

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: 78-7-69
Surface Elevation: 2073.5
Bottom of Coal Elevations: Upper Freeport Coal (E) - 1965.5
Lower Freeport Coal (D) - 1916.3
Upper Kittanning Coal (C') - 1853
Static Water Elevations and Date Measured Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 09/19/69
Drilled By: Tyger Drilling Company
Logged By: Tyger Drilling Company
Township: Paint
County: Cambria
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 333,237 **Easting** 1,674,604
Latitude: 40° 14' 35.85" **Longitude:** 78° 48' 10.16"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
	14.0	14.0	10	Clay						
=====	20.0	6.0	20	Shale						
.....	34.0	14.0	30	Sandstone						
=====	55.0	21.0	40	Sandy Shale						
.....			50							
.....			60	Sandstone						
.....			70							
.....			80							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: 78-9-69
Surface Elevation: 2084.6
Bottom of Coal Elevations: Upper Freeport Coal (E) - 1978.3
Lower Freeport Coal (D) - 1934.6
Upper Kittanning Coal (C') - 1865.3
Static Water Elevations and Date Measured Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 09/23/69
Drilled By: Tyger Drilling Company
Logged By: Tyger Drilling Company
Township: Paint
County: Cambria
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 332,994 **Easting** 1,674,838
Latitude: 40° 14' 33.48" **Longitude:** 78° 48' 07.10"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs					
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating	NP
	15.0	15.0	10	Clay							
			20	Shale							
	30.0	15.0	30	Sandstone							
			40		Sandstone (broken)						
			50								
			60								
			70								
			80								

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: 78-9-69
Surface Elevation: 2084.6
Bottom of Coal Elevations:
 Upper Freeport Coal (E) - 1978.3
 Lower Freeport Coal (D) - 1934.6
 Upper Kittanning Coal (C') - 1865.3

Static Water Elevations and Date Measured: Not Recorded

Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 09/23/69
Drilled By: Tyger Drilling Company
Logged By: Tyger Drilling Company
Township: Paint
County: Cambria
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates: **Northing** 332,994 **Easting** 1,674,838
Latitude: 40° 14' 33.48" **Longitude:** 78° 48' 07.10"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
.....	91.0	61.0	90	Sandstone (broken)						
=====	104.0	13.0	100	Sandy Shale						
	107.0	3.0		Upper Freeport Coal (E) - 28.0"						
=====	113.0	6.0	110	Shale						
.....	125.0	12.0	120	Sandstone						
=====	149.0	24.0	130	Sandy Shale						
=====	150.0	1.0	150	Lower Freeport Coal (D) - 12.0"						
=====			160	Shale						

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: 78-9-69
Surface Elevation: 2084.6
Bottom of Coal Elevations: Upper Freeport Coal (E) - 1978.3
Lower Freeport Coal (D) - 1934.6
Upper Kittanning Coal (C') - 1865.3

Static Water Elevations and Date Measured Not Recorded

Surveyed by: Berwind **Method:** Rotary Air
Remarks: _____

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 09/23/69
Drilled By: Tyger Drilling Company
Logged By: Tyger Drilling Company
Township: Paint
County: Cambria
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 332,994 **Easting** 1,674,838
Latitude: 40° 14' 33.48" **Longitude:** 78° 48' 07.10"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
170				Sandstone						
180										
190										
200										
210										
	217.0	57.0								
	220.0	3.0	220	Upper Kittanning Coal (C') - 28.0"						
	221.0	1.0		Sandstone						
				Shale						
	230.0	9.0	230							
				Sandstone						
			240							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: 78-9-69
 Surface Elevation: 2084.6
 Bottom of Coal Elevations: Upper Freeport Coal (E) - 1978.3
 Lower Freeport Coal (D) - 1934.6
 Upper Kittanning Coal (C) - 1865.3

Static Water Elevations Not Recorded
 and Date Measured _____

Surveyed by: Berwind Method: Rotary Air
 Remarks: _____

Operation Name : Mine 78 Surface No. 3 Mine
 Method of Drilling: Rotary Air
 Date Drilled: 09/23/69
 Drilled By: Tyger Drilling Company
 Logged By: Tyger Drilling Company
 Township: Paint
 County: Cambria
 Quadrangle: Windber
 Laboratory: N/A
 Grid Coordinates **Northing** 332,994 **Easting** 1,674,838
 Latitude: 40° 14' 33.48" **Longitude:** 78° 48' 07.10"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
	250.0	20.0	250	Sandstone						
			260							
			270							
			280							
			290							
			300							
			310							
			320							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-1-15
Surface Elevation: 2020.0
Bottom of Coal Elevations: Upper Freeport Rider Coal - 2006.0
Upper Freeport Coal (E) - 1993.0
Static Water Elevations and Date Measured Not Recorded
Surveyed by: Windber **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 08/19/15
Drilled By: Gary Toy Drilling
Logged By: Gary Toy Drilling
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 332,118 **Easting** 1,675,865
Latitude: 40° 14' 24.94" **Longitude:** 78° 47' 53.72"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs					
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating	NP
XXXXXXXXXXXXXX XXXXXXXXXXXXXX XXXXXXXXXXXXXX	3.0	3.0		Fill	Water @ 4' (10 gpm)						
.....				Sandstone, Gray (hard) (void @ 4')							
.....	11.0	8.0	10								
.....				Clay, Brown							
.....	13.0	2.0									
.....	14.0	1.0		Upper Freeport Rider Coal - 14"							
=====				Shale, Brown @ Gray							
=====			20								
=====				Shale, Dark Gray							
=====	25.0	11.0									
=====				Upper Freeport Coal (E) - 27.5"							
=====	27.0	2.0									
=====	28.0	1.0		Shale, Gray							
			30								
			40								
			50								
			60								
			70								
			80								

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-4-15
Surface Elevation: 1951.0
Bottom of Coal Elevations: Upper Kittanning Coal (C') - 1913.0

Static Water Elevations and Date Measured Not Recorded

Surveyed by: Windber **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 08/25/15
Drilled By: Gary Toy Drilling
Logged By: Gary Toy Drilling
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 331,663 **Easting** 1,675,859
Latitude: 40° 14' 20.44" **Longitude:** 78° 47' 53.73"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
.....				Spoil, Upper Kittanning						
.....			10							
.....	21.0	21.0	20							
////				Clay, Brown						
////	31.0	10.0	30							
=====	33.0	2.0		Shale, Gray						
■	38.0	5.0		Upper Kittanning Coal (C') - 62.0"						
=====	39.0	1.0		Shale, Brown						
			40							
			50							
			60							
			70							
			80							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-7-15
Surface Elevation: 1913.0
Bottom of Coal Elevations: Upper Kittanning Coal (C) Mined - 1891.0
Middle Kittanning Coal (C) - 1819.0
Lower Kittanning Coal (B) Mined - 1779.0
Static Water Elevations and Date Measured Not Recorded
Surveyed by: Windber **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 08/26/15
Drilled By: Gary Toy Drilling
Logged By: Gary Toy Drilling
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 331,669 **Easting** 1,675,253
Latitude: 40° 14' 20.44" **Longitude:** 78° 48' 01.54"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
=====				Shale, Dark Gray (with hard sandy sections)						
=====	91.0	18.0	90							
	94.0	3.0		Middle Kittannig Coal (C) - 32.0"						
=====				Shale, Dark Gray (with hard sandy sections)						
=====			100							
=====			110							
=====			120							
=====			130							
=====	133.0	39.0								
				Void (Lower Kittannig Mine)						
			140							
			150							
			160							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-9-15
Surface Elevation: 2061.0
Bottom of Coal Elevations: Upper Freeport Coal (E) - 1992.0

Static Water Elevations and Date Measured Not Redorded

Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 08/27/15
Drilled By: Gary Toy Drilling
Logged By: Gary Toy Drilling
Township: Paint
County: Cambria
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 332,351 **Easting** 1,675,482
Latitude: 40° 14' 33.48" **Longitude:** 78° 48' 07.10"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
.....	4.0	4.0		Sandstone / Clay mix						
//////	10.0	6.0	10	Clay, Brown						
=====	19.0	9.0		Shale, Brown (with hard sandy sections)						
.....	46.0	27.0	20	Sandstone, Gray						
.....			30							
.....			40							
//////	47.0	1.0		Clay, Brown						
=====	67.0	20.0	50	Shale, Gray						
=====			60							
	70.0	3.0	70	Upper Freeport Coal (E) - 28.0"						
=====	71.0	1.0		Shale, Gray						
			80							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-19-18
Surface Elevation: 1853.5
Bottom of Coal Elevations: Middle Kittanning Coal (C) - 1813.0
Lower Kittanning Coal (B) Mined - 1775.5

Static Water Elevations and Date Measured Not Recorded

Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 06/22/2018
Drilled By: Berwind
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 331,710 **Easting** 1,674,804
Latitude: 40° 14' 20.78" **Longitude:** 78° 48' 07.35"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs					
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating	NP
.....											
.....			10								
.....			20	Fill (spoil)							
.....			30								
.....	37.0	37.0									
	40.0	3.0	40	Middle Kittanning Coal (C) - 35.0"							
=====											
=====			50	Shale, Dark Gray (with hard sandy streaks)							
=====			60	Shale, Black							
=====			70	Shale, Dark Gray							
=====	74.0	34.0									
=====	78.0	4.0		Void - No Return (Possible Lower Kittanning Seam)							
=====			80	Shale							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-19-18
Surface Elevation: 1853.5
Bottom of Coal Elevations: Middle Kittanning Coal (C) - 1813.0
Lower Kittanning Coal (B) Mined - 1775.5
Static Water Elevations and Date Measured: Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 06/22/2018
Drilled By: Berwind
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates: **Northing** 331,710 **Easting** 1,674,804
Latitude: 40° 14' 20.78" **Longitude:** 78° 48' 07.35"


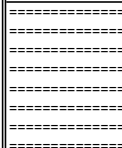

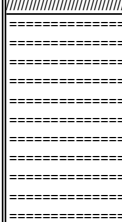
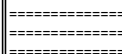

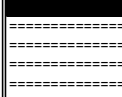
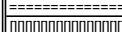
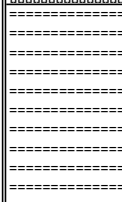
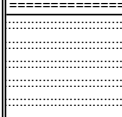

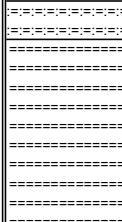
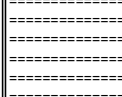
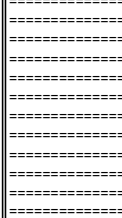
Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
=====				Shale						
=====										
=====										
=====										
=====										
=====										
=====										
=====										
=====										
=====										
	100.0	22.0	100							
			110							
			120							
			130							
			140							
			150							
			160							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-24-18
 Surface Elevation: 1970.9
 Bottom of Coal Elevations: Lower Freeport (D) - 1942.9
 Middle Kittanning (C) - 1807.4
 Static Water Elevations Not Recorded
 and Date Measured _____

Surveyed by: Berwind Method: Rotary Air
 Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
 Method of Drilling: Rotary Air
 Date Drilled: 07/18/18
 Drilled By: Berwind
 Logged By: Berwind
 Township: Paint
 County: Somerset
 Quadrangle: Windber
 Laboratory: N/A
 Grid Coordinates Northing 332,372 Easting 1,674,489
 Latitude: 40° 14' 27.29" Longitude: 78° 48' 11.51"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs					
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating	NP
	2.0	2.0		Clay, Brown	Damp						
	10.0	8.0	10	Shale, Brown (with clay streaks)							
	12.0	2.0		Clay, Brown							
	26.0	14.0	20	Shale, Brown (with sandy sections)							
				Shale, Dark Gray							
	28.0	2.0		Lower Freeport Coal (D) - 22.0"							
	33.0	5.0	30	Shale, Dark Gray							
	34.0	1.0		Limestone-Shale Mix							
	45.0	11.0	40	Shale, Brown & Gray (with hard sandy sections)							
	52.0	7.0	50	Sandstone, Hard Gray							
	54.0	2.0		Sandy Shale, Brown							
			60	Shale, Dark Gray (with hard sandy sections)							
			70								
			80								

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-24-18
Surface Elevation: 1970.9
Bottom of Coal Elevations: Lower Freeport (D) - 1942.9
Middle Kittanning (C) - 1807.4
Static Water Elevations and Date Measured Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 07/18/18
Drilled By: Berwind
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 332,372 **Easting** 1,674,489
Latitude: 40° 14' 27.29" **Longitude:** 78° 48' 11.51"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
=====	89.0	35.0		Shale, Dark Gray (with hard sandy streaks)						
=====										
.....	93.0	4.0	90	Sandstone, Hard Gray						
.....										
=====	109.0	16.0	100	Shale, Gray (with hard sandy sections)						
=====										
.....	126.0	17.0	110	Sandstone, Hard Gray						
.....										
.....			120							
.....										
.....			130							
.....										
.....			140							
.....										
.....			150	Shale, Dark Gray (with hard sandy streaks)						
.....										
.....			160							
.....										

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-24-18
Surface Elevation: 1970.9
Bottom of Coal Elevations: Lower Freeport (D) - 1942.9
Middle Kittanning (C) - 1807.4
Static Water Elevations Not Recorded
and Date Measured _____
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 07/18/18
Drilled By: Berwind
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 332,372 **Easting** 1,674,489
Latitude: 40° 14' 27.29" **Longitude:** 78° 48' 11.51"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
=====	161.0	35.0		Shale, Dark Gray						
	164.0	3.0		Middle Kittanning Coal (C) - 35.0"						
=====	165.0	1.0		Shale, Dark Gray						
			170							
			180							
			190							
			200							
			210							
			220							
			230							
			240							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-27-18
Surface Elevation: 2002.4
Bottom of Coal Elevations: Upper Freeport Coal - 1940.9
Lower Freeport Coal - 1888.9
Upper Kittanning Coal - 1834.9
Static Water Elevations and Date Measured Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Method of Drilling:
Date Drilled: Date drilled:
Drilled By: Drilled by:
Logged By: Logged by:
Township: Township:
County: County:
Quadrangle: Quadrangle:
Laboratory: Laboratory:
Grid Coordinates **Northing** 333,449 **Easting** 1,673,401
Latitude: 40° 14' 37.80" **Longitude:** 78° 48' 25.70"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs					
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating	NP
	1.0	1.0		Clay, Brown							
.....			10								
.....			20								
.....			30	Sandstone, Brown (hard)							
.....			40								
.....	49.0	48.0			Damp @ 43'						
=====			50								
=====	59.0	10.0		Shale, Dark Gray (with sandy streaks)							
=====	61.0	2.0	60	Upper Freeport Coal (E) - 29.0"							
=====			70	Shale, Dark Gray (with sandy streaks)							
=====	77.0	16.0									
OOOOOOOOOO			80	Limestone (with shale streaks)							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-27-18
Surface Elevation: 2002.4
Bottom of Coal Elevations:
 Upper Freeport Coal - 1940.9
 Lower Freeport Coal - 1888.9
 Upper Kittanning Coal - 1834.9

Static Water Elevations and Date Measured Not Recorded

Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Method of Drilling:
Date Drilled: Date drilled:
Drilled By: Drilled by:
Logged By: Logged by:
Township: Township:
County: County:
Quadrangle: Quadrangle:
Laboratory: Laboratory:
Grid Coordinates **Northing** 333,449 **Easting** 1,673,401
Latitude: 40° 14' 37.80" **Longitude:** 78° 48' 25.70"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
□□□□□□□□□□□□□□□□	81.0	4.0		Limestone						
=====										
=====			90							
=====				Shale, Dark Gray (with hard sandy sections)						
=====			100							
=====										
=====			110		Damp @ 110'					
=====	113.0	32.0								
	114.0	1.0		Lower Freeport Coal (D) - 6.0"						
=====										
=====			120							
=====										
=====			130							
=====				Shale, Dark Gray (with hard sandy sections)						
=====			140							
=====										
=====			150							
=====										
=====			160							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-27-18
Surface Elevation: 2002.4
Bottom of Coal Elevations: Upper Freeport Coal - 1940.9
Lower Freeport Coal - 1888.9
Upper Kittanning Coal - 1834.9
Static Water Elevations and Date Measured Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Method of Drilling:
Date Drilled: Date drilled:
Drilled By: Drilled by:
Logged By: Logged by:
Township: Township:
County: County:
Quadrangle: Quadrangle:
Laboratory: Laboratory:
Grid Coordinates **Northing** 333,449 **Easting** 1,673,401
Latitude: 40° 14' 37.80" **Longitude:** 78° 48' 25.70"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
=====				Shale, Dark Gray (with hard sandy sections)						
=====	165.0	51.0								
=====	166.0	1.0		Upper Kittanning Coal (C') - 25.0"						
=====	167.0	1.0		Shale, Black interbedded with coal - 12.0"						
=====	168.0	1.0		Upper Kittanning Coal (C') - 4.0"						
=====	170.0	2.0	170	Shale, Dark Gray						
			180							
			190							
			200							
			210							
			220							
			230							
			240							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-28-18
Surface Elevation: 1988.5
Bottom of Coal Elevations: Upper Freeport Coal - 1926.7
Lower Freeport Coal - 1869.5
Static Water Elevations and Date Measured Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 08/14/18
Drilled By: G.R. Toy Drilling
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 333,668 **Easting** 1,673,258
Latitude: 40° 14' 39.95" **Longitude:** 78° 48' 27.58"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
	6.0	6.0		Clay, Brown						
.....			10	Sandstone, Brown						
.....			20	Sandstone, Hard Brown & Gray	Damp @ 28'					
.....			30							
.....			40							
.....			50	Sandstone, Brown						
.....	52.0	46.0			Wet @ 52' (1 gpm)					
=====				Shale, Dark Gray (with sandy sections)						
=====	59.0	7.0								
=====			60	Upper Freeport Coal (E) - 32.0"						
=====	62.0	3.0								
=====				Shale, Dark Gray (with sandy sections)						
=====			70							
=====	76.0	14.0								
=====	77.0	1.0		Limestone						
=====				Shale, Dark Gray (with sandy sections)						
=====			80							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-28-18
Surface Elevation: 1988.5
Bottom of Coal Elevations: Upper Freeport Coal - 1926.7
Lower Freeport Coal - 1869.5

Static Water Elevations and Date Measured Not Recorded

Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 08/14/18
Drilled By: G.R. Toy Drilling
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 333,668 **Easting** 1,673,258
Latitude: 40° 14' 39.95" **Longitude:** 78° 48' 27.58"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
=====				Shale, Dark Gray (with hard sandy streaks)						
=====			90							
=====										
=====			100							
=====										
=====			110							
=====										
=====	116.0	39.0								
=====	117.0	1.0			Lower Freeport Coal (D) - 5.0"					
=====	118.0	1.0			Shale, Dark Gray					
=====	119.0	1.0		Lower Freeport Coal (D) - 6.0"						
=====	120.0	1.0	120	Shale, Dark Gray						
			130							
			140							
			150							
			160							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-31-18
Surface Elevation: 1899.0
Bottom of Coal Elevations: Upper Kittanning Coal (C') - 1878.5
Middle Kittanning Coal (C) - 1791.7
Lower Kittanning Coal (B) - 1751.5
Static Water Elevations and Date Measured Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 09/04/18
Drilled By: G.R. Toy Drilling
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 332,606 **Easting** 1,673,787
Latitude: 40° 14' 29.52" **Longitude:** 78° 48' 20.60"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs					
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating	NP
	3.0	3.0		Clay, Brown	Water @ 10' Damp						
=====				Shale, Brown (soft)							
=====			10	Shale, Dark Gray							
=====	16.0	13.0		Upper Kittanning Coal Top Split (C') - 2.0"							
.....	19.0	3.0		Sandstone, Gray (hard)							
=====	21.0	2.0	20	Upper Kittanning Coal (C') - 17.0"							
=====				Shale, Dark Gray (soft)							
=====			30	Shale, Gray (soft)							
=====	33.0	12.0									
	35.0	2.0		Clay, Brown							
=====				Shale, Gray & Brown (with sandy sections)							
=====			40								
=====	51.0	16.0	50	Shale, Dark Gray							
.....				Sandstone, Gray (hard)							
.....			60								
.....	70.0	19.0	70								
=====				Shale, Dark Gray (with sandy sections) (coal spar @ 76')							
=====			80								

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-31-18
Surface Elevation: 1899.0
Bottom of Coal Elevations: Upper Kittanning Coal (C) - 1878.5
Middle Kittanning Coal (C) - 1791.7
Lower Kittanning Coal (B) - 1751.5
Static Water Elevations and Date Measured Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 09/04/18
Drilled By: G.R. Toy Drilling
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 332,606 **Easting** 1,673,787
Latitude: 40° 14' 29.52" **Longitude:** 78° 48' 20.60"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
=====	83.0	13.0		Shale, Dark Gray (with sandy sections)						
=====										
=====	89.0	6.0		Sandstone, Gray (hard)						
=====										
=====	104.0	15.0	90	Shale, Dark Gray (with sandy sections)						
=====										
=====	107.0	3.0	100	Middle Kittanning Coal (C) - 32.0"						
=====										
=====	145.0	38.0	110	Shale, Dark Gray (with hard sandy sections) fractured @ 126'						
=====										
=====	148.0	3.0	120	Lower Kittanning Coal (B) - 30.0"						
=====										
=====	160.0	12.0	130	Shale						
=====										
=====	160.0	12.0	140							
=====										
=====	160.0	12.0	150							
=====										
=====	160.0	12.0	160							
=====										

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-33-18
Surface Elevation: 1903.0
Bottom of Coal Elevations:
 Upper Kittanning Coal (C') - 1854.2
 Middle Kittanning Coal (C) - 1813.0
 Lower Kittanning Coal (B) - 1774.0
 Clarion Coal (A) - 1735.2

Operation Name : Mine 78 Surface No. 3
Method of Drilling: Rotary Air
Date Drilled: 09/24/18
Drilled By: G.R. Toy Drilling
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates
 Northing 332,951 **Easting** 1,673,376
Latitude: 40° 14' 32.88" **Longitude:** 78° 48' 25.95"

Static Water Elevations Not Recorded
and Date Measured
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
	13.0	13.0	10	Clay, Brown						
				Clay, Dark Gray						
				Clay, Brown						
=====	17.0	4.0		Shale, Brown						
	19.0	2.0		Clay, Brown						
=====	46.0	27.0	20	Shale, Brown (with sandy sections)						
=====			30	Shale, Dark Gray (with sandy sections)						
=====			40							
	49.0	3.0		Upper Kittanning Coal (C') - 34.0"						
=====	50.0	1.0	50	Shale, Dark Gray						
	51.0	1.0		Clay, Gray						
=====	80	29.0	60	Shale, Gray (with hard sandy sections)						
=====			70	Shale, Dark Gray (with hard sandy sections)						
=====			80							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-33-18
Surface Elevation: 1903.0
Bottom of Coal Elevations:
Upper Kittanning Coal (C) - 1854.2
Middle Kittanning Coal (C) - 1813.0
Lower Kittanning Coal (B) - 1774.0
Clarion Coal (A) - 1735.2

Operation Name : Mine 78 Surface No. 3
Method of Drilling: Rotary Air
Date Drilled: 09/24/18
Drilled By: G.R. Toy Drilling
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates
Northing 332,951 **Easting** 1,673,376
Latitude: 40° 14' 32.88" **Longitude:** 78° 48' 25.95"

Static Water Elevations Not Recorded
and Date Measured
Surveyed by: Berwind **Method:** Rotary Air
Remarks:

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
=====				Shale, Dark Gray (with hard sandy sections)						
=====	88.0	37.0								
	90.0	2.0	90	Middle Kittanning Coal (C) - 18.0"						
=====				Shale, Dark Gray (with hard sandy sections)						
=====			100							
=====			110							
=====			120							
=====	126.0	36.0								
	129.0	3.0		Lower Kittanning Coal (B) - 37.0"						
=====			130	Shale, Dark Gray						
=====			140							
=====			150							
=====			160							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-33-18
Surface Elevation: 1903.0
Bottom of Coal Elevations:
 Upper Kittanning Coal (C') - 1854.2
 Middle Kittanning Coal (C) - 1813.0
 Lower Kittanning Coal (B) - 1774.0
 Clarion Coal (A) - 1735.2

Static Water Elevations Not Recorded
and Date Measured _____
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3
Method of Drilling: Rotary Air
Date Drilled: 09/24/18
Drilled By: G.R. Toy Drilling
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 332,951 **Easting** 1,673,376
Latitude: 40° 14' 32.88" **Longitude:** 78° 48' 25.95"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
=====				Shale, Dark Gray						
=====	167.0	38.0								
=====	168.0	1.0		Clarion Coal (A) - 10.0"						
=====			170							
=====			180							
=====			190	Shale, Dark Gray (with hard sandy streaks)						
=====	200.0	32.0	200							
=====			210							
=====			220							
=====			230							
=====			240							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-36-18
Surface Elevation: 1925.0
Bottom of Coal Elevations:
 Lower Freeport Coal (D) - 1884.2
 Upper Kittanning Coal (C) - 1842.8
 Middle Kittanning Coal (C) - 1800.0
 Lower Kittanning Coal (B) - 1761.2
 Clarion Coal (A) - 1722.5
Static Water Elevations and Date Measured:
 Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 10/16/18
Drilled By: G.R. Toy Drilling
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates: **Northing** 333,374 **Easting** 1,673,069
Latitude: 40° 14' 37.02" **Longitude:** 78° 48' 29.97"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs					
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating	NP
	3.0	3.0		Clay, Brown	Water at 41' 2 gpm						
=====	4.0	1.0		Shale, Dark Gray / Clay Mix							
	9.0	5.0		Clay, Brown							
=====			10	Shale, Brown & Gray							
=====			20								
=====			30								
=====	39.0	30.0		Shale, Dark Gray (with							
	41.0	2.0	40	Lower Freeport Coal (D) - 27.0"							
=====				Shale, Dark Gray							
=====			50	Shale, Gray (with hard sandy sections)							
=====			60								
=====			70	Shale, Dark Gray (with hard sandy sections)							
=====											
=====	78.0	37.0		Upper Kittanning Coal (C) - 44.0"							
			80								

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-36-18
Surface Elevation: 1925.0
Bottom of Coal Elevations:
 Lower Freeport Coal (D) - 1884.2
 Upper Kittanning Coal (C') - 1842.8
 Middle Kittanning Coal (C) - 1800.0
 Lower Kittanning Coal (B) - 1761.2
 Clarion Coal (A) - 1722.5
Static Water Elevations and Date Measured:
 Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 10/16/18
Drilled By: G.R. Toy Drilling
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates: Northing 333,374 Easting 1,673,069
Latitude: 40° 14' 37.02" **Longitude:** 78° 48' 29.97"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
	82.0	2.0		Upper Kittanning Coal (C') 44.0"						
=====				Shale, Dark Gray						
=====			90							
=====	96.0	14.0		Sandstone, Hard Gray						
=====			100							
=====	109.0	13.0		Shale, Dark Gray (with sandy sections)						
=====			110							
=====	114.0	5.0		Sandstone, Hard Gray						
=====			120							
=====	124.0	10.0		Middle Kittanning Coal (C) - 12.0"						
	125.0	1.0								
=====				Shale, Dark Gray (with sandy sections) (caved @ 150')						
=====			130							
=====			140							
=====			150							
=====			160							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-36-18
Surface Elevation: 1925.0
Bottom of Coal Elevations:
 Lower Freeport Coal (D) - 1884.2
 Upper Kittanning Coal (C') - 1842.8
 Middle Kittanning Coal (C) - 1800.0
 Lower Kittanning Coal (B) - 1761.2
 Clarion Coal (A) - 1722.5
Static Water Elevations
and Date Measured Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 10/16/18
Drilled By: G.R. Toy Drilling
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 333,374 **Easting** 1,673,069
Latitude: 40° 14' 37.02" **Longitude:** 78° 48' 29.97"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
=====	161.0	36.0		Shale, Dark Gray						
	162.0	1.0		Lower Kittanning Coal (B) - 33.0"						
	163.0	1.0								
=====										
=====			170							
=====										
=====			180	Shale, Dark Gray						
=====										
=====			190							
=====										
=====	198.0	35.0								
			200	Clarion Coal (A) - 42.0"						
	202.0	4.0								
=====	203.0	1.0		Shale						
			210							
			220							
			230							
			240							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: RR-39-18
Surface Elevation: 1833.0
Bottom of Coal Elevations: Middle Kittanning Coal (C) - 1807
Lower Kittanning Coal (B) - 1762
Static Water Elevations and Date Measured Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 11/12/18
Drilled By: G.R. Toy Drilling
Logged By: Berwind
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 331,897 **Easting** 1,674,475
Latitude: 40° 14' 22.59" **Longitude:** 78° 48' 11.62"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
	12.0	12.0	10	Clay, Brown						
=====	23.0	11.0	20	Shale, Dark Gray (with sandy sections)						
=====										
	26.0	3.0		Middle Kittanning Coal (C) - 35.0"						
=====	61.0	35.0	30	Shale, Dark Gray (with hard sandy sections) (fractured @ 47' - no return after 57')						
=====			40							
=====			50							
=====			60							
.....	66.0	5.0		Sandstone (hard) (no return)						
=====	68.0	2.0		Shale (no return)						
	71.0	3.0	70	Lower Kittanning Coal (B) - ? (no return)						
=====	80.0	9.0		Shale (no return)						
=====			80							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: 78-7-69
Surface Elevation: 2073.5
Bottom of Coal Elevations: Upper Freeport Coal (E) - 1965.5
Lower Freeport Coal (D) - 1916.3
Upper Kittanning Coal (C') - 1853
Static Water Elevations and Date Measured Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 09/19/69
Drilled By: Tyger Drilling Company
Logged By: Tyger Drilling Company
Township: Paint
County: Cambria
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 333,237 **Easting** 1,674,604
Latitude: 40° 14' 35.85" **Longitude:** 78° 48' 10.16"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
	83.0	28.0		Sandstone						
			90	Sandy Shale						
			100							
	106.0	23.0								
	109.0	3.0		Upper Freeport Coal (E) - 34.0"						
			110	Shale						
	112.0	3.0								
	116.0	4.0		Sandstone						
			120	Shale, Dark						
			130							
			140	Shale, Light						
			150							
	157.0	41.0								
	158.0	1.0		Lower Freeport Coal (D) - 3.0"						
			160	Shale						

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: 78-7-69
Surface Elevation: 2073.5
Bottom of Coal Elevations: Upper Freeport Coal (E) - 1965.5
Lower Freeport Coal (D) - 1916.3
Upper Kittanning Coal (C) - 1853
Static Water Elevations and Date Measured Not Recorded
Surveyed by: Berwind **Method:** Rotary Air
Remarks: _____

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 09/19/69
Drilled By: Tyger Drilling Company
Logged By: Tyger Drilling Company
Township: Paint
County: Cambria
Quadrangle: Windber
Laboratory: N/A
Grid Coordinates **Northing** 333,237 **Easting** 1,674,604
Latitude: 40° 14' 35.85" **Longitude:** 78° 48' 10.16"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs				
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
=====				Sandy Shale						
	250.0	29.0	250							
			260							
			270							
			280							
			290							
			300							
			310							
			320							

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: OB-4
Surface Elevation: 2061.5
Bottom of Coal Elevations: Upper Freeport Coal (E) - 1985.5

Static Water Elevations and Date Measured Not Recorded

Surveyed by: RMC **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 04/14/20
Drilled By: Holt Drilling
Logged By: Holt Drilling
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: G&C Coal Analysis Lab., Inc.
Grid Coordinates **Northing** 332,346 **Easting** 1,675,576
Latitude: 40° 14' 27.16" **Longitude:** 78° 47' 57.48"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs					
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating	NP
XXXXXXXXXXXXXX XXXXXXXXXXXXXX	2.0	2.0		Fill			1	0-3	0.03	None	-0.70
	3.0	1.0		Clay, Brown							
.....	24.0	21.0	10	Sandstone, Brown			2	3-6	0.01	None	-0.81
.....							3	6-9	0.00	None	0.59
.....							4	9-12	0.00	None	-0.14
.....							5	12-15	0.00	None	-0.34
.....							6	15-18	0.00	None	0.22
.....							7	18-21	0.00	None	7.84
.....							8	21-24	0.00	None	8.31
.....							9	24-27	0.00	None	1.38
=====	34.0	10.0	30	Shale, Brown			10	27-30	0.00	None	1.46
=====							11	30-33	0.00	None	1.35
=====							12	33-36	0.01	None	0.42
.....	62.0	28.0	40	Sandstone, Brown			13	36-39	0.00	None	3.29
.....							14	39-42	0.05	None	1.97
.....				Sandstone, Gray	15	42-45	0.04	None	0.73		
.....					16	45-48	0.05	None	-0.39		
.....			50	Sandstone, Brown	17	48-51	0.02	None	-0.17		
.....					Sandstone, Gray	18	51-54	0.03	None	-0.03	
.....				Sandstone, Gray		19	54-57	0.13	None	-0.03	
.....					20	57-60	0.15	None	0.98		
.....	73.0	11.0	70	Shale, Gray			21	60-63	0.99	None	10.47
=====							22	63-66	0.46	None	11.49
=====				Shale, Dark	23	66-69	0.22	None	25.90		
=====					24	69-72	0.05	Slight	36.09		
.....	76.0	3.0		Upper Freeport Coal (E) - 36.0"			25	72-73	0.74	None	10.73
.....							26	73-76	3.47	None	-1.54
.....							27	76-77	0.06	None	11.71
.....			80	Sandstone, Gray			28	77-80	0.39	None	5.50

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: OB-4
Surface Elevation: 2061.5
Bottom of Coal Elevations: Upper Freeport Coal (E) - 1985.5

Static Water Elevations and Date Measured Not Recorded

Surveyed by: RMC **Method:** Rotary Air
Remarks: None

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						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating
	81.0	5.0		Sandstone, Gray		29	80-81	0.28	None	4.97
			90							
			100							
			110							
			120							
			130							
			140							
			150							
			160							