

LITHOLOGIC DESCRIPTION OF USBM ROCK SPRINGS PROJECT WELL NO. 5-3
NENWNE Sec 15 T18N R106W SWEETWATER COUNTY, WYOMING

November 15, 1966

by

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Footage	Description
15.0-16.5	Shale, oil, light to medium greenish-gray with scattered crystals of fresh water carbonates.
16.5-17.1	Shale, oil, light olive drab to light gray, occasional crystallization.
17.1-18.0	Shale, oil, light to medium gray, lean, silty
18.0-18.2	Sandstone, tan to gray, fine-grained, salt and pepper appearance, slight porosity.
18.2-18.6	Shale, oil, light olive drab to medium brown, scattered crystals of carbonates.
18.6-18.9	Shale, oil, light brown to light olive, banded and varved with tan limestone streaks.
18.9-20.0	Shale, oil, light gray to medium grayish-brown, scattered crystals.
20.0-20.6	Shale, oil, medium grayish-brown to light olive drab, occasional mineral crystals.
20.6-22.6	Shale, oil, medium to dark gray with occasional streak of olive green.
22.6-22.9	Shale, oil, light gray to medium brownish-gray, banded, scattered crystals.
22.9-23.8	Shale, oil, light, medium, and dark gray, silty, dense in part, crystals in basal 2", some limestone inclusions.
23.8-24.3	Shale, oil, medium gray-green and olive drab, slight crystallization.
24.3-30.8	Shale, oil, light gray to tan, with thin sandstone zone at 25.4 and 30.1 feet, crystalline calcite zones and veinlets at 25.8-25.9 feet and 30.6 feet. vertical calcite veinlets between 27.1 and 27.4 feet.
30.8-31.6	Shale, oil, medium to dark grayish-brown, some calcite crystal groups, occasional thin limestone streaks.
31.6-32.4	Shale, oil, medium gray to dark brownish-gray, silty, some light brown streaks, limey to dolomitic, crystals more abundant.
32.4-33.1	Shale, oil, medium gray to olive drab.
33.1-38.2	Shale, oil, light to medium gray and some zones of olive drab, calcite veinlets as beds and as fracture fill.
38.2-41.5	Shale, oil, olive drab with streaks of medium gray, several zones of carbonate crystallization.
41.5-41.7	Shale, oil, dark greenish-gray banded with tan to buff shale, silty, dolomitic.
41.7-43.6	Shale, oil, olive green to gray, some calcite veinlets, occasional limestone inclusion.
43.6-44.2	Shale, oil, light gray with zones of grayish-brown, silty in part, streaks of crystallization.

Footage

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44.2-44.5	Shale, oil, olive drab, abundant calcite veinlets.
44.5-45.8	Shale, oil, light gray, silty, calcite veins along bedding planes.
45.8-46.9	Shale, oil, light to medium gray, both thinly and broadly banded with occasional horizontal zones of calcite crystals.
46.9-49.5	Shale, oil, medium gray to greenish-gray, slightly silty in part, some thin limestone layering.
49.5-51.6	Shale, oil, light to medium gray to grayish-green, silty and sandy, rare limestone streaks.
51.6-52.4	Shale, oil, medium to dark gray, thinly banded, abundant scattered crystals, probably carbonates.
52.4-52.9	Shale, oil, dark gray to sooty black, abundant crystallization.
52.9-53.6	Shale, oil, medium greenish-gray to gray, abundant crystals, pods of dolomitic or limey shale.
53.6-55.2	Shale, oil, same as above but distinctly banded with light dolomitic shale layers, calcite crystals and some pyritic crystals deposited in fractures below 54.3 feet.
55.2-55.7	Shale, oil, light to medium gray, some tan, calcite and pyrite as above.
55.7-60.0	Shale, light gray with occasional olive drab to tan zones, sandy and silty in part, abundant calcite crystallization, trace of pyrite, banded and contorted 59.7-60.0 feet.
60.0-60.9	Shale, oil, light gray with dolomitic shale thin bands and inclusions, silty in part, sandy zone 60.7-60.9 feet.
60.9-62.9	Shale, oil, medium to dark gray with some olive drab, zones of carbonate crystallization common.
62.9-63.9	Shale, oil, medium gray to grayish-green.
63.9-68.7	Shale, oil, medium to dark gray with some sooty black, some dark gray-green zones contain crystals.
68.7-71.2	Shale, oil, light to medium grayish-green with scattered crystals and zones and veinlets of crystals.
71.2-78.3	Shale, oil, medium gray, dull, partly varved below 73.1 feet, zones of crystallization at 76.2-76.5 feet and 77.1-77.2 feet.
78.3-81.4	Shale, oil, same as above but darker gray, varved.
81.4-81.8	Ash, siltstone, fine-grained sandstone, white to cream to tan and some gray shale partings, fractured, slightly porous.
81.8-83.5	Shale, oil, medium greenish-gray to olive, abundant carbonate crystals, occasional inclusions and beds of limey to dolomitic tan shale.
83.5-88.3	Shale, oil, dark gray to black, some varves.
88.3-92.2	Shale, oil, greenish-gray with abundant crystals to dark brown and black with no crystals.
92.2-93.7	Shale, oil, dark gray to sooty black, a gray-green band at 93.2 feet.
93.7-93.9	Sandstone, maroon to dark red with yellow staining fine-grained, slightly porous, minor oil staining.
93.9-94.2	Shale, oil, dark gray, finely varved with tan dolomitic shale.
94.2-95.2	Shale, oil, dark gray to sooty black.
95.2-95.9	Shale, oil, medium brown and dark gray, thickly banded.
95.9-96.0	Sandstone, gray to buff, fine-grained, fractured, slightly vuggy with fair porosity, some oil stain.

Footage	Description
96.0- 98.0	Shale, oil, dark gray to sooty black, banded with brown, zone of crystallization from 96.5-96.6 feet.
98.0- 98.3	Sandstone, pink, tan and maroon, fine-grained, slight oil stain, some porosity, marker bed (M-bed).
98.3- 98.6	Shale, oil, dark brown to sooty black, banded.
98.6- 99.8	Shale, light to dark brown thickly banded with medium to dark gray.
99.8-100.1	Shale, oil, tan to medium brownish gray, a gray sandstone, very fine-grained has been injected into brown shale at 100.0 feet.
100.1-101.2	Shale, oil, brown to dark gray, banded and varved, contorted, some thin stingers and inclusions of limey shale, occasional veinlets of carbonate crystals.
101.2-101.4	Ash, sandstone, siltstone, gray with streak of bluish limestone, fractured.
101.4-102.4	Shale, oil, dark gray to sooty black with dark brown limestone inclusions.
102.4-102.9	Shale, oil, medium gray to olive drab.
102.9-103.0	Ash, siltstone, sandstone, white to light gray to dark gray, fractured, porous, oil-stained.
103.0-104.0	Shale, oil, gray and tan to greenish-gray, thickly banded.
104.0-106.3	Shale, oil, broadly banded tan and light to medium gray.
106.3-107.0	Shale, oil, light gray, conchoidal fracturing.
107.0-108.1	Shale, oil, medium gray, dense with grayish-brown limestone zone, finely crystalline at 107.5-107.6 feet.
108.1-109.4	Shale, oil, abundantly varved, light, medium and dark gray shale with numerous tan and brown dolomitic shale inclusions.
109.4-109.6	Dolomite, buff to light brown, very finely crystalline, sandy, with thin dark gray shale partings on top and bottom of bed.
109.6-111.4	Shale, oil, medium to dark gray with contorted and injected brown and light gray shale to 111.0 feet. Band of tan to brown shale 111.3 feet.
111.4-112.2	Shale, oil, dark gray to sooty black, featureless.
112.2-112.3	Shale, oil, buff, dolomitic with hairline fractures.
112.3-114.4	Shale, oil, medium greenish-gray to black, broadly banded with tan to brownish-green shale, dolomitic, slightly fractured.
114.4-114.6	Dolomite, buff, finely crystalline, slightly sandy, oolitic in part considerable porosity, fair permeability with minor gray shale partings.
114.6-115.7	Shale, oil, black and dark gray, banded with tan to greenish-gray shale, dolomitic.
115.7-115.9	Shale, oil, olive drab to dark gray, injected with light to medium gray, fractured.
115.9-116.2	Shale, oil, dark gray to black with thin layers of light sandy shale and a brown limestone pod at 116.0 feet.
116.2-116.3	Sandstone, white to gray, salt and pepper appearance, ash and silt, tuffaceous, fine-grained, porous.
116.3-118.6	Shale, oil, light gray, olive green, black, very finely varved with tan to buff shale layers, calcareous.

Footage	Description
118.6-119.3	Shale, oil, tan to medium gray, finely varved as above with minor vertical fracturing. Light gray, fine-grained porous sandstone at 118.6 feet and 2 thin zones at 118.8-118.9 feet.
119.3-119.9	Shale, oil, medium to dark gray and black with several bands of tan dolomitic shale.
119.9-121.3	Shale, oil, tan to brown, finely varved with brownish-gray zone at 121.0-121.1 feet.
121.3-122.2	Shale, oil, medium to dark grayish-brown, varved with some black.
122.2-122.8	Sandstone, white to gray, very fine to fine-grained, chalky and silty, salt and pepper appearance in lower half porous and permeable, some vertical fracturing.
122.8-123.3	Shale, oil as in 121.3-122.2 feet.
123.3-123.5	Limestone, brownish-gray, finely crystalline, dense occasional shale parting.
123.5-124.5	Shale, oil, olive drab to dark gray with several bands of tan to brown shale.
124.5-124.9	Shale, oil, dark gray to black.
124.9-125.6	Shale, oil, tan, slightly dolomitic, silty, interbedded with thin, light to medium gray shale beds. From 125.5-125.6 feet, dark olive shale.
125.6-126.0	Sandstone, light gray, fine grained, salt and pepper appearance, chalky, tuffaceous (?), bottom is injected into underlying oil shale.
126.0-126.8	Shale, oil, medium brownish-gray, finely varved with tan shale.
126.8-127.3	Shale, oil, dark brownish-gray to black.
127.3-128.2	Shale, oil, dark shale and tan dolomitic shale very finely varved becoming light gray at 128.0 feet.
128.2-129.1	Shale, oil, medium gray, occasional fish scales.
129.1-129.5	Shale, to mudstone, buff, tan, very silty, porous, minor fracturing.
129.5-130.4	Shale, oil, light gray to medium greenish-gray with thin gray sandstone layers, dirty, fine-grained, calcareous.
130.4-130.9	Shale to mudstone as 129.1-130.5 feet.
130.9-131.1	Shale, oil, medium grayish-green.
131.1-131.2	Limestone, tan to gray, completely fossilized zone abundant fish scales, some carbonaceous material.
131.2-131.7	Siltstone, brown, sandy and sandstone, gray, fine-grained, porous, very calcareous.
131.7-131.9	Shale, light gray, finely banded with medium gray shale.
131.9-132.1	Shale, oil, medium grayish-brown, highly fossiliferous, fish scales, calcareous.
132.1-133.5	Shale, oil, gray, green with injected zones and bedded sandstone, gray fine-grained, very shaley calcareous, slightly fossiliferous.
133.5-133.9	Shale, oil, dark gray.
133.9-135.2	Shale, oil, light to medium gray, very silty to sandy, broadly banded.
135.2-136.3	Shale, very finely varved, dark gray to black and tan with pods of tan shale as inclusions. Black shale zone at 135.4 feet.

Footage	Description
136.3-137.5	Shale, oil, banded, shades of light to medium gray and tan, very calcareous with occasional pods of light tan shale.
137.5-137.8	Shale, oil, sooty black with gray shale layer at 137.6 feet.
137.8-142.9	Shale, oil, tan and light brown, banded with shale, light to medium gray, long vertical fracture from 141.7-142.9 feet.
142.9-143.7	Shale, oil, medium to dark gray, finely banded, light gray zone 143.4-143.6 feet.
143.7-144.6	Shale, oil, light to medium gray, finely banded occasional pods of tan dolomitic shale, calcareous.
144.6-146.6	Shale, oil, tan, light brown, medium brown and brownish-gray, finely banded, very calcareous.
146.6-152.9	Shale, oil, as above but broadly banded and becoming grayer with depth, light to some medium and dark gray below 151.0 feet. Soft shale zones at 148.1 and 149.4 feet.
152.9-155.5	Shale, oil, dark gray, finely varved with cream to tan, dolomitic shale with pods of the same tan shale. Black shale 154.1-154.2 feet.
155.5-155.8	Shale, oil, tan and buff, chalky, dolomitic with dark shale band 155.7 feet.
155.8-156.0	Shale, oil, medium to dark greenish-gray with occasional thin tan bands of shale.
156.0-156.3	Shale, oil, medium gray to greenish-gray.
156.3-161.8	Shale, oil, broad bands of alternating light gray to grayish-green and medium to dark gray. Injected gray sandstone stringers at 156.4 and 159.6 feet, slightly pyritic.
161.8-163.9	Shale, oil, medium to dark brownish-gray with occasional bands in lower 0.5 feet.
163.9-164.1	Shale, oil, tan, dense, slightly dolomitic.
164.1-164.4	Shale, oil, brownish-gray to greenish-gray.
164.4-164.6	Shale, oil, grayish-green, injected with abundant crystalline limestone, tan to brown with cast-like appearances in shale.
164.6-166.0	Shale, oil, medium to dark brownish-gray.
166.0-166.3	Shale, oil, tan, dense, dolomitic silty.
166.3-166.6	Shale, oil, as in 164.6-166.0 feet.
166.6-169.5	Shale, oil, light to dark brown, varved, some shades of gray.
169.5-170.2	Shale, oil, tan dense silty, slightly dolomitic, with minor dark shale partings.
170.2-171.4	Shale, oil, dark gray to black banded in strong contrast with tan to buff shale layers chalky and silty.
171.4-173.1	Shale, oil, medium to dark brownish-gray with occasional light grayish-tan bands.
173.1-174.1	Shale, oil, tan to buff and shades of brown banded with some medium gray and black shale.
174.1-174.2	Limestone, brown and gray, crystalline, dense, in association with gray shale.
174.2-174.4	Shale, oil, as 173.1-174.1 feet.
174.4-174.5	Shale, gray to steel-blue with some tan zones, with dark gray ash, distorted, fractured.

Footage	Description
174.5-175.0	Shale, oil, medium to dark gray with steel gray silty ash bed at 175.0 feet.
175.0-175.2	Shale, oil, tan to brown, dense with horizontal dark shale layers, minor fracturing.
175.2-176.4	Shale, oil, medium to dark gray, faintly, varved injected brown shale 175.2-175.4 feet.
176.4-176.7	Shale, oil, tan to medium brown, silty, slightly dolomitic.
176.7-177.3	Shale, black with sandy tan shale zone from 176.9-177.0 feet.
177.3-179.1	Shale, oil, medium gray to dark gray with thin tan sandy shale zones at 178.6, 178.7, and 178.9 feet.
179.1-180.0	Shale, oil, tan and buff to medium brownish gray with occasional dark gray shale layers.
180.0-180.3	Shale, oil, medium to dark gray injected with sandstone and siltstone, white, creamy and tan, fine-grained.
180.3-180.9	Shale, oil, dark gray to black, injected with same sandstone as above.
180.9-181.6	Shale, oil, dark gray to sooty black.
181.6-181.8	Sandstone, buff, fine-grained, slight porosity.
181.8-182.7	Shale, oil, as in 180.9-181.6 feet.
182.7-183.6	Shale, oil, light to medium gray and dark gray, banded.
183.6-184.0	Sandstone, very fine-grained with siltstone and marlstone, tan, buff and light brown.
184.0-186.1	Shale, oil, black with bluish-black zone at 184.5-184.6 feet.
186.1-186.3	Shale, tan to buff, silty with occasional hairline fractures.
186.3-186.6	Shale, oil, black.
186.6-186.7	Shale, tan to brown; upper part is brown with thin lenses of black shiny residue, similar to gilsonite, lower part tan, silty, slightly fossiliferous.
186.7-187.1	Shale, oil, bluish-gray, earthy, crumbles easily, slightly fossiliferous.
187.1-187.4	Shale, oil, upper layer is light to medium gray, lower layer is grayish-brown to dark gray, finely laminated and a thin sooty black basal zone.
187.4-187.7	Shale, oil, cream to tan, dense, earthy, slightly dolomitic, zone of light gray shale at 187.4 feet.
187.7-189.8	Shale, oil, dark gray to black with soft earthy zone at 188.1-188.2 feet.
189.8-190.5	Shale, oil, medium to dark gray, silty, fractured, and injected with minor dark gray to black shale streaks.
190.5-190.7	Shale, oil, tan, buff, earthy, with slightly weathered zone containing iron stain in upper half.
190.7-190.8	Shale, oil, medium to dark gray.
190.8-191.8	Sandstone, bluish-gray, fine-grained, grading downward to tan and buff.
191.8-192.3	Sandstone, light and medium gray, some buff, fine-grained, sub-rounded, porous in part, very calcareous, with minor gray shale.

Footage	Description
192.3-193.1	Shale, medium gray and streaks of dark gray, very calcareous, sandy, fossiliferous, two sandy zones in 193.0-193.1 feet.
193.1-193.2	Calcarenite, buff to light gray, sandy, porous, micro-fossiliferous.
193.2-193.7	Shale, buff, tan, light gray, calcareous and sandy in part.
193.7-193.9	Sandstone, gray, fine-grained, sub-angular; porous, very calcareous, occasional fish scales.
193.9-194.2	Shale, finely banded light and medium and dark gray, sandy, calcareous, fossiliferous.
194.2-194.3	Shale, tan, slightly sandy, some porosity.
194.3-194.4	Shale, medium gray, sandy, calcareous, slightly fossiliferous.
194.4-194.5	Calcarenite and coquina, almost entirely fossils with minor amounts of gray to tan shale, carbonaceous fish scales.
194.5-195.1	Shale, light to medium gray, tan, with horizontal zonations of dark gray blebs, very calcareous, slightly fossiliferous.
195.1-195.9	Shale, medium gray and dark tan, abundant micro and macro-fossils (est. 25%) mostly as shell remnants, highly calcareous.
195.9-196.6	Shale as above, but with a larger percentage of fossils (est. 30%-45%).
196.6-197.3	Shale as above, but with even larger percentage of fossils (est. 60%-65%).
197.3-197.6	Limestone, gray, very finely crystalline, dense fossiliferous.
197.6-200.0	Shale, medium gray, calcareous, fossils common and abundant in horizontal zones or layers.
200.0-202.7	Shale as above with zones of brown shale, slightly fewer fossils.
202.7-203.3	Shale, tan and light gray, dense, very calcareous, occasional fossils, some inclusions of tan crystalline limestone.
203.3-204.4	Limestone, gray, tan, very fine to medium crystalline highly fossiliferous, with abundant concentrations of tan to brown, resinous limestone.
204.4-205.4	Shale, oil (?), light to medium gray, dense, calcareous, occasional fossil, sandy in zones from 204.8-205.3 feet.
205.4-205.7	Sandstone, light gray to medium grayish-brown, fine-grained, porous, calcareous, banded with shale, brown to dark brown, sandy, occasional fossils.
205.7-206.1	Coquina, abundantly fossiliferous with minor shale matrix filling.
	Base of Green River Formation--top of Wasatch Formation at 206.1 feet.
206.1-207.0	Shale, grayish-green, sandy, slightly fossiliferous, occasional single crystals.