

5

FORM M-108 (9-3)

DRILL HOLE LOG - FERROUS

LAT. + 14,276.2	+4307.8	ANGLE	-60°	MINE	Sunrise, Wyo.		
DEP. + 4,302.3	+4233.4	BEARING	North	LOCATION	Emanuel #5		
ELEV.	5509.5	LEVEL	Surface	HOLE NO.	405		
DATE	DRILLED			CORE		MATERIAL	REMARKS
	FROM	TO	FEET	FT.			
12-6-71	0	9	9	0		Overburden; clay and sand.	
12-8-71	9	10	1	0		Same as above.	
	10	13	3	2		Hartville FM; light gray limestone with maroon clay seams.	
	13	18	5	5		Maroon clay with limestone breccia.	
	18	22	4	4		Maroon clay.	
12-9-71	22	28	6	5		Light gray limestone with calcite lined vug 25-26.	
	28	32	4	4		Light gray limestone to 29.5; grades into maroon clay.	
	32	36	4	4		Maroon clay with light gray limestone breccia.	
	36	41	5	5		Medium gray limestone with occasional clay seams.	
	41	44	3	3		Maroon clay.	
	44	49	5	5		Medium gray limestone.	
	49	55	6	6		Medium gray limestone; maroon clay 52-54.	
	55	60	5	5		Light gray limestone breccia with maroon clay.	
12-10-71	60	65	5	5		Same as above.	
	65	70	5	5		Maroon clay 65-66; medium gray limestone 66-70.	
	70	75	5	5		Medium gray limestone, maroon clay seams.	
	75	80	5	5		Same as above.	
	80	90	10	10		Same as above; clay 86-88.	
	90	100	10	10		Medium gray limestone with occasional maroon clay seams.	
	100	110	10	10		Same as above.	
	110	120	10	10		Same as above.	
	120	130	10	10		Same as above.	
	130	140	10	10		Medium gray limestone with maroon clay seams; calcite fracture fillings.	
	140	147	7	7		Medium gray limestone.	
	147	151	4	4		Maroon clay with limestone breccia.	
	151	161	10	10		Medium gray limestone with occasional maroon clay seams.	
12-12-71	161	171	10	10		Same as above.	
	171	181	10	10		Same as above.	
	181	191	10	10		Basal Hartville FM; light gray quartzite, fine grained and massive.	
	191	201	10	10		Same as above.	
	201	211	10	10		Same as above; mottled maroon clay 204-205.	
12-13-71	211	221	10	10		Same as 204-205; 219-221 light gray banded quartzite.	
	221	231	10	10		Maroon & light gray quartzite, some crossbedding.	

Driller R Rush / Longyear 78

98-3% core recovery

Core ID by RS Erickson

n: analyzer

DRILL HOLE LOG - FERROUS

LAT.	+ 14,276.2		ANGLE	-60°		MINE	Sunrise, Wyoming	
DEP.	+ 4,302.3		BEARING	North		LOCATION	Emanuel #5	
ELEV.	527.5		LEVEL	Surface		HOLE NO.	405	
DATE	DRILLED			CORE		MATERIAL	REMARKS	
	FROM	TO	FEET	FT.				
	231	241	10	10		Same as 221-231.		
	241	248	7	7		Same as above.		
	248	252	4	4		Same as above.		
	252	262	10	10		Same as above.		
	262	272	10	10		Same as above; maroon clay with quartzite breccia 263-269; 269-272 light gray-buff dolomite.		
	272	282	10	10		Light gray-buff dolomite with maroon clay bands.	Guernsey form. @ 269 ft.	
	282	292	10	10		Same as above.		
	292	302	10	10		Same as above; sandy 300-302.		
12-14-71	302	312	10	10		Light gray-buff dolomite breccia recemented with pink dolomite.		
12-15-71	312	322	10	10		Same as above; dark maroon hematite clay fracture filling 315-318.		
	322	332	10	10		Mottled maroon and buff sandy dolomite; cross-bedded with compression fractures.		
	332	342	10	10		332-335 same as above; 335-342 light gray quartzite breccia cemented with pink sandy dolomite.		
	342	352	10	10		342-344 same as above; 344-352 maroon banded sandy dolomite with some light gray quartzite breccia and tan clay breccia.		
	352	362	10	10		Same as above.		
	362	372	10	10		Same as above; vuggy zone at 371-373 with limonite and calcite in vugs.		
	372	382	10	10		372-381 same as above; 381-382 yellow-buff dolomite with occasional maroon bands; fine grained.		
	382	392	10	10		Same as 381-382.		
	392	402	10	10		Same as 381-382; calcite filled vugs 395-400.		
	402	412	10	10		Buff light gray dolomite with some maroon banding; occasional soft clay bands.		
12-17-71	412	422	10	10		Same as above.		
	422	432	10	10		Same as above; sandy 422-423.		
	432	442	10	10		Same as above; siliceous with some white chert breccia 440-442.		
	442	444	2	1.7		442-443 medium gray siliceous dolomite with white and maroon bands.		
	444	454	10	10		444-445 Same as 442-444; 445-454 Precambrian contact - altered red and greenish gray sericite schist; some white breccia & banding.	Precambrian @ 445 ft.	

DRILL HOLE LOG - FERROUS

DATE	DRILLED		TO FEET	CORE SURFACE	MATERIAL	REMARKS
	FROM	TO				
12-18-71	454	462	8	8	Same as 414-454.	Banding 40°
	462	472	10	10	Reddish brown sericite schist with white quartz bands; somewhat contorted.	
	472	482	10	10	Greenish gray sericite schist with white quartz bands.	
	482	492	10	10	Same as above; some limonite stain 488-490.	
	492	502	10	10	Green-gray sericite schist with white quartz bands.	
12-20-71	502	512	10	10	Same as above; slight hematite stain contorted banding 504-510.	
	512	522	10	10	Same as 502-512.	55°
	522	532	10	10	Same as 502-512.	50°
	532	542	10	10	Same as 502-512; highly contorted.	
	542	552	10	10	Same as above.	
	552	562	10	10	Same as above; hematite stained fractures at 556 and 560.	
	562	572	10	10	Same as above; hematite stained fracture at 569; 4" quartz bands.	
	572	582	10	10	Greenish gray chloritic quartz sericite schist; 6" quartz bands; contorted banding.	Schistosity 0°-15°
12-21-71	582	592	10	10	Green-gray chloritic sericite schist with quartz bands; bands up to 4" thick; slight hematite stain on fractures.	Schistosity 50°
	592	602	10	10	Same as above.	
	602	612	10	10	Same as above; slight hematite stain on fractures; contorted quartz bands up to 3" thick.	
12-22-71	612	622	10	10	Contorted black graphite schist with numerous lenses of quartz; slightly talcose in places.	
	622	632	10	10	Similar to 612-622; crenulations of fracture surfaces.	
	632	642	10	10	Similar to 612-622; highly contorted with more quartz lenses.	
	642	652	10	10	Highly contorted sericitic graphite schist with numerous quartz lenses.	
12-23-71	652	662	10	10	Moderately-highly contorted siliceous graphite schist; sericitic locally with numerous quartz lenses.	
	662	672	10	10	Similar to 652-662; scattered pyrite in fractures.	
	672	682	10	10	Precedated chlorite schist with contorted quartz lenses; slightly decomposed.	

DRILL HOLE LOG - FERROUS

LAT. + 14,276.27-4222.0 N DEP. + 4,362.37-4137.4 E ELEV. 5307.5				ANGLE BEARING LEVEL		North Surface		MINE LOCATION HOLE NO. 405		Sunrise, Wyoming Emanuel #5	
DATE	FROM	TO	DRILLED	FEET	FT.	CORE		MATERIAL		REMARKS	
	682	692		10	10			Soft intensely contorted chlorite schist with numerous contorted quartz lenses; very light hematite stain locally.			
	692	702		10	10			Similar to 682-692; thin deposits of hematite and pyrite on fractures.			
1-4-72	702	712		10	10			Same as 692-702; not decomposed.			
	712	722		10	10			Same as 692-702; not decomposed.			
	722	732		10	10			Highly contorted graphitic chlorite schist with contorted quartz lenses; minute crenulations and sparsely scattered pyrite.			
	732	742		10	10			Same as 722-732.			
								HOLE TO BE CONTINUED AT LATER DATE.			
								HOLE SURVEYS (Corr.)			
								100' 60'			
								200' 61'			
								300' 63'			
								400' 64'			
								500' 64'			
								600' 65'			
								700' 63'			
								742' 67'			
								SUMMARY			
0	171	171						Hartville formation: medium gray limestone with maroon clay seams.			
171	269	98						Basal Hartville formation: light gray quartzite with some maroon clay bands.			
269	445	176						Guernsey formation: light gray-buff and pink dolomite. Some light gray quartzite breccia and occasional maroon bands. Dolomite is siliceous from 422-445 ft.			
445	742	297						Precambrian graphitic-chloritic-sericitic schist with numerous quartz bands and lenses. Slight hematite stain on fractures. Scattered pyrite in fractures from 662-742 ft.			

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DRILL HOLE LOG - FERROUS

LAT. DEP. ELEV.	+14,307.0N +4233.4E 5309.5	ANGLE BEARING LEVEL	-50° North Surface	DRILLED		CORE		MATERIAL	REMARKS
				FROM	TO	FEET	FT. 1.0		
7-10	1373	7-10	Set 742 ft of EX casing.	742	732	10	0	742-1231	Banding to Axis of Core.
				732	752	10	0	Precambrian "upper" schist.	
				752	772	10	0	Pyritic, graphitic quartz, sericite schist.	
7-11				772	782	10	0	Quartz bands constitute about one-third of rock. 50 core.	
				782	792	10	0	Graphitic enough to cause a dark-gray color.	Schistosity at 782 is
				792	802	10	0	One or two percent pyrite, disseminated as	43° to core axis.
7-12				802	812	10	0	Smears on schistosity and in fractures.	80° at 792
				812	822	10	0	Schistosity is fairly contorted.	
				822	832	10	0		0° at 815
7-13				832	842	10	0		90° at 830
				842	852	10	0		43° at 842
				852	862	10	0		
7-14				862	872	10	0		43° at 865
				872	882	10	0		43° at 874
				882	892	10	0	Up to 50 percent quartz 882-892.	90° at 885; 25° at 890
7-15				892	902	10	0		43° at 897
				902	912	10	0		80° at 902; 40° at 907
7-16				912	922	10	0		70° at 918
				922	932	10	0	Some very fine banding 922-932.	43° at 926
				932	942	10	0	Wide bands of quartz 942-952.	50° at 937
7-17				942	952	10	0		20° at 947
				952	962	10	0		50° at 957
				962	972	10	0		0° at 968
7-18				972	981	9	0		40° at 978
				981	991	10	0		70° at 985
				991	1001	10	0	Fifty percent quartz 1001-1041.	70° at 995
7-19				1001	1011	10	0		50° at 1005
				1011	1021	10	0		43° at 1015
				1021	1031	10	0		70° at 1025
7-20				1031	1041	10	0		70° at 1038
				1041	1051	10	0		43° at 1045
				1051	1061	10	0	Wider bands of quartz; more pyrite 1051-1061.	80° at 1055
7-21				1061	1071	10	0		70° at 1067
				1071	1081	10	0	Fifty percent quartz; 1061-1091.	70° at 1075
				1081	1091	10	0	Fifty percent finer banding 1081-1091.	0° at 1085
7-22				1091	1101	10	0		70° at 1095
				1101	1111	10	0	Some fine banding with some wide bands of quartz 1091-1121.	70° at 1101
				1111	1121	10	0		70° at 1115

DRILL SAMPLE ANALYSIS - FERROUS

[illegible]

DRILL HOLE LOG - FERROUS

DATE	LAT. +14,307.0N DEP. +4233.7E ELEV. 5309.5	DRILLED FROM TO	ANGLE BEARING LEVEL	-60° North Surface	CORE FT.	REMARKS
7-24		1121 1131	10	10	0	Very little quartz. Nonmagnetic. 1121-1141
		1131 1141	10	10	0	60° at 1126
		1141 1151	10	10	0	60° at 1135
						Quite graphitic and pyritic 1140-1171, Non-magnetic.
		1151 1161	10	10	0	25° at 1146
						Quite pyritic, nonmagnetic 1151-1161.
7-25		1161 1171	10	10	0	60° at 1154
		1171 1181	10	10	0	60° at 1158
		1181 1191	10	10	0	Quite graphitic and pyritic, nonmagnetic
		1191 1201	10	10	0	50° at 1180
		1201 1211	10	10	0	Pyritic 1171-1201, nonmagnetic.
		1211 1221	10	10	0	20° at 1187
		1221 1231	10	10	0	60° at 1197
		1231 1241	10	10	0	0° at 1203
						Quite graphitic and pyritic 1201-1231, non-magnetic.
						30° at 1217
						60° at 1225
						1231-1391 Pyritic, graphitic, quartz, sericite schist.
		1241 1251	10	10	0	60° at 1231
7-27		1251 1261	10	10	0	Thirty to fifty percent quartz bands, ranging from lamina to bands up to one-half ft wide.
		1261 1271	10	10	0	Two to five percent pyrite. Schistosity is mostly contorted.
		1271 1281	10	10	0	80° at 1255
		1281 1291	10	10	0	
		1291 1301	10	10	0	
7-28		1301 1311	10	10	0	80° at 1311
		1311 1321	10	10	0	
		1321 1331	10	10	0	80° at 1325
7-30		1331 1341	10	10	0	
		1341 1351	10	10	0	
		1351 1361	10	10	0	90° at 1330
8-1		1361 1371	10	10	0	
		1371 1381	10	10	0	35° at 1378
		1381 1391	10	10	0	60° at 1359
8-2		Pulling casing, Left 15 ft				NX casing standpipe in hole. Nonradioactive.
						END OF HOLE at 1391
						Acid hole survey at 950 ft; 70° uncorrected, 61° corrected.
						Acid hole survey at 1161 ft; 67° uncorrected, 60° corrected.
						Acid hole survey at 1350 ft; 66° uncorrected, 59° corrected.

Driller: Longyear (Rush) / Longyear 78
 core recovery 100%

Core ID: England and Lynch 8

the sample

DRILL HOLE LOG - FERROUS

LAT. -14,307.0N			ANGLE -50°		MINE Sunrise Mine, Platte County, Wyoming	
DEP. +1233.4E			BEARING North		LOCATION Emanuel No. 5	
ELEV. 5309.5			LEVEL Surface		HOLE NO. DDH 405 Re-Enter	
DATE 10/13			CORRECTION		REMARKS	
FROM	TO	FEET	FT.	IN.	MATERIAL	Banding to axis of core.
					SUMMARY	
7-25	7-42	127.5			Pyritic, graphitic, quartz, sericite schist.	
	1161	1163			Core orientation at 1161-1163 ft.	
					Hole inclination is 60° corrected.	
					Reference etch is 85°/193° clockwise from top side of hole.	
					Lower apex of banding is 45° clockwise from reference line.	
					Banding to axis of core is 50° at 1161 ft.	
					Estimated Stereogram	
					Strike N60E	
					Dip 60° SE	
					Note: Acid tube slipped in core barrel and orientation may be erroneous.	

XXXX QUALITATIVE
XXXX SEMI-QUANTITATIVE
— QUANTITATIVE

ANALYTICAL REPORT

Job Number 15870
Page 20 of 20 Pages
Date 6 Aug 1973

TO: C.F.I. Steel Corp

SAMPLE: 715-26 DDH 405 Sulfides
J22 - J22 F7

NOTE: The values in this report are based on the results of the analysis of the sample as received. The values are not corrected for any losses or gains during the analysis process.

Copper	0.16	Iron	11.	Lanthanum	
Silver		Cobalt	0.004	Cerium	
Gold		Nickel	0.037	Praseodymium	
Zinc	0.043	Cesium		Neodymium	
Cadmium		Rubidium	0.023	Samarium	
Mercury		Barium	0.078	Europium	
Gallium		Strontium	0.006	Gadolinium	
Iodine		Titanium	0.30	Terbium	
Thallium		Zirconium	0.073	Dysprosium	
Germanium		Hafnium		Holmium	
Tin		Thorium		Erbium	
Lead	0.079	Vanadium	0.024	Thulium	
Arsenic	0.007	Columbium		Ytterbium	
Antimony		Tantalum		Lutetium	
Bismuth		Chromium		Yttrium	0.007
Selenium		Molybdenum	0.013		
Tellurium		Tungsten			
Bromine		Uranium			
Iodine		Manganese	0.043		

By M. Ray

NOTE: A PORTION OF THE REPORTED SAMPLES WILL BE RETAINED ON FILE FOR A PERIOD OF FIVE YEARS FROM THE ABOVE DATE. THE REMAINDER OF THE SAMPLES WILL BE RETAINED FOR THIRTY DAYS PENDING RECEIPT OF WRITTEN INSTRUCTIONS FOR DISPOSAL FROM THE ADDRESSEE ABOVE.

SKYLINE LABS, INC.

SPECIALISTS IN EXPLORATION GEOCHEMISTRY

12090 WEST 50TH PLACE • WHEAT RIDGE, COLORADO 80033 • TEL: (303) 424-7718

REPORT OF ANALYSIS

Job No. 72007

P.O. No. 31227

August 24, 1973

Mr. David G. Ellingwood
C. F. & I. Steel Corporation
Mining Department
Pueblo, Colorado 81002

Analysis of 28 Pulp Samples

Item	Sample No.	CaO (%)	MgO (%)	K ₂ O (%)	Na ₂ O (%)	S (%)	P (%)	Au (ppm)	Ag (ppm)
1. Hole 715 -	1	1.6	.94	.31	.027	.042	.030	*	*
2. Hole 715	2	6.8	.20	.25	.040	.029	.030	*	*
3. Hole 715	3	1.6	.032	.50	.040	.021	.16	*	*
4. Hole 715	4	1.3	.032	1.3	.040	.046	.16	*	*
5. Hole 715	5	1.8	.026	.048	.014	.021	.23	*	*
6. Hole 427	6	1.7	.036	1.3	.027	.021	.16	*	*
7. Hole 427	7	7.8	.094	3.0	.027	.025	.60	*	*
8. Hole 428	8	1.5	.12	.57	.027	.021	.020	*	*
9. Hole 428	9	1.9	1.3	1.4	.054	.025	.075	*	*
10. Hole 427	10	5.0	.060	3.7	.027	.025	.15	*	*
11.	11	1.9	.036	.84	.027	.025	.020	*	*
12.	12	.46	.043	.26	.027	.025	.075	*	*
13.	13	2.4	.31	3.2	.054	.038	.11	*	*
14.	14	.87	.21	1.7	.054	.038	.15	*	*
15.	15	.34	.018	.036	.054	.017	.040	*	*
16.	16	1.6	.065	.72	.027	.025	.030	*	*
17.	17	.68	.065	.88	.027	.021	.030	*	*
18. Hole 427	18	7.4	.046	2.3	.040	.021	.23	*	*
19. Hole 427	19	8.0	.10	1.4	.027	.025	.11	*	*
20. Sec. Al P ₂ O ₅	20	.023	.031	2.3	1.5	.025	15.	*	*
21. Sec. Al P ₂ O ₅	21	.048	.038	2.8	1.6	.034	15.	*	*
22. Fly Ash Hand	22	1.2	.45	2.3	.054	.046	.058	*	*
23. Fly Ash	23	.52	.24	1.1	.081	.046	.058	*	*
24. Fly Ash	24	.76	.33	1.1	.094	.071	.058	* <i>See note</i>	* <i>See note</i>
25. Hole 177 S.C.	25	.094	.18	.20	.027	42.6	.040	.03	1.8
26. Hole 427 S.C.	26	.24	2.5	3.6	.16	5.65	.058	.05	1.6
27. Hole 427 S.C.	27	3.2	1.8	.48	.040	9.57	.030	<.02	1.0
28. 715 - Zinc	28	.18	.76	1.2	.088	30.2	.020	.62	1.6

*Analysis not requested

Charles E. Thompson
Chief Chemist

LAT.		+14,307.0N		ANGLE		-60°		MINE		Sunrise, Platte County, Wyoming	
DEP.		+4233.4E		BEARING		North		LOCATION		Emanuel No. 5 E½ NW¼ SW¼, sec. 29,	
ELEV.		5309.5		LEVEL		Surface		HOLE NO.		DDH 405 Re-Enter T. 28 N., R. 65 W.	
DATE 1973	DRILLED			CORE		MATERIAL	REMARKS				
	FROM	TO	FEET	FT.	.0						
							Banding to axis of core				
						CORE ORIENTATION					
7-25	1161	1163				Acid tube slipped to bottom of core barrel.					
						Hole inclination -60° corrected.					
						Reference file mark from top axis of tube:					
						85° clockwise (strong etch)					
						195° clockwise (weak etch)					
						Banding is contorted.					
						Lower apex of banding 45° clockwise of reference line.					
						Average schistosity 50° to axis of core at 1161 ft.					
						Estimated	Stereonet				
						Strike Dip	Strike Dip				
						N60E 60°SE	N56°E 64° S34°E Strong etch				
						E-W Vertical	N50°W 60° S40°W Weak etch				
						Hole appears to be crossing, bedding about perpendicular, which indicates E-W stroke and 30°S dip.					

DRILL HOLE LOG - FERROUS

LAT. DEP. ELEV.		+14,307.0 +4,233.4E 5,309.5		ANGLE BEARING LEVEL		DRILLED		CORE		MATERIAL		REMARKS	
DATE	FROM	TO	FEET	FT.	10ths								
11/2	1331	1401	10	10	0							80	
11/3	1411	1411	10	10	0							Graphite sericite schist, with quartz bands up to 1 inch pyritic to 1.431'. Bedding generally contorted, occasional calcite from 1.501-1.530'.	
11/5	1421	1431	10	10	0								
11/7	1441	1441	10	10	0								
11/8	1451	1451	10	10	0								
11/9	1461	1461	10	10	0								
11/10	1471	1471	10	10	0								
11/11	1481	1481	10	10	0								
11/12	1491	1491	10	10	0								
11/13	1501	1501	10	10	0								
11/14	1511	1511	10	10	0								
11/15	1521	1521	10	10	0								
11/16	1531	1531	10	10	0								
11/17	1541	1541	10	10	0								
11/18	1551	1551	10	10	0								
11/19	1561	1561	10	10	0								
11/20	1571	1571	10	10	0								
11/21	1581	1581	10	10	0								
11/22	1591	1591	10	10	0								
11/23	1601	1601	10	10	0								
11/24	1611	1611	10	10	0								
11/25	1621	1621	10	10	0								
11/26	1631	1631	10	10	0								
11/27	1641	1641	10	10	0								
11/28	1651	1651	10	10	0								
11/29	1661	1661	10	10	0								
11/30	1671	1671	10	10	0								
11/31	1681	1681	10	10	0								