

**Normin/Boise Cascade**

International Falls

Seattle Slew

Folder: 2

Doc #: 25

Company Normin Mining

70-24-1 FILE #1

ITEM
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LEGEND**SURVEY**

Footage	Bearing	Inclination
0		45°
34'		45.5°
402'		43°
722'		38°

Property INT'L FALLS - SEATTLE SLEW Hole No. SS-7
Location NE 1/4 SW 1/4, SEC. 1 - 70N-24W Bearing at Collar GRD N, 336° Azm
KOOCHICHING CO. - HASMER BROWN LEASE Inclination at Collar -45°
Coord. - Collar 19+00S
52+00W Length 722'
Elev. - Collar 1162' Core Size NQ
Date started 2-7-89
Completed 2-12-89 Logged by D. BAXTER

LITHOLOGY, ALTERATION, MISC.	FT.	GRAPHIC LOG	MINERALIZATION	RECOVERY				ANALYTICAL					BOX
				Run	Run length	Core	%	Sample	Interval	Au			
Overburden - Peat + Muskeg	34	↑ ↓		34									
MAFIC TUFF - Massive to very weakly banded	38.2		2-5% po as diss. or rare 2-6 mm. clots	38.2		68° 70°		20572	34-38.2	45			
Ragged bands of carbonate usually parallel or sub-parallel to foliation or bedding. Carb. more common from 38' to 41' upward	40 41		3-6% po, py, ± opy.	41				20573	38.2-41	45			
M. TUFF as @ 34-41 w/ abundant fractures & bxa filled with carbonate.			2-5% po in fractures with the carbonate			42°		20574	41-48	11			
@ 44-47 bands are highly contorted and contain 1 cm or less pods	48			48				20575	48-48.5	45			
RTZ - TOUR VEIN	50												
MAFIC TUFF - as @ 34-41 with more ragged carbonate in fractures and highly contorted bands.	56.5		as @ 41-48			60°		20576	48.5-56.5	45			
MAFIC TUFF - f.g., m. grn., well bdd.	60		80% pods @ 56.7'			58° 60°		20577	56.5-58.5	45			
MAFIC TUFF - as above with 1 cm thick chert + clastic layers @ 57'			1-2% diss po - py			40° 35° 58°		20578	58.5-63.8	45			
52' BIO - Clastic zone @ 61.8'			2-4% po in cherts										
MAFIC TUFF - as @ 50-56.5			1-2% diss po					20579	63.8-69	45			
ragged carb .15' chert @ 65.5'													
TUFF or CLASTIC UNIT - as @ 44-48 with abundant BIO beds. Abundant ragged carb. throughout	70		3-6% po in fractures and clots assoc w/ carb.					20580	69-79	45			
BIO more common @ 75'-79'	80												

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LITHOLOGY, ALTERATION, MISC.	FT.	GRAPHIC LOG	MINERALIZATION	RECOVERY				ANALYTICAL						BOX
				Run	Run length	Core	%	Sample	Interval					
MAFIC TUFF - as @ 128.5-138	150		1-2% po-py					20590	147-153	45				
MAFIC TUFF - as @ 89-99 with abnt. ragged carb. in contorted layers and stringers. 2' Fe Fm @ 154'	160		1-3% diss po. 4-5% po in Fe Fm					20591	153-162	5				
? MAFIC TUFF - as @ 89-99 with Fe Fm layers + bio-rich layers 15' Fe Fm @ 162.8', 163.8', 167.3' 1.0' Fe Fm @ 165.2			4-6% po-py @ 163.8-164.1 2-4% po-py in other Fe Fm 1-3% po elsewhere					20592	162-163.5	45				
FE-FM Pale gray to black bands 1mm-10mm wide. Bands are highly contorted. 8mm po vein @ 173.8	170		Highly variable sulfide 2% ~3-7% py-po Rare zones up to 10% po			60 80 47 50		20593	168.5-175	45				
? MAFIC TUFF? f.g. chlt-act with patches of ragged carb. 2' 8% vein @ 178'			1-2% py-po					20594	175-178	45				
FE-FM as @ 168.5-175 with mat layers @ 174.3	180		as @ 168.5-175			53 55 58		20595	178-181	45				
? MAFIC TUFF - as @ 175-178 Qtz veins or chert @ 182.8-183.4			as @ 175-178					20596	181-184.2	45				
FE-FM as @ 168.5-175 QTZ-act-chlt Massive to weakly banded. f.g. ? Mafic Tuff? 1.2cm Qtz pods @ 186, 188, 193.5	190		as @ 168.5-175 Trace - 1% py-po					20597	184.2-5.4	45				
1cm chert units @ 194.3								20598	185.4-196	45				
BANDED CLASTICS - Qtz, act, chlt, gnt Hervasive carb. stringers abundant 1-2 cm rotated gnt crystals	200		1-2% po-py			70 63 70 70 70		20599	196-203	45				
SLCS CLASTICS + FE-FM Cste Qtz-bio-chlt 203-204 Rare gnts			Tr-1% po-py					20600	203-206.2	45				
BANDED CLSTCS - as @ 196-203 with zones of slcs clstcs: 2' @ 206.2 4' @ 208.5 1.8' @ 213.7	210		Tr-1% diss po-py 5' 3-5% po @ 207.5'			58 55 56 57		20601	206.2-215.5	45				
BANDED CLSTCS - as @ 196-203	220		as @ 196-203					20602	215.5-222	45				

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LITHOLOGY, ALTERATION, MISC.	FT.	GRAPHIC LOG	MINERALIZATION	RECOVERY				ANALYTICAL								BOX
				Run	Run length	Core	%	Sample	Interval							
SLCS CLSTC + FE FM - as @ 203-206.2. Repetitive interbeds. Rembed. Qtz 223.7'-224.1'	220		1-3% po-py mainly in the FeFm layers			66 55 53 52		20603	222-228	45						
QTZ=ACT=CHLT MASSIVE .2' zones of slcs clstcs @ 230.5' + 233.6' .2' FeFm @ 234.1'	230		Tr. diss. po-py 2-4% po-py in FeFm					20604	228-235	45						
Slcs clstc zones richer in bio	240							20605	235-245	45						
ragged carb 246-251 .5' slcs clstc 247.5' .2' FeFm @ 249.8'	250							20606	245-252	45						
FeFm + CHERT - brittle fault running ~ parallel to core QTZ=ACT=CHLT massive as @ 228-235 .1' FeFm @ 258. Ragged carb. through out	260		2-5% po-py in and near fault and in bedded layers Tr-2% po-py			75 63		20607	252-254.5	45						
BANDED CLASTICS - as @ 196-203 with less grnt from 259.5-263.5 .2' FeFm @ 259.5', .6' slcs clstc 261.6'	270		2-3% po-py, 3-4% po in FeFm					20608	254.5-259.5	45						
FeFm as @ 168.5-175'	280		3-4% po-py					20609	259.5-265	5						
MAFIC TUFF - F.g., m. grn color, weak to mod. banding 1-2 cm Qtz pods @ 269', 271', + 272.9'	290		Tr-1% po-py			42 54 20 45		20610	265-266	10						
QTZ=ACT=CHLT massive with chert + FeFm layers ragged carb .2' FeFm @ 276', 276.6', 277.1'	300		2-3% po-py diss					20611	266-273.2	45						
SLCS CLSTC - as @ 203-206.2 but less silica and coarser gr. Qtz=act=bio=chlt ragged carb. stringers	310		1-2% po-py diss					20612	273-279	5						
								20613	279-288	45						

LITHOLOGY, ALTERATION, MISC.	FT.	GRAPHIC LOG	MINERALIZATION	RECOVERY				ANALYTICAL							BOX
				Run	Run length	Core	%	Sample	Interval						
QZ-ACT-CHLT Massive as @ 245-252 very rare bio. layers pervasive ragged carb. stringers little or no banding	290		2-3% diss po-py					20614	283.5-297	45					
SLCS CLSTC - as @ 203-206.2 but with pervasive ragged carb as seen above. • 8' chert @ 299'	300		2-8% po, minor py					20615	297-303.3	45					
QZ-ACT-CHLT Massive as @ 245-252 Rare 1-2cm qtz pods			1-3% diss po-py					20616	303.3-308	45					
QZ-ACT-CHLT Crudely Banded Several 1cm qtz pods may be chert or contorted veins, Pervasive ragged carb.	310		3-5% po as diss +/- stringers					20617	303-315.5	45					
MAFIC TUFF - as @ 266-273.2 with abundant qtz veining	320		1-3% po-py					20618	315.5-320.4	45					
90% qtz vein material			Tr - 1% py					20619	320.4-323.5	45					
			1-3% po-py					20620	323.5-326.5	45					
BANDED CLASTICS - as @ 196-203 w/o garnets qtz-act-chlt-bio F. to mag. with rare .15' chert beds variable amounts of ragged carb.	330		2-4% po-py					20621	326.5-333.5	45					
BANDED CLASTICS - as above w/o biotite. qtz-act-chlt Pervasive ragged carb. 336-339 Chert or qtz vein pods @ 340-341	340		1-5% po-py 3-5% po @ 336-340					20622	333.5-341.1	45					
BANDED CLASTICS - as @ 326.5-333.5 minor ragged carb. chert or qtz vein pods @ 346-465 350-352	350		as @ 326.5-333.5					20623	341.1-352	6					
Bleached, silicified, & etched @ 352.4-356							45 46 55	20624	352-359	45					

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LITHOLOGY, ALTERATION, MISC.	FT.	GRAPHIC LOG	MINERALIZATION	RECOVERY				ANALYTICAL							BOX
				Run	Run length	Core	%	Sample	Interval						
BAND CLASTICS - as above with 2-4 mm orpiment-rich layers @ 360' + 362.8'	360		as above			52 54		20625	359 - 363	45					
BANDER CLASTICS - as @ 326.5-333.5 w/o Biotite. Ragged carb. 368-9 Highly contorted 1/2 cm chert layers from 370-371	370		1-4% po-py diss. Higher % assoc w/carb			60 58 52		20626	363 - 372	45					
BANDER CLASTICS - as @ 326.5-333.5 Numerous thin chert layers (3-15 mm) Qz = act = bio-chlt Banding highly contorted in most areas.	380		2-4% po, minor py. .5% 5% po @ 374			51 87 84 80 32		20627	372 - 382	45					
.1' chert @ 384.8 " 386.2 Highly contorted chert bands .3' chert @ 391'	390							20628	382 - 392	45					
.1' chert @ 397' .3' Fe Mn @ 401'	400					70		20629	392 - 402	45					
.2' gtz carb = ep fault zone @ 405.3' .25' chert @ 407.2'	410					60 61		20630	402 - 412	45					
	420					85 86 14 85		20631	412 - 422	45					
.25' remob. chert/vain @ 425.5' .1' cherts @ 428' .1' chert @ 429'	430							20632	422 - 432	45					

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LITHOLOGY, ALTERATION, MISC.	FT. 430	GRAPHIC LOG	MINERALIZATION	RECOVERY				ANALYTICAL						BOX
				Run	Run length	Core	%	Sample	Interval					
QZ-ACT BANDED f. to m. gr. with qtz pods/layers (remob. chert?) and layers of laminated chert. 1' chert @ 434', 436', 441' 45' chert @ 437' variable amounts of ragged carb.	440		2-4% po diss, mainly adjacent to chert beds					20633	432- 442	LS				
FE FM - chert + sulfide layers w/ qtz-act	450		4-6% po in chert layers					20634	442- 447.2	LS				
QZ-ACT BNDD - as @ 432-442 ragged carb.			as @ 432-442					20635	447.5- 449	LS				
FE FM - as @ 447.5-449			as @ 447.5-449					20636	449- 456	LS				
QZ-ACT Massive to BNDD as @ 432-442 with 15' chert/FcM @ 461.5' ragged carb. sub-parallel to bedding 1.4' qtz(chert) + layered carb @ 467' 8' qtz(chert) layers @ 469.2	460 470		1-3% po-py 2-3% po		46 49 28 31			20638	458.2- 467	LS				
CHERT or silicified qtz-act bnnd. Fine laminations @ 476'-478'			3-4% po diss in bnnd cherts		40 46			20639	467- 470.4	LS				
QZ-ACT BNDD - as @ 432-442 with brecciation, stufen & epdten. Highly fractured + carb-rich @ 483.6-84 ragged carb.	480		1-3% po-py					20640	472.4- 478	LS				
QZ-ACT BNDD - as @ 432-442 ragged carb. diss throughout Carb. in fractures @ 493.7-494.4	490		1-3% po-py					20641	478- 485.6	LS				
QZ-ACT Massive to weakly BNDD	499 500		7-2% po-py	499				20642	485.6- 495	LS				
								20643	495- 499	LS				

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LITHOLOGY, ALTERATION, MISC.	FT.	GRAPHIC LOG	MINERALIZATION	RECOVERY				ANALYTICAL						BOX
				Run	Run length	Core	%	Sample	Interval	Aw				
Qtz-Act-Chlt Massive w/ tr BIO	500		2-3% diss po-py	502				20531	499.502	45				
as above w/ qtz-chlt veins @ 502.2 and 503.0	502		as above, also 1cm zones of 4-5% po-py	504				20532	502-504	45				
Qtz-Act-Chlt Massive F. to mig. rare qtz pods or stringers	510		1-2% diss py.	510				20533	504-510	45				
Qtz-Act-BIO w/crude banding	512.3		1-2% diss PY.	512.3				20534	510-512.3	45				
Qtz-Act-Chlt Massive - Minor late fractures and alteration	515		2-3% diss po-py	515				20535	512.3-515	6				
Qtz-Act-Chlt - Crudely Banded F. to m.g. Rare grnt clots @ 520'	523		1-3% po-py zones of 4-6% po @ 519 and 521	523				20536	515-523	45				
Biotitic zone (.2') @ 524.5 Some late fractures + alteration Massive from 529-531'	531		as above 4-5% po-py @ 525	531				20537	523-531	5				
Qtz-Act-Chlt as above with minor Fe Fm @ 531.2 and 536	540		1-2% po-py 3-5% po-py with Fe Fm	540				20538	531-540	45				
Qtz-Act-BIO Crudely Banded Clastic? Well banded @ 548' Coarser grained @ 542'	551.2		1-2% widely diss py-po	551.5				20539	540-551.5	10				
Qtz-Act-Chlt - Crudely Banded as @ 515-523	556.1		2-3% diss po-py	556.1				20540	551.5-556.1	45			6.002	
Qtz-Act-Chlt as above with minor Fe Fm @ 557 and 559	559.5		3-4% po-py in and near the Fe Fm.	559.5				20541	556.1-559.5	68			.002	
Biotically Qtz-Chlt-Act (Fe Fm?) Crudely banded and distorted.	567.2		3-8% po +/or py in clots and stringers and as disseminations	567.2				20542	559.5-567.2	864			.042	
Qtz-TOUR VEIN 60-70% qtz	567		Qtz Vein?	567				20543	567.2-567.2	626			.019	
Qtz-Act-Chlt Massive as @ 504-510	570		as @ 504-510	570				20544	567-570	87			.004	

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LITHOLOGY, ALTERATION, MISC.	FT.	GRAPHIC LOG	MINERALIZATION	RECOVERY				ANALYTICAL						BOX
				Run	Run length	Core	%	Sample	Interval	Aw				
Q ₁₂ -ACT-CHLT Crudely Banded as @ 515-523 More Biotite from 570-572.5	570 572.5		1-2% diss po-py	635.5				20545	570-575.5	11			.005	
Q ₁₂ -ACT-CHLT Banded (4-15mm grt) Some bands are contorted	579.4		2-6% po-py as diss. and stringers	579.4				20546	575.5-579.4	7			.002	
Q ₁₂ -ACT-CHLT Banded as above w/o garnets	584		2-4% diss po-py and rare stringers	584				20547	579.4-584	5			.002	
Q ₁₂ -ACT-CHLT Crudely Banded as @ 515-523 Rare grt porphyroblasts	593		1-3% diss po-py 4-5% po @ 589.5	593				20548	584-593	5			.002	
Q ₁₂ -ACT-CHLT-BIO Crudely Banded Biotite occurs biotite-rich Q-A-C layers Rare grt porphyroblasts	604		2-3% po-py diss. 5-6% po @ 592-598 3-4% po @ 602-604	604				20549	593-604	79			.002	
Q ₁₂ -ACT-CHLT BANDED as @ 579.4-584 Some zones are more massive Rare grt porph.	612		2-4% diss po-py	612				20550	604-612	5				
	618.3		2-3% diss po-py	618.3				20551	612-618.3	6				
Q ₁₂ -ACT-CHLT Crudely Banded as @ 515-523 minor Bio @ 520 2" Fe Fm @ 622.5	626		1-4% diss po-py	626				20552	618.3-626	6				
Q ₁₂ -ACT-CHLT Crudely Banded as @ 515-523 with several 1-2 cm Fe Fm bands. Fe Fm @ 629.2 →	631.2		1-2% diss po-py	631.2				20553	626-631.2	8				
Q ₁₂ -ACT-CHLT Banded Fe Fm from 631.2-632	634.9		1-3% diss po-py	634.9				20554	631.2-634.9	25				
Q ₁₂ -ACT-CHLT-BIO: Crudely Banded as @ 593-604	640		1-3% diss po-py	640				20555	634.9-640	25				

LITHOLOGY, ALTERATION, MISC.	FT.	GRAPHIC LOG	MINERALIZATION	RECOVERY				ANALYTICAL						BOX
				Run	Run length	Core	%	Sample	Interval	Au				
CHLT-QTZ-GRNT Massive to Crudely Banded Garnet grains are intergrown with Pyroxenite stringers. Rare Qtz pods + bands ? Altered Fe Fm?	640 641.2 653.8		2-8% po as diss. pods and stringers Tr. py.	641.2				20556	641.2- 653.8	5				
QTZ-ACT-CHLT-BIO Crudely Banded as @ 593-604 Rare garnet porph.	659 665		1-3% po-py 1-2% po-py	659				20557	653.8- 659	15				
QTZ-ACT-CHLT Banded with minor Biotite Thin Fe Fm @ 668	672		2-5% po as diss and stringers	672				20559	665- 672	5				
QTZ-ACT Massive - Brecciated & altered. Fe Fm band @ 674	674.5		Tr. po	674.5				20560	672- 674.5	15				
QTZ-ACT-CHLT-BIO Crudely Banded as @ 593-604 as above with several chert/FeFm layers. Bra zone @ 682	680 683.5		1-2% diss po-py	680				20561	674.5- 680	11				
QTZ-ACT-CHLT Massive to Crudely Banded	689		1-3% diss. po zones of 6-8% po	689				20563	683.5- 689	15				
QTZ-ACT-CHLT-BIO Crudely Banded as @ 593-604 Rare Grnt. CHERT or silicified sediments	693 695		1-3% diss po-py No visible antides	693 695				20564 20565	689- 693 693- 695	15 15				
QTZ-ACT-CHLT Banded w/minor BIO Qtz-epidote alt @ 697.6 Thin Fe Fm @ 698 + 702	702.4 707.5		1-3% po near the Fe Fm @ 698	702.4 707.5				20566 20567	695- 702.4 702.4- 707.5	15 15				
QTZ-ACT-CHLT Banded as above with several chert/FeFm layers	710		Tr po-py	710				20568	707.5- 711	13				

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