ASSESSMENT REPORT

on

1997 SUMMIT AREA DRILL PROGRAM

(for filing on the Summit-1, Summit--2, Summit --3, and Niagra 97-1 Groups)

NTS 82E/2 E

Lat: 49° 07' 00"N
Long: 118° 31' 12"W

Kettle River Resources Ltd.
Box 130, 330 Copper St.
Greenwood, B.C.
V0H 1J0

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Echo Bay Minerals Co.
Republic, WA

December, 1997

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1.0 SUMMARY

The Summit area is located in Southern B.C., about 11 kilometres west of Greenwood. The property is underlain by rocks of the Triassic Brooklyn Formation, located in the uppermost thrust slice in the Greenwood Camp and is part of the B.C. Basin, which hosts the thickest sequence of Brooklyn rocks exposed in the area (Fyles, 1990). The area contains four prospects explored for gold by Echo Bay Minerals Co., Republic, WA, during 1997 under an agreement with Kettle River Resources, Greenwood, B.C. Kettle River Resources has a substantial land position in this area. The prospects explored with diamond drilling by Echo Bay Minerals Co. are the R.Bell, Bluebell, North Emma, and Emma Vein (Figure 1).

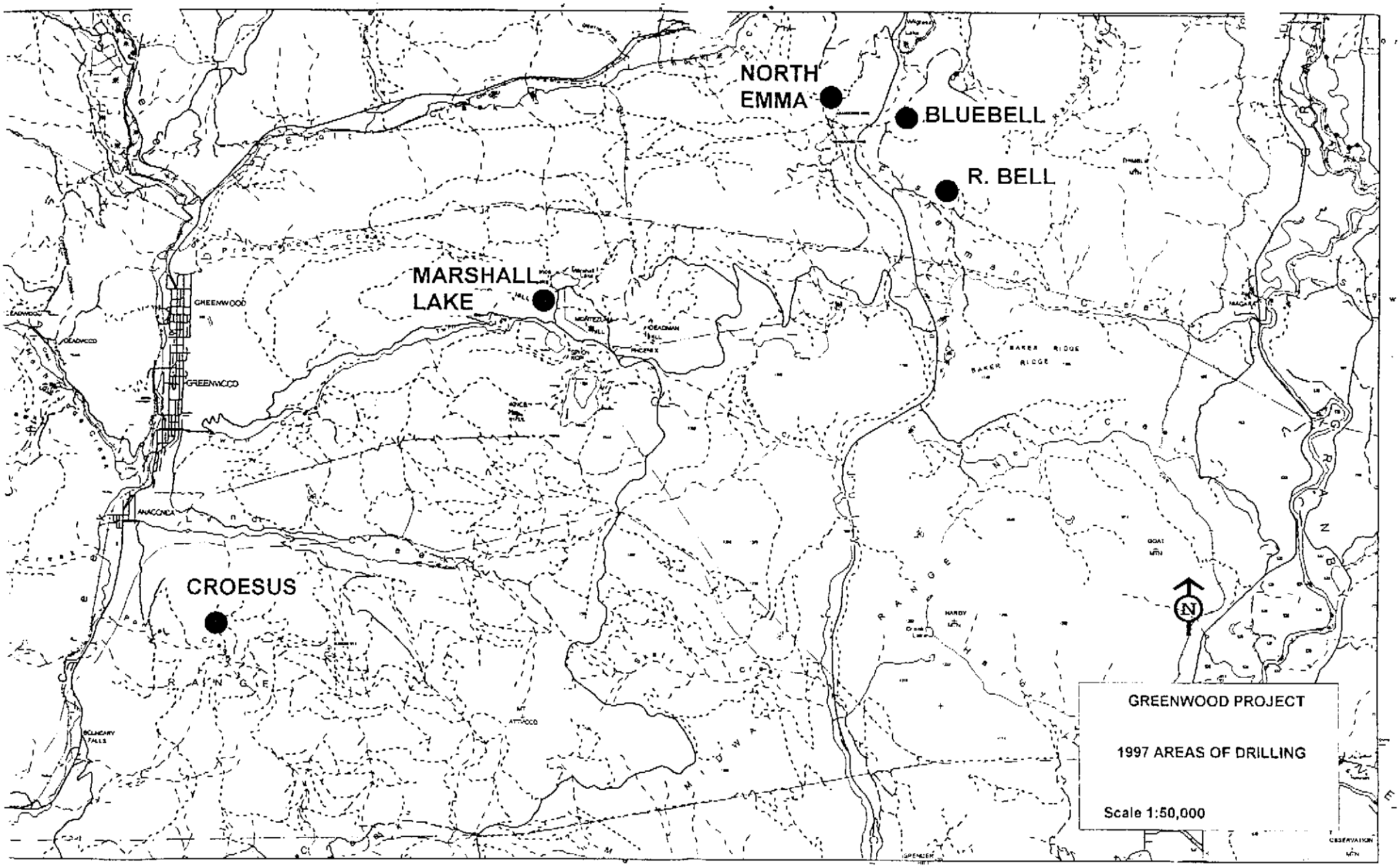
Copper skarn-type mineralization, which has been the target of historic work in the area (B.C. Mine, Oro Denoro, Emma) occurs within epidotized and pyritic Brooklyn volcanic rocks and in massive epidote-garnet skarn near the contact with (underlying) Brooklyn limestone. To a lesser extent, skarn type mineralization occurs within the limestone. A number of low angle Tertiary dykes are seen cutting the older rocks. Copper mineralization is controlled by a major structure, striking approximately north-south and dipping moderate to steeply east. Anomalous gold, silver and zinc accompany the copper mineralization, Massive magnetite/manganese skarn also occurs, without significant base or precious metal values.

Follow-up to anomalous gold soil values adjacent to known skarn mineralization at the R.Bell prospect in 1996 by Kettle River Resources resulted in the discovery of a new limestone hosted gold zone, about 75 metres north of the main copper skarn workings. High grade gold occurs as irregular patches and discontinuous veins, in a zone of silicified limestone, about 10 metres wide. The average grade across the zone is 0.287 oz/t, with areas within this larger zone grading in excess of 3 oz/t Au. There are no other elements anomalous within the gold zone. On a small scale, controls to mineralization are difficult to determine - in some cases the steep north-south bedding has controlled emplacement of silica-gold rich fluids, other places low angle cross-cutting faults appear to be important. The overal controls to the mineralized zone are equally unclear.

Elsewhere on the property, a number of steep, north-trending structures cut Brooklyn limestone. Silicification, brecciation, pyrite mineralization and anomalous gold values on surface are associated with several of these structures. In other cases, the limestone is cherty and more susceptible to shattering and cracking where cut by these structures with little introduction of silica.

A 3,172 foot, 15 hole drill program was completed in August and September of 1997, to test The area around the R.Bell for additional zones of mineralization similar to the R.Bell (Figures 2,3). No strongly anomalous results were obtained from the drilling. At Bluebell, 843 feet in three holes were drilled, (Figures 4,5) again with no anomalous results except for a 2.5 foot interval of massive sphalerite-pyrite-chalcopyrite. At North Emma (Figures 6,7), 472 feet in three holes were drilled across the northern end of the old Emma workings under a shallow surface trench that contained high gold grades in sulfide-rich mineralization. Only 5 feet of 0.11 opt Au was intersected in this drilling. About 1000 feet north of the North Emma a trend of silicified breccia and vein breccia had been identified by Kettle River Resources (Figure 6). We drilled 343 feet in two holes on this trend (Figure 6,8), confirmed the epithermal zone at depth, but encountered no significant gold values.

This program has tested the most promising gold targets of the Summit area, and we have no recommendations to offer at this time for future gold exploration at that locality. There is some potential for copper-zinc mineralization, however, so thearea could be usefuly explored for those commoditiies.


NORTH EMMA
BLUEBELL
R. BELL
MARSHALL LAKE
CROESUS
GREENWOOD
GREENWOOD PROJECT
1997 AREAS OF DRILLING
Scale 1:50,000

2.0 INTRODUCTION

2.1 LOCATION, ACCESS AND TERRAIN

Work described in this report was done on the R.Bell Crown Grant (L 1506), Bluebell Crown Grant (L2136), and Emma Crown Grant (L 591) located about 11 kilometres east of Greenwood, as shown on Figure 1. The claims are situated east and west of Highway 3, approximately 2 km south of Wilgress Lake, in a landscape of low to moderate relief and wooded slopes. There is excellent access via old mining and logging roads leaving Highway 3 in a large pullout, about 2.5 km south of Wilgress Lake, and on Oro Denoro road from the Phoenix Rd., 1 km west of Highway 3.

The property is situated at an elevation of about 1000 metres. It is, for the most part, consists of a few open grassy slopes in generally cedar-and pine-wooded slopes. Water is available for drilling from Fisherman Creek and the old Emma workings.

2.2 PROPERTY AND OWNERSHIP

For the purposes of filing assessment work, the Summit area has been grouped three ways and a portion of the total work filed onto each group. The three groups are described below and shown on Figure 1b. - 1d.. A single report has been prepared to describe the work program. All claims are owned 100% by Kettle River Resources Ltd and are part of a larger land package in the Phoenix - Eholt area.

SUMMIT - 1 Group

CLAIM NAME	TENURE	TYPE	UNITS	EXPIRY
CORDICK	CG625	CG	1	
EMMA	L 591	CG	1	
R. BELL	CG1506	CG	1	
BLUEBELL	L 2136	CG	1	
ORO DENORO	L 692	CG	1	
SUMMIT 96-1	347795	LOCATED	9	09/07/200
SUMMIT 96-2	347796	LOCATED	15	09/07/200
SUMMIT 96-3	347797	LOCATED	12	05/07/200
SUMMIT 96-4	347798	LOCATED	12	04/07/200
SUMMIT 96-5	347799	LOCATED	20	05/07/200
SUMMIT 96-6	347800	LOCATED	20	05/07/200

SUMMIT - 2 GROUP

CLAIM NAME	TENURE	TYPE	UNITS	EXPIRY
CORDICK	CG625	CG	1	
EMMA	L 591	CG	1	
R. BELL	CG1506	CG	1	
BLUEBELL	L 2136	CG	1	
ORO DENORO	L 692	CG	1	
EYE 1 FR	216651	LOCATED	1	28/01/200
BELL	339164	LOCATED	1	10/08/200
SUMMIT 96-3	347797	LOCATED	12	05/07/200
BAT 3	215574	LOCATED	16	23/03/200
SUMMIT 96-5	347799	LOCATED	20	05/07/200
SUMMIT 96-6	347800	LOCATED	20	05/07/200

NIAGRA-97-1 GROUP

CLAIM NAME	TENURE #	TYPE	UNITS	EXPIRY
CORDICK	CG625	CG	1	
EMMA	L 591	CG	1	
R. BELL	CG1506	CG	1	
BLUEBELL	L 2136	CG	1	
ORO DENORO	L 692	CG	1	
NG-1	353177	LOCATED	1	18/12/2002
NG-2	353178	LOCATED	1	18/12/2002
NG-3	353179	LOCATED	1	18/12/2002
SUMMIT 96-3	347797	LOCATED	12	05/07/2003
NIAGRA	353176	LOCATED	20	20/12/2002
SUMMIT 96-6	347800	LOCATED	20	05/07/2003
ECHO 1	356216	LOCATED	1	21/05/2003
ECHO 2	356217	LOCATED	1	21/05/2003
ECHO 3	356222	LOCATED	1	21/05/2003
ECHO 4	356223	LOCATED	1	21/05/2003
ERWIN	L 1691	CG	1	

* Expiry dates listed are after filing this report.

2.3A HISTORY OF THE R. BELL

The following section (2.3A) is excerpted from the 1996 Assessment Report on the R.Bell Property, by L. Caron, for Kettle River Resources:

The R. Bell crown grant is situated immediately north of the historic Summit City at the headwaters of Fisherman Creek, and is part of the Summit Camp. A considerable amount of work, directed at copper skarn-type mineralization, has been done in the camp and on the property, as summarized below. Other more regional studies of geology and mineralization relevant to the R.Bell area are Reisbakken (1970), Peatfield (1978), Seraphim (1956) and Fyles (1990).

1896 - a 100 foot deep shaft was dug on the R.Bell (Minister of Mines Annual Report, 1896 p.578)

1897 - considerable work is reported for the R.Bell, including a 70 foot deep main shaft, a 30 foot shaft and 16 foot cross-cut and a small open cut. The main ledge is said to run north-south, dipping E 60°, consisting of chalcopyrite, pyrite and sphalerite in a dark green volcanic, with some silver and gold values. Massive magnetite is also reported and reference is made to nearby limestone and dyking (Minister of Mines Annual Report, 1897 p.594).

1900 - 200 feet of drifting and sinking done (Minister of Mines Annual Report, 1900 p.870)

1901 - the R.Bell is listed as one of the more important mines in the Grand Forks Mining Division, with approximately 480 tons of ore shipped. Development to date is recorded as 400 feet of sinking and 600 feet of cross-cutting and drifting (Minister of Mines Annual Report, 1901 p.1051,1052,1064)

1902 - 560 tons shipped (Minister of Mines Annual Report, 1905 p.183).

1902 - 1957 - there is no written record of work in this period, although the property was apparently still actively worked during this period.

1957 - the property was examined, sampled and described in some detail by Carswell (1957), as part of a M.Sc. dissertation on the Summit Camp.

1966 - a limited ground mag survey was done by Bornite Mines Ltd. (Weymark, 1966)

1983 - soil sampling and ground mag and VLF was done by Kettle River Resources over the R. Bell crown grant as part of a larger exploration program on the Bluebell property. A good gold anomaly was discovered which was not followed up (Kyba and Daughtry, 1984).

1991 - minor mapping and rock sampling was done on the R. Bell by Canamax as part of their larger exploration program on the Bluebell property, under option from Kettle River Resources (Hitchins, 1991).

1996 - Kettle River Resources Ltd. did follow-up soil sampling and detailed geological mapping and rock sampling. A high grade gold zone was found in silicified limestone adjacent to the skarn mineralization which had been the focus of previous exploration. The gold zone was exposed by trenching. The drill program described in this report was then completed.

2.3B HISTORY OF THE BLUEBELL PROSPECT

1921 - A Ministry of Mines Report describes a shaft 110 feet deep with a drift driven 25 feet 60 feet below the surface.

1990-1991 A Canamax exploration program drilled one hole on the Bluebell claim, and failed to intersect a mineralized horizon.

2.3C HISTORY OF THE EMMA MINE

The best reference for Emma's history is Church, B.N., 1986, Geological Setting and Mineralization in the Mount Attwood - Phoenix area of the Greenwood Mining Camp, BCMEMPR Paper 1986-2.

2.4 SUMMARY OF CURRENT WORK PROGRAM

Fourteen NQ diamond drill holes were drilled from July 17 to September 24, 1996, for a total of 3,534 feet. Drilling was done under contract by Bergeron Drilling of Greenwood, B.C.. Core was logged and sawn for sampling at Kettle River's core facility at Boundary Falls. Logging and sampling was done by L. Caron and core sawing by N. Braam and D. Pazdzierski. Program supervision and drill hole lay-out was done by G. Stewart. A total of 265 core samples were collected and sent to Min-En Labs in Vancouver for preparation and 30 element ICP plus Au analysis.

3.0 GEOLOGY AND STUCTURE

The following section is excerpted from the 1996 Assessment Report on the R.Bell Property, by L. Caron, for Kettle River Resources:

The Greenwood area has been mapped on a regional basis by Fyles (1990), and prior to this, by Little (1983) and Church (1986). The distribution of rocks in the Greenwood area is controlled by a series of faults, including both Jurassic thust faults and Tertiary extensional (and detachment) faults hence an understanding of the structure of the area is critical to understanding the geology. The reader is referred to Fyles (1990) for an in-depth description of the regional geology and structure.

Fyles' mapping shows the pre-Tertiary rocks form a series of thrust slices, which lie above a basement high grade metamorphic complex. The thrusting event is felt to be an effect of the development of the Okanagan gneiss domes, which also results in the regional northward dip of rock units (Fyles, 1990). A total of at least five thrust slices are recognised, all dipping gently to the north, and marked in many places by bodies of serpentine. Fyles' interprets these serpentinite bodies as *representing part of a disrupted ophiolite suite, belonging to the Knob Hill Group of late Paleozoic age.* Commonly, these serpentinite bodies have undergone Fe-carbonate alteration to listwanite, as a result of the thrusting event.

The oldest rocks in the camp belong to the late Paleozic Knob Hill Group of dominantly volcanic affinity, and consist mainly of chert, greenstone and related intrusives, and serpentine. Unconformably overlying these rocks are sediments and volcanics (largely argillite, siltstone, limestone and andesite) of the late Paleozoic Attwood Group. Rocks of the Knob Hill and Attwood Groups are in turn unconformably overlain by the Triassic Brooklyn Formation, represented largely by limestone, clastic sediments and pyroclastics. In many cases in the Greenwood area, evidence for thrusting is seen by the older Knob Hill Group rocks resting over the younger Attwood Group or Brooklyn Formation rocks. *The historically important skarn deposits in the Greenwood area (i.e. Phoenix, Oro Denoro, Motherlode-*Greyhound) area hosted within the Triassic rocks.

Three separate intrusive events are known regionally to cut the above sequence, the Jurassic aged Lexington porphyry, the Cretaceous Nelson intrusives, and the Eocene Coryel dykes and stocks.

Tertiary sediments and volcanics unconformably overly the older rocks with the distribution of these Tertiary rocks largely controlled by series faults. Regionally, three Tertiary fault sets are recognised, and early set gently east dipping set, a second set of low angle west dipping, listric normal detachment type faults, and a late, steep dipping, north to northeast trending set of right lateral or west side down normal faults (Fyles, 1990).

The R. Bell property is underlain by rocks of the Triassic Brooklyn Formation, located in the uppermost thrust slice in the Greenwood Camp, in what is referred to as the B.C. Basin. The B.C. Basin hosts the thickest sequence of Brooklyn rocks exposed in the Greenwood area. A number of significant mineral occurrences are located within the basin, and have historically been categorised as the Summit Camp. The mineral occurrences include true copper skarn type deposits, such as the Oro Denoro, which have strong structural controls and cross-cut stratigraphy, as well as a number of deposits such as the Emma and B.C. Mine where massive sulfides (with high precious metal content) are stratabound. Stratabound mineralization also occurs at the Cyclops, Rathmullen and Lancashire Lass showings.,

Detailed property scale mapping and sampling of surface and underground exposures on the R.Bell property was done during 1996 by Kettle River Resources. Copper skarn-type mineralization, which has been the target of historic work on the property occurs within epidotized and pyritic Brooklyn volcanic rocks and in massive epidote-garnet skarn near the contact with (underlying) Brooklyn limestone. To a lesser extent, skarn type mineralization occurs within the limestone. A number of low angle Tertiary dykes are seen cutting the older rocks. Copper mineralization is controlled by a major structure, striking approximately north-south and dipping moderate to steeply east. Anomalous gold,

silver and zinc accompany the copper mineralization, Massive magnetite/manganese skarn also occurs, without significant base or precious metal values.

Follow-up to anomalous gold soil values adjacent to known skarn mineralization resulted in the discovery of a new limestone hosted gold zone, about 75 metres north of the main copper skarn workings. High grade gold occurs as irregular patches and discontinuous veins, in a zone of silicified limestone, about 10 metres wide. The average grade across the zone is 0.287 oz/t, with areas within this larger zone grading in excess of 3 oz/t Au. There are no other elements anomalous within the gold zone. On a small scale, controls to mineralization are difficult to determine - in some cases the steep north-south bedding has controlled emplacement of silica-gold rich fluids, other places low angle cross-cutting faults appear to be important. The overall controls to the mineralized zone are equally unclear.

Elsewhere on the property, a number of steep, north-trending structures cut Brooklyn limestone. Silicification, brecciation, pyrite mineralization and anomalous gold values are associated with several of these structures. In other cases, the limestone is cherty and more susceptible to shattering and cracking where cut by these structures, however there is little introduced silica.

4.0 DRILLING

Twenty-three holes were drilled during August and September, 1997 as described below. Drill hole locations are plotted on Figure 3 and Figure 6 and logs are included in Appendix 1. Analytical results for core samples are contained in Appendix 2. A total of 4842 feet were drilled, and 113 samples submitted for fire assay to Custom Analytical Labs, Republic WA. Drill hole specifications and co-ordinates are tabulated below.

Table 1. Drill programs of the 1997 Summit Exploration effort

Area	Dates	Footage	Holes
R. Bell	Aug. 25 - Sept. 13	3172	15
Bluebell	Sept. 14 - Sept. 22	843	3
North Emma	Sept. 23 - Sept. 30	827	5

R.Bell

The R.Bell is in Brooklyn rocks, following a contact between marble and overlying volcaniclastic greenstone. We drilled 3172 feet in 15 holes (Figure 2, Table 2) on "R.Bell", so-named because it was designed on the premise that the skarned R.Bell fault/horizon was a significant control on the formation of the Summit veins. Just prior to drilling on the Summit, Jerry Ray and Dave LeFebure spent several days (August 18 to 24) in the Greenwood area, and visited the Summit twice, once with Linda Caron and Gerge Stewart, and once with me. Jerry argued very strongly for an epithermal interpretation of the Summit veins, George for control by the R.Bell skarned structure, and Dave for a combination of the two. Consequently, I elected to drill a fence of holes north from Summit parallel to the R.Bell structure. The fence extended from R.Bell to Cordick, a distance of over 1000'.

Table 2. R.Bell Drilling

Hole	Site	Dip	Az	Depth
RB-1-97	E	-45	110	255
RB-2-97	E	-90	—	151
RB-3-97	I	-45	110	255
RB-4-97	I	-60	110	163
RB-5-97	I	-45	290	199
RB-6-97	K	-45	110	110
RB-7-97	K	-45	290	300
RB-8-97	K	-60	290	190
RB-9-97	J	-45	290	250
RB-10-97	J	-60	290	351
RB-11-97	J	-90	—	151
RB-12-97	J	-65	110	310
RB-13-97	K	-90	—	251
RB-14-97	G	-90	—	161
RB-15-97	G	-45	290	90

The amount of footage devoted to Summit was justified by the high grades in the Summit prospect and the limited expression of the Summit veins. Chip channel sampling by Tom Johnson in August returned a 24-foot sample assaying 0.883 opt Au. A small volume of rock at that grade would produce a minable orebody, and we felt an aggressive drilling program was justified. We flagged sites at 100-foot intervals north from Summit, labelling them "A" through "L" (Figure 2). Drilling near sections "A" - "C" was conducted in the 1996 KRR program, so our drilling was done on "E", "G",

R. BELL DRILLING PROGRAM
1997 AUGUST

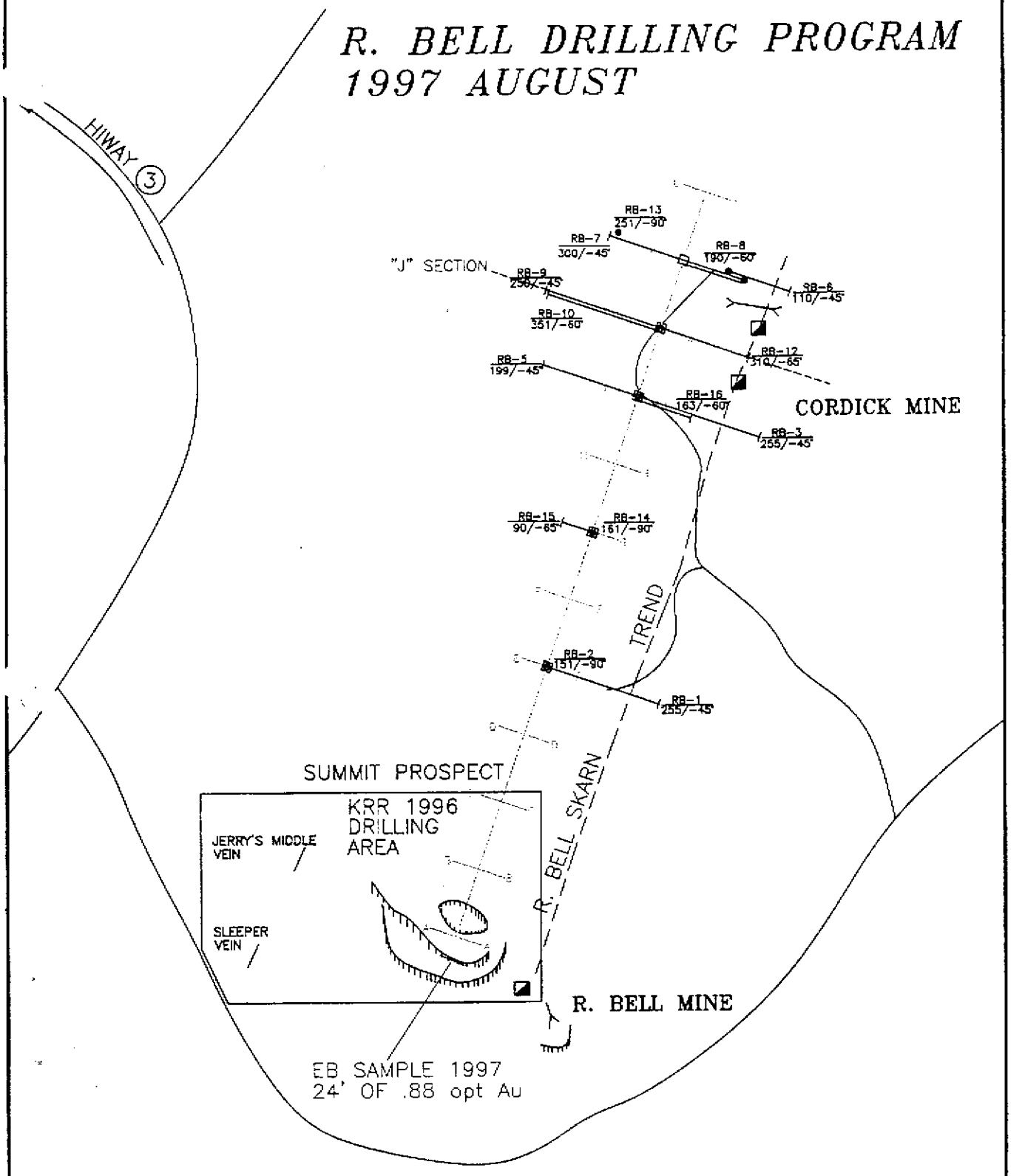


FIGURE 2

	ECHO BAY MINERALS *KETTLE RIVER* *GREENWOOD PROJECT* *REPUBLIC, WASHINGTON*
SCALE	0 100 200 FEET
DATE: 10-15-97	DWG FILE: RBDRILL
DRAWN BY: S. BLOOD	GEOLOGY BY: M. RASMUSSEN

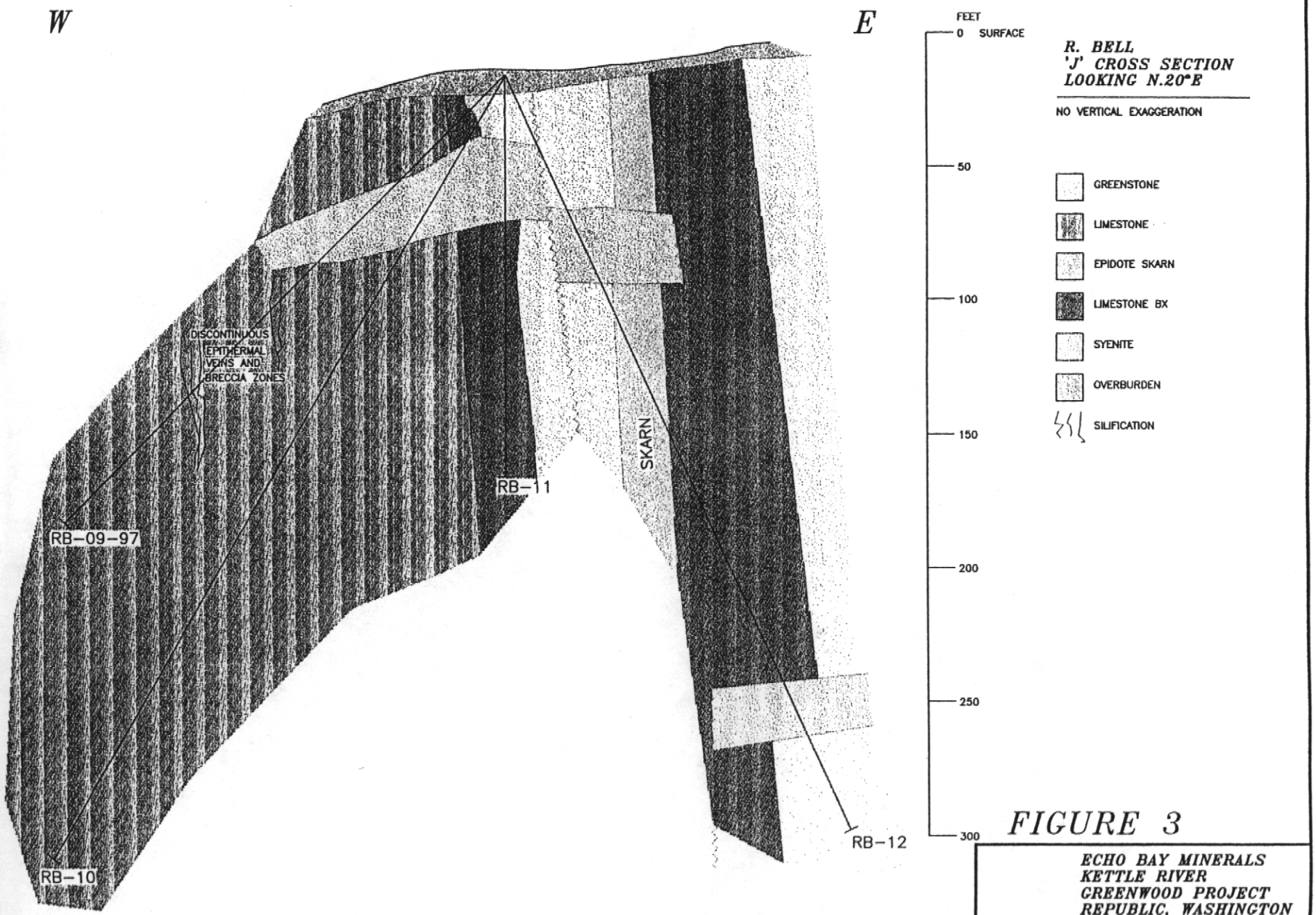


FIGURE 3

ECHO BAY MINERALS
KETTLE RIVER
GREENWOOD PROJECT
REPUBLIC, WASHINGTON

SCALE 0 25 50 FEET

DATE	DWG FILE	DRAWN BY	GEOLOGY BY
10-15-97	RBELLJXS	S. BLOOD	M. RASMUSSEN

"I", "J", and "K". Drilling on the north end was dense owing to proximity to the Cordick (analogue to R.Bell), and having encountered two epithermal zones which seemed to correlate with the "Sleeper", "Jerry's Middle", and "Jerry's Upper" epithermal prospects to the south. I was hopeful that the intersection of the Cordick trend and this epithermal trend would be mineralized, and drilled the area carefully to test that possiblity. Results were negative, and I concluded that the epithermal trend we saw in the drilling was probably not correlatable to the Sleeper trend, and was itself discontinuous and unmineralized.

RB-1-97, RB-2-97

The general plan of the drilling was to test the limestone in a vertical hole and in a -45° hole toward the east (the R.Bell contact) from each drill site. Accordingly, at the first site, "E", RB-1-97 was drilled at -45°, az. 110°, to a depth of 245 feet. The rocks encountered defined a pattern which persisted through the strike length of the drill program. Massive white to gray marble gave way at 135 ft. to 60 ft. of fragmental and detrital limestone clasts in volcaniclastic matrix to massive volcaniclastic greenstone at 195 ft. The mixed zone of limestone clasts in volcaniclastic matrix is the "Limestone Agglomerate" of many previous reports. I consider the rock to be a depositional unit that could have formed in a volcanic environment near the base of a limestone cliff or scarp or highground. The matrix looks detrital rather than igneous, albeit volcanic, very immature. A little skarning was visible around 190-193 ft. RB-2-97 drilled 151 ft. at -90° through the carbonate, encountering no significant alteration or mineralization.

RB-3-97, RB-4-97, RB-5-97

RB-3-97 was drilled from the "I" station at -45°, az. 110°, to a depth of 255 ft. After 45 ft. of Fsp-Hb-phyric syenite, the limestone-limestone conglomerate-greenstone sequence was seen, with a minor bit of hematitic alteration at 148.5'. RB-4-97 was drilled at -60° on the same azimuth, because we were near the Cordick, and I wanted to test the dip on the contact and see if alteration picked up at all at depth. We TD'd at 155 ft., having established the stratigraphic attitude of the limestone-mixed zone contact. RB-5-97 was drilled at -45°, az. 290°, to a depth of 194. Epithermal, open-space quartz-calcite veining was well-developed from 93-100 ft., and sparked interest in the possiblity that an epithermal continuation of the Sleeper trend might be converging on the R.Bell-Cordick trend. Rapid turn-around sampling of the interval returned negative results.

RB-6-97, RB-7-97, RB-8-97

This hole was drilled from "K" , but because of nearby trees, had to be placed about 25 ft. east and 15 feet north of the actual "K" site. The hole collared in greenstone at -45°, az. 110. It hit a little mixed rock, but was obviously above the contact of interest, so was terminated at 110 ft. RB-7-97 stepped another 25 ft. east (for logistic reasons) and drilled at -45° on a 290° azimuth in order to cross the zone of interest from east to west. We hoped to intersect the epithermal zone seen in RB-5-97. We stopped the hole at 300 ft., having past the depth at which a vertical epithermal zone would have been encountered, and concluding that if the zone were inclined toward the west, we would be better off drilling it in a vertical or east-dipping hole. Because we were so close to Cordick workings, however, we drilled RB-8-97 at -60°, az. 290°, to have another pass at the contact (mixed) zone. The hole was terminated at 190 ft. in marble, having seen very little alteration.

RB-9-97, RB-10-97, RB-11-97, RB-12-97

These holes were drilled from "J" (See Figure 2, 3). RB-9-97 was drilled at -45°, az. 290°, to a depth of 250 ft. Its purpose was to intersect the epithermal zone. Two zones of interest were intersected, one a qz vein zone at about 120-123 ft., the other a sulfide-rich breccia zone from 163-174. Neither returned significant gold assays. RB-10-97 was drilled in the same direction at -60° to a depth of 351 ft. in an attempt to intersect the two zones of interest from RB-9. The effort was not successful, and we concluded that the epithermal zones were dipping west above RB-10. RB-11-97 was a vertical hole drilled 151 ft. through mostly limestone breccia/conglomerate of the mixed zone.

RB-12-97 was oriented at -65° on a az. of 110°, to a depth of 310 ft. The purpose of this hole was to drill under Cordick to test mineralization at depth. Nothing significant was encountered.

RB-13-97

This hole was drilled vertically in an attempt to intersect the west-dipping epithermal zone and test its northward continuity from RB-9-97. RB-13-97 stepped out from "K" 100 feet west and drilled to a depth of 251 ft., well below our projected target. The zone was not intersected, and nothing significant was encountered.

RB-14-97, RB-15-97

These holes were drilled from station "G", to test the limestone adjacent to the contact with limestone conglomerate and greenstone. Both holes were negative with respect to prospective rock.

BLUEBELL DRILLING

The Bluebell property used two-stations (Figures1, 4, 5). The stations were separated by 200 feet and were sited 100 feet west of the Bluebell horizon. Two holes were drilled from the first station and one from the second for a total of 843 feet. As indicated in the drill sections, the skarn horizon was not well developed or mineralized. It is likely that flat faults controlling the syenite intrusions have displaced the ore horizon, but no offset indicators were recognized.

Table 3. Bluebell Drilling

Hole	Dip	Az	Depth
BB-1-97	-40	100	403
BB-2-97	-50	100	230
BB-3-97	-50	100	210

The geology of the Bluebell consists of marble, chert-rich sharpstone, volcanic and intrusive greenstones, and syenite dikes. The skarn is most closely associated with the contact between marble and intrusive greenstone (microdiorite). The skarn is pyroxene-garnet skarn, with surprisingly little epidote. Skarn intersections were generally sulfide poor, with a 2-foot thick zone of massive sphalerite being a prominent exception.

NORTH EMMA

Three holes were drilled under a pit on the north end of the main Emma workings (Figures 1, 6,7, Table 4). Barry Kyba had taken a sulfide-rich rock from tis pit in 1996 which assayed 0.3 opt Au. I collected a sample from the rocks beside the pit which assayed 0.117 opt Au. The drilling tested the idea that gold in the Emma was zoned toward the north, owing possibly to an intersection with the Emma vein. That model was not supported by the drilling. Although we did get 5 feet of 0.11 in NE-97-3, the mineralization pattern indicated waning of mineralization.

Table 4. North Emma Drilling

Hole	Dip	Az	Depth
NE-1-97	-45	260	83
NE-2-97	-55	260	179
NE-3-97	-70	260	210

The geology of the North Emma drilling indicated four rock types (Figure 7): marble, pyroxene skarn, garnet-magnetite skarn, and microdiorite. For once we didn't have to drill through thick syenite dikes. Magnetite ± sulfide occurs primarily in the garnet zone, and was well developed in the NE-97-2 hole. The significance of the garnet-->pyroxene zonation is not clear, but seems to indicate either (1) proximal to distal gradient away from the microdiorite, or (2) geochemical aluminosilicate gradients from the carbonate to the greenstone.

DRILL SECTION SHOWING:
BB-01-97 & BB-02-97,
LOOKING SOUTH

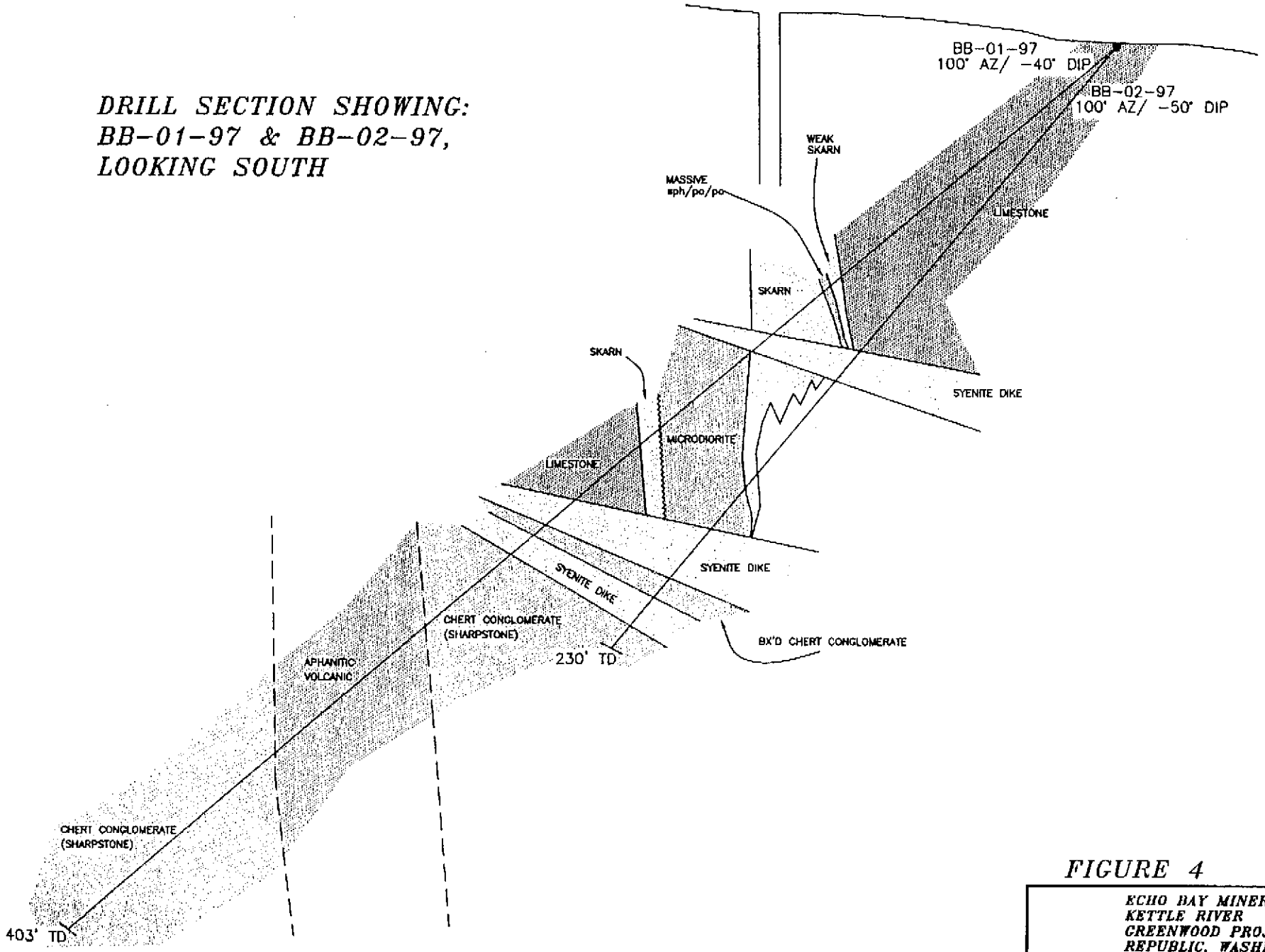
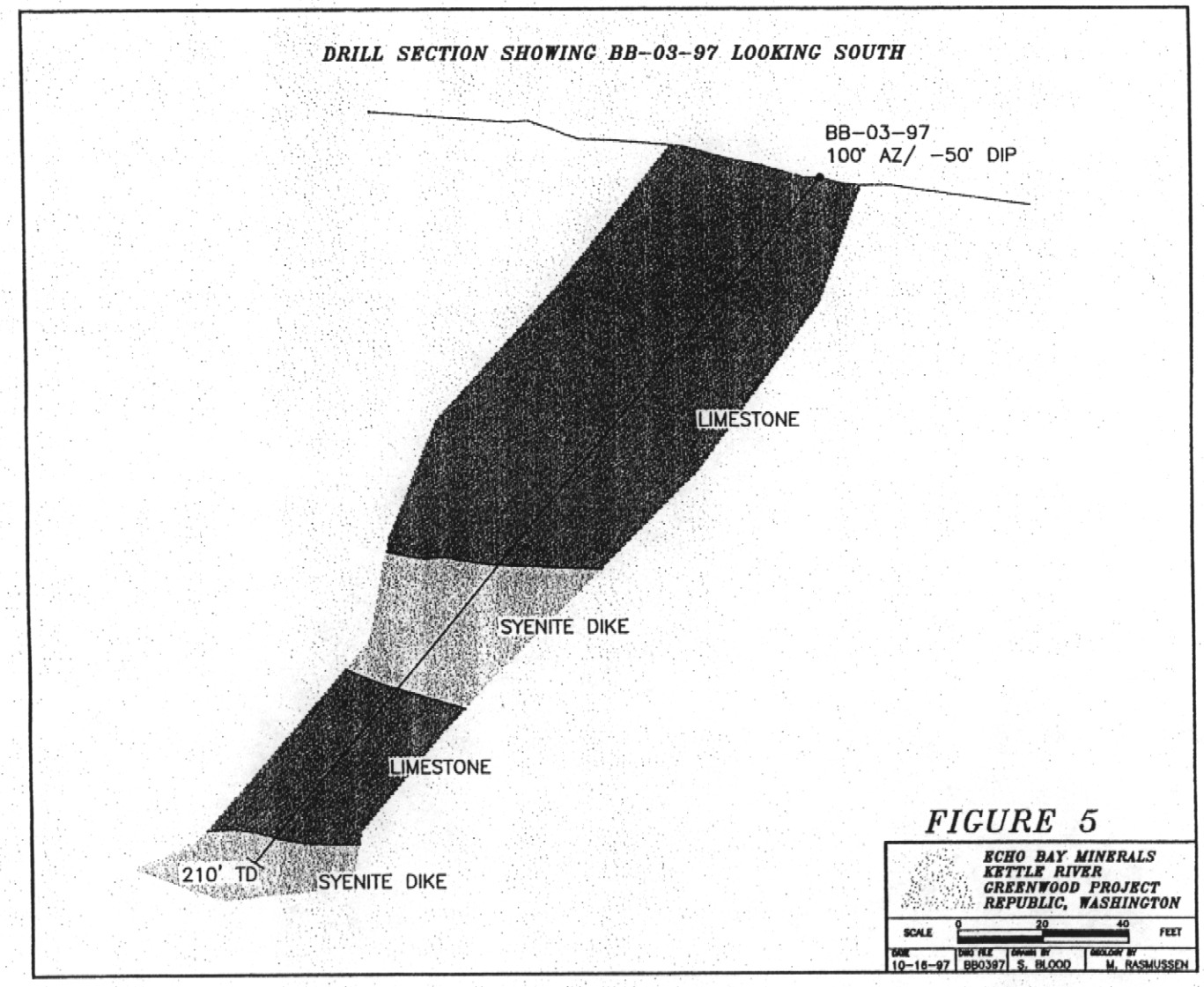
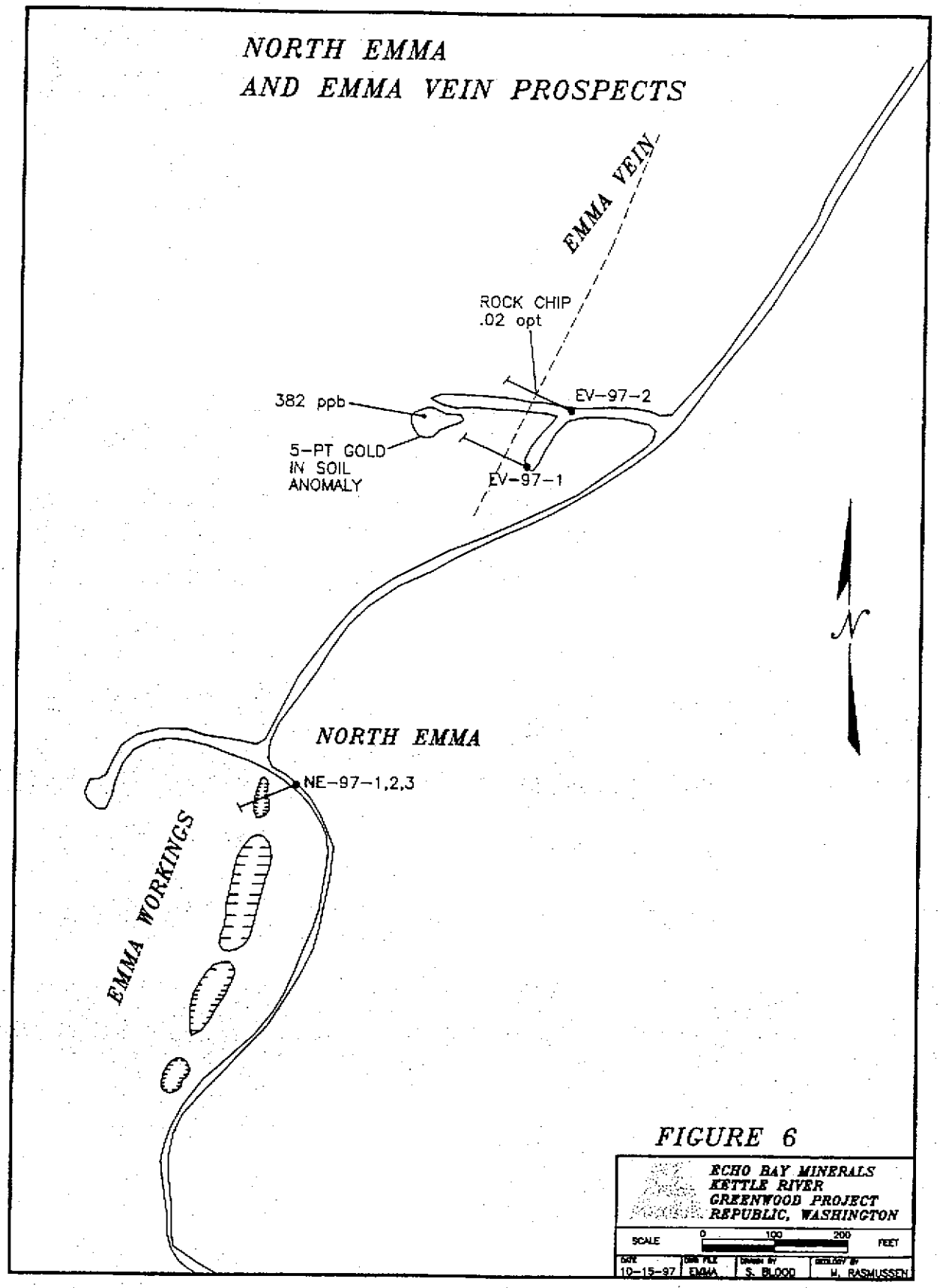


FIGURE 4

ECHO BAY MINERALS
KETTLE RIVER
GREENWOOD PROJECT
REPUBLIC, WASHINGTON

SCALE	0 20 40 FEET		
DATE	DWG FILE	DRAWN BY	GEOLOGY BY
10-16-97	BB010297	S. BLOOD	M. RASMUSSEN


DRILL SECTION SHOWING BB-03-97 LOOKING SOUTH
BB-03-97
100° AZ/ -50° DIP
LIMESTONE
SYENITE DIKE
LIMESTONE
210' TD
SYENITE DIKE
FIGURE 5
ECHO BAY MINERALS
KETTLE RIVER
GREENWOOD PROJECT
REPUBLIC, WASHINGTON
SCALE 0 20 40 FEET
DATE 10-16-97
DWG FILE BB0397
DRAWN BY S. BLOOD
GEOLOGY BY M. RASMUSSEN


NORTH EMMA
AND EMMA VEIN PROSPECTS
EMMA VEIN
ROCK CHIP
.02 opt
382 ppb
EV-97-2
5-PT GOLD
IN SOIL
ANOMALY
EV-97-1
N
NORTH EMMA
NE-97-1,2,3
EMMA WORKINGS
FIGURE 6
ECHO BAY MINERALS
KETTLE RIVER
GREENWOOD PROJECT
REPUBLIC, WASHINGTON
SCALE
0
100
200
FEET
DATE
10-15-97
DWG FILE
EMMA
Drawn By
S. BLOOD
GEOLOGY By
M. RASMUSSEN

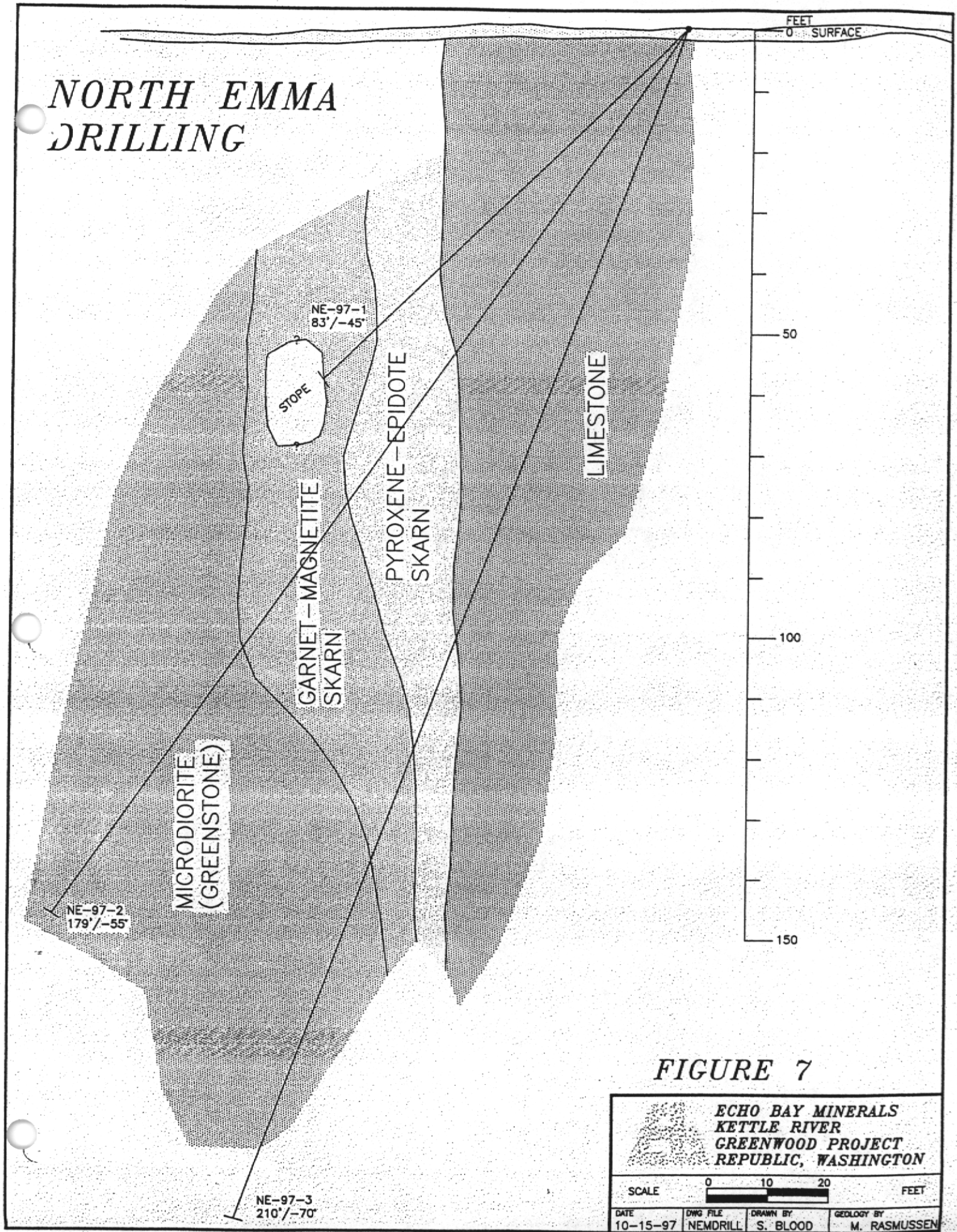
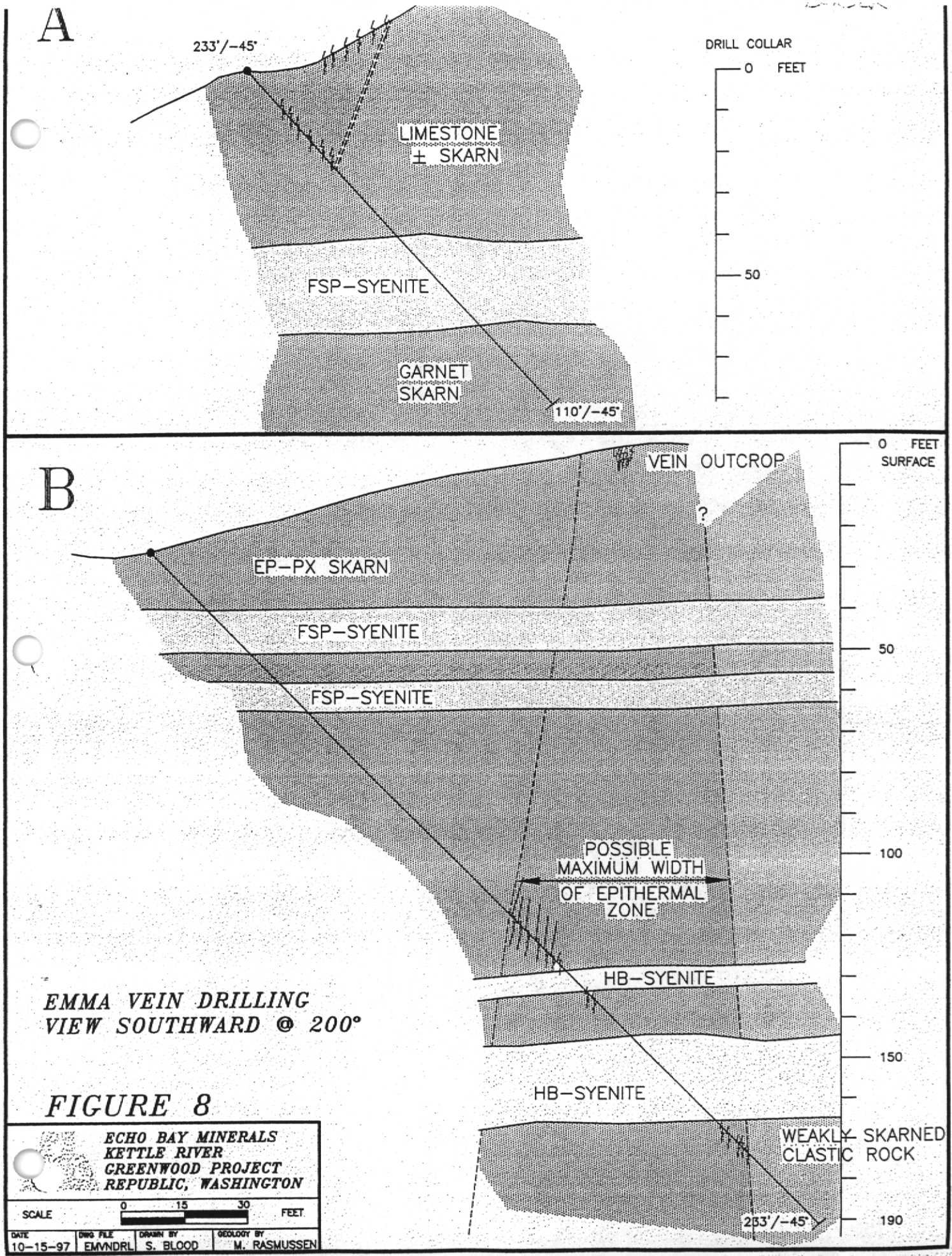


FIGURE 7

ECHO BAY MINERALS
KETTLE RIVER
GREENWOOD PROJECT
REPUBLIC, WASHINGTON

SCALE	0 10 20 FEET		
DATE	DWG FILE	DRAWN BY	GEOLOGY BY
10-15-97	NEMDRILL	S. BLOOD	M. RASMUSSEN


A
233'/-45°
LIMESTONE
± SKARN
FSP-SYENITE
GARNET
SKARN
110'/-45°
DRILL COLLAR
0 FEET
50
B
VEIN OUTCROP
?
EP-PX SKARN
FSP-SYENITE
FSP-SYENITE
POSSIBLE
MAXIMUM WIDTH
OF EPITHERMAL
ZONE
HB-SYENITE
HB-SYENITE
WEAKLY SKARNED
CLASTIC ROCK
233'/-45°
0 FEET
SURFACE
50
100
150
190
EMMA VEIN DRILLING
VIEW SOUTHWARD @ 200°
FIGURE 8
ECHO BAY MINERALS
KETTLE RIVER
GREENWOOD PROJECT
REPUBLIC, WASHINGTON
SCALE
0 15 30
FEET
DATE
10-15-97
DWG FILE
EMVNDRL
DRAWN BY
S. BLOOD
GEOLOGY BY
M. RASMUSSEN

EMMA VEIN

Two holes were drilled in the Emma Vein (Figure 6), a trend of siliceous brecciated outcrops over 1000 feet long, on a northerly bearing similar to the Emma horizon. Two gold-in-soil anomalies are associated with this trend, and a rock chip assaying 0.017 opt Au was collected from one of the outcrops this summer (Figure 8, Table 5).

Table 5. Emma Vein Drilling

Hole	Dip	Az	Depth
EV-1-97	-45	290	110
EV-2-97	-45	290	233

The geology of the Emma Vein drilling consists of garnet-pyroxene limestone and syenite dikes. West of the limestone, clastic greenstones were intercepted at the bottom of hole EV-97-2. Two assays similar to the rock chip value reported above were obtained.

In summary, 23 holes were drilled to test the limestone hosted R.Bell gold zone, the skarn-related Bluebell and North Emma prospects, and the epithermal Emma Vein. None of the drill intercepts warranted follow-up beyond this initial program.

5.0 CONCLUSIONS AND RECOMMENDATIONS

We conclude that the Summit area is more prospective for copper than for gold, and do not consider future gold exploration a viable enterprise in this locality.

6.0 REFERENCES

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APPENDIX 1

DIAMOND DRILL LOGS

ECHO BAY MINERALS | Project R. Bell | Dhid RB-01-97 | Coord: N ' E ' | Elev | Az 110° Incl -45° TD 245' | Date 3 Sept 97 | Logger LI | Page 1 of 3

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Cc	Calc	Silica% Vn	Pc	Chl	Arg	Sid	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	mt	hm	po	cp	sp	sl	Veins Type	Veins no/ft	Veins ang	thick	Au moz	Comments
0			0-23' Thin-bedded Limestone Minor stylolites conchard. to bedding, minor sandy areas < 4cm wide, minor green chorty areas.			bedding 40°-45°																							
25			25-69' Limestone			25-27 shows signs of extension & $CaCO_3$ healing minor movement (slump?) across bedding																							
70			bedding attitude? taken from stylolites 69-71.6' Skarny zone.			bedding@0 cont. at 50° contact 40°																							
75			← irregular, broken contact 71.6-198' This Limestone unit has hem. in varying amounts to give a pink cast to rock unit & hem. on frax.																										
90						30° ± broken chorty unit 50° Prod. slick perpendicular to dip																								
95																													

ECHO BAY MINERALS | Project R. Ball | Dhld RB01-97 | Coord: N E' E | Elev | Az 110° Incl -45° TD 245' | Date 29 Oct 97 Logger EJ | Page 2 of 2

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	ROD	Rec	STRUCTURES Fractures/Faults	Ck	Dolo	Silica% Vn	Silica% Py	Cln	Arg	Sil	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	mt	hm	go	cp	sp	sl	Veins Type	Veins no/ft	Veins ang	Thick	Au moz	Comments
100			71.6-188' cont'd limestone ← broken chert Contains a few irregular dark sections, appearing conchoidal w/ bedding.			35° contact																						105-110.5 ∠ 104-261 110.5-112 ∠ -261 112-117 ∠ -263 117-122 8 -264 122-127 ∠ -265 127-131.5 4 -266
105																														
110																														
115																														
120																														
125																														
130			128-138' Brecciated healed limestone w/ < chert partings, some minor movement.																											
135																														
140			138-148.5' grading into limestone breccia unit.																									140-140.5 3 -267 140.5-145 ∠ -268
145																														
150			148.5-159' grading somewhat into volcaniclastic fragmental greenstone w/ limestone clasts & epidote, which increases @ lower contact.																											
155																														
160			159-171.4' limestone.																											
165																														
170																														
175			171.4-179' Greenstone welded tuff w/ qtz eyes & minor pumice(?) stringers along frax & replacing fsp & < epidote replacing fsp.			50° contact																								
180			179-190' limestone			30° contact w/ < slickenmovement, ~7 mm.																									
185																														
190			190-193' Skarny zone & limestone beads												epidote & garnet	1-2% irreg. pyrite blebs		1-2%												
193			193-245' volcaniclastic fragmental			70° contact																								

ECHO BAY MINERALS | Project R. Bell | Dhld RR-01-97 | Coord: N E | E | Elev | Az 110° | Incl -45° | TD 245' | Date 3 Sept 97 | Logger CJ | Page 3 of 3

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Silica% Cc	Dolo	Vn	Prv	CN	Arg	Sd	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	ml	hm	po	cp	ap	sl	Veins Type	no/ft	ang	thick	Au moz	Comments
200																													
	V		193-245' volcaniclastic fragmental greenstone												mod. to str. silicification pervasive thru unit ≤30% epidote locally in areas.														
205	V		lapilli tuff w/ lithic frag's ≤ 3 cm.																										
210	V																												
215	V																												
220	V																												
225	V																												
230	V																												
235	V																												
240	V																												
245	V		T.D. 245'																										

ECHO BAY MINERALS | Project R. Bell | Dhid RB-02-97 | Coord: N E' E | Elev | Az | Incl -90° TD 151 | Date 4 Sept 97 Logger LJ | Page 1 of 2

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	ROD	Rec	STRUCTURES Fractures/Faults	Silica% Ce	Dolo	Vn	Pvr	Chl	Arg	Sul	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	el	hm	po	cp	bn	sl	Veins Type	no/ft	ang	Thick	Au moz	Comments
0			0- Limestone																											
5																														
10																														
15																														
20																														
25						55° bedding										local replacement? pyrite perpendicular to bedding													
30			Minor, ≤ 2 cm. angular chert, jasperoid & limestone clasts, carb matrix.																											
35																														
40																														
45																														
50																														
55																														
60																														
65																														
70																														
75																														
80			local brecciation & minor sulfidation															1-2%												
85			local brecciation																											
90																														
95																														

ECHO BAY MINERALS | Project R. Bell | Dhid RB-02-97 | Coord: N E' E | Elev | Az | Incl -90° TD 151' | Date 4 Sep 97 | Logger JL | Page 2 of 2

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Silica% Cc	Dolo	Vn	Prv	Chl	Arg	Sd	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	ml	hm	po	cp	sp	sl	Veins Type	no/ft	ang	thick	Au moz	Comments
100																													
105																													
110			"crackle breccia" conchoidal to bedding, healed w/ dk. grey & sulfidic matrix			50°												3-4%											
115																													
120																													
125			2 narrow (~2cm) bands of silicification along joints.			80°				X																			
130																													
135			area where frax have been filled with open-space $CaCO_3$ ± 5mm. thick.																										
140			Few narrow (1-3mm) frax w/ sprite													← miner													
145																													
150																													
			T.D. 151'																										

ECHO BAY MINERALS | Project R Bell | Dhld RB-03-97 | Coord: N E Elev | Az 110 Incl -45 TD 255 | Date 8/29 | Logger mrc | Page 1 of 2

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Silica% Ca	Dolo	Vn	Prv	Chl	Arg	Sid	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	ml	hm	po	cp	sp	sl	Veins Type	Veins no/ft	Veins ang	thick	Au moz	Comments
0-47																														
5															Pink															
10			SYENITE																											
15			· Hh-phyric, 1 cm-scale fsp laths																											
20																														
25																														
30																														
35																														
40																														
45															Green															
47'						Fault contact ε ~45° to CA																									
47' – 91'																														
50			LIMESTONE (MARBLE)																											
55			· white to green, recrystallized																											
60			· thin to thick bedded												Fracture controlled qtz-clay ± py alteration thin intervals															
65'			· ε ~45° to CA			~~ Fault (1cm)																									
70																														
75			Blebby cc veins from 71'-81'																								71-81 cc vns	2-3	75°			
80						~~ Fault ε ~45° to CA																										
85															Pink sericite (fsp) replacement															
90																														
91' – 148.5'			91' det. contact ε ~45°																											
95			LIMESTONE BRECCIA ("Agglomerate")																											

ECHO BAY MINERALS | Project RBelt | Dhld RB-03-97 | Coord: N E Elev | Az 110° Incl -45° TD 255' | Date 12-96 | Logger [illegible] | Page 2 of 3

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Ca	Dole	Silica% Vn	Pv	Ch	Arg	Sid	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	mt	hm	po	cp	sp	sl	Veins Type	no/ft	ang	Thick	Au moz	Comments
105			91'-148.5' LIMESTONE BRECCIA ("Agglomerate") - mainly clast-supported monolithic depositional breccia, with a few beds of sandy-volcanic clastics assoc & aligned as clasts, clasts are angular to subangular, ≤ 10 cm in long dimension - "Agglomerate" is probably a good term, owing to the vole. character of the matrix material - A few clasts are red e.g. 142'																									
110																														
115																														
120																														
125																														
130																														
135																														
140																														
145																														
			148.5																											
150			148.5-255 VOLCANICLASTIC FRAGMENTAL GREENSTONE Fairly fractures in fine grained vole. clastic, usually incomplete alteration												Prom. pervas. epidote															
155																														
160														110	ch bnd														
165			- Green to fine grained felt v. poorly sorted volcaniclastic rock, ? gd grains, platy broken xls, and lithic clasts																											
170																														
175			- Common bedding planes variable, ave prob. ~ 45° to CA												? pink (hsp?) alteration															
180																														
185																														
190																														
195			V1																											

ECHO BAY MINERALS | Project H Bell | Dhid RB-03-97 | Coord: N | E | Elev | Az 110 | Incl -45 | TD 255' | Date 8/24 | Logger HH2 | Page 2 of 2

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Cs	Dsb	Silica% Ss	Pxv	Chl	Arg	Sd	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	ml	hm	po	cp	bp	sl	Veins Type	no/ft	ang	Thick	Au moz	Comments
205	H		198.5 - 255																										
			FRAGMENTAL, VOLCANIC CLASTIC GREENSTONE													Ep chlor													
210	H																												
215	H																												
220	H																												
225	H		INTENSELY BROKEN ZONE - WIDE FLT WITH LONGITUDINAL SHEARED INTERVAL IN CENTER			225' Broken Zone w/ cement																							
230	H																												
235	H					TECTONIC Bx w/ CEMENT																							
240	H																												
245	H					247																							
250	H																												
255	H		TD																										

ECHO BAY MINERALS | Project RB-04-97 | Dhld RBeck | Coord: N E Elev | Az 110° Incl -60 TD 162' | Date 8/29 | Logger MRS | Page 1 of 2

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Ca	Dol	Silica% Vn	Silica% Piv	Silica% Ch	Silica% Arg	Silica% Sil	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	mt	hm	po	cp	ap	si	Veins Type	Veins no/ft	Veins ang	thick	Au moz	Comments
0	a		0-35' SYENITE - chiefly hb-phyric - sparse fsp cm-scale phenos; SALMON-COLORED Fsp in groundmass																											
35			dkM green 30-35'; apkm groundmass; contact @ 55° to CA																											
40			Thick bedded/massive sparsely stylolitic sparry cc fracture-filled																											
55			thin beds @ 53', 50° to CA; Embayed by green-black igneous material																											
60			DIKE 30° to CA; Thin-bedded hornfels beds @ 60			FHC @ 58' 40° to CA																									
65			Densely crackled & stylolitic from 60'-65'			FHC @ 64' 40° to CA sheeted graphitic																									
75			Tan to buff color												strong alt 73'-75'															
80			white marble - cc fracs 5-1/8" - pinkish-gray fracs common																											
90			healed fracs (vuggy)																											
95																													

ECHO BAY MINERALS | Project R. Bell | Dhld RB-05-97 | Coord: N E 116 Elev | Az -60 Incl | TD 163 | Date | Logger | Page of

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	ROD	Rec	STRUCTURES Fractures/Faults	Ck	Dole	Silica% Vn	Silica% Piv	Silica% CN	Silica% Arg	Silica% Bx	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	tn	hm	po	cp	bn	sl	Veins Type	Veins no/ft	Veins ang	Thick	Au moz	Comments
105			Bx zone & rock (hem) matrix Warped thin beds 103' ~45° to CA																											
110						Fx @ 108' 55° to CA																									
115																														
120			Thin beds, 118' @ 10° to CA																											
125																														
130			Bx zone 125'-127' hem (mtx) & grn volc matrix																											
135			skarnylds, 137' 45° to CA																											
140																														
145			Bx, grn matr 145'-146'																											
150																														
155			- - -																											
160			Limestone Depositional Breccia Chert-supported "Agglomerate"																											
165			TD=163' → grn volc is matrix																											

ECHO BAY MINERALS | Project: Greenwood | Dhld: RR05-97 | Coord: N E Elev | Az 290° Incl -45° TD 194 | Date 9/12/97 | Logger MLC | Page 1 of

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Cu	Dhb	Silica% Vn	Silica% Prv	Silica% Chl	Silica% Arg	Silica% Sid	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	ml	hm	po	cp	bp	si	Veins Type	Veins no/ft	Veins ang	thick	Au moz	Comments
0			@ 2' 2' – 38' - LIMESTONE (FINE MARBLE) - Thin/med bedded - white to gray to gray green - Sparse beds of blockstic debris (e.g. 36', 26', 20')			bedding @ 35° to CA																							
40			contact @ 38' - indistinct 38'-67.5' Contact																										
45			SYENITE - buff to pinkish gray - FSP + HB phenos in aphan matrix																										
65			contact @ 67.5', 25° to CA 67.5'-69' LIMESTONE			contact @ 25° to CA									wk silicification														
70																													
75						Broken, bx'td																							
80			78'-80' Black Frag LS - White calcite matrix Bx'd, dark matrix 81' - contact poss. faulted			Bx'd contact @ 85° to CA									78'-80' Replacement ?										Veinlets 1 per ft	20	var			104-0236 75-80 104-0237 80-85
85			84'-89.5' HL > Fsp phenos SYENITE																						Veinlets Less	less	var			
90			89.5 - T.D. LIMESTONE Thick bedded			filled contact @ 85° to CA veins developed										wk py to 100'													104-0238 85-90 104-0239 90-95

ECHO BAY MINERALS | Project GREENWOOD DDH RB-05-97 Coord: N E Elev Az 240 Incl -45 TD 194 Date 9/12/97 Logger HH Page 2 of 2

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Ca	Oxide	Silica% Si	Fr	Ch	Arg	Sd	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	ml	hm	bo	cp	ap	sl	Veins Type	no/ft	ang	Au thick	Au moz	Comments
105			LIMESTONE																											104-024 1/ 100-105
110			cc veins																											104-0242 105-110
115																														
120																														
125																														
130			Epithermal veins																											
135			cc veinlets																											
140			no																											
145																												17	140-45 104-318	
150						150-160																						<	145-50 319	
155			Bx'd zone 150 to 160			Crushed bx'd zone																						<	150-55 320	
160																												<	155-160 321	
165																														
170																														
175																														
180																														
185																														
190																														
195			194 TD																											

ECHO BAY MINERALS | Project RBeN | Dhld RB-06-97 | Coord: N E Elev | Az 110° Incl -45° TD 110' | Date 8/31 | Logger MR | Page 1 of 2

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	ROD	Rec	STRUCTURES Fractures/Faults	Silica% Cs	Dolo	Vn	Prv	Chl	Arg	Sd	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	mt	hm	po	cp	sp	sl	Veins Type	no/ft	ang	thick	Au moz	Comments
5	V		0-29.5' Volcanic Greenstone epidotic, v abund qtz vnlts, hem → Prox. Some rounded qtz & L/Fl. clasts																											
10	V																													
15	V		13-17' - 2-5% ppl, ub mag, v. minor CO_3, local.																											
20	V		← Prox zone - 19-21', discontinuous;																											
25	V																													
30	V		Increasing v abund. epidote near contact, brecciated - veg. to contact. 29.2-30.0' Limestone ub w/ silicy. hem. 30.0-45' Replacement Zone - v.fg epid., ephesky, v.abund garnet clusters, mod prox CO_3, < mag, irreg vnlts.																											
35																														
40			38-39' garnet-epidote rich area in lt w/ cavity, mag & hem.																											
45						42.5' Prox w/ mag, gt, chl, cavity, CO_3 filling.											42-43' band of Pprreg, gt, irreg w/ Sephesky py.															
50	V		45-110' Volcanic greenstone < Okeo - some Prox, abund. epidote, qtz vnlts, dk. brn-red/gunmy? alteration, fading away from contact.																											
55	V		Minor hem on many Prox, CO_3 on some.																											
60	V																													
65	V																													
70	V																													
75	V																													
80	V																													
85	V					1 cm pc - mag + cp, CO_3																									
90	V																													
95	V																													

ECHO BAY MINERALS | Project R Rolf | Dhld RB-06-97 | Coord: N | E | Elev | Az 110° | Incl -45° | TD 110' | Date 8/31 | Logger WR | Page 2 of 2.

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Cc	Dole	Silica% Vn	Pr	CN	Arg	Sil	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	mt	hm	po	cp	ap	sl	Veins Type	no/ft	ang	thick	Au moz	Comments
105	V																												
110	V		T.D.																										

ECHO BAY MINERALS | Project R-Bell | Dhld RB-07-97 | Coord: N E Elev | Az 290° Incl -45 TD 300' | Date Sept 97 | Logger [illegible] | Page 1 of 3

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Silica% Ca	Dolo	Vn	Pv	Chl	Arg	Sil	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	mt	hm	po	cp	ap	sl	Veins Type	Veins no/ft	Veins ang	thick	Au moz	Comments
0'	✓		0-77' Volcaniclastic Fragmental Greenstone																										
5	✓																												
10																													
15	✓																												
20	✓																												
25	✓																												
30	✓																												
35	✓																												
40	✓																												
45																													
50	✓																												
55	✓																												
60	✓																												
65	✓																												
70	✓																												
75			Fault ~75'																										
80			77-115' Syenite — as logged previously																										
85																													
90																													
95																													

MEANING ?

RB-07-97

ECHO BAY MINERALS | Project | Dhld | Coord: N | E | Elev | Az 240 | Incl -45TD 300' | Date 9/1 | Logger TJ | Page 2 of

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Ox	Dole	Silica% Vn	Pnv	Chl	Arg	Sid	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	mt	hm	po	cp	sp	sl	Veins Type	Veins no/ft	Veins ang	Thick	Au moz	Comments
100			77-115' Syenite																										
105																													
110																													
115			115-119' Fine-gr, apidote-rich (60-?) w/ 5-10% irreg. Py blebs																										
120			115-138' Limestone breccia — Meding?																										
125																													
130																													
135																													
140			138'-300' Limestone																										
145																													
150																													
155																													
160																													
165																													
170																													
175																													
180																													
185																													
190																													
195																													

RB-07-97

ECHO BAY MINERALS | Project | Ohld | Coord: N | E | Elev | Az 290 Incl -45 TD 300 | Date 9/1 | Logger TJ | Page 2 of 3

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Cc	Dolo	Silica% Sc	Px	Chl	Arg	Sc	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	el	hm	po	cp	ap	sl	Veins Type	no/ft	ang	thick	Au moz	Comments
			138-300' Limestone																											
270						Brecciated & healed																								
280																														
290			Thin bedded																											

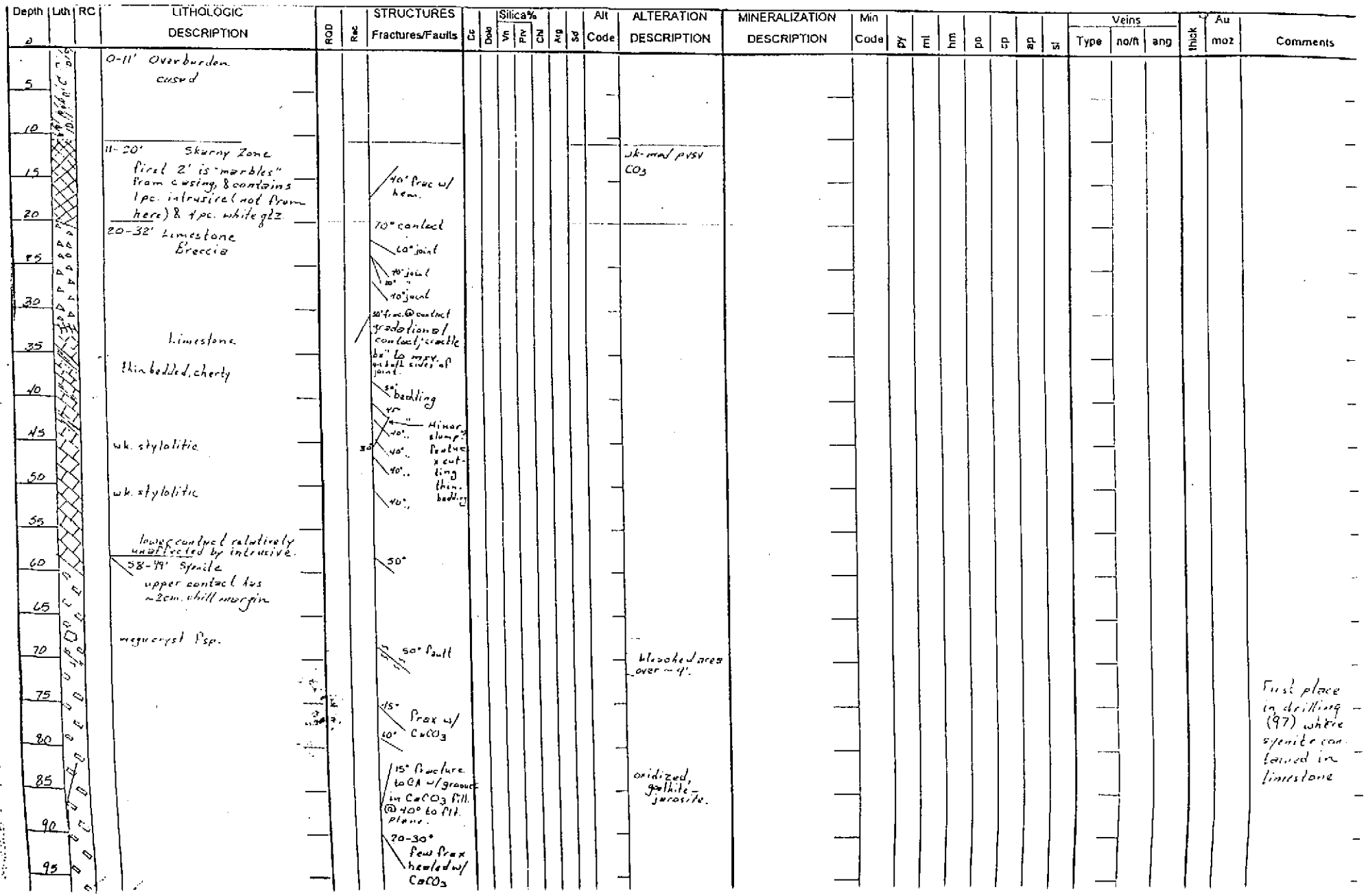
ECHO BAY MINERALS | Project K. Bell | Dhld KB-08-97 | Coord: N | E | Elev | Az 290° Incl -60° TD 190' | Date 25 Jul 97 | Logger LJ | Page 1 of 2

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Ca	Code	Silica% Si	Py	Ca	Arg	Sx	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	ml	hm	po	cp	sp	si	Veins Type	no/ft	ang	thick	Au moz	Comments
0			0- Volcaniclastic Fragmental Greenstone			50° epidote along < frax																							-60° @ "K"
5			<CO3 &/or hem. along some frax																										
10																													
15																													
20			Some igneous frags ≤ 2 cm., rounded																										
25			6" f.-medgr. gry-grn sed w/ 5% euh. py. 25-30' qtz pebble cong. w/ epidote in matrix, random clasts			55°																							
30																													
35			Tuff conglomerate, mpl. brn. matrix, 20% 1-2 mm qtz. clasts			offset 15 mm 35°																							
40			39'-51' abund. hem. on frax & in matrix around clasts & fragments																										
45						45° 1" band hem-rich sed as above																							
50																													
55			fragments ≤ 1 cm.																										
60																													
65			epidote-rich area- epidote & sulf's more abund. to contact		35°	2 CA ~ minor lin slick										5-10% irreg. py 2 5% blotchy sulf's		5-10											
70																													
75																													
80			Fault 80-99' Syenite as previously described.			gouge & crushed rock ~1½'																							
85																													
90																													
95			Pink-salmon, 1-2 mm Kfp w/ 5-10% hbl, & 5-10% wh & grn. K'fsp < 1 cm.																										

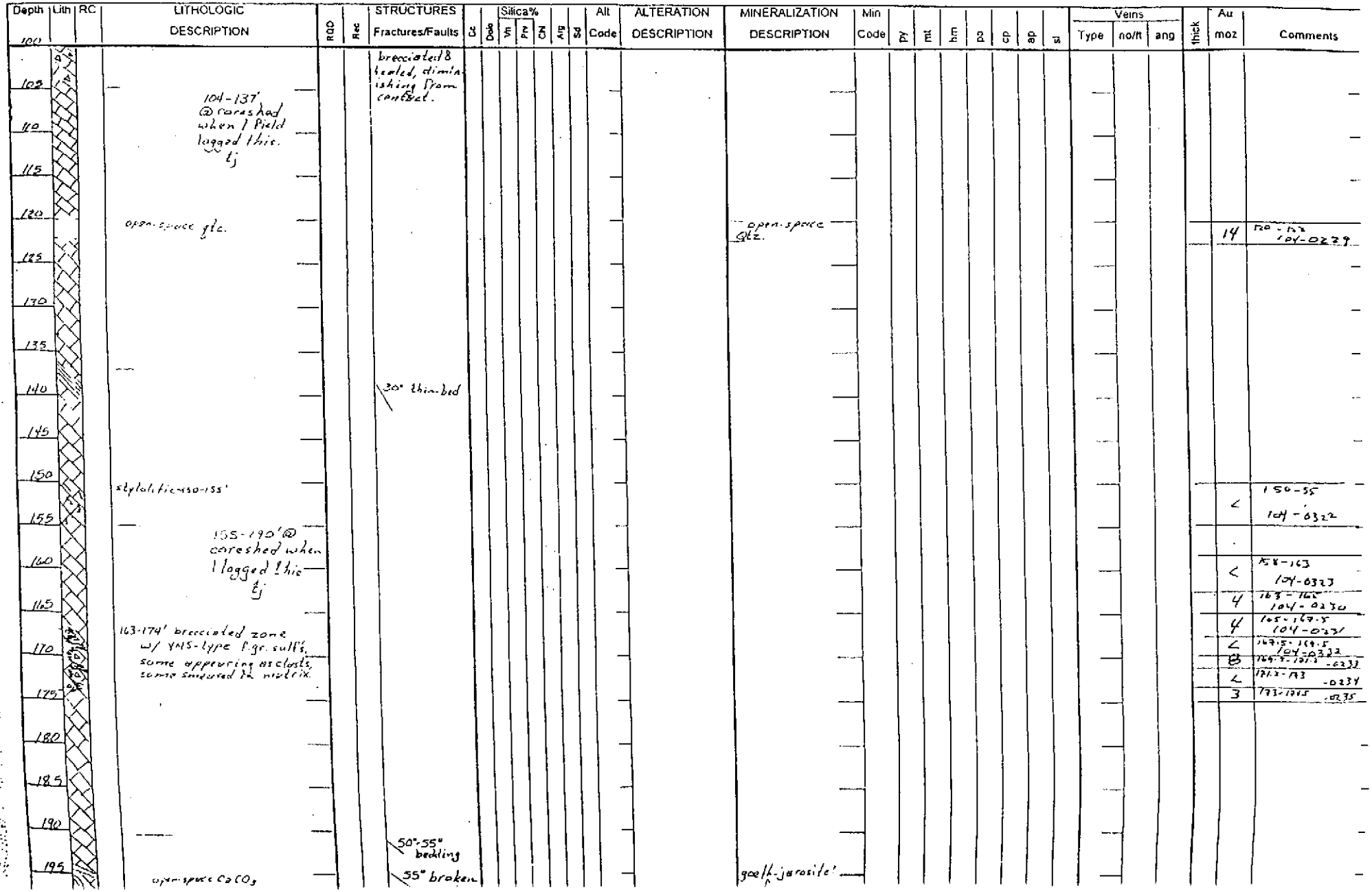
ECHO BAY MINERALS | Project K Area | Drill KD-DX-77 | Coord. N | E | Elev | AZ 240° Incl -60° TD 190' | Date 2/3/97 Logger Li | Page 2 of 2

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Silica% Cs	Dbo	Vn	Prv	Chl	Arg	Sul	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	Mt	hm	po	cp	ep	sl	Veins Type	Veins no/ft	Veins ang	thick	Au moz	Comments
100			99-104' Volcaniclastic Fragmental Greenstone													101' - 2" band of 30% py., 2-5% ~~massive~~													
105			104-133.5' "Skarny Zone" Igneous Prebolith w/ epidote overprint. The sulf./bbl replacement clots are gen. by a small fracture, either bounded by, or divided by.													5-10% replacement clots w/ 30-40% pyrite core in bbl/CO_3 rind.		2-5%										
110																													
115																(sulf / bbl/CO_3)													
120																													
125																													
130																													
135			75° 133.5-173.5' Limestone Breccia "Mixed Zone" 136-150 - epidote-CO_3 'skarny zone' w/ hem. on fracs.			5 mm shear																							
140																													
145																													
150			Limestone Breccia clasts - 30-70% Limestone, containing some chert pebbles in intense crushed areas. Matrix - a varying mixture of epidote, CO_3, a med. grey material & hemalite, & chlorite.													1-2% irreg. pyritic clots												
155																													
160																													
165																													
170																													
175			173.5-190' Limestone "some minor bx'n & healing, some stylolitic areas & stylolite matrices.																										
180																													
185																													
190'			TD																										

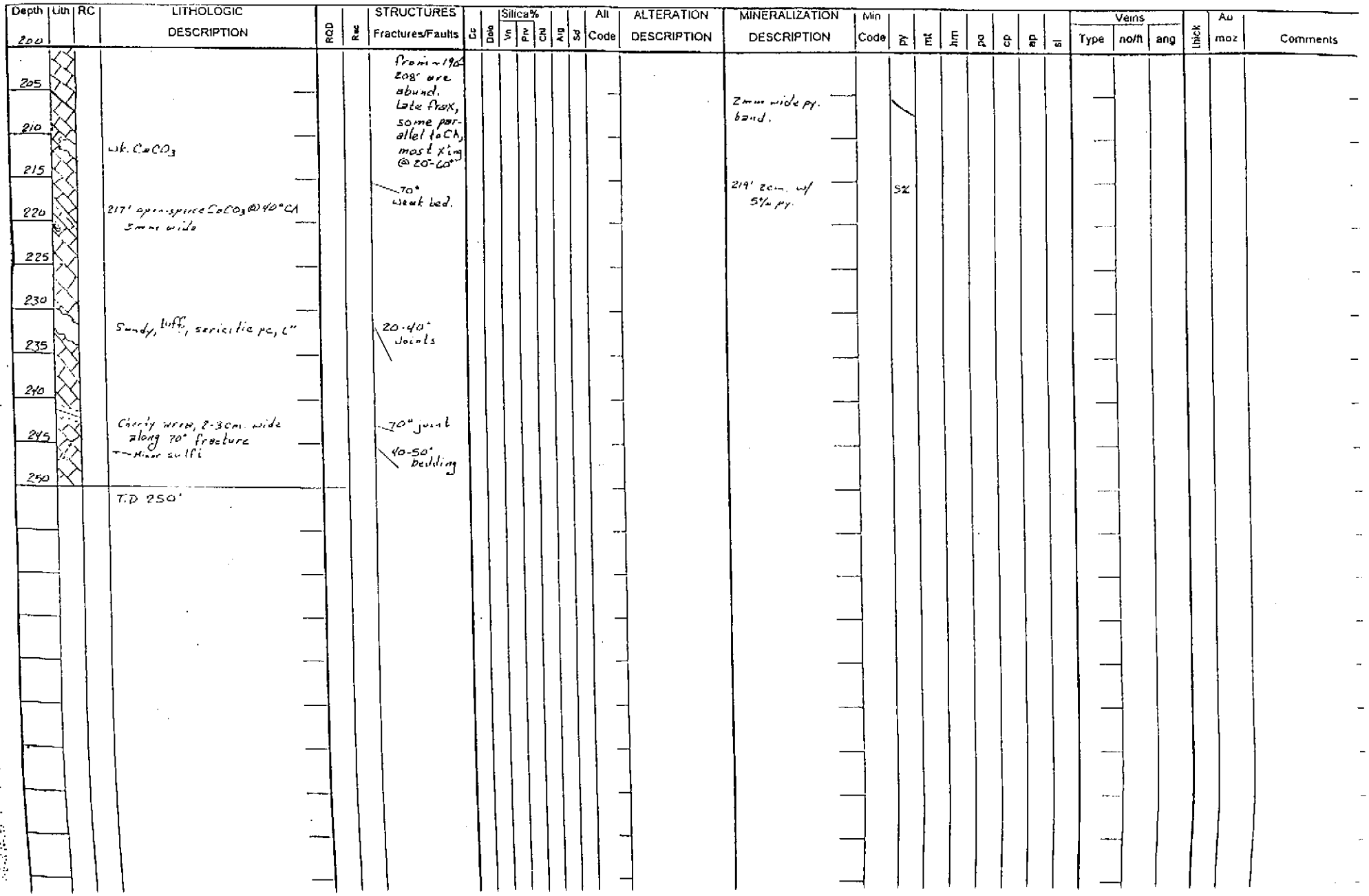
RE-09-97


Depth
Lith
RC
LITHOLOGIC DESCRIPTION
RQD
Rec
STRUCTURES Fractures/Faults
Silica%
Cc
Dolo
Sh
Prv
Chl
Arg
Sd
Alt Code
ALTERATION DESCRIPTION
MINERALIZATION DESCRIPTION
Min Code
py
ml
hm
po
cp
ap
sl
Veins
Type
no/ft
ang
thick
Au moz
Comments
0-11' Overburden caved
11-20' Skarny Zone
first 2' is "marbles" from casing, & contains 1pc. intrusive (not from here) & 1pc. white qtz.
20-32' Limestone Breccia
Limestone
thin bedded, cherty
wk. stylolitic
wk. stylolitic
lower contact relatively unaffected by intrusive.
38-49' Syenite
upper contact has ~2cm. chill margin
megacryst Fsp.
40° frac w/ hem.
70° contact
60° joint
70° joint
30° "
40° joint
50° frac @ contact
gradational/ contact/crackle
bx' to mod. oxidized sides of joint.
50° bedding
Minor slump? Fracture cutting thin bedding
50°
50° fault
15° Frac w/ CaCO3
10°
15° fracture to QA w/ grouch in CaCO3 fill. @ 40° to fit. plane.
20-30° Few frac healed w/ CaCO3
wk-mod pvsv CO3
bleached area over ~4'.
oxidized, goethite-jarosite.
First place in drilling (97) where syenite contained in limestone

RB-04-17


Depth
Lith
RC
LITHOLOGIC DESCRIPTION
RQD
Rec
STRUCTURES
Fractures/Faults
Silica%
Alt Code
ALTERATION DESCRIPTION
MINERALIZATION DESCRIPTION
Min Code
Veins
Type
no/ft
ang
thick
Au moz
Comments
104-137' @ core shed when I field logged this. tj
open-space qtz.
breccia ted & healed, diminishing from contact.
30° thin-bed
stylolitic ~150-155'
155-190' @ core shed when I logged this tj
163-174' brecciated zone w/ YNS-type f.gr. sulfs, some appearing as clasts, some smeared in matrix
50°-55° bedding
55° broken
open-space CaCO3
open-space qtz.
goeth-jarosite
150-55
104-0322
158-163
104-0323
163-165
104-0230
165-169.5
104-0231
169.5-171.3
104-0232
171.3-173
-0234
173-174.5
-0235

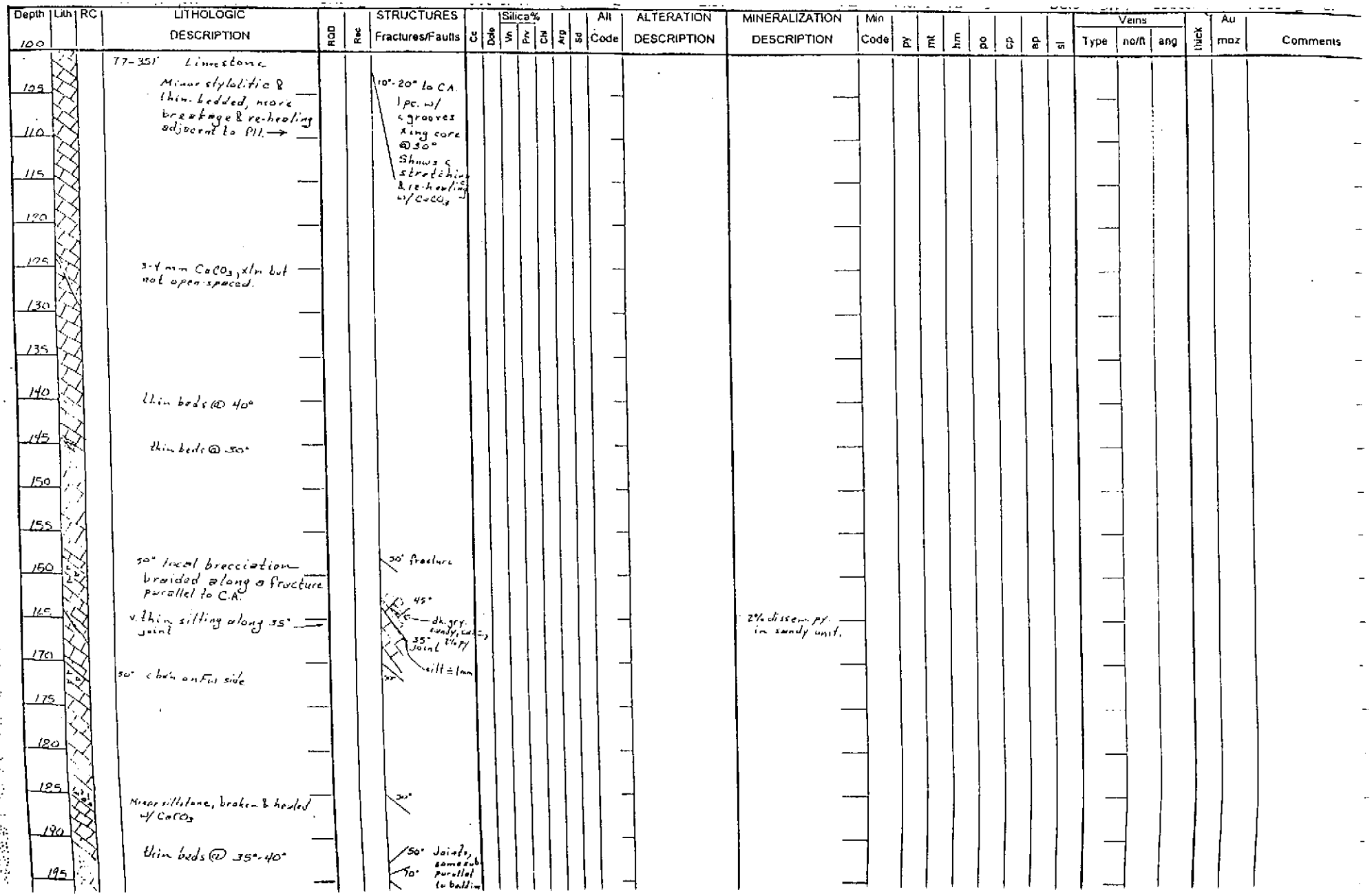
RB-05-22


Depth
Lith
RC
LITHOLOGIC DESCRIPTION
ROD
Rec
STRUCTURES
Fractures/Faults
Silica%
Cc
Dolo
Vn
Prv
Chl
Arg
Sd
Alt Code
ALTERATION DESCRIPTION
MINERALIZATION DESCRIPTION
Min Code
py
mt
hm
po
cp
sp
sl
Veins
Type
no/ft
ang
Thick
Au moz
Comments
200
205
210
215
220
225
230
235
240
245
250
From ~190 zone are abund. Late frax, some parallel to Ch, most x'ing @ 20-60°
wk. CaCO3
70° weak bed.
217' open-spruce CaCO3 @ 40° CA 3mm wide
2mm wide py. band.
219' 2cm. w/ 5% py.
5%
Sandy, tuffs, sericitic pc, 6"
20-40° Joints
Clayey wrap, 2-3cm. wide along 70° fracture
--Minor sulfi
70° joint
40-50° bedding
T.D 250'

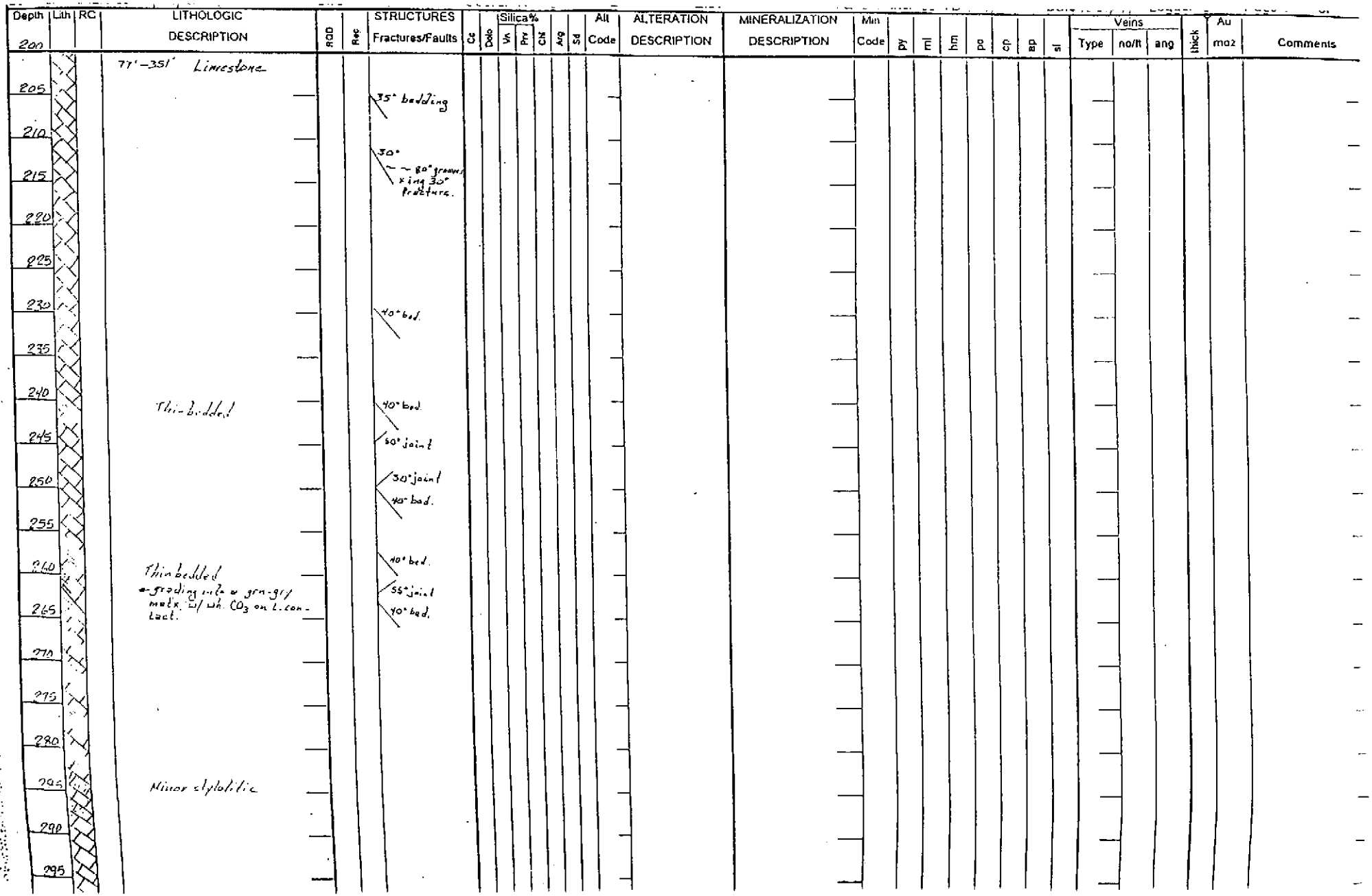
KRB-V-97

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Cc	Code	Silica% Vn	Pv	CN	Arg	Sd	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	mt	hm	po	cp	ap	sl	Veins Type	no/ft	ang	Thick	Au moz	Comments
0			Overburden 0-8'																											
5																														
10			8-9' Greenstone 9-10' Volc'clast. Frag. Grstone 10-21' Skarn																											
15																														
20																														
25			21'-29' Limestone breccia weakly magnetic																											
30			29-77' Syenite weakly magnetic																											
35																														
40																														
45																														
50																														
55																														
60																														
65																														
70																														
75																														
80			77-351' Limestone wkly. stylolitic			tuff/siltstone bed to recycle possible slope wash Ls 40° bedding																									
85																														
90																														
95			92' thin bedded siltstone/Ls, chem.																											

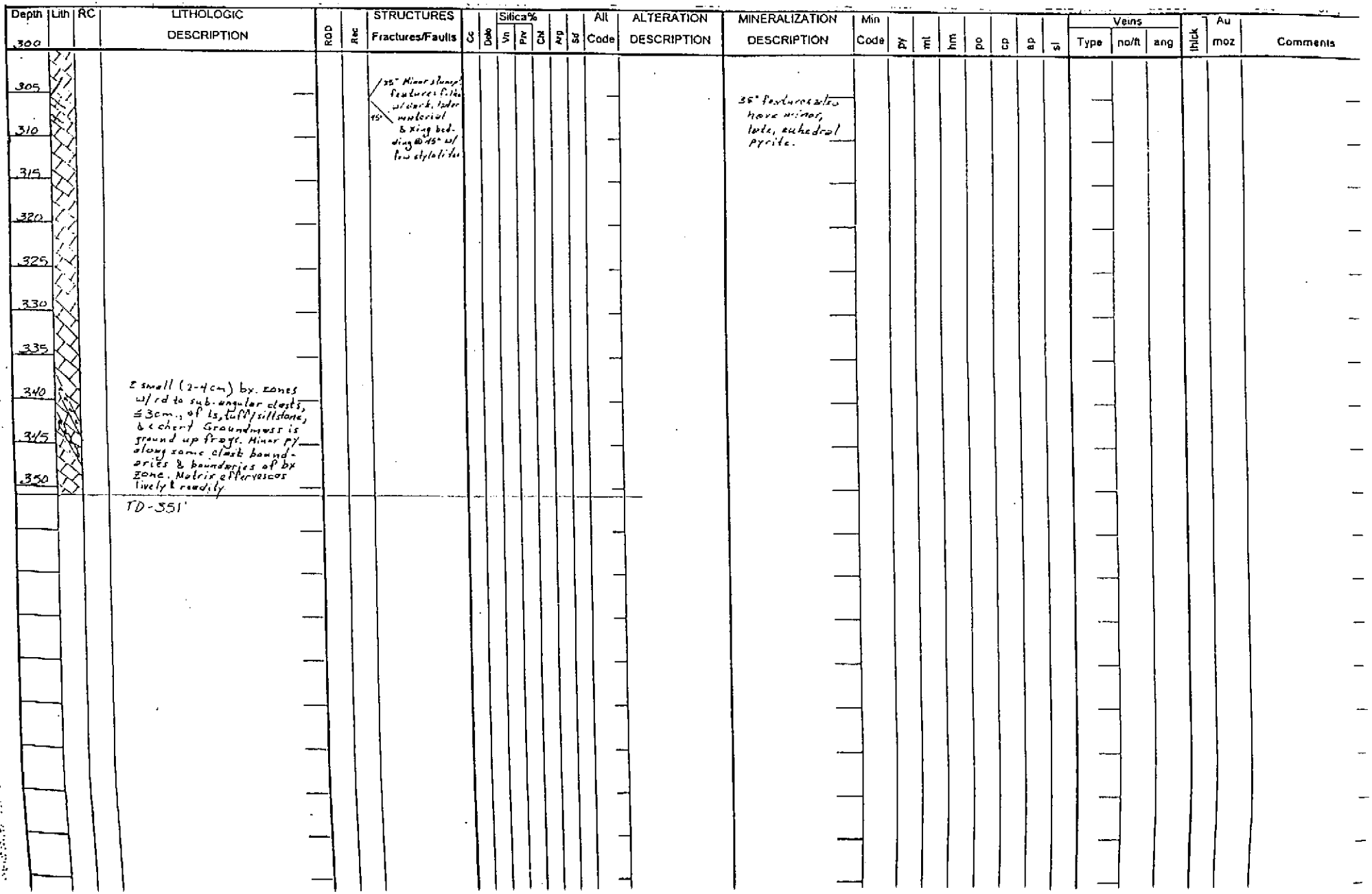
RB-D-011


Depth
Lith
RC
LITHOLOGIC DESCRIPTION
RQD
Rec
STRUCTURES Fractures/Faults
Cc
Dolo
Silica% Vn
Prv
Chl
Arg
Sd
Alt Code
ALTERATION DESCRIPTION
MINERALIZATION DESCRIPTION
Min Code
py
mt
hm
po
cp
sp
sl
Veins Type
no/ft
ang
thick
Au max
Comments
77-351' Limestone
Minor stylolitic & thin-bedded, more breakage & re-healing adjacent to flt.
10°-20° to CA
1 pc. w/ 2 grooves xing core @ 30°
3-4 mm CaCO3 xln but not open-spaced.
Thin beds @ 40°
Thin beds @ 50°
50° local brecciation braided along a fracture parallel to C.A.
v. thin silting along 35° joint
50° chl on flt side
45°
dk. gry. sandy, calc.
35° joint 1% py
silt = 1mm
2% disem. py in sandy unit.
Minor siltstone, broken & healed w/ CaCO3
Thin beds @ 35°-40°
50° Joints, some sub parallel to bedding
70°

RB-10-97


Depth
Lith
RC
LITHOLOGIC DESCRIPTION
RQD
Rec
STRUCTURES Fractures/Faults
Cc
Dolo
Silica%
Vn
Prv
Chl
Arg
Sd
Alt Code
ALTERATION DESCRIPTION
MINERALIZATION DESCRIPTION
Min Code
py
ml
hm
po
cp
sp
sl
Veins
Type
no/ft
ang
thick
Au maz
Comments
200
205
210
215
220
225
230
235
240
245
250
255
260
265
270
275
280
285
290
295
77'–351' Limestone
35° bedding
30°
~ ~ 80° grooves
x ing 30° fracture.
40° bed.
Thin-bedded
40° bed.
50° joint
30° joint
40° bed.
Thin bedded
- grading into a grn-gry
matx. w/ wh. CO3 on b. con-
tact.
40° bed.
55° joint
40° bed.
Minor chloritic

RC-XD-017


Depth
Lith
RC
LITHOLOGIC DESCRIPTION
300
305
310
315
320
325
330
335
340
345
350
5 small (2-4 cm) bx. zones w/rd to sub-angular clasts, ≤ 3cm., of ls, tuff/siltstone, & chert. Groundmass is ground up frags. Minor py along some clast boundaries & boundaries of bx zone. Matrix effervescas tively & readily
TD-351'
ROD
Rec
STRUCTURES
Fractures/Faults
35° Minor slump features (like at back, later material & xing bedding @ 45° w/ few stylolites
45°
Cc
Dolo
Silica%
Vn
Py
Chl
Arg
Sd
Alt
Code
ALTERATION DESCRIPTION
MINERALIZATION DESCRIPTION
35° fractures also have minor, late, euhedral pyrite.
Min
Code
py
ml
hm
po
cp
ap
sl
Veins
Type
no/ft
ang
Thick
Au
moz
Comments

RB-11-27

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Cc	Dolo	Silica% Vn	Pvr	CN	Arg	Sx	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	ml	hm	po	cp	sp	sl	Veins Type	no/ft	ang	thick	Au moz	Comments
0			0-6' Overburden																											
5																														
10			6-27' Greenstone Dk. grn. w/ megacrysts of pink K-fp (2-4cm)												K-fp's are predom. pink, w/o pale grn. rind & contain some small (~1mm) plag (some?) & ofen. minor chloritic mafic (<5%) minerals as inclusions. K-fp's are generally subhedral.															
15																														
20																														
25																														
30			27-54.5' Syenite			30° contact																								
35																														
40																														
45																														
50																														
55			54.5-59' epidote skarn			75° contact																								
60			59'-151' Mixed zone - limestone breccia			45° contact																								
65			Limestone clasts w/matrix of varying amounts of chlorite, epidote, hematite																											
70						90° Joint																								
75						90° Joint																								
80						90°																								
85						90°																								
90						70°																								
95																														

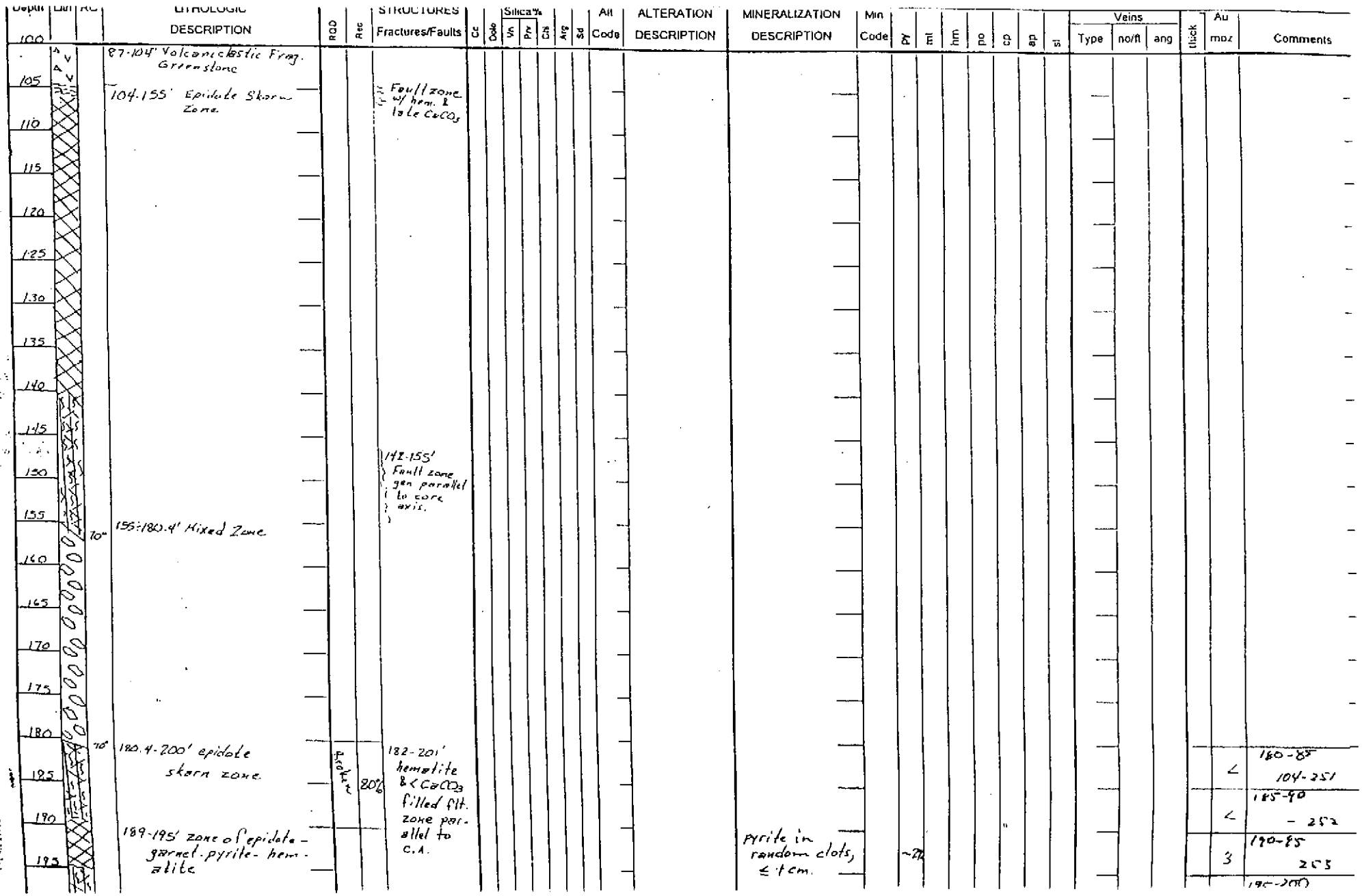
RP-11-?

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Cc	Code	Silica% Vn	Piv	CN	Alg	Sd	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	mt	hm	bo	cp	ap	sl	Veins Type	no/ft	ang	Ihick	Au moz	Comments
100			59-151' Mixed Zone - limestone Breccia			~70° joint																								
105																														
110																														
115																														
120																														
125																														
130																														
135																														
140																														
145																														
150																														
			151' T.D.																											

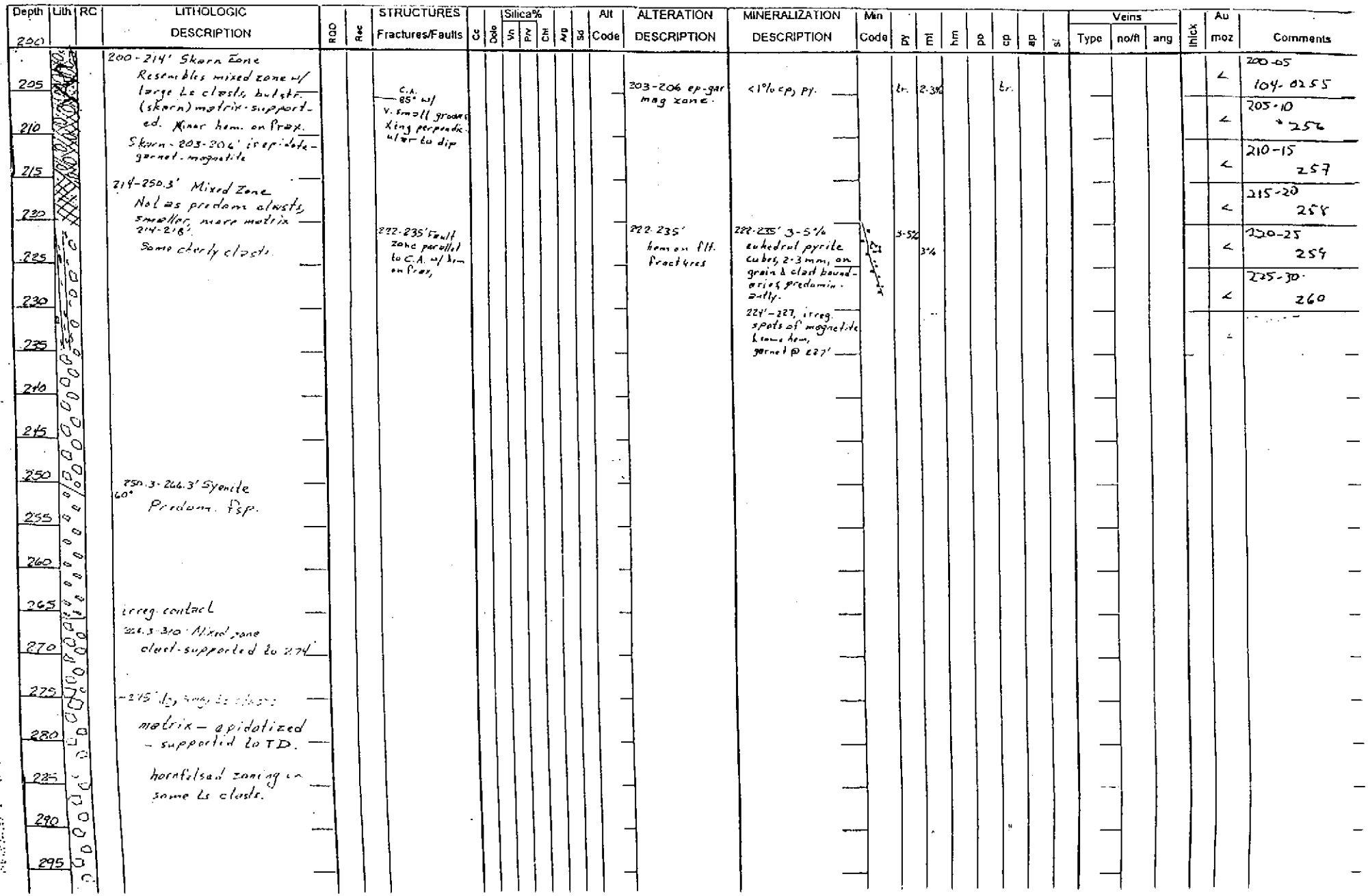
KC-12-91

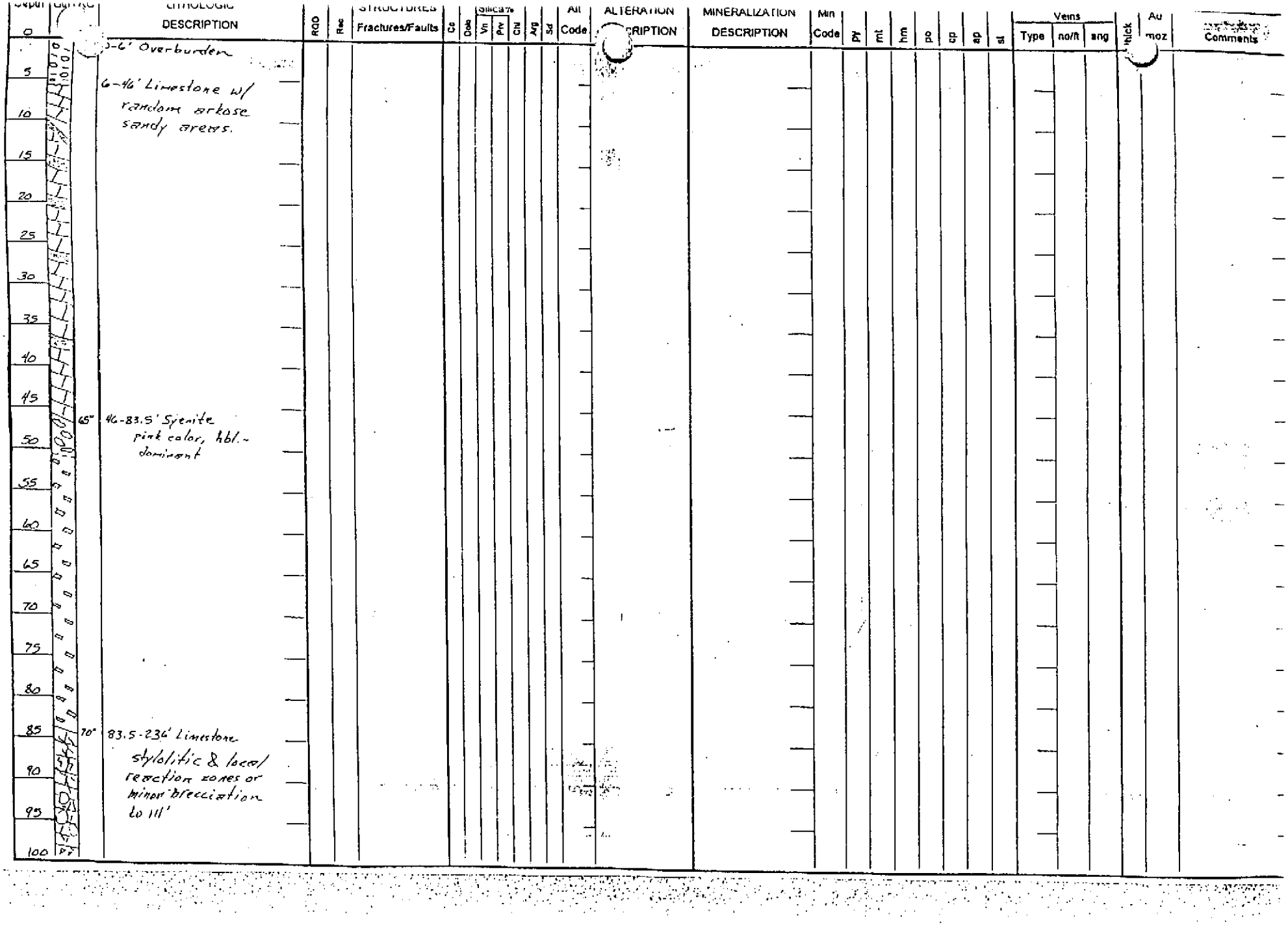
Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Cc	Oxide	Silica% Vn	Pyr	CN	Arg	Sid	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	ml	hm	po	cp	sp	sl	Veins Type	no/ft	ang	thick	Au moz	Comments
0																														
5			0-4' Overburden																											
10			4-14' Greenstone as in hole #11 w/ megacrystic K-Sp & few possible felsic clasts from Frax.																											
15			14-55' Volcaniclastic Fragmental Greenstone. epidote in fill																											
20																														
25																														
30																														
35																														
40			39-40' a zone of epidote bands & 5% euhedral py.													euh. py cubes 1-3 mm		5%												
45																														
50																														
55			55-87' Syenite																											
60																														
65																														
70																														
75																														
80																														
85																														
90			87-104' Fragmental Volcaniclastic Greenstone																											
95																														

RB-12-97

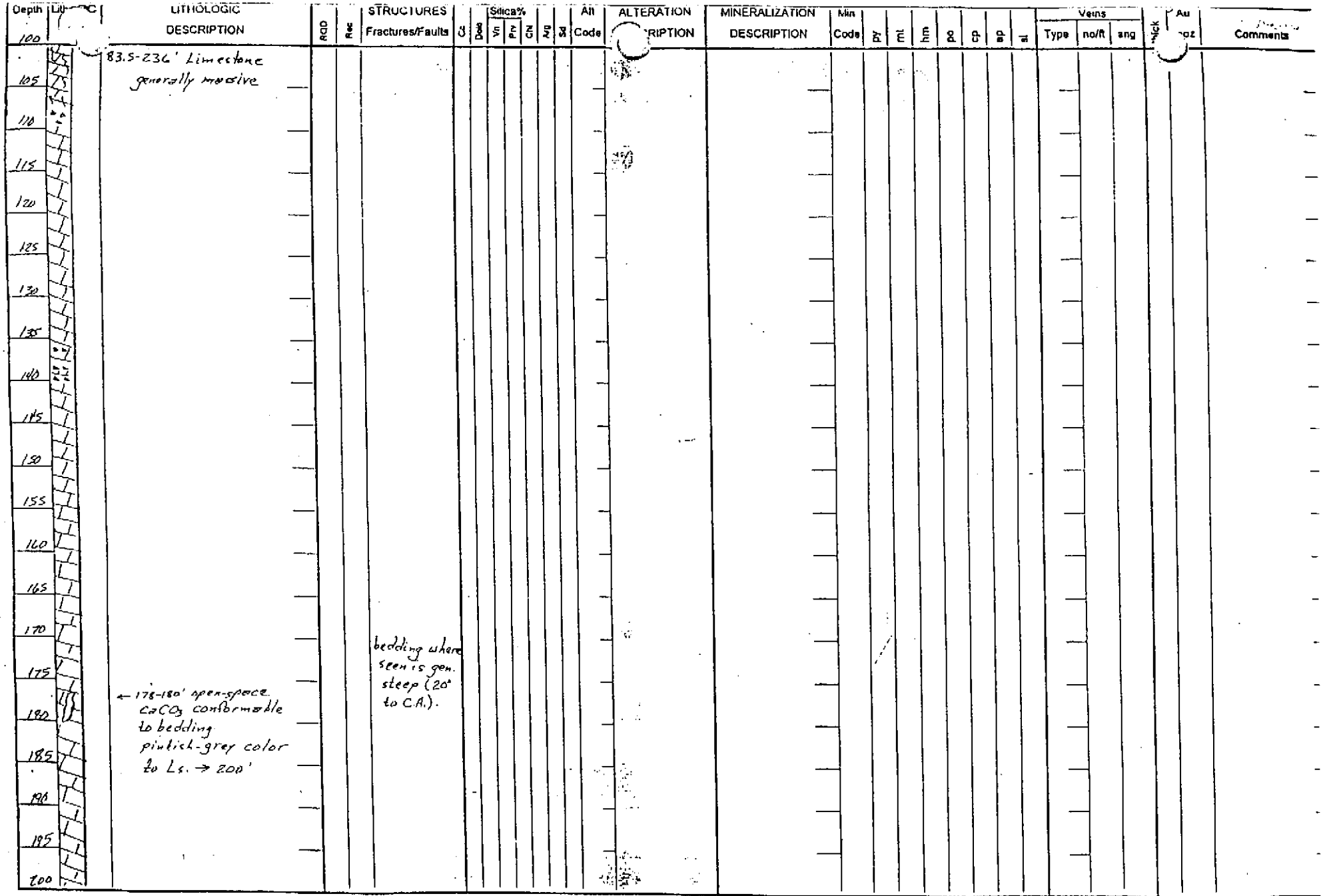

Depth
Lith
AC
LITHOLOGIC DESCRIPTION
RQD
Rec
STRUCTURES Fractures/Faults
Ca
Calc
Silica% Vn
Silica% Pvr
Clay
Arg
Sil
Alt Code
ALTERATION DESCRIPTION
MINERALIZATION DESCRIPTION
Min Code
py
ml
hm
po
cp
sp
sl
Veins Type
Veins no/ft
Veins ang
thick
Au ppb
Comments
100
105
110
115
120
125
130
135
140
145
150
155
160
165
170
175
180
185
190
195
87-104' Volcaniclastic Frag. Greenstone
104-155' Epidote Skarn Zone.
Fault zone w/ hem. & late CaCO3
141-155' Fault zone gen parallel to core axis.
70°
155-180.4' Mixed Zone
180.4-200' epidote skarn zone.
Broken
80%
182-201' hematite & <CaCO3 filled flt. zone parallel to C.A.
189-195' zone of epidote-garnet-pyrite-hematite
pyrite in random clots, ≤ 1cm.
~2%
160-85 104-251
185-90 - 252
190-85 253
190-200

R.B. 12-97

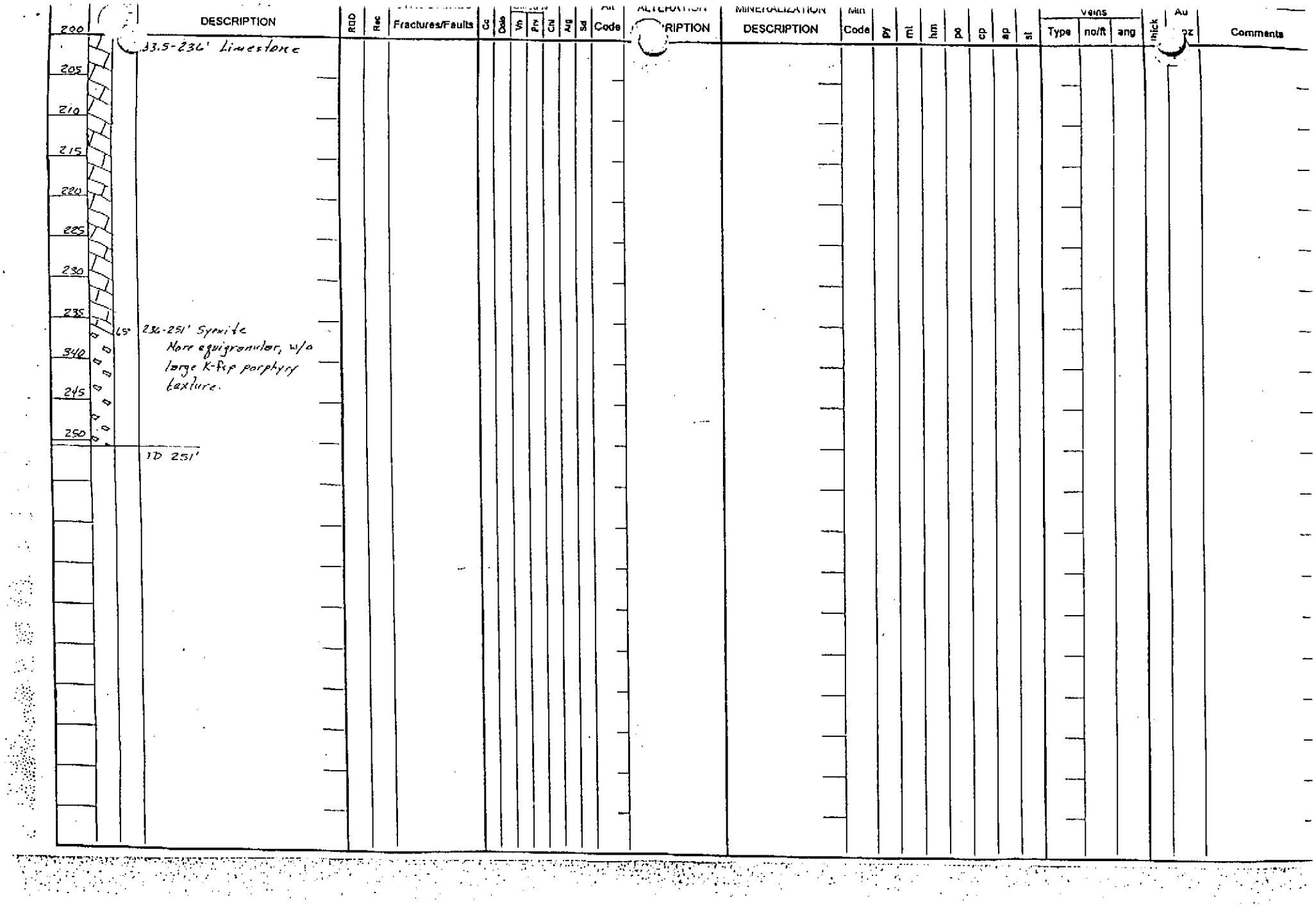

Depth
Lith
RC
LITHOLOGIC DESCRIPTION
RQD
Rec
STRUCTURES
Fractures/Faults
Silica%
Cc
Dolo
Vn
Prv
Chl
Arg
Sil
Alt
Code
ALTERATION DESCRIPTION
MINERALIZATION DESCRIPTION
Min Code
py
ml
hm
po
cp
sp
Veins
Type
no/ft
ang
Inlck
Au
moz
Comments
200-214' Skarn Zone
Resembles mixed zone w/ large Ls clasts, but str. (skarn) matrix-supported. Minor hem. on Prox.
Skarn - 203-206' is epidote-garnet-magnetite
214-250.3' Mixed Zone
Mat'l is predom. clasts, smaller, more matrix 214-218'.
Some clearly clasts.
C.A. 65° w/
v. small grooves King perpendic. w/ or to dip
222-235' Fault zone parallel to C.A. w/ hem on Fract.
203-206 ep-gar mag zone.
222-235' hem on filt. fractures
<1% cp, py.
222-235' 3-5% euhedral pyrite cubes, 2-3 mm, on grain & clast boundaries, predominantly.
224'-227', irreg. spots of magnetite, some hem, garnet @ 227'
250.3-266.3' Syenite
60°
Predom. Fsp.
irreg. contact
266.3-310' Mixed zone
clast-supported to 274'
-275' (?) matrix-supported
matrix - epidotized
- supported to TD.
hornfelsed zoning in some Ls clasts.
200-05
104-0255
205-10
256
210-15
257
215-20
258
220-25
259
225-30
260


Depth
Lithologic
DESCRIPTION
ROD
Rec
STRUCTURES
Fractures/Faults
Ca
Dolo
Silica%
Vn
Prv
Clu
Arg
Sd
Alt
Code
ALTERATION
DESCRIPTION
MINERALIZATION
DESCRIPTION
Min
Code
py
mt
hm
po
cp
ap
sl
Veins
Type
no/ft
ang
Thick
Au
moz
Comments
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
0-6' Overburden
6-46' Limestone w/ random arkose sandy areas.
65°
46-83.5' Syenite pink color, hbl.-dominant
70°
83.5-234' Limestone stylolitic & local reaction zones or minor brecciation to 111'

RB-13-97


Depth
LITHOLOGIC DESCRIPTION
83.5-236' Limestone generally massive
← 178-180' open-space CaCO3 conformable to bedding pinkish-grey color to Ls. → 200'
STRUCTURES
Fractures/Faults
bedding where seen is gen. steep (20° to C.A.).
ALTERATION
MINERALIZATION DESCRIPTION
Veins
Type
Comments

RB-13-97


DESCRIPTION
RQD
Rec
Fractures/Faults
Ca
Oxide
Vn
Prv
Clu
Arg
Sid
Alt Code
ALTERATION
RIPTION
MINERALIZATION
DESCRIPTION
Min Code
py
ml
hm
gl
cp
ap
st
Veins
Type
no/ft
ang
Thick
Au
oz
Comments
200
205
210
215
220
225
230
235
240
245
250
65°
33.5-236' Limestone
236-251' Syenite
Mare equigranular, w/o large K-fsp porphyry texture.
TD 251'

RB-13-97

ECHO BAY MINERALS | Project R. Bell | Dhld RB-14-97 | Coord: N 6' E | Elev | Az | Incl -90° TD 161' | Date 17Sep97 | Logger LJ | Page 1 of 2

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Cs	Dole	Silica% Vn	Silica% Pv	Silica% Cn	Arg	Sd	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	mt	hm	po	cp	sp	sl	Veins Type	Veins no/ft	Veins ang	thick	Au moz	Comments
0			0-20.5' Syenite pinkish-grey, hbl-phyric																											
5																														
10																														
15																														
20			20.5-41' Mixed zone			x~?																								
25																														
30																														
35																														
40																														
41			41-161' Limestone																											
45																														
50																														
55																														
60																														
65																														
70																														
75																														
80																														
85																														
90																														
95			92-98'- mixed? zone																											

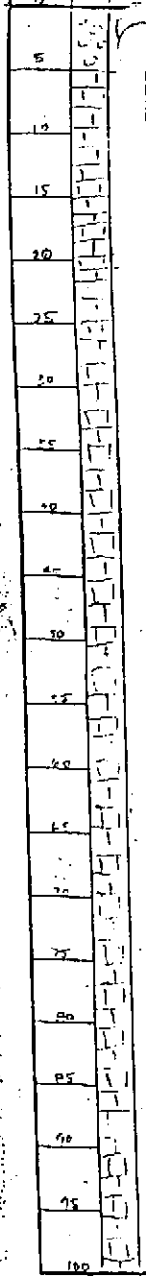
ECHO BAY MINERALS | Project K. Bell | Dhld EB-14-97 | Coord: N G' E | Elev | Az | Incl -90° TD 161' | Date 17Sep97 | Logger Li | Page 2 of 2

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Cs	Dbld	Silica% Vn	Silica% Pv	CN	Anp	Str	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	mt	hm	po	cp	bp	sl	Veins Type	Veins no/ft	Veins ang	Inick	Au moz	Comments
100																														
105																														
110																														
115			Calcite veinlet, ~2cm wide, w/ hem-chl. rind on one side, & epidote-hem. (1-2 mm. wide) in core.																											
120																														
125																														
130																														
135																														
140																														
145																														
150																														
155																														
160																														
			161 T.D.																											

ECHO BAY MINERALS | Project R. Bell | Dhld RB-15-97 | Coord: N G E Elev | Az 290° Incl -45° TD 90' | Date 21 Sep 97 Logger EJ | Page 1 of 1

Depth	Lith	RC	LITHOLOGIC DESCRIPTION	RQD	Rec	STRUCTURES Fractures/Faults	Cc	Dolo	Silica% Sil	Silica% Prv	Silica% Chl	Arg	Sid	Alt Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	mt	hm	po	cp	sp	sl	Veins Type	Veins no/ft	Veins ang	Thick	Au moz	Comments
0			0-3' Overburden																											
5			3-27' Syenite Dike																											
10																														
15																														
20																														
25																														
30		60°	27-90' Limestone skarny (epidote) in local zones.																											
35																														
40																														
45																														
50			44-48' broken & healed, resembles "open space" filling but no open spaces.																											
55			bedding generally 20-30° to C.A., minor arkose zones.			bedding 20-30°																								
60																														
65																														
70																														
75																														
80			77-78.2' local brecciation resembling "altered zones" but no epidote noted. sharp Ls & tuff clasts, matrix largely chl-hem.																											
85						bedding 20-30°																								
90			TD. - 90'																											

DESCRIPTION	RQD	Rec	Fractures/Faults	Cc	Dolo	Vn	Prv	Cln	Arg	Std	Code	DESCRIPTION	DESCRIPTION	Code	Py	mx	hm	po	sp	ap	si	Type	no/ft	ang	Thick	moz	Comments
0																											
5																											
10																											
15																											
20																											
25																											
30																											
35																											
40																											
45																											
50																											
55																											
60																											
65																											
70																											
75																											
80																											
85																											
90																											
95																											
100																											



s/b

5 - 110.5'

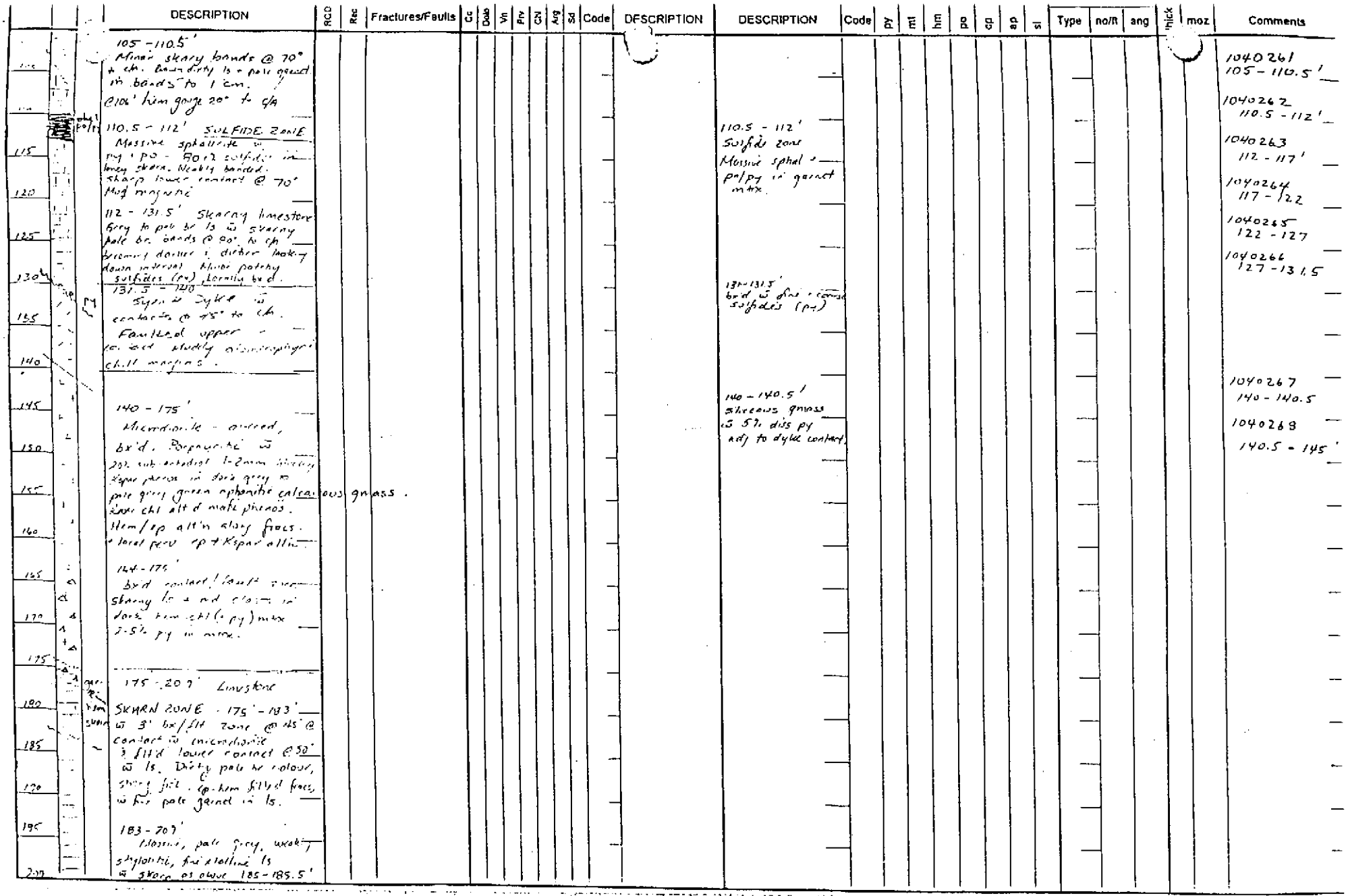
LIMESTONE

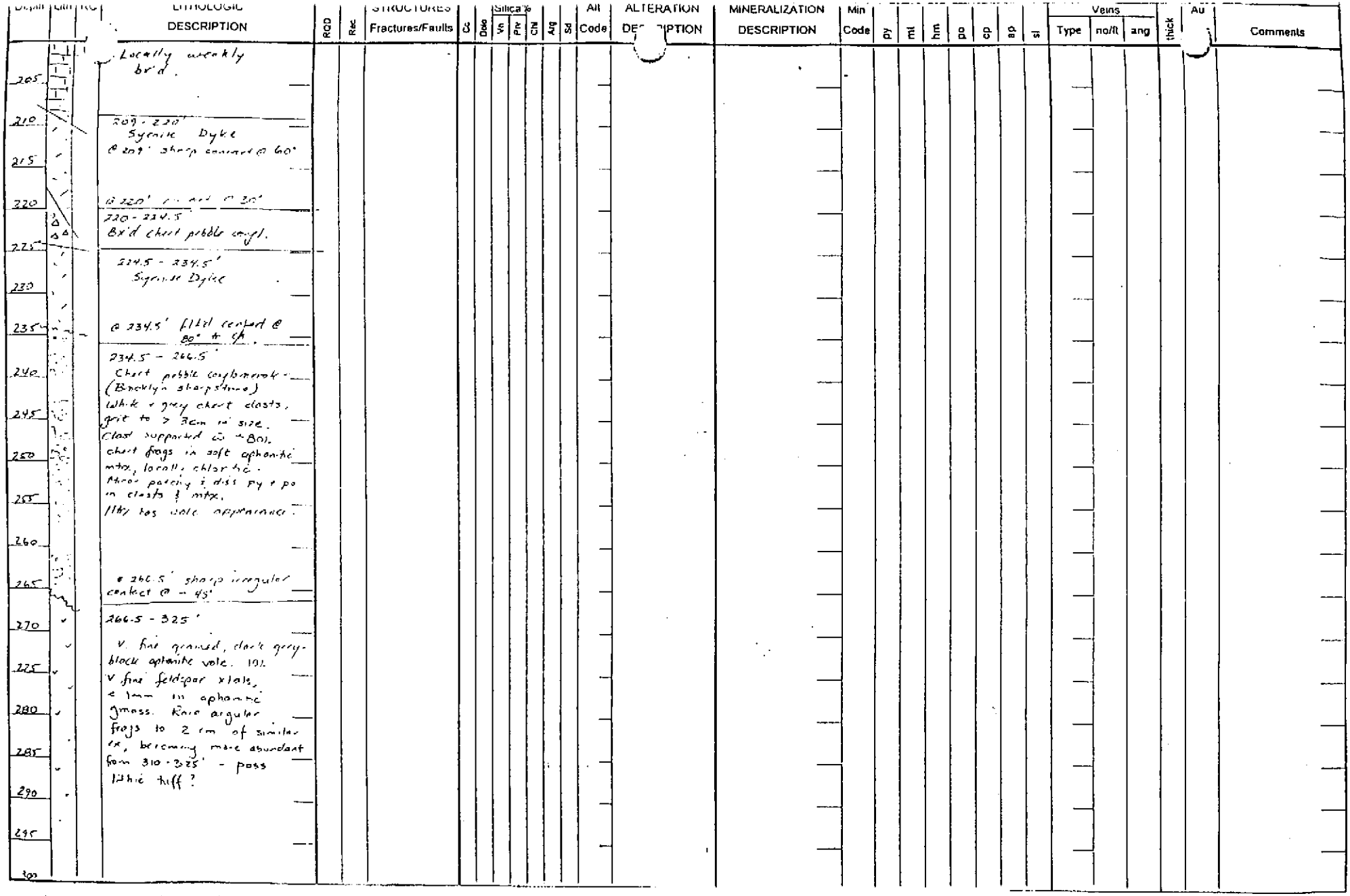
Massive, white to buff coloured med. xtalline marble - weakly stylolitic. Minor skarny bands, typically ∠ 55° to C/A, rp-px skarn in bands ∠ .5 cm in thickness. Locally pervasive. Also local cherty bands to 4 cm, may have buff coloured envelopes & grey cherty bands.

60-65
weak - mod rp skarn - pervasive patchy

95-100'
> # of thin cherty bands: typically 60° to ℄

tr sulfides @ 95'

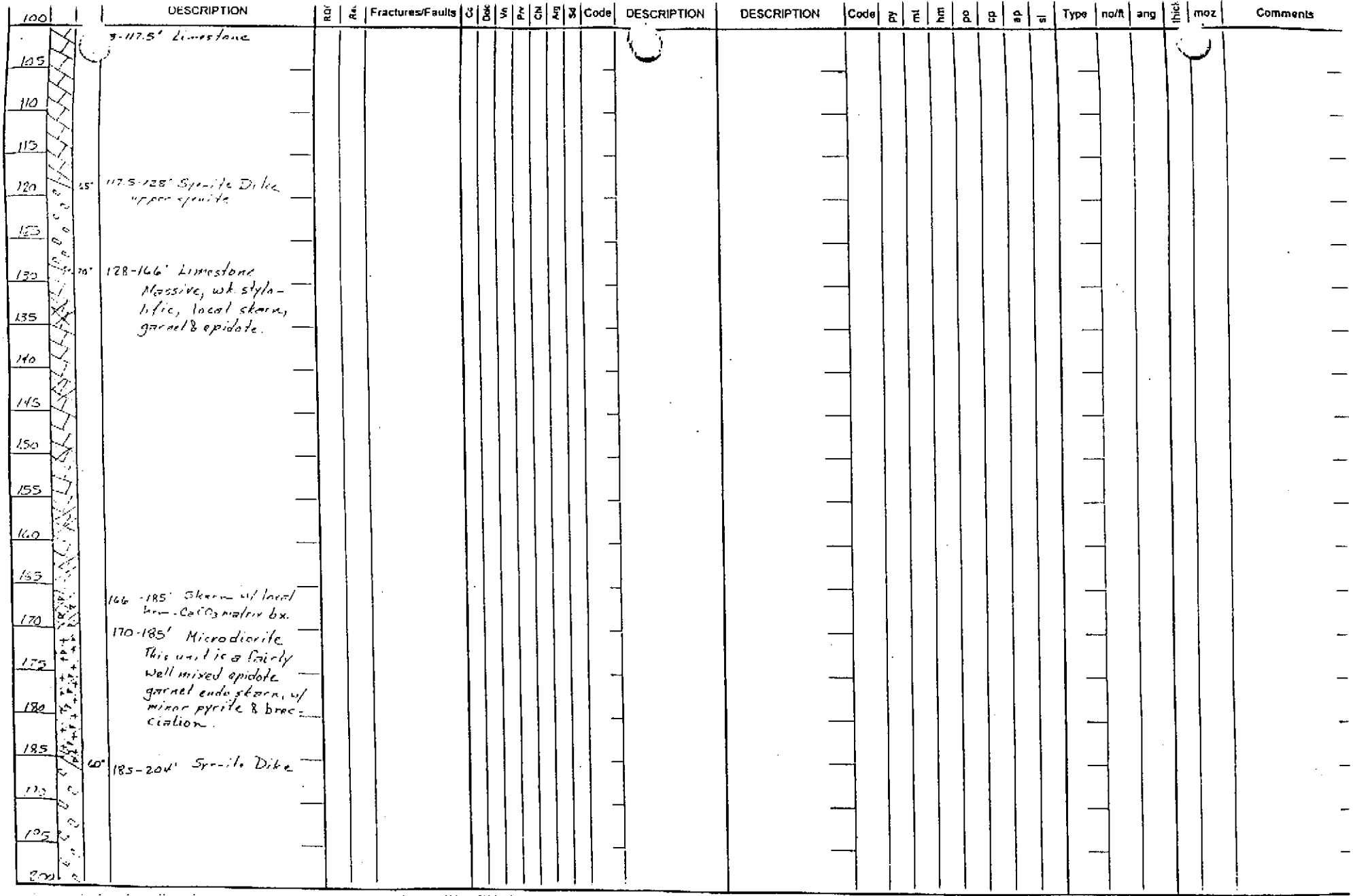

DESCRIPTION
RQD
Rec
Fractures/Faults
Cc
Dolo
Vn
Prv
CN
Arg
Sid
Code
DESCRIPTION
DESCRIPTION
Code
py
mt
hm
po
cp
ap
sl
Type
no/ft
ang
thick
moz
Comments
105 - 110.5'
Minor skarny bands @ 70° to ch. Boundary is a pale green inbands 1 to 1 cm.
@104' hem gouge 20° to c/a
110.5 - 112' SULFIDE ZONE
Massive sphalerite w py + PO - 80% sulfides in limey skarn. Weakly banded. Sharp lower contact @ 70° Mod magnetic
112 - 131.5' Skarny limestone Grey to pale br ls w skarny pale br. bands @ 90° to ch. Creamy darker & dirtier looking down interval. Minor patchy sulfides (py) Locally bxd.
131.5 - 140 Syen & Dyke w contacts @ 45° to ch. Faulted upper & lower study chilled margins.
140 - 175'
Microdiorite - altered, bx'd. Porphyritic w 20% subeuhedral 1-2mm plagioclase phenos in dark grey to pale green aphanitic calcareous groundmass. Lower chl alt'd mafic phenos. Hem/sp alt'n along fracs. Local perv sp + Kspar alt'n
144 - 175'
bx'd contact/fault zone Skarny ls + mod clasts in dark hbl-chl (+ py) matrix 2-5% py in matrix.
175 - 207' Limestone
SKARN ZONE - 175' - 183' w 3' bx/filt zone @ 45° @ contact w microdiorite & filld lower contact @ 50° w ls. Dirty pale br colour, strong filt. sp-hem filld fracs, w fine pale grained ls.
183 - 207'
Massive, pale grey, weakly silicified, fine crystalline ls w skarn as above 185 - 185.5'
110.5 - 112' Sulfide zone Massive sphal + py/py in garnet matrix.
131 - 131.5' bx'd w dyke + coarse sulfides (py)
140 - 140.5' Siliceous gneiss w 5% dis py adj to dyke contact
1040261 105 - 110.5'
1040262 110.5 - 112'
1040263 112 - 117'
1040264 117 - 122
1040265 122 - 127
1040266 127 - 131.5
1040267 140 - 140.5
1040268 140.5 - 145'

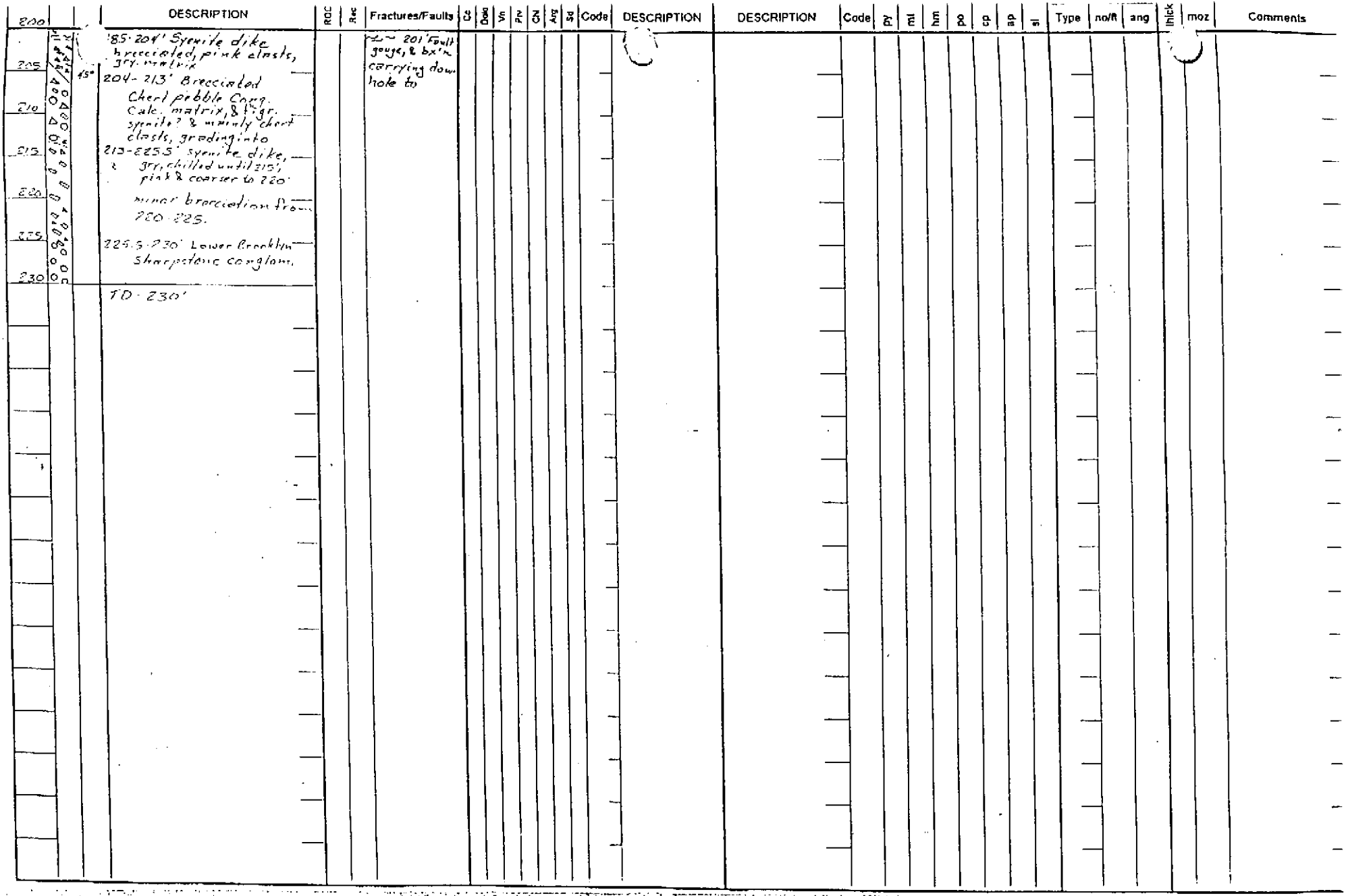

Depth
Dip
RQD
LITHOLOGIC DESCRIPTION
RQD
Rec
STRUCTURES Fractures/Faults
Silica %
Alt Code
ALTERATION DESCRIPTION
MINERALIZATION DESCRIPTION
Min Code
Veins
Type
Au
Comments
Locally weakly brec'd.
209 - 220' Syenite Dyke
@ 209' sharp contact @ 60°
@ 220' [illegible] @ 30°
220 - 234.5' Brec'd chert pebble congl.
234.5 - 234.5' Syenite Dyke
@ 234.5' filled contact @ 80° to CA.
234.5 - 266.5' Chert pebble conglomerate - (Brockly sharpstone) Wht & grey chert clasts, grit to > 3cm in size. Clast supported ca ~80%. chert frags in soft aphanitic mtx, locally chloritic. Minor pervasive f diss Py + po in clasts & mtx. Mtx has pale appearance.
@ 266.5' sharp irregular contact @ ~45°
266.5 - 325' V. fine grained, dark grey-black aphanitic volc. 10% V fine feldspar xtals, < 1mm in aphanitic groundmass. Rare angular frags to 2 cm of similar rx, becoming more abundant from 310 - 325' - pass into tuff?

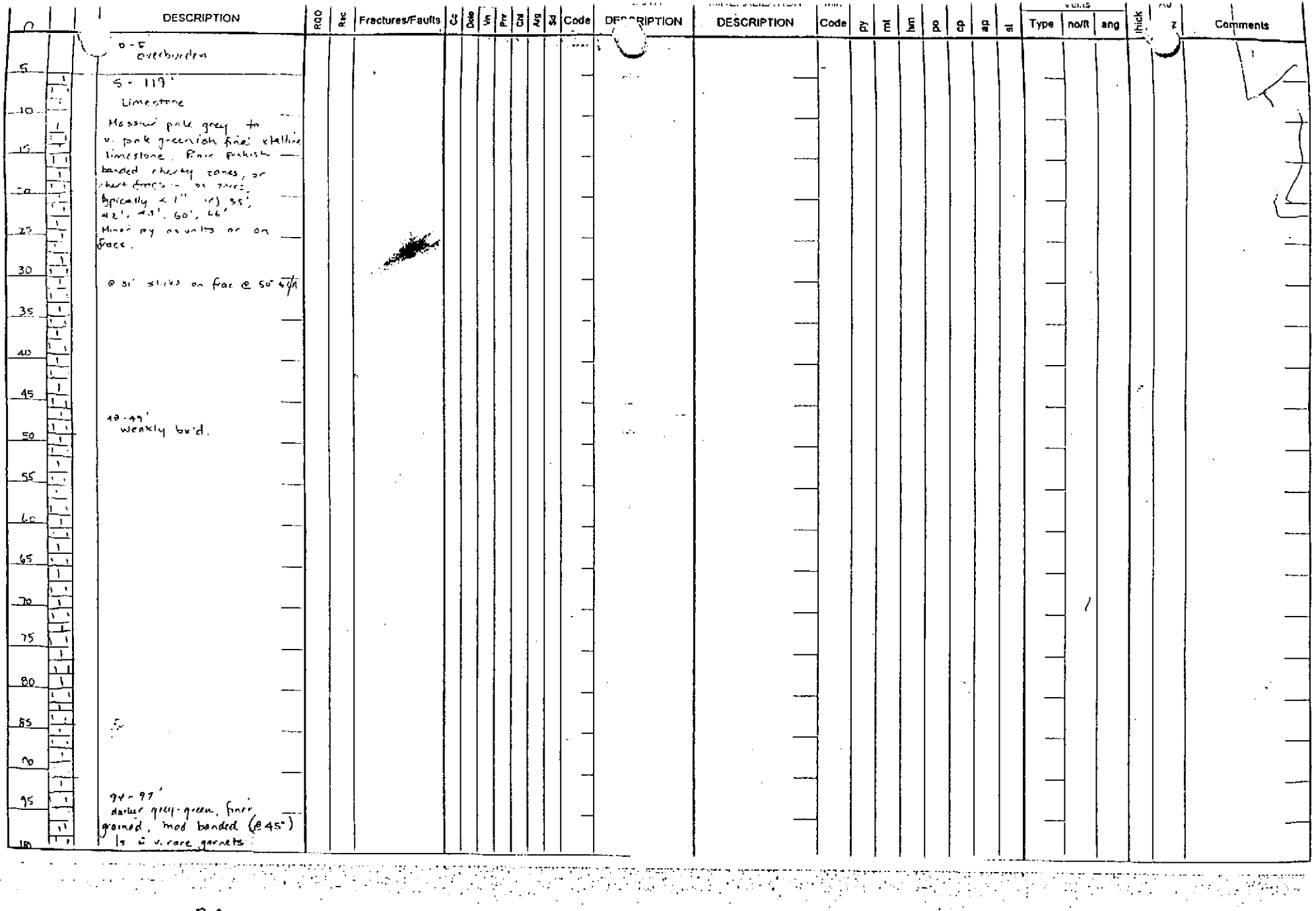
Depth	Lithology	Lithologic Description	RQD	Rec	Structures: Fractures/Faults	Cc	Dde	Silica: Vn	Silica: Pre	Silica: Chl	Arg	Sid	Alteration Code	Alteration Description	Mineralization Description	Mn Code	py	mt	hm	po	cp	sp	si	Veins: Type	Veins: no/ft	Veins: ang	Thick	Au	Comments
305																													
310																													
315																													
320																													
325																													
330		325 - 403' Chert pebble conglomerate (Emeryllyn sharpstone) as above. Clast supported 80% chert clasts in vole matrix.																											
335																													
340		338 - 341' fg vole as above																											
345																													
350																													
355																													
360																													
365																													
370																													
375																													
380																													
385																													
390																													
395																													
400																													

DESCRIPTION	RQD	Rec	Fractures/Faults	Cc	Dde	Vn	Prv	Chl	Arg	Sil	Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min Code	py	mt	hm	gd	cp	sp	si	Veins Type	Veins no/ft	Veins ang	thick	Au	Comments
405 T.D. 403'																											

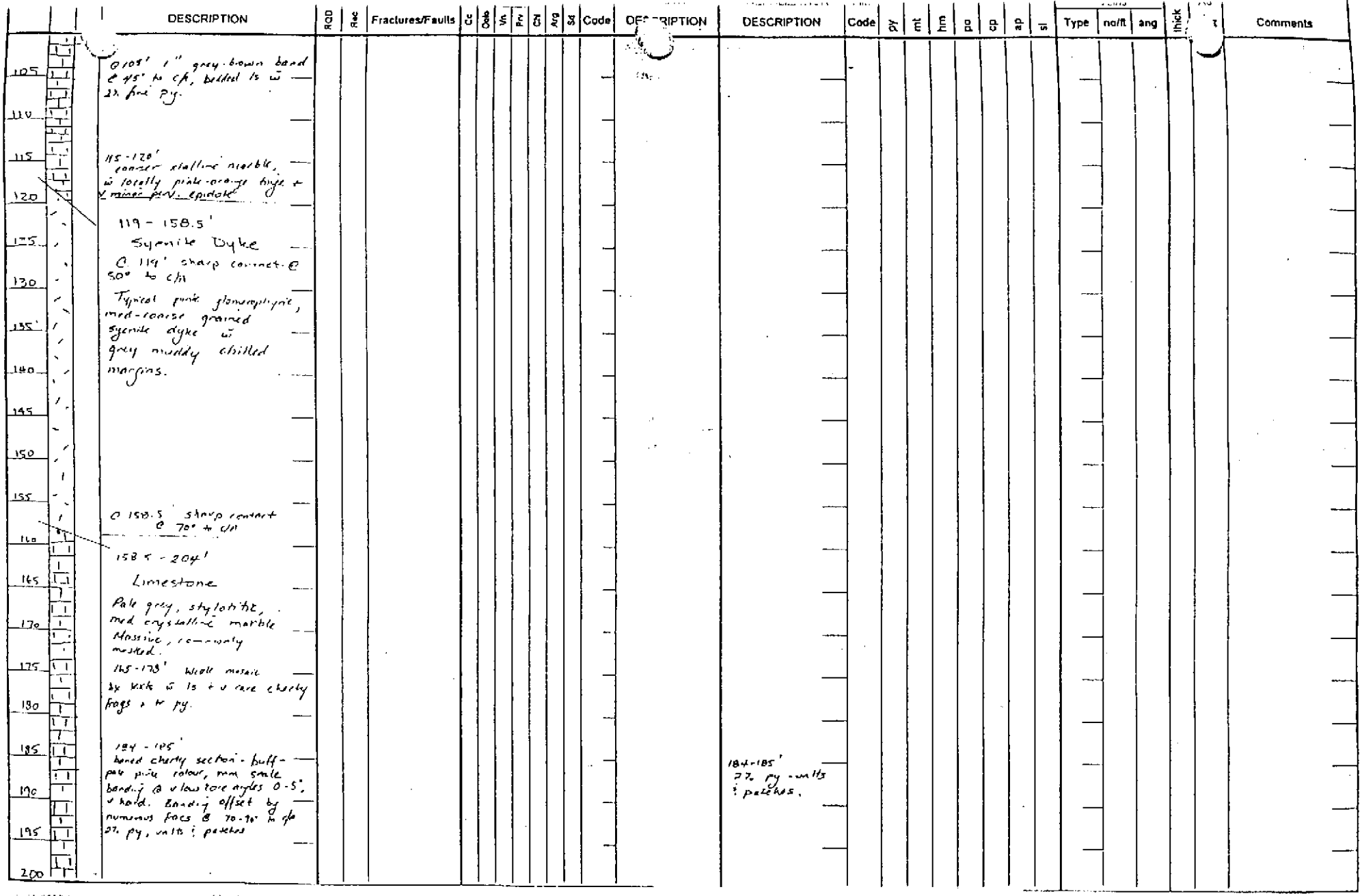
0	DESCRIPTION	RC	Re	Fractures/Faults	Cl	Dol	Sh	Py	Gl	Ang	Sil	Code	DESCRIPTION	DESCRIPTION	Code	py	mt	hm	gl	cp	ap	st	Type	no/ft	ang	thic	moz	Comments
5	0-3' Overburden																											
10	3 - 117.5' Msv. Limestone																											
15	Minor garnet-epidote skarnification throughout unit, stylolitic												Minor garnet-epidote skarn zones throughout unit.	Minor, 1-2 mm disem. py & minor py grains along stylolitic zones.													
20																												
25																												
30																												
35																												
40																												
45																												
50																												
55																												
60																												
65																												
70																												
75																												
80																												
85																												
90																												
95																												
100																												


DESCRIPTION
RQD
Ref.
Fractures/Faults
Cc
Dde
Vn
Prv
Chl
Arg
Sil
Code
DESCRIPTION
DESCRIPTION
Code
py
mt
hm
po
cp
sp
sl
Type
no/ft
ang
thick
moz
Comments
100
105
110
115
120
125
130
135
140
145
150
155
160
165
170
175
180
185
190
195
200
0-117.5' Limestone
45°
117.5-128' Syenite Dike
pink syenite
70°
128-166' Limestone
Massive, wk. styla-
litic, local skarn,
garnet & epidote.
166-185' Skarn w/ local
brn-CaCO3 matrix bx.
170-185' Microdiorite
This unit is a fairly
well mixed epidote
garnet endo skarn, w/
minor pyrite & brec-
ciation.
60°
185-204' Syenite Dike


DESCRIPTION
ROC
Rec
Fractures/Faults
Cc
Dolo
Vn
Prv
CN
Arg
Sd
Code
DESCRIPTION
DESCRIPTION
Code
py
ml
hm
po
cp
ap
sl
Type
no/ft
ang
Thick
moz
Comments
200
205
210
215
220
225
230
185-204' Syenite dike, brecciated, pink clasts, grey matrix
45°
204-213' Brecciated Chert pebble Cong. Calc. matrix, & fine gr. syenite? & mainly chert clasts, grading into
213-225.5' syenite dike, gry, chilled until 215', pink & coarser to 220'
minor brecciation from 220-225.
225.5-230' Lower Franklin Sharpstone conglom.
TD-230'
~201' Fault gouge, & bx'n carrying down hole to


DESCRIPTION
RQD
Rec
Fractures/Faults
Cc
Dole
Vn
Prv
Chl
Arg
Sid
Code
DESCRIPTION
DESCRIPTION
Code
py
mt
hm
po
cp
ap
sl
Type
no/ft
ang
thick
Comments
0 - 5
overburden
5 - 119'
Limestone
Massive pale grey to v. pale greenish fine crystalline limestone. Rare pinkish banded chunky zones, or chert fingers - as above.
Typically < 1" (r) 35°, 42°, 43°, 60°, 66°
Minor py as veins or on face.
@ 31' stylos on frac @ 50°
40-49'
weakly bed.
94 - 97'
darker grey-green, finer grained, mod banded (@ 45°)
Is a v. rare garnets

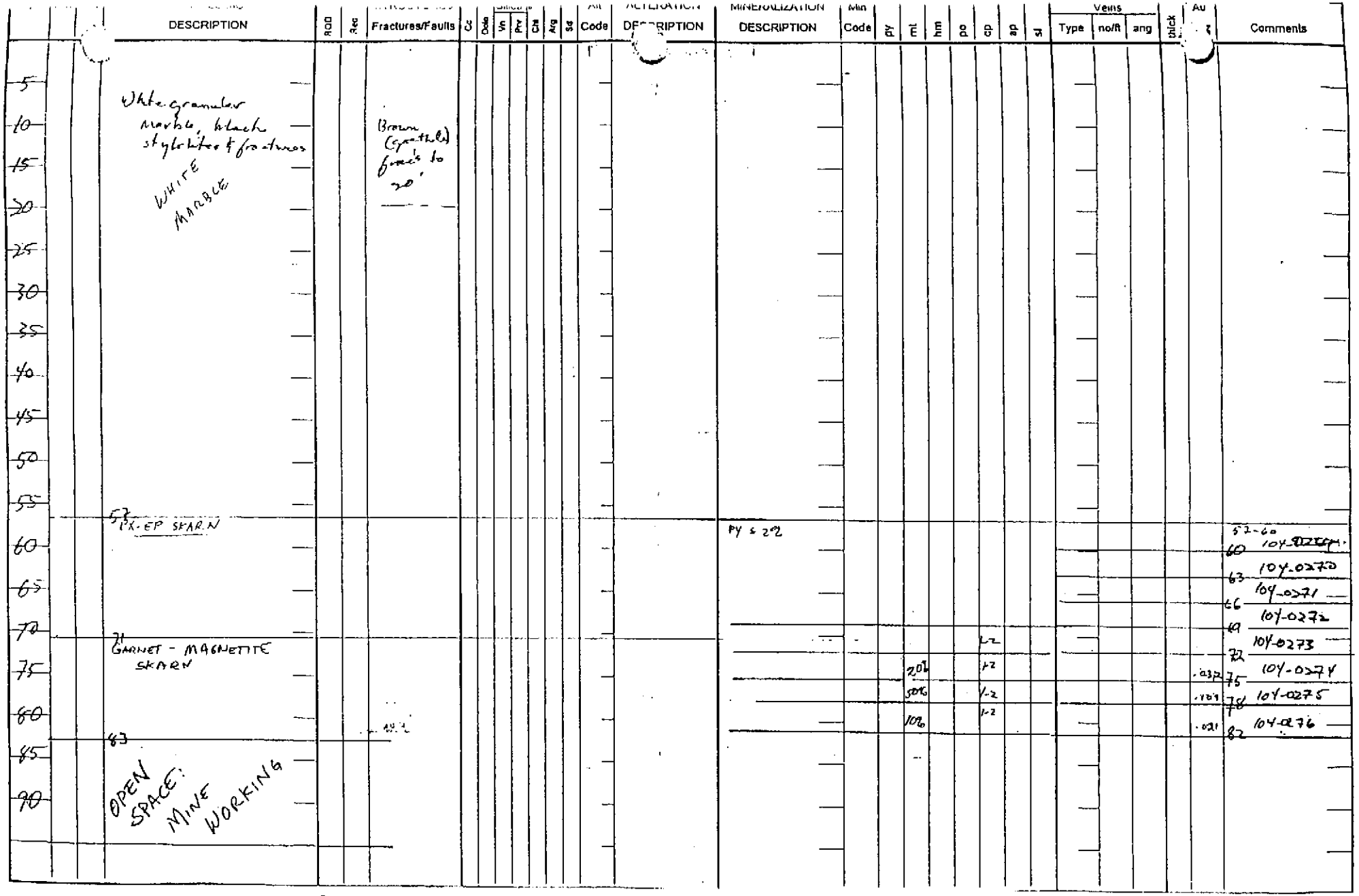
BB-03-17


DESCRIPTION
RQD
Rec
Fractures/Faults
Cc
Calc
Sh
Prv
Chl
Arg
Sil
Code
DESCRIPTION
DESCRIPTION
Code
py
mt
hm
po
cp
ap
si
Type
no/ft
ang
thick
τ
Comments
@ 105' 1" grey-brown band @ 45° to c/h, bedded is w 2% fine py.
115-120' coarser xtalline marble, w locally pink-orange bands + v minor perv. epidote
119 - 158.5'
Syenite Dyke
@ 119' sharp contact @ 50° to c/h
Typical pink glomeroporphyritic, med-coarse grained syenite dyke w grey muddy chilled margins.
@ 158.5 sharp contact @ 70° to c/h
158.5 - 204'
Limestone
Pale grey, stylolithic, med crystalline marble
Massive, recurrently mottled.
165-178' Weak mosaic bx brk w is + v rare clearly frags + tr py.
184 - 185'
banded cherty section - buff-pale pink colour, mm scale banding @ v low core angles 0-5°, v hard. Banding offset by numerous facs @ 70-90° in the 2% py, veins + pockets
184-185'
2% py - veins + pockets.

BB-03-17

DESCRIPTION	RQD	Rec	Fractures/Faults	Cc	Dde	Vn	Pv	Chl	Arg	Sd	Code	DESCRIPTION	DESCRIPTION	Code	py	mt	hm	po	cp	ap	sl	Veins Type	Veins no/ft	Veins ang	thick	Au	Comments
205 204-210' Syenite dyke as above w/ fault contact @ 204' @ 45° to C/A 210 T.D. 210'																											

BB-01-97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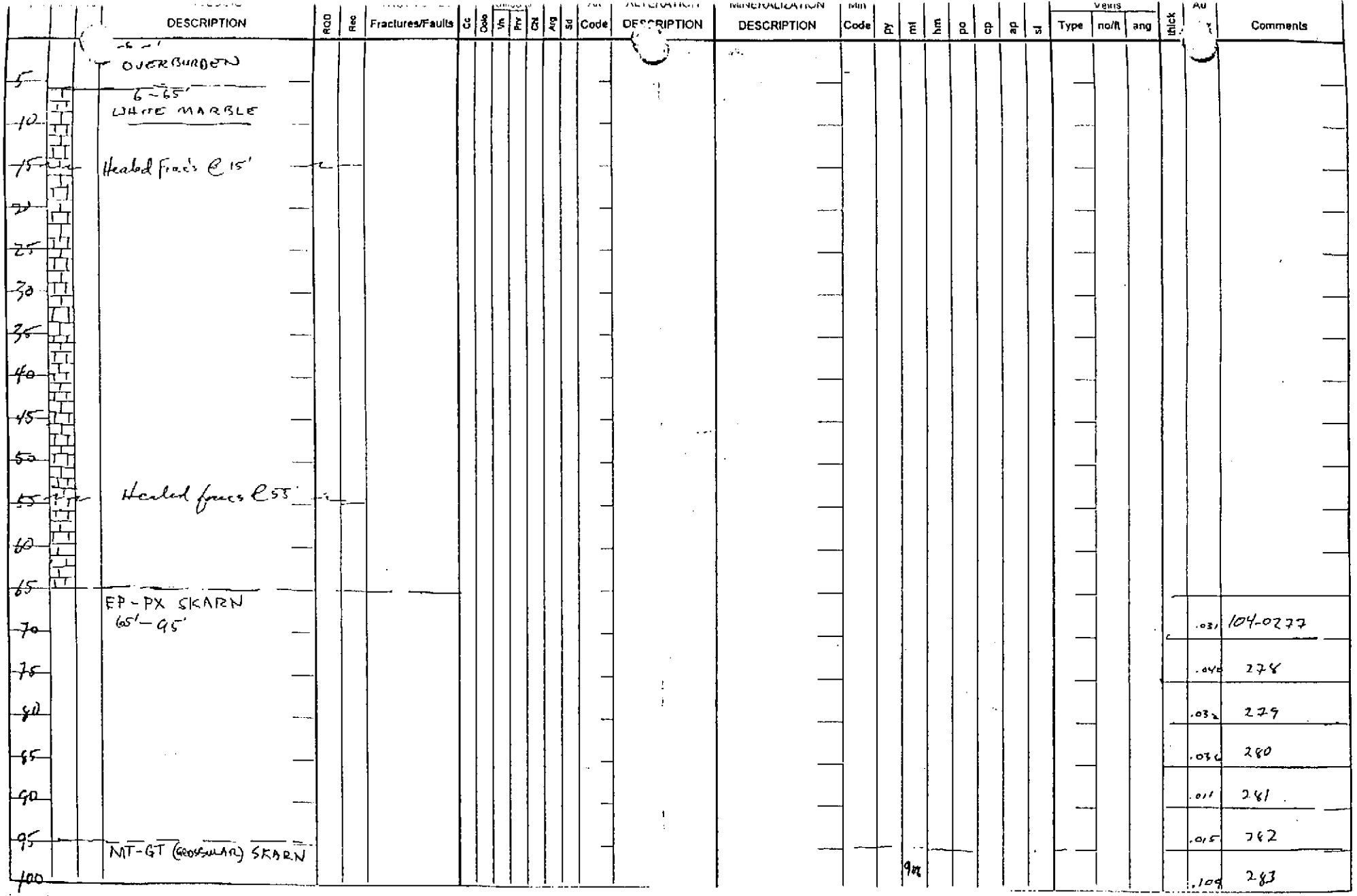
ROD
Rec
Fractures/Faults
Cc
Dde
Vn
Prv
Chl
Arg
Sil
Code
ALTERATION DESCRIPTION
MINERALIZATION DESCRIPTION
Min Code
py
el
hm
po
cp
sp
sl
Veins
Type
no/ft
ang
thick
Au
g/t
Comments
White granular marble, black stylolites & fractures
WHITE MARBLE
Brown (Granitoid) fracs to 20'
57
PX-EP SKARN
py < 2%
71
GARNET - MAGNETITE SKARN
63
OPEN SPACE: MINE WORKING
57-60
10Y-0270
63
10Y-0271
66
10Y-0272
69
10Y-0273
72
10Y-0274
.032
75
10Y-0275
.109
78
10Y-0276
.021
82

NE-01-97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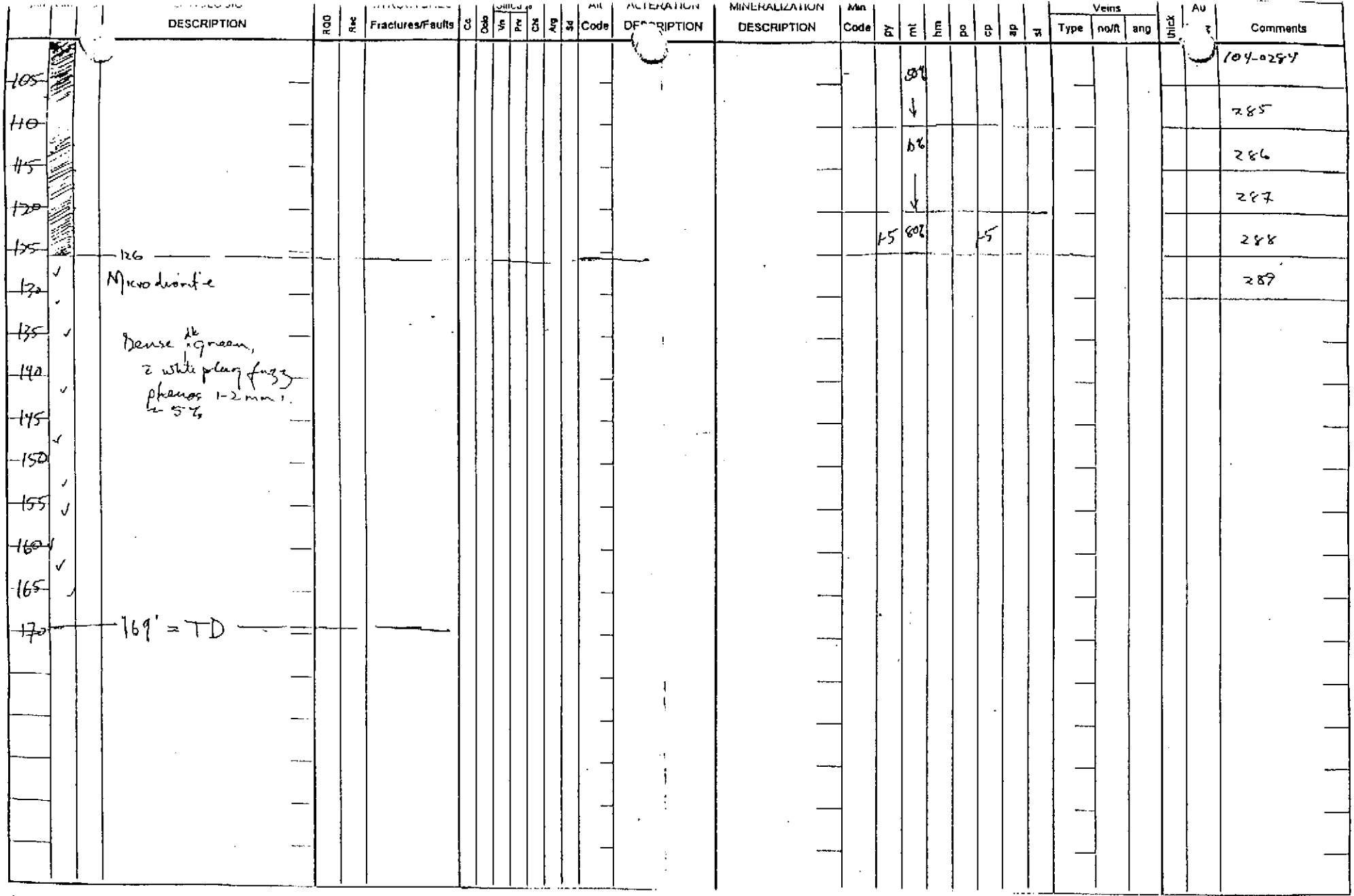
Rec
Fractures/Faults
Cc
Code
Vn
Prv
Ch
Arg
Sd
Code
ALTERATION DESCRIPTION
MINERALIZATION DESCRIPTION
Min Code
py
ml
hm
po
cp
ap
sl
Veins
Type
no/ft
ang
thick
Au
Comments
0-6' OVERBURDEN
6-65' WHITE MARBLE
Healed Fracs @ 15'
Healed fracs @ 55'
EP-PX SKARN 65'-95'
MT-GT (GROSSULAR) SKARN
9m
.031 104-0277
.046 278
.032 279
.030 280
.011 281
.015 282
.109 283

NE-02-97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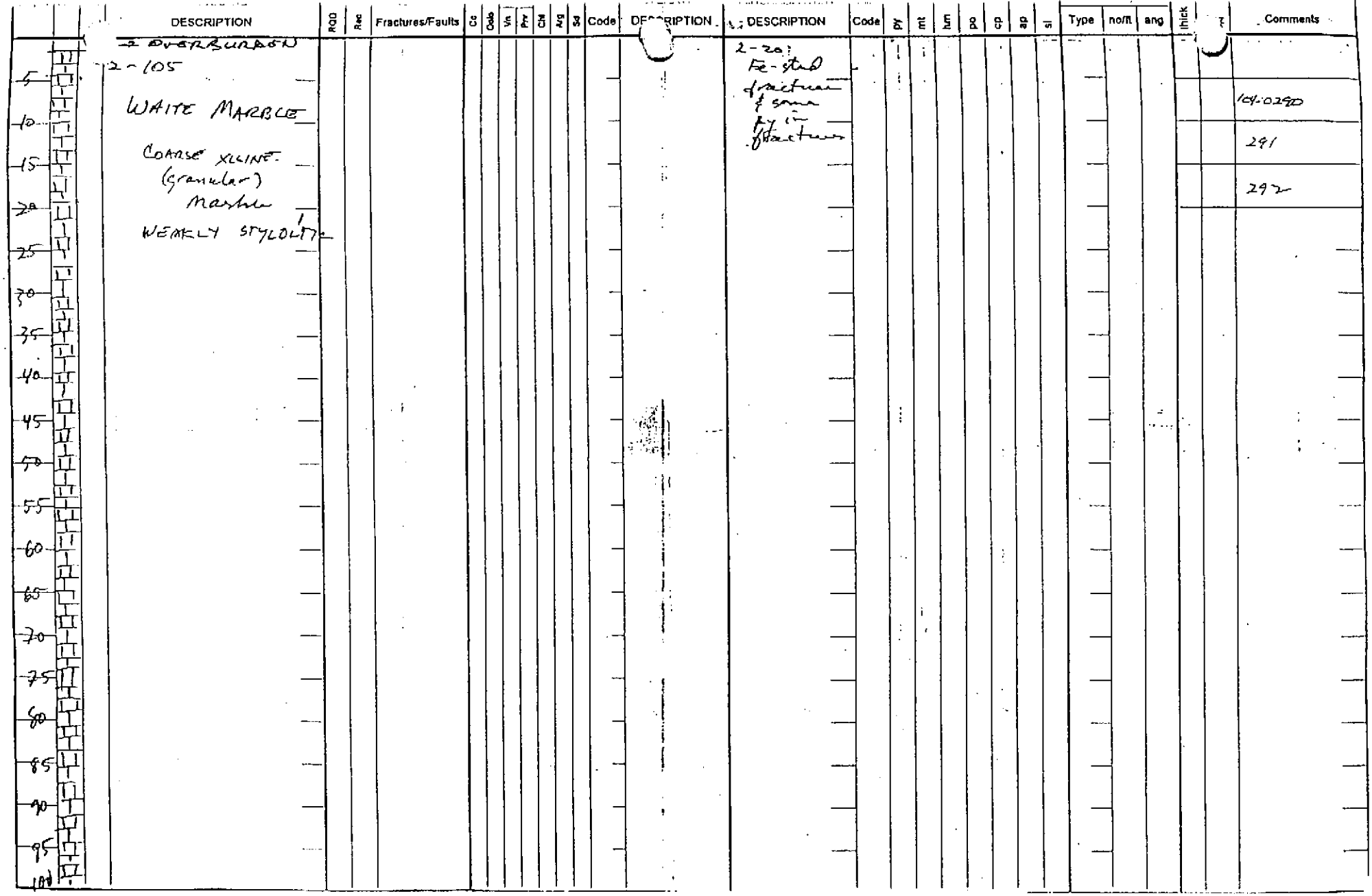
Rec
Fractures/Faults
Cs
Oxide
Silica
Vn
Prv
Clx
Arg
Sil
Alt
Code
ALTERATION
DESCRIPTION
MINERALIZATION
DESCRIPTION
Min
Code
py
mt
hm
po
cp
sp
sl
Veins
Type
no/ft
ang
thick
Au
g/t
Comments
105
110
115
120
125
130
135
140
145
150
155
160
165
170
126
Microdiorite
Dense dk grn-grey, 2 wht plag fuzzy phenos 1-2mm, ~5%
169' = TD
104-254
285
286
287
288
289
5%
↓
10%
↓
45
60%
45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Code
Vn
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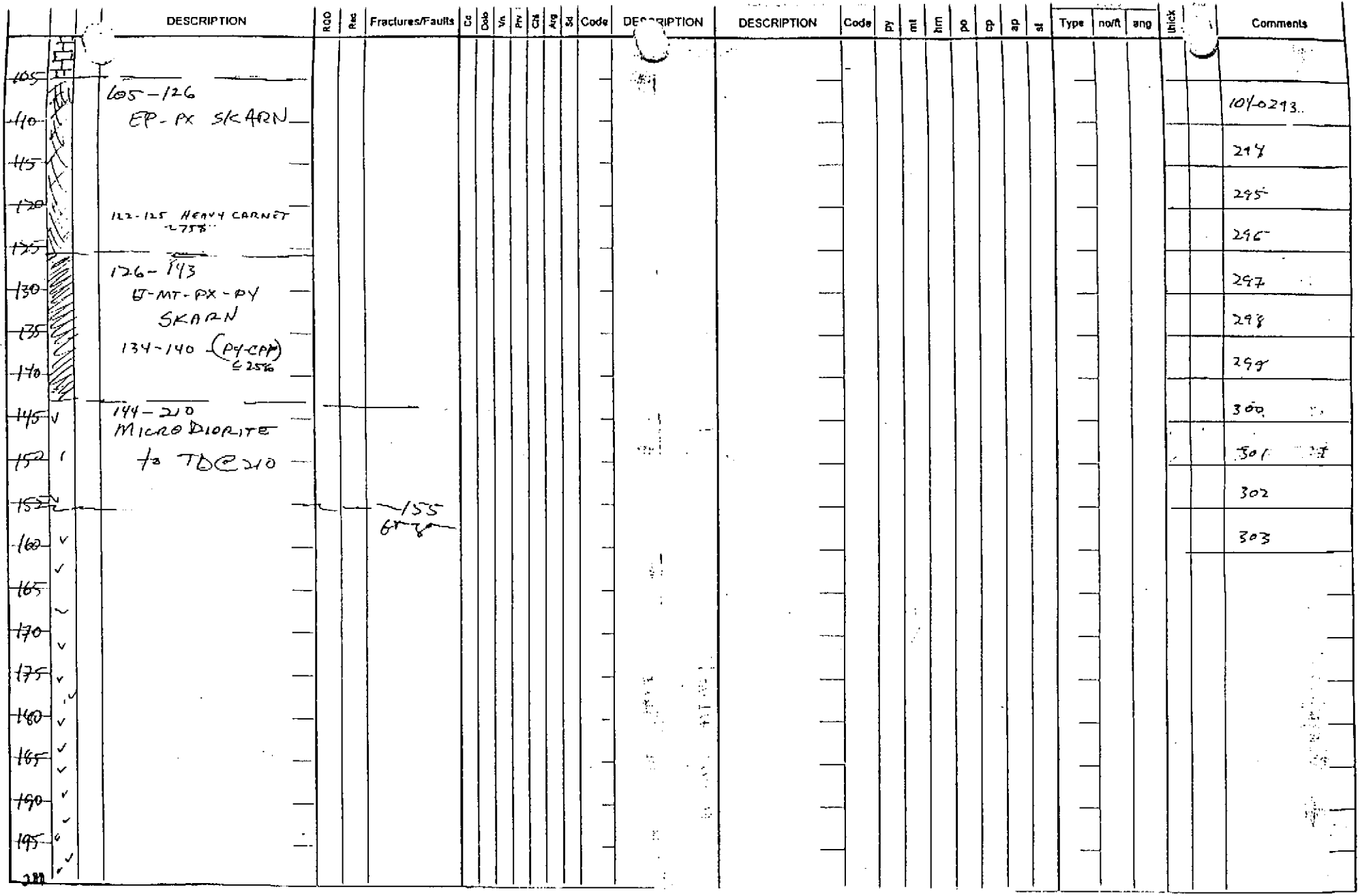
Code
DESCRIPTION
DESCRIPTION
Code
py
mt
hm
po
cp
ap
sl
Type
no/ft
ang
thick
Comments
0 OVERBURDEN
2-105
WAITE MARBLE
COARSE XLINE. (Granular) Marble
WEAKLY STYLOLITIC
2-20: Fe-stnd fracture & some py in fractures
104-0290
291
292
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100

NE-03-94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RQD
Rec
Fractures/Faults
Co
Dolo
Vn
Prv
Chl
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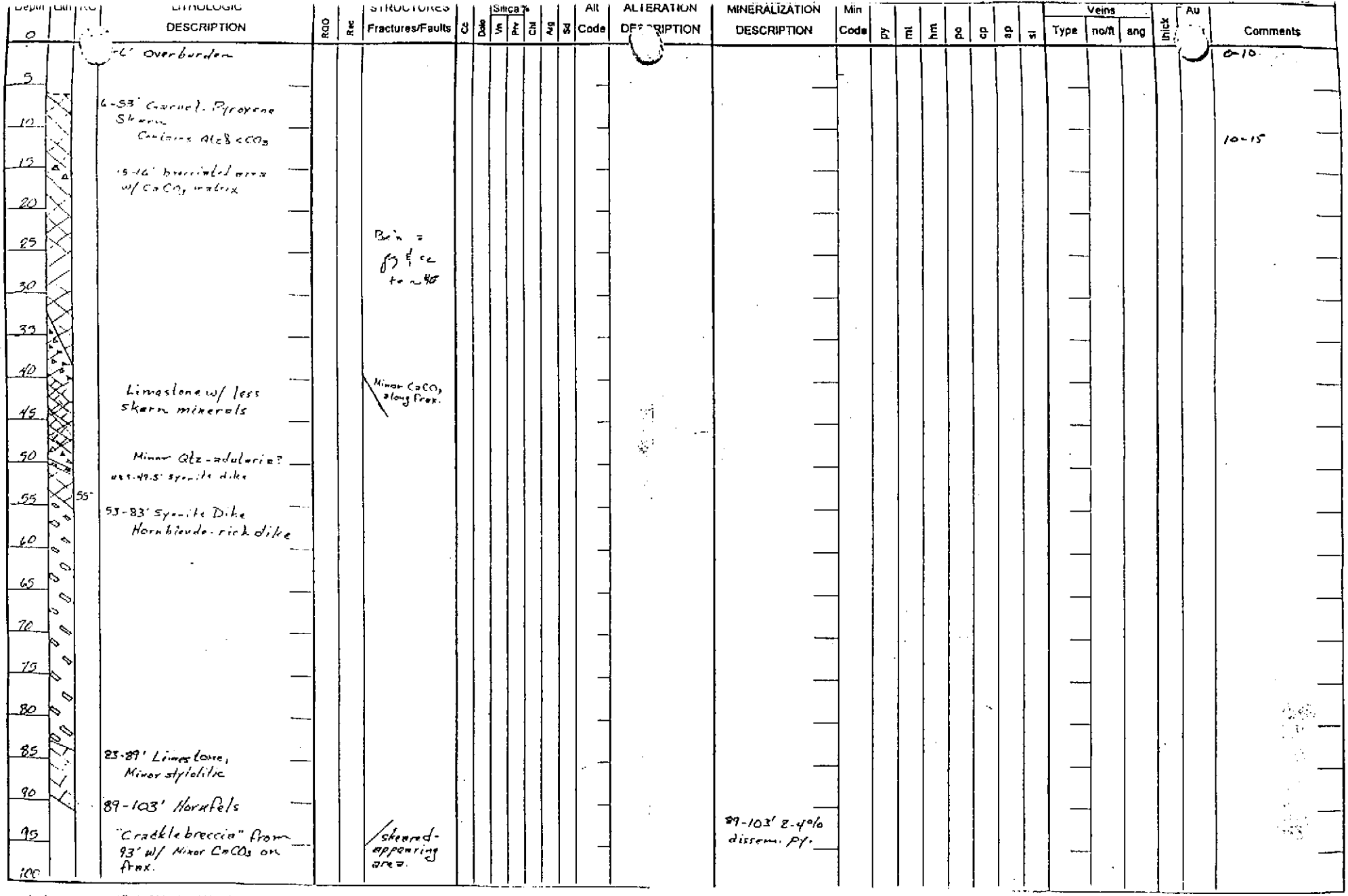
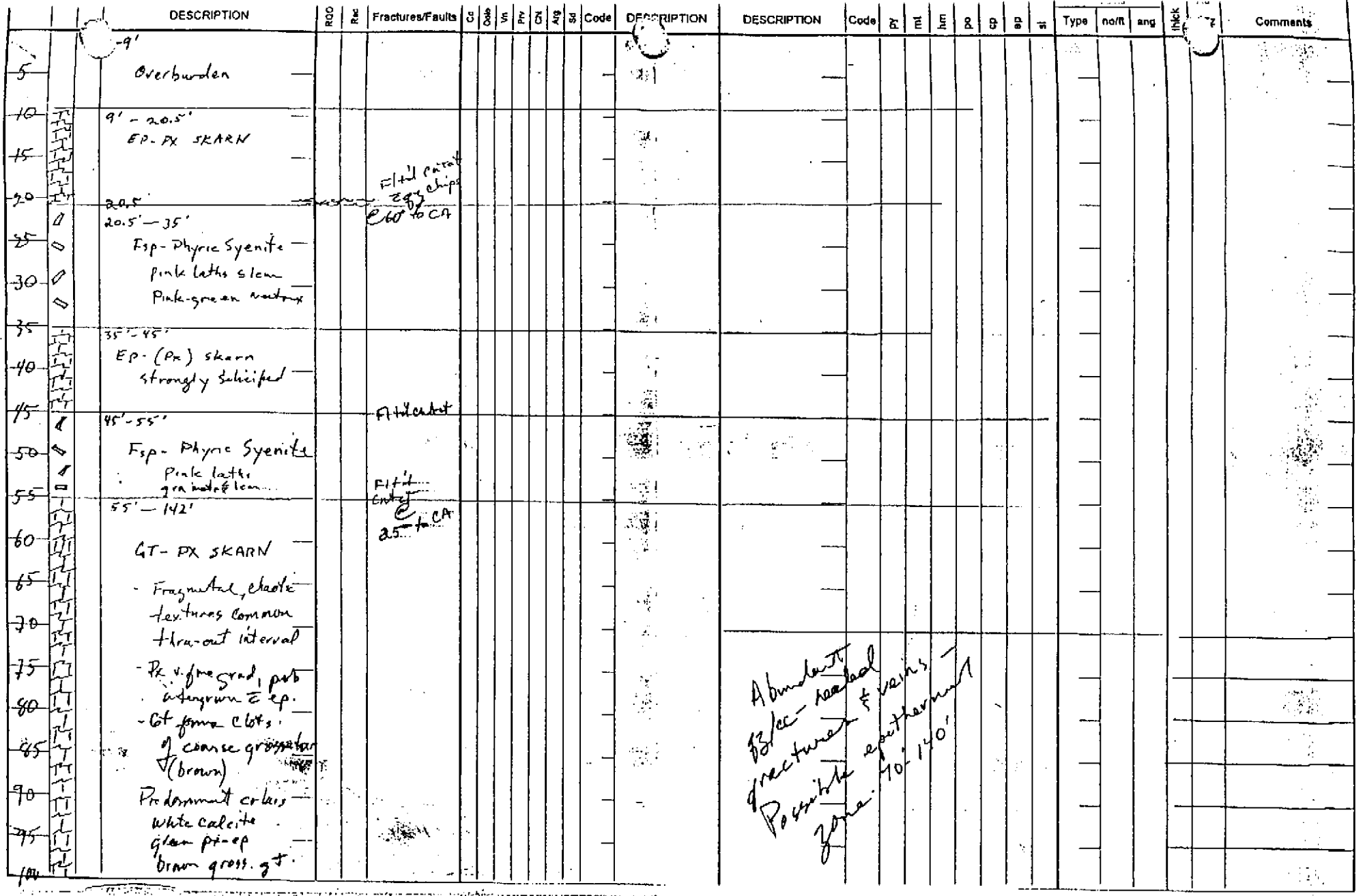
Sil
Code
DESCRIPTION
DESCRIPTION
Code
py
mt
hm
po
cp
ap
sil
Type
no/ft
ang
thick
Comments
105
110
115
120
125
130
135
140
145
150
155
160
165
170
175
180
185
190
195
200
105-126
EP-PX SKARN
122-125 HEAVY CARNOT
-175B
126-143
EP-MT-PX-PY
SKARN
134-140 (PY-CPY)
≤ 25%
144-210
MICRO DIORITE
to TDC 210
~155
6" qtz
10/0293
294
295
296
297
298
299
300
301
302
303

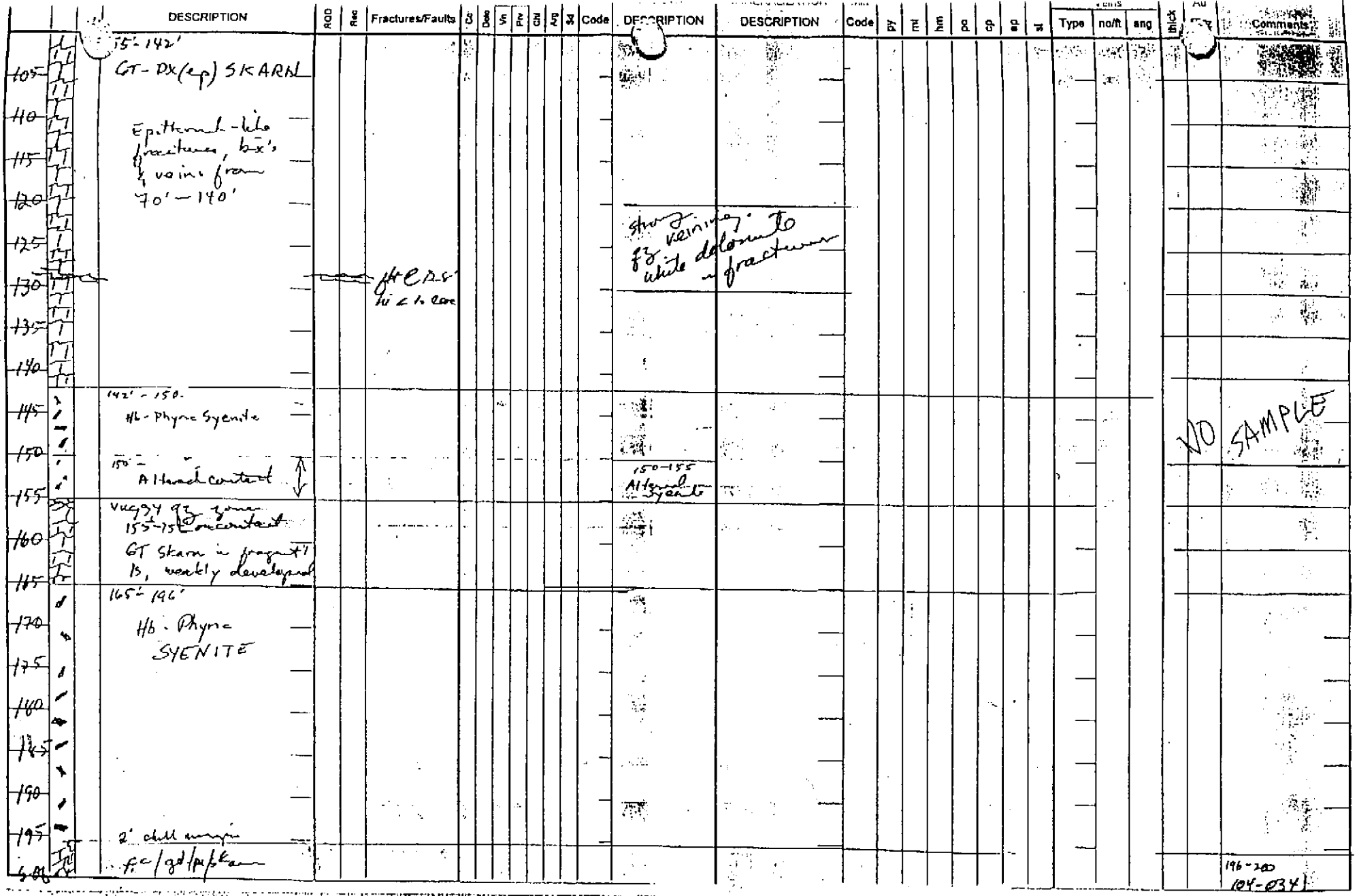

Depth
Dip
Azi
LITHOLOGIC DESCRIPTION
RQD
Rec
STRUCTURES Fractures/Faults
Cs
Silica %
Dole
Sil
Prv
Chl
Arg
Sid
Alt Code
ALTERATION DESCRIPTION
MINERALIZATION DESCRIPTION
Min Code
py
mt
hm
po
cp
sp
sl
Veins
Type
no/ft
ang
thick
Au
Comments
0-10
10-15
0-6' Overburden
6-53' Garnet-Pyroxene Skarn
Contains Alt & CaCO3
15-16' brecciated area w/ CaCO3 matrix
Brn = fg & cc to ~45
Limestone w/ less skarn minerals
Minor CaCO3 along frac.
Minor Qtz-adularia?
Minor Qtz-adularia?
was 49.5' syenite dike
53-83' Syenite Dike
Hornblende-rich dike
55°
83-89' Limestone, Minor stylolitic
89-103' Hornfels
"Cradle breccia" from 93' w/ Minor CaCO3 on frac.
sheared-appearing area.
89-103' 2-4% dissem. py.

EV-01-97

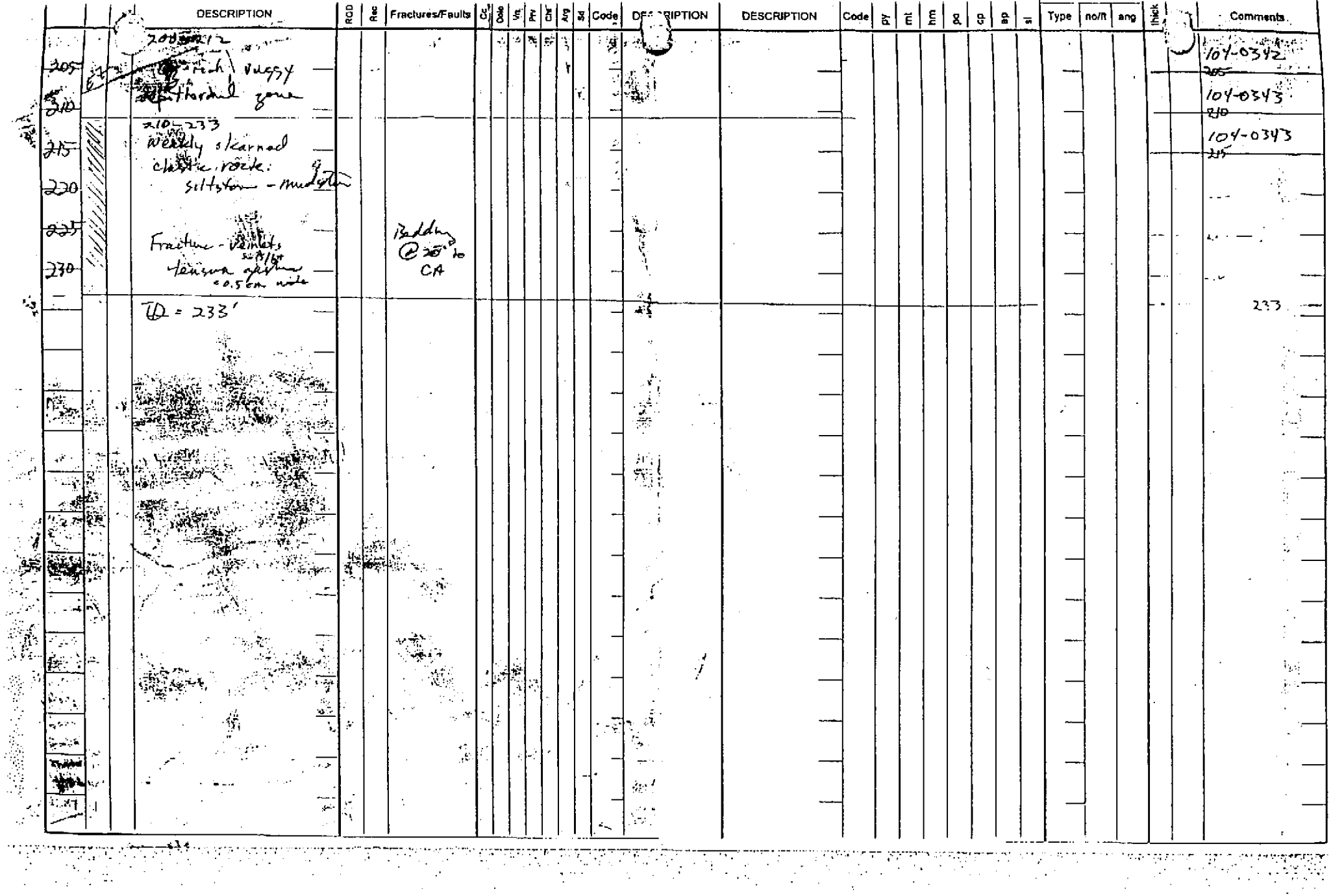
100	DESCRIPTION	RQD	Rec	Fractures/Faults	Cs	Data	Silicification: Vs	Silicification: Ptv	Silicification: CN	Alt: Arg	Alt: Sd	Alt: Code	ALTERATION DESCRIPTION	MINERALIZATION DESCRIPTION	Min: Code	py	mt	hm	po	cp	ap	si	Veins: Type	Veins: no/ft	Veins: ang	thick	Au	Comments
105	103-120' Garnet-Pyroxene Skarn																											
110														Minor sulf bands														
115	andularia? Drilling Prox.																											
120	TD-120'																											


DESCRIPTION
ROD
Rec
Fractures/Faults
Cc
Oxide
Sh
Prv
Ch
Alg
Sid
Code
DESCRIPTION
DESCRIPTION
Code
py
mt
hm
po
cp
ep
si
Type
no/ft
ang
thick
Comments
0-9'
Overburden
9' - 20.5'
EP-PX SKARN
Flt'd contact @ 60° to CA
20.5'
20.5' — 35'
Fsp-Phyric Syenite
pink laths sl calc
Pink-green matrix
35' - 45'
EP-(PX) skarn
strongly silicified
Flt'd contact
45' - 55'
Fsp-Phyric Syenite
Pink laths
granular sl calc
Flt'd contact @ 25° to CA
55' — 142'
GT-PX SKARN
- Fragmental, chaotic textures common thru-out interval
- Px v. fine grad. pods intergrown w ep.
- Gt forms clots of coarse grossular (brown)
Predominant colors white calcite green px-ep brown gross. gt.
Abundant fg/cc-sealed fractures & veins
Possible epithermal zone 90-140'

EV-02-97


DESCRIPTION
RQD
Rec
Fractures/Faults
Ca
Dol
Si
Py
Clu
Arg
Sil
Code
DESCRIPTION
DESCRIPTION
Code
py
mt
hm
po
cp
sp
sl
Veins
Type
no/ft
ang
thick
Au
Comments
105
110
115
120
125
130
135
140
145
150
155
160
165
170
175
180
185
190
195
200
15'-142'
GT-Dx(ep) SKARN
Epithermal-like fractures, bx's & veins from 70'-140'
142'-150'
Hb-Phyric Syenite
150'-
Alt'd contact
Vugs 2% qz lined
155'-175' contact
GT skarn in fragments, weakly developed
165'-196'
Hb-Phyric SYENITE
2' drill margin
fine/gd/phyric
stwk veining to fg white dolomite fractures
150-155 Alt'd Syenite
NO SAMPLE
196-200
104-0341

EV-02-97


DESCRIPTION
RQD
Rec
Fractures/Faults
Code
DESCRIPTION
DESCRIPTION
Code
py
mt
hm
gl
cp
sp
si
Type
no/ft
ang
Thick
Comments
205
210
215
220
225
230
210-233
Weakly skarned clastic rocks: siltstone - mudstone
Fracture - veinlets
Bedding @ 20° to CA
TD = 233'
104-0342
104-0343
104-0343
233

EV-02-97

APPENDIX 2

ANALYTICAL RESULTS

CUSTOM ANALYTICAL SERVICES
P.O. Box 722 * 101-4 Hwy 21 So.
Republic, WA 99166
(509) 775-3885

ECHO BAY MINERALS (1362)
2251 W KETTLE RIVER RD.
CURLEW, WA 99118
ATTN:MIKE RASMUSSEN
ATTN:DAN HUSSEY

RB-97-9
epithermal vein sample fro

James P. Gubler, Manager.

September 5, 1997 R71682

TEST FOR:	Au FIRE ASSAY	Ag FIRE ASSAY
METHOD: USED:		
RESULTS IN:	oz/ton	oz/ton
RB:9:163	.004	<.01
RB:9:120.5	.014	.09

CHARGES

104:318 RBell-5-97	140-45	.017	.01
104:319	145-50	<.002	<.01
104:320	150-55	<.002	<.01
104:321	155-60	<.002	<.01
104:322 RB-9-97	150-55	<.002	.05
104:323	158-163	<.002	<.01

R. BELL
DRILLING ASSAYS

September 8, 1997 R71692

TEST FOR:	Au FIRE ASSAY	Ag FIRE ASSAY
METHOD: USED:		
RESULTS IN:	oz/ton	oz/ton
104:229 RB-9-97	120-23 <.002	.13
104:230	163-65 <.002	.01
104:231	165-167.5 .004	.01
104:232	167.5-169.5 <.002	.03
104:233	169.5-171.2 .008	.07
104:234	171.2-173 <.002	.21
104:235	173-174.5 .003	.08
JOHNSON: SILICA BLANK	<.002	-
CF#2: STANDARD	.136	-

September 24, 1997 R71801

TEST FOR:	Au FIRE ASSAY	Ag FIRE ASSAY
METHOD: USED:		
RESULTS IN:	oz/ton	oz/ton
104:251 RB-97-12	180-85 <.002	.17
104:252	185-90 <.002	.16
104:253	190-95 .003	.03
104:254	.004	.08
104:255	<.002	.11
104:256	<.002	.02
104:257	<.002	.05
104:258	<.002	.14
104:259	<.002	.07
104:260	220-30' <.002	.27
104:260 RESPLIT	<.002	.27
LGK:STANDARD	.146	**
104:SILICA BLANK	<.002	**

07/26/1997 11:15 5097753601 CUSTOM ANALYTICAL

CUSTOM ANALYTICAL SERVICES
P.O. Box 722 * 101-4 Hwy 21 So.
Republic, WA 99166
(509) 775-3885

ECHO BAY MINERALS CO. (1354)
921 FISH HATCHERY ROAD
REPUBLIC , WA 99166
ATTN:TOM JOHNSON
ATTN:MIKE RASMUSSEN

July 26, 1997 R71307

TEST FOR:	Au	Ag	Cu	Zn	Bi	
METHOD:	FIRE	FIRE	GEO	GEO	GEO	
USED:	ASSAY	ASSAY	CHEM	CHEM	CHEM	
RESULTS IN:	oz/ton	oz/ton	ppm	ppm	ppm	
RB97:1R	1.345	1.71	72	263	403	grab
RB97:2R	.883	.44	30	75	114	24' chip channel
RB97:3R	.026	.13	36	129	50	27' chip
RB97:4R	1.433	1.89	63	74	365	4' chip
RB97:5R	.813	1.46	31	43	80	1' chip
RB97-6R	.029	.41	19	508	72	grab

RECON, MAP NEXT

15 July 97 R. Bell Area

tj

N

Limestone

#6 is Qtz & sulfides on dump of pit in limestone.

F. gr. Qtz diorite w/ mod. prop'lc altn.

#6

TSV (Marron)

not sure how this lies in here.

Fault

R. Bell

R. Bell N. of Hwy 3 15 July 97 tj

Phoenix tails S. 45° W

#1 - chip of Qtz. ht. in pit

#2 - 24' chip-chnl. minz'd. area (16' true width) 2 Qtz veins

#3 - 27' chip-chnl. Ls.

#4 - 3' chip-chnl. Qtz. on flt.

#5 1' chip-chnl. Qtz on flt.

N

74°

#3

28°

56°

#4

#2

blue flag or tail

In both these instances of late silicification, the Qtz is following bedding on the Hw side of the faults.

85°

49°

#5

3 drill holes

17°

38°

21°

54°

75°

70°

DH

R Bell Geochem

Chemex Labs, Inc.

Analytical Chemists * Geochemists * Registered Assayers
994 Glendale Ave., Unit 3, Sparks
Nevada, U.S.A. 89431
PHONE: 702-356-5395 FAX: 702-355-0179

To: ECHO BAY MINERALS CO.

921 FISH HATCHERY ROAD
REPUBLIC, WASHINGTON
99166

Project : GREENWOOD
Comments: ATTN: MIKE RASMUSSEN

Page Number :1
Total Pages :1
Certificate Date: 07-OCT-97
Invoice No. :19745300
P.O. Number :ST2809
Account :NCD

CERTIFICATE OF ANALYSIS A9745300

SAMPLE	PREP CODE	Au ppb RUSH	Au FA oz/T	As ppm	Sb ppm	Hg ppb		
RB97-10R	255 295	< 5	-----	16	7.0	670		Recon samples to
RB97-11R SKARN	255 295	35	-----	14	2.0	1435		test for epithermal
RB97-12R	255 295	< 5	-----	1	0.4	< 10		
RB97-13R	255 295	< 5	-----	2	0.2	10		
RB97-14R VEIN	255 295	>10000	0.749	8	0.6	20		
RB97-15R VEIN	255 295	2540	-----	2	0.2	< 10		signatures in R Bell
RB97-16R	255 295	90	-----	4	0.2	< 10		skarn & vein rocks
RB97-17R	255 295	340	-----	2	0.4	10		
RB97-18R	255 295	10	-----	2	0.6	< 10		

CERTIFICATION: Ian Bichler

CUSTOM ANALYTICAL SERVICES
P.O. Box 722 * 101-4 Hwy 21 So.
Republic, WA 99166
(509) 775-3885

ECHO BAY MINERALS (1362)
2251 W KETTLE RIVER RD.
CURLEW, WA 99118
ATTN:MIKE RASMUSSEN
ATTN:DAN HUSSEY

RECON

August 26, 1997 R71615

TEST FOR:	Au	Ag
METHOD:	FIRE	FIRE
USED:	ASSAY	ASSAY
RESULTS IN:	oz/ton	oz/ton
RB-97:10	.012	.25
RB-97:11	.009	.09
RB-97:12	.004	<.01
RB-97:13	<.002	<.01
EV-97:1	.017	<.01
EV-97:2	<.002	<.01
CD-97:1	.020	.08
NE-97:1	.110	.45
RAS: SILICA BLANK	<.002	-
LGK: STANDARD	.147	-

(Blueball - should be "BB", not "RB") epidote - garnet - ind

} oxidized/epithermal

Emma Vein
Emma Vein
Cordick skarn (bleached mag/epidote/ 3-5% py-cpy
North Emma pit sulf. rich skarn

CHARGES

TOTAL CHARGES $0.00

James P. Gubler, Manager

CUSTOM ANALYTICAL SERVICES
P.O. Box 722 * 101-4 Hwy 21 So.
Republic, WA 99166
(509) 775-3885

ECHO BAY MINERALS CO. (1354)
921 FISH HATCHERY ROAD
REPUBLIC , WA 99166
ATTN:TOM JOHNSON
ATTN:DAN HUSSEY

October 16, 1997 R71812

TEST FOR:		Au	Ag	Cu	Zn
METHOD:		FIRE	FIRE	GEO	GEO
USED:		ASSAY	ASSAY	CHEM	CHEM
RESULTS IN:		oz/ton	oz/ton	ppm	ppm
104:261	BB-01-97 105-110.5'	<.002	.02	203	748
104:262	110.5-112'	<.002	.01	2,401	36,081
104:263	112-117'	<.002	<.01	93	1,036
104:264	117-122'	.008	<.01	650	1,073
104:265	122-127'	<.002	.11	1,386	671
104:266	127-131.5'	.004	.05	3,257	307
104:267	140-140.5'	.003	.07	516	126
104:268	140.5-145'	<.002	.12	274	140
JOHNSON: SILICA BLANK		<.002	-	-	-
HGK: STANDARD		.196	-	-	-

BLUEBELL
DRILL ASSAYS

CHARGES

TOTAL CHARGES $0.00

Chris Kitchell, Manager

Excellence Begins Here...

CUSTOM ANALYTICAL SERVICES
P.O. Box 722 * 101-4 Hwy 21 So.
Republic, WA 99166
(509) 775-3885

ECHO BAY MINERALS (1362)
2251 W KETTLE RIVER RD.
CURLEW, WA 99118
ATTN:MIKE RASMUSSEN
ATTN:DAN HUSSEY

October 16, 1997 R71834

North Emma Drill Assays

TEST FOR:		Au	Ag	Cu
METHOD:		FIRE	FIRE	GEO
USED:		ASSAY	ASSAY	CHEM
RESULTS IN:		oz/ton	oz/ton	ppm
104:269	NE97-1 60-63	<.002	.08	62
104:270	63-66	<.002	.06	34
104:271	66-69	<.002	.13	34
104:272	57-60	<.002	.27	126
104:273	69-72	<.002	.06	1,396
104:274	72-75	<.002	.39	4,367
104:275	75-78	<.002	.19	3,823
104:276	78-82	.011	.45	6,302

* out of sequence

October 7, 1997 R71894

TEST FOR:	Au	Ag
METHOD:	FIRE	FIRE
USED:	ASSAY	ASSAY
RESULTS IN:	oz/ton	oz/ton
104:277	.006	.23
104:278	.002	.03
104:279	<.002	.09
104:280	<.002	.14
104:281	<.002	.14
104:282	<.002	.17
104:283	<.002	.01
104:284	<.002	<.01
104:285	<.002	<.01
104:286	<.002	<.01
104:287	<.002	<.01
104:288	<.002	.02
104:289	<.002	.09
104:290	<.002	.07
104:291	<.002	.02
104:292	<.002	.13
104:293	<.002	.16
104:294	.006	.39
104:295	.016	.03
104:296	.004	.42
104:297	<.002	.13
104:298	.022	.07
104:299	.024	.31
104:300	.028	.07
104:301	<.002	.08
104:302	<.002	.12
104:303	<.002	<.01
104:296PULP DUP.	<.002	.43
104:303RESPLIT	<.002	.01
LGK: STANDARD	.139	-
JOHNSON: SILICA BLANK	<.002	-

Footage
65-70 NE-02-97
70-75
75-80
80-85
85-90
90-95
95-100
100-105
105-110
110-115
115-120
120-125
125-130 (NE-03-97)
5-10
0-15
15-20
105-110
110-115
115-120
120-125
125-130
130-135
135-140
140-145
145-150
150-155
155-160

CHARGES

TOTAL CHARGES $0.00

Chris Kitchell, Manager

CUSTOM ANALYTICAL SERVICES
P.O. Box 722 * 101-4 Hwy 21 So.
Republic, WA 99166
(509) 775-3885

ECHO BAY MINERALS (1362)
2251 W KETTLE RIVER RD.
CURLEW, WA 99118
ATTN:MIKE RASMUSSEN
ATTN:DAN HUSSEY

Final Report

Emma Vein
Drill Assays

October 22, 1997 R72005

TEST FOR:		Au	Ag
METHOD:		FIRE	FIRE
USED:		ASSAY	ASSAY
RESULTS IN:		oz/ton	oz/ton
	Emma Vein		
104:304 EV-97-1	0-10	.009	.06
104:305	10-15	<.002	.13
104:306	15-12	<.002	.05
104:307	20-25	<.002	.03
104:308	25-30	<.002	.21
104:309	30-35	<.002	.07
104:310	35-40	<.002	<.01
104:311	40-45	<.002	.05
104:312	45-50	<.002	.02
104:313	90-95	<.002	<.01
104:314	95-100	<.002	<.01
104:315	100-05	<.002	.04
104:316	105-10	<.002	.10
104:317	110-15	<.002	<.01
104:324 EV-02-97	70-75	<.002	.03
104:325	75-80	<.002	<.01
104:326	80-85	<.002	<.01
104:327	85-90	<.002	<.01
104:328		<.002	.03
104:329		<.002	<.01
104:330		<.002	.09
104:331		<.002	.04
104:332		<.002	.03
104:333		<.002	<.01
104:334		.003	.04
104:335		<.002	.16
104:336		.009	.14
104:337		.006	.17
104:338		.006	.02
104:339		.012	.14
104:340	160-65	.012	.14
104:323DUP.		<.002	.01
104:339-340 COMP. RA		.010	.10
RASMUSSEN: BLANK		<.002	-
LGK: STANDARD		.148	-

CHARGES

TOTAL CHARGES $0.00

Chris Kitchell, Manager

Au Ag

WC-97:1	.250	<.01	–
WC-97:2	.006	<.01	–
WC-97:3	.272	<.01	–
WC-97:5	<.002	.13	–
WC-97:6	<.002	.31	–
WC-97:7	<.002	.15	–
WC-97:8	.068	.14	–
PL-97:1	.088	.27	–
PL-97:2	.017	<.01	–
HJ-97-1	.106	.48	–
HJ-97-1 RESPLIT	.105	.47	–
HGK:STANDARD	.203	**	–
SILICA BLANK	<.002	**	–

Winnipeg - Crown

Boxer Zone

Hartford Junction

Recon

APPENDIX 3

COST STATEMENT

STATEMENT OF COSTS

(R.Bell, Bluebell, North Emma, Emma Vein)

LABOR			
M. Rasmussen	15 days @ $300/day	$4500.00	
T. Johnson	18 days @ $150/day	2700.00	
		$7200.00	
DRILLING			
Bergeron Drilling			
4842 feet @ $14.20/ft		$68,756.40	
Mobilization, Cat Work, Reclamation		18,276.01	
		$87,032.41	
ANALYTICAL COSTS			
Custom Analytical Services, Republic, WA			
113 Au, Ag assays @$13/sample		$1469 (US)	1939 (Cdn)
Chemex Geochem, Au, Hg, Cu, Rush		403 (US)	560 (Cdn)
VEHICLES, SUPPLIES			
EB Fleet trucks, 33 days @ $25/day(US)		$825 (US)	1089 (Cdn)
TOTAL		**$97,820.41 (Cdn)**	

APPENDIX 4

STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, Michael G. Rasmussen, certify that:

1. I am an exploration geologist residing at 868-7 Rupert Spur Rd., Republic, WA, USA
2. I obtained a B.A. in Biology at Andrews University, Berrien Springs, MI, in 1969.
3. I earned an M.S. degree in Geology at Loma Linda University, Riverside, CA, in 1983.
4. I graduated with a Ph.D. degree from the University of Washington in 1993 in Geological Sciences.
5. I have practised my current profession since 1990.
6. I am employed by Echo Bay Minerals Co. as a Senior Exploration Geologist.

Michael G. Rasmussen, Ph.D.

2-23-97
Date