

HOLE NO. P-1 SHEET 1 OF 7 DATE: 10/3/74 LOGGED BY: Carnahan T.D. 940

DEPTH	+ -MM	FRX	PP	GAL/ TON	CORE REC.	LITH.	DESCRIPTION
615		None	None				OIL SHALE, gray to dark gray, slightly calcareous; hard
616							very thinly bedded-bedding well developed; occasional
617							thin beds of black material, hard, noncalcareous, very
618							fine grained to silty
619							
620							Black, strong sulfur odor
621							
622							LIMESTONE, light-dark gray, argillaceous, shaly
623							
624							
625							
626							
627							
628							SHALE, gray-dark gray, hard, slightly silty
629							
630							SHALE, dark gray-dark reddish gray; sandy, hard, thinly
631							bedded
632							
633							SHALE as above with thin stringers of coarser material
634							grading to fine sand
635							
636							SHALE, gray-dark gray, silty; hard, thinly bedded
637							
638							
639							
640							SANDSTONE, tuffaceous
641							
642							SHALE, dark gray, silty with some coarser grained material
643							
644							
645		None	None				SHALE, dark gray, mostly silty with black inclusions
646							of odoriferous material occurring in thin SANDSTONE lens
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COMMENTS:

THE CLEVELAND-CLIFFS IRON CO.

PROJECT: White River Shale ProjectHOLE NO. P-1 SHEET 2 OF 7 DATE: 10/3/74 LOGGED BY: Gentzler & Carnahan T.D. 940

DEPTH	+MM	FRX	PP	GAL TON	CORE REC.	LITH.	DESCRIPTION
665	+80			16.8			
666				11.9			SHALE, dark gray, fine grained (silt or finer); thin
667				9.8			bedded with BITUMEN stains
668		None	None	9.8			
669				9.0			
670				16.7			
671				9.7			671.17-673.33 UPPER WAVY BED - SANDSTONE, white-brownish
672				9.8			gray, tuffaceous; distorted bedding
673				8.5			SHALE, dark gray-dark reddish gray, fine grained; hard
674				10.0			thinly bedded
675	+70			11.6			
676				11.6			OIL SHALE, pale brown to dusky brown; homogeneous, thin
677				16.6			bedded
678				15.0			
679				18.2			
680				15.7			
681				10.5			1/8" SANDSTONE, tuffaceous
682				10.4			
683				7.5			
684				8.4			
685	+60			12.1			
686				13.9			
687				8.2			
688				6.9			1/4" SANDSTONE, tuffaceous, waxy
689				8.9			
690				7.2			
691				5.1			
692				15.0			1/8" SANDSTONE, tuffaceous
693				14.2			
694				10.9			
695	+50			8.3			
696				10.0			
697				14.5			
698				40.1			
699				18.4			
700				10.7			
701				12.4			
702				14.0			1/8" SANDSTONE, tuffaceous (dark black zone)
703				13.9			
704				13.6) Laminae are thicker & wavy-marked contrast caused
705	+40			23.8) by alternation of light & dark colored bands (laminae)
706				24.9			OIL SHALE, brown-dark brown, thinly laminated
707				14.3			
708				15.3			
709				32.5			
710				21.3			
711				7.4			SILTSTONE, light colored (buff-light brown); laminated
712				4.3			to massive with thin, dark-colored streaks; low grade
713				3.5			
714				5.8			

COMMENTS:

THE CLEVELAND-CLIFFS IRON CO.

PROJECT: White River Shale Project

HOLE NO. P-1 SHEET 3 OF 7 DATE: 10/3/74 LOGGED BY Gentzler & Carnahan T.D. 940

DEPTH	+MM	FRX	PP	GAL/TON	CORE REC.	LITH.	DESCRIPTION
715	+30		.00.40	5.8			
716			.20.70	4.0			
717		NEAR VERTICAL		4.9			
718				3.5			
719				3.1			
720				2.3			OIL SHALE, gray-brown, thinly laminated; medium grade
721				2.9			
722				4.9			
723				14.4			
724				13.0			
725	+20			22.1			OIL SHALE, brown-dark brown, variegated, laminated; good grade
726				30.4			
727				16.0			OIL SHALE, light brown, laminated with wavy irregular laminae & small, irregular inclusions (layers) of tuffaceous SANDSTONE-some seeping oil
728			.60	15.3			
729				11.8			
730				16.5			
731				22.7			OIL SHALE, brown-dark brown, good grade
732				28.9			
733				42.7			
734				25.0			
735	+10		.50	26.1	736.00		(Irregular break at 0.05' thick wavy tuff layer)
736				20.9			OIL SHALE, mostly medium brown with variegated very dark brown layers
737				27.5			
738				41.0			
739				19.4			
740				12.2			
741				13.0			
742				22.7			
743				14.7			
744				12.5			
745	0		.50*.80*	11.9			745.5-745.9, MAHOGANY MARKER, SANDSTONE tuffaceous; irregular interbedded contact at top - sharp, undulatory contact on bottom; few small tar seeps; undulatory layers within zone.
746				11.4			
747				10.6			
748			.80	9.6			(Irregular break at thin tuff layer)
749				12.5			
750				14.0			
751				34.3			
752				42.4			
753				21.4			
754				22.4			
755	-10		.90	21.8			(Irregular break in 0.10' tuffaceous zone)
756				23.0			
757				29.2			
758				39.4			
759			.90	33.5			MAHOGANY BED (?) OIL SHALE, grayish-black, very finely laminated, extremely high grade; slightly calcareous
760				43.2			761.0-762.5, alternating light & dark bands, varying from very fine to 1/8" thick; distorted bedding
761				63.6			763.0-763.8, NAHCOLITE, dissolution zone
762			.30.40	73.1			763.0-765.0, laminae dip 25°
763			.00.70	71.6			
764			.70.90	20.0			

Drilled 30.0 Ft.
Recovered 28.8 Ft.

736.00

23.5' Recovered **
(100%)

MISSING ZONE

COMMENTS: *Irregular breaks within tuff zone.

**Core was jammed in barrel - pulled at 759 ft. after approximately 24 ft. was cut.

DEPTH	+MM	FRX	PP	GAL/TON	CORE REC.	LITH.	DESCRIPTION
765	-20		.00	20	44.3		OIL SHALE, dark brown; high oil yield zone
766			.30		34.2		766.3-766.5 SANDSTONE, fine-grained, porous; yielding oil & H ₂ S
767					31.4		
768			.20		18.8		
769					40.8		
770					48.6		
771			.80		25.6		
772			.90		17.9		
773			.60		20.0		773.4-774.2 OIL SHALE, dark brown-black; high oil zone
774			.20	.25	47.1		SANDSTONE (0.1') tuffaceous, pale brown; irregular upper & lower boundaries; distorted bedding containing
775	-30		.50	.90	37.3		CALCITE, NAHCOLITE; oil & yielding H ₂ S
776			.00		38.5		SANDSTONE, irregular lens; as above at 774.2'
777					47.9		SILTSTONE (OIL SHALE), dark to light brown, fine to 1/8'
778					22.4		laminae, high oil content 775.5-779.5' & 783.5-786.0'
779					23.5		
780			.10	.60	24.6		SANDSTONE, tuffaceous, fine-grained (1/2" thick); distorted bedding within SANDSTONE & SILTSTONE
781			.75		23.6		
782					26.2		
783			.50		19.5		
784					18.6		
785	-40		.10		31.7		SANDSTONE, tuffaceous (1/2" thick); contorted upper & lower contacts; bedding distorted above
786					32.5		
787					15.1		
788			.00		9.8		
789					12.8	790.00	
790					13.4		OIL SHALE, brown-dark brown, medium grade
791					18.0		
792					34.6		
793					35.4		
794					28.6		
795	-50				22.1		
796			.40		23.0		
797					32.4		OIL SHALE, buff-light brown, low grade
798					30.4		
799					21.3		
800					20.0		
201			.40		13.6		
202			.00	.30	10.6		
203			.60		12.6		
204					14.1		
205	-60				10.1		0.10' SANDSTONE, tuffaceous; irregular layer
206			.50		9.7		
207					28.2		
208			.00	.20	8.7		
209			.40		4.1		
210					6.9		
211					20.7		
212			.00	.70	9.8		0.30' SANDSTONE, tuffaceous
713					7.5		OIL SHALE, medium brown, laminated
814					16.6		0.10' SANDSTONE, tuffaceous, irregular layer

Drilled 30.00 Ft.
Recovered 29.50 Ft.
Loss suspected to be at 759'7" to 760'1"

790.00

Drilled 30.00 Ft.
Recovered 30.08 Ft.

COMMENTS: Much H₂S while drilling (at 770'), pipes coated dark green-black as if copper plated.

THE CLEVELAND-CLIFFS IRON CO.

PROJECT: White River Shale ProjectHOLE NO. P-1 SHEET 5 OF 7 DATE: 10/5/74 LOGGED BY: Gentzler & Carnahan T.D. 940

DEPTH	+MM	FRX	PP	GAL/TON	CORE REC.	LITH.	DESCRIPTION
815	-70			33.7			
816				13.2			SHALE, light brown, low grade
817				18.5			
818				9.2			
819				5.6	820.00		
820				46.5			SHALE, brown, medium grade
821				13.8			
822			.10.20	8.0			
823			.40.90	4.1			
824			.00.20	3.4			
825	-80			4.2			
826				8.4			826.60-828.65; TUFF, sandy, contorted; contorted beds
827				23.0			indicate soft sediment deformation; contains a few thin,
828		20°		10.4			irregular shaly zones
829		20°		13.1			
830				14.9			
831				12.2			
832			.70	8.3			
833				5.2			
834				6.0			
835	-90			5.7			
836			.80	6.6			
837			.50	4.3			
838			.00	6.3			
839				8.1			
840				5.2			
841				5.7			
842				7.6			
843				10.1			
844				6.5			
845	-100			8.1			OIL SHALE, brown, medium grade
846			.20	11.4			0.20' SANDSTONE, tuffaceous
847			.20	10.4			SHALE, lean to medium grade
848				11.7	849.00		SHALE, medium grade
849				10.5			OIL SHALE - SILTSTONE, medium to dark brown, with fine to
850				9.5			thick laminations; medium to low grade
851				9.3			
852			.30	10.0			0.15' oil impregnated zone, coarse grained
853				9.4			
854				7.6			
855	-110		.40	5.4			
856				5.0			
857				7.5			
858			.40	8.0			858.25-858.40, oil impregnated zone; bleeding oil at upper
859			.60	7.4			contact
860		40/25°	.05	4.6			
861				2.1			
862			.45	5.3			
863				6.5			
864			.80	7.8			864.5-864.7 distorted bedding

COMMENTS:

HOLE NO. P-1 SHEET 6 OF 7 DATE: 10/6/74 LOGGED BY: Gentzler T.D. 940

DEPTH	+MM	FRX	PP	CAL/TON	CORE REC.	LITH.	DESCRIPTION
865	120		40.75	5.5			865.6-865.7, minor distortion of bedding
866			.60	2.2			
867				2.8			
868				3.2			SHALE - SILTSTONE, light to medium brown, very little
869			.00.25	2.7			color contrast; very finely laminated; very low oil
870			.20.30	2.7			content; very slightly calcareous
871				6.3			
872				6.3			
873				7.3			
874			.05	7.3			
875	130			10.2			
876				10.2			
877				29.1			
878				29.1			878.3; SANDSTONE lenses, tuffaceous, oil impregnated;
879			.35	10.6	879.90		distorted bedding immediately above & below them
880				10.6			
881			.95	16.8			SHALE - SILTSTONE, but medium to dark brown with higher
882			.00	16.8			oil content; some distorted bedding
883			.30.65	27.1			
884			.40	27.1			
885	140		.00.50	9.2			SANDSTONE, tuffaceous, slightly oil impregnated with good
886			.25.70	9.2			permeability; slightly calcareous, highly
887			.55	11.6			irregular lower contact
888				11.6			HEMATITE (?) 1/4" zone, black; parking plane at top
889				12.0			VOLCANIC ASH (?) soft, very fine grained; non-calcareous
890			.95	12.0			with minor amounts of PYRITE (very fine)
891			.40	4.9			888.1 oil saturated blebs, small with distorted bedding
892			.40.80	4.9			above & below
893			.20.80	4.7			
894				4.7			
895	150			9.7			891.45-891.60, BITUMEN zone
896			.45	9.7			
897			.35	11.9			SANDSTONE lens, tuffaceous; very irregular upper & lower
898				11.9			contacts; bedding undisturbed above & below
899				9.5			897.30-897.35 SANDSTONE, tuffaceous; oil impregnated zone
900				9.5			which bleeds oil
901				17.5			
902			.70.95	17.5			VOLCANIC ASH (?) zone of distorted bedding containing very
903			.05.20	7.5			irregular lenses of oil saturated, very fine grained
904			.80	7.5			material
905	160		.60.80	14.4			
906			.95	14.4			SHALE - SILTSTONE, light to dark brown, slightly calcareous
907			.25.45	8.6			low to medium oil content
908			.15	8.6			
909			.10	10.2	10.00		
910			.60	10.2			SHALE - SILTSTONE, low grade
911			.20	10.8			SHALE, dark brown, high grade
912				10.8			0.40' SANDSTONE, tuffaceous; irregular upper & lower
913				19.6			contacts
914				19.6			SHALE - SILTSTONE, buff-gray, low grade

Drilled 30.00 Ft.
Recovered 30.60 Ft.

COMMENTS:

PROJECT: White River Shale Project

HOLE NO. P-1 SHEET 7 OF 7 DATE: 10/6/74 LOGGED BY: Carnahan, T.D. 940

COMMENTS: