

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY^{1/}

Core samples from U.S. Bureau of Mines Wyoming Corehole 5 drilled in 1972 in NE1/4SW1/4 (1,195 ft. S of N line and 1,556 ft. E of W line in irregular section) of sec 3, T 24 N, R 107 W, Sweetwater County, Wyoming.

Surface elevation: 6,611.4 feet
Cored interval: 330 to 779 feet

| From | To | Description |
|---------------------------------------|-------|---|
| LANEY MEMBER OF GREEN RIVER FORMATION | | |
| 330.0 | 349.9 | Siltstone and mudstone: Light to medium slightly olive and brownish gray (5 to 2.5Y 6/1 and 6/2-5/1), calcareous. Faint very distorted to regular streaked bedding and some laminae. Irregular thick parting; irregular to fairly regular fracture. Few zones with fairly abundant fine carbonaceous flecks in upper part. |
| 349.0 | 351.1 | Mudstone: Light to medium brownish gray (2.5Y 6/2 and 6/1-5/2 and 5/1, rare 4/1), slightly to moderately calcareous. Faintly streaked to laminated. Irregular thick parting; slightly irregular fracture. |
| 351.1 | 353.3 | Mudstone: Medium to some light brownish gray (2.5Y 5/2 and 5/1-4/1, some 6/2-6/1), calcareous. Faint to moderately distinct laminae; distorted and displaced at 351.8-352.2. Irregular thick to medium parting; slightly irregular fracture. Abundant ostracods in some parts. |
| 353.3 | 356.0 | Mudstone: Medium to some light and rare dark olive gray (5Y 5/2 and 5/1 upper part, 4/1-6/2 and rare 3/1 lower part), calcareous. Very faint streaked bedding in upper part; faint to distinct distorted streaks and stringers in lower part. Fairly regular to irregular thick parting; irregular to fairly regular fracture. Gray silty limestone with some brownish-gray mudstone laminae in upper 0.3 foot; grayish-brown to buff oolitic limestone at 355.6-355.8. |
| 256.0 | 360.1 | Siltstone and mudstone: Light to medium slightly olive to brownish gray (5Y 6/1-5/1 upper part to 2.5Y 5/1 lower part), calcareous. Very faintly streaked to massive. Irregular thick parting; irregular to fairly regular fracture. Rare fine carbonaceous flecks. |
| 360.1 | 360.3 | Missing. |

^{1/} By L. G. Trudell, completed June 27, 1974.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| 360.3 | 366.0 | Siltstone and mudstone: Medium to light brownish gray (2.5Y 5/1 and 5/2-6/2), calcareous. Faintly streaked to massive. Irregular thick parting; regular to some irregular fracture. |
| 366.0 | 367.7 | Mudstone: Medium and rare light brownish gray (2.5Y 5/2 and 5/1-4/1, rare 6/2), calcareous. Faintly streaked to massive; distorted and displaced bedding in lower part. Irregular thick parting; fairly regular to irregular fracture. Faintly streaked brownish-gray shaly marlstone at 366.9-367.1. |
| 367.7 | 369.4 | Mudstone and marlstone (lean oil shale?): Medium slightly olive and brownish gray (5 to 2.5Y 5/1-4/1, some 5/2), calcareous. Faintly laminated; some thin distorted and displaced zones. Slightly irregular thick parting; slightly irregular fracture. Some very fine tan to buff streaks near base. Sample of lean oil shale from 368.5 feet: X-ray - calcite, quartz, analcime, illite, dolomite, feldspar, pyrite. |
| 369.4 | 372.8 | Siltstone and mudstone: Light to medium slightly brownish and olive gray (2.5 to 5Y 6/1 and 6/2-5/1 and 5/2), calcareous. Massive in upper 0.7 foot; faint to distinct contorted stringers in other parts. Irregular thick parting; fairly regular to irregular fracture. Some oil-shale stringers as above from 370.1 to 371.1. |
| 372.8 | 376.4 | Siltstone and mudstone: Medium brownish gray (2.5Y 5/2-5/1, rare 4/2 lower part), moderately to slightly calcareous. Faint very distorted streaked bedding and rare laminae. Irregular thick parting; slightly irregular fracture. |
| 376.4 | 377.5 | Mudstone: Brownish gray (2.5Y 5/2), slightly calcareous. Very faint streaked bedding. Irregular thick parting; slightly irregular fracture. Sample of brownish-gray mudstone from 376.8 feet: X-ray - analcime, quartz, feldspar, illite, calcite, pyrite, dolomite. |

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Laramie Energy Research Center, Laramie, Wyoming

October 1, 1974

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Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| 377.5 | 378.5 | Mudstone (lean oil shale?): Medium to rare dark brownish and olive gray (2.5 to 5Y 4/2 and 4/1-5/2 and 5/1, rare 3/1), slightly calcareous. Faint streaked bedding; becoming interfingered with thin dense massive slightly brownish gray calcareous mudstone streaks and stringers in lower half. Irregular thick to medium parting; irregular fracture. |
| 378.5 | 378.8 | Limestone: Slightly brownish gray (2.5Y 4/1). Dense, massive; some fine oil-shale streaks and stringers. |
| 378.8 | 379.1 | Mudstone (lean oil shale?): Like 377.5-378.5. |
| 379.1 | 381.3 | Siltstone and mudstone: Brownish gray to gray buff (2.5Y 5/1-7/1), slightly calcareous. Faintly streaked to massive; some fine brownish-gray shaly streaks and stringers at 380.1-380.4. Irregular thick parting; irregular fracture. |
| 381.3 | 382.3 | Mudstone: Medium and rare dark to light brownish gray (2.5 to 5Y 4/1-6/1, rare 3/1), calcareous. Marly mudstone with faint streaked bedding in upper part to light silty mudstone with fine darker streaks and stringers in lower part. Irregular thick parting; slightly irregular fracture. |
| 382.3 | 386.0 | Siltstone and mudstone: Light and rare medium slightly brownish gray (2.5Y 6/1, rare 5/1), calcareous. Faint distorted streaked bedding. Irregular thick parting; slightly irregular fracture. |
| 386.0 | 389.0 | Mudstone: Light brownish gray (2.5Y 6/1-6/2), calcareous. Very faintly streaked to massive; faint contorted and displaced bands and laminae near base. Irregular to fairly regular thick parting; slightly irregular fracture. |
| 389.0 | 396.7 | Mudstone: Light to medium brownish gray (2.5Y 6/2-5/2), slightly calcareous. Faintly streaked and variegated in upper part becoming massive in lower part. Irregular thick parting; slightly irregular to regular fracture. |
| 396.7 | 397.7 | Mudstone: Brownish gray (2.5Y 5/2), slightly calcareous to dolomitic. Massive to very faintly variegated. Irregular thick parting; slightly irregular fracture. Sharp diagonal displaced contact with oil shale below. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| 397.7 | 398.8 | Oil shale: Medium and very rare dark brownish gray (2.5Y 5/2-4/1, rare 3/1), calcareous. Faint to moderate distinct very fine laminae; some thin distorted and displaced zones. Irregular to fairly regular thick parting; slightly irregular fracture. Some ostracods. Rare very fine pyrite streaks. Sample of oil shale from 398.4 feet: X-ray-calcite, quartz, analcime, illite, feldspar, dolomite, pyrite. |
| 398.8 | 403.2 | Oil shale: Medium and rare dark brownish gray and olive gray (2.5 to 5Y 5/2-4/2, rare 3/1), slightly to moderately calcareous. Faintly laminated; some fine displacements. Irregular to regular thick to some medium parting. A thin irregular light slightly brownish gray silty layer at 401.1; a thick layer with some oil-shale stringers and streaks at 402.0-402.4. (400.0-400.3 missing). Sample of light slightly brownish gray silty layer from 402.3 feet: X-ray - quartz, analcime, feldspar, illite, dolomite, pyrite. |
| 403.2 | 404.2 | Oil shale: Medium to dark olive gray (5Y 4/2-3/1), calcareous. Faintly laminated; some fine displacements. Fairly regular thick parting. Rare fine to small grayish-brown blebs. |
| 404.2 | 406.5 | Oil shale: Medium to some light and dark olive gray (5Y 5/2-4/1, some 6/1 and 3/1), calcareous. Faint to moderately distinct laminae; some very fine displacements. Irregular to fairly regular thick parting; irregular to fairly regular fracture. Thin gray to gray-buff silty layers at top and 404.9. Very fine discontinuous diagonal calcite-filled fractures at 406.0-406.2. |
| 406.5 | 409.2 | Oil shale: Medium to dark olive gray and brownish gray (5 to 2.5Y 4/2-3/1, some 5/2, rare 2/1), calcareous. Faintly laminated. Regular to some irregular thick to thin parting; some coarse hackly fracture in lower part. A very thin light gray silty layer at 408.4. Rare ostracods in lower part. |
| 409.2 | 410.9 | Oil shale: Medium to dark olive gray (5Y 4/2-3/1, some 5/2), calcareous. Faintly laminated. Regular to irregular thin to thick parting; irregular to some slightly conchoidal fracture. Sharp irregular truncated contact with siltstone at base. A 1 3/4-inch massive brownish-gray mudstone band at top. |

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|---|-------|---|
| | | Sample of medium to dark olive-gray oil shale from 409.8 feet: X-ray - calcite, quartz, analcime, illite, dolomite, feldspar. |
| 410.9 | 413.1 | Siltstone and mudstone: Light slightly olive gray (5Y 7/1-6/1), calcareous, massive. Irregular thick parting; slightly irregular fracture; irregular dark fracture surface with very slight slickensides at 412.2-412.6. Irregular displaced contact with oil shale at base. |
| 413.1 | 413.7 | Oil shale: Medium to dark olive gray (5Y 4/2-3/1, rare 2/1 and 5/2), slightly to moderately calcareous. Faintly laminated. Irregular to fairly regular thick parting; irregular fracture. Irregular slightly shredded contact with siltstone at base. |
| 413.7 | 416.0 | Siltstone: Light gray in upper part to light brownish gray in lower part (N 6 to 2.5Y 6/1), slightly calcareous, massive. Irregular parting and fracture. Few fine to thin shredded oil-shale stringers near top. Sample of light gray siltstone from 414.1 feet: X-ray - quartz, analcime, feldspar, dolomite, illite, pyrite, calcite. |
| 416.0 | 417.6 | Siltstone and mudstone: Light to medium and some dark brownish gray (2.5Y to 10YR 6/1-4/1, some 3/1 near base), slightly calcareous, massive. Irregular parting and fracture. Sharp slightly inclined contact with oil shale below. |
| 417.6 | 418.6 | Oil shale: Medium and rare light to very dark brownish gray (2.5Y 5/2-3/1, rare 6/2 upper part, some 2/1 lower part), dolomitic to calcareous. Distinct to faint laminae; distorted and displaced in upper part. Irregular to regular thick parting; irregular fracture. Medium to dark gray mudstone with fine contorted oil-shale stringers at 417.9-418.1. |
| TOP OF WILKINS PEAK MEMBER OF GREEN RIVER FORMATION | | |
| 418.6 | 419.9 | Oil shale: Medium and some dark olive gray (5Y 4/2-5/2, some 3/1), dolomitic. Faint thin laminae. Slightly irregular to irregular thick to medium parting; irregular fracture. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| | | Sample of olive-gray oil shale from 419.8 feet: X-ray - dolomite, quartz, calcite, aragonite, analcime, feldspar, montmorillonite. |
| 419.9 | 420.9 | Oil shale: Medium to some dark olive gray and brownish gray (5 to 2.5Y 4/2, some 3/2 - 2/1), dolomitic. Faintly laminated and banded. Regular to irregular thick parting; irregular fracture. |
| 420.9 | 421.7 | Oil shale: Dark to medium brownish gray (2.5Y 2/1 - 4/2, rare 5/2), dolomitic to calcareous. Faint streaked bedding in upper part to moderately distinct very fine laminae in lower part. Irregular to regular thick parting; irregular to fairly regular fracture. A thin vermiform gray silty stringer in upper 0.2 foot. Sample of finely laminated dark to medium brownish-gray oil shale from 421.6 feet: X-ray - calcite, dolomite, quartz, montmorillonite. |
| 421.7 | 422.5 | Oil shale: Medium to dark brownish gray and some tan to rare buff (2.5Y 5/2 - 3/1, some 6/2, rare 7/2 and 2/1), calcareous. Distinct to faint very fine laminae. Regular thick to some thin parting; slightly irregular to slightly hackly fracture. |
| 422.5 | 423.2 | Oil shale: Tan to grayish brown (2.5Y 6/2 - 5/2, some streaks of 4/2), dolomitic. Faint to distinct streaked bedding. Irregular thick parting; irregular to slightly conchoidal fracture. A small gray silty inclusion of 422.7. |
| 423.2 | 423.7 | Marlstone: Buff to rare light brownish gray (2.5 to 5Y 7/2 - 8/2, rare 6/2), dolomitic. Very faint streaked bedding and some faint laminae. Slightly irregular thick parting; regular fracture. Dense faintly variegated tan to dark brownish-gray band with some tight vertical fractures in lower 0.1 foot. Sample of buff marlstone from 423.3 feet: X-ray - dolomite, quartz, feldspar. |
| 423.7 | 425.6 | Oil shale: Dark and some medium brownish gray to black (2.5 to 5Y 3/1 - 1/1, some 4/2), dolomitic. Faint and some moderately distinct laminae to very faint streaked |

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Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| | | bedding. Fairly regular to irregular thick to rare thin parting; irregular and some coarse hackly fracture. Some fine light brownish-gray silty biotitic streaks in upper part. A 0.1-foot buff muddy marlstone band with very fine black oil-shale streaks at 425.2 - 425.3. Sample of black oil shale from 424.4 feet: X-ray - dolomite, quartz, calcite, feldspar, illite, pyrite. |
| 425.6 | 426.2 | Oil shale: Dark to medium olive gray (5 to 7.5Y 3/2 - 5/2 and 5/3), dolomitic. Faint to moderately distinct streaked bedding. Slightly irregular thick parting; irregular and some coarse hackly fracture. Abundant very fine disseminated crystals in upper 0.2 foot. Abundant very thin to fine light brownish-gray crystalline streaks in lower part. Sample of dark olive-gray oil shale with abundant very fine disseminated crystals from 425.6 feet: X-ray - calcite, quartz, dolomite, feldspar, illite. |
| 426.2 | 427.0 | Oil shale: Olive gray to grayish brown and tan (5Y 4/2 - 5/2 and 2.5Y 5/3 - 6/3, some 5Y 6/1 - 7/1 near top), dolomitic. Faint to moderately distinct streaked bedding and some laminae. Irregular to fairly regular thick to some thin parting; irregular hackly fracture. Some fine to thin crystalline streaks and disseminated crystals. Sample of olive-gray oil shale with crystalline streaks from 426.4 feet: X-ray - calcite, quartz, dolomite, feldspar. |
| 427.0 | 432.8 | Marlstone: Medium to light and rare dark slightly olive gray (5Y 5/1 - 6/1, some 4/1 - 4/2, rare 3/1 and 7/1), dolomitic. Faintly laminated and banded to very faintly streaked. Irregular thick to some medium and rare thin parting; irregular and some coarse hackly fracture. Abundant fine disseminated crystals and crystalline streaks in most parts. Sample of slightly olive-gray marlstone from 430.8 feet: X-ray - quartz, dolomite, feldspar, ferroan, illite, montmorillonite. |
| 432.8 | 434.9 | Marlstone (lean oil shale): Medium to light olive gray and some brownish gray (5 to 7.5Y 5/1 and 5/2 - 6/1 and 6/2, some 2.5Y 6/2 - 5/2 and rare 4/2 in upper part), dolomitic. Faint and rare moderately distinct streaked bedding to some very faint thin laminae. Irregular to slightly irregular thick parting; irregular fracture. Abundant fine disseminated crystals. Some very fine pyrite. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| 434.9 | 436.4 | Oil shale: Medium to rare light and dark olive gray (5 to 7.5Y 5/2 and 5/1 - 4/1, rare 6/2 and 3/1), dolomite. Faint streaked bedding; faintly laminated below 436.0. Abundant fine-grained crystalline streaks and patches. Some very fine pyrite. Irregular thick parting; irregular slightly hackly fracture. Sample of olive-gray oil shale with crystalline patches from 435.3 feet: X-ray - calcite, dolomite, quartz, montmorillonite. |
| 436.4 | 437.4 | Oil shale: Medium to dark olive gray (5Y 4/2 and 4/1 - 3/2 and 3/1), dolomitic. Faint very fine laminae. Irregular thick to medium parting; irregular fracture. Sample of medium to dark olive-gray oil shale from 436.8 feet: X-ray - dolomite, calcite, quartz, feldspar, illite, pyrite. |
| 437.4 | 438.0 | Oil shale: Medium to dark and rare light olive gray (5Y 5/2 - 3/1, rare 6/2), dolomitic. Faint to moderately distinct laminae. Irregular to fairly regular thick to medium parting; irregular fracture. |
| 438.0 | 439.1 | Oil shale: Medium to light olive gray (5Y 5/2 - 6/2, rare 4/2), dolomitic. Moderately distinct to faint streaked bedding. Irregular thick to medium parting; irregular fracture. Some very fine disseminated pyrite or pyrrhotite. A thin dense yellowish-buff lens at 438.4. |
| 439.1 | 439.4 | Marlstone: Medium to light slightly olive gray (5 to 7.5Y 4/2-6/1, rare 7/1), dolomitic. Faint thin to fine laminae. Abundant very fine dark gray specks. |
| 439.4 | 440.3 | Missing. |
| 440.3 | 441.7 | Oil shale: Medium to some dark olive gray to greenish gray (5Y to 5GY 4/2 and 4/1 - 5/2 and 5/1, some 3/1), dolomitic. Moderately distinct to faint streaked bedding and laminae. Irregular thick parting; irregular fracture. Thin zone of buff marlstone with some very fine short open vertical fractures at top. Some fine light streaks with very fine dark gray specks in upper 0.2 foot. Few fine tan crystalline blebs and streaks at 440.5 - 440.7. |

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Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| 441.7 | 442.8 | Oil shale: Dark to light olive gray (5Y 3/1 - 6/2, some 6/3 streaks) dolomitic. Fairly distinct streaked bedding. Irregular thick parting; irregular fracture. |
| 442.8 | 443.8 | Oil shale: Light to some dark olive gray (5Y 6/2 - 4/2, some 3/1), dolomitic. Moderately distinct streaked bedding to faint very fine laminae. Irregular thick parting; irregular to slightly conchoidal fracture. |
| 443.8 | 445.2 | Oil shale: Light to medium olive to grayish brown (5 to 2.5Y 6/2 and 6/3 - 5/2 and 5/3), dolomitic. Faintly laminated to very faintly streaked. Irregular to fairly regular thick to medium parting; irregular fracture. Sample of very faintly bedded olive oil shale from 444.8 feet: X-ray - calcite, dolomite, quartz, feldspar, illite, montmorillonite. |
| 445.2 | 445.8 | Oil shale: Medium to light olive gray (5Y 5/2 - 6/2, rare 4/2), dolomitic. Faint thin to fine laminae. Irregular thick parting; irregular to slightly conchoidal fracture. Some very fine dark specks. |
| 445.8 | 447.0 | Marlstone: Light slightly olive gray (10 to 7.5Y 6/1 - 8/1, some 6/2 - 7/2), dolomitic. Faint to moderately distinct thin laminae and bands; faintly streaked with few small buff lenses in lower 0.4 foot. Irregular to some very regular thick to rare thin parting. Abundant very fine dark flecks in upper part. Abundant fine buff-white earthy to crystalline calcite blebs in lower part. Sample of light gray marlstone with some very fine dark flecks from 446.2 feet: X-ray - dolomite, quartz, calcite, feldspar, montmorillonite, illite. |
| 447.0 | 449.2 | Oil shale: Medium to very dark olive gray (5 to 10Y 5/1 and 5/2 - 2/1), dolomitic. Distinct to faint streaked bedding. Irregular thick parting; irregular and some slightly hackly fracture. Very abundant fine buff to brown crystalline calcite streaks and blebs. Some very fine pyrite. A very thin lenticular white earthy tuff with abundant dark specks at 448.1. Sample of dark oil shale with buff to tan crystalline streaks from 447.4 feet: X-ray - dolomite, quartz, calcite, feldspar. |

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| From | To | Description |
|-------|-------|---|
| 449.2 | 451.2 | Oil shale: Medium to dark olive gray (5 to 7.5Y 5/1 and 5/2 - 3/2), dolomitic. Moderately distinct to faint streaked bedding. Irregular thick parting; irregular fracture. Abundant calcite streaks and blebs. Some very fine pyrite. A fine gray - buff tuff streak at 449.5. |
| 451.2 | 452.3 | Oil shale: Medium to light olive gray (7.5 to 10Y 4/2 and 4/1 - 6/2 and 6/1), dolomitic to very slightly calcareous. Faint and some moderately distinct streaked bedding. Irregular thick to medium parting; irregular fracture. Abundant fine buff calcite blebs and streaks. |
| 452.3 | 453.1 | Marlstone: Light and some medium slightly olive gray (7.5Y 7/1 - 6/1, some 5/1), slightly calcareous to dolomitic. Faint thin to fine laminae. Slightly irregular thick to medium parting; slightly irregular and conchoidal to regular fracture. Abundant very fine dark specks (pyrrhotite?). |
| 453.1 | 454.2 | Oil shale: Medium and rare light olive gray (7.5 to 5Y 5/2 - 4/2 and 4/1, rare 6/2), very slightly calcareous to dolomitic. Very faint fine to some thin laminae. Irregular to fairly regular thick to medium parting; irregular to slightly conchoidal fracture. Abundant very fine pyrrhotite (?) in upper part. |
| 454.2 | 455.2 | Oil shale: Medium to dark olive gray (5Y 4/2 - 3/2), dolomitic. Faint very fine laminae. Fairly regular to irregular thick parting; irregular fracture. Abundant very fine pyrrhotite (?) near top. A 3/4-inch dense brown dolomite lens at 454.6. Sample of olive-gray oil shale from 454.5 feet: X-ray - dolomite, calcite, quartz, feldspar, analcime. |
| 455.2 | 456.4 | Oil shale: Medium to some dark olive gray (5Y 4/2 - 5/2, some 3/2), dolomitic. Faint very fine to thin laminae. Slightly irregular thick parting; irregular fracture. A 1/2-inch black lenticular silty layer at 455.6 with fine vermiform stringers extending about 1 1/2-inch into oil shale below. A fine dense brown dolomite streak at 456.3. |

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Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| 456.4 | 457.7 | Oil shale: Medium to light olive gray (7.5 to 5Y 5/2 - 6/2), dolomitic. Faintly laminated and banded. Irregular to fairly regular thick to medium parting; irregular to slightly conchoidal fracture. Abundant very fine dark specks in some zones. Some thin to fine displaced dense buff dolomite laminae at 457.6. |
| 457.7 | 458.8 | Marlstone: Light and rare medium slightly olive gray (5 to 10Y 6/1, rare 5/1 - 5/2), dolomitic. Faint laminae and thin bands. Regular thick parting; slightly conchoidal to regular fracture. Some very fine dark specks. Finely laminated buff marlstone and grayish-brown siltstone at 458.3 - 458.4. Thin to fine broken and displaced buff marlstone stringer at 458.6. |
| 458.8 | 460.5 | Oil shale: Medium to dark and rare light olive gray (5Y 5/2 - 3/2, rare 6/2 upper part), dolomitic. Faint thin to fine laminae; moderately distinct streaked bedding near top. Irregular to some fairly regular thick to rare thin parting; irregular fracture. Few small dense brownish-gray dolomite lenses at 459.3. Small black silty nodule at 459.5. Very fine brittle black organic streak at 460.1. Abundant very fine pyrrhotite (?) near base. |
| 460.5 | 461.3 | Oil shale and Marlstone: Medium olive gray to light almost neutral gray (5Y 5/2 - 7/1), dolomitic. Faint fine to thin laminae. Irregular to fairly regular thick to medium parting; irregular to regular fracture. A thin lenticular olive-gray marlstone stringer with very abundant very fine dark pyrrhotite (?) specks at top. A fine light gray silty tuff lamina at 460.8. Sample of marlstone with pyrrhotite (?) from 460.5 feet: X-ray - montmorillonite, dolomite, calcite, feldspar, quartz, analcime. |
| 461.3 | 462.3 | Marlstone: Light olive gray to yellow buff (5Y 6/2 - 7/2 and 7/3) and light to medium gray (N 7-5), dolomitic. Faint to distinct bands and laminae with rare nodular layers in upper part; faintly streaked gray marlstone with some small round buff marlstone inclusions in lower 0.4 foot. Irregular thick to medium parting; slightly irregular and conchoidal fracture. Abundant short open vertical fractures with brown coatings at 461.4 and few short very irregular open fractures at 461.5. |

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Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| | | Sample of yellow-buff marlstone from 461.8 feet: X-ray - dolomite, quartz, feldspar. |
| 462.3 | 462.8 | Oil shale: Buff and tan to very dark brownish gray (2.5Y 7/2 and 6/3 - 2/1). Distinct irregular laminae and streaked bedding. Slightly irregular thick parting; irregular and some slightly hackly fracture. Some streaks of very fine round brown crystal grains. A 0.1-foot brownish-gray to brown biotitic tuff band at base. |
| 462.8 | 464.3 | Oil shale: Black to dark brownish gray with medium brown to brownish-gray streaks (2.5Y 1/1 - 3/1 and 3/2; 4/2 - 5/3 streaks), dolomitic. Distinct to faint streaked bedding. Irregular to wavy thick to rare thin parting; irregular and some hackly fracture. Some fine to thin brown tuff streaks and stringers in upper part. A 1-inch pinched out dark brownish-gray very fine sandy-textured tuff at 463.5. A 1-inch irregular tuff with buff-white and brownish-gray contorted internal bedding at 463.9. A 3/4-inch dark brownish-gray silty irregular tuff lens at 464.0. Abruptly grades to olive-gray oil shale at base. |
| 464.3 | 464.9 | Oil shale: Olive gray (5 to 7.5Y 4/2 - 5/2), dolomitic. Faint streaked bedding. Irregular thick to medium parting; irregular fracture. |
| 464.9 | 465.7 | Oil shale: Medium to light olive green (7.5 to 10Y 5/2 - 6/2), dolomitic. Faintly banded to laminated and streaked. Irregular thick to medium parting; irregular fracture. Sample of medium to light olive-green oil shale from 465.6 feet: X-ray - dolomite, quartz, calcite, feldspar, illite, pyrite. |
| 465.7 | 466.5 | Marlstone: Light to rare medium olive gray (7.5 to 5Y 6/2 and 6/1 - 7/2 and 7/1, rare 5/1 - 4/1), dolomitic. Faint to some distinct laminae and bands. Irregular to regular thick to medium parting; slightly conchoidal to irregular fracture. Rare short tight fractures with patchy brown coatings. |

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Laramie Energy Research Center, Laramie, Wyoming October 1, 1974

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| 466.5 | 467.3 | Oil shale: Medium to light olive gray (7.5Y 5/1 and 5/2 - 6/1 and 6/2, rare 4/1 and 7/1), dolomitic. Faint streaked bedding and some moderately distinct thin laminae. Irregular to regular thick to medium parting; irregular fracture. Very abundant fine buff to tan round to rectangular crystals. Few thin to 1-inch dense buff slightly dolomitic lenses at 467.1 - 467.2. A thin dark gray silty layer at 466.7 with fine vermiform stringers extending 1/2 inch into oil shale below. Sample of oil shale with fine buff to tan crystals from 467.2 feet: X-ray - dolomite, calcite, quartz, feldspar, pyrite. |
| 467.3 | 467.8 | Oil shale: Medium to light olive gray (7.5 to 5Y 5/2 - 6/2, some 4/2), dolomitic. Distinct streaks and pinched out laminae. Slightly irregular thick to medium parting. Rare thin dense buff streaks. |
| 467.8 | 469.8 | Marlstone: Light slightly olive gray to almost neutral gray (7.5 to 5Y 6/1 - 7/1, some 7/2), dolomitic. Faintly laminated and banded. Fairly regular thick parting; slightly irregular and conchoidal fracture. Thin zone of abundant thin irregular platy light gray cherty inclusions at 468.1 (rarely with fine brownish-black rims). A 1-inch light brownish-gray silty-textured limestone band with thin buff marlstone inclusions at base (slightly displaced by tight high angle fractures). Sample of light gray marlstone from 469.5 feet: X-ray - dolomite, quartz, feldspar, illite, pyrite, calcite. |
| 469.8 | 472.4 | Oil shale: Medium olive gray and some dark brownish gray (7.5 to 5Y 5/2 - 4/2, some 2.5Y 3/1 and 3/2, rare 2/1), dolomitic. Faint laminae and rare moderately distinct streaked bedding. Irregular to fairly regular thick parting; irregular fracture. Rare fine light to dark brownish-gray crystalline blebs, streaks, and lenses. |
| 472.4 | 472.7 | Oil shale: Medium brownish gray (2.5Y 4/1 - 5/1), dolomite. Very faintly laminated. Irregular parting and fracture. |

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Laramie Energy Research Center, Laramie, Wyoming October 1, 1974

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| 472.7 | 474.7 | Marlstone: Light slightly olive gray to gray buff (5Y 6/1 - 7/1), dolomitic. Faintly banded and laminated. Irregular thick parting; irregular to slightly conchoidal fracture. Rare thin gray cherty streaks in lower part. Grades to light and medium olive gray oil shale near base. |
| 474.7 | 476.0 | Oil shale: Medium to some dark olive gray and brownish gray (5 to 2.5Y 5/2 - 4/2, some 3/2 - 2/1 in lower part), dolomitic. Faint to fairly distinct regular to discontinuous laminae and streaks. Irregular thick parting; irregular fracture. A thin buff marlstone lamina at 475.0. Rare fine to thin light brownish-gray cherty lenses. |
| 476.0 | 477.1 | Oil shale: Dark and rare medium brownish gray (2.5Y 3/1 - 2/1, some 3/2 - 4/2), dolomitic. Faint to moderately distinct streaked bedding. Irregular to slightly wavy thick to some medium parting; irregular fracture. Rare thin brown blebby dolomite streaks and lenses in upper part. Common irregular light brownish-gray silty tuff stringers and nodules in lower 0.1 foot. A very fine brittle vitreous black organic lamina at 476.95. Sample of dark brownish-gray oil shale from 476.8 feet: X-ray - dolomite, quartz, calcite, feldspar, pyrite. |
| 477.1 | 477.9 | Layered tuff: Medium to light brownish gray (10YR 4/2 - 5/2 upper part, 2.5Y 5/2-6/2 lower part), very fine sandy to silty texture. Contorted and fractured; rare fine to thin oil-shale stringers; overturned broken fold in lower part. Sample of brownish-gray sandy tuff from 477.4 feet: X-ray - K feldspar, analcime, quartz, illite, pyrite. |
| 477.9 | 478.9 | Oil shale and marlstone: Medium to light olive gray (7.5 to 10Y 4/2 - 6/2, some 5Y 4/2 - 5/2 near top), dolomitic. Faintly laminated to very faintly streaked. Irregular thick to medium parting; irregular fracture. Rare fine dark brownish-gray silty streaks in lower part; some very fine black hornblende (?) disseminated in marlstone near streaks. Sample of marlstone with silty streak and very fine disseminated black grains from 478.7 feet: X-ray - Na feldspar, quartz, dolomite, calcite, analcime, hornblende, pyrite. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| 478.9 | 480.9 | Marlstone: Light to some medium slightly olive to almost neutral gray (7.5Y 7/2 and 7/1 - 6/1, some 5/1), dolomitic; some silty calcareous laminae and streaks. Faint bands and laminae. Irregular thick parting; irregular to conchoidal fracture. A thin lenticular grayish-tan silty calcareous layer at 479.6; some fine laminae and streaks elsewhere. |
| 480.9 | 482.2 | Marlstone and oil shale: Buff to some olive gray (2.5 and 5Y 8/2 and 8/3 - 6/2, some 5/2 - 5/3), dolomitic. Faint laminae and bands to very fine regular streaked bedding. Several fine to thin light to very dark brownish-gray silty layers with abundant black grains (like 478.7) between 481.0 and 481.2. Sample of bright buff marlstone from 481.7 feet: X-ray - dolomite, quartz, calcite, feldspar. |
| 482.2 | 483.3 | Oil shale: Medium to dark brownish gray and some tan to buff (2.5Y 5/2 - 2/1, some 6/3 - 7/2), dolomitic. Distinct to faint streaked bedding and some laminae. Slightly irregular thick to rare thin parting; irregular and slightly hackly fracture. A 3/4-inch pinched gray biotitic tuff layer at base. |
| 483.3 | 484.1 | Oil shale: Dark brownish gray in upper inch (2.5Y 2/1); medium olive gray in other parts (5 to 7.5Y 4/2 - 5/2), dolomitic to slightly calcareous. Faint very fine laminae and streaked bedding. Irregular thick to medium parting; irregular and some very coarse hackly fracture. |
| 484.1 | 485.3 | Mudstone and marlstone: Light olive gray in upper 2 inches (5Y 6/2 - 7/2), light gray in other parts (N7-6), dolomitic. Very faint laminae and bands. Irregular to fairly regular thick to thin parting; slightly conchoidal to some irregular fracture. Sample of light gray mudstone from 485.0 feet: X-ray-dolomite, quartz, calcite, feldspar, pyrite. |
| 485.3 | 486.2 | Oil shale: Dark to some medium brownish gray (2.5Y 3/2 - 2/1, some 4/2), dolomitic. Faint to some moderately distinct streaked bedding and discontinuous laminae; very faintly bedded medium to light olive zone at 485.7 - 485.9. Irregular thick to medium parting; slightly irregular and conchoidal fracture. Some fine light brownish-gray to tan blebby mineral streaks. A thin nodular dense brownish-gray dolomite (?) stringer at top; one small angular chalky white inclusion immediately below stringer. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| | | Sample of oil shale with tan blebby mineral streaks from 486.1 feet: X-ray - calcite, dolomite, quartz. |
| 486.2 | 487.2 | Oil shale: Dark and some medium brownish gray (2.5Y 3/2 - 2/1, some 4/2), dolomitic. Faint streaked bedding. Irregular thick parting; irregular fracture. Abundant blebby crystalline streaks as above in upper 1 1/2 inches. Sample of dark brownish-gray oil shale from 486.8 feet: X-ray - calcite, dolomite, quartz, feldspar, pyrite. |
| 487.2 | 487.7 | Oil shale: Medium olive with some dark brownish-gray streaks (5Y 4/3 - 5/3, some 2.5Y 3/2 - 2/1), dolomitic. Faint to distinct streaked bedding. Irregular thick parting; irregular fracture. |
| 487.7 | 487.9 | Oil shale: Dark and some medium brownish gray (like 486.2 - 487.2). Very sharp regular contact with marlstone below. |
| 487.9 | 489.0 | Marlstone: Light and rare medium olive and brownish gray to buff (5 to 2.5Y 6/2 and 6/1 - 8/2, rare 5/1; becoming almost neutral in lower part). Faint to distinct bands and laminae. Regular to some irregular thick to medium parting; irregular and conchoidal to fairly regular fracture. A very fine black oil shale lamina at 488.4. Some buff silty-textured limestone laminae in lower part. |
| 489.0 | 489.8 | Limestone(?): Buff and gray buff to tan (5Y 7/2 and 7/1 to 2.5Y 4/3), very calcareous, silty to very fine sandy textured. Faint regular and distorted laminae to streaked bedding. Irregular to fairly regular thick parting; slightly irregular fracture. Few fine to thin gray silty streaks and laminae. Few short tight high angle fractures in upper part. Sample of sandy limestone (or calcareous sandstone) from 489.8 feet: X-ray - calcite, dolomite, quartz, baritocalcite, feldspar. |
| 489.8 | 490.0 | Oil shale: Olive gray (5Y 4/2 - 5/2). Faintly laminated with few distinct buff streaks. Some fine to very thin gray silty biotitic streaks and layers near top. |
| 490.0 | 490.9 | Marlstone: Light olive gray to buff (5Y 6/2 - 8/2, some 6/1 - 7/1 lower part), dolomitic. Faint to moderately distinct laminae and thin bands. Regular thick to rare |

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Laramie Energy Research Center, Laramie, Wyoming October 1, 1974

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| | | thin parting; regular to slightly conchoidal fracture. Abundant fine buff-white chalky calcite blebs in lower part. |
| 490.9 | 491.9 | Mudstone: Light to rare medium gray (N 7-6, rare 5; very slight green tint), slightly calcareous. Moderately distinct to faint bands and thin laminae. Fairly regular to irregular thick parting; conchoidal to slightly irregular fracture. Some fine calcite blebs and laminae in upper part. Very sharp slightly wavy contact with oil shale below. |
| 491.9 | 493.5 | Oil shale: Dark to medium brownish and olive gray (2.5 and 5Y 2/1 - 4/2 some 5/2), dolomitic. Moderately distinct to faint streaked bedding. Rare thin to fine olive-gray to brownish-gray silty biotitic streaks and lenses. Abundant fine crystalline blebs and streaks in some zones. Sample of dark brownish-gray oil shale with abundant fine crystalline streaks from 492.8 feet: X-ray - dolomite, quartz, calcite, feldspar, pyrite. |
| 493.5 | 494.1 | Oil shale: Medium to light olive gray (7.5Y 4/2 - 6/2), dolomitic to slightly calcareous. Moderately distinct to faint streaked bedding. Fairly regular to irregular thick to medium parting; irregular fracture. |
| 494.1 | 495.1 | Marlstone: Light to medium almost neutral gray (7.5Y 6/1 - 5/1), dolomitic, slightly silty. Faintly banded. Regular to irregular thick parting; conchoidal fracture. |
| 495.1 | 496.3 | Marlstone: Light to medium slightly olive gray (7.5 to 5Y 6/1 - 5/1, some 6/2 - 5/2, rare 4/1), a 3-inch tan to buff zone near top (2.5Y 6/3 - 7/2), dolomitic, slightly silty. Faint and rare distinct laminae to very faint streaked bedding. Regular to irregular thick parting; regular and conchoidal to irregular fracture. Very abundant fine buff calcite blebs in lower half. Sample of gray marlstone with fine buff calcite blebs from 496.2 feet: X-ray - dolomite, quartz, calcite, feldspar, pyrite, illite. |
| 496.3 | 497.5 | Oil shale: Medium to dark olive gray (7.5 to 5Y 5/2 - 3/2, some 2/2 - 2/1), dolomitic to slightly calcareous. Faint streaked bedding and some discontinuous laminae. Fairly regular to irregular thick to medium parting; irregular and some slight to coarse hackly fracture. Abundant fine slightly brownish-gray calcite blebs and streaks down to 497.1 |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| 497.5 | 499.0 | Oil shale: Medium to some dark olive gray (7.5 to 5Y 5/2 - 4/2, some 3/2), dolomitic. Faint to some moderately distinct streaked bedding and very fine laminae. Irregular thick to medium parting; irregular fracture. Sample of olive-gray oil shale from 498.6 feet: X-ray - calcite, dolomite, quartz, feldspar, illite. |
| 499.0 | 499.6 | Marlstone: Light olive gray to very light buff (5Y 6/2 - 8/1), dolomitic, slightly silty near base. Faint thin laminae and bands. Fairly regular thick parting; slightly conchoidal fracture. |
| 499.6 | 500.1 | Missing. |
| 500.1 | 500.2 | Siltstone: Light gray (N 6-7), massive. biotitic. Worn surface at top; regular slightly wavy contact with marlstone below. Sample of light gray siltstone from 500.2 feet: X-ray - K and Na feldspars, hornblende, biotite, pyrite, siderite. |
| 500.2 | 500.8 | Marlstone: Very light buff to light gray (5Y 8/2 - 6/1), dolomitic. Faint and rare distinct bands and thin laminae. Fairly regular to irregular thick to medium parting; slightly conchoidal to irregular fracture. |
| 500.8 | 502.2 | Oil shale: Dark brownish gray to medium olive green (2.5Y 3/2 and 2/1 to 7.5Y 5/2 and 5/3). Faint to moderately distinct streaked bedding. Fairly regular to irregular thick to medium parting; irregular slightly hackly fracture. Abundant grayish-brown fine-grained calcite streaks and blebs. Some fine to small dense brown dolomite lenses. Irregular worn surface with buff silty nodular marlstone at top. |
| 502.2 | 503.1 | Oil shale: Medium and rare light olive green with some dark olive-gray streaks (7.5 to 10Y 5/2 and 5/3 - 4/2, rare 6/2, some 5Y 4/2 - 3/2, rare 2/2), dolomitic to slightly calcareous. Faint to some distinct streaked bedding and rare laminae. Irregular to fairly regular thick to medium parting; irregular fracture. Rare fine tan calcite streaks. |
| 503.1 | 503.7 | Marlstone: Buff to light olive gray (5Y 7/2 - 6/2), dolomitic, slightly silty. Faint bands and thin laminae. Slightly irregular thick parting; slightly conchoidal fracture. Some fine-grained calcite laminae, streaks, and blebs in lower part. |

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| 503.7 | 504.9 | Oil shale: Medium to some dark and rare light olive gray (7.5 to 5Y 5/2 - 4/2, some 3/2, rare 6/2 - 6/1), dolomitic. Faint to some distinct streaked bedding. Slightly irregular to irregular thick to medium parting; irregular and some hackly fracture. Abundant fine-grained calcite streaks and blebs. Few fine dark gray silty blebs and lenses in lower 0.4 foot. |
| 504.9 | 506.1 | Marlstone: Light slightly greenish gray (7.5 to 10Y 6/1 - 8/1), dolomitic. Faint thin laminae and bands. Regular to irregular thick to medium parting; slightly conchoidal to some irregular fracture. Some fine white calcite blebs and streaks in lower part. |
| 506.1 | 506.6 | Oil shale: Olive gray (7.5 to 5Y 5/2 and 5/3 - 4/2). Faint streaked bedding. Slightly irregular thick parting; irregular and slightly hackly fracture. Very abundant fine buff calcite blebs. Sample of oil shale with abundant fine calcite blebs from 506.3 feet: X-ray - calcite, dolomite, quartz, montmorillonite, illite, feldspar. |
| 506.6 | 507.2 | Oil shale: Grayish brown to buff (2.5Y 5/2 - 7/2, some 4/2). Oil shale with distinct streaked bedding draped over a 2-inch wavy massive buff marlstone band at top; faint regular laminae in lower part. Rare fine biotitic tuff blebs and streaks near base. Sample of grayish-brown oil shale from 506.9 feet: X-ray - calcite, dolomite, quartz, montmorillonite, feldspar, illite. |
| 507.2 | 507.7 | Main tuff: Buff white (2.5Y 9/2), silty. Massive; rare fine marlstone streaks. Irregular thick to thin parting; slightly irregular fracture. Some very fine biotite flakes. Sample of tuff from 507.4 feet: X-ray - K and Na feldspars, biotite. |
| 507.7 | 508.1 | Marlstone: Buff to some light olive gray (5Y 8/2 - 7/2, some 6/2 - 6/1), dolomitic to slightly calcareous. Faintly banded and laminated. Fairly regular thick and rare thin parting; slightly irregular and conchoidal fracture. |
| 508.1 | 509.1 | Marlstone and tuff: Buff (5 to 2.5Y 7/2) and light to medium gray (N 7-5). Faintly streaked marlstone with abundant crystalline calcite blebs; abundant thin broken layers and angular inclusions of gray silty biotitic tuff. Irregular thick to thin parting; irregular fracture. Very irregular truncating contact with oil shale below; oil shale is bleached to light gray adjacent to contact. |

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| 509.1 | 510.1 | Oil shale: Dark to some light olive gray (5 to 7.5Y 3/1 - 5/1 and 5/2, some 6/1 - 6/2), dolomitic to slightly calcareous. Faint to fairly distinct regular to discontinuous laminae and streaks. Fairly regular to irregular thick to thin parting; irregular and some hackly fracture. Some very fine pyrite crystals in darker parts. Sample of dark olive-gray oil shale from 509.3 feet: X-ray - quartz, K feldspar, aragonite, dolomite, pyrite, calcite, illite, montmorillonite. |
| 510.1 | 511.1 | Oil shale: Medium to light olive gray and some buff (5 to 7.5Y 5/2 - 6/2, some 7/2), dolomitic. Faint streaked bedding and fine to thin laminae and bands. Slightly irregular to irregular thick to medium parting; irregular fracture. A 1-inch dense slightly brownish-gray dolomite band 510.8. |
| 511.1 | 511.8 | Marlstone: Light to medium slightly olive gray (7.5 to 10Y 7/1 - 5/1), dolomitic. Faint to moderately distinct laminae and thin bands; some displaced bedding. Irregular to fairly regular thick parting; irregular fracture. Abundant fine lacy crystalline calcite streaks and stringers. |
| 511.8 | 513.0 | Oil shale: Light to medium olive gray (10 to 5Y 7/2 - 5/2), dolomitic to slightly calcareous. Faintly streaked with some thin to fine bands and laminae. Irregular to fairly regular thick parting; irregular to slightly conchoidal fracture. Abundant tan fine-grained calcite blebs, streaks, and stringers in some zones. |
| 513.0 | 513.7 | Marlstone: Medium to light slightly olive gray (7.5 to 10Y 6/1 - 5/1), dolomitic. Faint fine to thin laminae and bands. Irregular thick parting; irregular to conchoidal fracture. |
| 513.7 | 514.5 | Oil shale: Light to medium olive gray (7.5Y 6/2 - 5/1, rare 7/2), dolomitic to slightly calcareous. Faint streaked bedding and thin to fine laminae. Irregular thick parting; irregular and some conchoidal fracture. Abundant fine crystalline calcite streaks and blebs in upper 0.2 foot. Abundant fine distorted buff to grayish-brown silty stringers and streaks in lower inch. |
| 514.5 | 515.5 | Oil shale: Medium to rare dark olive gray (5Y 5/2 - 4/2, rare 3/2), dolomitic. Faint streaked bedding. Irregular thick parting; irregular and some coarse hackly fracture. |

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| | | A thick vermiform stringer from 514.7 to 515.1; partly composed of light brownish-gray fine-grained conglomerate and partly of fine platy oil-shale and buff marlstone breccia with slightly wavy horizontal bedding. |
| 515.5 | 516.5 | Oil shale: Medium to rare light and dark olive gray (5 to 7.5Y 5/2 - 4/2, rare 6/2 and 3/2), dolomitic. Faint streaked bedding and fine slightly distorted laminae. Irregular thick to medium parting; irregular and some coarse hackly fracture. Some thin to fine gray to brown biotitic tuff lenses and streaks. A 1/2-inch broken buff marlstone lens at 515.8. |
| 516.5 | 517.8 | Oil shale: Medium and some dark to light olive gray (5 to 7.5Y 5/2 - 6/2, some 4/1 - 3/1 upper part). Faint laminae and bands with some large irregular displacements. Irregular thick to thin parting; irregular fracture. Some fine drusy calcite on irregular natural fracture surfaces. Some fine disseminated calcite blebs in lower part. |
| 517.8 | 519.1 | Oil shale: Medium olive gray to almost neutral gray (7.5Y 4/2 and 5/2 - 5/1), dolomitic to moderately calcareous. Faint streaked bedding and some fine laminae. Fairly regular to irregular thick to thin parting; irregular hackly fracture. Abundant fine disseminated calcite crystals. Abundant fine pyrite cubes in some zones. |
| 519.1 | 520.1 | Marlstone: Light to medium slightly olive gray (7.5Y 6/1 - 5/1, some 7/1, rare 4/1), slightly calcareous to dolomitic. Faintly banded and laminated. Irregular to rare regular thick to rare thin parting; irregular to slightly conchoidal fracture. Abundant fine calcite streaks and blebs in some zones. |
| 520.1 | 520.5 | Missing |
| 520.5 | 522.5 | Oil shale and some marlstone: Medium to some light olive gray (7.5 to 10Y 5/2 and 5/1 - 4/2 and 4/1, some 6/1 - 7/1), slightly to moderately calcareous. Faint laminae and streaked bedding. Irregular thick to medium parting; irregular and some coarse hackly fracture. Rare fine calcite streaks. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| 522.5 | 523.5 | Oil shale: Medium and rare dark olive gray (7.5 to 10Y 5/2 - 4/2 and 4/1, rare 3/2), dolomitic to slightly calcareous. Faintly laminated. Irregular medium to thin parting; irregular to hackly fracture. Rare fine brownish-gray to dark gray silty streaks and laminae. |
| 523.5 | 525.6 | Oil shale: Medium and rare light olive gray (10Y 5/2 and 5/1 - 4/2 and 4/1, rare 6/1 - 7/1), dolomitic to slightly calcareous. Faintly laminated and streaked. Irregular thick to some thin parting; irregular and some hackly fracture. Rare fine calcite streaks. |
| 525.6 | 526.5 | Marlstone and oil shale: Buff to olive gray (7.5Y 7/2 - 5/2 and 5/1, rare 5Y 4/2), dolomitic to slightly calcareous. Faint and rare distinct laminae and bands. Fairly regular to irregular thick to thin parting; fairly regular to irregular fracture. Some fine calcite blebs in buff layers. |
| 526.5 | 527.6 | Oil shale: Light to medium olive (7.5 to 10Y 6/2 - 4/2 and 4/3), dolomitic to calcareous. Faintly laminated. Irregular thick to rare thin parting; irregular coarse hackly fracture. Abundant very fine calcite crystals in upper part. A very thin lenticular dark gray silty stringer at 526.6; fine gray silty laminae at 527.1 and 527.3. |
| 527.6 | 528.3 | Oil shale: Light to medium olive green (7.5 to 10Y 7/2 - 5/2, some 5/1), slightly calcareous. Very faint laminae and streaked bedding. Slightly irregular to irregular thick to medium parting; irregular and some coarse hackly fracture. |
| 528.3 | 529.0 | Marlstone and some mudstone: Buff to light and rare medium olive gray (7.5 to 10Y 8/2 - 6/2, rare 5/2), dolomitic to slightly calcareous. Faint laminae and some bands. Regular to irregular thin to thick parting; slightly irregular fracture. Rare very fine gray-buff silty biotitic laminae. |
| 529.0 | 530.6 | Marlstone: Light gray (N 6-7), buff in lower 0.2 foot (7.5 to 5Y 8/1 - 8/2), dolomitic to very slightly calcareous. Faint thin laminae and bands. Regular |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY
Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| | | thick to some thin parting; slightly irregular and conchoidal fracture. Abundant fine calcite blebs in some zones. Sample of light gray marlstone from 529.7 feet: X-ray - dolomite, quartz, feldspar, calcite, pyrite, ferroan, illite, montmorillonite. |
| 530.6 | 531.6 | Oil shale and marlstone: Buff to light and rare medium olive gray (5Y 7/2 - 6/2, rare 5/2), dolomitic to slightly calcareous. Faint laminae to very fine streaked bedding. Irregular medium to thick parting; conchoidal to irregular fracture. A thin irregular gray silty layer at 531.1. |
| 531.6 | 532.6 | Oil shale: Light to medium olive gray (5Y 6/2 - 5/2, rare 4/2), dolomitic. Faint very fine laminae and streaked bedding. Irregular thick parting; irregular fracture. Some small brownish-gray to gray tuff lenses and fine stringers at 532.0 - 532.2. |
| 532.6 | 533.7 | Oil shale: Medium to dark olive gray (5Y 4/2 - 3/2, some 2/1, rare 5/2), dolomitic. Faint to some moderately distinct very fine laminae and streaks. Slightly irregular to irregular thick parting; irregular fracture. Few very small brownish-gray marlstone lenses and fine streaks. A fine woody-textured vitreous black organic streak at 533.4. Sample of dark olive-gray oil shale from 533.5 feet: X-ray - quartz, calcite, dolomite, feldspar, illite, pyrite, montmorillonite. |
| 533.7 | 534.9 | Oil shale: Medium to light olive gray (7.5 to 10Y 5/2 and 5/1 - 6/2 and 6/1, rare 4/2 upper part), dolomitic to calcareous. Faint very fine laminae in upper part becoming very faintly bedded in lower part. Irregular thick to rare thin parting; irregular and some coarse hackly fracture. Very abundant very fine disseminated crystals. A thin slightly wavy and displaced brownish-gray silty tuff layer at top. Sample of olive-gray oil shale with very fine disseminated crystals from 534.6 feet: X-ray - calcite, dolomite, quartz, aragonite, analcime, feldspar, ferroan, pyrite, illite, montmorillonite. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| 534.9 | 535.9 | Marlstone: Light gray to olive gray (7.5 to 10Y 8/1 and 8/2 - 6/1 and 6/2), dolomitic. Faint laminae and bands. Regular to some irregular thick to rare thin parting; regular to irregular fracture. Abundant very fine white blebs and streaks in some zones. |
| 535.9 | 536.9 | Marlstone grading to oil shale: Very light to medium olive gray (7.5 to 10Y 8/2 and 8/1 - 5/2 and 5/1), dolomitic to slightly calcareous. Faint thin bands to very fine laminae. Regular to irregular thick to rare thin parting; fairly regular to irregular and hackly fracture. Thin gray silty tuff with small buff-white silty inclusions at 536.3 |
| 536.9 | 538.3 | Oil shale: Medium to dark olive gray (7.5Y 5/2 - 3/2), dolomitic. Faint streaked bedding becoming faintly laminated below 538.0; distinct tan to dark olive-gray laminae in lower inch. Irregular thick parting; irregular and some coarse hackly fracture. |
| 538.3 | 539.0 | Oil shale: Medium olive gray (7.5Y 4/2 and 4/1 - 5/1), dolomitic to slightly calcareous. Very faintly laminated and banded. Irregular medium to thick parting; irregular and some coarse hackly fracture. Some very fine calcite streaks and disseminated crystals in upper part. |
| 539.0 | 539.9 | Marlstone: Medium to light gray (10Y 5/1 - 7/1), very slightly calcareous. Faint thin laminae and bands. Irregular to regular thick to medium parting; slightly irregular and conchoidal fracture. |
| 539.9 | 540.3 | Missing |
| 540.3 | 541.5 | Marlstone: Light to medium gray (10 to 7.5Y 7/1 - 5/1; becoming slightly olive in lower part), slightly calcareous to dolomitic. Faintly banded and laminated. Regular to some irregular thick to rare thin parting; slightly conchoidal and irregular fracture. A fine gray-buff conglomeratic limestone stringer one inch above base. |
| 541.5 | 542.3 | Marlstone and oil shale: Buff to some medium olive gray (5Y 8/2 - 6/2, some 5/2, rare 4/2), dolomitic to slightly calcareous. Faint to some distinct laminae and streaked bedding. Irregular thick to some thin parting; irregular fracture. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| | | Sample of buff marlstone from 541.6 feet: X-ray - dolomite, calcite, quartz, feldspar, montmorillonite, illite. |
| 542.3 | 542.5 | Oil shale: Dark to medium olive gray (5Y 3/2 - 4/2, rare 5/2), dolomitic. Faint streaked bedding; some distinct thin buff to tan marlstone streaks and lenses near base. Irregular parting and fracture. |
| 542.5 | 543.7 | Oil shale and marlstone: Light and some medium olive gray to buff (7.5Y 6/2 - 8/1, some 5/2), slightly calcareous. Faintly banded and laminated; some moderately distinct streaked bedding. A thin tan to buff marlstone layer at top. Sharp regular contact with oil shale below. |
| 543.7 | 546.2 | Oil shale: Medium to very dark olive gray (7.5 to 5Y 4/2 - 2/1, some 5/2 upper part), dolomitic. Faint to some moderately distinct streaked bedding. Irregular to some fairly regular thick to medium parting; irregular fracture. Very fine disseminated pyrite becoming abundant in lower part. Few thin brownish-gray to tan dolomite lenses and streaks at 544.9 - 545.0. |
| 546.2 | 547.5 | Oil shale: Medium to light olive gray (7.5 to 10Y 4/2 and 4/1 - 6/1, some 7/1 lower part), slightly calcareous. Faint and rare moderately distinct laminae. Irregular to fairly regular thick to medium parting; irregular and some coarse hackly fracture. Abundant very fine disseminated pyrite in some zones. Some fine to thin gray wavy to vermiform limestone streaks and blebs at 546.7. Very thin irregular gray silty calcareous tuff layer with some biotite at 547.1. |
| 547.5 | 548.8 | Marlstone: Gray buff to light slightly olive gray (5Y 7/1 and 7/2 - 6/1), slightly calcareous to dolomitic. Faintly laminated. Regular to some irregular thick parting; slightly irregular and conchoidal fracture. |
| 548.8 | 551.0 | Oil shale: Medium to dark olive gray and brownish gray (5 to 2.5Y 4/2 - 2/1, some 5/2 mostly in upper part), dolomitic. Faint to distinct streaked bedding. Slightly irregular to irregular thick parting; irregular fracture. Few dark zones with abundant very fine disseminated crystals. Very fine pyrite becoming abundant in lower part. A 1/2-inch brownish-gray silty tuff stringer at base. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| | | Sample of dark brownish-gray oil shale with abundant very fine disseminated crystals from 549.3 feet: X-ray - dolomite, calcite, quartz, feldspar, montmorillonite, illite. |
| 551.0 | 551.8 | Oil shale: Olive gray (5 to 7.5Y 4/2 - 5/2), slightly calcareous. Very faintly streaked and laminated. Irregular thick to medium parting; irregular coarse hackly fracture. Abundant very fine disseminated pyrite near top. |
| 551.8 | 553.0 | Oil shale and marlstone: Olive gray to gray buff (7.5 to 10Y 5/1 - 7/1 and 7/2), slightly calcareous. Faintly laminated. Regular thick to medium parting; fairly regular fracture. Abundant very fine disseminated calcite crystals in some zones in lower part. |
| 553.0 | 554.1 | Marlstone: Light olive gray to buff (7.5 to 5Y 6/1 - 7/2, some 8/2), dolomitic to slightly calcareous. Faintly laminated and banded. Regular to some irregular thick to thin parting; fairly regular fracture. Abundant very fine calcite blebs in upper part. |
| 554.1 | 554.9 | Oil shale: Medium to some light and rare dark olive gray and brownish gray (5 to 2.5Y 5/2 - 4/2, some 6/2, rare 3/2 and 7/2), dolomitic. Moderately distinct to faint laminae and streaked bedding. Regular thick parting; slightly irregular and rare coarse hackly fracture. Abundant fine calcite blebs and very fine disseminated crystals in some zones. Thin gray-buff biotitic tuff streaks at 554.4 and 554.6. |
| 554.9 | 556.3 | Oil shale: Medium and some light olive gray (7.5 to 10Y 5/2, some 7.5 to 5Y 6/2 - 7/2), slightly calcareous. Faintly laminated and streaked to very faintly bedded. Irregular thick to thin parting; irregular to coarse hackly fracture. |
| 556.3 | 557.3 | Marlstone: Light greenish gray to olive gray and rare buff (5GY to 7.5Y 6/2 - 7/2, rare 5Y 7/2 near base), dolomitic to moderately calcareous. Faintly laminated and banded. Irregular to regular thick to thin parting; irregular to slightly conchoidal fracture. Gray mottling in upper 0.3 foot appears to be halo-like discoloration adjacent to irregular invisible fractures. Some thin to fine limestone streaks and layers from 556.6 to 556.9. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| 557.3 | 559.1 | Marlstone and lean oil shale: Light to some medium olive gray and some buff (7.5Y 7/2 - 6/2, some 5/2 lower part, some 5Y 8/2 near top), slightly calcareous. Very faintly laminated to nearly massive. Regular to irregular thick to some thin parting; slightly conchoidal to irregular fracture. |
| 559.1 | 560.4 | Limestone(?): Buff to light olive gray (5Y 7/2 - 6/2), fine conglomeratic texture, massive. Irregular parting and fracture. Rare fine oil-shale shreds. Slightly interfingering contact with oil shale below. (0.8 foot missing?). Sample of buff conglomeratic limestone (?) from 599.3 feet: X-ray - dolomite, calcite, quartz, feldspar, montmorillonite. |
| 560.4 | 560.6 | Oil shale: Dark to medium brownish and olive gray (2.5 to 5Y 3/2 - 4/2 in upper inch; 5 to 7.5Y 4/2 - 5/2 in lower part), dolomitic to slightly calcareous. Faintly laminated; some very fine buff streaks near top. |
| 560.6 | 561.8 | Marlstone and lean oil shale: Light to medium olive gray (7.5 to 10Y 7/2 - 5/2), slightly calcareous to dolomitic. Faintly laminated and streaked to massive. Fairly regular thick parting; slightly irregular and conchoidal fracture. Some discolored gray patches and stringers. |
| 561.8 | 562.1 | Oil shale: Dark to light olive gray (5Y 3/2 - 4/2 in upper inch, 5/2 - 6/2 in lower part), dolomitic. Contorted laminae and truncated stringers in upper inch; regular fine laminae and streaked bedding in lower part. Fine buff calcite blebs becoming abundant in lower part. |
| 562.1 | 562.9 | Oil shale: Olive gray (7.5Y 5/2), slightly calcareous. Faint very fine laminae and streaked bedding. Irregular thick to medium parting; irregular fracture. A thin vermiform stringer of buff conglomeratic limestone in upper 0.2 foot (like 559.3). |
| 562.9 | 564.2 | Marlstone (lean oil shale?): Light olive gray (10 to 7.5Y 6/2 - 7/2), slightly calcareous to dolomitic. Very faint laminae and streaked bedding. Fairly regular to irregular |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| | | <p>thick to medium parting; slightly conchoidal to irregular fracture. Abundant fine-grained crystalline calcite blebs, streaks, and patches in lower part.</p> <p>Sample of light olive-gray marlstone from 563.3 feet: X-ray - dolomite, quartz, feldspar, calcite, montmorillonite, illite, pyrite.</p> |
| 564.2 | 565.2 | Oil shale: Light to rare medium olive gray (7.5Y 6/2 - 7/2, rare 5Y 6/2 - 5/2), slightly calcareous. Very faintly streaked and laminated. Irregular to fairly regular thick to medium parting; irregular fracture. Some fine-grained calcite streaks and patches in upper part. A fine lenticular gray-buff biotitic tuff layer at 564.8. |
| 565.2 | 566.2 | Marlstone (lean oil shale?): Light to rare medium olive gray (10 to 7.5Y 7/2 - 6/2, rare 7.5 to 5Y 6/2 - 5/2), slightly calcareous. Very faintly laminated and streaked. Slightly irregular thick parting; slightly irregular and conchoidal fracture. |
| 566.2 | 567.0 | Marlstone: Very light buff (7.5Y 8/2 - 8/1), slightly calcareous. Very faintly bedded. Regular to some irregular medium to thin parting; regular to slightly conchoidal fracture. Rare fine-grained calcite streaks and laminae. |
| 567.0 | 568.0 | Marlstone and oil shale: Buff to medium olive gray (7.5 to 5Y 7/2 - 5/2, rare 4/2 lower part), slightly to moderately calcareous. Faint to some fairly distinct streaks and laminae. Irregular thick parting; irregular to slightly conchoidal fracture. Some fine white calcite streaks in upper part. Few fine buff-white biotitic tuff streaks at 567.8. |
| 568.0 | 569.0 | Mudstone and oil shale: Light to some medium olive gray (7.5 to 10Y 7/2 - 6/2, some 5/2 in lower part), slightly calcareous. Very faintly banded and laminated. Regular to irregular thick to rare thin parting. Abundant muscovite in silty zones. |
| 569.0 | 570.2 | Oil shale: Medium to light olive green (10 to 7.5Y 5/2 and 4/1 - 6/2, some 7/2 lower part), slightly calcareous. Faint regular to distorted laminae and streaked bedding. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| | | Irregular to fairly regular thick to medium parting; irregular and some coarse hackly fracture. Few very fine irregular discontinuous dark gray fracture fillings. |
| 570.2 | 571.2 | Marlstone: Buff (5 to 7.5Y 7/2 - 9/2), slightly calcareous. Faintly laminated and banded. Irregular to regular thick to medium parting; slightly irregular fracture. Marlstone with very abundant oolites in lower 3/4 inch. Sample of very oolitic marlstone from 571.2 feet: X-ray - calcite, dolomite, montmorillonite, quartz. |
| 571.2 | 572.9 | Oil shale: Olive green (10Y to 5GY 5/2), slightly calcareous. Faint streaked bedding. Irregular thick to medium parting; irregular coarse hackly fracture. Sample of olive-green oil shale from 572.3 feet: X-ray - montmorillonite, illite, quartz, feldspar, dolomite, calcite. |
| 572.9 | 573.5 | Marlstone and siltstone: Buff to rare light brownish gray (10 to 7.5Y 8/2 - 8/1 in upper part to 5Y 7/2 and rare 2.5Y 6/2 in lower part), dolomitic marlstone in upper part to very calcareous siltstone in lower part. Very faintly bedded; some faint laminae in lower part. Irregular to regular medium to thin parting; irregular to fairly regular fracture. Abundant fine gray calcite blebs in lower part. Abundant muscovite in lower part. |
| 573.5 | 574.0 | Oil shale: Light to some medium olive gray (7.5 to 5Y 6/2 - 7/2, some 5/2), slightly to very calcareous. Faint streaked bedding and some very fine laminae. Fairly regular to irregular thick and rare thin parting; slightly irregular fracture. Abundant fine calcite blebs; a thin medium-grained vertical calcite stringer at 573.8 - 573.9. |
| 574.0 | 574.9 | Oil shale: Light to medium olive gray and rare brownish gray (7.5Y 6/2 - 5/2, rare 5 to 2.5Y 5/2 - 4/2), slightly calcareous. Very faint streaked bedding and some faint laminae. Irregular thick to medium parting; irregular to slightly conchoidal fracture. Very abundant fine dark disseminated crystals in upper part. Sample of olive-gray oil shale with abundant fine disseminated crystals from 574.2 feet: X-ray - montmorillonite, illite, dolomite, calcite, quartz, feldspar, pyrite. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| 574.9 | 577.3 | Oil shale and marlstone: Light and some medium olive gray (7.5 to 10Y 6/1 - 7/1, some 8/1 and 6/2 - 5/2), slightly calcareous. Faint and some moderately distinct laminae and bands. Irregular to regular thick to some thin parting; slightly conchoidal to irregular fracture. Abundant fine buff calcite blebs in some zones. Sample of light olive-gray marlstone from 576.7 feet: X-ray - dolomite, quartz, feldspar, montmorillonite. |
| 577.3 | 578.4 | Oil shale: Medium to light olive gray (7.5 to 10Y 5/2 - 6/2, some 7/2), slightly calcareous. Faint laminae and streaked bedding. Irregular to regular thick to medium parting; irregular to slightly conchoidal fracture. |
| 578.4 | 579.4 | Marlstone: Light olive gray to buff (7.5 to 10Y 6/2 - 7/2, rare 8/2, some 6/1 - 7/1 lower part), slightly calcareous. Faint laminae and some bands. Regular to irregular thick to some thin parting; slightly irregular and conchoidal fracture. Occasional very fine white calcite streaks and layers. |
| 579.4 | 580.5 | Missing |
| 580.5 | 583.9 | Marlstone and very lean oil shale: Buff to light and rare medium olive gray (7.5 to 10Y 8/2 and 8/1 - 6/2, rare 5/2), slightly to moderately calcareous. Faint laminae and bands. Regular to irregular thick to rare thin parting; irregular to slightly conchoidal fracture. Few fine to thin irregular vertical stringers of fine to medium-grained calcite. Rare fine buff-white calcareous streaks and blebs. |
| 583.9 | 585.2 | Marlstone: Very light greenish gray (10Y to 5GY 8/1 - 7/2, some 6/2 lower part), slightly calcareous. Faint laminae to very faint disrupted streaked bedding. Irregular thick to medium parting; slightly irregular to irregular and rare hackly fracture. |
| 585.2 | 586.3 | Marlstone: Light to medium greenish gray (5 to 10GY 6/1 and 6.5/1 and 5/2), slightly calcareous. Faintly mottled to streaked. Irregular thick parting; slightly irregular fracture. Becoming very oolitic in lower 0.1 foot. Sample of greenish-gray marlstone from 585.8 feet: X-ray - quartz, feldspar, calcite, montmorillonite, illite, dolomite. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| 586.3 | 587.2 | Marlstone: Buff and some light gray (2.5 to 5Y 8/2 - 7/2, some 6/), calcareous, silty in parts. Very faintly bedded with few fine to thin laminae. Irregular to regular thick to thin parting; slightly conchoidal to irregular fracture. Few thin light greenish-gray marlstone stringers in upper part. A thin vermiform stringer with abundant fine dislocated dark gray filaments at 586.8 - 587.0; thin gray discoloration halos 1/8 to 1/4 inch away from stringer. |
| 587.2 | 588.4 | Oil shale: Light olive gray to buff (5 to 7.5Y 6/2 - 7/2), dolomitic. Faint and rare moderately distinct streaked bedding and discontinuous laminae. Irregular thick parting; slightly hackly to irregular fracture. Abundant fine to moderately coarse disseminated calcite crystals and crystalline streaks. Few small dense buff dolomite lenses near top. Sample of light olive-gray oil shale with abundant calcite crystals from 587.4 feet: X-ray - dolomite, quartz, calcite, montmorillonite, feldspar, illite. |
| 588.4 | 590.8 | Oil shale and marlstone: Light olive gray to buff (5 to 10Y 6/2 - 8/2), slightly to moderately calcareous. Faint streaked bedding to some indistinct laminae and bands. Irregular thick to medium parting; irregular fracture. Fairly abundant fine calcite streaks and occasional short vermiform stringers. |
| 590.8 | 591.8 | Marlstone: Light olive gray to very light buff (5Y 6/2 - 9/2), calcareous. Faintly banded to very faintly bedded. Regular to some irregular thick to thin parting. A fine white calcite lamina at 591.2. Sample of buff marlstone from 591.6 feet: X-ray - dolomite, quartz, calcite, feldspar, montmorillonite. |
| 591.8 | 592.5 | Oil shale: Medium to dark olive gray and brownish gray (5 to 2.5Y 5/2 - 3/2), dolomitic. Faint discontinuous very fine laminae and streaked bedding. Irregular to fairly regular thick parting; irregular and some slightly hackly fracture. A 3/4-inch to very thin tapering vermiform stringer of buff marlstone in upper 3 inches; contains some buff and gray oolites in upper part. Sample of medium to dark olive-gray oil shale from 592.4 feet: X-ray - dolomite, quartz, calcite, feldspar, montmorillonite. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| 592.5 | 593.1 | Oil shale: Medium olive to light olive gray (5Y 5/3 to 7.5Y 6/2 and some 7/2), slightly to moderately calcareous. Faint very fine laminae and streaked bedding. Irregular thick to medium parting; very irregular fracture. |
| 593.1 | 593.7 | Marlstone: Light olive green (7.5 to 10Y 7/2), slightly calcareous. Massive to very faintly streaked. Irregular thick parting; irregular conchoidal fracture. Very oolitic in lower 0.1 foot. |
| 593.7 | 594.5 | Oil shale(?): Light to some medium olive green (10Y 7/2 - 6/2, some 5/2 lower part), slightly calcareous. Faint interrupted streaked bedding. Irregular thick parting; very irregular fracture. Some very indistinct vertical oolitic stringers and irregular patches. |
| 594.5 | 594.9 | Marlstone (oil shale?): Light to rare medium olive gray (5 to 7.5Y 6/2 - 7/2, rare 5/2 - 5/3), calcareous. Faintly banded and streaked. Displaced to coarsely brecciated contact at top; slightly displaced contact at bottom. |
| 594.9 | 598.0 | Oil shale(?): Light to medium olive gray (7.5Y 6/2 - 5/2), slightly calcareous. Very faintly laminated to massive. Irregular to regular thick to medium parting; irregular to regular and rare conchoidal fracture. Very fine disseminated pyrite (common cubes) becoming abundant in lower part. A 1 1/2-inch buff crystalline limestone band at 597.9. Sample of olive-gray oil shale with disseminated pyrite from 597.5 feet: X-ray - quartz, analcime, calcite, dolomite, feldspar, montmorillonite, illite. |
| 598.0 | 599.1 | Oil shale(?): Light to medium olive gray mottled and streaked with gray (7.5Y 6/2 - 5/2 with 5/1 in upper part), slightly calcareous. Mottled and streaked in upper part; massive in lower part. Irregular thick parting; irregular to conchoidal fracture. |
| 599.1 | 600.2 | Sandy mudstone: Light to medium olive gray (7.5 to 10Y 6/2 and 6/1 - 5/2 and 5/1), calcareous. Faintly variegated. Irregular thick parting; slightly irregular fracture. Moderately coarse to very fine rounded sand grains becoming very abundant in lower part. Fairly abundant very fine disseminated pyrite. |
| 600.2 | 600.5 | Missing. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| 600.5 | 601.6 | Sandy mudstone: (Same as 599.1 - 600.2) |
| 601.6 | 602.7 | Silty mudstone grading to shaly marlstone: Medium to some light olive green (10Y 5/2, some 6/2), moderately to slightly calcareous. Massive to very faint streaked bedding. Irregular thick to medium parting; irregular coarse hackly fracture. Sample of olive-green shaly marlstone from 602.4 feet: X-ray - montmorillonite, illite, dolomite, calcite, analcime, quartz, feldspar. |
| 602.7 | 604.3 | Marlstone and siltstone (oil shale?): Light to some medium olive gray (7.5 to 5Y 7/2 - 6/2, some 5/2 in lower part), very calcareous to slightly calcareous. Marlstone abundantly streaked with siltstone in upper part grading to faintly streaked marlstone in lower part. Irregular thick and rare thin parting; irregular and some slight to coarse hackly fracture. Rare fine dark olive-gray to black oil-shale streaks. |
| 604.3 | 605.4 | Marlstone (oil shale?): Tan to buff and rare medium brownish gray and olive gray (2.5 to 5Y 6/3 - 7/3, some 6/2 - 8/2, rare 5/2), dolomitic to slightly calcareous. Moderately distinct streaks and laminae to very faint banding. Irregular to fairly regular thick to some thin parting; slightly conchoidal to irregular fracture. Abundant fine white calcite blebs and few thin to 1-inch crystalline layers. |
| 605.4 | 606.3 | Marlstone: Buff to nearly white (5Y 7/2 - 9/1), calcareous. Faintly banded. Irregular to fairly regular thick to rare thin parting; irregular to fairly regular fracture. Abundant fine white calcite blebs. |
| 606.3 | 606.7 | Sandstone: Buff (5Y 8/2 - 7/2), very calcareous, coarse to very fine grained. Very faintly bedded. Irregular parting; slightly irregular fracture. Abundant fine buff to white marlstone clasts. Irregular contact with oil shale below. Sample of sandstone from 606.6 feet: X-ray - calcite, quartz, dolomite, feldspar, montmorillonite. |
| 606.7 | 607.1 | Oil shale: Light to medium olive and some grayish brown (5Y 6/2 and 6/3 - 5/2 and 5/3, some 2.5Y 6/3 - 5/3 near base), slightly calcareous. Very faint streaked bedding. Slightly irregular parting; irregular hackly fracture. Abundant fine light gray sandy and silty to some dense calcareous streaks and vermiform stringers. |

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| 607.1 | 607.4 | Marlstone: Light olive gray (5Y 6/2 - 7/2). Very faintly bedded. Thin tan layer with abundant very fine buff specks at base. |
| 607.4 | 608.9 | Marlstone (oil shale?): Light olive green (10 to 7.5Y 6/2, rare 7/2), slightly calcareous. Faint streaked bedding and some laminae. Irregular and rare regular thick to some medium parting; irregular to slightly conchoidal fracture. Some gray discoloration near top. Some very indistinct irregular fine vertical stringers in lower part. Few fine gray silty streaks and stringers in lower 0.3 foot. |
| 608.9 | 609.9 | Marlstone and mudstone: Light olive gray (5 to 7.5Y 6/2 - 7/2), calcareous. Faintly streaked and mottled. Slightly irregular thick parting; fairly regular fracture. |
| 609.9 | 612.5 | Siltstone, mudstone, and some very fine sandstone: Gray buff (5Y 7/1 - 7/2), calcareous. Massive with rare very faint laminae. Irregular thick to thin parting; irregular fracture; some broken core and rubble. |
| 612.5 | 615.0 | Mudstone, siltstone, and fine sandstone: Buff and gray buff to some light brownish gray (5 to 2.5Y 7/2 - 7/1, some 6/2), calcareous. Massive with some faint regular to displaced laminae. Very rare fine pyrite blebs in mudstone. Sample of buff mudstone from 613.7 feet: X-ray - quartz, analcime, calcite, feldspar, dolomite, illite, montmorillonite. |
| 615.0 | 620.9 | Mudstone: Buff to light brownish gray (5 to 2.5Y 7/2 - 6/2 and 6/2) calcareous. Faint commonly displaced and disrupted laminae and some massive bands. Irregular to fairly regular thick parting; slightly irregular fracture. Some indistinct irregular fine to thin vertical stringers. Rare fine pyrite blebs. (617.8 - 620.5 missing?). |
| 620.9 | 623.5 | Mudstone: Light olive gray to buff (5Y 6/2 - 7/2), calcareous. Faintly mottled with siltstone in upper part becoming massive with some very faint streaks and laminae in lower part. Slightly irregular thick parting; slightly irregular fracture. very rare pyrite blebs. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| 623.5 | 625.6 | Siltstone and mudstone: Gray buff to rare light olive gray (5Y 7/1 - 7/2, rare 6/2), calcareous. Very faintly bedded siltstone with irregular shaly to papery parting and hackly fracture thickly interbedded with mudstone as above and below. |
| 625.6 | 627.9 | Mudstone: Buff to light olive gray (5Y 7/2 - 6/2 and 6/3), calcareous. Faintly mottled in upper and lower parts; very faint commonly disrupted and displaced laminae in middle part. Irregular thick parting; slightly irregular fracture. Some thick to fine indistinct vertical stringers. |
| 627.9 | 628.4 | Marlstone: Light to medium olive gray (5Y 6/2 - 5/3), slightly calcareous. Massive with few moderately distinct regular laminae. Irregular thick parting; irregular conchoidal fracture. Few fine indistinct vertical stringers near top. Rare very fine pyrite blebs. Sample of olive-gray marlstone from 628.2 feet: X-ray - quartz, analcime, feldspar, calcite, illite, montmorillonite, dolomite. |
| 628.4 | 631.4 | Mudstone with some siltstone and fine sandstone: Light olive gray to buff (5Y 6/2 - 7/2, some 7/1), calcareous. Faint slightly irregular laminae and streaked bedding. Irregular thick to some medium parting; slightly irregular fracture. Some thin to fine vertical stringers. Abundant very fine white to buff earthy grains in sandstone in lower part. |
| 631.4 | 633.1 | Mudstone and marlstone: Light and some medium olive gray to buff (5Y 6/2 and 6/3 - 7/2, some 5/2 - 5/3), moderately to slightly calcareous. Faint commonly disrupted laminae. Irregular thick parting; irregular fracture. |
| 633.1 | 635.3 | Mudstone and siltstone: Light olive gray to gray buff (5Y 6/2 - 7/1), calcareous. Faint regular to some disrupted laminae and streaked bedding in thick gradational zones of mudstone and siltstone. Irregular thick parting; slightly irregular fracture. |
| 635.3 | 636.8 | Siltstone: Buff (5Y 7/2), very calcareous, sandy. Massive with rare faint streaks. Irregular thick to some thin parting; slightly irregular fracture. Abundant very fine white earthy grains (commonly angular). |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| | | Sample of sandy siltstone from 636.3 feet: X-ray - quartz, feldspar, calcite, analcime, illite, montmorillonite, dolomite. |
| 636.8 | 639.8 | Missing. |
| 639.8 | 644.0 | Mudstone: Light olive gray to buff (5Y 6/2 - 7/2), calcareous. Faint displaced laminae and some faintly mottled zones. Irregular to fairly regular thick parting; slightly irregular to irregular fracture. Sparse very fine disseminated pyrite. |
| 644.0 | 645.7 | Mudstone and marlstone: Light to medium olive gray (5 to 7.5Y 6/2 - 5/2, some 7/2 upper part), calcareous. Very faint irregular laminae and streaked bedding; some massive zones. Irregular thick parting; irregular to regular fracture. Sparse disseminated pyrite. |
| 645.7 | 646.4 | Marlstone (oil shale?): Light to medium olive green (7.5 to 10Y 6/2 - 5/2, some 4/2), moderately to slightly calcareous. Very faint irregular to regular laminae. Slightly irregular thick to medium parting; irregular and some slightly hackly fracture. Rare very fine pyrite. |
| 646.4 | 646.7 | Oil shale: Grayish brown to tan and buff (2.5 to 5Y 4/3 - 6/3 and 7/2). Faint to fairly distinct distorted to regular laminae. Irregular to regular thick to thin parting; irregular slightly hackly fracture. Abundant fine to thin light olive-gray mudstone and siltstone laminae. |
| 646.7 | 647.7 | Marlstone and mudstone: Light to medium olive gray (7.5Y 6/2 - 5/2), slightly to moderately calcareous. Very faint laminae and streaked bedding. Irregular thick parting; irregular hackly to conchoidal fracture. |
| 647.7 | 648.7 | Marlstone: Light olive gray (7.5 to 5Y 6/2 - 7/2), slightly calcareous. Very faintly laminated to massive. Irregular thick parting; irregular fracture. Abundant fine to thin sandy-textured limestone layers. A 1-inch white to light gray earthy to silty biotitic tuff band near base. |
| 648.7 | 649.3 | Limestone, marlstone, and some oil shale: Light to medium olive gray and rare brownish gray (7.5 to 5Y 7/2 - 5/2 and 5/3, rare 2.5Y 4/2 in lower part). Faintly to moderately distinctly laminated sandy-textured limestone and some marlstone and oil-shale layers with very abundant calcite |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| | | grains. Fairly regular thick to thin parting; irregular to fairly regular fracture. Sample of sandy-textured limestone from 649.0 feet: X-ray - montmorillonite, dolomite, calcite. |
| 649.3 | 652.6 | Marlstone (some oil shale?): Light to rare medium olive gray (7.5Y 7/2 - 6/2, rare 5/2 - 4/2 and 8/1), slightly to moderately calcareous. Very faint to rare moderately distinct laminae. Irregular to fairly regular thick to some medium parting; irregular to slightly conchoidal fracture. Abundant fine to moderately coarse calcite crystals and some fine layers down to 651.8. |
| 652.6 | 653.6 | Marlstone: Buff (7.5 to 5Y 7/2 - 8/2), calcareous. Faintly streaked to laminated. Slightly irregular thick to thin parting; slightly irregular fracture. Abundant fine crystalline calcite streaks and layers. |
| 653.6 | 654.6 | Marlstone grading to oil shale: Buff to medium olive gray (5Y 7/2 - 5/2, rare 4/2 in lower part), slightly calcareous to dolomitic. Faint to some distinct streaks and discontinuous laminae. Irregular thick parting; irregular fracture; rubble in upper 2 inches. Sample of olive-gray oil shale from 654.4 feet: X-ray - dolomite, quartz, calcite, feldspar, montmorillonite. |
| 654.6 | 655.7 | Marlstone: Buff to light and some medium olive gray (5Y 7/2 - 6/2, some 5/2 in middle part), slightly calcareous. Faint streaked bedding and some laminae. Regular to irregular thick to rare thin parting; fairly regular to irregular fracture. A very thin white tuff streak at top. A 3/4-inch gray siltstone band near base. |
| 655.7 | 656.0 | Oil shale: Olive gray to buff (5Y 5/2 - 7/2, some 4/2 near top), dolomitic to calcareous. Moderately distinct to faint streaked bedding and slightly distorted and displaced laminae. Irregular thick parting; irregular fracture. |
| 656.0 | 657.5 | Marlstone: Buff to light olive gray (5 to 7.5Y 7/2 - 6/2), slightly to very calcareous. Faintly streaked and laminated to massive. Irregular medium to thick parting; irregular fracture; rubble at top. Abundant coarse rounded gray sand grains at 657.1 - 657.2. Some crystalline calcite patches at 657.2 - 657.3. |

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|---|
| 657.5 | 658.6 | Oil shale: Medium to dark and some light olive gray (5Y 5/2 - 3/2, some 6/2, rare 2/1), dolomitic. Distinct to faint streaked bedding and rare laminae. Irregular to slightly irregular thick to rare medium and thin parting; irregular to slightly irregular fracture. Abundant fine buff-white crystalline calcite specks and streaks at 657.7 - 657.9. A very thin buff mudstone (tuff?) streak at 657.7. Very sharp regular contact with sandstone at base. |
| 658.6 | 660.2 | Marlstone: Light to medium olive gray (7.5Y 6/2 - 5/2), slightly calcareous. Very faintly mottled and streaked to massive. Irregular parting and fracture. Rare very fine pyrite. A thin conglomeratic sandstone layer at top grading downward into sandy marlstone. Marlstone grading to silty mudstone in lower 0.2 foot. |
| 660.2 | 662.1 | Mudstone and marlstone: Gray buff to light and rare medium gray (7.5Y 8/1 - 6/1, rare 5/1), calcareous. Faintly mottled to commonly distorted and displaced very fine laminae and streaks. Irregular thick to medium parting; irregular fracture; broken core and rubble in lower half foot. |
| 662.1 | 663.6 | Mudstone: Buff white to gray buff (5Y 9/1 - 8/1), very limy. Massive to very faintly variegated. Irregular thick parting; fairly regular to irregular fracture. Very abundant moderately coarse rounded carbonate (?) clasts. Some gray oolites in upper part. Buff to tan conglomeratic algal layer at 662.2 - 662.3; few small algal inclusions near base. Sample of very limy buff-white mudstone (limestone?) from 662.6 feet: X-ray - dolomite, calcite, quartz, feldspar, illite, montmorillonite. |
| 663.6 | 665.0 | Mudstone: Gray buff and light slightly greenish gray to white (5Y to 5GY 7/1 - 9/1), calcareous. Massive to faintly mottled and variegated. Irregular thick parting; slightly irregular fracture. Abundant moderately coarse rounded grains. Small stromatolitic algal heads at 664.6. |
| 665.0 | 669.0 | Mudstone: White to light slightly greenish gray (10Y 9/1 - 8/1), calcareous. Massive to faintly mottled and variegated. Irregular thick parting; slightly irregular to irregular fracture. Fine to moderately coarse round and rare angular carbonate (?) clasts becoming abundant in lower part. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| 669.0 | 674.0 | Mudstone: Light slightly greenish gray (7.5Y to 5GY 8/1 - 7/1), calcareous. Massive with rare faint mottling. Irregular thick to some medium parting; irregular and rare coarse hackly fracture. Abundant moderately coarse round grains (sparse broken grains show concretionary structure). Sample of light greenish-gray mudstone from 672.7 feet: X-ray - quartz, feldspar, dolomite, calcite, illite, montmorillonite. |
| 674.0 | 679.3 | Mudstone: Light slightly olive gray to white (7.5Y 8/1 - 9/1), calcareous. Very faintly mottled to massive. Irregular thick to medium parting; irregular fracture; some crumbly broken zones. Moderately abundant fine round grains. |
| 679.3 | 680.0 | Missing. |
| 680.0 | 682.0 | Mudstone: White to some light greenish gray (10Y 9/1, some 8/1 lower part), very calcareous. Massive. Irregular thick to medium parting; irregular fracture. Abundant fine oolites (commonly dark gray). |
| 682.0 | 687.7 | Mudstone: Light slightly olive gray (10 to 7.5Y 8/1, some 7/1), calcareous. Massive to very faintly mottled. Irregular thick to some thin parting; irregular fracture; common crumbly broken core. Fairly abundant gray oolites in upper part. Sample of crumbly mudstone from 686.5 feet: X-ray - dolomite, quartz, feldspar, calcite, montmorillonite, illite. |
| 687.7 | 698.6 | Mudstone and siltstone: Light slightly olive gray (7.5Y 8/1 - 7/1), calcareous. Faintly mottled to massive. Irregular thick parting; irregular to fairly regular fracture; rubble in lower half foot. Rare small to 1-inch irregular dense gray limestone nodules. Some very fine biotite in lower part. |
| 698.6 | 700.0 | Missing. |
| 700.0 | 705.0 | Siltstone and mudstone: Light slightly olive gray (7.5Y 8/1 - 7/1, rare 6/1), calcareous. Massive to very faintly mottled and streaked. Irregular thick to rare thin parting; irregular and some hackly fracture; rare crumbly broken core. Some biotite. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| | | Sample of light gray siltstone from 703.2 feet: X-ray - quartz, feldspar, dolomite, calcite, illite, montmorillonite. |
| 705.0 | 711.4 | Siltstone: Light slightly olive gray (7.5Y 7/1 - 6/1, some 8/1), slightly calcareous. Massive to faintly variegated. Irregular thick to some medium parting; slightly irregular to irregular fracture. Some biotite. |
| 711.4 | 712.5 | Sandy siltstone and fine to medium sandstone: Light slightly olive gray (7.5Y 6/1 - 7/1), slightly calcareous, massive. Irregular thick parting; slightly irregular fracture; rounded rubble at 711.5 - 711.9. Sparse biotite. Coarser grains are fairly angular. Gradational boundaries at top and bottom. |
| 712.5 | 716.6 | Mudstone: Light slightly olive gray (7.5 to 10Y 7/1 - 8/1, rare 6/1), slightly calcareous to noncalcareous. Faintly mottled and variegated. Irregular thick parting; slightly irregular to irregular and some slightly conchoidal fracture. Occasional small to 1-inch irregular dense light gray to buff-white limestone nodules in lower part. |
| 716.6 | 719.0 | Missing. |
| 719.0 | 722.0 | Mudstone: Light olive gray (7.5Y 6/1 and 6/2 - 7/1, some 8/1 upper part), slightly calcareous, very silty. Faintly variegated to massive. Irregular thick to some thin parting; irregular and some hackly fracture. Rare very fine pyrite cubes. |
| 722.0 | 724.0 | Sandy siltstone grading to fine sandstone: Light gray to olive gray (7.5Y 7/1 - 6/2), very slightly calcareous. Faintly variegated to massive. Irregular thick to some medium parting; slightly irregular to irregular fracture; firm in upper part to slightly friable in lower part. Rare very fine pyrite. Some very fine biotite. Sample of light olive-gray fine-grained sandstone from 723.8 feet: X-ray - quartz, K and Na feldspars, illite, montmorillonite, pyrite. |
| 724.0 | 726.0 | Siltstone: Light slightly olive gray (7.5Y 7/1 and 7/2 - 8/1), calcareous, sandy in upper part to muddy in lower part. Massive to very faintly streaked. Irregular thick to thin parting; slightly irregular to hackly fracture. Sparse biotite. Rare very fine pyrite. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 5

| From | To | Description |
|-------|-------|--|
| 726.0 | 735.8 | Siltstone: Light slightly olive gray (7.5Y 7/1 - 8/1), slightly to very calcareous, sandy in parts. Massive with some very faintly mottled zones. Irregular thick and rare medium to thin parting; fairly regular to irregular and rare hackly fracture. |
| 735.8 | 739.0 | Missing. |
| 739.0 | 744.0 | Siltstone: As above. A 1-inch broken dense buff limestone nodule at 741.3. |
| 744.0 | 750.2 | Mudstone: Light olive gray (7.5 to 5Y 7/2 - 6/2), slightly calcareous, silty to marly. Massive to faintly variegated and mottled. Irregular thick parting; slightly irregular to irregular fracture. Some fine to small dense buff limestone nodules in upper part. Some indistinct fine vermiform silty to sandy stringers in lower foot. Rare very fine pyrite. (Sample of marly mudstone from 748.4 gave no oil in test tube.) Sample of light olive-gray marly mudstone from 748.4 feet: X-ray - quartz, K and Na feldspars, illite, montmorillonite. |
| 750.2 | 750.5 | Sandstone: Medium brownish gray (2.5 to 5Y 5/2), fine grained. Massive; few very small light silty blebs. Rounded core ends. Abundant muscovite. |
| 750.5 | 759.0 | Missing. |
| 759.0 | 762.0 | Sandstone: Light olive gray (5 to 7.5Y 6/2 and 6/1, rare 7/1) fine grained, grading to siltstone and silty mudstone in lower foot. Massive; rare very faint streaked bedding. Irregular medium to thick parting; irregular fracture; some rounded rubble in upper part. Abundant muscovite; biotite becoming fairly abundant in lower part. |
| 762.0 | 767.9 | Siltstone and silty mudstone: Light olive gray (5 to 7.5Y 6/2), some sandy zones. Massive with rare faint mottling. Irregular thick to rare thin parting; irregular and rare coarse hackly fracture. Abundant muscovite and sparse biotite. Rare very fine pyrite. Rare small buff limestone nodules in lower part. |
| 767.9 | | Bottom of recovered core. |
| 779.0 | | Bottom of hole. |