EL PASO NATURAL GAS COMPANY
Fed-Spurrier 1
Sec. 5, T. 20 S., R. 44 E.
Malheur County, Oregon
Descriptions of Well Samples

February 6, 1963

230 - 240  Shale and bentonite: Light gray - greenish, silty to fine sandy.

240 - 260  Agglomerate (?)

260 - 280  Shale and bentonite: Light gray, silty.

280 - 290  Agglomerate (?)

290 - 300  Shale: Light gray, sandy.

300 - 340  Basalt (?): Slightly altered, dark gray - black, with small irregular cavities containing opal and calcite.

340 - 360  Tuffaceous sandstone: Whitish, calcareous, friable, medium grained, with partly altered feldspar grains.

360 - 400  Crystal tuff: Whitish, firm calcareous vitric ash, with fragments of feldspar and pyroxene (?) crystals.

400 - 410  Vitric tuff and tuffaceous siltstone: Pinkish and white with scattered small fragments of black crystals.

410 - 450  Andesite (?): Medium gray, vesicular. Some thin interbeds of ash.

450 - 710  Basalt: Dark gray, with calcite veining and cavity filling. Some quartz filling, microcrystalline. Some black, more dense basalt near base. A few interbeds of light-colored ash.

710 - 740  Rhyolite (?): Dark pinkish gray, small quartz-filled cavities, also some calcite filling.

740 - 750  Claystone: Pinkish - red, baked.

750 - 843  Claystone: Pinkish and whitish.

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| 900 - 930 | Ash: Pink and whitish. |
| 930 - 945 | Basalt: Brownish black, partly altered with calcite. |
| 945 - 960 | Ash: Whitish with minute black crystal fragments. |
| 960 - 990 | Basalt: Brownish black, microcrystalline with some calcite veining. |
| 990 - 1030 | Rhyolite (?): Reddish with milky-white veinlets of quartz and calcite. Some zeolite in small cavities. Medium-gray basalt at bottom. |
| 1030 - 1070 | Varied colored ash |
| 1070 - 1110 | Basalt: Pinkish dark gray with some calcite and zeolite. |
| 1110 - 1240 | Tuffaceous siltstone: Whitish and pinkish, with a few small pieces of chaledony. |
| 1240 - 1280 | Basalt: Dark gray, somewhat altered. Contains greenish zeolite in small cavities, some calcite. Some chloritization. |
| 1280 - 1310 | Basalt: Dark brownish black, hard, microcrystalline. |
| 1310 - 1330 | Tuff: Fine, varied colored, firm. |
| 1330 - 1345 | Sandstone: Whitish, friable, very fine grained, containing a few small surrounded basalt fragments. Some claystone stringers included. |
| 1345 - 1375 | Siltstone: White, friable. |
| 1375 - 1410 | Rhyolite (?): Pinkish gray, with veinlets of milky-white quartz. Some dark-brownish basalt in lower portion. |
| 1410 - 1425 | Tuff: Whitish and pink, firm. |
| 1425 - 1438 | Rhyolite (?): Pinkish gray with veinlets of milky-white quartz. |
| 1438 - 1460 | Tuff: Grayish white and pink, firm to soft. |
| 1460 - 1472 | Basalt: Dark grayish black, hard, fine grained with zeolite-filled cavities. |
| 1472 - 1483 | Tuff: Pink and white, firm to soft. |
1483 - 1490 Basalt: Black, hard, fine grained.
1490 - 1580 Tuff: Pink and white, firm to soft.
1580 - 1620 Rhyolite (?): Grayish pink with wavy veinlets of milky-white quartz, some calcite, zeolite, and chlorite.
1620 - 1660 Tuffaceous siltstone: Pinkish, whitish, and light gray. Whitish siltstone is partially altered to clay.
1660 - 1740 Basalt: Brownish black, hard, fine grained. Lower portion somewhat chloritized.
1740 - 1770 Basalt: Dark pinkish gray, hard, microcrystalline, slightly altered.
1770 - 1785 Tuff: Pinkish and white with some light-green claystone and white ash.
1785 - 1820 Basalt: Dark grayish black, hard, fine grained, with some calcite and chlorite.
1820 - 1848 Tuff: White and pink, firm with some white claystone.
1848 - 1854 Sandstone: Whitish, firm to friable, very fine grained.
1854 - 1880 Tuff: White and pink as above.
1880 - 1890 Crystal tuff: White, very fine, firm.
1890 - 1985 Tuff: Grayish white and pink, firm, thin interbeds of black carbonaceous shale, few thin stringers of whitish, firm, very fine-grained sandstone with clayey matrix.
1985 - 1990 Welded tuff (?): Pinkish gray, hard, cemented, siliceous, contains some calcite.
1990 - 2080 Tuff: Pink and light brown, firm, some interbedded brown shale. Some thin beds of black carbonaceous shale containing black shiny coal.
2080 - 2095 Sandstone: White, firm, very fine grained, feldspathic.
2095 - 2108 Siltstone: Grayish white and light green, firm, with some grayish-white limestone containing pyrite. Also some thin layers of black carbonaceous shale.
2108 - 2147 Sandstone: Grayish white, firm, very fine grained, partially cemented, containing some pyrite.
2147 - 2155 Tuff: Whitish, green and pink, firm, with interbeds of grayish-black fissile shale.

2155 - 2175 Limestone: Grayish white, firm, hard, with light-colored interbeds of siltstone and fine, friable sandstone.

2175 - 2200 Basalt: Reddish gray, partially altered with quartz filling cavities.

2200 - 2240 Tuff: White, pink and light gray, friable and grayish-black shale with thin streaks of coal. Also a small amount of limestone.

2240 - 2250 Coal: Black, thinly laminated, shaly.

2250 - 2267 Limestone: Grayish white, hard to firm.

2267 - 2278 Tuff: Pink, red, green, and white. Firm.

2278 - 2295 Sandstone: Medium gray, friable, fine grained.

2295 - 2305 Tuffaceous siltstone: White, green and gray, firm to friable, and shaly black brittle coal. Thin bed of coarse sandy limestone in this section.

2305 - 2320 Sandstone: Whitish light green, friable, coarse, subangular, composed of fragments of limestone, siltstone, and altered volcanic rock in a silty matrix. Some interbedded grayish-white, fine-grained, firm to friable silty sandstone containing carbonaceous material.

2320 - 2340 Tuffaceous siltstone: Medium gray and light green, friable, containing small fragments of black carbonaceous material and interbedded with coarse sandstone above.

2430 - 2510 Rhyolite: Dark pinkish gray and reddish gray, some partially altered and having quartz-lined cavities. Thin layers of baked clay and interbeds of varied colored siltstones.


2520 - 2555 Tuff fine: White, pink and light gray, friable to firm, containing some thin layers of black shaly coal.

2555 - 2560 Welded tuff (?): Pinkish dark gray, hard.

2560 - 2570 Sandstone: White, friable to loose, coarse silty, composed of feldspar, quartz and rock fragments. Fair show on gas analyzer.
2570 - 2610  Siltstone: Dark to medium gray, friable, containing small splintery fragments of black carbonaceous material and some black shale. Also a small amount of light-gray, fine- to medium-grained, quartz sandstone. Gamma Ray - Neutron indicates possible gas zone. Fair show on analyzer.

2610 - 2645  Tuffaceous siltstone: White and light greenish gray, friable with interbeds of white, fine, hard, cemented quartz sandstone. Show on analyzer.

2645 - 2660  Siltstone: White, fine sandy, friable, with many slivers of white shell (?) fragments; some fine-grained, loose sand intermixed. Also thin layers of black shale.

2660 - 2675  Shale: Black, brittle and shaly, fissile coal.

2675 - 2720  Siltstone: White to medium-gray, very fine sandy, friable, and fine silty sandstone.

2720 - 2815  Shale: Grayish-black, and medium-gray, friable to firm siltstone with splinters of black carbonaceous material. Small amount of coal. Some silty sandstone in lower section. Fair gas show on analyzer.

2815 - 2890  Shale: Black, fissile with thin layers of coal and occasional layers of interbedded medium-grained, firm to hard, silty, feldspathic sandstone.

2890 - 2955  Sandstone: White, firm to hard, medium grained, feldspathic, cemented with lime.

2955 - 2970  Tuffaceous siltstone: Light gray and green, firm.

2970 - 2990  Welded tuff (?): Medium gray, containing large fragments of feldspar crystals.

2990 - 3050  Siltstone: Light gray, green and tan, firm, and dark gray, firm siltstone containing fragments of carbonaceous material. Some thin layers of black shale and coal.

3050 - 3085  Tuffaceous siltstone: Light gray and green, firm, and fine sandy siltstone.

3085 - 3090  Siltstone: Medium to dark gray, firm to hard, with small pieces of black carbonaceous material and thin layers of coal.

3090 - 3110  Welded tuff (?): Pinkish, grayish black, hard.
3110 - 3310  Tuff fine: Light gray and pink, firm, with inter-bedded thin layers of dark-gray shale and coal. Good gas show on analyzer 3220 - 3260.

3310 - 3330  Welded tuff (?)

3330 - 3410  Tuff: As above.

3410 - 3440  Shale: Medium gray, firm with scattered small fragments of carbonaceous material, some black shaly coal.

3440 - 3450  Sand: Medium gray, friable, fine grained containing coarse subrounded grains of black shale. Slight gas show on analyzer.

3450 - 3505  Sand: Tan, friable, medium to fine grained; inter-beds of grayish-black shale and medium-gray shale with thin layers of coal.

3505 - 3568  Tuffaceous siltstone: Light gray and green, firm.

3568 - 3577  Sandstone: White, firm to hard, medium to coarse grained, feldspathic, cemented with lime.

3577 - 3599  Tuffaceous siltstone: As above.

Core No. 1 (3598 - 3632)

3598 - 3599  Shale: Light gray, soft bentonite.

3599 - 3600  Siltstone: Light gray, very sandy, micaceous, soft.

3600 - 3601  Sandstone: Light green, speckled with small black mineral fragments, fine-grained, silty friable, subangular grains.

3601 - 3602  Shale: Light gray, soft sandy.

3602 - 3603  Sandstone: Light gray, silty, fine grained, partially cemented, micaceous.

3603 - 3604  Siltstone: Medium hard, very sandy, inclusions of quartz and shale.

3604 - 3607  Siltstone: Gray, dense, micaceous.

3607 - 3608  Sandstone: Light gray, fine grained, silty, sub-rounded, micaceous, poorly sorted.

3608 - 3610  Sandstone: White, medium grained, hard, well cemented, subangular, micaceous.

3610 - 3613  Siltstone: Dark gray, carbonaceous inclusions, micaceous.
3613 - 3614  **Siltstone**: Light gray, carbonaceous streaks, micaceous, sandy.

3614 - 3615  **Sandstone**: Speckled with minute fragments of black minerals, calcareous, medium hard, micaceous, poorly sorted.

3615 - 3616  **Sandstone**: As above but harder.


3632 - 3643  **Shale**: Light gray, firm, silty.

3643 - 3730  **Sandstone**: Light gray, friable, medium to coarse grained, subrounded and interbeds of light gray hard siltstone.

3730 - 3840  **Crystal tuff, fine**: White, hard, very fine, vitric with partially altered feldspar.

3840 - 3890  **Siltstone**: Medium gray, firm to hard, with some laminae of black soft carbonaceous material and coal.

3890 - 3895  **Shale**: Medium gray to dark gray, firm.

3895 - 3910  **Sandstone**: Grayish white, firm to hard, medium grained, subangular, feldspathic, cemented with lime.

3910 - 3950  **Crystal tuff, fine**: White, hard, very fine grained, silicified.

3950 - 3965  **Sandstone**: White, friable, medium grained, subangular, feldspathic. Feldspar partially altered.

3965 - 3970  **Shale**: White, limy, firm.

3970 - 4000  **Sand**: White, loose, coarse grained, subangular, feldspathic.

4000 - 4035  **Siltstone**: Light gray, firm.

4035 - 4060  **Sandstone**: White, firm, medium grained, subangular, cemented with lime and scattered fragments of partially altered pyroxene (?)..

4060 - 4070  **Sand**: White, loose, subangular, feldspathic.

4070 - 4095  **Shale**: Medium gray, brittle, silty with some black carbonaceous streaks.
4095 - 4145 Sandstone: White, firm to friable, medium grained, angular, partially cemented with lime and scattered small fragments of dark minerals.

4145 - 4150 Siltstone: Medium to darkish gray and grayish tan, firm to brittle.

4150 - 4260 Sandstone: Dark gray, fine grained, silty, speckled with minute fragments of dark minerals.

4260 - 4370 Siltstone and shale: Dark gray, firm.

4370 - 4435 Crystal tuff, fine: White, fine grained, silicified, underlain by white fine-to medium-grained, subangular, partially lime-cemented sandstone. Many small black mineral fragments in the sandstone.

4435 - 4440 Shale: Dark grayish black, firm, with thin layers of coal.

4440 - 4460 Sandstone: Medium gray, hard, fine silty with scattered medium-sized grains of feldspar and quartz.

4460 - 4470 Siltstone and shale: Medium gray to grayish black, firm with thin layers of black carbonaceous material.

4470 - 4515 Sandstone: Medium to dark gray, firm, fine grained, containing thin layers of carbonaceous material and a little coal.

4515 - 4530 Shale: Medium gray, firm.

4530 - 4582 Sandstone: Light to medium gray, firm, fine silty, feldspathic, with thin layers of coal.

4582 - 4805 Siltstone: Medium to light gray, firm, sandy grading to fine sand and interbedded with grayish-black, firm shale. Some coal.

4805 - 4915 Diorite - gabbro (?): Medium to dark gray, fine-grained, feldspar and hornblende crystals. Some metallic sulphide mineralization. Interbedded medium-gray siltstone and fine sandstone.

4915 - 4980 Andesite (?): Medium gray, fine grained, hard.

4980 - 5010 Siltstone: Medium to light gray, firm with some black carbonaceous material.

5010 - 5065 Tuff, fine: Light gray, greenish and pink, firm. Greenish siltstone partially altered to clay.
5065 - 5085  Sandstone: Whitish light gray, firm to friable, very fine grained, silty. Slight gas show on analyzer.

5085 - 5095  Shale: Medium to dark gray, firm to brittle, with pieces of black carbonaceous material.

5095 - 5135  Andesite (?): Light gray, firm to hard, partially altered with small areas of metallic sulphide mineralization.

5135 - 5150  Shale: Medium gray, firm.

5150 - 5170  Gabbro - diorite (?): Dark gray, microcrystalline, feldspar and hornblende.

5170 - 5190  Tuffaceous siltstone: Light gray and green, firm; green siltstone partially altered to clay. Interbeds of medium- to dark-gray silty shale.

5190 - 5240  Tuffaceous siltstone and shale: As above.


5340 - 5450  Tuffaceous siltstone: Light gray, tan, and green, firm and thin beds of black shale with some coal. Green siltstone partially altered to clay.

5450 - 5580  Siltstone and sandstone: White, hard, silty to silty medium grained, feldspathic, partially cemented.

5580 - 5650  Tuffaceous siltstone: Whitish, pink and medium to dark gray, firm with thin beds of gray, very fine-grained sandstone speckled with minute fragments of black crystals. Some thin layers of brittle black shale.

5650 - 5660  Tuffaceous sandstone: Medium to dark gray, hard, fine to medium grained, silicified, with slightly altered feldspar.

5660 - 5740  Shale: Grayish black, firm, silty.

5740 - 5745  Siltstone: Light gray and tan, firm, containing some friable layers of fine sandstone.

5745 - 5805  Shale: Grayish black, firm, and medium-gray, fine sandy siltstone with small fragments of carbonaceous material. Some coal.

5805 - 5850  Tuffaceous siltstone: Gray, green and white, firm siltstone with layers of fine sandy siltstone and gray, hard, fine-grained sandstone speckled with minute fragments of black crystals.
5850 - 5945  Sandstone: Grayish white, firm, fine silty to silty medium grained, feldspathic.

5945 - 6055  Shale: Grayish black, firm, silty, with medium-gray siltstone containing small irregular pieces of black carbonaceous matter. Some thin beds of gray, fine silty sandstone speckled with very small fragments of black crystals. A small amount of coal in the shale.

6055 - 6080  Sandstone: Medium gray, hard, medium grained, subrounded, well cemented.

6080 - 6090  Siltstone: Medium gray to grayish black, fine sandy, firm.

6090 - 6195  Sand: Light grayish white, loose, coarse grained, angular feldspathic with pieces of dark volcanic rock.

6195 - 6212  Siltstone: Light gray, firm and medium-gray to dark-gray, firm shale.

6212 - 6230  Sand: White, loose, coarse grained, angular, feldspathic with scattered weathered mica plates. Becomes more indurated toward bottom.

6230 - 6240  Shale: Dark gray, firm, silty with laminae of black carbonaceous material. Some fine-grained silty, firm sandstone interbedded.

6240 - 6265  Sandstone: Whitish, medium- to coarse-grained, friable, some weathered, sandstone composed of quartz and feldspar.

6265 - 6280  Sandstone: Whitish, medium to coarse grained, fairly well cemented, firm, with some pyrite.

6280 - 6500  Sandstone: Medium gray, hard, fine silty, calcareous, cemented, feldspathic sandstone. Some finely disseminated pyrite in portions.

6500 - 6535  Shale: Dark gray-black, silty, some fine silty sandstone interbedded.

6535 - 6550  Sandstone: Medium greenish-gray, hard, cemented sandstone, siliceous. Some pyrite.

6550 - 6565  Shale: Medium-gray to grayish black, silty to fine, sandy shale.

6565 - 6570  Sandstone: White, coarse, soft, with angular grains of quartz and feldspar.
6570 - 6990 Altered rhyolite (?): White, calcareous, firm to very firm. Areas of finely disseminated pyrite. Becomes less limy with depth. Core No. 2 (6854-6864), rhyolite - light gray, inclusions of quartz and sanidine.

6990 - 7060 Andesite: Medium dark gray, hard. Core No. 3 (7053 - 7056), andesite - above.

7060 - 7340 Rhyolite: White, partly altered, firm to very firm. Occasional thin interbeds of fine micaceous sandstone and siltstone.

7340 - 7355 Andesite: Medium greenish gray, hard.

7355 - 7460 T.D. Rhyolite: Partly altered, small patches of chlorite and finely disseminated pyrite. Mineralization appears to increase with depth.