



Voice Communications

Miner to Miner Test Data

Equipment	Test Site	Comm Type	Distance Between Miners	Entry/Crosscut Conditions				SIO Score
				Height	Width	Scenario	Notes	
TK290	M7-062707-A	VHF	575ft	6ft	20ft	1	Test in Main Entry	4,4,4
TK290	B4-062707-B	VHF	380ft	10ft	23ft	2,3,4	Test in Belt Line	4,4,4
TK290	MB2-062707-C	VHF	250ft	8ft	20ft	2,3,4,6,7,8	1 Miner in main entry and 1 miner in the belt line	4,4,4
TK290	M3-062707-D	VHF	200ft	4.6ft	25ft	2	Test in Main Entry with curvature	4,4,4
TK290	MB1-062707-E	VHF	105ft	4.6ft	25ft	2,3,4,7	1 miner in main entry and 1 miner in belt line	5,4,5
TK290	MB1-062707-F	VHF	160ft	4.6ft	22ft	2,3,4,6,7,8	1 miner in belt line and 1 miner in main entry	5,4,5
TK290	B3-062707-G	VHF	300ft	5.6ft	25ft	3,4,5,7	Test in Belt Line	5,4,5
TK290	M3-062707-H	VHF	300ft	5.6ft	25ft	2	Test in Main Line	5,4,5

TK290	MB2-062707-I	VHF	230ft	5,6ft	25ft	2,3,4,5,7,8	1 Miner in Main entry and 1 Miner in Belt line	5,4,5
TK290	M-062707-J	VHF	200ft	7ft	20ft	6	1 Miner at portal and 1 Miner 200ft in mine past 2 vent doors	4,4,4
TK290		VHF	Greater then 1 Mile	Surface Test	Surface Test	Line of Sight	Mine to Miner on Surface	5,5,5

NOTE:

M = Main Entry

B = Belt Line

The main entry and belt line are adjacent entries with various size pillars and crosscuts

Test Site: where M is shown means test was done in the main entry.

The number indicates how many crosscuts between the 2 miners (radios)

Where B is shown means test was done in the belt line entry.

The number indicates the number of crosscuts between the 2 miners.

Where MB is shown means test was done with 1 miner in the main entry and the other miner in the belt line



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Miner to Surface Test Data

Equipment System/Miner	Test Site	Comm Type	Distance from Backbone or Node	Entry/Crosscut Conditions				SIO Score	Distance from Surface Comm-Center	Number Amps/Nodes to Surface Comm-Center
				Height inches	Width feet	Scenario	Notes			
TK290 and Flexcom System	M-062707-A	VHF	20ft	6ft	16ft	2,4,7	Inside Portal Vent Doors	5,5,5	900ft	0
TK290 and Flexcom System	M-062707-B	VHF	23ft	8ft	23ft	1	Main Entry	5,5,5	2000ft	1
TK290 and Flexcom System	B1-062707-C	VHF	150ft	6ft	16ft	2,3,4,5,6,7,8	Adjacent Entry to leaky feeder cable	4,3,3	2100ft	1
TK290 and Flexcom System	B2-062707-D	VHF	220ft	6ft	16ft	2,3,4,6	Belt Line 2 crosscuts from opening, concrete stoppings	4,3,4	2300ft	1
TK290 and Flexcom System	B3-062707-E	VHF	250ft	9ft	23ft	2,3,4	Belt Line 3 crosscuts from opening, concrete stoppings	5,4,4	2500ft	1
TK290 and Flexcom System	M-062707-F	VHF	3ft	4.5ft	25ft	1	Main Entry Driving under leaky feeder cable	5,4,5	7000ft	6
TK290 and Flexcom System	B-062707-G	VHF	26ft	4.5ft	25ft	1,3,4,5,7	Belt Line with lin of sight to cable	5,5,5	7000ft	6
TK290 and Flexcom System	B1-062707-H	VHF	50ft	4.5ft	25ft	3,4,5,7,8	Belt Line behind 1 pillar	4,3,4	7100ft	6
TK290 and Flexcom System	B-	VHF	50ft	6.5ft	25ft	3,4,5,7	Standing beside belt line	5,5,5	11300ft	10

Equipment System/Miner	Test Site	Comm Type	Distance from Backbone or Node	Entry/Crosscut Conditions				SIO Score	Distance from Surface Comm-Center	Number Amps/Nodes to Surface Comm-Center
				Height inches	Width feet	Scenario	Notes			
	062707-I									
TK290 and Flexcom System	B-062707-J	VHF	80ft	5.5ft	25ft	2,3,4,5,8	Belt Line behind pillar	5,4,5	11400ft	10
TK290 and Flexcom System	M-062707-K	VHF	2ft	6ft	25ft	1	Driving in main entry	5,5,5	12700ft	11
TK290 and Flexcom System	M-062707-L	VHF	25ft	6ft	25ft	1	Main Entry walking	5,5,5	12700ft	11
TK290 and Flexcom System	B-062707-M	VHF	55ft	6.5ft	25ft	2,3,4,7,	Belt Line	5,4,5	12700ft	11
TK290 and Flexcom System	B1-062707	VHF	220ft	7ft	25ft	2,3,4,5,6,7,8	Belt Line up 1 crosscut behind concrete stopping	4,3,4	12900ft	11
TK290 and Flexcom System	Surface	VHF	0.5 miles	surface	surface		Driving on Surface using the backbone	5,5,5	0.6 miles	0

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Tracking

Miner to Reader Test Data

Equipment	Test Site	Comm Type	Number of Miners	Distance to Reader or Coverage Area	Rate of Travel	Describe Ride	Entry/Crosscut Conditions			
							Height	Width	Scenario	Notes
Tag 11813 and IILB 0002	M.062707-A	UHF	1	210 ft	Walk - crawl	Walk	5 ft	26 ft	1, 7	Main entry to determine miner location
Tag 11813 and IILB 0002	M-062707-B	UHF	1	160 ft	3 mph	Vehicle – Mantrip	5 ft	26 ft	1, 7, 10	Main entry to determine miner location
Tag 11813, 11809, 11807, 11850 and IILB 0002	M-062707-C	UHF	4	130 ft	Walk - crawl	Walk	5 ft	26 ft	1, 7	Main entry to determine miner location
Tag 11807 and IILB 0002	M-062707-D	UHF	1	180 ft	crawl	crawl	5 ft	26 ft	1, 7	Main entry to determine miner location
Tag 11813 and IILB 0002	MB-062707-E	UHF	1	60 ft	Walk	Walk	6.5 ft	22.9 ft	2, 3, 4, 5, 7, 8	Belt line – 3 ft away from closest wall, 12 ft away from farthest wall 10ft behind pillar
Tag 11813, 11809, 11807, 11850 and IILB 0002	MB-062707-F	UHF	4	60 ft	crawl	crawl	6.5 ft	22.9 ft	2, 3, 4, 5, 7, 8	Belt line – 3 ft away from closest wall, 12 ft away from farthest wall 10 ft behind pillar
Tag 11807 and IILB 0003	M-062707-G	UHF	1	90 ft	Walk	Walk	6 ft	26 ft	1, 7	Main entry to determine miner location

Tag 11807 and IILB 0003	M-062707-H	UHF	1	25 ft	3 mph	Vehicle – Mantrip	6 ft	26 ft	1, 7, 10	Main entry
Tag 11813, 11809, 11807, 11850 and IILB 0003	M-062707-I	UHF	4	80 ft	Crawl	Crawl	6 ft	26 ft	1, 7	Main entry
Tag 11807 and IILB 0003	MB-062707-J	UHF	1	40 ft	Crawl	Crawl	6.2 ft	26 ft	2, 3, 4, 5, 7, 8	Belt line – 4 ft away from closest wall, 10 ft away from farthest wall
Tag 11813, 11809, 11807, 11850 and IILB 0003	MB-062707-K	UHF	4	40 ft	Walk	Walk	6.2 ft	26 ft	2, 3, 7, 8	Belt line – 3 ft away from closest wall, 12 ft away from farthest wall
Tag 11813, 11809, 11807, 11850, 3 lamp tags and IILB 00011	M-062707-M	UHF	7	125ft	Drive 5mph	mantrip	7ft	20ft	1, 4, 5, 7,10	Main Entry at Portal to determine when miners enter or exit mine
Tag 11813 and IILB 00011	M-062707-M	UHF	1	180 ft	Walk	Walk	2.5m	9m	1, 4, 5, 7	Portal near surface to determine if miner enters or exits mine
Tag 11813, 11809, 11807, 11850, 3 lamp tags and IILB 00012	Surface	UHF	7	100ft			Mine office	Mine office	No line of sight	To Determine if a miners tag or cap lamp has been removed from lamp and tag location

NOTE:

M = Main Entry

B = Belt Line

The main entry and belt line are adjacent entries with various size pillars and crosscuts

**Test Site: where M is shown means test was done in the main entry.
Both the miner tag and the tag reader are in the main entry**

**Where MB is shown means test was done with the tag reader in the main entry and
the miner's tag was in the belt line**

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Reader to Surface Test Data

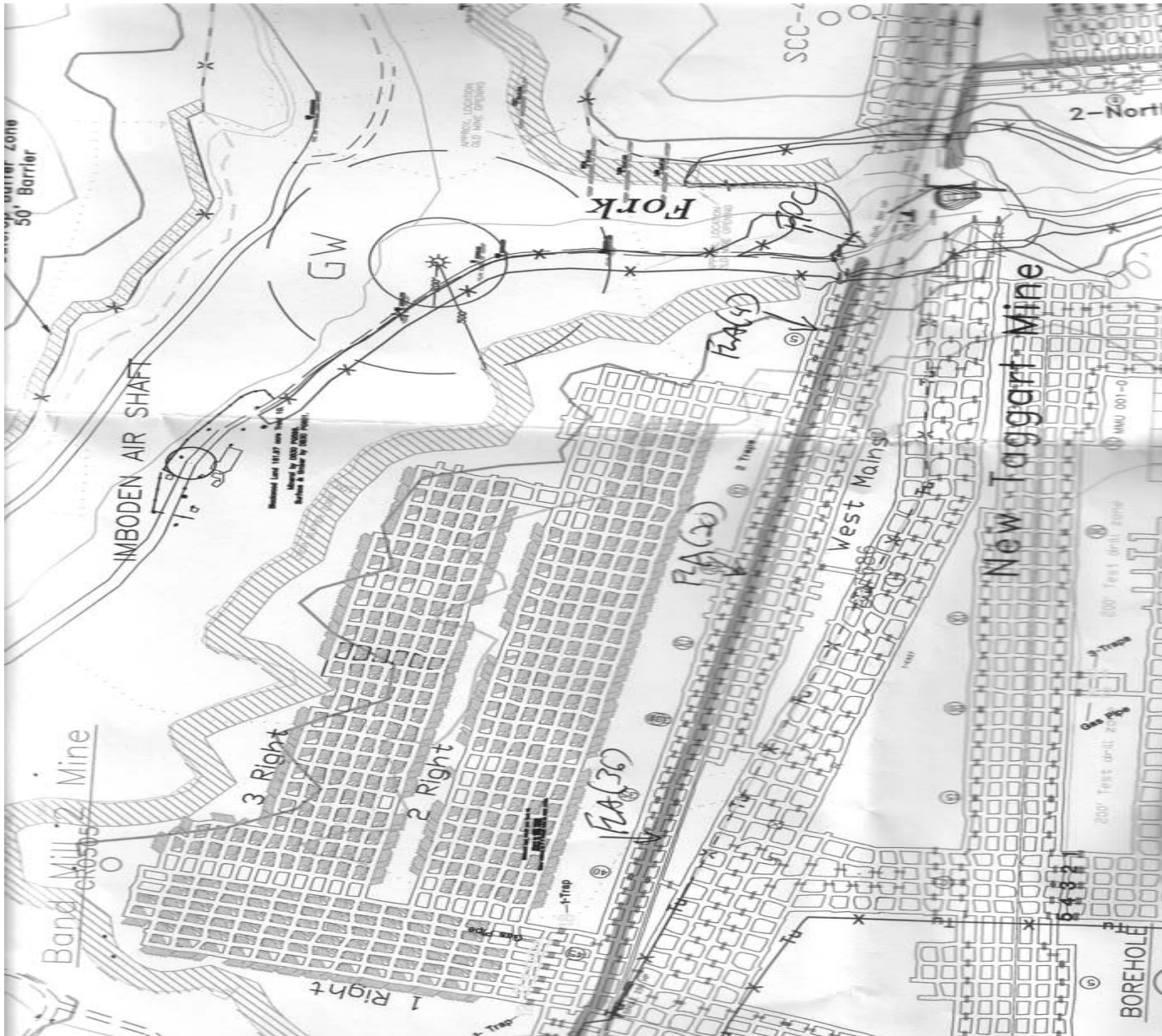
Equipment System/Miner	Test Site	Comm Type	Distance Reader to Surface Comm-Center	Entry/Crosscut Conditions				Number Amps/Nodes to Surface Comm- Center
				Height inches	Width feet	Scenario	Notes	
IILB 0.0.0.2 + Flexcom	M-062707-A	VHF	6890ft	4.9 ft	26 ft	1, 7	To Determine a miners last known location	6
IILB 0.0.0.3 + Flexcom	M-062707-B	VHF	11483ft	5.9 ft	26 ft	1, 7	To Determine a miners last know location	10
IILB 0.0.0.11 + Flexcom	Portal	VHF	1150ft	7.5 ft	29.5 ft	1,4,5,7	To Determine when a Miner has entered or exited the mine	0
IILB 0.0.0.12 + Flexcom	Office	VHF	25ft			No line of sight	To Determine if a miners tag has been picked up from tag location	0

Please note that all the buffering is at the MRS tag beacon location. The data is time and date stamped at the tagging beacon location and not in the data base on surface.

4 tag beacons were installed in and at the mine to show functionality of the tagging system and software.

The critical communications with the MRS Insite tagging system is the UHF link between the tag (transponder) and the beacon (tag reader)

See tag to reader results for these locations.



Cumberland River Coal Mine

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