

Datum: WGS84 Lat: 38.941117 NENE 8-13-24E
Long: -94.7619885

HNTB

LOG OF BORING

BORING NO.

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PROJECT Gateway

LOCATION Johnson County, Kansas

DATE STARTED 04/05/2012 DATE COMPLETED 04/05/2012

EXPLORATION CONTRACTOR Terracon

DRILLER J. Johnson

DRILL RIG CME-75

HAMMER TYPE Auto

HAMMER EFFICIENCY

LOGGED BY J. Martens

REVIEWED BY L. Wagner

STATION / NORTHING / 237823.737

OFFSET / EASTING / 2233137.833

SURFACE ELEVATION 990.7 ft

DATUM NAVD 88

GROUND WATER LEVELS:

▽ AT TIME OF DRILLING NATD

▼ AFTER N/A

DRILLING METHOD	DEPTH (ft)	SAMPLE TYPE NUMBER	SAMPLE RECOVERY (in)	CORE REC % (RQD %)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION Unified (Visual) Classification System	GEOLOGIC NAME	ELEVATION (ft)
	0									990.7
SSA 4" OD								Orange Brown with Black Nodules, Firm, LEAN CLAY, Moist (CL), with Rootlets		990
									3.0	987.7
	5							LIMESTONE, Highly Weathered, Broken	Plattsburg LS	
									5.0	
								LIMESTONE, Brownish Gray, Moderately Hard		985
								1,100 psi downpressure		
	9	SPT S1	3		50/3"			3 - 4" SHALE Seam at 8.5'		
CORE BARREL NQ2	10	NQ C1		88% (75%)				LIMESTONE, Gray, Fine Grained, Medium Bedded, Fresh, Moderately Hard to Hard, Fossiliferous		980
	11							1" Gray SHALE Seam at 11.3'		
								With Wavy SHALE Laminae from 11.6 - 11.7'		
								40 degree Fracture at 12.4'		
		NQ C2		97% (65%)				Vertical Healed Fracture, Fossiliferous from 13.5 - 14.1'		976.6
	15							SHALE, Gray, Laminated, Fresh, Moderately Hard, with Calcareous Partings		
									16.0	
	16							SANDSTONE with Interbedded Shale Laminae, Gray, Medium Bedded, Fresh, Moderately Hard	Bonner Springs SH	975
									16.8	
		NQ C3		98% (63%)				SHALE, Gray, Laminated, Fresh, Moderately Hard to Hard		
								1" LIMESTONE Seam at 17.4'		
	20							Becoming Greenish Gray, Limey, with Limestone Nodules and Inclusions at 20'		
	21							Becoming Maroon and Greenish Gray, with Limestone Inclusions and Seams at 21'		970
		NQ C4		82% (8%)						
	25									

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BORING LOG 2 W/O LAB DATA - GATEWAY_TEMPLATE.GDT - 4/6/12 11:58 - O:\55921\GEOTECH\GINT\GEOLOGY BORINGS.GPJ



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PROJECT Gateway

STATION / NORTHING / 237823.737

LOCATION Johnson County, Kansas

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DRILLING METHOD	DEPTH (ft)	SAMPLE TYPE NUMBER	SAMPLE RECOVERY (in)	CORE REC % (RQD %)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION Unified (Visual) Classification System	GEOLOGIC NAME	ELEVATION (ft)
	25									
	26	NQ								965
								SHALE, Gray to Bluish Gray, Blocky, Fresh, Moderately Hard to Hard With Interbedded Calcareous Sandstone Laminae from 27.3 - 28.1'		
		NQ C5		100% (80%)						
	30									
	31									960
								31.8		
		NQ C6		92% (52%)				SANDSTONE, Gray, Very Fine Grained, Thick Bedded, Fresh, Cemented/Moderately Hard		
	35							Becoming Laminated to Very Thin Bedded, Abundant Interbedded Shale Partings at 34.2'		
	36							34.1		
								SHALE, Gray, Laminated, Fresh, Moderately Hard		
								36.1		
								SANDSTONE, Gray, Very Fine Grained, Medium Bedded, Fresh, Cemented/Moderately Hard		955
								36.8		
		NQ C7		87% (13%)				SHALE, Gray, Laminated, Fresh, Soft to Moderately Hard, "Poker Chipped" Shale badly disturbed by coring process.		
	40									
	41									950
								1/4" Fossiliferous LIMESTONE Seam at 41.3'		
		NQ C8		100% (0%)						
	45									
	46									
								46.0		
								1" Fossiliferous LIMESTONE Seam at 45.7'		944.7
								LIMESTONE, Gray, Very Fine Grained, Fresh, Medium to Thick Bedded, Hard	Farley LS	945
		NQ C9		100% (85%)				Wavy SHALE Partings from 48.0 - 48.4'		
	50							Becoming Fossiliferous at 49.7'		
								50.1		
								SHALE, Gray, Laminated, Fresh, Moderately Hard, Trace Calcareous Partings		940
	51									
								"Poker Chipped"		
		NQ		100%						

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BORING LOG 2 W/O LAB DATA - GATEWAY_TEMPLATE.GDT - 4/6/12 11:58 - 0:155921\GEOTECH\GINT\GEOLOGY BORINGS.GPJ



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DRILLING METHOD	DEPTH (ft)	SAMPLE TYPE NUMBER	SAMPLE RECOVERY (in)	CORE REC % (RQD %)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION Unified (Visual) Classification System	GEOLOGIC NAME	ELEVATION (ft)
	55	C10		(7%)				SHALE, Gray, Laminated, Fresh, Moderately Hard, Trace Calcareous Partings (<i>continued</i>)		56.0
										935

Boring backfilled with Enviropug upon completion.
Auger Refusal at 9.0 feet.
Bottom of borehole at 56.0 feet.