

COMINCO LTD.

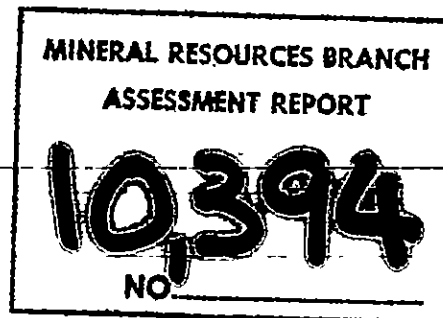
SULLIVAN MINE

KIMBERLEY, B.C.

SILURIAN (LOT 13556) C.G.M.C. GROUP

ASSESSMENT REPORT

	<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
1.	Introduction .....	1
2.	Detailed Technical Data and Interpretation .....	2
3.	Author's Qualifications .....	3
4.	Index and Location Maps .....	4,5
5.	Itemized Cost Statement .....	6
6.	Diamond Drill Log .....	7-28



SULLIVAN MINE

COMINCO LTD.

KIMBERLEY, B.C.

SILURIAN AND DEVONIAN C.G.M.C.'S GROUP

ASSESSMENT REPORT

(This assessment work was done on a Producing Property)

The following report describes the results of drilling diamond drill hole 6448, a 1812-metre hole, in the Kimberley area on the Silurian and Devonian Crown-granted mineral claims located in the Fort Steele Mining Division.

The N.T.S. Location is 82F/9E

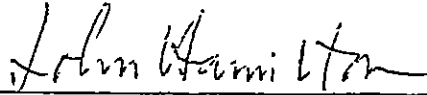
Latitude 49°43'42"N  
Longitude 116°03'45"W

Cominco Ltd., owner of the claims, was the operator of the exploration program.

A.S. Hagen is author of this report

Date of Submission: May, 1982

Endorsed For  
Release By:

  
\_\_\_\_\_  
J.M. Hamilton  
Chief Geologist, Kimberley

10394

## INTRODUCTION

### (i) Specific Location

D.D.H. 6448 is located 4 kilometres west of the Sullivan orebody. Access to the site is by way of gravel road originating at the Sullivan Mine open pit area.

### (ii) Property Definition

The property being investigated forms part of the Sullivan Mine claim group, owned by Cominco Ltd. Cominco has operated the Sullivan Mine for about 76 years. The Sullivan orebody is one of the largest base metal deposits in British Columbia and has contributed a major portion of the mineral wealth generated in the province.

(iii) One hole is being reported on in this report. D.D.H. 6448 was drilled using H wireline tools, 9.6 cm in diameter to a depth of 705 metres; N wireline tools, 7.6 cm in diameter from 705 metres to 1,470 metres and B wireline tools, 6.0 cm in diameter, from 1,470 metres to 1,812 metres.

(iv) D.D.H. 6448 was drilled on the Silurian and Devonian Crown-granted mineral claims as follows:

Silurian C.G.M.C.	0 - 1098 m
Devonian C.G.M.C.	1098 - 1812 m

DETAILED TECHNICAL DATA AND INTERPRETATION

D.D.H. 6448

(i) Purpose

The purpose of D.D.H. 6448 was to test the Sullivan Horizon at depth, west of the Sullivan Mine and north of the Kimberley Fault. The Kimberley Fault is a north-dipping, east-west trending fault which occurs immediately north of the Sullivan orebody. The fault has an apparent vertical displacement of approximately 1500 metres.

(ii) Results

The drill target, the Sullivan Horizon, was not reached. D.D.H. 6448 was stopped at 1,812 metres after deflecting into the Kimberley Fault. Eight wedging attempts to control hole wandering were unsuccessful.

(iii) Interpretation

- 0 - 6 m Overburden
- 6 - 10 m Bedrock, no core. Triconed into more competent ground.
- 10 - 1464 m Quartzitic wacke, wacke and subwacke, light to dark gray, medium to very fine, very thick-bedded to thinly-laminated. These rocks are typical of turbidites and inter-turbidites of the Middle Aldridge Formation. Three zones of gabbro, typical of Moyie intrusives were intersected from 362-417m, 591-643m and 832-920m.
- 1464 - 1564 m Bedded sedimentary rock similar to 10-1464 m with minor shearing parallel to bedding and colour alteration that highlights features in the more argillaceous portions of beds.
- 1564 - 1649 m Kimberley Fault zone. Intensely sheared, disrupted sedimentary rock. Considerable recrystallized, milky-white quartz throughout. Some original bedding features poorly preserved. At the base of this zone is one metre healed breccia containing quartzitic fragments set in a dark grey, gouge-like matrix.
- 1649 - 1783 m Sedimentary rock, intensely altered due to proximity to the Kimberley Fault zone. Bedding features are extremely vague.
- 1783 - 1812 m Wacke and subwacke, greenish-gray, very fine; laminated to thin bedded. Pervasive minor chloritic alteration. These rocks are typical of the Lower Aldridge Formation.

(iv) Conclusion

D.D.H. 6448 was drilled in Middle Aldridge stratigraphy to 1465 m, in the Kimberley Fault to 1649 m and in Lower Aldridge stratigraphy to 1812 m where the hole was stopped. The target Sullivan Horizon was faulted out by the Kimberley Fault. No sulphide mineral accumulations of economic interest were intersected.

AUTHOR'S QUALIFICATIONS

As author of this report, I, Arthur S. Hagen certify that:

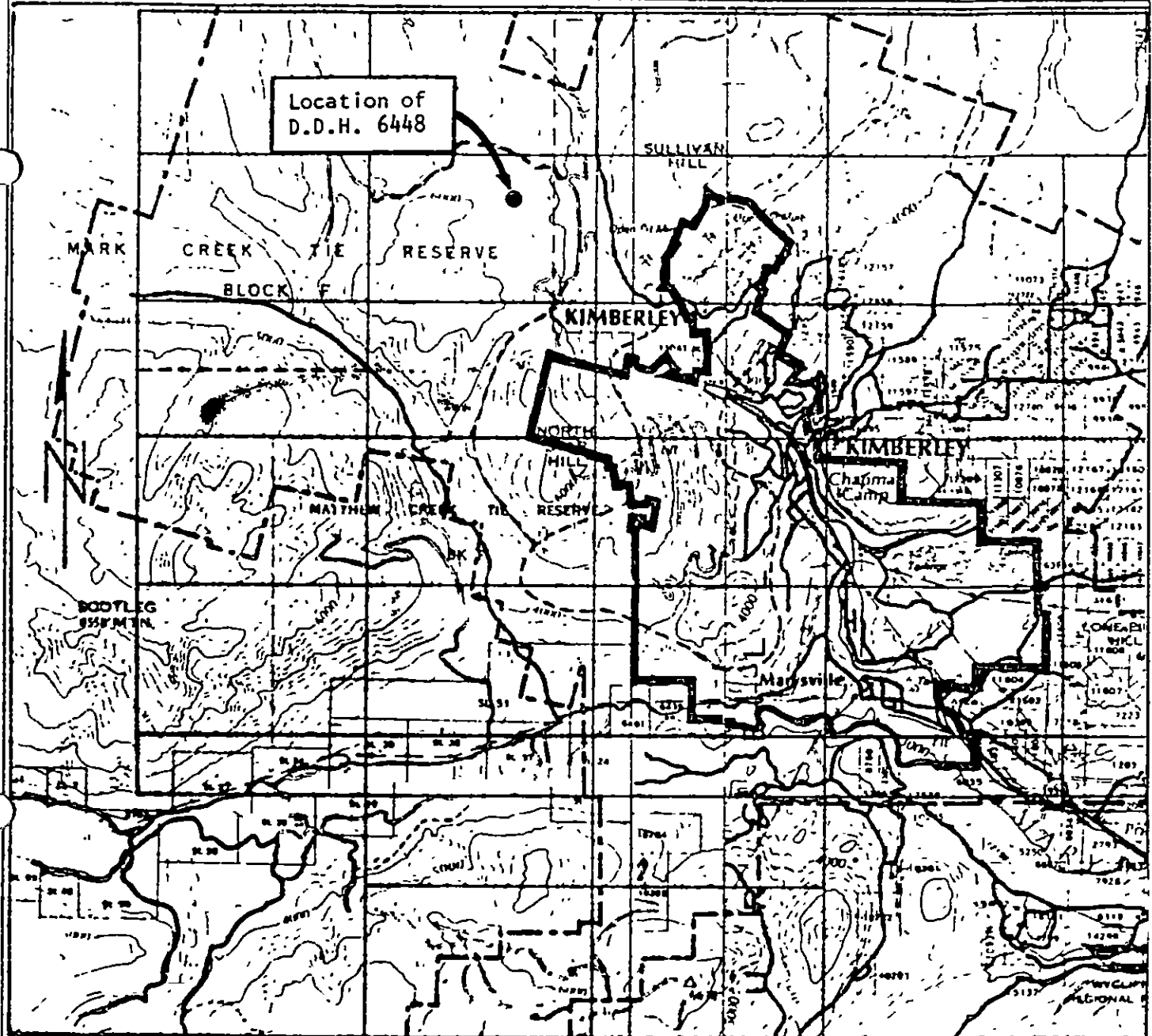
I am employed by Cominco Ltd. as a Senior Geological Technician active in minerals exploration.

I have been continuously engaged in mining and exploration geology for the past 25 years.



---

A.S. Hagen  
Sr. Geological Technician



NTS 82 F/9E



SULLIVAN MINE- KIMBERLEY, B.C.



Drawn by:	ASH	Traced by:	
Revised by	Date	Revised by	Date

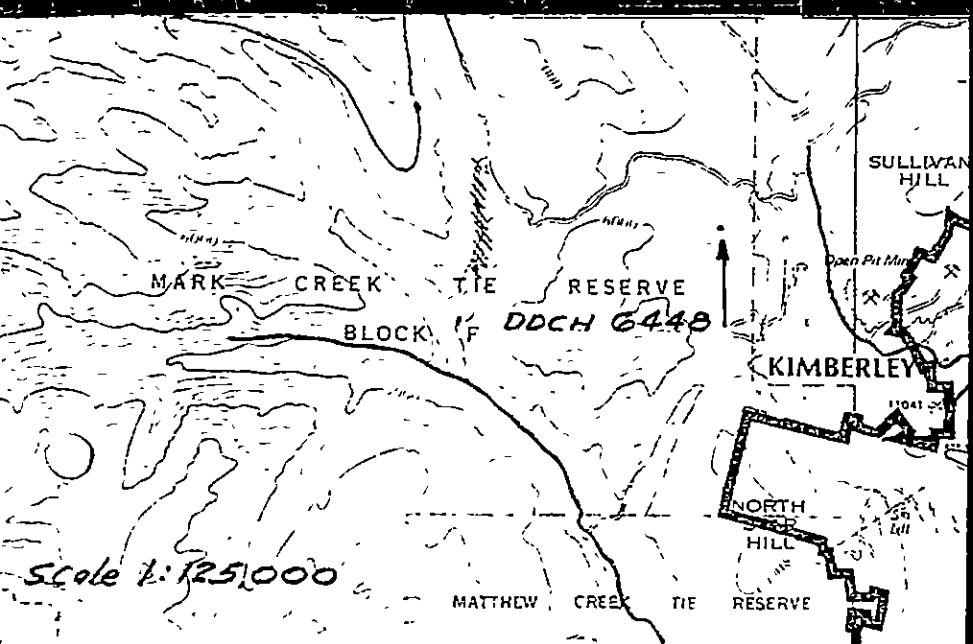
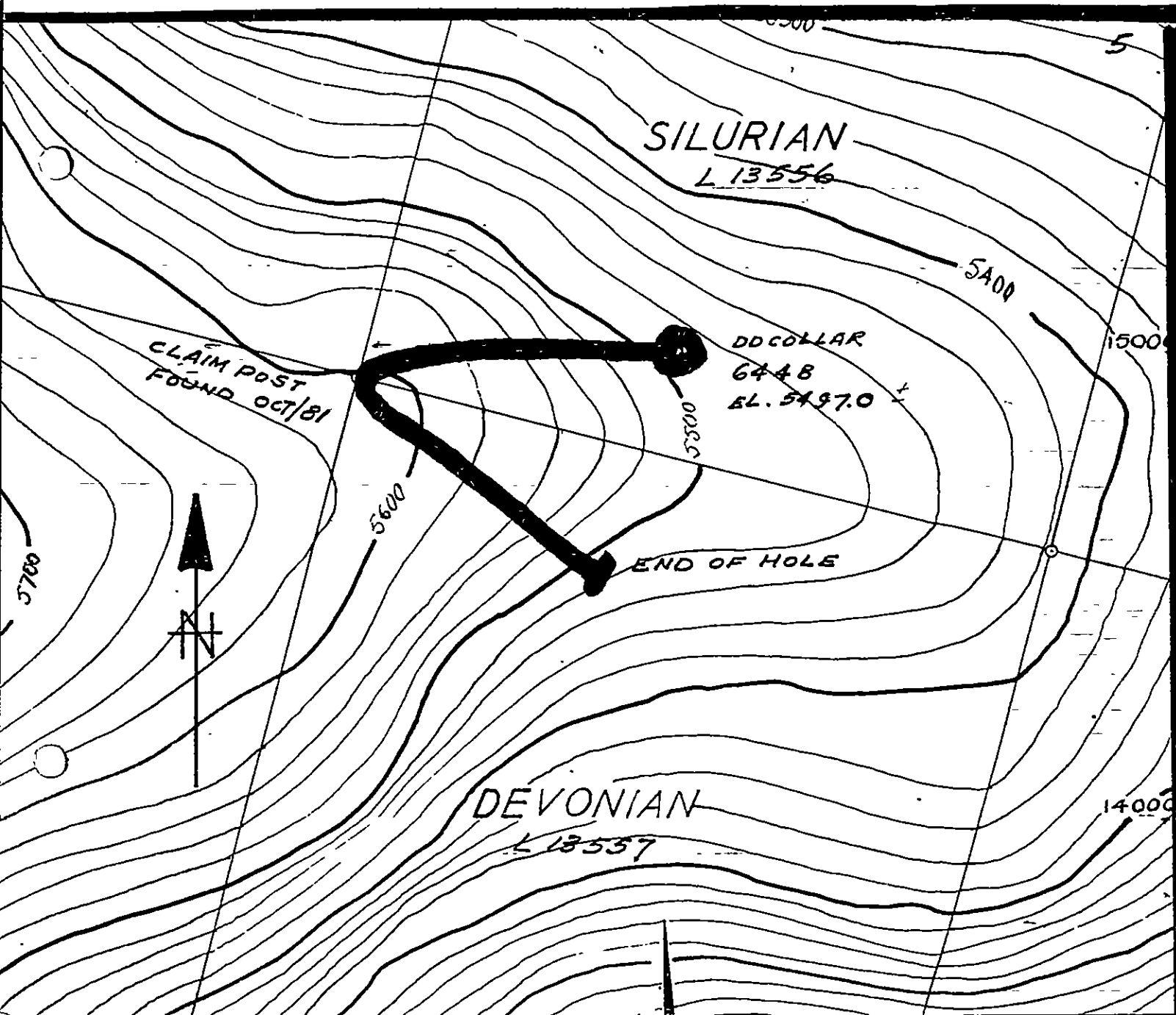
INDEX MAP

LOCATION OF D.D.H. 6448

Scale: 1:125,000

Date April 1982

Plate



COMINCO LTD.  
 SULLIVAN MINE -  
 KIMBERLEY B.C.  
DDCH-6448  
SILURIAN GROUP  
 SCALE 1:3600

Scale 1:125,000

COMINCO LTD.  
Sullivan Mine  
Kimberley Operations

CONTRACTOR: Longyear Canada Inc. 6  
LOCATION: East Slope - Mark Hill

START: September 8, 1981  
FINISH: March 3, 1982

COST STATEMENT: SILURIAN GROUP DD6448 - 1811m (5944')

metres

0 - 9 O.B.	\$ 1,059.20	
9 - 704 HQ	85,324.55	
704 - 1469 NQ	129,209.90	
1469 - 1811 BQ	<u>86,671.20</u>	\$302,264.85

Hourly Charges

Hole Conditioning	\$ 63,735.00	
Water Line Maintenance	10,003.00	
Hole Reduction	6,457.50	
Wedging	32,422.44	
Moving In, Out, Set Up	26,532.25	
Tests - Sperry Sun, Heat	10,800.00	
Travel Time	<u>18,984.00</u>	168,934.19

Mud and Additives

Quik Gel 2406 50# bags	\$ 18,863.04	
Quik Trol 1653 1 kg bags	14,992.71	
CC 16 12 50# bags	405.60	
Kwik Seal 38 40# bags	1,548.50	
Portland Cement 33 80# bags	247.50	
Fondu Cement 73 87# bags	2,044.00	
Vegetable Oil 28 45 gal.drums	7,369.32	
Torq Trim 1 55 gal.drums	1,203.47	
S.A.P.P. 1 100# bag	<u>116.55</u>	46,790.69

Materials

HQ Bits 2 @ \$757.90	\$ 1,515.80	
HQ Shells 1 @ 308.46	308.46	
NQ Bits 13 @ 477.00	6,201.00	
NQ Shells 6 @ 241.33	1,447.96	
BQ Bits 9 @ 328.60	2,957.40	
BQ Shells 5 @ 198.22	991.10	
HW Casing 3 @ 215.87	647.61	
HW Shoe 1 @ 243.80	243.80	
BW Shoe 1 @ 116.60	116.60	
Tricones 5 @ 201.35	1,006.75	
NQ Rods 8 @ 123.23	985.84	
NX Reamer 1 @ 715.63	715.63	
BQ Rods 1 @ 99.27	99.27	
Hoist Cable 4 @ 338.36	1,353.44	
15% Overhead Charge	2,654.89	
Less Diamond Recovery (Credit)	<u>-7,269.00</u>	13,976.55

Cominco Charges

Tractors (move & snowplowing)	\$ 4,014.00	
Trucks Lowbed, Crane	2,360.00	
Operators	6,549.00	
Labour Crew	88.00	
Shop Labour	2,070.00	
Geology Supervision	<u>20,000.00</u>	35,081.00

Miscellaneous Charges

Core Boxes	\$ 2,271.77	
Mobilization-Demobilization	<u>4,600.00</u>	6,871.77

TOTAL COST \$573,919.05



# Diamond Drill Geological Log For D.D.H. 6448



LAT	149901.09	DEP	-9912.26	ELEV.	5566.00
DIP	-67°40'	AZIM.	272°20'58"	LENGTH	5,944'
HORIZ. COMP.	1400' (approx.)	VERT. COMP.	5706.80'		
DATE COLLARED	Sept. 14, 1981	DATE COMPLETED	February 25, 1982		
CORE STORAGE	Open Pit				
DRILLED ON CLAIM(S)	Silurian C.G.M.C. and Devonian C.G.M.C.				
OBJECTIVE	Test Sullivan Horizon				
PLANNED LENGTH	5500'				
TERMINATION COMMENTS	Target faulted out.				
DRILLED BY	Longyear Canada Inc.				
TYPE DRILL	V52				
CORE SIZE	HQ 32'-2311', NQ 2311'-4820', BQ 4820'-5944'				
PERFORMANCE COMMENTS	This drill machine performed very satisfactorily. Only minor delays were experienced due to maintenance and repair.				

**GENERAL COMMENTS:**  
 Despite eight wedging attempts, the hole continued to wander and eventually intersected the major Kimberley Fault complex resulting in the drilling target being faulted out.

CASING REMAINING IN HOLE (LENGTH & SIZE)	3-10' HW Casing
TYPE CAP & SEALING METHOD	2 foot HW casing cap threaded into casing.
OTHER MATERIAL REMAINING IN HOLE	Steel wedges @ 3466' and 3494'.
SURVEY INSTRUMENT USED	Sperry-Sun Single Shot.
ADDITIONAL DOWN HOLE TESTS	Thermal test at 5,943' = 121°F.

### LOG LEGEND

#### BED THICKNESS CLASSIFICATION

BEDS	Very Thick Bedded
	100 cm
	Thick Bedded
	30 cm
	Medium Bedded
	10 cm
	Thin Bedded
	3 cm
	Very Thin Bedded
	1 cm
	Laminated
	0.5 cm
LAMINAE	Thin Laminated

#### LITHOLOGY ABBREVIATIONS

- OQ - Orthoquartzite
- QA - Quartz Arenite
- QW - Quartz Wacke
- QCW - Quartzitic Wacke
- W - Wacke
- SW - Sub Wacke
- AG - Argillite

DDH 6448

# Diamond Drill Geological Log



Objective TEST SULLIVAN HORIZON AT DEPTH, WEST OF THE  
MINE & NORTH OF THE KIMBERLEY FAULT  
Sampled N11  
Logged By A S HAGEN Date Sept /81 - Feb./82 Composites N11  
Block Sect Place Silurian C.G.M.C.  
Devonian C.G.M.C. App. Bear 270° at collar App. Dip -68° at collar Length 5,944'

From	To	Discard	Reason
0	18	Overburden	
18	32	Bedrock, no core.	Triconed and cased into more competent ground
32	140	Thinly laminated to thin bedded sediments.	W-SW-A Some thinly laminated segments Occasional current effects. Wispy calcite, quartz, pyrrhotite laminations and flecks common. Bedding 70°-75° to core. Minor fracturing 25°-30° to core.
140	147	Thin bedded-medium bedded QW-QW-W with SW-A interbeds.	Some pyrrhotite flecks in coarser material Abrupt changes from coarser, light grey, more siliceous sediment to medium-dark grey SW-A beds. Bedding 65°-70° to core.
147	153	Medium-dark grey, massive appearing SW-A.	Similar lithology to 32' to 140' with wispy, pyrrhotite mineralized quartz-carbonate. Vaguely thinly laminated.
153	204	Medium-thick bedded QA-QW-QW with medium-dark grey SW-A tops and/or interbeds.	Coarser, siliceous material predominates, some amalgamated beds Occasional clasts noted (not a dominant feature). Current effects noted in some tops and interbeds. Chlorite, biotite, sericite alteration in part. Quartz vein (2") 15° to core at 163'. Bedding 65°-75° to core.
204	248	Thick bedded sediments, QA-QW-QW with SW-A tops and/or interbeds.	Some amalgamated beds. Beds commonly change abruptly from quartzitic to argillaceous material. Bedding 75° to core.

Core Size

HQ

Hole No

6448

Page

1

40 Scale

Color, Plat & Dip Ore Classes & Ave



# Diamond Drill Geological Log



Objective		Sampled		40 Scale	
Logged By		Date		Color Plot & Dips	
Block		Composites		Ore Classes & Ave	
From	To	Discard	Reason	App Bear	App Dip
529	534		Medium-thick bedded sediment, QcW-W with thin, massive, medium-dark grey, SW-A tops (3 beds apparent), variable hardness within beds.		
534	553		Same lithology as 517' to 529'. Bedding 75-80° to core.		
553	603		Medium-thick bedded sediment, QW-QcW (occasional W) with SW-A tops and/or interbeds. Beds commonly change abruptly from quartzite to argillaceous tops, some graded beds. Amalgamated beds in part. Bed tops are commonly medium-dark grey massive SW-A. Calcareous concretion (6") at 554'. Current effects noted in argillaceous portions. Abundant pyrite flecks in some beds. Bedding 75°-80° to core.		
603	670		Thinly laminated to thin bedded sediment, W-SW-A. Light grey massive SW-A beds (distal portions of turbidites?) common. Light grey laminated pyrite speckled calcareous beds also common to this zone. Bases of medium QA-QW beds at 653' and 656'. Bedding 75° to core.		
670	682		Medium-thick bedded sediment, QW-QcW. Similar lithology to 553'-603' etc. Some dark grey, thinly laminated sediment in bottom half of zone. Bedding 80° to core.		
682	730		Thinly laminated to thin bedded sediment, W-SW-A. Lithology similar to 603'-670'. Base of medium QW bed at 691'. Subtly graded QW-A beds common, usually calcareous at bases. Thick (up to 2') beds of massive to vaguely laminated SW-A occur occasionally. Bedding 80° to core.		
730	736		Two thick beds grading from QW-QcW to SW-A tops separated by 1' of alternating massive, light grey SW-A and dark grey, finely laminated beds. Pyrite flecks		

Core Size

HQ

Hole No

6448

Page

3

# Diamond Drill Geological Log



Objective		Sampled		Color Plot & Dip		Ore Classes & Ave	
Logged By		Date		Composites			
Block	Sect	Place	App Bear	App Dip	Length		
From	To	Discard	Reason				
			throughout thick beds. Bedding 80° to core				
736	811		Thinly laminated to medium bedded sediment, similar lithology to 682'-730' etc. Subtly graded beds of W-SW-A thicker (medium) in this zone. Narrow (up to 1") quartz-calcite healed fractures, mainly parallel to bedding, noticeable in this zone with pyrrhotite, pyrite mineralization (galena at 746') Some calcareous segments From 756' to 768' core is shattered by tight fracturing mainly 20° to 30° to core with slight bedding offsets along the breaks (similar shattering 784'-786', fracturing from parallel to 20° to core) Bedding 75° to core.				
811	825		Thick bedded sediment, grading from W to SW-A. Interbeds of dark grey, thinly laminated material and medium-light grey massive to vaguely laminated SW-A. Beds are predominantly argillaceous. Bedding 75° to core.				
825	830		Very thick bed grading from QW to massive SW-A top				
830	851		Thinly laminated to thin bedded W-SW-A. Bedding vague from 843' to 848', appears as massive mudstone in part. Bedding 75° to core.				
851	866		Similar lithology to 736'-811'. Bedding 75°-80° to core.				
866	898		Medium-thick bedded sediment, QW-QW with thin SW-A tops. Fast deposition indicated by absence of typical interturbidite lithologies. Material is predominantly quartzitic, tons are massive medium-dark grey SW-A. Rare thin bed. Bedding 80° to core.				
898	912		Thinly laminated to thin bedded W-SW-A. Vague bedding part in some sections.				

Core Size

HQ

Hole No

6448

Page

4



# Diamond Drill Geological Log



Objective		Sampled		Composites		App Bear		App Dip		Length	
Block	Date	Sect	Place	App Bear	App Dip	Length	40 Scale		Color Plot & Dips	Ore Grades & Aver	
From	To	Discard	Reason								
				laminated to medium bedded. Bedding is folded to overturned in part. Sheared and/or sloughed-like along bedding occasionally with some segmented lens-like remnants (e.g. 978'). Erratic quartz-calcite healed fracturing is common. Occasional crenulated beds. Overturned bedding noted at 985', 997' and 1025'. Core moderately to badly (minor) broken, in part, due to tight fracturing at shallow angle to bedding, fractures also perpendicular to bedding causing slight offsets throughout. Thin (2"-3") sections of gouge at 982' & 983'. No major fault break is indicated. Minor pyrrhotite-pyrite flecks.							
1029	1051			Disturbed bedding similar to previous footage, however, less intense. Bedding thickness range is from thinly laminated to thick bedded. Beds range compositionally from QcW to SW-A, graded in part. Some crenulations (e.g. 1034' & 1044.5') and other folding similar to previous footage, e.g. 1037', 1049' (overturned). Occasional pyrrhotite-pyrite flecks and blebs.							
1051	1062			Two very thick beds (bases 1055', 1062'). Predominantly QA-QW grading to SW-A tops. Bases 75° to core. Quartz, calcite, pyrrhotite and chlorite healed fracture, parallel to bedding at 1051.5'. Minor pyrrhotite-pyrite flecks.							
1062	1076			Lithology similar to 1029'-1051'. (homogeneous QW bed 1064.5'-1066'). Pyrrhotite-pyrite throughout as flecks or irregular lenses. Bedding 70° to core.							
1076	1133			Thinly laminated to thin bedded W-SW-A. Abundant alternating thinly laminated beds and medium grey, massive SW-A types. Occasional massive type in medium thickness range. Quartz-carbonate healed fracturing with pyrrhotite-pyrite occurs parallel to bedding and in fractures 25°-30° to core (minor breaks). Deformed, contorted 1108'-1111' with erratic quartz-carbonate, pyrrhotite-pyrite healed fracturing.							
				Core Size		HQ		Hole No.		Page	
								6448		6	

# Diamond Drill Geological Log



Objective		Sampled	
Logged By		Date	
Block		Composites	
From	To	Discard	Reason
			Some minor offsets along tight fracturing Bedding 75° to core.
1133	1163		Thinly laminated to laminated W parted by segments of W-SW-A (distal turbidites). Bedding 75° to core.
1163	1169		Vaguely bedded W-SW-A, appears massive for most part with irregular pyrrhotite blebs throughout. Variable hardness, some suggestion of grading in part (distal turbidites).
1169	1186		Thick bedded sediment, amalgamated in part QA-QW with W-SW-A tops and/or interbeds. Rock is altered (bleached) highlighting features 2", very fine grained albite-like bed at 1179'. Medium (9") bed grading from QW to SW top at the base of this footage.
1186	1191		Thinly laminated to thin bedded sediment, predominantly W-SW with occasional thin homogeneous QW bed. Rock is altered (bleached). Bedding 70° to core.
1191	1199		Very thick bed grading from QA to SW-A top 1191'-1196'. Thick graded bed below (QA to SW top) with irregular gabbro contact at base. Colour alteration highlights deformed features at the base.
1199	1367		Intrusive sill Gabbro, fine grained at contacts, varying from medium to coarse grained throughout. Compositional proportions variable. Two narrow granophyre-like zones 1248'-1250' and 1277'-1279'. Disseminated pyrrhotite in various amounts throughout. Top contact appears discordant, bottom contact conforms to bedding at 80° to core.
1367	1377		Two very thick beds, bases 1372' and 1377', QA-QW with SW-A tops, topped by

Core Size  
HQ

Hole No  
6448

Page  
7

40 Scale
Color Plot & Dip
Ore Classes & Ave



# Diamond Drill Geological Log



Objective		Sampled			
Logged By		Date		Composites	
Block	Seal	Place	App Bear	App Dip	Length
From	To	Discard	Reason		
		thick QW bed			
1377	1391	Thinly laminated to thin bedded W-SW-A. Section includes 3 graded, medium beds with bases at 1382' (QW to SW-A), 1388' (W to SW-A) and 1389' (W to SW-A). Colour alteration highlights features. Bedding 80° to core			
1391	1402	Medium-thick graded sediment, QW-QcW with SW-A tops, some rip-up clast. Irregular pyrrhotite seam (1/4") along bedding at 1391' Bedding 75°-80° to core.			
1402	1459	Thinly laminated to thin bedded W-SW-A, occasional bed in medium range Typical inter and distal turbidite lithologies. 2" quartz-calcite healed breccia 30° to core at 1408'. Usual tight fracture patterns from 25° to 35° to core, some meandering fracturing occasionally parallels core. Thinly laminated, beds common, some narrow segments with light grey bands. Occasional, narrow, light grey calcareous bed (up to 1"). Bedding 80° to core.			
1459	1533	Medium-thick bedded sediment, QW-QcW with SW-A tops. Some graded beds, other homogeneous quartzites changing abruptly to massive SW-A tops. Approx 6' core ground out from 1464' to 1474' due to broken ground (driller's report), not a major break, fracturing appears similar to previous breaks). Occasional clast (e.g. 1459'). Bedding variable 65° to 80° to core.			
1533	1559	Thinly laminated to thin bedded (predominantly) W-SW-A with occasional medium and thick bed of QW-QcW similar to previous footage with bases at 1541' (thick), 1542.5' (thick), 1551' (thick), 1553' (thick), 1556' (thick), 1557' (medium), 1559' (thick). Bedding 80° to core.			

Core Size

HQ

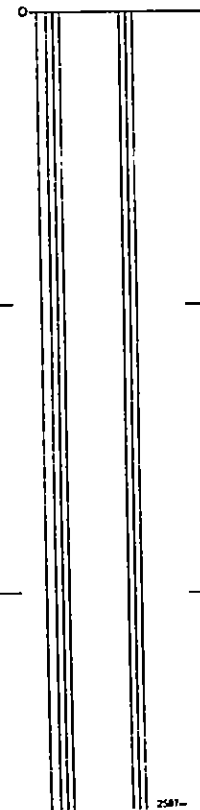
Notes

6448

Page

8

40 Scale  
Color Plot & Dip  
Ore Classes & Avar



# Diamond Drill Geological Log



Objective		Sampled		40 Scale	
Logged By		Date		Clear Plot & Dip	
Block		Sect		Ore Classes & Ave	
Place		App. Bear		App. Dip	
Length		Composites			
From	To	Discard	Reason		
1559	1634		Thinly laminated to thin bedded W-SW-A beds. Occasional medium-thick, graded QcW-W. Some light grey, pyrrhotite pyrite flecked, calcareous beds (pyrrhotite-pyrite commonly concentrated at bases of beds). Bedding 70°-80° to core		
1634	1694		Medium-thick bedded sediment (predominantly thick). Q1-QW (QcW) with massive SW-A tops predominantly. Inter-turbidite and distal turbidite lithologies rare. Cleavage at 1670' and 1673.5' is 25° to core, indicating gently dipping to flat beds (ref. west dipping cleavage trend in area). Occasional fracturing causes broken core in part, some indication of movement along bedding planes. e.g. 1675' minor gouge and broken ground. Bedding 70° to core.		
1694	1735		Thinly laminated to thin bedded sediment W-SW-A. Fracturing results in considerable broken core in this section. Bedding mainly 70°-75° to core (some variations, e.g. 88° at 1712'). Minor faulting 40°-45° to core at 1701' - 1701' bedding 30° to core, some offsets, irregular bedding, fracturing with gouge in part. Predominant fracturing 30° to core.		
1735	1781		Medium-thick (predominantly thick) bedded sediment, Q1-QW-QcW, graded in part. Some beds change abruptly from quartzitic bottoms to thin argillaceous tops. Distal and inter-turbidite beds in minority (widest zone 1752.5' - 1754.0'). Occasional, moderately (rare badly) broken core. Fracturing as in previous footage. Bedding 65°-70° to core.		
1781	1782		Gouge with fragmented sediment along break parallel to bedding at 70° and break parallel to 10° to core. Probable result of bedding slip movement.	Core Size HQ	Page 9
				Notes No 6448	

# Diamond Drill Geological Log



Objective		Sampled	
Logged By		Date	
Beck		Sec	Place
		App Bear	App Dip
		Length	
From	To	Discard	Reason
1782	1895		Thinly laminated to thin bedded sediment, predominantly W-SW-A. Some QW-QcW, distal turbidite beds in very thin-thin bedded range. Thick, graded QW to SW-A bed at 1876' (base), medium QW to SW-A bed at 1885' and thick QA-QW to W-SW bed at 1894'. Calcareous segments common. Colour alteration (biotitization, bleaching) highlights features. Occasional broken core due to tight fracturing in patterns similar to previous footages (25°-30° to core common, some meandering breaks parallel core in part). Bedding 65°-70° to core.
1895	1902		Gabbro sill, fine grained. Calcite-quartz healed fracturing in part.
1902	1930		Lithology similar to 1782'-1895' with three thick QA-QW beds with bases at 1908', 1911 and 1923'. Some broken sections resulting from fracturing as in previous footages. Bedding 70° to core.
1930	1938		Medium-thick bedded sediment QW-QcW with SW-A tops and/or inter and distal turbidite beds.
1938	2110		Gabbro sill. Fine grained at contacts, medium grained 1948'-1956' and 2004'-2104', coarse grained 1956'-2004'. Quartz-calcite healed fracturing similar to that in sediments, however, less intense. Some quartz veining (e.g. 10" at 2029' with minor pyrrhotite). 2" crushed gabbro with gouge 15° to core at 2036' (minor movement indicated). Basal contact occurs in proximity to gouge filled fracture 10° to parallel to core. Distorted, altered, laminated sediment at base offset, along fracturing, into gabbro.
2110	2158		Predominantly thinly laminated to thin bedded sediments of W-SW-A with occasional medium-thick bedded QA-QW beds as follows: 2116' (med.), 2117' (med.), 2118' (med.), 2122' (thk), 2139' (thk), 2153' (thk), & 2156' (thk). Homogeneous, thin QA-QW beds occasionally. Bedding 65°-70° to core.

Core Size

HQ

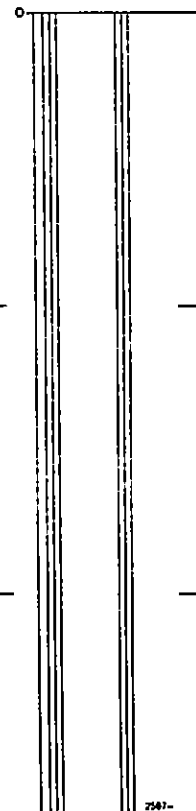
Core No

6448

Page

10

40 Scale  
Color Plot & Dips  
Dra Classes & Ave



# Diamond Drill Geological Log



Objective		Date		Place	Composites	App Bear	App Dip	Length
From	To	Discard	Reason					
2158	2177		Very thick bedded sediment QA-QW (amalgamated in part?), very minor amount of argillaceous material (2" at 2172'). Zone appears as two homogeneous beds.					
2177	2191		Thick bedded sediment. QA-QW-QcW with SW-A tops and/or interbeds. Some irregular, lense-like sediments. Bedding 65°-70° to core.					
2191	2265		Thinly laminated to thin bedded sediment. W-SW-A. Thin, light grey QW-QcW beds common with spotty pyrite at bases. Numerous, narrow laminated beds occur in this section. Bedding 70°-75° to core.					
2265	2312		Thick bedded sediment, rare medium bed. QA-QW, both graded and homogeneous types with SW-A tops. Minor amount of distal and inter-turbidite beds. Some irregular, lens-like features (e.g. 2300', 2305'). Bedding 75°-80° to core.					
2312	2323		Thinly laminated to thin bedded sediment, W-SW-A. Bedding vague in dark grey, argillaceous segments (appears massive in part). Some fine grained, light grey, homogeneous QcW beds. Current features, occasional clast.					
2323	2336		Thick bedded sediment QW-QcW-W. Some graded beds, some homogeneous with massive, dark grey argillaceous tops.					
2336	2368		Thinly laminated to laminated W-SW. Gouge along fracture parallel to core 2344' to 2346'.					
2368	2403		Medium-thick bedded sediment QW-QcW with SW-A tops and interbeds.					
2403	2616		Medium-thick (predominantly thick) bedded sediments. QA-QW-QcW. Abrupt					

40 Scale  
Color Print & Dips  
Ore Classes & Ave

Core Size  
HQ to 2311'  
NQ starts 2311'

Hole No                      Page  
6448                              11



# Diamond Drill Geological Log



Objective		Sampled		4D Scale	
Logged By		Date		Color Plot & Dips	
Block		Sect		Ore Classes & Aven	
Place		App Bear		App Dip	
Length		Discard		Reason	
					(current) features common. Drill bit scoring obliterates most features. Tourmalinized (?) mud chip, boomerang shape, at 3058'.
3069	3101				Same as 3018'-3054'. Fracturing causes broken core in part Fracturing with gouge causes badly broken segments, 3081'-3083' and 3084'-3087'.
3101	3106				Same as 3054'-3069'
3106	3135				Laminated W intercalated with, predominantly, laminated to medium bedded W-SW-A (QcW in part) Amalgamated medium bedded QW-QcW with 3121' to 3126' Bedding 85° to core.
3135	3192				Medium-thick bedded sediment, similar to 3018'-3054' etc. Chlorite developed along cleavage, 35° to core, occasionally (e.g. 3169', 3181'). Bedding 75°-80° to core.
3192	3217				Thinly laminated to thin bedded sediments, predominantly W-SW-A with intercalated, thin, sand beds Numerous narrow (laminated segments between 3199' and 3217'. Some light grey, pyrite flecked calcareous beds Bedding 80° to core.
3217	3294				Medium-thick bedded sediments, QW-QcW with SW-A tops and interbeds. Occasional clasts (rip-ups). Bedding 75°-80° to core.
3294	3346				Medium-thick bedded sediments, QW-QcW with SW-A (predominantly massive) tops, occasional clasts (rip-ups) Moderate to badly broken core 3337' to 3346' due

Core Size  
NQ

Hole No  
6448

Page  
13

# Diamond Drill Geological Log



Objective		Date		Place		Composites		App Bear		App Dip		Length	
From	To	Discard	Reason										
			to more intensive fracturing in that section. Some gouge at 3338', however, no major break indicated. Bedding 75° to 80° to core.										
3346	3353		No core, drillers report badly broken ground										
3353	3358		Broken ground, approximately 3' of core lost. Gouge in fractures 10° to core.										
3358	3408		Lithology similar to 3294'-3346'. Bedding 75°-80° to core.										
3408	3418		Thin-medium bedded QcW-W (predominantly W) with SW-A interbeds.										
3418	3466		Medium-thick bedded QW-QcW, lithology similar to 3358'-3408' etc. Some broken sections due to fracturing from parallel to 10° to core. Bedding 75°-80° to core.										
3466	3474		Laminated W with intercalated, medium-thick QW-QcW similar to 3418'-3466'. Minor, thrust-like offsets along tight fracturing 45° to core at 3465'. Bedding 75° to core.										
3474	3637		Medium-thick bedded QA-QW-QcW, SW-A tops and interbeds. Some amalgamated beds. Beds commonly change from quartzite to thin, massive SW-A tops. Pyrite flecks along cleavage(?) 35° to core at 3475'. Occasional clasts (rip-ups). Four feet of thinly laminated to very thin bedded sediments										
			3500'-3504', predominantly SW-A with some sand lenses and crossbedding										
			moderately broken in part, due to fracturing from 15° to 60° to core.										
			Bedding 70°-75° to core.										
				Core Size									
				NQ									
				Core									
				Hole No								Page	
				6448								14	

# Diamond Drill Geological Log



Objective		Date		Place	App Bear	App Dip	Length
Block	Sect	Discard	Reason				
3637	3710		Medium-thick (predominantly thick) bedded QA-QW-QcW with SW-A tops, interbeds rare. Folded beds 3639'-3648', bedding parallel to core in part (undulating). Some broken core with thin gouge along fractures indicating bedding plan movement. Fracturing similar to that in previous footage causes broken sections, some fracturing parallels core. Chlorite with pyrrhotite occurrence at 3683' (minor). Bedding 3648'-3710' is 65°-75° to core.				
3710	3751		Folded beds, coring parallels bedding for most of this footage. Bedding @ 3712' is 40° to core. 3713'-3746' is undulating, parallel to core for most part. 3747'-3750' is 40°-45° to 50° to core.				
3751	3766		Predominantly thinly laminated-laminated W-SW-A. Oriented biotite suggests cleavage 35°-40° to core.				
3766	3781		Argillaceous beds predominate, thinly laminated to thin bedded with medium beds (QA, QW) at 3777' and 3778.5'. Some cross bedding, irregular lenses. Bedding 75° to core.				
3781	3832		Thick-very thick bedded QA-QW-QcW, interbed material rare. Occasional rip-up clast. Bedding 75°-88° to core.				
3832	4015		Medium-thick bedded QA-QW-QcW, rare thin bed, SW-A tops are predominantly massive. Some beds near very thick range (predom QA). Unusual, trough-like structure at 4,002'. Bedding 75°-85° to core.				
4015	4031		Medium-thick beds of QcW-W and thinly laminated to thin bedded W-SW-A. Bedding 75°-80° to core.				
4031	4120		Medium-thick bedded QA-QW-QcW, rare thin bed. SW-A tops. Thin massive tops common. Occasional W-SW-A interturbidite sediment from thinly laminated to thin bedded. Some irregular, current and/or slough fractures highlighted in.				

Core Size

NQ

Hole No

6448

Page

15

7401



# Diamond Drill Geological Log



Objective							Sampled		40 Scale			
Logged By							Date		Color Plot & Dips		Ore Grades & Avar	
Block			Sect		Place		App Bear		App Dip		Length	
From	To	Reason										
		argillaceous segments. Bedding 75° to core.										
4120	4169	Medium-thick QW-QcW-W and thinly laminated to thin bedded W-SW-A. Core from 4150' to 4169' is moderately to badly broken in part, due to fracturing from perpendicular to parallel to core. Bedding 75° to core at 4120', 60° to core at 4169'.										
4169	4245	Core becomes increasingly broken from 4169' to badly broken for the major portion of this section. Approx. 2/3 of core lost, very fractured ground (adjacent to fault). Lithology originally medium-thick QW-QcW-W with usual W-SW-A interbeds. Bedding at 4232' is 70° to core.										
4245	4259	Fault zone as follows 4245'-4254' 7.5' core loss, fragment filled gouge, fracture planes 20° to core. 4254'-4258' 4' core loss, shattered, brecciated sediment. Badly broken core. 4258'-4259' Lamprophyre, fracturing 15°-30° to core.										
4259	4267	Very thick bed, QA, light to med grey. Homogeneous for most part, laminations in top 4" of sand portion. Upper 1.5' of bed changes abruptly from quartzite to W-SW-A. Minor Pb and Zn mineralization in 1/2" quartz vein at 4261' (cuts core at 15°). Bed 75° to core.										
4267	4271	Predominantly W-SW-A, laminated to thin bedded, some lensy sands in massive mids. One medium graded QcW bed with base at 4270'. Bedding 70° to core.							Core Size			
							NQ					
							Hole No		6448		Page	
											16	

# Diamond Drill Geological Log



Objective		Date		Sampled		Composites		App Bear		App Dip		Length	
Block	Sect	Place	Reason	From	To	Discard	Color	Plot	Dips	Dre	Classes	Aver	
4271	4273	Lamprophyre dyke, sediment fragments in upper 6". Dyke 25° to core.											
4273	4339	Thick-very thick bedded sediments, QA-QW, (amalgamated in part?) with W-SW-A tops and/or interbeds up to 3' thick. Graded beds predominate, some laminated segments. Bedding to core 80° at 4276', 55° at 4300', 42° at 4326'. Cleavage 55°-60° to core at 4300'. Minor Pb, Zn and Pyrr. in healed fractures 40° to core 4321'-4322'.											
4339	4355	Thinly laminated to thin bedded sediments, W-SW-A. Occasional calcareous flecks. Two medium QW beds with bases at 4350' and 4354'. Bedding 60° to core.											
4355	4388	Medium-thick bedded sediments, QW-QcW. This section predominantly quartzitic with thinner segments of W-SW-A tops and/or interbeds. Bedding at 4385' is 75° to core with cleavage 45° to core. Some fine, light grey, calcareous speckling.											
4388	4436	Predominantly, thinly laminated to thin bedded W-SW-A, rare medium QW-QcW bed (4419.5' and 4422'). Dark-light colour contrast is generally poor. Light grey, calcareous laminations at 4424' and 4432'. Bedding to core as follows: 4390.5'-65°, 4400'-60° (cleavage 60°), 4404.5'-60° (cleavage 40°), 4420'-65°, 4424'-60° (cleavage 35°), 4426.5' - (distorted, overturned fold), 4430'-50° (cleavage 60°), 4436'-70° to parallel to core to 40°. Irregular, tight fracturing causes broken core in part, some slickensided fracture planes.											
4436	4492	Medium-thick beds of QA-QW-QcW with usual SW-A tops and interbeds. Beds are folded and/or contorted from 4436' to 4456' with bedding occasionally parallel to core. Bedding to core 55°-60° except for minor, local folds. Light grey, calcareous laminations occasionally.											

Core Size

NQ

Hole No

6448

Page

17

2587-

# Diamond Drill Geological Log



Objective		Sampled		Composites		App Bear		App Dip		Length	
Logged By	Date	Sect	Place	App Bear	App Dip	Length	40 Scale		Core Plot & Dips		Ore Classes & Ave
Bleck	Reason	From	To	Discard							
4492	4562				Medium-thick bedded sediments (predominantly thick), QA-QW-QcW with SW-A tops and/or interbeds, some calcareous segments. Bedding to core: 4503'-50°, 4527'-65°, 4561'-52°.						
4562	4623				Medium-thick bedded sediments, W with occasional bed in QcW range. Calcareous (laminated) portions in upper 15' (up to 2') Laminated, interturbidite lithologies common. Some disrupted segments (current and/or slough) with clasts in part (eg. 4600'). Bedding to core: 4565'-52°, 4580'-55°, 4596'-30°, 4605'-45°, 4615'-65°, 4621'-45°. Cleavage at 4574' is 30° to core.						
4623	4627				Very thick QA-QW, 6" SW-A top.						
4627	4639				Thinly laminated to thin bedded QcW-W-SW-A. One thick (1.5') QcW with base at 4632'. Bedding 55° to core.						
4639	4672				Medium and thick bedded QW-QcW-W. Thinly laminated W-SW-A interbeds. Bedding 50°-55° to core.						
4672	4722				Medium-thick (predominantly thick) bedded QW-QcW with SW-A tops and/or interbeds. Folded bedding indicated (bedding to core: 4693'-30°, 4704'-60°, 4709'-20°), fracturing 35°-40° to core, part of core is moderately broken.						
4722	4773				Medium-thick bedded sediment, QcW-W with SW-A tops and/or interbeds. Similar to previous footage, however, less quartzitic. Folding indicated bedding angles to core as follows: 4728'-50°, 4730'-15°, 4740' to 4765' from parallel to 10°, 4773'-25°.						
4773	4794				Lithology similar to 4672'-4722'. Bedding 70° to core. Fracturing 35°-50° to core.						

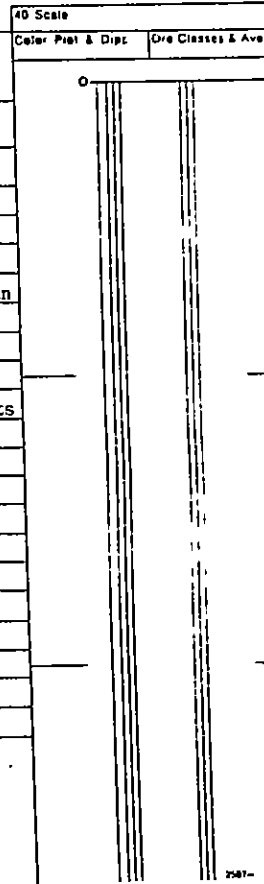
Core Size: NQ  
 Hole No: 6448  
 Page: 18

# Diamond Drill Geological Log



Objective		Date		Place		App Bear		App Dip		Length	
From	To	Discard Reason									
4794	4805	Predominantly SW-A, laminated to thin bedded One medium QcW bed at 4802'. Moderate to badly broken core, fracturing 59° to 70° to core is major pattern with other erratic breaks.									
4805	4820	Similar to previous footage, however, light shearing effects (parallel to bedding) beginning to appear. Some thin (up to 2') quartzite lenses in part 16' QcW-W bed with base at 4810', 10" QA bed with base at 4813'. Bedding 60° to core.									
4820	4873	Medium-thick bedded sediments, QA-QW-QcW with SW-A tops and interbeds (laminated in part). Light shearing effects highlights features in argillaceous segments. Shearing parallels bedding at 40°-45° to core.									
4873	4924	Thin-medium bedded sediments, QW-QcW-W. Argillaceous tops and interbeds comprise approximately 50° of zone. Light shearing effects as in previous footage. Bedding 65°-76° to core									
4924	5069	Medium-thick bedded sediments, QA-QW-QcW. Similar lithology to previous footage, however, quartzitic segments are thicker and comprise major portion of zone. Light shearing as in previous footage. Bedding to core as follows: 4951'-68°, 4988'-70°, 5014'-75°, 5028'-64° and 5052'-70°									
5069	5130	Thinly laminated to thin bedded W-SW-A, occasional medium bed of QA-QcW (bases at 5085', 5110', 5113' (Thk.), 5115', 5118' and 5123'). Light shearing as above. Bedding to core: 5071'-75°, 5100'-75°, 5129'-70°.									
5130	51409	Intensely sheared, disrupted sediment of the Kimberley Fault. Alteration effects result in a variety of colours, particularly in original more argillaceous segments where broken ground is common. Considerable									

Core Size  
 NQ to 4820'  
 BQ  
 Hole No 6448  
 Page 19



# Diamond Drill Geological Log



Objective		Sampled	
Logged By	Date	Composites	Length
Block	Sect	Place	App Bear
App Dip	App Bear	App Dip	Length
From	To	Discard	Reason
			recrystallized milky-white quartz throughout. Some original bedding features vaguely preserved. Segments occasionally calcareous. From about 5230' and below, the rock appears to have been originally more quartzitic than the material in the shear immediately above. Scattered, spotty pyrite is common, some appearing to have formed along original bedding planes, occasional pyrrhotite, although very minor, chalcocopyrite notable for 0.5' at 5304'. Shearing appears to parallel original bedding at 70° to core. The bottom 2 feet of this zone consists of medium-light grey quartzitic fragments in a dark grey, healed, rouge-like material (base of Kimberley Fault zone?).
5409	5848		Zone of intensely altered sediments, similar in many respects to lower half of preceding footage. Recrystallized milky-white quartz common throughout. Bedding features are extremely vague to nonexistent, however, argillaceous segments indicate bed tops and/or interbeds (these segments are commonly more broken with slickensides than predominant quartzitic segments). Pyrite occasionally occurs along what is interpreted as original bedding planes, and also as erratically scattered flecks. The rock has a mottled appearance due to alteration. This section of stratigraphy is well shattered (healed) with segments of well contrasted, brecciated rock. The upper 10 feet of the zone contains a distinctly honey coloured, talc-like material in association with shattered, milky-white quartz. Original bedding angles to core indicated as follows: 5437'-70°, 5496'-65°, 5541'-72°, 5590'-72°, 5672'-75°, 5846'-72°, 5847'-local overturned fold. Crushed brecciated rock at 5644' (2') indicates ground movement, possibly along bedding plane.
5848	5844		Rock becomes less siliceous overall with more distinctive bedding features. Beds range predominantly from laminated to thin bedded, W-Su-A, typical of Lower Aldridge type lithology. As in previous footages, chloritization gives rock a greenish tinge. Ground is far less disturbed than that in preceding

40 Scale  
Color Print & Dips  
Ore Classes & Aves

Core Size

BQ

Hole No

6448

Page  
20

