 6th to 20th, 1991 by J. T. Thomas Diamond Drilling Ltd.

#### a. Location and Access

The Fireweed property is located 54 km northeast of Smithers, B.C. (Figure 1). The claims occur along the southern shore of Babine Lake just east of Smithers Landing. The area is readily accessible from Smithers via a network of primary and secondary logging roads. Topographic relief in the area is low to moderate with elevations ranging from 710 to 1160 meters above sea level. Large areas on the property are clear cuts with the remaining forested patches consisting of balsam fir, spruce and pine.

#### b. Mineral Rights

The drilling was carried out on the GER 3 and FW 4 claims which are part of the Fire 1 group (Figure 2). The claim status of these claims is as follows:

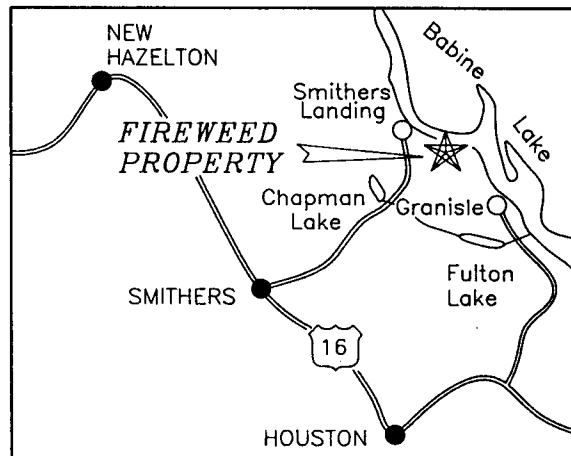
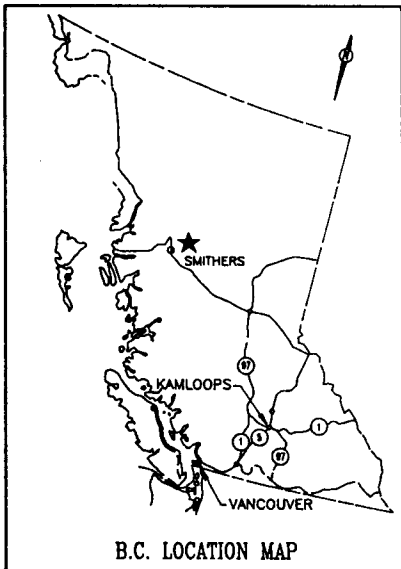
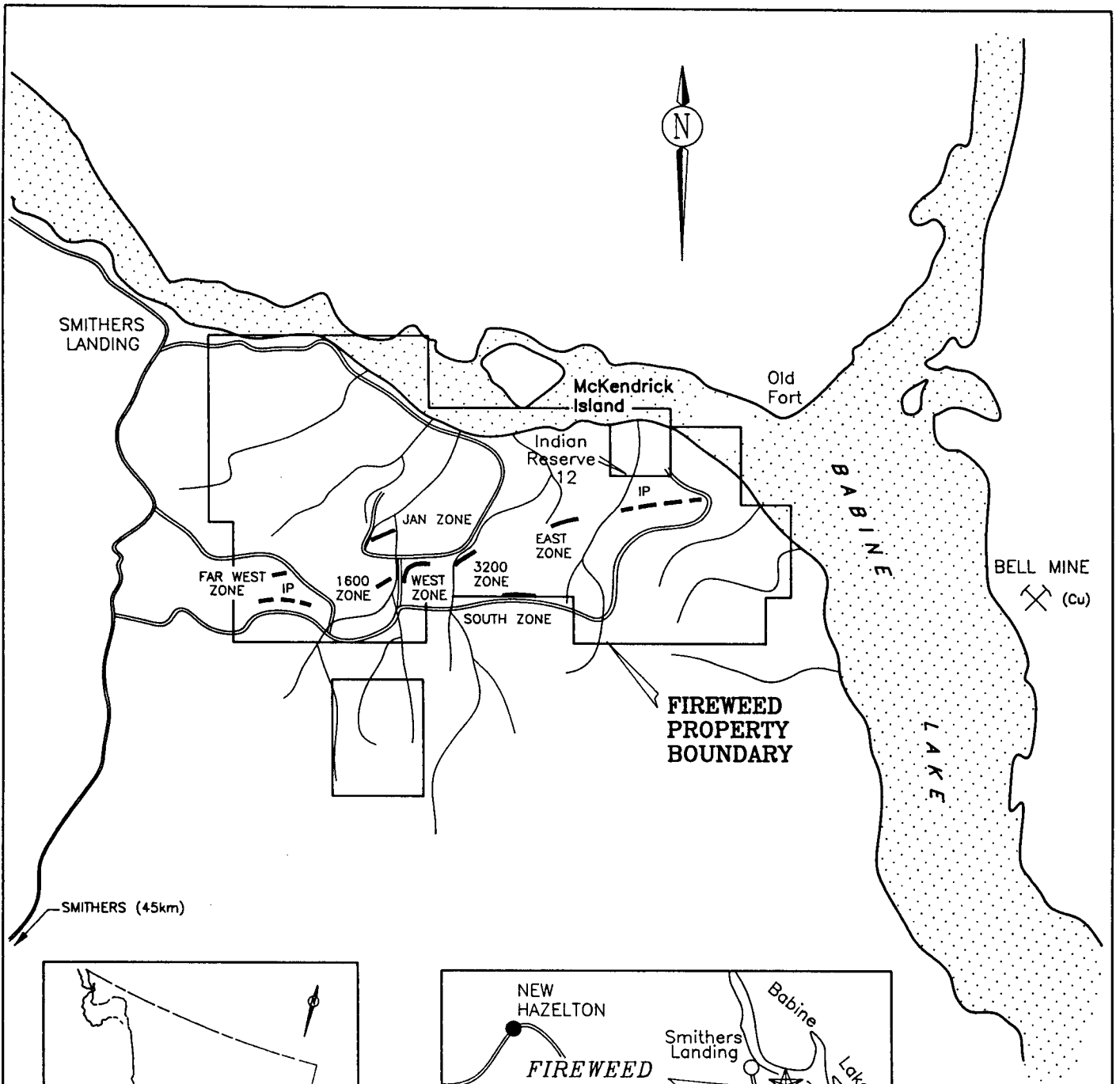


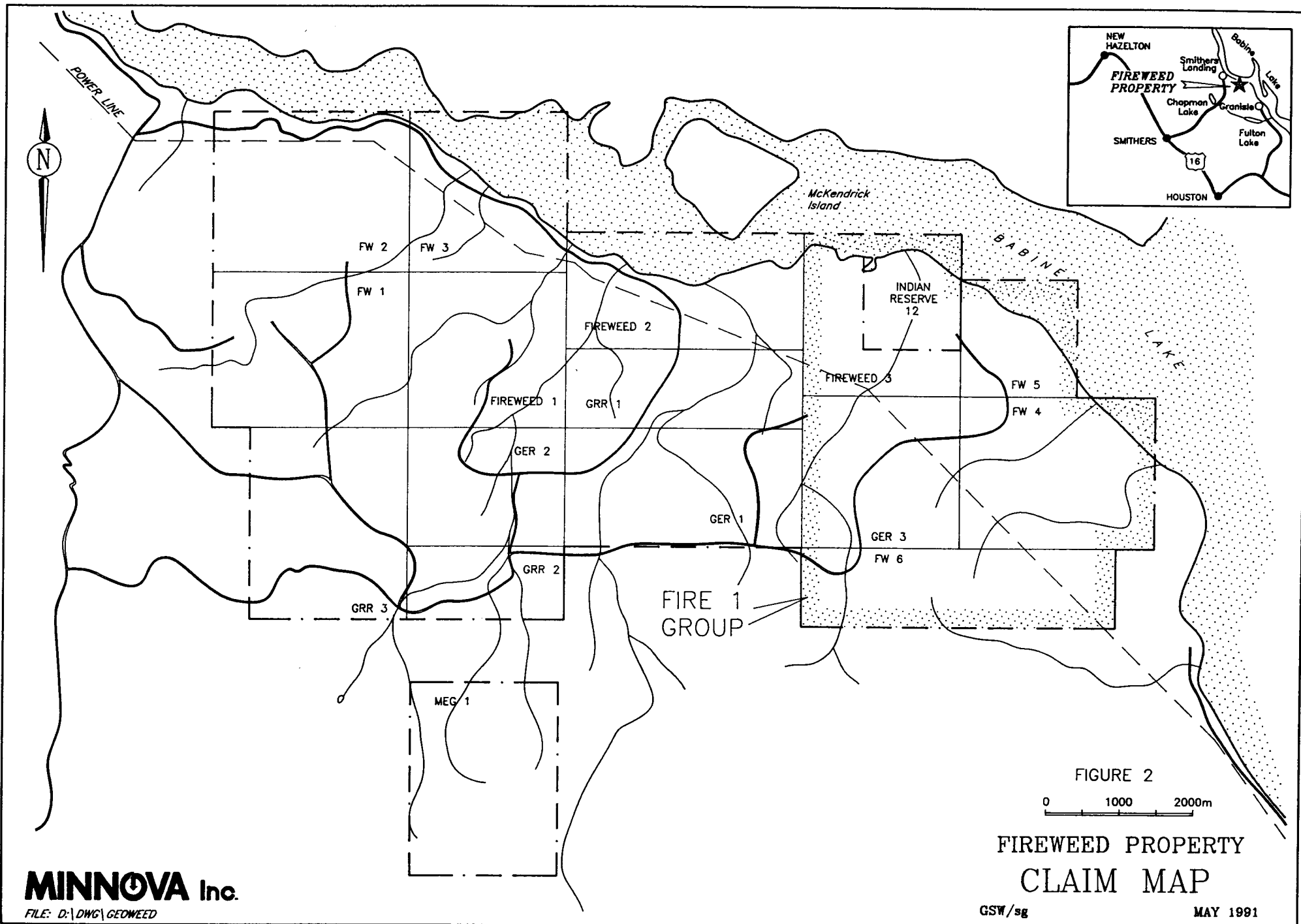
FIGURE 1



**FIREWEED PROPERTY  
CLAIM LOCATION MAP**

IDP/sg

OCTOBER 1990



**MINNOVA Inc.**

FILE: D:\DWG\GEOWEED

FIGURE 2  
 0 1000 2000m  
**FIREWEED PROPERTY  
 CLAIM MAP**  
 GSW/sg MAY 1991

Fire 1 Group

<u>Claim</u>	<u>No. of Units</u>	<u>Record Number</u>	<u>Month of Record</u>
FW 4	20	9267	Feb.
FW 5	9	9268	Feb.
FW 6	16	9269	Feb.
GER 3	16	8975	Sept.
FIREWEED 3	16	9236	Jan.

c. History

The Fireweed property was staked in July, 1987 following the discovery of mineralized float. Canadian United Minerals acquired an option to earn a 100% interest in the claims in August, 1987. They exercised that option subject to a retained NSR royalty by carrying out exploration programs consisting of geological mapping, soil geochemical surveys, geophysical surveys (mag, VLF, IP), backhoe trenching and diamond drilling (79 holes = 14,000 + m). This work has defined six mineralized zones which occur along an east-west trend in the center of the property (Figure 1). The mineralization consists of two types: massive sulphide (pyrrhotite, sphalerite ± chalcopyrite) pipes and breccias which crosscut the sediment sequence and stratiform (py, sph, galena, tetrahedrite) zones which occur in coarse sandstone units. Mineralization of the latter type is best exposed in the West Zone where an estimated 640,000 tons of 2.2% Zn, 1.3% Pb and 10 opt Ag has been defined.

Minnova acquired the property in August, 1990 and carried out linecutting and IP to the east and west of the known mineralized zones. Several weak to moderate IP chargeability anomalies have been defined along the trend of the known mineralization.

## 2. Work Done

This report summarizes the results of four diamond drill holes (FW-80 - 83 inclusive) which tested IP anomalies to the east of the known mineralization. The holes are located on the GER 3 and FW-4 claims (Figure 3). Detailed drill logs are included in Appendix I. The drill core is stored in J.T. Thomas' yard in Smithers, B.C.

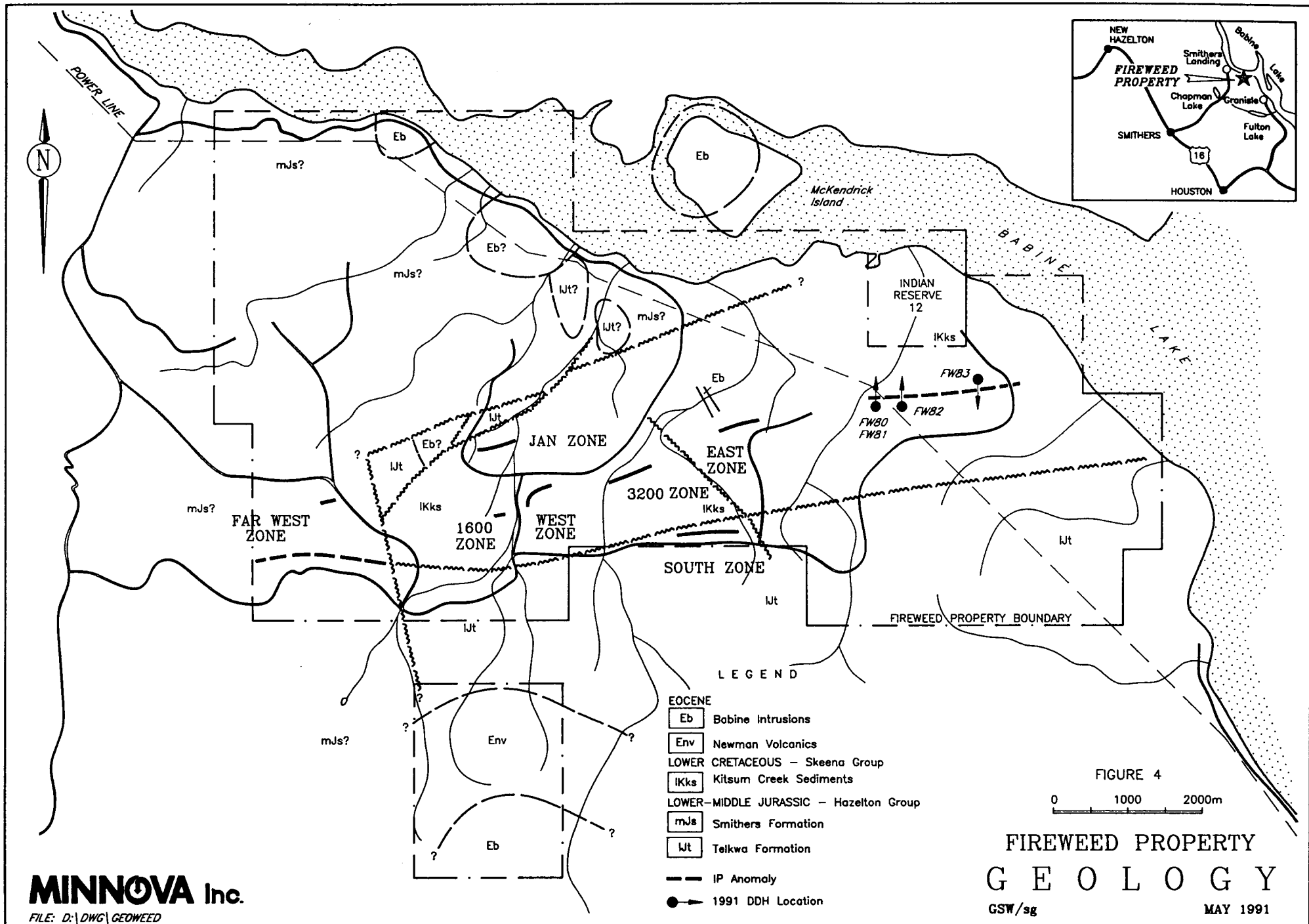
## 3. Geology

Outcrop exposure on the Fireweed property is poor due to an extensive overburden cover consisting of sand, gravel and clay. The geological picture presented in Figure 4 is based on the limited exposure and diamond drill and trench data. The claim group is underlain primarily by mudstones, siltstones and fine to coarse-grained sandstones that belong to the Kitsum Creek formation of the lower Cretaceous Skeena Group. These sediments are bounded on three sides by lower to middle Jurassic Hazelton Group volcanics and sediments. The entire sequence is intruded by a number of feldspar-biotite and feldspar-hornblende stocks of Tertiary age (Babine Intrusives). The Newman dacitic Volcanics exposed in the southern part of the property are associated with these intrusions.

Mineralization on the property is hosted in the Kitsum Creek sediments and occurs along a 5 km long east-west trend. Two types of mineralization have been recognized - crosscutting massive sulphide (po, sph, ± cp) pipes and breccias and stratiform (py, sph, gn, tet) zones hosted in coarse sandstone units.

## 4. Diamond Drill Results

Four diamond drill holes (FW-80 - 83) tested a weak east-west trending IP anomaly over a strike length of 1.4 km. All four holes intersected a sedimentary sequence of sandstones and





siltstones but no zones of economic mineralization were defined. All of the diamond drill holes intersected thick overburden ranging from 45 meters thick in the vicinity of holes FW-80 and 81 to 75 meters thick in FW-83.

5. Conclusions

Diamond drilling to the east of the known zones of mineralization failed to define any areas of additional mineralization. Deep overburden and the weak IP response suggests that the IP anomaly is not due to a bedrock source. Further diamond drilling in this area is not warranted.

*Gary Wells*

6. Itemized Cost Statement

filed for \$25,000.00

GER 3, FW

Diamond Drill Holes FW-80, 81, 82, 83

A. Contractor Costs (see attached invoices)

## 1. Drilling Costs

a.	FW-80 (131.1 m)	5515.14
b.	FW-81 (137.2 m)	6102.48
c.	FW-82 (170.1 m)	8313.98
d.	FW-83 (167.7 m)	8412.49

## 2. Cat time - road clearing and site construction

72 hours x \$70/hr	5040.00
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## 3. Man hours - water line maintenance

79 hours x \$21/hr	1659.00
--------------------	---------

B. Field Costs

## 1. Personnel

T. Eldridge	14 days x \$300/day	4200.00
J. MacDonald	14 days x \$300/day	4200.00

## 2. Truck/radios

14 days x \$70/day	980.00
--------------------	--------

## 3. Food/Accommodation

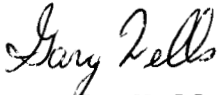
14 days x \$70/day	980.00
--------------------	--------

Total	<u>\$45,403.09</u>
-------	--------------------

7. Statement of Qualifications

I, Gary S. Wells, hereby certify that:

1. I hold an Honours Bachelor of Science degree in combined geology and chemistry (1975) from Carleton University, Ottawa, Ontario and a Ph.D degree in geology (1980) from Queen's University, Kingston, Ontario.
2. I am an associate member of the Geological Association of Canada and a member of the Canadian Institute of Mining and Metallurgy.
3. I have practised my profession in exploration continuously since graduation in 1980.

  
Gary S. Wells

Date: May 15, 1991

Appendix I

Diamond Drill Logs: FW-80, 81, 82, 83





HOLE NUMBER: FW-80

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 13-May-1991

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
101.40 TO 106.70	MDSTN	Colour: black Grain Size: Siltstone grades into mudstone; massive bedding; minor slicks				
106.70 TO 122.90	SLTST & SST	Colour: dark grey to black sltst; med grey sst. Flaser bedding, convoluted bedding Possible ripples, minor slicks  111.45-112.7 -shears and fault gouge and breccia; minor displacement; graphite slicks (oblique movement)  112.6-112.7 -rubby core	45			Siltstone with thin and occasional medium-thick interbed of sst; some mudstone intervals are carbonaceous  121.9-122.9 -grading downwards into sst.
122.90 TO 125.85	SST	Colour: light-med. grey Grain Size: fine to medium Rip-up clasts of sltst-mdstn; scours, possible x-beds; tops up hole	50	Thin calcite veinlets devoid of sulphides		Carbonaceous wisps locally  125.90 -thin 3 cm seam of fusane  122.90-131.1 (E.O.H.) - is a sst dominated sequence (approx. 80% SST); outwash or migrating river channel
125.85 TO 128.80	SST AND SLTST	Colour: med. and dark grey Grain Size Thin interbeds, some x-beds and rip-up clasts; minor slicks				

HOLE NUMBER: FW-80

DRILL HOLE RECORD

LOGGED BY: J. McDonald

PAGE: 3

HOLE NUMBER: FW-80

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 13-May-1991

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
128.80 TO 131.10	SST  E.O.H.	Colour: med. light grey Grain Size: medium Top 1.0 m is thin bedded with carbonaceous wisps; remainder is massive	61	Minor calcite veinlets; sst are calcareous		sst consists of sub-angular to sub-rounded clasts of qtz-fld and sltst or mdstn; lithic or kose

HOLE NUMBER: FW-80

DRILL HOLE RECORD

LOGGED BY: J. McDonald

PAGE: 4





HOLE NUMBER: FW-81

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 13-May-1991

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 73.17	«CASING»					
73.17 TO 84.00	MDSTN & SLTST	Colour: dark grey to black Grain Size: Massive bedding, also includes poorly developed thin beds of sst and sand sltst Narrow 5 cm to 20 cm wide zones of fracture to breccia with gouge and slicks (oblique movement)	40	Minor calcite veinlets		Broken and rubbly core to 85 m
84.00 TO 86.00	SLTST AND S	Colour: dark grey Grain Size: Thin wispy bedding, convoluted and flaser				
86.00 TO 91.00	SST & SLTST	Colour: med. grey sst, dark grey sltst Thick beds with thin bedded sltst tops; carbonaceous wisps; rip-up clasts, flaser bedding  88.5-91 -fractured to brecciated with minor gouge development	45	Minor calcite veinlets; 50 deg and 15 deg to c.a.		
91.00 TO 99.10	SLTST AND SAND SLTST	Colour: dark grey Grain Size: Common flaser bedding; poorly developed thin bedding; some scours and minor fracturing	50			
99.10 TO 110.90	SST	Colour: light grey Grain Size: medium Thick beds with minor very thin beds of sltst 50-55 deg, scours, clasts sltst, scours, clast (sltst) 109.9-110.8 -fractured with minor gouge; gouge @ 60 deg to c.a.		Minor calcite veinlets, calcareous		Minor carbonaceous wisps; porous due to leaching of calcite?

HOLE NUMBER: FW-81

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 13-May-1991

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
110.90 TO 132.00	SLTST	<p>Colour: dark grey Grain Size: Thin to massive bedding, minor flaser bedding</p> <p>111.35-113 -strongly fractured with gouge and breccia; some graphitic gouge; minor slicks with oblique movement</p> <p>115 m 121 m</p>	20 35	Minor calcite veinlets		Minor sst and sltst throughout; common mudstn interbeds
132.00 TO 137.10	SLST & SST	<p>Colour: Grain Size: Faulted from 111.35-137.1 Rubbly fractured core 5 cm wide zones with gouge some graphitic slicks show oblique movement</p>		Minor calcite veinlets		Minor sst about 15% of interval
	E.O.H.					



HOLE NUMBER: FW-82

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 13-May-1991

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 103.63	«CASING»					
103.63 TO 107.28	BASAL TILL	Colour: Grain Size: Poorly sorted sand to boulder sized clasts within a clay-silt matrix graphitic in 15 cm above the bedrock contact				Clasts of sst, sltst and mdstn; also less igneous clasts fld porphyry, possible tuff
107.28 TO 116.08	SLTST	Colour: dark grey black 107.28-131 -fault zone 107.3 m Fracturing and lesser brecciation throughout; shears up to 20 cm and gouge up to 10 cm wide; slickensides show oblique to strike slip movement some gouge and shears are graphite (20%) Shears @ Shears @ Micro-faults appear to have normal displacement	30  45 55	Calcite veining throughout; veinlets at 0, 40, 60, 80 deg. to c.a.	<1%	
116.08 TO 123.50	MDST & SLTS T	Colour: dark grey and black	55		<1%	Structure as noted above
123.50 TO 130.06	SST & SLT ST	Colour: medium and light grey Grain size: fine to med. Primarily medium to thick beds; some flaser bedding; some rip-up clasts variable 0 - 45 deg			<1%	Structure as noted above; about 30% thick interbed of sltst
130.06 TO 133.12	SLTST	Colour dark to medium grey Massive bedding 58 deg to 70 deg average 60 deg				

HOLE NUMBER: FW-82

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 13-May-1991

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
133.12 TO 141.70	SST & SLTST	Grain Size: fine to coarse Thin bedded and minor laminated sltst and sst; cross bedding (tops up-hole), flaser bedding, graded bedding (tops uphole) 60 - 65 deg Minor shears with graphite slicks		Minor calcite veining	<1%	
141.70 TO 147.50	MDSTN	Colour: black Bedding is massive, minor shearing and fracturing				
147.50 TO 170.07	SLTST  E.O.H.	Colour: dark grey to dark Fault Zone Moderate shearing, broken core, calcite veinlets throughout; minor gouge and breccia development some shear slips and gouge are graphitic slicks show oblique movement and less dip slip	65			Minor interbeds of sst and mdst

HOLE NUMBER: FW-82

DRILL HOLE RECORD

LOGGED BY: J. McDONALD

PAGE: 3



HOLE NUMBER: FW-83

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 13-May-1991

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 109.00	«CASING»					
109.00 TO 113.33	SST	Colour: medium grey Grain Size: fine to med. Thin to medium beds; cours and rip-up clasts; tops uphole, contorted bedding	45			Silty sandstone with some carbonaceous wisps
113.33 TO 121.91	MDST	Colour: black Massive Fault zone  114-122 -narrow (10-15 cm) zones of shearing 0-10 deg with or without brecciation and gouge; slicks show dip slip movement; graphite on some slicks and in some gouge; fault mark bedding to c.a. change from 45 deg above it to 0 - 10 deg below it; shear primarily at 45-55 to c.a.		-very minor calcite veinlets		Rare carbonaceous seam (coal-durane)
121.91 TO 140.85	SST	Colour: dark grey to black Grain Size: v. fine to fine Thin to medium bedding; convoluted bedding 0-10 deg Vague wispy bedding contacts; one scour suggests tops uphole? 10-15 deg		Calcareous		Fine grained sst interval with minor sltst  128 -grain size increases slightly and get dark and light-medium grey sst; some possible bioturbation; muddy siltstone
140.85 TO 151.78	SLTST	Colour: dark Massive, vague bedding				
151.78 TO 157.15	SST	Colour: med. grey Grain Size: fine and medium Thin and medium beds				Thin to medium beds, generally vague wispy contacts; unit coarsens downward hard to get top direction, possible tops uphole?

HOLE NUMBER: FW-83

DRILL HOLE RECORD

LOGGED BY: J. McDONALD

PAGE: 2



HOLE NUMBER: FW-83

MINNOVA INC.  
DRILL HOLE RECORD

DATE: 13-May-1991

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
157.15 TO 167.30	MDSTN E.O.H.	Colour: dark grey Grain Size: Massive - vague bedding				Mudstone to silty-mudstone

HOLE NUMBER: FW-83

DRILL HOLE RECORD

LOGGED BY: J. MCDONALD

PAGE: 3

Appendix II

Diamond Drilling Invoices

# J. T. THOMAS

## DIAMOND DRILLING LTD.

Box 94  
 Smithers, B.C.  
 V0J 2N0  
 Phone: (604) 847-4361

Branch Office  
 Timmins, Ont.

TO: Minnova Inc.  
 3rd Floor - 311 Water Street  
 Vancouver, B.C.  
 V6B 1B8

Invoice No.: 91-1  
 Invoice Date: March 19, 1991  
 Property: Fireweed

This is our invoice for diamond drilling and other services to the completion of the project.

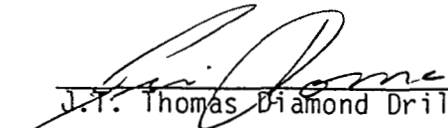
DRILL: A-12

MOND DRILLING: 2975.4 Metres (see attached Pages One - Three)	\$	127,453.45
MAN & MACHINE HOURS: (see attached Pages Four - Five)		5,391.50
MATERIALS: (see attached Page Six)		11,148.33
GRADER: to clear access road (see attached Invoice)		219.00

SUB TOTAL:	\$	144,212.28
GST: 7%		10,094.86
TOTAL DUE:	\$	154,307.14

The above calculations are agreed to by:

\_\_\_\_\_  
 Company Representative

  
 J.T. Thomas Diamond Drilling (1980) Ltd.

**MINNOVA INC.**

GST Registration # R102737806

VENDOR NAME	INVOICE NUMBER OR DATE	CURRENCY 1 - CDN 2 - U.S.	F	
J. T. THOMAS	91-1	1		
ACCOUNT CODE				CR
AMOUNT				

*Garth CK'd*

# J. T. THOMAS

## DIAMOND DRILLING LTD.

Box 394  
 Smithers, B.C.  
 V0J 2N0  
 Phone: (604) 847-4361  
 Minnova - Drill A-12

February 7 - March 12, 1991

Branch Office  
 Box 944  
 Timmins, Ont. P4N 7H5  
 Phone: (705) 267-6633  
 Page One

DIAMOND DRILLING:

Hole No.	Date	Overburden		Coring		Total Meterage	Rate	Amount
		From	To	From	To			
91-80	February 12	0 -	15			15.0	\$ 39.90	\$ 598.50
		15 -	30			15.0	43.90	658.50
		30 -	45			15.0	48.30	724.50
		45 -	60			15.0	53.10	796.50
		60 -	62.5			2.5	58.40	146.00
				62.5 -	131.1	68.6	39.90	2,737.14
91-81	February 14	0 -	15			15.0	39.90	598.50
		15 -	30			15.0	43.90	658.50
		30 -	45			15.0	48.30	724.50
		45 -	60			15.0	53.10	796.50
		60 -	73.2			13.2	58.40	770.88
				73.2 -	137.2	64.0	39.90	2,553.60
91-82	February 15	0 -	15			15.0	39.90	598.50
		15 -	30			15.0	43.90	658.50
		30 -	45			15.0	48.30	724.50
		45 -	60			15.0	53.10	796.50
		60 -	75			15.0	58.40	876.00
		75 -	90			15.0	64.20	963.00
		90 -	103.7			13.7	70.60	967.22
						103.7 -	150.0	46.3
				150.0 -	170.1	20.1	43.90	882.39
91-83	February 17	0 -	15			15.0	39.90	598.50
		15 -	30			15.0	43.90	658.50
		30 -	45			15.0	48.30	724.50
		45 -	60			15.0	53.10	796.50
		60 -	75			15.0	58.40	876.00
		75 -	90			15.0	64.20	963.00
		90 -	105.0			15.0	70.60	1,059.00
		105 -	109.8			4.8	77.60	372.48
				109.8 -	150.0	40.2	39.90	1,603.98
				150.0 -	167.7	17.7	43.90	777.03
91-84	February 19	0 -	15			15.0	39.90	598.50
		15 -	30			15.0	43.90	658.50
		30 -	45			15.0	48.30	724.50
		45 -	60			15.0	53.10	796.50
		60 -	70.1			10.1	58.40	589.84
				70.1 -	140.2	70.1	39.90	2,796.99
91-85	February 21	0 -	15			15.0	39.90	598.50
		15 -	30			15.0	43.90	658.50
		30 -	45			15.0	48.30	724.50
		45 -	60			15.0	53.10	796.50

# J. T. THOMAS

## DIAMOND DRILLING LTD.

Box 394  
 Smithers, B.C.  
 V0J 2N0  
 Phone: (604) 847-4361  
 Minnova - Cat

February 7 - March 12, 1991

Branch Office  
 Timmins, Ont.  
 Page One

CAT HOURS:

<u>Date</u>	<u>Cat</u>	
February 7	8	} snow ploughing, road & site construction FW-80 to 83 incl.
February 8	8	
February 9	7½	
February 10	7½	
February 11	8	
February 12	8	
February 14	8	
February 15	8	
February 16	1	
February 16	8	
February 17	5	
February 18	8	
February 19	7	
February 20	8	
February 21	8	
February 22	8½	
February 23	6	
February 24	8	
February 25	8	
February 26	8	
	1	
	1	
February 27	8	
February 28	7	
March 1	8	
March 2	8	
March 3	8	
March 4	6	
March 5	6	
March 6	8	
	1	
March 7	6	
March 8	5	
March 9	8	
March 12	2	

229½

Total Cat Hours : 229½ Hours @ \$ 70.00/Hour = \$ 16,065.00

# J. T. THOMAS

## DIAMOND DRILLING LTD.

Box 394  
 Smithers, B.C.  
 V0J 2N0  
 Phone: (604) 847-4361  
 Minnova - Drill A-12

February 7 - March 12, 1991

Branch Office  
 Timmins, Ont.  
 Page Four

MAN & MACHINE HOURS: (50% of cost of waterlines over 3,000 feet)

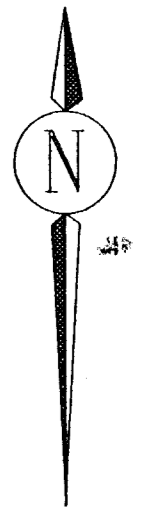
<u>Date</u>	<u>Mohr</u>	<u>R.Denboer</u>	<u>Dyck</u>	<u>M.Denboer</u>	<u>Campbell</u>	<u>W.Groot</u>	<u>Larsen/ M.Groot/ Rudkavich</u>	<u>Larsen</u>	<u>Drill</u>
Feb. 7			½	1					
Feb. 16	½	½			3	3	6		
Feb. 17	½	1½	1½	1½					
Feb. 18	4	4	1½	1½		½	1½		
Feb. 19	3½	3½	6	6	1	½			
Feb. 20	1½	1½	4	4	3	3			
Feb. 21	1	1			4½	4½			
Feb. 22	3½	2	1	1	3	3½			2 2
Feb. 23	2	2	1½			½			
Feb. 24	1½	1½		1	½	2			
Feb. 25	3	3	1	1	1				
Feb. 26			½	1					
Feb. 27				1		1			
Feb. 28	4½	4½	1					1	
Mar. 1	1	1			1				
Mar. 2	1	1		1	1½				
Mar. 3			1	1		1½			

}

waterlines  
for FW-80  
to FW-83 incl

FIREWEED 2

BABINE



GRR 1

FIREWEED 3

FW 5

FW 4

FW-80  
FW-81

FW-82

FW-83

LAKE

GER 1

GER 3

GER 4

FW 6

POWER LINE

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

21,353

*Gary Vella*

**MINNOVA Inc.**

MAP No.  
3

FIREWEED PROPERTY  
1991 DIAMOND DRILL HOLE LOCATIONS

DATE : MAY 1991	FILE : FIREASS.DWG
DRAWN BY : GSW/sg	SCALE : 1 : 5000
REVISED :	0 100 200m