

13100002000C PROJECT: NCRDS87 QUADRANGLE: NEW WINDSOR
 COUNTY: MERCER 14N - R 1W SECTION: 25 NENESE
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 816.0 GEOLOGIST: WEIBEL DATE COLLECTED: 0 / 0/1925
 Drillers Log Coal Test LOGGED (FT.): 216.00
 SOURCE: OXFORD COAL CO. #2 LOCATION IMPRECISE

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	
816.00			UNCONSOLIDATED	70.00	0.00	
746.00	CARBONDALE		GRAY SHALE	21.00	70.00	
725.00	CARBONDALE		DARK SHALE	7.00	91.00	
718.00	CARBONDALE	COLCHESTER	COAL	1.00	98.00	
717.00	SPOON		SHALE	80.00	99.00	
637.00	SPOON		SANDSTONE	0.00	179.00	
637.00	SPOON		UNCLASSIFIED	7.00	179.00	
630.00	SPOON		COAL	2.00	186.00	
628.00	SPOON		UNDERCLAY	3.00	188.00	
625.00	SPOON		UNCLASSIFIED	19.00	191.00	
606.00	SPOON		BLACK SHALE	0.50	210.00	
605.50	SPOON	ROCK ISLAND	COAL	4.10	210.50	
601.40	ABBOTT		UNCLASSIFIED	1.40	214.60	

13100004000C PROJECT: NCRDS87 QUADRANGLE: NEW WINDSOR
 COUNTY: MERCER 14N - R 1W SECTION: 35 SE 200N 1222E
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 780.0 GEOLOGIST: WEIBEL DATE COLLECTED: 0 / 0/1943
 Survey Sample Study Coal Test LOGGED (FT.): 446.00
 SOURCE: LARSON & SWANSON

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	
780.00			UNCLASSIFIED	80.00	0.00	
700.00	SPOON		BLACK SHALE	5.00	80.00	
695.00	SPOON		LIMESTONE	3.00	85.00	
692.00	SPOON		SANDSTONE	5.00	88.00	
687.00	SPOON		UNCLASSIFIED	84.00	93.00	
603.00	SPOON	SEVILLE	LIMESTONE	2.00	177.00	
601.00	SPOON	ROCK ISLAND	COAL	1.00	179.00	UNCERTAIN CORRELATION
600.00			UNCLASSIFIED	99.00	180.00	
501.00			SANDSTONE	6.00	279.00	
495.00			UNCLASSIFIED	20.00	285.00	
475.00			SILTSTONE	130.00	305.00	
345.00			SANDSTONE	11.00	435.00	
334.00			UNCLASSIFIED	0.00	446.00	

13100087000C PROJECT: NCRDS87 QUADRANGLE: MATHERVILLE
 COUNTY: MERCER 15N - R 1W SECTION: 5 NENESE
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 790.0 GEOLOGIST: WEIBEL DATE COLLECTED: 0 / 0/1914
 Drillers Log Coal Test LOGGED (FT.): 183.50
 SOURCE: COAL VALLEY COAL CO. LOCATION AND ELEVATION IMPRECISE

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	
790.00			UNCONSOLIDATED	119.00	0.00	
671.00	SPOON		UNCLASSIFIED	31.00	119.00	
640.00	SPOON		BLACK SHALE	1.00	150.00	
639.00	SPOON	SEVILLE	LIMESTONE	1.00	151.00	
638.00	SPOON		BLACK SHALE	1.00	152.00	
637.00	SPOON	ROCK ISLAND	COAL	1.00	153.00	
636.00	ABBOTT		UNDERCLAY	8.00	154.00	
628.00	ABBOTT		UNCLASSIFIED	2.00	162.00	
626.00	ABBOTT		LIMESTONE	5.00	164.00	
621.00	ABBOTT		UNCLASSIFIED	7.75	169.00	
613.20	ABBOTT		COAL	3.25	176.80	
610.00	ABBOTT		UNDERCLAY	3.50	180.00	

13100091000C PROJECT: NCRDS87 QUADRANGLE: ORION
 COUNTY: MERCER 15N - R 1W SECTION: 23 SENW 100N 300W

CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 710.0 GEOLOGIST: WEIBEL DATE COLLECTED: 0 / 0/1943
 Survey Sample Study Coal Test LOGGED (FT.): 230.00
 SOURCE: LARSON & SWANSON

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	
710.00			UNCONSOLIDATED	90.00	0.00	
620.00	SPOON		SHALE	6.00	90.00	
614.00	SPOON	ROCK ISLAND	COAL	3.00	96.00	
611.00	ABBOTT		SANDSTONE	1.00	99.00	
610.00	ABBOTT		SHALE	5.00	100.00	
605.00	ABBOTT		SILTSTONE	5.00	105.00	
600.00	ABBOTT		SHALE	25.00	110.00	
575.00	ABBOTT		SANDSTONE	55.00	135.00	
520.00	ABBOTT		SHALE	35.00	190.00	
485.00	ABBOTT		BLACK SHALE	5.00	225.00	
480.00			UNCLASSIFIED	0.00	230.00	

13100127000C PROJECT: NCRDS99 QUADRANGLE: MATHERVILLE
 COUNTY: MERCER 15N - R 2W SECTION: 34 NENE 660N 0W
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 720.0 GEOLOGIST: HAMER DATE COLLECTED: 0 / 0/1900
 Drillers Log LOGGED (FT.): 95.20
 SOURCE: COAL VALLEY MINING CO 0234 ELEVATION APPROXIMATE

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	
720.00	PLEISTOCENE		CLAY	41.00	0.00	
679.00	PLEISTOCENE		SS/SH	9.00	41.00	INCLUDES "FIRE CLAY"
670.00	CARBONDALE	COLCHESTER	COAL	1.33	50.00	
668.70	TRADEWATER		UNDERCLAY	9.00	51.30	WHITE FIRECLAY
659.70	TRADEWATER		SANDSTONE	5.25	60.30	
654.40	TRADEWATER		SHALE	3.17	65.60	BLACK
651.30	TRADEWATER		SHALE	1.75	68.70	DARK FIRECLAY
649.50	TRADEWATER		LIMESTONE	16.00	70.50	
633.50	TRADEWATER		SHALE	2.00	86.50	BLACK
631.50	TRADEWATER	ROCK ISLAND	COAL	4.62	88.50	
626.80	TRADEWATER		UNDERCLAY	2.00	93.20	

13100128000C PROJECT: NCRDS99 QUADRANGLE: MATHERVILLE
 COUNTY: MERCER 15N - R 2W SECTION: 34 SWNE 0N 160W
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 700.0 GEOLOGIST: HAMER DATE COLLECTED: 0 / 0/1900
 Drillers Log LOGGED (FT.): 92.10
 SOURCE: COAL VALLEY MINING CO. 234 ELEVATION APPROXIMATE

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	
700.00	PLEISTOCENE		CLAY	23.00	0.00	
677.00	CARBONDALE		SS/SH	16.00	23.00	INCLUDES FIRECLAY
661.00	CARBONDALE		SHALE	13.00	39.00	FIRECLAY
648.00	CARBONDALE	COLCHESTER	COAL	0.83	52.00	
647.20	TRADEWATER		UNDERCLAY	13.00	52.80	
634.20	TRADEWATER		GRAY SHALE	18.50	65.80	
615.70	TRADEWATER		LIMESTONE	0.83	84.30	
614.90	TRADEWATER		SHALE	0.42	85.10	
614.50	TRADEWATER	ROCK ISLAND	COAL	3.66	85.50	
610.80	TRADEWATER		UNDERCLAY	3.00	89.20	GRITTY

13100159000C PROJECT: NCRDS99 QUADRANGLE: MATHERVILLE
 COUNTY: MERCER 15N - R 2W SECTION: 34 SENE 115N 0E
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 640.0 GEOLOGIST: HAMER DATE COLLECTED: 0 / 0/1900
 Drillers Log LOGGED (FT.): 28.80
 SOURCE: COAL VALLEY MINING CO. 0234 ELEV & FOOT EW APPROXIMATE

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	

640.00	PLEISTOCENE		CLAY	10.00	0.00	
630.00	TRADEWATER		GRAY SHALE	13.00	10.00	
617.00	TRADEWATER		SHALE	0.58	23.00	BLACK
616.40	TRADEWATER	ROCK ISLAND	COAL	3.67	23.60	
612.70	TRADEWATER		UNDERCLAY	1.50	27.30	

13100234000C PROJECT: NCRDS87 QUADRANGLE: BUFFALO PRAIRIE
 COUNTY: MERCER 15N - R 4W SECTION: 13 SESE 330S 330W
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 765.0 GEOLOGIST: WEIBEL DATE COLLECTED: 1 / 0/1954
 Survey Sample Study Coal Test LOGGED (FT.): 200.00
 SOURCE: NELSON, PATTERSON & EDWARDS

THICKNESS (FT.)						
ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	UNIT	OVERBURDEN	COMMENT
765.00			UNCONSOLIDATED	80.00	0.00	
685.00	SPOON		SANDSTONE	3.00	80.00	
682.00	SPOON		BLACK SHALE	12.00	83.00	
670.00	SPOON		DARK SHALE	14.00	95.00	
656.00	SPOON		BLACK SHALE	6.00	109.00	
650.00	SPOON	ROCK ISLAND	COAL	0.00	115.00	
650.00	ABBOTT		SANDSTONE	5.00	115.00	
645.00	ABBOTT		UNCLASSIFIED	43.00	120.00	
602.00	ABBOTT		COAL	7.00	163.00	
595.00	ABBOTT		UNCLASSIFIED	30.00	170.00	
565.00			UNCLASSIFIED	0.00	200.00	

13120778000C PROJECT: NCRDS87 QUADRANGLE: NORTH HENDERSON
 COUNTY: MERCER 13N - R 1W SECTION: 25 NWSW 1N 1W
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 763.3 GEOLOGIST: WEIBEL DATE COLLECTED: 0 / 0/1968
 Survey Core Study Mineral Test LOGGED (FT.): 273.50
 SOURCE: NEW JERSEY ZINC COMPANY

THICKNESS (FT.)						
ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	UNIT	OVERBURDEN	COMMENT
763.30			UNCLASSIFIED	40.00	0.00	
723.30	CARBONDALE		SHALE	20.70	40.00	
702.60	CARBONDALE		LIMESTONE	0.40	60.70	
702.20	CARBONDALE		SHALE	8.40	61.10	
693.80	CARBONDALE		BLACK SHALE	2.00	69.50	
691.80	CARBONDALE	OAK GROVE	LIMESTONE	1.50	71.50	
690.30	CARBONDALE	MECCA QUARRY	BLACK SHALE	7.25	73.00	
683.00	CARBONDALE	COLCHESTER	COAL	0.50	80.30	
682.50	CARBONDALE		BLACK SHALE	0.50	80.80	
682.00	CARBONDALE	COLCHESTER	COAL	0.60	81.30	
681.40	CARBONDALE		BLACK SHALE	0.75	81.90	
680.70	CARBONDALE	COLCHESTER	COAL	0.30	82.60	
680.40	SPOON		GRAY SHALE	3.25	82.90	
677.10			SILTSTONE	8.75	86.20	
668.40			DARK SHALE	14.30	94.90	
654.10			GRAY SHALE	2.65	109.20	
651.40			COAL	0.15	111.90	
651.30			SILTSTONE	15.85	112.00	
635.40			SHALE	5.00	127.90	
630.40			SILTSTONE	1.40	132.90	
629.00			BLACK SHALE	4.75	134.30	
624.30	SPOON	ROCK ISLAND	COAL	1.50	139.00	UNCERTAIN CORRELATION
622.80	ABBOTT		SHALE	14.10	140.50	
608.70	ABBOTT		SILTSTONE	37.50	154.60	
571.20	ABBOTT		DARK SHALE	33.05	192.10	
538.10	ABBOTT		BLACK SHALE	5.45	225.20	
532.70	ABBOTT		SHALE	9.65	230.60	
523.00	ABBOTT		DARK SHALE	11.00	240.30	
512.00	ABBOTT		SILTSTONE	21.45	251.30	
490.60	ABBOTT		CONGL	0.80	272.70	
489.80			UNCLASSIFIED	0.00	273.50	

13120781000C PROJECT: NCRDS87 QUADRANGLE: VIOLA
 COUNTY: MERCER 14N - R 2W SECTION: 2 SWSE 1S 1E
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 667.5 GEOLOGIST: WEIBEL DATE COLLECTED: 0 / 0/1968
 Survey Core Study Mineral Test LOGGED (FT.): 144.50

SOURCE: NEW JERSEY ZINC CO.

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	
667.50			UNCLASSIFIED	21.00	0.00	
646.50	SPOON		SILTSTONE	11.30	21.00	
635.20	SPOON		SHALE	23.45	32.30	
611.70	SPOON		SILTSTONE	3.25	55.80	
608.50	SPOON		SHALE	49.30	59.00	
559.20	SPOON	ROCK ISLAND	COAL	0.80	108.30	UNCERTAIN CORRELATION
558.40	ABBOTT		SILTSTONE	4.90	109.10	
553.50	ABBOTT		SHALE	13.20	114.00	
540.30	ABBOTT		SILTSTONE	5.55	127.20	
534.70	ABBOTT		SILTSTONE	11.75	132.80	
523.00			UNCLASSIFIED	0.00	144.50	

1317000000C PROJECT: NCRDS QUADRANGLE: NEW WINDSOR
 COUNTY: MERCER 14N - R 1W SECTION: 35 2270S 1180E
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 780.0 GEOLOGIST: LOUCHIOS DATE COLLECTED: 0 / 0/1943
 Drillers Log Coal Test LOGGED (FT.): 485.00
 SOURCE: UTAH INTERNATIONAL 4 CODED COAL LOG

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	
780.00			NO RECORD	80.00	0.00	
700.00	CARBONDALE		BLACK SHALE	5.00	80.00	
695.00	CARBONDALE		LIMESTONE	3.00	85.00	
692.00	CARBONDALE		SANDSTONE	5.00	88.00	
687.00	CARBONDALE		SHALE	12.00	93.00	
675.00	CARBONDALE		SANDY SHALE	10.00	105.00	
665.00	CARBONDALE		SHALE	15.00	115.00	
650.00	CARBONDALE		GREEN SHALE	10.00	130.00	
640.00	CARBONDALE		SHALE	10.00	140.00	
630.00	CARBONDALE		GREEN SHALE	5.00	150.00	
625.00	CARBONDALE		SANDY SHALE	22.00	155.00	
603.00	CARBONDALE		LIMESTONE	2.00	177.00	
601.00	CARBONDALE	COLCHESTER	COAL	1.00	179.00	
600.00			SANDY SHALE	3.00	180.00	
597.00			DARK SHALE	15.00	183.00	
582.00			GREEN SHALE	17.00	198.00	
565.00			SHALE	30.00	215.00	
535.00			BLACK SHALE	10.00	245.00	
525.00			GREEN SHALE	5.00	255.00	
520.00			SHALE	5.00	260.00	
515.00			SANDY SHALE	14.00	265.00	
501.00			SANDSTONE	6.00	279.00	
495.00			BLACK SHALE	5.00	285.00	
490.00			SANDSTONE	15.00	290.00	
475.00			GREEN SHALE	130.00	305.00	
345.00			SANDSTONE	11.00	435.00	
334.00			LIMESTONE	39.00	446.00	

13170001000C PROJECT: NCRDS QUADRANGLE: NEW WINDSOR
 COUNTY: MERCER 14N - R 1W SECTION: 22 120S 100E
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 750.0 GEOLOGIST: LOUCHIOS DATE COLLECTED: 0 / 0/1975
 Drillers Log Coal Test LOGGED (FT.): 150.00
 SOURCE: UTAH INTERNATIONAL 20755 CODED COAL LOG

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	
750.00			NO RECORD	83.00	0.00	
667.00			SANDSTONE	2.00	83.00	
665.00			SHALE	10.00	85.00	
655.00			SHALE/SS/LIMESTN	18.00	95.00	
637.00	SPOON	ROCK ISLAND	COAL	4.00	113.00	
633.00			SANDSTONE	33.00	117.00	

13170002000C PROJECT: NCRDS QUADRANGLE: ORION
 COUNTY: MERCER 15N - R 1W SECTION: 13 1160N 1230W

CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 762.0 GEOLOGIST: LOUCHIOS DATE COLLECTED: 0 / 0/1972
 Drillers Log Coal Test LOGGED (FT.): 460.00
 SOURCE: UTAH INTERNATIONAL 662 CODED COAL LOG

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	
762.00			NO RECORD	180.00	0.00	
582.00	TRADEWATER		SH & SS	48.00	180.00	INTERBEDDED
534.00	TRADEWATER	ROCK ISLAND	COAL	2.00	228.00	
532.00	TRADEWATER		SHALE	40.00	230.00	
492.00			LIMESTONE	190.00	270.00	

13170003000C PROJECT: NCRDS QUADRANGLE: ORION
 COUNTY: MERCER 15N - R 1W SECTION: 21 1800S 250E
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 725.0 GEOLOGIST: LOUCHIOS DATE COLLECTED: 0 / 0/1972
 Drillers Log Coal Test LOGGED (FT.): 354.00
 SOURCE: UTAH INTERNATIONAL 649 CODED COAL LOG

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	
725.00			NO RECORD	41.00	0.00	
684.00	TRADEWATER		SANDSTONE	2.00	41.00	
682.00	TRADEWATER		SHALE	32.00	43.00	
650.00	TRADEWATER	ROCK ISLAND	COAL	2.00	75.00	
648.00			SHALE	88.00	77.00	
560.00			LIMESTONE	189.00	165.00	

13170004000C PROJECT: NCRDS QUADRANGLE: ORION
 COUNTY: MERCER 15N - R 1W SECTION: 22 400N 1430W
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 740.0 GEOLOGIST: LOUCHIOS DATE COLLECTED: 0 / 0/1970
 Drillers Log Coal Test LOGGED (FT.): 443.00
 SOURCE: UTAH INTERNATIONAL 609 CODED COAL LOG

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	
740.00			NO RECORD	45.00	0.00	
695.00	TRADEWATER		SHALE	83.00	45.00	
612.00	TRADEWATER		LIMESTONE	3.00	128.00	
609.00	TRADEWATER	ROCK ISLAND	COAL	1.00	131.00	
608.00			SH & SS	262.00	132.00	INTERBEDDED
346.00			LIMESTONE	49.00	394.00	

13170005000C PROJECT: NCRDS QUADRANGLE: ORION
 COUNTY: MERCER 15N - R 1W SECTION: 23 1700N 1730W
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 710.0 GEOLOGIST: LOUCHIOS DATE COLLECTED: 0 / 0/1943
 Drillers Log Coal Test LOGGED (FT.): 232.00
 SOURCE: UTAH INTERNATIONAL 91 CODED COAL LOG

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	
710.00			NO RECORD	90.00	0.00	
620.00	TRADEWATER		GREEN SHALE	6.00	90.00	
614.00	TRADEWATER	ROCK ISLAND	COAL	3.00	96.00	
611.00	TRADEWATER		SANDSTONE	1.00	99.00	
610.00	TRADEWATER		GREEN SHALE	35.00	100.00	
575.00	TRADEWATER		SANDY DARK SHALE	40.00	135.00	
535.00	TRADEWATER		BLACK SHALE	5.00	175.00	
530.00	TRADEWATER		CARB SH	10.00	180.00	
520.00	TRADEWATER		SANDSTONE	15.00	190.00	
505.00	TRADEWATER		BLACK SHALE	25.00	205.00	
480.00	TRADEWATER		LIMESTONE	2.00	230.00	

13170006000C PROJECT: NCRDS QUADRANGLE: NORTH HENDERSON
 COUNTY: MERCER 13N - R 1W SECTION: 14 1800N 20W
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 740.0 GEOLOGIST: LOUCHIOS DATE COLLECTED: 0 / 0/1977
 Drillers Log Coal Test LOGGED (FT.): 480.00
 SOURCE: UTAH INTERNATIONAL 20848 CODED COAL LOG

ELEVATION TOP (FT.)	FORMATION	MEMBER	LITHOLOGY	THICKNESS (FT.)		COMMENT
				UNIT	OVERBURDEN	
740.00			NO RECORD	83.00	0.00	
657.00			SHALE	32.00	83.00	
625.00			SANDSTONE	18.00	115.00	
607.00			SHALE	49.00	133.00	
558.00	TRADEWATER	ROCK ISLAND	COAL	3.00	182.00	UNCERTAIN CORRELATION
555.00			SHALE	74.00	185.00	
481.00			SANDSTONE	15.00	259.00	
466.00			SHALE	39.00	274.00	
427.00			LIMESTONE	167.00	313.00	

13170007000C PROJECT: NCRDS QUADRANGLE: NORTH HENDERSON
 COUNTY: MERCER 13N - R 1W SECTION: 25 2340S 750W
 CONFIDENTIAL: N
 SURFACE ELEVATION (FT.): 763.0 GEOLOGIST: LOUCHIOS DATE COLLECTED: 0 / 0/1968
 Drillers Log Coal Test LOGGED (FT.): 595.00
 SOURCE: UTAH INTERNATIONAL 20778 CODED COAL LOG

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