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CORE REPORT

Forest City Basin
20104 JV-P Boldridge #1

Sec 5 T7S R21E
Atchison Co., Kansas

Submitted To:
BTA Oil Producers
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BTA Oil Producers
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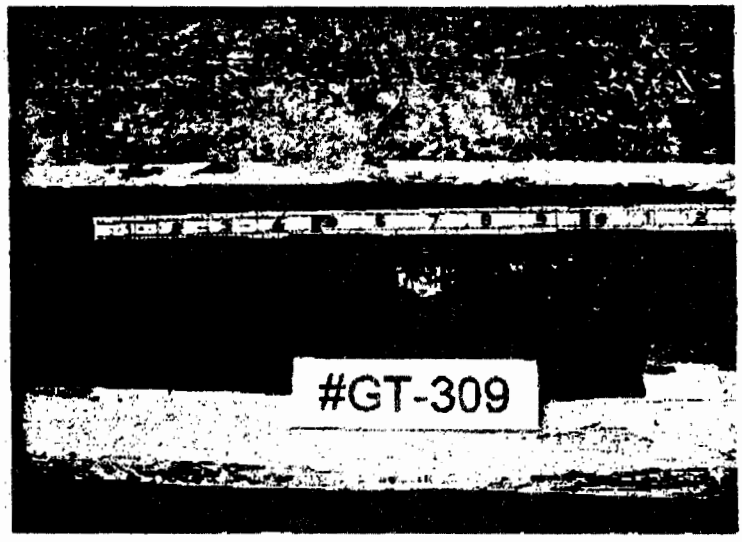
Core Report

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
1,124.0–1,139.8	Sandstone	Light gray-greenish gray, fine- to medium-grained, micaceous, mostly massive w/sparse irregular cross-bedding.
1,139.8-1,147.6	Siltstone/shale	Medium gray shale interbedded with buff siltstone; small-scale cross-bedding in siltstone; local shale beds to 0.5 feet.
1,147.6-1,163.1	Shale to silty shale	Medium to dark gray with buff silty beds up to 0.1', spherical to irregular nodules of pyrite up to 0.1'. 1,157.0-1,160.0: core-parallel fracture; 1,160.4-1,163.1: broken core.
1,163.1-1,167.0	**Weir Coal**	1,163.1-1,166.0: Dark gray to black carbonaceous shale with buff bands; weak visible desorption. **Canister GT-309: 1,166.0-1,167.0 – 0.8 feet of poorly cleated vitreous to greasy banded coal with traces of an unknown white mineral along some of the face cleats; 0.2' of brown siltstone with traces of coaly material (root zone ?). Sample exhibits weak visible desorption. Reservoir system thickness: 1,163.1 – 1,166.7 (3.6').**
1,167.0-1,174.0	Siltstone to sandstone	Siltstone grading to very fine-grained sandstone, brown immediately below coal (siltstone grading to light gray (sandstone). Carbonaceous plant debris on bedding-parallel breaks in sandstone; sandstone micaceous with traces of pyrite; locally calcareous.



1167-714
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BTA Oil Producers
20104 JV-P Boldridge #1
Core Report

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
1,174.0-1,177.5	Shale	Light green to medium gray with local maroon bands; locally up to 5% disseminated pyrite.
1,175.5-1,181.4	Shale	Light to medium gray, trace of pyrite, poker chip fractures.
1,181.4-1,189.5	Shale	Dark gray with small, irregular pyrite nodules; 1,183.2-1,189.5: irregular masses of limonite (oxidized pyrite nodules ?) both parallel & cross-cutting bedding.
1,189.5-1,190.8	Limestone	Medium gray to brownish gray, contains irregular clasts of dark gray shale; lower 0.4' appears brecciated with $CaCO_3$ matrix.
1,190.8-1,200.0	Shale to silty shale	Medium to dark gray, laminated; core broken, some slipped during run. 1,195.0-1,200.0: local pyritized plant debris. +/- 1,197.0: possible fault gouge.
1,200.0-1,201.0	Shale	Dark gray with buff siltstone interbeds
1,201.0-1,205.0	**Lost core.**	
1,205.0-1,209.3	Shale	Dark gray with buff siltstone interbeds
1,209.3-1,212.0	Shale	Medium to dark gray with thin calcareous bands, trace of pyrite.
1,212.0-1,212.9	Limestone	Black grading to dark gray at base, CaCO3 replacing fossil fragments.
1212.9-214 1221-22.63 1,212.9-1,222.6	Siltstone to sandstone	Medium gray siltstone grading to light brown sandstone at base, carbonaceous plant debris on broken bedding surfaces, locally pyritized. 1,216.3-1,220.5: darker gay with 3-5% disseminated pyrite. 1,220.5-1,222.6: brecciated in appearance; calcareous with decreased pyrite.
1,222.6-1,227.1	Sandstone	Light gray, fine-grained, calcareous with traces of disseminated pyrite.
1,227.1-1,233.0	Shale	Green to gray, trace amounts of pyrite (nodules), non-calcareous.
1,233.0-1,233.6	Shale	Black, 0.15' high angle pyrite vein (?), calcareous, high angle slickensides throughout.

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BTA Oil Producers
20104 JV-P Boldridge #1
Core Report

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
1,241.5-1,242.7	5 Claystone	Light brown to gray, soft, gummy.
1,242.7-1,245.8	4 Siltstone	Light green, sand grains distributed evenly throughout.
1,245.8-1,253.5	4 Siltstone	Light gray with black shale laminations, sandstone lenses (brown, medium to coarse grained) throughout.
1,253.5-1258.8	3 Sandstone	Light gray, fine-grained grading to coarse-grained at base, slightly calcareous.
1,258.8-1,259.5	1 Sandstone	Brown, coarse-grained, non-calcareous.
1,259.5-1,264.4	4 Siltstone	Light gray, fine-grained with sandstone laminations from middle to base.
1,264.4-1,268.9	Siltstone	Light gray, black shale laminations, non- calcareous.
1,268.9-1,271.6	Shale	Dark gray to black, poker chip fractures.
1,271.6-1,275.0	Shale	Black, soft, harder and siliceous to base, very fine-grained sandstone lenses through lower 0.6'. **Bleeding gas from 1,274.2-1,275.0**
1,275.0-1,278.1	Sandstone	Black to dark gray becoming lighter toward base, carbonaceous laminations in upper 0.5', slightly calcareous.
1,278.1-1,281.2	Sandstone	Light gray, medium-grain, shale laminations becoming more abundant to base.
1,281.2-1,284.0	**Lost Core**	
1,284.0-1,287.5	Siltstone	Dark gray, fine-grained sandstone lenses/laminations, carbonaceous laminations occurring through lower section.
1,287.5-1,288.5	**Krebs Coal**	**Canister GT-322** contains 0.5' of banded coal with well-developed cleat and 0.5' of dark gray siltstone. Coal partial rubblized with moderate visible desorption. **Reservoir system: 1,288.0-1,288.5'**

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BTA Oil Producers
20104 JV-P Boldridge #1
Core Report

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		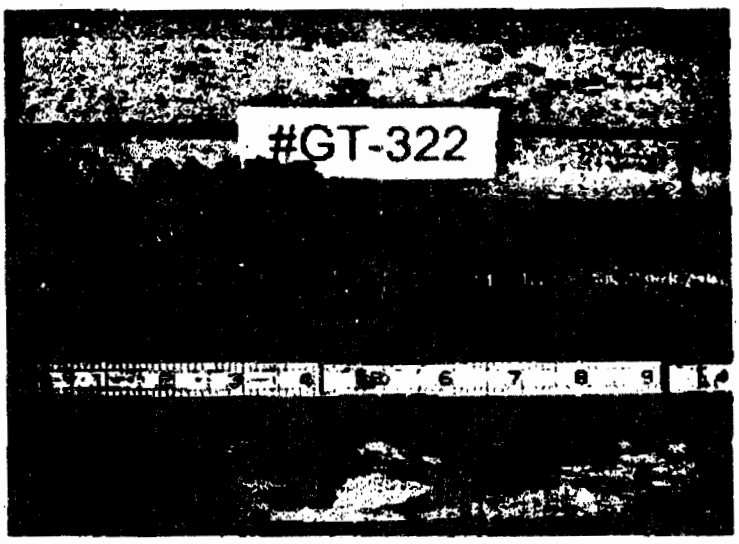
1,288.5-1,292.2	Sandstone	Light gray, very fine-grained, carbonaceous laminations in upper section, black shale laminations in lower section, becoming calcareous toward base.
1,292.2-1,294.3	Shale	Dark gray to black, poker chip fractures, high angle slickensides.
1,294.3-1,296.9	Shale	Black, siliceous, 0.2' bed with shell clasts at top, lower 0.6' more siliceous w/abundant shell clasts, non-calcareous.
1,296.9-1,297.2	Siltstone	Dark gray, coaly laminations.
1,297.2-1,299.6	**Krebs Coal**	**Canister GT-373**: (1,297.2-1,298.2) and **Canister GT-374** (1,298.2-1,299.2) each contains 1.0' of banded, well-cleated coal with traces of an unknown white mineral along some of the face cleats, fibrous mineral on parting surfaces replaced by pyrite. 1,299.2-1,299.6 becoming silty to base. **Reservoir thickness: 2.4 feet**

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BTA Oil Producers
20104 JV-P Boldridge #1
Core Report

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1,299.6-1,310.8	Siltstone	Light gray, carbonaceous laminations from middle to base, bands of pyrite (parallel to bedding) occurring through lower 0.6'.

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20104 JV-P Boldridge #1
Core Report

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
1,310.8-1,311.8	Siltstone	Light gray, fine-grained sandstone with black shale laminations, carbonaceous laminations occurring through lower 0.5'.
1,311.8-1,312.7	**Coal**	Banded with a dull luster, (2 mm vitrain bands throughout), 2 cleat orientations (60°), sparse white clay lenses, extensive white mineralization (non-$CaCO_3$) on cleat surface, pyrite replacement of detrital plant material.
1,312.7-1,315.1	Shale	Light gray to light brown, carbonaceous laminations, 45° slickensides throughout.
1,315.1-1,316.0	Shale	Black, coaly laminations.
1,316.0-1,316.1	**Coal**	Banded with dull luster, 2 cleat orientations, extensive white mineralization (non-$CaCO_3$) on cleat surface. ***visible desorption** 1,315.9-1,316.3 feet
1,316.1-1,316.5	Shale	Black, coaly laminations.
1,316.5-1,323.9	Siltstone	Light gray, extensive pyrite bands and nodules throughout. High density black shale from 1,323.6-1,323.9 (horizontal and vertical fractures healed with white non-$CaCO_3$ mineral).
1,323.9-1,324.6	**Coal**	Banded dull luster, poor cleat development, cleat spacing > 1", white non-$CaCO_3$ mineral filled fracs (powdered when scratched with knife), weak visible desorption.
1,324.6-1,325.2	Shale	Dark gray, siliceous.
1,325.2-1,329.5	Siltstone	Dark gray w/ light gray, fine-grained sandstone lenses/laminations.
1,329.5-1,368.3	Siltstone	Dark gray to black, light gray fine-grained sandstone laminations throughout, black shale laminations occurring more frequently to base. ***visible desorption** form vitreous laminations: 1,353.5-1,354.2; 1,354.9-1,355.2
1,368.3-1,370.5	Siltstone	Dark gray, sparse black shale laminations.

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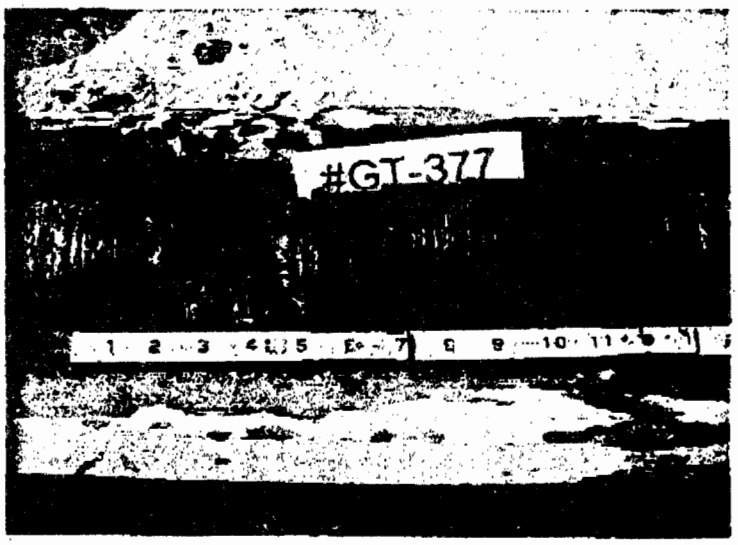
BTA Oil Producers
20104 JV-P Boldridge #1
Core Report

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
1,370.5-1,371.5	Shale	Light gray, siliceous, light gray fine-grained sandstone bed (1 mm-10 mm) throughout.
1,371.2-1,372.2	**Above Rowe Coal**	**Canister GT-377** (1,371.2-1,372.1) contains 0.5' of dark gray carbonaceous shale with coaly lenses, 0.3' of poorly cleated coal with conchoidal fracture and greasy luster, and 0.2 feet of carbonaceous shale as above. Weak visible desorption from both coal and carbonaceous shale.
		
1,372.2-1,374.5	Shale	Light gray, siliceous, pyrite replacement of plant debris, high angle slickensides.
1,374.5-1,376.8	Shale	Black, poker chip fractures.
1,376.8-1,381.1	**Rowe Coal**	**Canisters GT-269** and **GT-388*** (1,376.8-1,377.8 & 1,378.8-1,379.8 respectively) each contain 1.0' of coal with poor to moderate cleat development, greasy to sub-vitreous luster and traces of pyrite. Trace of white mineralization (non-CaCO3) on cleat in GT-385.

*The sample from canister **GT-385** was re-sealed in canister **GT-388**.

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BTA Oil Producers
20104 JV-P Boldridge #1
Core Report

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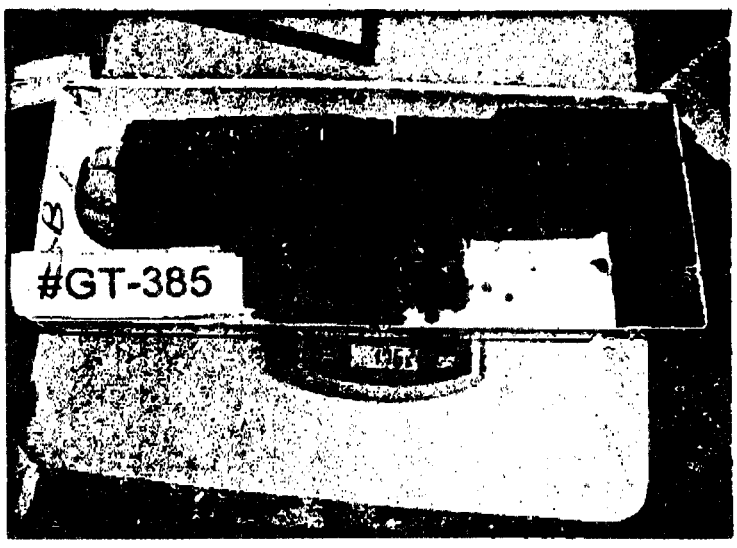

Canister GT-371 consists of 1.0' of coal with thin bands of carbonaceous shale. Coal is banded, greasy to sub-vitreous with two cleat orientations (30°), cleat spacing - 5 mm, trace white mineralization (non-$CaCo_3$), trace pyrite.

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BTA Oil Producers
20104 JV-P Boldridge #1
Core Report

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		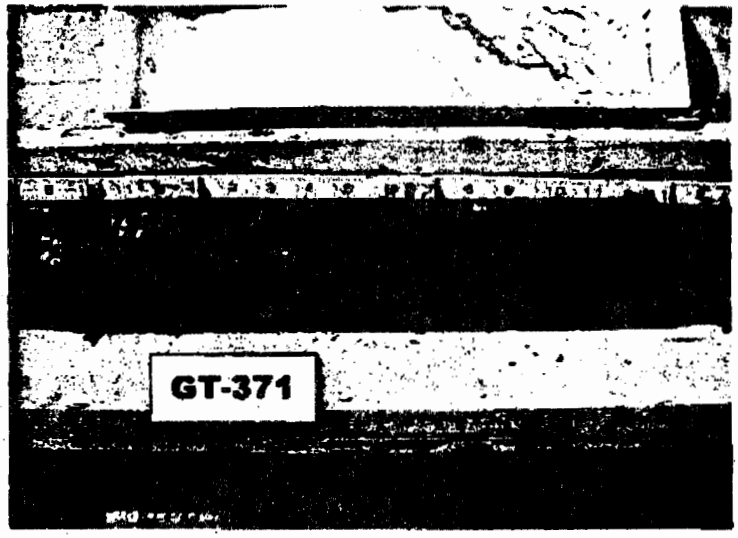
		The remaining 1.3 feet of coal was not sampled.
		Total thickness of the Rowe reservoir system is **4.3'**. All 4.3' displayed weak visible desorption. The Rowe Reservoir system is overlain and underlain by gray shale.
1381.1-1340.0	**Depth Correction**	During coring Layne Christensen discovered an error in the pipe tally. As a result a 40-foot depth correction was made. The depth at the time the error was discovered was 1,383.0 feet, which was changed to 1,343.0 feet. **All depths above this point are uncorrected.**
1,340.0-1,353.9	Shale	Light gray to light brown, grading to gray siltstone to base, sparse carbonaceous laminations.
1,353.9-1,355.4	Siltstone	Light to dark gray, coaly laminations (<5mm), pyrite replacing carbonaceous plant debris.
		* **visible desorption** 1,353.9-1,354.6 feet
1,355.4-1,359.1	Siltstone	Dark gray w/ light brown interbeds, coaly laminations (2-3 mm) throughout, fine-grained sandstone laminations occurring more frequently at top.
1,359.1-1,362.4	Siltstone	Dark gray, black shale laminations thinning and decreasing to base.

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BTA Oil Producers
20104 JV-P Boldridge #1
Core Report

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
1,362.4-1,363.8	Shale	Black, poker chip fractures, light gray, fine-grained sandstone laminations and lenses, trace pyrite, slightly siliceous.
1,363.8-1,367.1	Sandstone	Light gray, very fine-grained, low-angle natural fracture (no offset).
1,367.1-1,378.5	Sandstone	Light gray, fine-grained with black shale laminations throughout.
1,378.5-1,399.7	Shale	Black, poker chip fractures, trace pyrite on bedding, 0.2' pyrite band at 1,380.0' (parallel to bedding).
1,399.7-1,401.7	**Riverton 'C' Coal**	**Canister GT-389** (1,399.7-1,400.7) contains 0.3' of carbonaceous shale and 0.7'of banded coal. Coal has vitreous luster and fairly well developed cleat. Cleat spacing is approximately 1 cm. and is vertically extensive. Face cleats partially filled with white non-$CaCO_3$ mineral.

GT-394 (1,400.7-1,401.7) contains approximately 1.0' of rubblized coal. Coal is as above.

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Core Report

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		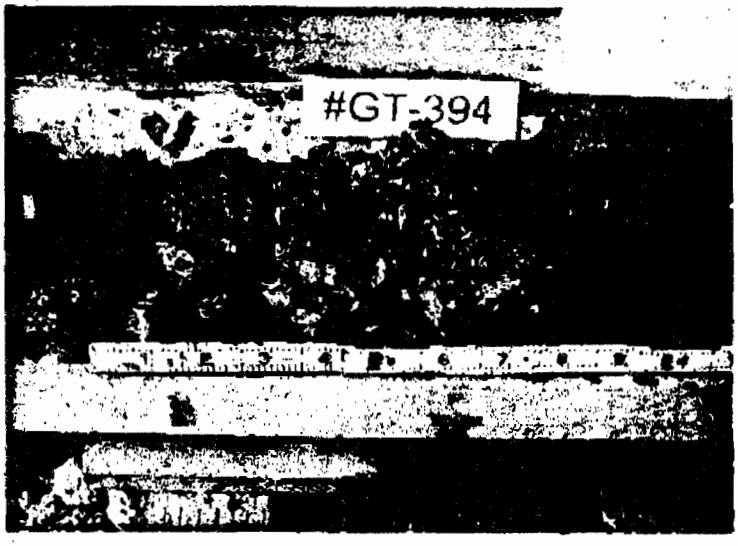 **Total reservoir thickness is 2.0 feet.** Riverton 'C' coal seam is overlain by black shale w/ siltstone laminations.
1,401.7-1,405.9	Shale	Light gray to light brown, low angle slickensides.
1,405.9-1,408.5	Shale	Black to dark gray, soft, gummy, large pyrite nodule at 1,406 5'.
1,408.5-1,412.6	Shale	Light gray, siliceous, carbonaceous plant material on bedding planes.
1,412.6-1,417.4	Siltstone	Light gray, fine-grained pyrite nodules increase toward base.
1,417.4-1,418.0	Shale	Light gray to light brown, horizontal slickensides.
1,418.0-1,422.5	Shale	Light gray to light brown grading to black.
1,422.5-1,434.1	Shale	Black, soft, gummy, slightly siliceous, pliable.
1,434.1-1,435.3	Shale	Black, hard, fissile w/conchoidal fracture surfaces, light gray to white sandstone laminations increase toward base.
1,435.3-1,437.5	Shale & Siltstone	Black shale grading to siltstone w/large sandstone lenses (fine-grained, light gray to white).
1,437.5-1,442.6	Shale	Black, soft, gummy, pliable, trace pyrite on bedding.

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BTA Oil Producers
20104 JV-P Boldridge #1
Core Report

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1,442.6-1,446.3	Shale	Light to dark gray, hard.
1,446.3-1,449.0	Shale	Dark gray, soft, gummy, pliable.
1,449.0-1,469.8	Shale	Black to dark gray, hard, poker chip fractures.
1,469.8-1,476.2	Sandstone	Light gray, fine-grained with silty and shaley laminations, large pyrite band at 1,473.7, pyrite nodules throughout, minor organic laminations at base.
1,476.2-1,477.0	Sandstone	Light gray to white, medium- to fine-grained, mud filled burrows (brown), amber colored trace mineral (resin?), trace pyrite throughout, white powdery mineral on burrow fracture surfaces.
1,477.0-1,480.6	Siltstone	Dark gray, w/white, fine-grained sandstone laminations.
1,480.6-1,482.5	Siltstone	Dark gray.
1,482.5-1,484.5	Sandstone	Light brown to gray, coarse-grained, pyrite nodules (upper 6"), very porous.
1,484.5-1,487.4	Siltstone	Dark gray, w/white, fine-grained sandstone laminations in upper 12", calcareous throughout.
1,487.4-1,494.2	Shale	Dark gray, silliceous, poker chip fractures, brown silty beds (1") through middle.
1,494.2-1,496.3	Shale	Dark gray, soft, gummy, pliable.
1,496.3-1,500.3	Sandstone	Dark gray, medium-grained, trace pyrite nodules, light gray fine-grained sandstone lenses / laminations throughout (decreasing toward to base).
1,500.3-1,504.2	Sandstone	Light gray to white, fine- to medium-grained, organic laminations throughout.
1,504.2-1,505.3	Sandstone	Light gray to light brown, fine-grained, red to orange nodule at base, slightly calcareous at base.
1,505.3-1,507.5	Sandstone	Light gray to white, fine- to medium-grained, sub-vertical fracture (healed w/white non-$CaCO_3$ mineral).

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Core Report

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1,507.5-1,512.0	Limestone	White, micritic, non-fossiliferous, stylolites common throughout, minor black shale laminations at base, vertical fracture healed w/ pyrite.
		Coring TD = 1,512.0'