

Datum: WGS84 Lat: 38.9434401 41-13-24E NE SW SE SW
 Long: -94.754984

HNTB

LOG OF BORING

BORING NO.

B-21

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PROJECT Gateway

STATION / NORTHING / 238740.565

LOCATION Johnson County, Kansas

OFFSET / EASTING / 2235098.515

DATE STARTED 03/31/2012 DATE COMPLETED 03/31/2012

SURFACE ELEVATION 1042.0 ft

EXPLORATION CONTRACTOR Terracon

DATUM NAVD 88

DRILLER K. Kempton

DRILL RIG CME-55 ATV

GROUND WATER LEVELS:

HAMMER TYPE Auto

HAMMER EFFICIENCY 79%

▽ AT TIME OF DRILLING 12 ft

LOGGED BY J. Martens

REVIEWED BY L. Wagner

▽ AFTER N/A

DRILLING METHOD	DEPTH (ft)	SAMPLE TYPE NUMBER	SAMPLE RECOVERY (in)	CORE REC % (ROD %)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION Unified (Visual) Classification System	GEOLOGIC NAME	ELEVATION (ft)
	0									1042.0
HSA 3.25" ID								Topsoil, Dark Brown, Firm, LEAN CLAY, Moist (CL) Brown to Red Brown, Stiff, LEAN CLAY, Moist (CL)		
	5	ST U1	17			4.5+ (Bott)				1040
	10	SPT S1	14		4-5-6 (11)			Reddish Brown, Hard, Sandy LEAN CLAY, Moist (CL), with remnant Sandstone fragments (Residuum) With remnant Shale structure ▽ With remnant Sandstone seam 11.5' to 12.0' Increasing plasticity		1035
	14	SPT S2	0	83% (0%)	50/3"					1030
CORE BARREL NQ	15	NQ C1						LIMESTONE, Brown Gray, Fine to Medium Grained, Very Thin to Thin Bedded, Weathered, Moderately Hard Becoming Thin to Medium Bedded, Slightly Weathered at 15' 2" Gray SHALE Seam at 15.8'	Stoner LS	1028
	20	NQ C2		100% (53%)				Becoming Fossiliferous, with Wavy SHALE lenses at 8" - 12" Spacing at 18'		1025
	25	NQ C3		97% (80%)				LIMESTONE, Gray, Fine to Medium Grained, Thin to Medium Bedded, Fresh, Moderately Hard, with Abundant Thin Wavy Shale Laminae, Fossiliferous		1020

(Continued Next Page)

BORING LOG 2 W/O LAB DATA - GATEWAY_TEMPLATE.GDT - 4/6/12 12:01 - 0:155921\GEO\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)
	25									
	25							LIMESTONE, Gray, Fine to Medium Grained, Thin to Medium Bedded, Fresh, Moderately Hard, with Abundant Thin Wavy Shale Laminae, Fossiliferous (continued)		
	27.4	NQ C4		100% (53%)					Eudora SH	1014.6
	30							SHALE, Dark Gray, Blocky to Fissile, Fresh, Soft Becoming Black, Calcareous at 27.9'		1015
	30									
	32.8	NQ C5		98% (35%)				Becoming Dark Gray at 32.2'	Captain Creek LS	1009.2
	35							LIMESTONE, Gray, Fine Grained, Medium Bedded, Fresh, Moderately Hard to Hard		
	35							With Wavy Shale Laminae at 34.7'		
	35.4							With Vug at 35.4'		
	38.1	NQ C6		100% (62%)						1005
	38.6							Sandy SHALE, Gray, Blocky, Fresh, Moderately Hard	Vilas SH	1003.9
	40.0							Calcareous SANDSTONE with Abundant Thin Shale Partings, Gray, Very Thin to Thin Bedded, Fresh, Cemented/Moderately Hard		

Boring backfilled with Enviroplug upon completion.
Auger Refusal at 14.0 feet.
Bottom of borehole at 40.0 feet.