# DRILLING REPORT DDH 151/164 INCLUSIVE

YORKE-HARDY PROPERTY

OMENICA MINING DIVISION

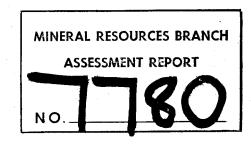
93L/14W

Lat 54°49' Long 127°18'

Climax Molybdenum Corp. of B.C. Ltd. Box 696 Smithers, B.C.

January 29, 1980

D.A. Davidson M.A.Sc. P.Eng. Project Supervisor



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# CLIMAX MOLYBDENUM CORPORATION OF BRITISH COLUMBIA, LIMITED

P. O. BOX 696 SMITHERS, BRITISH COLUMBIA TELEPHONE: (604) 847-9949

January 24, 1980

Ministry of Energy, Mines and Petroleum Resources. Victoria, B.C.

Dear Sirs:

This report contains geology logs for DDH 151/164 inclusive, for underground drilling done on our Yorke-Hardy property in the Omenica Mining Division near Smither, B.C. (Lat. 54°49', Long. 127°18').

The program consisted of the preparation of drill stations and the drilling of 14 "up-holes" with an aggregate footage of 6178 feet. The work was performed by Canadian Mine Sarvices.

6178 feet. The work was performed by Canadian Mine Services. The holes were drilled on Mineral Leases M-83/M-85 inclusive. Surface support for the work operated on Mineral Lease M-81.

Drill core was logged by Dr. D. Atkinson. All core was crushed, and the reject material is stored at the Climax warehouse in Smithers, B.C.

Yours sincerely,

D. Davidson M.A.Sc. P.Eng. Project Supervisor

DD/bd

- Mixed zone of granodiorite and stoped volcanic blocks. Ratio 1:1. Granodiorite is mottled grey and green with 5% mafic minerals, chiefly chlorite. Texture is granitic, grain size 0.75 1mm. Volcanic blocks are black, equigranular and grains are 0.3mm. Quartz molybdenite veins are fen typically enveloped by phyllic halos to 5cm width.
- Granodiorite is mottled pink, grey and green with 5 20% mafics, chiefly chlorite. Locally 2mm felspar laths form 5% of the rock. Grain size ranges from 0.5mm to 1mm. Clots of garnet, epidote, chlorite, magnetite and sericite have replaced 5 10% of the primary texture. Phyllic halos are common replacing much of the rock, enveloping numerous quartz + molybdenite veins. Scheelite occurs with quartz and magnetite and chalcopyrite is common in narrow veins.
- 185 213 Mixed zone of granodicrite and stoped volcanic blocks.
  Ration 1:1. As 0 20 for rock types. Alteration and veining as 20 185.
- Granodiorite is mottled grey, green and pink and is porphyritic. 1.5 2mm felspar laths form 3% of the rock. Clots of chlorite, sericite and magnetite to lcm have replaced 5% of the primary texture. Breccia zones are present from 20ft to 0.5 ft in width. Angular to subrounded granodiorite fragments to 3cm size occur in brown and black chloritic, magnetic and biotite rich matrix. Alteration includes both extensive zones of phyllic and felspar rimming quartz + molybdenite veins, quartz + sheelite and pyrite + chalcopyrite veins.
- Porphyritic granodiorite is dark green with an aphanitic groundmass containing 2 5mm subhedral to ragged felspars forming 20% of the rock. Garnet, epidote, chlorite and sericite have replaced 10% of the rock. Few phyllic and felspar halos to 2cm rimming occassional quartz + molybdenite veins.
- 426 477 Granodiorite (as 20 185) very few molybdenite veins.
- 477 481 As 406 426
- 481 End of hole.

- Mixed zone of granodiorite and stoped volcanic blocks, ratio 1:1. Granodiorite is mottled grey and green with up to 10% chlorite. Grain size is 0.75mm and texture is locally porphyritic. Volcanic blocks are black and equigranular. Numerous wide phyllic halos envelope abundant quartz molybdenite stockwork veins.
- Granodicrite is mottled grey pink and green with up to 20% mafic minerals as chlorite. Texture is porphyritic. Clets of garnet, epidote, chlorite and sericite have replaced 10% of the rock. Numerous phyllic halos have obliterated much of the primary magnetite vein stockwork, some magnetite veins contain scheelite.
- 105 190 Mixed zone of granodiorite and stoped volcanic blocks, Ratio 1:1. As 0 20. Veining and alteration as 20 105.
- 190 230 As 20 105.
- Granodicrite is mottled grey, green and pink and perphyritic in texture. Several breccia zenes of subangular granodicrite fragments to 2cm in a brown coloured believed biotite rich matrix. Intense phyllic alteration throughout rimming numerous quartz + molybdenite veins, including banded veins to 1 ft width. Numerous narrow pyrite + chalcopyrite veins also present.
- 340 350 Mixed zone as 0 20 for rock type. Magnetite veins form stockwork. Rare quartz + molybdenite veins, occassional scheelite + quartz veins.
- 350 389 Granodiorite as 20 105. Quartz molybdenite veins rare.
- 389 End of hole.

- 0 90
- Granodiorite is mottled grey and green with up to 15% mafic minerals as chlorite, secondary biotite, magnetite and pyrite shreds and clots. Texture is perphyritic with up to 3% 2mm subhedral felspar phenocrysts in a 0.75mm groundmass. 5% of the primary texture is replaced by 0.5cm clots of chlorite, magnetite and sericite. Alteration occurs as bleach and pink felspar and green grey phyllic halos to 2cm width. Occassional quartz + melybdenite veins including a 1.5 ft banded type 1 at 35 35.5. Narrow magnetite veins form a stockwork with regular narrow chalcopyrite and pyrite veins.
- 90 260
- Mixed zone of granodiorite and stoped volcanic blocks. Ratic 1:1. Granodiorite is mottled grey, pink and green with up to 5% mafic minerals, as chlorite, pyrite and magnetite shreds. Texture is perphyritic with 2mm felspar laths forming 2% of the rock. Ground-mass grain size is 0.5mm. Volcanic blocks are black and equigranular. Alteration includes clots to 2cm size replacing 10% of the primary texture of garnet, epidote, chlorite, sericite and magnetite. Felspar alteration is common as halos to 5cm width, phyllic halos also present to 2cm width. Narrow veins of magnetite form a stockwork, quartz veins are common and may contain scheelite, quartz molybdenite veins are common, as banded type 1 and coarse grained type 11. Chalcopyrite and pyrite also common.
- 260 480
- Granodiorite
  Texture as 0 90
  Alteration includes clots of garnet etc. as above.
  Halos of phyllic and felspar alteration may obliterate
  primary texture, veining includes local magnetite
  stockworks, irregularly common quartz molybdenite
  veins as above, quartz + scheelite and pyrite +
  chalcopyrite.
- 480

End of hole.

- Mottled green and grey grancdiorite with up to 20% mafic minerals as secondary biotite, chlorite, magnetite and pyrite shreds and aggregates. Grain size is 0.75 to 1 mm. Texture is granitic.

  Alteration includes clots to 0.5 cm of chlorite, sericite and magnetite with garnet and epidote. Bleach and pink halos of secondary felspar and greenish grey phyllic halos envelope magnetite, quartz, k-felspar, scheelite and molybdenite veins.
- Mixed zone of black stoped volcanic blocks and mottled grey pink and green grancdiorite. Ratio 1:1. Volcanic rock is equigranular, grain size is 0.3 mm. The grancdiorite contains 10% mafic minerals, has a porphyritic texture, 1% 2mm felspar laths in a groundmass with a 0.5mm grain size. Alteration and veining as 0 70.
- Mottled green and grey granodiorite very variable mafic content, up to 30%. Texture is porphyritic 2% 2mm felspar laths in a 0.5 0.75mm groundmass. Alteration as spots of chlorite and sericite plus numerous halos of felspar and phyllic alteration. Magnetite veins form a stockwork with quartz, pyrite, k-felspar, scheelite and numerous molybdenite veins.
- 310 380 Porphyritic granodiorite is grey with 10% subhedral to ragged 2-5mm felspars in a 0.75mm groundmass. Vain and alteration assemblage as 150 310.
- 380 495 Rock type as 150 310. Alteration as 150 310 Veins include magnetite, quartz, pyrite and few molybdenite types.
- 495 End of hole.

The state of the s

- Mottled grey-green granediorite with 10% mafic minerals (Biotite, chlorite, pyrite and magnetite). Texture is granitic, grain size 0.75 1mm. 5% of primary minerals are replaced by garnet, epidote and chlorite in clots 2cm wide. Rock is variously bleached by phyllic and felspar halos to 1cm width rimming quartz, magnetite, pyrite, chalcopyrite, scheelite and molybdenite veins.
- Mixed zone of granodiorite and stoped volcanic blocks, ratio 1:1. Granodiorite is mottled green and grey with 2-5% mafic minerals (chlorite + pyrite + magnetite). Texture is porphyritic with subhedral 2mm felspars to 2% in granitic groundmass of 0.75mm felspar, quartz and mafic aggregate. volcanic blocks are black and equigranular. Alteration and veining as above.
- 110 150 Mettled pink, grey and green granedicrite texture, alteration and veining as 70 110.
- 150 170 Pervasive felspar alteration, pink colour, loss of primary texture. Numerous molybdenite vains.
- 170 310 As 0 70
- 310 340 Pervasive alteration, loss of primary texture due to extensive development of secondary felspar with numerous phyllic halos. Veining by quartz, felspar, pyrite, magnetite, calcite, molybdenite and scheelite.
- 340 440 Mottled green and grey granodicrite with 5% mafics (chlorite, pyrite, magnetite and secondary biotite).

  Texture is porphyritic 2% 2mm felspar laths in a granite groundmass
- 440 505 As 0 70
- 505 End of hole.

- 0 40
- Mottled gray granodicrite, with a variable mafic content to 20% as secondary bictite, chlorite, magnetite and pyrite shreds. Texture is clouded, due to clay and sericite dustings. Alteration includes lcm spots of garnet, epidote, chlorite and sericite replacing 5 10% of the primary minerals.

Halos of secondary felspar and phyllic alteration rim magnetite, chlorite, quartz k-felspar, pyrite, chalcopyrite, scheelite and molybdenite veins. Breccia dykes to locm width are found with grey aphanitic matrix containing subrounded grancdicrite fragments up tolom wide.

- 40 80
- Mottled grey and green grancdiorite with a variable mafic content to 10%. Texture is porphyritic, 2mm felspar laths occupy 2% of the rock in a 0.5mm groundmass.

  Spots of garnet, epidote, chlorite and sericite are overprinted by phyllic and numerous felspar alteration halos which rim molybdenite veins. Other veins include magnetite, chlorite, pyrite, chalcopyrite, quartz and scheelite.
- 80 100 As 0 40.
- 100 150 Mottled grey and pink granodicrite, with a 5% mafic mineral content. Texture is perphyritic, subhedral 2mm felspar phenocrysts form 2% of the rock in a 0.75mm groundmass. Garnet, epidote, chlorite and sericite spets to 2cm width have replaced 5% of the primary minerals. Both felspar and phyllic alteration halos rim magnetite quartz, pyrite and occassional molybdenite veins.
- 150 649.5 Mcttled grey granodicrite with 5-10% mafic minerals.
  Texture is perphyritic, 1% 2mm anhedral felspars ina
  0.5mm groundmass characterized by graphic intergrewths.
  Breccia dykes are common, matrix is black, aphanitic
  and commonly magnetic containing rounded granodicrite
  fragments to 2cm width.
  Alteration spets of chlorite, sericite, magnetite
  with minor garnet and epidete. Phyllic and felspar
  alteration halos envelop molybdenite and quartz veins.
- 649.5 End of hole.

- O 390 Mettled grey-green and pink granodiorite containing 2% 2mm subhedral felspar phenocrysts in a 0.5mm groundmass with granitic, and locally graphic texture. Mafic content 5%, chiefly chlorite with some secondary bictite. Clots of garnet, epidote, chlorite and sericite have replaced 5 10% of the primary minerals. Numerous bleach and pink felspar and grey-green phyllic halos envelope stockwork of magnetite, quartz, quartz + molybdenite, and rare scheelite.
- Mixed zone of granodiorite and steped volcanic blocks. Ratio 1:1. Granodiorite as above. Volcanic blocks are black and equigranular, grain size is 0.3mm. Extensive alteration halos to 10cm of gray-green phyllic and minor bleach felspar envelopes. Veins include magnetite and quartz. Some wide quartz + molybdenite veins.
- Porphyritic granodiorite. Phenocrysts are subhedral to ragged 1-4mm Felspars forming 15% of the rock, 1-2mm Quartz eyes form 5%. Groundmass is aphanitic, grey to buff coloured. Hales are gray of buff enveloping magnetite, quartz and quartz + molybdenite veins.
- 600 End of hole.

0 - 500

Grey granodicrite with 10% mafics as aggregates of chlorite, secondary biotite, pyrite and magnetite. Texture is perphyritic 2% subhedral 2mm felspar phenocrysts in a graphic textured groundmass. Pervasive secondary felspar alteration has obliterated majority of texture from 180 - 320 feet. Impressive stockworks of molybdenite magnetite and quartz cut this pervasive alteration.

500

End of hole.

- Grey granediorite, mafic content to 5% include secondary biotite and chlorite. Chlorite + magnetite + sericite spots to 5mm have replaced primary minerals. Texture is perphyritic subhedral felspar laths to 2mm form 2% of the rock, quartz eyes to 1mm form 3% of the rock. Groundmass grain size is 0.5mm and texture is good graphic intergrowth of quartz and felspar.

  Numerous bleach and pink felspar halos some grey phyllic envelopes, rim magnetite stockwork. Quartz and felspar veins and occassional stockwork molybdenite veins.
- Mixed zone ratio 1:1. Granodiorite and stoped volcanic blocks. Granodiorite is perphyritic, felspar laths to 2mm form 2% of the rock. Breccia zones are common to 10cm containing subangular granodiorite fragments, 2cm size to 1mm size range. In a chloritic, magnetic matrix volcanic blocks are black and equigranular. Alteration and veining as above plus some 1cm banded quartz + molybdenite veins.
- 130 260 Extensive and pervasive alteration, buff coloured secondary felspar with grey phyllic halos mask majority of texture. Several quartz + molybdenite veins, rock type as 60 130.
- Extensive and pervasive alteration of granodicrite.

  Texture typically masked by both felspar and phyllic alteration. Granodicrite texture is as 0 60.

  With 350 360 perphyritic granodicrite containing 10% 2mm ragged felspar phenocrysts. Quartz + melybdenite veins occur regularly rimmed by felspar halos.
- 400 End of hole.

- Dark grey, extensively altered granodiorite.

  Development of secondary minerals including chlorite, sericite, magnetite, brown biotite, epidote, garnet and felspar as spots and clots, halos and pervasive zones have masked majority of primary texture. Relict quartz eyes and white to green anhedral felspar phenocrysts occur in a felted mat of sericite chlorite and quartz. Some graphic intergrowths of quartz and felspar may represent primary groundmass. Veins are chlorite, sericite, quartz, k-felspar and molybdenite.
- 90 110 Grey-green granodiorite, mafic minerals 2-5% aggregates of biotite and chlorite. Grain size 0.5mm, excellent graphic intergrowth between felspar and quartz. Some felspar phenocrysts, anhedral, 2mm, 1% of rock.
- 110 120 As 0 90
- Perphyritic granodiorite, phenocrysts are 5% 1-2mm quartz eyes, 15% 1-4mm euhedral to ragged felspars in a buff aphanitic or 0.5mm groundmass, with graphic texture. Areas of pervasive phyllic chlorite + magnetite + secondary biotite and silicification obliterate primary texture. Garnet, epidote + chlorite clots to 5cm & veins common. Some good quartz molybdenite veins to 25mm width.
- 400 End of hole.

- Grey-green granodiorite, well developed graphic intergrowth of quartz and felspar in 0.5mm groundmass. Texture is perphyritic with 1-2mm quartz eyes and 1-2mm buff coloured subhedral felspar laths, phenocryst content 3%. Mafic mineral aggregates also give secondary perphyritic texture. Mafic minerals are chlorite and brown secondary biotite, 5% of rock. Clots of garnet and epidete or veins to 1cm width also replace 5% of primary minerals.

  Veins are magnetite, quartz and melybdenite enveloped by bleach felspar and grey-green phyllic halos.
- 20 80 Mixed zone of granodiorite (as 0 20) and black equigranular stoped volcanic blocks. Ratio 3:1.
- Porphyritic granodiorite. Aphanitic gray to buff groundmass with 15% 1-4mm subsected felspar laths and glassy 1-2mm to 5% quartz eyes.

  Mafic spots 1-2mm of chlorite and secondary bictite also give porphyritic texture.

  Stockwork fractures are chlorite + magnetite, quartz, quartz + molybdenite and pyrite veins enveloped by pink and bleach felspar hales.
- 405 End of hole.

Light grey granodiorite, well developed graphic 0 - 20 texture in groundmass. Phenocrysts are 1mm quartz eyes, 2mm subhedral felspar laths. Mafic content 1-5%. Some chlorite + magnetite veins and alteration hales. Stockwork development of veins containing secondary brown biotite produces brecciated texture. Veins are quartz, mclybdenite and magnetite enveloped by buff and grey halos. 20 - 130 Mixed zone of black stoped volcanic blocks and granodiorite ( as 0 - 20 ). Ratio 1:3 Alteration and veining as above. 130 - 440 As 0 - 20. Texture obliterated by pervasive alteration 300 - 330 where molybdenite veining is intense. 440 End of hole.

- Grey granodicrite, texture is porphyritic. 2mm subhedral felspar laths form 1% of rock in 0.5mm groundmass with good graphic intergrowths. Mafic content is 10% aggregates of brown secondary bictite and chlorite. Clots of sericite + chlorite + epidote + garnet and veins of magnetite + epidote + garnet and chlorite + sericite to 2cm width have replaced 10% of the primary minerals. Extensive alteration as phyllic halos and some pink or bleach felspar halos Good stockwork of magnetite and quartz veins with minor pyrite + chalcopyrite and quartz + molyodenite veins.
- 75 130 Dark grey granodiorite. As 0 75 but increase in mafic content 15-20% Rare stoped volcanic blocks and 108 109 lamprophyre dyke.
- 130 140 Breccia. Granodicrite fragments, microscopic to 3cm in dark chloritic, magnetite rich matrix. Fragments are angular to subrounded.
- 140 200 As 0 75 Good molybdenite stockwork.
- 200 220 Mixed zone of granodicrite (as 0 75) and stoped velcanic blocks.
- 220 400 As 0 75 Good quartz molybdenite veining, veins to 10cm.
- 400 End of hole.

HOLE No. 164

## ROCK DESCRIPTION

0 - 40

Grey granodiorite, texture is perphyritic. 2mm subhedral felspar laths form 1% of rock in 0.5mm groundmass with good graphic intergrowths. Mafic content is 10% aggregates of brown secondary biotite and chlorite. Clots of sericite + chlorite + epidote + garnet and veins of magnetite + epidote + garnet + chlorite + sericite to 2cm width have replaced 10% of the primary minerals. Extensive alteration as phyllic hales and some pink or bleach felspar halos. Good stockwork of magnetite and quartz veins with minor pyrite + chalcopyrite and quartz + molybdenite veins.

40

End of hole.

		nn a	ELEV.	CORE		
DDH	CO-01	פעא יייייייייייייייייייייייייייייייייייי	ELEV.	SIZE	INC.	BRG.
		•.				
151	17.500N	15,000E	3517	HQ	+45°	090°
152	17,500N	15,000E	3521	HQ	+90°	-
153	17.700N	15,000E	3518	NQ	+45°	270°
154	17.700N	15,000E	3518	NQ	+45°	090°
155	17,700N	15,000 <b>E</b>	3520	NQ	+90°	
156	17,900N	15,000E	3518	NQ	+55°	270°
157	17.900N	15,000E	3518	NÇ	+57°	090°
158	17,900N	15,000E	3519	NÇ	+90°	
159	18,100N	15,075E	3520	NQ	+90°	-
160	18,500N	15,000E	3520	NQ	+90°	-
161	18,300N	15,000E	3519	NQ	+90°	_
162	18,300N	15,000E	3518	NQ	+52°	270°
163	18,100N	15,065E	3519	NQ	+55°	270°
164	18,095N	15.065E	3518	NQ	+55°	300°

# EXHIBIT A

# Drilling Payments

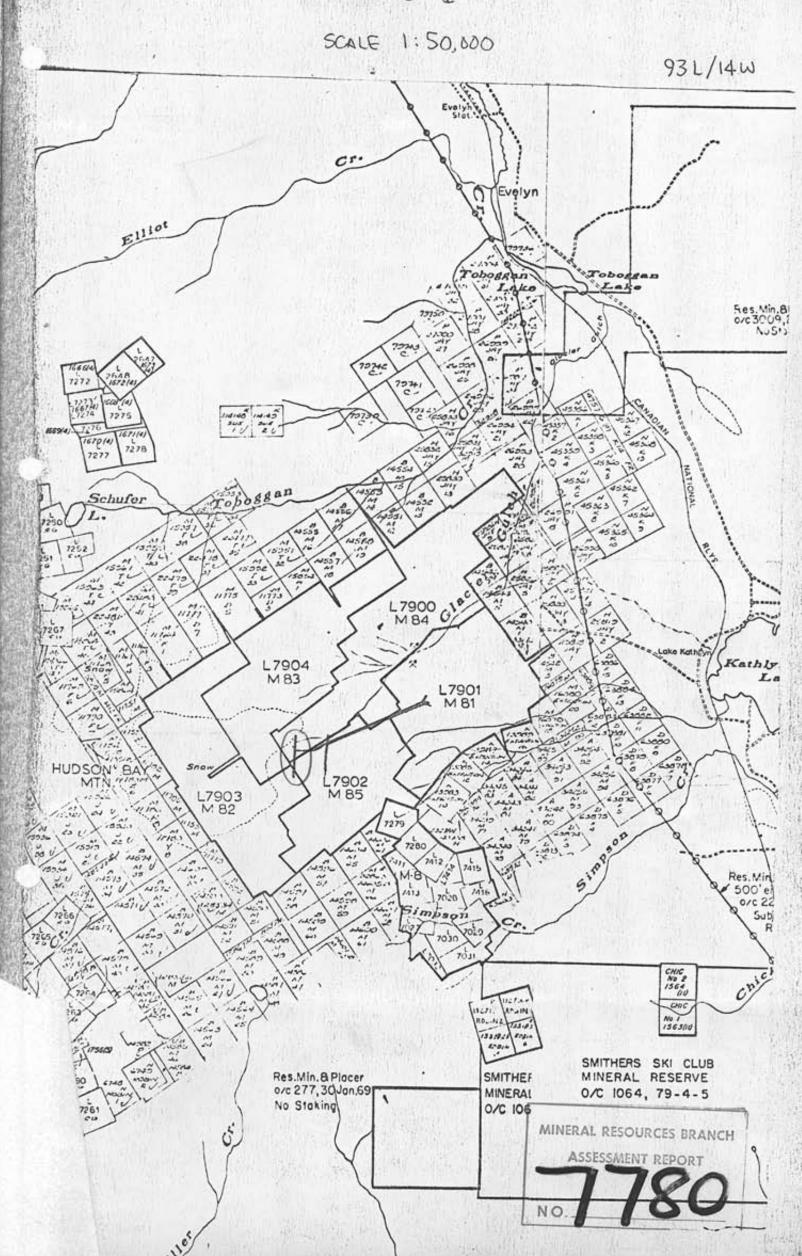
- A. Total cost of mobilization from point of origin to the portal area and demobilization (one-half paid after move on and one-half when job is complete)......\$5,000.00
- COMPANY shall pay CONTRACTOR the sum of Fiftythree Dollars (\$53.00) per hour plus ten percent (10%), for each hour, or a pro-rata portion thereof for each drilling rig which COMPANY requests be held in readiness to resume drilling pending completion by COMPANY of probing, depth measurements, or surveying of the hole, or pending further instructions from COMPANY. CONTRACTOR shall make no claim for, and COMPANY shall have no duty or obligation to pay CONTRACTOR, standby payments for any time elapsing between the end of any work day or shift and the beginning of the next succeeding work day or shift, or for any time when CONTRACTOR has not been specifically requested by COMPANY to stand by, including any standby or delay resulting from CONTRACTOR's acts, omissions, or neglect or breakdown of CONTRACTOR's equipment, except as to standby time required for the setting of cement and delays caused by other contractors pursuant to Paragraph C of Article XI, Other Contractors, Company Access, and Cooperation, which shall be deemed as standby requested by COMPANY.
- C. Core drilling, per linear foot:

Linear Foot	HQ	<u>NQ</u>	BQ
0 to 500'	\$19.75	\$18.25	\$16.75
500 to 750'.		21.00	19.50
750 to 1,000'		28.00	26.00

- D. Drilling equipment time -- two-man crew and equipment:
  - 1. Cementing, regaining lost circulation, and hole conditioning, per hour plus materials used. Asso. Stabilization. Asso. Delays 10.....\$57.00 plus 10%
  - 2. Installing and pulling casing, per hour...\$57.00 plus 10%

	3.	Reaming (plus CONTRACTOR's third-party invoice cost for bits and all consumables f.o.b. jobsite), per hour\$57.00 plus 10%
	4.	Re-entry and cleaning out old hole (plus CONTRACTOR's third-party invoice cost of all bits and supplies, f.o.b. jobsite), per hour\$57.00 plus 10%
	5.	Hole survey (plus cost, if any, of instrument rental), per hour\$57.00 plus 10%
	6.	Move in from portal and set-up on first borehole, and tear-down of last borehole and move out to portal at job completion, per hour\$53.00 plus 10%
	7.	Interstation moves, in excess of 20 man-hours, per hour
	8.	Supplies consumed, damaged beyond re-use, or lost in boreholes on which work is progressing on a site-cost basis would be charged at field replacement cost.
	9.	Additional personnel in excess of two-man crew, per man-hour\$17.75 plus 10%
	be ch	ng left in hole at COMPANY's request will arged at replacement cost plus twelve per- (12%).
	will	mud, drill mud additives, and cement used be charged at CONTRACTOR's published list ich site +10% portation to the jobsite.
o t	her c	harges shall be paid to or billed by CONTRACTOR ior written approval of the COMPANY.
		200 DE DE

FIGURE 1



18,500N 25 DDH 160 FIGURE Z DRILL HOLE LOCATIONS 3500 LEVEL . 1" = 100 FT. DDH 161, 162 DDH 159, 163, 164 18000N. 22 DDH 156, 157, 158 21 DDH 153,154,155 500N-20 DDH 150,151,152 MUVIRAL RESOURCES BRANCH DDH 147, 148, 149 19