

APPENDIX B

Well Inventory

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Inventory of Wells within 2 Kilometers of the Dewey-Burdock Project Edgemont, South Dakota

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INVENTORY OF WELLS WITHIN TWO KILOMETERS OF THE DEWEY-BURDOCK PROJECT AREA

Details available for wells constructed within two kilometers of the Dewey-Burdock Uranium Project are provided in this report. Historical records are reviewed in Section 1.0 and summary tables are provided in Section 2.0. Referenced materials are appended and correspond with sources cited in the summary tables.

1.0 HISTORICAL RECORDS REVIEWED

Silver King Mines, Inc. correspondence, Tennessee Valley Authority correspondence and reports, South Dakota and Wyoming databases, RESPEC's RSI 2020 report, Powertech (USA) Inc.'s records, and other records were reviewed to inventory water wells within 2 kilometers of the project in the following sections:

T6S R1E Sections 7 through 10 and 15 through 36

T6S R2E Sections 30, 31 and 32

T7S R1E Sections 1 through 24

T7S R2E Sections 5, 6, 7, 8, 17, 18, and 19

1.1 Silver King Mines, Inc. Records

A letter from Keith Andersen, Silver King Mines, Inc. (SKM), to John Hatch, SD Water Rights Commission, on January 12, 1979 was reviewed. Copies of pump test data and other records from SKM's files were attached, including an interoffice memorandum from Keith Andersen, SKM, to R. Caywood, SKM, dated December 18, 1978. This memorandum provides references to the following information:

- a. Water Wells in the Edgemont Project Area prepared in May 1977: this document shows the location and available information for Hydro IDs 1 through 134; it is provided as Source A
- b. Nine wells installed the Fall of 1976 for measuring water levels during the February 1977 pump test: B-1 FR (#672), B-2 (Abandoned November 1978, no Hydro ID identified), B-3 FR (no Hydro ID identified), B-3 (Abandoned November 1978, no Hydro ID identified), B-4 (Abandoned December 1978, no Hydro ID identified), B-5 (Abandoned December 1978, #637), B-6 FR(#659), B-6 (Abandoned Dec 1978, #660), B8 (#661), and Burdock Well (#668)
- c. Four additional wells installed August 1977 for November 1977 pump test: B-7 FR (#665), B-7 (#666), B-9 FR (#646), and B-9(#658)

- d. Ten wells installed during the Summer of 1978: BPZ 14 (#602), BPZ 15 FR (#601), BPZ 16 (#643), BPZ 17 FR (#644), BPZ 18 (#608), BPZ 19 FR (#607), BPZ 20 (#609), BPZ 21 FR (#610), BPZ 22 (#626), and BPZ 23 FR (#625)
- e. Seven replacement wells installed during the Fall of 1978: B-2 LAK (#674), B-2 FU (#673), B-10 FR (#671), B-10 FU (#670), B-10 LAK (#669), B-11 FR (#664), B-11 LAK (#663)
- f. Test well constructed January 1977 (#668) used during February and November 1977 pump tests

1.2 Tennessee Valley Authority Records

Tennessee Valley Authority's (TVA) Draft Environmental Statement (1979) was reviewed. This document was not finalized. Wells referenced are listed below with corresponding Hydro IDs:

p. 51, test well completed near shaft (#668)

p. 52, map showing following the wells: B-9 (BPZ-9 LAK, #658), B9FR (BPZ-9 FR, #646), B-2 (BPZ-2 LAK, #674), B1FR (BPZ-1 FR, #672), B-7 (BPZ-7 LAK, #666), B7FR (BPZ-7 FR, #665), B-6 (BPZ-6 LAK, #660), B6FR (BPZ-6 FR, #659), B-3 (BPZ-3 LAK, no corresponding Hydro ID), B3FR (BPZ-3 FR, no corresponding Hydro ID), B-4 (BPZ-4 LAK, no corresponding Hydro ID), B-5 (BPZ-5, #637), B-8 (BPZ-8 LAK, #661)

p. 53, 61 water wells within 4 miles are summarized on Table 2.5.2-1 (corresponding Hydro IDs were found for all except D-14, which had no information except a location at SESE 12-7S-1E, and E-7, which also had no information except a location at NENE 6-7S-1E; Source B provides the cross-referenced list)

The TVA report "Analysis of Aquifer Tests Conducted at the Proposed Burdock Uranium Mine Site," WR28-1-520-109, by J.M. Boggs and A.M. Jenkins, May 1980, was reviewed. Wells referenced and corresponding Hydro IDs are: Burdock test well (#668), B-10LAK (#669), B-10FU (#670), B-10FR (#671), B-11LAK (#663), B-11FR (#664), B-9LAK (#658), B-9FR (#646), B-7LAK (#666), B-7FR (#665), and Sundance Well (#662 based on depth but not location).

A letter from Gary Cummings, TVA, to Peter Martin, TVA, on March 23, 1982 regarding water levels at Dewey Pump test monitoring wells was reviewed. Wells referenced and corresponding Hydro IDs are: D-8 (#147), D-6 (#617), D-5 (#616), D-4LK (#622), D-4FR (#623), D-3LK (#657), D-3FR (#436), D-2LK (#612), D-1FU (#614), D-1FR (#613), D-1LK (#615), and Dewey Pumped Well (#611).

A letter from Gary Cummings, TVA, to Peter Martin, TVA, on April 12, 1982 regarding domestic and livestock wells monitored during the Dewey Pump Test was reviewed. Wells referenced are: 119, 103, 104, 39, BPZ 20 FR (#610), BPZ 20 LAK (#609), D-7 (#624), 40U, 40L, 102, 13, 41, 48, BY-1 FR (40U?), BPZ LA 22 (#626), BPZ FR 22 (#625), 99, 96, 106, 107, 115, 147, 148, 38, 49, 109, 110, 111, and 117. Water levels or flow rates are reported. Well locations, construction details and owners are not.

A letter from Gary Cummings, TVA, to Peter Martin, TVA, on July 12, 1982 regarding Dewey observation wells was reviewed. Wells referenced and corresponding Hydro IDs are: Dewey Main Well (#611), D-8 LK (#147), D-5 LK (#616), D-6 LK (#617), D-1 FU (#614), D-1 FR (#613), D-1 LK (#615), D-2 LK (#612), D-3 FR (#436), D-3 LK (#657), D-4 FR (#623), and D-4 LK (#622).

The TVA report "Hydrogeologic Investigations at Proposed Uranium Mine Near Dewey, South Dakota," WR28-2-520-128, by J.M. Boggs, October 1983, was reviewed. Wells referenced and corresponding Hydro IDs are: D-PW (#611), D-1LK (#615), D-1FU (#614), D-1FR (#613), D-2LK (#612), D-3LK (#657), D-3FR (#436), D-4LK (#622), D-4FR (#623), D-5LK (#616), D-6LK (#617), D-7FR (#624), D-8LK (#147), D-20LK (#609), and D-20FR (#610).

A stand-alone table showing well construction and well locations for the Dewey Pump Test wells was reviewed. The wells referenced and corresponding Hydro IDs are: Dewey Test Well (#611), D-1 FR (#613), D-1FU (#614), D-1LK (#615), D-2LK (#612), D-3FR (#436), D-3LK (#657), D-4FR (#623), D-4LK (#622), D-5LK (#616), D-6LK (#617), and D-7FR (#624).

1.3 South Dakota Water Well Records

South Dakota well records were reviewed online. Records were identified for sixty-nine Hydro IDs: 2, 13 recompletion record, 17, 38, BY-1 (possible 40U recompletion), rehabilitation record for 42, 115 replacement record, 147, 220, 429, 431, 432, 433, 436, 510, 609, 610, 611, 612, 613, 614, 615, 616, 617, 622, 623, 624, 631, 657, 662, 663, 664, 668, 669, 670, 671, 673, 674, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 703, 704 Unkpapa, 705, 706, 707, 708, 709, and 3026. Seven additional wells with no matching Hydro ID were also identified: SWSW 15-6S-1E Spencer, SWNE 18-6S-1E BNRR, 20-6S-1E SKM, NENE 27-6S-1E Smith, NWNE 29-6S-1E SKM, 2-7S-1E Linch, and 20-7S-1E Tubbs. Assignment of Hydro IDs to these wells is pending ongoing field location and verification work. Records found are provided in Source C.

1.4 South Dakota Oil and Gas Records

South Dakota oil and gas records were reviewed online. Twelve oil tests were identified within two kilometers of the permit boundary. Of these, three had been converted to water wells (API Numbers 4004720045, 4004705093, and 4004720065, which were converted to Hydro IDs 3, 4, and 5, respectively). Of the nine remaining tests, two had no information regarding plugging and abandonment (API Numbers 4003305219 and 400330521 at 19-6S-1E), four were identified as having been plugged and abandoned and a dry hole marker placed at the surface (API Numbers 4004705095 at 2-7S-1E, 4004720071 at 11-7S-1E, 4004705089 at 21-7S-1E, and 40047020077 at 15-7S-1E), two were identified as having been plugged and abandoned with no dry hole marker placed per the landowner's request (API Numbers 4004720085 at 21-7S-1E and 4004720074 at 21-7S-1E), and one (API 4004705147 at 22-7S-1E) was cased to the top of the Spearfish with a cement plug at the base of the casing. The hole is open below the casing to a second cement plug within the 2nd Converse. A steel cap is tack-welded to the surface casing making it available for possible future use as a water-supply well. A dry hole marker was screwed onto the tack-welded cap. Source D provides South Dakota Oil and Gas records for test wells that were not converted to water wells. Completion reports for test wells converted to water wells are provided in Source C.

1.5 South Dakota Water Rights Records

South Dakota water rights were also reviewed online. Three PERMITTED springs (0181-2, 0182-2 and 0183-2) issued to Grand Island and Wyoming Railroad on August 9, 1890 for springs A, B and C in 18-T6S-R1E were identified. One CANCELLED groundwater right was identified for BN Railroad in 19-T6S-R1E. The well associated with this water right was plugged and abandoned on July 31, 1998. A corresponding Hydro ID has not been assigned to it. One LICENSED groundwater right belonging to Henry Hollenbeck, number 380-2, was previously identified by RESPEC and WWC and was confirmed online in NWNW 17-6S-1E. The well associated with this water right still exists and was assigned Hydro ID 710. Coordinates for the well were estimated by Sean Hetrick, Powertech, based on the well's location on a topographic map: East 1019431, North 459018 NAD 1927, South Dakota State Plane South FIPS 4002 (feet). Mark Hollenbeck, Powertech, subsequently measured the coordinates using a handheld GPS February 27, 2012. The well's coordinates converted from the handheld GPS are East 1019432, North 459053 NAD 1927, South Dakota State Plane South FIPS 4002 (feet). The surface elevation from a USGS topographic map at the location of a mapped flowing well is 3,767 feet above mean sea level. Inspection of the well by Mark Hollenbeck the same day indicated the well was no longer flowing and is inaccessible by pump due to the casing being filled to the top with rocks. Subsequent research indicated that Silver King Mines, Inc. was also aware of the presence of this well. A water level taken from it in 1980 was below surface (the well was not flowing). The ID assigned to the well by Silver King Mines, Inc. was 149.

1.6 Wyoming Water Rights Records

Wyoming water rights were reviewed online. Water right 183561 belonging to Putnam and Putnam was previously identified by WWC and confirmed online at SWSW 28-41N-60W. This water right was found to correspond with Hydro ID 5002. Information on the water right was obtained from Ms. Krissie Groth at the Wyoming State Engineer's office in Cheyenne. A second water right, P137.0W for Earl Carr for 2,000 gallons per minute at NENW 21-41N-60W, was identified just outside the 2-kilometer boundary. The status of this water right shows CANCELLED. Further information was not available online, but can be retrieved from the State Engineer's office, if needed.

1.7 Wyoming Oil and Gas Records

Wyoming oil and gas records were reviewed online. No records were identified within the 2-kilometer area reviewed. This is a bit surprising considering the project rests on the eastern boundary of the Powder River Basin. A number of oil tests were identified northwest and southwest of the 2-kilometer boundary.

1.8 RESPEC Records

Logs in Source A-2 of RSI 2020, Draft Characterization of the Groundwater Flow System at the Dewey Burdock Uranium Project, November 2008, were reviewed. State Completion Reports prepared for 25 Powertech wells are not labeled with Hydro IDs. The order is given here for reference: 675, 677, 678, 703, 681, 686, 684, 682, 704, 683, 680, 687, 689, 3026, 698, 688, 690, 692, 696, 694, 685, 691, 693, 697, and 695. These logs are presented again in Appendix 2.2-B of Powertech's 2009 Technical Report.

Of the 56 pages of other State logs presented in Source A-2 of RSI 2020, 33 pages representing 32 logs have matching Hydro IDs, 4 logs have no matching Hydro ID, 4 logs are duplicates, and 15 pages representing 11 logs are outside the two-kilometer area reviewed. Logs are not labeled with Hydro IDs in the Source. The order is given here for reference: 429, 436, 431, 617, 433, 622, 623, dup 623, 657, 432, 614, 613, 609, 610, dup 610, outside 2-km, outside 2-km, outside 2-km, outside 2-km, 663, 664, 669, 670, 671, 674, 673, 662, 11 (2 pages), 220, 115?, outside 2-km, 8, 38, outside 2-km, no match Smith & Associates, outside 2-km (5 pages for same well), outside 2-km, outside-2km, 510, outside 2-km, outside 2-km, no match Tubbs, 2, 17, 13, dup 13, no match Linch, 116, 631, no match Spencer, and dup 662. These logs are presented again in Appendix 2.2-B of Powertech's Technical Report, February 2009.

1.9 Powertech (USA) Inc. Records

Attachments and well construction reports provided in Appendix 2.2-B of the Technical Report, February 2009 were reviewed and found to be the same as those presented by RESPEC in RSI 2020.

TR RAIs submitted to NRC in June 2011 and a report by Mike Beshore prepared in October 2011 were reviewed. Following are notes made regarding wells and Hydro IDs:

- Remove #108 from Table TR RAI P&R 10-1; is outside the 2-kilometer area reviewed
- #116 and #506 appear on both Tables TR RAI P&R 10-1 and 2; revise to show on Table 1 only
- #635 is not a well but a pipeline from #5; move to Table 2
- Add a footnote to #651 indicating it is not a well but a stock tank formerly filled by a pipeline from #6 (Fall River); #6 no longer flows and the stock tank is no longer used
- Wells or former wells possibly within 2 kilometers missing from Tables 1, 2 and 3 are: 50, 710, 5002, B-3, B-3FR, B-4, and APIs 4004705089, 4003305219, 4003305221, 4004705095, 4004705147, 4004720071, 4004720074, 4004720077, 4004720085.

1.10 Miscellaneous Records

A Draft Well Test Analysis report prepared by Dan Hoyer on August 20, 2007 regarding the April 1979 Burdock Lakota Pump Test, the July 1979 Burdock Fall River Pump Test 1982, and the February 1982 Dewey Lakota Pump Test was reviewed. Wells referenced and corresponding Hydro IDs are: BPZ-7FR (#665), BPZ-7LAK (#666), BPZ-11LAK (#663), BPZ-11FR (#664), BPZ-10FU (#670), BPZLAK (#669), PBZ-10FR (#671), Burdock Test Well (#668), PBZ-1FU (#673), PBZ-1FR (#674), BPZ-1FR (#672), BPZ-9FR (#646), PBZ-9LAK (#658), DPZ-7FR (#624), Bud Hollenbeck (#115), DPZ-8LAK (#147), D-3LAK (#657), DPZ-3FR (#436), DPZ 4L dewey 9 (#622), DPZ 4FR dewey 8 (#623), DPZ 2 LK dewey 5 (#612), Dewey Pump Well (#611), DPZ 1 LK dewey 2 (#615), DPZ 6 LK dewey 1 (#617), DPZ 5 LK dewey 10 (#616), 6S1E20AD6 (#613), BPZ 20 FR cement plant east (#610), and BPZ 20 LAK (#609).

1.11 Other Records Not Reviewed

Respec reviewed U.S. Geological Survey (USGS) records while preparing the February 2009 TR. Work prepared by Respec regarding USGS records was not reviewed during this inventory except where Hydro IDs within 2 kilometers occurred.

2.0 SUMMARY TABLES

Wells within two kilometers of the Dewey-Burdock project are summarized in Tables 1, 2 and 3 as follows:

- Table 1 summarizes current wells within two kilometers of the project area. These wells have been physically located in the field.
- Table 2 summarizes historical wells noted in data sources within two kilometers of the project area that are no longer present at the surface. These wells were looked for, but were not found.
- Table 3 summarizes plugged and abandoned wells within two kilometers of the project area. These wells have been confirmed by Powertech (USA) Inc. to be plugged and abandoned. Each well was visually inspected and found to have cement within its casing and/or well bore.

Wells have one of the following uses:

- Domestic: Are currently used or can reasonably be expected to be used for drinking water use, including wells that are also used for livestock water.
- Stock: Water of livestock is sole use; well cannot be used for drinking water use (i.e., no piping to domestic water system, etc.).
- Monitor: Sole use is for monitoring.
- Irrigation: Sole use is for crop irrigation.

Sources referenced in tables are appended.

Table 1. Current Wells within 2 Kilometers of Project Area

Hydro ID	Legal Location				SD State Plane NAD 27		NGVD29	Construction Summary					Flowing Artesian	Aquifer(2)	Use	Other Name	Source
	T.	R.	Sec.	Qtr. Qtr.	East (ft)	North (ft)	Surface Elevation(1) (ft)	Date Completed	Total Depth (ft)	Depth to Top of Screen or Bottom of Casing (ft)	Depth to Bottom of Screen or Bottom of Open Hole (ft)	Casing Diameter (in)					
ALLUVIAL																	
676	6S	1E	34	SESW	1030846	439891	3662	9/26/2007	23	2-inch PVC 0.010-slot 12.5	to 22.5	2-inch PVC 0 to 12.5	no	Alluvial	Monitor	DB-GW676	C
677	7S	1E	4	SWSW	1023527	434077	3562	9/25/2007	14.5	2-inch PVC 0.010-slot 4	to 14	2-inch PVC 0 to 4	no	Alluvial	Monitor	DB-GW677	C
678	7S	1E	9	SWNE	1026522	431925	3595	9/25/2007	14.5	2-inch PVC 0.010-slot 4	to 14	2-inch PVC 0 to 4	no	Alluvial	Monitor	DB-GW678	C
679	6S	1E	27	NWSE	1032294	446245	3715	9/26/2007	39.5	2-inch PVC 0.010-slot 19	to 39	2-inch PVC 0 to 19	no	Alluvial	Monitor	DB-GW679	C
707	6S	1E	34	SWNE	1032064	441813	3693(3)	5/5/2011	40	2-inch PVC 0.010-slot 30	to 40	2-inch Sched 40 PVC 0 to 30	no	Alluvial	Monitor	DB-11-34-ALLUV-4	C
708	7S	1E	3	SESW	1030383	434098	3631(3)	5/4/2011	30	2-inch PVC 0.010-slot 20	to 30	2-inch Sched 40 PVC 0 to 20	no	Alluvial	Monitor	DB-11-3-ALLUV-3	C
709	7S	1E	15	SENW	1029415	426607	3596(3)	5/9/2011	38	2-inch PVC 0.010-slot 28	to 38	2-inch Sched 40 PVC 0 to 28	no	Alluvial	Monitor	DB-11-15-ALLUV-4	C
FALL RIVER																	
5	7S	1E	14	NENW	1035181	427284	3643	12/26/1975	2267, cement bridge plug 850, last measured 175	open hole 155	to 175	28# 8 5/8-inch 0 to 155 and 4-inch steel 0 to 155	yes	Fall River	Stock	D-17, API 40 047 20065	A, B, D, E, downhole tool
6	7S	1E	14	NESE	1037218	425012	3671	Late 1950s	280 original 200 last measured	open hole 135	to 200	12-inch steel 0 to 135	no	Fall River	Stock		A, E
7	7S	1E	23	NWNW	1033304	422417	3574	Late 1950s	200	UNK	UNK	6	no	Fall River	Domestic	D-27, R. Kenobbie	A, B
9	7S	1E	23	NENE	1038003	421806	3594	1960s	90	UNK	UNK	6-inch (Source A) 2-inch steel (Source E)	yes	Fall River	Stock	D-25	A, B, E
14	7S	1E	2	NWSW	1033700	434723	3672	UNK	470 (source A) 300 (source E)	UNK	UNK	4	historically yes, presently no	Fall River	Stock	D-5	A, B, E
17	7S	1E	12	SENW	1040223	431329	3789	1954	156	UNK	UNK	3	no	Fall River	Stock	D-13	A, B, C
18	7S	1E	9	SWSW	1022812	428960	3566	Late 1920s Early 1930s	527	UNK	UNK	4	yes	Fall River	Domestic	D-10, D. Andersen	A, B, E
37	7S	2E	18	NWSW	1044183	423947	3689	UNK	145	open hole 93	to 145	5 1/2-inch 0 to 93	no	Fall River	Stock		A, E, downhole tool
38	6S	1E	33	SWNW	1024328	442289	3634	11/12/1949	550	open hole 494	to 550	4-inch 0 to 494	yes	Fall River	Stock	B-4	A, B, C, F
49	6S	1E	32	NWNW	1018932	444022	3628	1970s	540 (historically 600)	screen 475	to 540	4	yes	Fall River	Stock		A, E
107	6S	1E	18	SWNE	1017018	458158	3708	UNK	90	UNK	UNK	5	historically yes, presently unknown	Fall River	Domestic		A
111	6S	1E	17	NWNE	1022074	459586	3794	UNK	100	UNK	UNK	4	no	Fall River	Stock		A
112	6S	1E	16	SESE	1027864	455881	3831	UNK	120	UNK	UNK	4 1/2	no	Fall River	Stock		A
116	6S	1E	18	SENE	1017992	458111	3723	UNK	UNK	UNK	UNK	1	historically yes, presently unknown	Fall River	Stock		A
138	6S	1E	18	NENE	1017537	459030	3724	1977	100	UNK	UNK	UNK	historically yes, presently unknown	Fall River	Domestic		I
436	6S	1E	20	NWNE	1021603	454436	3737	8/18/1981	590	open hole 505	to 590	4-inch 108#/ft black iron 0 to 505	no	Fall River	Monitor	D-3FR	C, K, M
610	6S	1E	29	SWNE	1021599	447969	3704	6/27/1978	680	1-inch 40# black iron torch slotted 630	to 672	1-inch 408#/ft black iron 0 to 630	no	Fall River	Monitor	D-20FR, BPZ-21 FR	C, K, L
613	6S	1E	20	NWNE	1022125	453775	3738	8/14/1981	580, lithologic log to 600	open hole 504	to 580	4-inch 108#/ft black iron 0 to 504	no	Fall River	Monitor	D-1FR	C, K, M
623	6S	1E	20	NENE	1022669	454299	3750	8/17/1981	580	open hole 503	to 580	4-inch 108#/ft black iron 0 to 503	no	Fall River	Monitor	D-4FR	C, E, K, M
624	6S	1E	18	SENE	1017992(4)	458111(4)	3723(4)	7/30/1981	120	4-inch slotted PVC casing 90	to 115	4-inch 160# PVC 0 to 90	historically yes, presently unknown	Fall River	Monitor	D-7FR	C, K, M



Table 1. Current Wells within 2 Kilometers of Project Area

Hydro ID	Legal Location				SD State Plane NAD 27		NGVD29	Construction Summary					Flowing Artesian	Aquifer(2)	Use	Other Name	Source
	T.	R.	Sec.	Qtr. Qtr.	East (ft)	North (ft)	Surface Elevation(1) (ft)	Date Completed	Total Depth (ft)	Depth to Top of Screen or Bottom of Casing (ft)	Depth to Bottom of Screen or Bottom of Open Hole (ft)	Casing Diameter (in)					
628	6S	1E	20	SESE	1022654	449402	3737	UNK	523	326	523	UNK	no	Fall River	Stock		GPS, downhole tool
631	6S	1E	26	NWNW	1034335	448992	3744	2/1998	80	5-inch steel 1/4 x 6 slots 30	to 70	5-inch 15.5#/ft steel 0 to 30	no	Fall River	Stock		C
638	7S	1E	2	NENE	1038269	437976	3791	Before 1979	180	UNK	UNK	2	no	Fall River	Monitor	D-2	B
681	6S	1E	32	NENW	1020330	443725	3624	1/27/2008	600	3-inch PVC 0.020-slot 585	to 600	6-inch SDR21 0 to 585 3-inch PVC 575 to 585	yes	Fall River	Monitor	DB07-32-3C	C
683	6S	1E	29	NESW	1020209	446107	3669	3/4/2008	650	2-inch PVC 0.020-slot 635	to 650	4-inch SDR17 0 to 635 2-inch PVC 625 to 635	no	Fall River	Monitor	DB07-29-7	C
685	6S	1E	32	NWNE	1020687	443415	3626	2/4/2008	595	2-inch PVC 0.020-slot 580	to 595	4-inch SDR17 0 to 580 2-inch PVC 570 to 580	yes	Fall River	Monitor	DB07-32-4C	C
687	6S	1E	32	NENW	1020078	443730	3626	2/6/2008	605	2-inch PVC 0.020-slot 590	to 605	4-inch SDR17 0 to 590 2-inch PVC 580 to 590	yes	Fall River	Monitor	DB07-32-5	C
688	7S	1E	11	NESW	1035027	429974	3687	4/1/2008	255	3-inch PVC 0.020-slot 345	to 255	6-inch SDR17 0 to 245 3-inch PVC 235 to 245	no	Fall River	Monitor	DB08-11-17	C
691	6S	1E	32	NENW	1020366	443706	3626	3/10/2008	505	3-inch PVC 0.020-slot 490	to 505	6-inch SDR17 0 to 490 3-inch PVC 480 to 490	yes	Fall River	Monitor	DB08-32-9C	C
694	7S	1E	15	NWNW	1028717	426836	3600	3/22/2008	392	3-inch PVC 0.020-slot 377	to 392	6-inch SDR17 0 to 377 3-inch PVC 367 to 377	yes	Fall River	Monitor	DB08-15-3	C
695	6S	1E	32	SESE	1022385	439312	3594	3/20/2008	508	3-inch PVC 0.020-slot 493	to 508	6-inch SDR17 0 to 493 3-inch PVC 483 to 493	yes	Fall River	Monitor	DB08-32-13	C
698	7S	1E	2	NESW	1035946	436967	3739	3/25/2008	205	3-inch PVC 0.020-slot 180	to 205	6-inch SDR21 0 to 180 3-inch PVC 170 to 180	no	Fall River	Monitor	DB08-2-1	C
706	6S	1E	21	NENE	1028589	453276	3823.29(5)	12/5/2009	328	3-inch PVC 0.020-slot 284	to 314	6-inch SDR17 0 to 284 3-inch PVC 274 to 284	no	Fall River	Monitor	DB09-21-2	C
FUSON																	
614	6S	1E	20	NWNE	1022185	453769	3739	9/14/1981	620	open hole 609	to 620	4-inch 10#/ft black iron 0 to 609	no	Fuson	Monitor	D-1FU	C, K, M
CHILSON																	
1	7S	1E	9	SESE	1027696	429227	3624	1950s	600	UNK	UNK	4	yes	Chilson	Stock	D-11	A, B
2	7S	1E	16	SESE	1026724	423922	3554	1930s Recompleted 11/17/1981	640 original 650 recompleted	4-inch slotted 10#/ft black iron 566 to 608	and 629 to 650	4-inch 10#/ft black iron 0 to 566 and 608 to 629	yes	Chilson	Domestic	D-20, W. Peterson	A, B, C
3	7S	1E	22	SWNW	1028593	421104	3541	11/28/1970	2400, cement bridge plug 1030	open hole 367	to 1030	4 1/2-inch steel 0 to 389 suspended inside 8 5/8-inch 20# steel 0 to 367	yes	Chilson	Stock	D-24, API 40 047 20045	A, B, D
12	7S	1E	4	SESE	1026978	434378	3641	Late 1960s	730 (source A) 805 (source B)	UNK	UNK	4 1/2	yes	Chilson	Stock	D-7	A, B
13	7S	1E	3	NWNW	1028360	438470	3673	1950s Recompleted 10/22/1980	625	open hole 580	to 625	5 1/2-inch 14# steel 0 to 580	yes	Chilson	Domestic	D-6, K. Spencer	A, B, C
15	7S	1E	2	NENW	1035304	438317	3713	UNK	280 (source A) 495 (source B)	UNK	UNK	4	no	Chilson	Stock	D-3	A, B, E
16	7S	1E	1	NWSE	1041428	434446	3869	Mid 1970s	330	UNK	UNK	4 1/2	no	Chilson	Domestic	D-1, C. Daniel	A, B
42	7S	1E	5	SWNE	1021144	436481	3596	1949 Rehabilitated 11/15/2009	Original 600 Current 580	4-inch PVC 0.25-slot	to 300 with open hole below to 580	4-inch PVC 0 to 280 8-inch steel 0 to 220 reduced to 1 1/4-inch at surface	yes	Chilson	Domestic	D-8, L. Putnam	A, B, C
43	6S	1E	34	SWSE	1031123	439436	3672	UNK	350	UNK	UNK	4	historically yes until Triangle Mine dewatered then no, presently unknown	Chilson	Domestic	B-5, Spencer Homestead	A, B
50	41N	60W	28	SWNW	974693	446835	3677	1930s	609	UNK	UNK	4	yes	Chilson	Stock	50N	A
51	7S	1E	9	SENE	1027411	431487	3615	1890s	550	UNK	UNK	10	yes	Chilson	Stock	D-9	A, B
61	7S	1E	11	NWSE	1036832	429987	3740	UNK	525	UNK	UNK	5	no	Chilson	Stock	D-12	A, B
96	41N	60W	22	SWSW	1011630	451853	3664	UNK	560	UNK	UNK	5	yes	Chilson	Domestic	Dixon	A
102	6S	1E	18	SWNE	1016825	458312	3708	UNK	267	UNK	UNK	5	yes	Chilson	Domestic		A



Table 1. Current Wells within 2 Kilometers of Project Area

Hydro ID	Legal Location				SD State Plane NAD 27		NGVD29	Construction Summary				Flowing Artesian	Aquifer(2)	Use	Other Name	Source
	T.	R.	Sec.	Qtr. Qtr.	East (ft)	North (ft)	Surface Elevation(1) (ft)	Date Completed	Total Depth (ft)	Depth to Top of Screen or Bottom of Casing (ft)	Depth to Bottom of Screen or Bottom of Open Hole (ft)					
109	6S	1E	17	NENW	1020801	459625	3835	UNK	220	UNK	UNK	no	Chilson	Domestic	Cook	A
110	6S	1E	17	NENE	1023777	459643	3817	UNK	240	UNK	UNK	no	Chilson	Stock		A
147	6S	1E	17	NESW	1020879	456566	3729	2/9/1982	750	open hole 650	to 750	no	Chilson	Monitor	D-8LK, HAM-4	C, K
510	7S	1E	12	SESE	1042933	428178	3759	6/12/1988	540	5-inch PVC 0.064-slot 300 to 340	and 480 to 520	yes	Chilson	Stock		C
609	6S	1E	29	SWNE	1021735	447808	3702	6/26/1978	1000	1-inch 40# black iron torch slotted 903	to 966	no	Chilson	Monitor	D-20LK, BPZ-20	C, K, L
611	6S	1E	20	NWNE	1021837	453958	3731	10/17/1981	815	8 5/8-inch 0.030-slot galvanized steel 695 to 730	and 755 to 800	no	Chilson	Monitor	D-PW	C, K, M
612	6S	1E	20	NWNE	1021757	454133	3732	8/14/1981	800	open hole 692	to 800	no	Chilson	Monitor	D-2LK	C, K, M
615	6S	1E	20	NWNE	1022172	453708	3738	8/13/1981	800	open hole 712	to 800	no	Chilson	Monitor	D-1LK	C, K, M, downhole tool
616	6S	1E	20	SWNE	1022135	453141	3745	9/15/1981	835	open hole 735	to 835	no	Chilson	Monitor	D-5LK	C, K, M
617	6S	1E	20	NWNE	1021029	453586	3723	9/15/1981	810	open hole 715	to 810	no	Chilson	Monitor	D-6LK	C, K, M
619	7S	1E	2	NWNW	1034739	437071	3701	UNK	286	231	286	no	Chilson	Stock	D-4, Daniel West, MET	B, downhole tool
620	6S	1E	35	NWNW	1033951	443209	3731	UNK	UNK	UNK	UNK	no	Chilson	Stock		GPS
622	6S	1E	20	NENE	1022776	454033	3747	8/17/1981	780	open hole 714	to 780	no	Chilson	Monitor	D-4LK	C, E, K, M
637	7S	1E	11	NENE	1038075	430320	3743	Fall 1976	UNK	UNK	UNK	no	Chilson	Monitor	BPZ-5	L, N
650	7S	1E	1	SESE	1043795	433351	3820	UNK	196	146	196	no	Chilson	Stock		GPS, downhole tool
657	6S	1E	20	NWNE	1021637	454497	3740	8/18/1981	800	open hole 715	to 800	no	Chilson	Monitor	D-3LK	C, K, M
680	7S	1E	11	NESW	1035078	429969	3688	12/19/2007	436	4.5-inch PVC 0.020-slot 426	to 436	no	Chilson	Monitor	D807-11-11C	C
682	7S	1E	11	SENE	1035136	431259	3720	2/21/2008	460	2-inch PVC 0.020-slot 450	to 460	no	Chilson	Monitor	D807-11-2	C
684	7S	1E	11	NESW	1035188	429745	3691	2/13/2008	423	2-inch PVC 0.020-slot 413	to 423	no	Chilson	Monitor	D807-11-14C	C
686	7S	1E	11	NESW	1034966	429751	3694	2/24/2008	428	2-inch PVC 0.020-slot 418	to 428	no	Chilson	Monitor	D807-11-15	C
689	6S	1E	32	NENW	1020316	443789	3626	3/11/2008	730	3-inch PVC 0.020-slot 715	to 730	yes	Chilson	Monitor	D808-32-10	C
692	7S	1E	11	NESW	1035068	429999	3701	4/16/2008	335	3-inch PVC 0.020-slot 325	to 335	no	Chilson	Monitor	D808-11-19	C
696	7S	1E	15	NWNW	1028687	426946	3602	3/21/2008	587	3-inch PVC 0.020-slot 572	to 587	yes	Chilson	Monitor	D808-15-2	C
697	6S	1E	32	SESE	1022350	439347	3594	3/18/2008	682	3-inch PVC 0.020-slot 667	to 682	yes	Chilson	Monitor	D808-32-12	C
704(6)	7S	1E	5	SWNE	1020966	436647	3599	Original 4/29/2008 Perforated 2/4/2009	UNK	UNK	UNK	UNK	Chilson (Beginning 2/4/2009)	Domestic	L. Putnam 704 Unkpapa	P



Table 1. Current Wells within 2 Kilometers of Project Area

Hydro ID	Legal Location				SD State Plane NAD 27		NGVD29	Construction Summary				Flowing Artesian	Aquifer(2)	Use	Other Name	Source
	T.	R.	Sec.	Qtr. Qtr.	East (ft)	North (ft)	Surface Elevation(1) (ft)	Date Completed	Total Depth (ft)	Depth to Top of Screen or Bottom of Casing (ft)	Depth to Bottom of Screen or Bottom of Open Hole (ft)					
705	6S	1E	21	NENE	1028624	453314	3825.53(5)	12/5/2009	Borehole TD 600 Cemented to 460	3-inch PVC 0.020-slot 428	to 458	no	Chilson	Monitor	DB09-21-1	C
3026	7S	1E	1	SESE	1043749	433354	3822	3/26/2008	196	3-inch PVC 0.020-slot 166	to 196	no	Chilson	Monitor	DB08-1-6	C
5002	41N	60W	28	SWSW	974687	446660	3681	1970s	639	UNK	UNK	yes	Chilson	Stock	WR P183561	A, H
7002	7S	1E	23	NWNW	1033333	421931	3571	1930s	500	UNK	UNK	yes	Chilson	Stock	D-26	A, B
INYAN KARA																
40(7)	6S	1E	30	SWNW	1013415	447182	3635	About 1969	660 (680 for BY-1)	UNK	UNK	yes	Inyan Kara	Domestic	40S, 40U possibly BY-1	A, G C for BY-1
115	6S	1E	18	SENE	1017697	457640	3720	Original before 1977 Replaced 10/2/1984	360	4-inch PVC 1/64-slot 200 to 220	and 300 to 360	yes	Inyan Kara	Domestic		A, C
668	7S	1E	15	NWNE	1031029	427450	3622	1/31/1977	574	10-inch stainless steel 280 to 335 (300 to 350 source E)	and 8-inch stainless steel 480 to 555 (495 to 550 source E)	yes	Inyan Kara	Stock	Burdock Well	C, E, L, O
4002	6S	1E	30	NWSW	1013424	446931	3621	1940s	700	UNK	UNK	yes	Inyan Kara	Domestic	40L	A, G
SUNDANCE																
662	7S	1E	11	SESW	1035381	428928	3679	7/26/1978	880	5 1/2-inch 14# torch slotted 666	to 780	yes	Sundance	Monitor	Sundance Well	C, L, O
UNKPAPA																
114	7S	2E	7	SESW	1045410	428653	3764	UNK	365	UNK	UNK	no	Unkpapa	Stock	E-2, Bennett Canyon Well	A, B, J
506	7S	2E	8	SWNW	1050129	430704	3936	UNK	470	UNK	UNK	no	Unkpapa	Stock	E-3	B
690	7S	1E	11	NESW	1035113	429971	3700	4/15/2008	631	3-inch PVC 0.020-slot 621	to 631	yes	Unkpapa	Monitor	DB08-11-18	C
693	6S	1E	32	NENW	1020329	443667	3626	3/8/2008	930	3-inch PVC 0.020-slot 910	to 930	yes	Unkpapa	Monitor	DB08-32-11	C
703	7S	1E	1	SWSE	1042294	434136	3877	4/18/2008	525	3-inch PVC 0.020-slot 475	to 525	no	Unkpapa	Domestic	C. Daniel DB08-1-7	C
704(6)	7S	1E	5	SWNE	1020966	436647	3599	4/29/2008	955	3-inch PVC 0.020-slot 915	to 955	yes	Unkpapa (Cemented to Chilson 1/28/2009)	Domestic	L. Putnam DB08-5-1	C
UNKNOWN																
4	7S	1E	15	SESE	1032516	423080	3580	3/5/1965	2264, cement bridge plug 1645	open hole 971	to 1645	yes	Unknown	Stock	D-19, API 40 047 05093	A, B, D
41	6S	1E	31	SWNE	1015385	442081	3611	UNK	UNK	UNK	UNK	yes	Unknown	Stock	B-3	A, B, G
106	6S	1E	18	NENE	1018099	459625	3724	UNK	196	open hole 160	to 196	yes	Unknown	Stock		A, E, downhole tool
113	7S	2E	6	NESW	1046437	434417	3844	UNK	40	UNK	UNK	no	Unknown	Stock	E-1, Bennett #2 Well	A, B, J
117	6S	1E	8	SWSE	1022177	460796	3923	UNK	UNK	UNK	UNK	no	Unknown	Stock		A
220	6S	1E	19	SENE	1017872	452334	3680	10/16/1984	900	historically 4-inch slotted PVC 780 to 800 and 840 to 880	presently 6-inch PVC screen 463 to 523, caved below	yes	Unknown	Stock		C, E
270	6S	1E	19	NWSW	1014108	451942	3659	UNK	UNK	UNK	UNK	yes	Unknown	Stock		GPS, E
618	7S	1E	2	SENE	1038074	435906	3759	UNK	133	62	133	no	Unknown	Stock		GPS, downhole tool
639	7S	2E	7	SENW	1045704	430722	3771	UNK	UNK	UNK	UNK	no	Unknown	Stock		GPS
640	7S	1E	12	SESE	1043010	427965	3754	UNK	UNK	UNK	UNK	no	Unknown	Stock		GPS
642	7S	1E	12	SESE	1042926	428042	3757	UNK	33	open hole 12	to 33	no	Unknown	Stock		GPS, E, downhole tool
645	7S	1E	16	NENE	1027681	427998	3609	UNK	UNK	UNK	UNK	no	Unknown	Stock		GPS



Table 1. Current Wells within 2 Kilometers of Project Area

Hydro ID	Legal Location				SD State Plane NAD 27		NGVD29	Construction Summary					Flowing Artesian	Aquifer(2)	Use	Other Name	Source
	T.	R.	Sec.	Qtr.	East (ft)	North (ft)	Surface Elevation(1) (ft)	Date Completed	Total Depth (ft)	Depth to Top of Screen or Bottom of Casing (ft)	Depth to Bottom of Screen or Bottom of Open Hole (ft)	Casing Diameter (in)					
656	6S	1E	31	SE	1014230	442000	3622	UNK	UNK	UNK	UNK	UNK	yes	Unknown	Stock		GPS
710	6S	1E	17	NW	1019432(8)	459053(8)	3767(9)	Before 6/29/1951	376	UNK	UNK	UNK	historically yes, presently no	Unknown	Irrigation	WR 380-2, 149	Q, R

Notes: (1) Surface elevations are based on a digital elevation model (DEM), except where noted. Accuracy is plus or minus 15 feet.

(2) Inyan Kara indicates screened interval is across Fall River and Chilson.

(3) Estimated from Powertech digital topographic map

(4) Coordinates and elevation for Hydro ID 116 used for Hydro ID 624 pending field verification

(5) Surveyed by Andersen Engineers, March 2011

(6) 704 was originally completed in the Unkappa aquifer. It was recompleted 1/28/2009 in the Chilson aquifer.

(7) Hydro ID 40 possibly replaced by BY-1 (depth 680 ft and casing diameter 5.5 inches) on 3/4/1982

(8) Handheld GPS coordinates converted to South Dakota State Plane NAD 27, Powertech (USA) Inc., February 2012

(9) USGS 7.5 Minute Series (Topographic), Dewey Quadrangle, Wyoming-South Dakota, 1951

UNK = Unknown

Sources: A. Water Wells in Edgemont Project Area, Silver King Mines, May 1977, in letter from Keith Andersen, Silver King Mines, Inc., to John Hatch, South Dakota Water Rights Commission, January 12, 1979

B. Tennessee Valley Authority Draft Environmental Statement, 1979, Table 2.5.2-1

C. South Dakota Water Well Records - Notice of Well Construction Records, Artesian Well Repair Records, and Well Drillers Reports

D. South Dakota Oil and Gas Records

E. Dewey Burdock Groundwater Well Report for 2010 and 2011 Field Work Completed, M. Beshore, Powertech (USA) Inc., October 4, 2011

F. Responses to Nuclear Regulatory Commission Comments (Revision 1), C. Hocking, RESPEC, to M. Hollenbeck, Powertech (USA) Inc., July 22, 2010

G. Letter from SKM to TVA, Domestic and Livestock Wells Monitored During Dewey Pump Test, April 12, 1982

H. Wyoming Water Right Permit 183561, June 12, 2007

I. Additional Water Wells in Edgemont Project Area, Silver King Mines, Inc., Interoffice Correspondence, Andersen to Caywood, August 3, 1979

J. Forest Service Wells and Springs, in letter from Keith Andersen, Silver King Mines, Inc., to John Hatch, South Dakota Water Rights Commission, January 12, 1979

K. Hydrogeologic Investigations at Proposed Uranium Mine Near Dewey, South Dakota, Tennessee Valley Authority, WR28-2-520-128, J. Mark Boggs, October 1983

L. Coordinates, Elevations and Water Levels for Burdock Piezometers, in letter from Keith Andersen, Silver King Mines, Inc., to John Hatch, South Dakota Water Rights Commission, January 12, 1979

M. Baseline Water Quality and Water Level/Flow Rates, in letter from Keith Andersen, Silver King Mines, Inc., to Steve Stampfli, Office of Surface Mining, South Dakota Department of Water and Natural Resources, March 3, 1982

N. Burdock Mine Area Hydrology Status Report, Silver King Mines, Inc. Interoffice Correspondence from Keith Andersen to R.M. Caywood, December 18, 1978, included in letter from Keith Andersen to John Hatch, South Dakota Water Rights Commission, January 12, 1979

O. Analysis of Aquifer Tests conducted at the Proposed Burdock Uranium Mine Site, Burdock, South Dakota, Tennessee Valley Authority, WR28-1-520-109, J.M. Boggs and A.M. Jenkins, May 1980

P. Interoffice communication, Len Eakin, Powertech (USA) Inc., to Mike Beshore, Powertech (USA) Inc., May 9, 2011

Q. South Dakota Water Right 380-2

R. Letter from R.M. Caywood, Silver King Mines, Inc., to Clinton C. Smythe, Tennessee Valley Authority, regarding addition of Well No. 149 to monitoring program, May 12, 1980





Table 2. Historical Wells Noted in Data Sources within 2 Kilometers but No Longer Present at Surface

Hydro ID	Legal Location				SD State Plane NAD 27		NGVD29	Construction Summary					Flowing Artesian	Former Aquifer	Previous Use	Other Name	Source
	T.	R.	Sec.	Qtr. Qtr.	East (ft)	North (ft)	Surface Elevation(1) (ft)	Date Completed	Total Depth (ft)	Depth to Top Screen (ft)	Depth to Bottom Screen (ft)	Casing Diameter (in)					
ALLUVIAL																	
502	6S	1E	27	NWSE	1031990	446360	3716	UNK	46	UNK	UNK	UNK	no	Alluvial	Unknown	B-2	B
621	6S	1E	27	NWSE	1031930	446397	3717	UNK	50	UNK	UNK	UNK	no	Alluvial	Unknown	B-1	B
FALL RIVER																	
646	7S	1E	15	SWNE	1031248	426409	3611	August 1977	293	251	293	1	yes	Fall River	Monitor	B-9FR	L, N, O
659	7S	1E	10	SWNE	1031876	431048	3651	Fall 1976	UNK	UNK	UNK	UNK	yes	Fall River	Monitor	B-6FR	O
664	7S	1E	10	SWSE	1030634	428338	3621	11/7/1978	360	315	360	4.5	yes	Fall River	Monitor	B-11FR	C, L, O
671	7S	1E	15	NWNE	1031016	427870	3623	10/18/1978	350	300	350	4.5	yes	Fall River	Monitor	B-10FR	C, L, O
672	7S	1E	15	NWNE	1030632	427480	3622	Fall 1976	376	334	376	4	yes	Fall River	Monitor	B-1FR	L, O
CHILSON																	
10	7S	1E	13	NENE	1043664	427041	3736	1970s	200	UNK	UNK	UNK	no	Chilson	Stock	D-15	A, B
39	6S	1E	29	NENE	1022916	448656	3733	UNK	700	UNK	UNK	5	no	Chilson	Stock		A
48	6S	1E	19	SENW	1015295	453037	3663	Late 1960s	725	UNK	UNK	2 1/2	yes	Chilson	Stock		A
425	7S	1E	14	SENW	1034449	426208	3630	UNK	237	UNK	UNK	UNK	UNK	Chilson	Unknown		USGS
658	7S	1E	15	SWNE	1031234	426398	3611	August 1977	545	503	545	1	yes	Chilson	Monitor	B-9LAK	L, N, O
660	7S	1E	10	SWNE	1031822	431030	3652	Fall 1976	UNK	UNK	UNK	UNK	yes	Chilson	Monitor	B-6	O
661	7S	1E	12	NENW	1040977	431970	3694	Fall 1976	UNK	UNK	UNK	UNK	no	Chilson	Monitor	B-8	O
663	7S	1E	10	SWSE	1030659	428346	3621	11/7/1978	550	504	550	4.5	yes	Chilson	Monitor	B-11LAK	C, L, O
669	7S	1E	15	NWNE	1031005	427910	3622	10/25/1978	550	510	550	4.5	yes	Chilson	Monitor	B-10LAK	C, L, O
674	7S	1E	15	NWNE	1030555	427513	3621	11/6/1978	570	525	570	4.5	yes	Chilson	Monitor	B-2LAK	C, L, O
670	7S	1E	15	NWNE	1031065	427936	3623	10/19/1978	395	377	395	4.5	yes	Fuson	Monitor	B-10FU	C, L, O
673	7S	1E	15	NWNE	1030628	427511	3622	11/6/1978	420	400	420	4.5	no	Fuson	Monitor	B-1FU, B-2FU	C, L, O
UNKNOWN																	
634	6S	1E	34	NESE	1032502	440168	3689	UNK	UNK	UNK	UNK	UNK	no	Unknown	Unknown		GPS
OTHER																	
429	6S	1E	20	SENE	1023157	452953	3783	NA	800	NA	NA	NA	NA	Not a Well	NA		USGS, duplicates 615
431	6S	1E	20	SENE	1023157	452953	3783	NA	815	NA	NA	NA	NA	Not a Well	NA		USGS, duplicates 611
433	6S	1E	20	SENE	1023157	452953	3783	NA	835	NA	NA	NA	NA	Not a Well	NA		USGS, duplicates 616
432	6S	1E	20	SENE	1023157	452953	3783	NA	800	NA	NA	NA	NA	Not a Well	NA		USGS, duplicate 612
605(2)	7S	1E	10	SWSE	1031814	428484	3642	NA	NA	NA	NA	NA	NA	Not a Well(2)	NA		E
635(3)	7S	1E	14	NENW	1004085	427131	3643	NA	NA	NA	NA	NA	NA	Not a Well(3)	NA		E
651(4)	7S	1E	14	NWSE	1036009	424246	3600	NA	NA	NA	NA	NA	NA	Not a Well(4)	NA		E

Notes: (1) Surface elevations are based on a digital elevation model (DEM), except where noted. Accuracy is plus or minus 15 feet.

(2) Hydro ID 605 is not a well. It is a pipe from Hydro ID 668.

(3) Hydro ID 635 is not a well. It is a pipe from 5.

(4) Hydro ID 651 is not a well. It was historically a pipe from Hydro ID 6.

UNK = Unknown

NA = Not applicable, not a well

Table 3. Plugged and Abandoned Wells within 2 Kilometers of the Project Area

Hydro ID	Legal Location				SD State Plane NAD 27		NGVD29	Construction Summary					Flowing Artesian	Former Aquifer	Previous Use	Other Name	Source
	T.	R.	Sec.	Qtr. Qtr.	East (ft)	North (ft)	Surface Elevation(1) (ft)	Date Completed	Total Depth (ft)	Depth to Top Screen	Depth to Bottom Screen (ft)	Casing Diameter (in)					
FALL RIVER																	
665	7S	1E	11	SWSW	1033153	428901	3672	August 1977	252	210	252	1	no	Fall River	Monitor	B-7FR	L, N, O
---	6S	1E	19	SWSE	Long 104.042397	Lat 43.508820	3690	1/1/1931	405	0	0	UNK		Fall River	Oil Test	API 40 033 05219	D
---	6S	1E	19	SWSE	Long 104.042397	Lat 43.508820	3690	1/1/1932	420	0	0	UNK		Fall River	Oil Test	API 40 033 05221	D
CHILSON																	
666	7S	1E	11	SWSW	1033128	428870	3669	August 1977	441	399	441	1	no	Chilson	Monitor	B-7LAK	L, N, O
MINNELUSA																	
---	7S	1E	2	SESE	Long 103.958032	Lat 43.466062	3792	8/19/1964	2447	0	0	8 5/8-inch 0 to 142		Minnelusa	Oil Test	API 40 047 05095	D
---	7S	1E	22	NWSE	Long 103.983142	Lat 43.429674	3522	12/24/1965	2400	0	0	14-inch 0 to 30 8 5/8-inch 0 to 1125		Minnelusa	Oil Test	API 40 047 05147	D
---	7S	1E	11	SWSE	Long 103.963826	Lat 43.451453	3679	12/22/1976	2250	0	0	8 5/8-inch 0 to 163		Minnelusa	Oil Test	API 40 047 20071	D
---	7S	1E	21	NENE	Long 103.997735	Lat 43.433117	3533	4/7/1979	2500	0	0	8 5/8-inch 0 to 250		Minnelusa	Oil Test	API 40 047 20074	D
---	7S	1E	15	SWSW	Long 103.991563	Lat 43.435870	3564	8/13/1979	2462	0	0	8 5/8-inch 0 to 660		Minnelusa	Oil Test	API 40 047 20077	D
---	7S	1E	21	NENE	Long 103.996978	Lat 43.433064	3537	1/24/1980	2460	0	0	8 5/8-inch 0 to 800		Minnelusa	Oil Test	API 40 047 20085	D
MADISON																	
---	7S	1E	21	NESE	Long 103.997224	Lat 43.425795	3526	2/22/1964	3057	0	0	8 5/8-inch 0 to 269		Madison	Oil Test	API 40 047 05089	D
UNKNOWN																	
606	7S	1E	11	SWSW	1033713	428609	3668	UNK	UNK	UNK	UNK	UNK		Unknown	Unknown	D-16	B
636	7S	1E	11	NESW	1034774	429982	3698	UNK	UNK	UNK	UNK	7		Unknown	Unknown		GPS
652	7S	1E	2	NWSE	1036360	434742	3748	UNK	UNK	UNK	UNK	UNK		Unknown	Unknown		GPS
653	7S	1E	22	NWNE	1030679	422487	3569	UNK	UNK	UNK	UNK	UNK		Unknown	Unknown		GPS
654	6S	1E	34	NWNE	1032372	443410	3687	UNK	UNK	UNK	UNK	8		Unknown	Unknown		GPS
655	6S	1E	34	NENE	1033454	443307	3719	UNK	UNK	UNK	UNK	12		Unknown	Unknown		GPS

Notes: (1) Land elevations based on Digital Elevation Model (DEM).
UNK = Unknown

SOURCE A

WATER WELLS IN EDMONT PROJECT AREA

(Silver King Mines, Inc., May 1977, in a letter from Keith Andersen, Silver King Mines, Inc., to John Hatch, South Dakota Water Rights Commission, January 12, 1979)

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WATER WELLS IN EDMONT PROJECT AREA

<u>Well No.</u>	<u>Location</u>
1	SE/4 SE/4 Sec. 9 T7S,R1E
2	SE/4 SE/4 Sec. 16 T7S,R1E
3	SW/4 NW/4 Sec. 22 T7S,R1E
4	SE/4 SE/4 Sec. 15 T7S,R1E
5	NE/4 NW/4 Sec. 14 T7S,R1E
6	NE/4 SE/4 Sec. 14 T7S,R1E
7	NW/4 NW/4 Sec. 23 T7S,R1E
8	NW/4 SE/4 Sec. 23 T7S,R1E
9	NE/4 NE/4 Sec. 23 T7S,R1E
10	NE/4 NE/4 Sec. 13 T7S,R1E
11	NW/4 SW/4 Sec. 24 T7S,R1E
12	SE/4 SE/4 Sec. 4 T7S,R1E
13	NW/4 NW/4 Sec. 3 T7S,R1E
14	NW/4 SW/4 Sec. 2 T7S,R1E
15	NW/4 NW/4 Sec. 2 T7S,R1E
16	NW/4 SE/4 Sec. 1 T7S,R1E
17	SE/4 NW/4 Sec. 12 T7S,R1E
18	NW/4 SW/4 Sec. 9 T7S,R1E
19	NW/4 NW/4 Sec. 18 T7S,R1E
20	NW/4 SW/4 Sec. 17 T7S,R1E
21	SW/4 NW/4 Sec. 19 T7S,R1E
22	NE/4 SW/4 Sec. 27 T40N, R60W
23	NW/4 NW/4 Sec. 29 T7S, R1E
24	NE/4 NW/4 Sec. 28 T7S,R1E
25	SE/4 NW/4 Sec. 27 T7S,R1E
26	SW/4 NE/4 Sec. 35 T7S,R1E
27	SE/4 SE/4 Sec. 33 T7S,R1E
28	NE/4 SW/4 Sec. 22 T8S,R2E
29	NE/4 NW/4 Sec. 16 T8S,R2E
30	SE/4 SE/4 Sec. 31 T7S,R2E
31	SW/4 NW/4 Sec. 31 T7S,R2E



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<u>Well No.</u>	<u>Location</u>
32	SW/4 SW/4 Sec. 30 T7S,R2E
33	NW/4 SE/4 Sec. 25 T7S,R1E
34	NW/4 NW/4 Sec. 30 T7S,R2E
35	SW/4 NE/4 Sec. 19 T7S,R2E
36	NW/4 NE/4 Sec. 30 T7S,R2E
37	NW/4 SW/4 Sec. 18 T7S,R2E
38	SW/4 NW/4 Sec. 33 T6S,R1E
39	NE/4 NE/4 Sec. 29 T6S,R1E
40	NW/4 SW/4 Sec. 30 T6S,R1E
41	SW/4 NW/4 Sec. 31 T6S,R1E
42	SW/4 NE/4 Sec. 5 T7S,R1E
43	SE/4 SW/4 Sec. 34 T6S,R1E
44	NW/4 SE/4 Sec. 31 T7S,R2E
45	NW/4 NW/4 Sec. 5 T8S,R2E
46	SW/4 NE/4 Sec. 31 T7S,R2E
47	SW/4 SW/4 Sec. 32 T7S,R2E
48	SE/4 NW/4 Sec. 19 T6S,R1E
49	SW/4 SW/4 Sec. 29 T6S,R1E
50	SW/4 SW/4 Sec. 28 T41N,R60W
51	SW/4 NE/4 Sec. 9 T7S,R1E
52	NE/ SE/4 Sec. 30 T7S,R2E
53	SW/4 NE/4 Sec. 30 T7S,R2E
54	NE/4 SE/4 Sec. 25 T7S,R1E
55	NW/4 NE/4 Sec. 36 T7S,R1E
56	SE/4 SE/4 Sec. 32 T7S,R2E
57	NE/4 SE/4 Sec. 5 T8S,R2E
58	NW/4 NE/4 Sec. 31 T7S,R1E
59	NE/4 NW/4 Sec. 5 T8S,R2E
60	NE/4 SW/4 Sec. 33 T7S,R2E
61	NW/4 SE/4 Sec. 11 T7S,R1E
62	SW/4 SW/4 Sec. 25 T7S,R1E
63	SW/4 NW/4 Sec. 36 T7S,R1E



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<u>Well No.</u>	<u>Location</u>
64	SW/4 NE/4 Sec. 9 T8S,R2E
65	NW/4 NE/4 Sec. 9 T8S,R2E
66	NE/4 NW/4 Sec. 8 T8S,R2E
67	SE/4 NW/4 Sec. 8 T8S,R2E
68	NE/4 NE/4 Sec. 8 T8S,R2E
69	SW/4 SE/4 Sec. 25 T7S,R1E
70	SE/4 SW/4 Sec. 25 T7S,R1E
71	NW/4 SE/4 Sec. 6 T8S,R2E
72	NW/4 SE/4 Sec. 6 T8S,R2E
73	NE/4 SW/4 Sec. 6 T8S,R2E
74	NE/4 SW/4 Sec. 6 T8S,R2E
75	SW/4 SW/4 Sec. 17 T8S,R2E
76	SE/4 NW/4 Sec. 17 T8S,R2E
77	NW/4 NE/4 Sec. 17 T8S,R2E
78	NE/4 SE/4 Sec. 20 T8S,R2E
79	NE/4 SE/4 Sec. 27 T8S,R2E
80	SW/4 NW/4 Sec. 35 T8S,R2E
81	SW/4 NW/4 Sec. 14 T8S,R2E
82	SW/4 SW/4 Sec. 10 T8S,R2E
83	NE/4 SW/4 Sec. 14 T8S,R2E
84	SW/4 NW/4 Sec. 10 T8S,R2E
85	NE/4 SE/4 Sec. 28 T8S,R2E
86	NW/4 SW/4 Sec. 6 T8S,R2E
87	NW/4 NE/4 Sec. 1 T8S,R1E
88	NE/4 SE/4 Sec. 35 T7S,R1E
88	SE/4 SE/4 Sec. 35 T7S,R1E
89	NW/4 NE/4 Sec. 11 T8S,R1E
90	SE/4 NW/4 Sec. 23 T8S,R2E
91	SE/4 NW/4 Sec. 12 T8S,R2E
92	SE/4 SW/4 Sec. 23 T8S,R2E
93	SE/4 NE/4 Sec. 2 T8S,R2E
94	SW/4 SW/4 Sec. 34 T7S,R2E



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<u>Well No.</u>	<u>Location</u>
95	SE/4 Sec. 25 T40N,R61W
96	SW/4 SW/4 Sec. 22 T41N,R60W
97	Not Located
98	SW/4 NW/4 Sec. 17 T41N,R60W
99	NE/4 NE/4 Sec. 17 T41N,R60W
100	NW/4 SE/4 Sec. 7 T41N,R60W
101	SW/4 NE/4 Sec. 1 T41N,R61W
102	SW/4 NE/4 Sec. 18 T6S,R1E
103	NW/4 NW/4 Sec. 10 T41N,R60W
104	NW/4 SW/4 Sec. 10 T41N,R60W
105	SE/4 NW/4 Sec. 9 T41N,R60W
106	NE/4 NE/4 Sec. 18 T6S,R1E
107	SE/4 NE/4 Sec. 18 T6S,R1E
108	SE/4 NE/4 Sec. 18 T6S,R1E
109	NE/4 NW/4 Sec. 17 T6S,R1E
110	NE/4 NE/4 Sec. 17 T6S,R1E
111	NW/4 NE/4 Sec. 17 T6S,R1E
112	SE/4 Sec. 16 T6S,R1E
113	NE/4 SW/4 Sec. 6 T7S,R2E
114	NE/4 SW/4 Sec. 7 T7S,R2E
115	SE/4 NE/4 Sec. 18 T6S,R1E
116	SE/4 NE/4 Sec. 18 T6S,R1E
117	SW/4 SE/4 Sec. 8 T6S,R1E
118	NE/4 SE/4 Sec. 7 T6S,R1E
119	NW/4 NW/4 Sec. 8 T6S,R1E
120	NW/4 SW/4 Sec. 5 T6S,R1E
121	SW/4 SW/4 Sec. 31 T5S,R1E
122	NE/4 NW/4 Sec. 30 T5S,R1E
123	NE/4 NW/4 Sec. 21 T42N,R60W
124	NW/4 SW/4 Sec. 18 T5S,R1E
125	SW/4 SW/4 Sec. 6 T6S,R1E



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<u>Well No.</u>	<u>Location</u>
126	SE/4 SW/4 Sec. 16 T41N,R60W
127	SW/4 NE/4 Sec. 7 T41N,R60W
128	NW/4 SE/4 Sec. 1 T41N,R61W
129	Sec. 7 Sec. 5 T41N,R60W
130	
131	NW/4 SE/4 Sec. 4 T8S,R2E
132	NW/4 SE/4 Sec. 4 T8S,R2E
133	
134	SE/4 NW/4 Sec. 29 T40N,R60W

Water Wells in Edgemont Project Area

Map #	Owner	Use	Depth	Probable Aquifer	Remarks
1	Peterson & Son Inc.	Stock	600	K 1	Flowing 1.1 gpm, stopped during test. Casing was cut off closer to ground & flow recovered to 1.3 gpm, 6 wks after test.
2	Peterson & Son Inc.	Domestic	640	K 1	Flowing est. 15 gpm.
3	Peterson & Son Inc.	Stock	Oil test		Flowing 3 gpm.
4	Peterson & Son Inc.	Stock	Oil Test		Couldn't measure- broken out around casing. Also used by Glen Peterson for garden.
5	Peterson & Son Inc.	Stock	Oil Test		Plugged at 850", possible Sundance flow. Flowing 6.6 gpm, slowed to 5 gpm during test
6	Glen Peterson	Stock	280'	K f	SWL 11'2", Siphon Arrangement into tank.
7	Glen Peterson " "	Domestic	500' 200"	K 1 K f	Flowing 4.25 gpm. Slowed to 3.6 during test SWL 12' 8"
8	Leslie Coates " "	Domestic	500 240	K 1 K f	Flowing 4.2 gpm. Flow est. 1 gpm. Pumped to house.
9	Leslie Coates	Stock	90 ?	K f	Flowing 2.5 gpm.
10	Leslie Coates	Stock	200	K 1	SWL 78' New well.
11	Leslie Coates	Stock	Oil test		Flowing 5 gpm.
12	Leslie Coates	Stock	730'	K 1	Flowing 0.6 gpm, slowed to < 0.1 gpm during test. Recovered to 0.3 gpm after 6 weeks.
13	Miles Spencer	Domestic	500	K 1	Flowing 2.5 gpm., slowed to 1.2 gpm during test, Recovered to 2.0 gpm after 6 weeks.
14	Earl Darrow	Stock	470	K 1	Barely flowing. Stopped during test. SWL recovered to 1.0 ft.
15	Earl Darrow	Stock	280	K 1	Pump jack, couldn't measure accurately SWL approximately 24'
16	Earl Darrow	Stock	330	K 1	New well, SWL 157' 7"
17	H. P. Heck	Stock	156	K f	Windmill, couldn't measure
18	Dick Andersen	Domestic	527	K f	Flowing 7.5 gpm.



Water Wells in Edgemont Project Area

Map #	Owner	Use	Depth	Probable Aquifer	Remarks
19	Dick Andersen	Stock	740	K f	Pump jack, couldn't measure.
20	Edwin Andersen	Domestic	530	K f	Flowing 4.5 gpm.
21	Tubbs Ranch	Stock	910	K f	Flowing 14 gpm.
22	Coates, Andersen	Stock	800	K f	Pump jack, reported SWL 30'
23	Tubbs Ranch	Stock	600	K f	Flowing 0.8 gpm.
24	Tubbs Ranch	Domestic			Siphon arrangement, water level 23'
25	Tubbs Ranch	Stock			Windmill, couldn't measure, reported to barely flow.
26	Tubbs Ranch	Stock	350	K f	Windmill, couldn't measure, reported to barely flow.
27	Tubbs & Schultz	Stock	900	K 1	Submersible pump to pipeline. SWL 15'
28	Tubbs Ranch	Stock	300	K f	Will flow 20 gpm. H2S
29	B. Childers	Stock			Wild well, flowing est. 35 gpm. H2S around casing.
30	Harold Dodson	Domestic	120	K f	Barely flows, pumped to house.
	" "	Stock	120	K f	Flows 0.75 gpm
31	F. A. Heck	Domestic	104	K f	Flows 1.3 gpm.
32	Tony Bryan	Domestic	90	K f	Pumped to house, couldn't measure, flow est. 1/2 gpm.
33	H. P. Heck	Domestic	96	K f	Piped into house, flowing reported 1.25 gpm
34	Tony Bryan	Stock	330	K 1	2 wells, one no flow & not used, one flows 1.5 gpm.
35	Tony Bryan	Stock	148	K 1	Pumped well, not visited.
36	Tony Bryan	Stock	255	K 1	Flowing 10 gpm.
37	Tony Bryan	Stock	145	K 1	Pumped well, not visited
38	Lloyd Putnam	Stock	550	K 1	Flowing 1.5 gpm.
39	Norris Darrow	Stock	700	K 1	Windmill, reported SWL 15'
40	Norris Darrow	Domestic Domestic	660 700	K 1 K 1	Two wells piped together, both flow, but couldn't measure



POWERTECH (USA) INC.

Water Wells in Edgemont Project Area

Map #	Owner	Use	Depth	Probable Aquifer	Remarks
1	Robert Bakewell	Domestic			Flows 12 gpm.
2	Lloyd Putnam	Domestic	600	K 1	Flows est. 25 gpm.
3	Preston Richardson	Domestic	350	K 1	Submersible pump, couldn't measure, stopped flowing when old Triangle mine dewatered.
4	Harold Dodson	Stock	130	K f	Will flow est. 40 gpm.
5	Harold Dodson	Stock	190	K f	Flows 3.1 gpm. H2S
6	Harold Dodson	Stock	Oil test	K f	Plugged at 140', but couldn't measure. Flowing around casing.
7	Harold Dodson	Stock	90	K f	SWL 10'
8	Norris Darrow	Stock	725	K 1	Will flow est. 60 gpm.
9	Norris Darrow	Stock	600	K 1	Flows 5 gpm.
50	Lloyd Putnam	Stock	609	K 1	Flows 1.5 gpm., may be 2 wells piped together.
51	Burlington R.R.	Stock	550	K 1	Flows 15.5 gpm., used by Leslie Coates.
52	Tony Bryan	Stock			Flows 2.8 gpm.
53	Tony Bryan	Stock			Windmill, couldn't measure.
54	Tony Bryan	Stock	90	K f	Flows 0.5 gpm.
55	Tony Bryan	Stock	92	K f	Flows 9 gpm.
56	Effie Gow	Domestic	300	K 1	Broken out around casing, flowing
57	Effie Gow	Garden	270	K 1	Couldn't measure, reported 100+ gpm. H2S Used by Rev. Brown to irrigate garden.
58	F. A. Heck	Stock	100+	K f	Flows 4 gpm.
59	F. A. Heck	Stock	118	K f	Flows 2.8 gpm H2S
60	F. A. Heck	Stock			Windmill, couldn't measure.
61	Earl Darrow	Stock	525	K 1	Pumpjack, couldn't measure.
62	F. A. Heck	Stock			Couldn't measure, flowing est. 2 gpm into covered tank.



POWERTECH (USA) INC.

Water Wells in Edgemont Project Area

Map #	Owner	Use	Depth	Probable Aquifer	Remarks
63	Tony Bryan	Stock	100+	K f	Flows 1.5 gpm.
64	Leonard McElhane	Stock			Flows 5 gpm H2S, may flow more through big valve.
65	" "	?			2 wells, one windmill, SWL 15', neither apparently used.
66	" "	Stock			Valve at well head shut off except for small line to H. Dodson's stock tank. Reported by Keene as flowing 270 gpm. in 1970
67	Leonard McElhane	Stock			Flows 25 gpm. H2S.
68	" "	Domestic	230	K l	Piped to house, couldn't measure.
69	H. P. Heck	Stock	130	K f	Flows 6 gpm.
70	H. P. Heck	Stock	375	K f, K l	Flows 1.2 gpm.
71	Ed Benton	Domestic		K f	Flows 1.0 gpm.
72	Ed Benton	Stock	212	K f	Pumped to house, reported to barely flow
73	Ed Benton	Stock	560	K l	Yard water, Flows 13 gpm H2S
74	Ed Benton	Stock	305	K f	Flows 1.6 gpm.
75	Ed Benton	Stock	430	K f	Casing rusted out, flows, couldn't measure
76	Ed Benton	Stock	420	K f	Windmill, reported to pump dry
77	Darrell Heldmar	Stock	400	K f	Broken out around casing, est. 7 or 8 gpm.
78	" "	"	410	K f	Broken out around casing, est. 5 gpm.
79	B. Childers	Domestic	337	K f	Pump jack, Keene reports SWL 30'
80	" "	Stock	650	K l	Couldn't measure, pump set at 250'
81	" "	"	440	K l	Pump jack, Keene reports SWL 100'
82	" "	"	200	K f	Flows 4 gpm, sl. H2S
83	" "	"	270	K f	Flows 9 gpm., H2S
					Pump jack, couldn't measure.



POWERTECH (USA) INC.

Water Wells in Edgewood Project Area

Map #	Owner	Use	Depth	Probable Aquifer	Remarks
84	Dick Miller	Stock	155	K f	Flows 0.25 gpm.
85	Tubbs Ranch	Domestic	415	K f	Pumped to house, Reported SWL 30'
86	Tubbs Ranch	Stock	360	K f	Pump jack, SWL reported 20'
87	Tubbs Ranch	Appears abandoned	380	K f	Plugged with wooden plug. Reported SWL 20'
88	Tubbs Ranch	Appears abandoned	320	K f	Two wells, one may be caved in, one SWL 10'
89	Porter & Benton	Pipeline	860	K I	Submersible pump, runs extensive pipeline. SWL reported 5'
90	B. Childers	Stock	Oil test		SWL 1.0'
91	Carl Reutter	Stock	150	K f	Windmill SWL 34'
92	Carl Reutter	Domestic	298	K f	Pumped to house, Keene reports SWL 132'
93	Bob Runge	Domestic	200	K I	Two wells, couldn't measure, Keene reports SWL 80'
94	Bob Runge	Stock	200+	K I	Flows 0.75 gpm.
95	Wayne Jackson	Pipeline	860 880	K f	Barely flows, submersible pump to pipeline.
96	Billy Stearns	Domestic	560	K I	Flows 4.8 gpm.
97	Billy Stearns	Stock		K I	Uranium test cased to 200', hole reported to be caving below that & sealing off flow. Flows.
98	Billy Stearns	Stock	Oil test		Leaking around top of casing, flows est 2 g
99	Gerald Darrow	Domestic	420	K I	Flows 2.2 gpm.
100	" "	Stock	530	K I	Flows 150 gpm (by Hodson) apparently used to fill water trucks.
101	" "	Morresy Pipeline	665	K I	Pipeline serves ranches west, submersible pump. Hodson reports flow 3 gpm.
102	Lloyd Darrow	Domestic	267	K I	Will flow est. 100 gpm. Sells water
103	Lloyd Darrow	Stock	350	K I	Flows 1.3 gpm.



POWERTECH (USA) INC.

Water Wells in Edgemont Project Area

Map #	Owner	Use	Depth	Probable Aquifer	Remarks
104	Lloyd Darrow	Stock		K J	Jensen jack, reported SWL 6'
105	Lloyd Darrow	Stock		K I	Not visited, reported SWL 8 to 10'
106	Lloyd Darrow	Stock			Flows 3.5 gpm.
107	Earl Darrow	Domestic	90	K f	Pumped into house, flow est. 1 gpm.
108	Chet Taylor	Domestic	90	K f	Taylor lives here part of time. Info reported by Earl Darrow. Flow rep. 1 gpm
109	Vivian Cook	Domestic	220	K I	Reported SWL 22'
110	Vivian Cook	Stock	240	K I	Reported SWL 30'
111	Vivian Cook	Not used	100	K f	Owner plans to develop, reported SWL 5'
112	Miles Spencer	Stock	120	K f	Windmill, couldn't measure.
113	Miles Spencer	Stock			Back up well for Spencer pipeline.
114	No info				Forest Service.
115	Bud Hollenbeck	Domestic		K f	Flows 3 gpm.
116	Bud Hollenbeck			K f	Flows 2.75 gpm. At Dewey Post Office.
117	Bud Hollenbeck	Stock Garden			Submersible Pump. SWL 27'
118	Bud Hollenbeck	Stock	Oil test		Flowing out of casing at ground level
119	Bud Hollenbeck	Stock			Submersible pump, reported SWL 6'
120	Forest Service	Stock			Pumpjack, couldn't measure.
121	Bud Hollenbeck	Stock	430	K I	Will flow?? est. 100 gpm.
122	Bud Hollenbeck	Stock			Windmill, couldn't measure.
123	Bud Hollenbeck	Stock			Pump jack, couldn't measure.
124	Bud Hollenbeck	Stock			Not visited, reported windmill.
125	Bud Hollenbeck	Stock			Casing rusted off. Flows at ground level.
126	Francis Carr	Domestic		K I	Flows, couldn't measure.
127	Francis Carr	Stock	Oil test	K I	Casing rusted off, flows at ground level.



POWERTECH (USA) INC.

Water Wells in Edgemont Project Area

Map #	Owner	Use	Depth	Probable Aquifer	Remarks
128	Francis Carr	Stock	Oil test	K 1	Couldn't measure, est. 5 gpm.
129	There are several old oil tests in this area. The ones reported as being used are reported above. There appears to be some flow from some of these but the casings seem to be bad and all there is now are some marshy areas. Some use of water for stock from these is possible.				
130	Dick Miller	Domestic	155	K f	?
131	Dick Miller	Stock	110	K f	Flows 0.8 gpm
132	Dick Miller	Stock	300	K 1	Flows est. 2 gpm
133	Dick Miller	Stock	300	K 1	Not contacted. Information from Keene
134	Roberts & Daniels	Stock	860		



POWERTECH (USA) INC.

	S.	to Electricity	Dia.	Condition	Setting, Capacity, Age, etc.	Use	Requirement
1	S	300 ft.	4"	25 yrs. - fair	none		
2	D.S.I.	300 ft.	5"	45 yrs. - poor	none		casing rusted out - flowing around casing
3	S	1/2 mile	4"	10 yrs.	none		oil test open hole from top of F. R.
4	S.I.	700 ft.	3"	10 yrs. - poor	none		oil test flowing around casing
5	S	2 miles	5"	10 yrs. - fair	none		oil test - open hole from top of FR
6	S	1 mile	12"	20 yrs.	none		
7 FR	D	on site	6"	20 yrs.	jet pump at 25 ft.		
7 LAK	S.I.	" "	5 1/2"	40 yrs. - poor	none		
8 FR	D.I.	on site		45 yrs. - poor	jet pump in basement		
8 LAK	S.I.	on site	6"	45 poor	none		
9	S	1 mile	6"	10 yrs.	none		
10	S	2 miles		2 yrs. - good	pump jack		
11	S	1/2 mile	8"	10 yrs.	none		oil test
12	S	2000 ft.	4 1/2"	10 yrs. - poor	none		open hole from top FR
13	D.S.I.	on site	5"	20 yrs. - fair	none		
14	S	1/2 mile	4"	poor	none		first pump test stopped flow - well not used since flow stopped
15	S	on site	4"	fair	cylinder type		

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Appendix B



Well #	D. S.	Distance to Electricity	Well Dia.	Age and Condition	Pump Information-Type Setting, Capacity, Age, etc.	Season of Use	Water Requirement	Remarks
16	S	on site	4½"	1 yr. - good	no pump installed yet			
17	S	2 miles	UNK.		windmill			
18	D.S.I.	on site	4"	48 yrs.	pressure pump			
19	S	1 mile	6"	16 yrs. - fair	pump jack			
20	D.S.I.	on site	6"	51 yrs. - poor	shallow well jet pump			casing rusted out - was repaired
21	S	1½ mile	7"	65 yrs.	none			oil test
22	S	on site	3"	10 yrs. - good	cylinder type			
23	S	1 mile	6"		none			
24	D.S.	on site	3"		none			
25	S	2 miles	4½"		windmill			
26	S	1 mile	5"		windmill			
27	S	on site	12"		submersible pump			serves pipeline
28	S	1/2 mile	6"	poor	none			
29	S	1/2 mile	5"	poor	none			casing rusted out
30	D.I.	on site	6"	24 yrs.	deep well jet pump est. @ 80 ft.			



Well #	D. S.	Distance to Electricity	Well Dia.	Age and Condition	Pump Information-Type Setting, Capacity, Age, etc.	Season of Use	Water Requirement	Remarks
30	S	on site	6"	cleaned 1977 22 years	none			
31	D.S.I.	on site	5½"	28 yrs.	none			
32	D.S.I.	on site	6"		pump type unknown			
33	D.S.	on site	5"	32 yrs.	none			
34	S	1 mile	2½"		none			2 wells - one does not flow and is not used
35		2 miles	8"	poor	windmill			
36	S	1½ mile	4"	poor	none			
37		2½ miles	5½"	poor	cylinder type			
38	S	½ mile	4"	26 yrs.	none			
39	S	½ mile	5"	poor	windmill			
40	D.S.I.	on site	6"	8 yrs.	none			
40	D.S.I.	on site	6"	31 yrs. poor	none			pipied together
41	D.S.I.	on site	6"		submersible			serves pipeline
42	D.S.I.	on site	5"	33 yrs. poor	none			casing rusted out and repaired
43	D	on site	4"	poor	submersible			



Well #	D. S.	Distance to Electricity	Well Dia.	Age and Condition	Pump Information-Type Setting, Capacity, Age, etc.	Season of Use	Water Requirement	Remarks
44	S	1/2 mile	6"	20 yrs.	none			
45	S	on site	4"	8 yrs. poor	none			
46	D.S.I.	1/2 mile	6"	18 yrs. poor	none			oil test - leaking around casing
47	D.S.I.	on site	6"	18 yrs. fair	none			
48	S	on site	2 1/2"	10 yr.	none			
49	S	1 mile	4"	3 yrs.	none			
50 N	S	2 miles	4"	40 yrs. poor	none			
50 S	S	2 miles	6"	5 yrs. poor	none			surface casing only ?
51	S	1 mile	10"	80 yrs. poor	none			repaired 1930's ?
52	S	1/2 mile	2 1/2"		none			
53	S	1 mile	6"		windmill			
54	S	1500 ft.	6"		none			
55	S	2000 ft.	6"		none			
56	D.S.I.	on site	3"	10 yrs. poor	submersible			leaking around casing
57	S.I.	1/2 mile	4"		none			

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Appendix B



Well #	D. S.	Distance to Electricity	Well Dia.	Age and Condition	Pump Information-Type Setting, Capacity, Age, etc.	Season of Use	Water Requirement	Remarks
58	S	100 ft.	6"		none			
59	S	1500 ft.	4"	poor	none			
60	S	1 mile	UNK.		windmill			
61	U	3 miles	5"		pump jack			
62	S	1 1/2 mile	6"	1 yr. good	none			well replaced 1977
63	S	2000 ft.	5"		none			
64	S	1/2 mile	2 1/2"	poor	none			
65	U	1/2 mile	6"	poor	none			
66	S	Approx. 1/2 mile	5"		none			
67	S	Approx. 1/2 mile	5"	poor	none			
68	D	on site	4"		none			
68	S.I.	on site	4"		none			
69	S	400 ft.	6"	18 yrs.	none			
70	S	2000 ft.	4"	7 yrs. poor	none			open hole from top Fall River
71	D	on site	5"		pump type unknown			



Well #	D. S.	Distance to Electricity	Well Dia.	Age and Condition	Pump Information-Type Setting, Capacity, Age, etc.	Season or Use	water Requirement	Remarks
72	S.I.	on site	6"	32 yrs. poor	none			
73	D.S.I.	on site	5"	2 yrs. good	submersible			
74	S	1/2 mile	5"	30 yrs. poor	none			casing rusted out
75	S	Approx. 1 mile	5"		windmill			pumps dry
76	S	Approx. 1 1/2 mile	7"	18 yrs. poor	none			casing rusted out
77	S	Approx. 1 1/2 Mile	5"	poor	none			casing rusted out
78	D.S.	on site	5"		cylinder			
79	D.S.I.	on site	6"		submersible set at 250'			
80	S	Approx. 3000 ft.	6"		cylinder			
81	S	Approx. 1 1/2 mile	4"		none			
82	S	Approx. 1 1/2 mile	4 1/2"		none			
83	S	Approx. 1 mile	6"		cylinder			
84	S	Approx. 1 mile	2"		none			
85	D	on site						
86	S	1/2 mile	4"	poor	cylinder			stopped flowing when well #66 flowing uncontrolled about 1970

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Appendix B



Well No.	D. S.	Distance to Electricity	Well Dia.	Age and Condition	Pump Information-Type Setting, Capacity, Age, etc.	Season of Use	Water Requirement	Remarks
87	U	3/4 mile	4"	poor	none			same as 86
88	S.U.	1500 ft.	8"	poor	none			was used with pump jack in 1977 - not used in 1978
88	S	on site	6"		pump type unknown probably submersible			serves pipeline
89	D.S.	on site	6"	good	submersible			serves pipeline
90	S.U.	on site	6"		none			oil test
91	S	1 mile	5"		windmill			
92	D.S.I.	on site	4 1/2"		submersible			
93	D.S.I.	on site	2"		submersible			
93	S.U.	on site	6"		none			
94	S	on site	5"		none			
95	D.S.I.	on site	10"		submersible			serves pipeline
96	D.S.I.	on site	5"		none			
97	S	1 mile	4"	poor	none			cased to 200"
98	S	2 miles	10'	poor	none			oil test
99	D.S.I.	on site	4"		none			



Well No.	D. S.	Distance to Electricity	Well Dia.	Age and Condition	Pump Information-Type Setting, Capacity, Age, etc.	Season of Use	Water Requirement	Remarks
100	S		8"		none			
101	D	on site	7"		submersible			serves extensive pipeline
102	DSI	on site	5"	fair	none			
103	S	1 mile	4"		none			
104	S	1 mile	4 1/2"		Jensen jack			
105	S	3 miles	4"		pump jack			
106	S	1/2 mile	4"		none			
107	DSI	on site	5"	poor	none			
108	DSI	on site	6"	poor	none			
109	DSI	on site	6"		submersible - set @ 90'			
110	SI	on site	6 1/2"		submersible			
111	SU	200 ft.	4"		none			
112	S	1 mile	4 1/2"		windmill			
113	S	2 miles	UNK		windmill			
114	S U	3 miles	UNK		windmill			



D. S.	Distance to Electricity	Well Dia.	Age and Condition	Pump Information-Type Setting, Capacity, Age, etc.	Season of Use	Water Requirement	Remarks
DSI	on site	3½"		jet pump			
U	on site	1"		none			
S.I.	on site	6"		submersible pump			
S	1500 ft.	9½"	poor	none			oil test
S	on site	5"		submersible pump			
S	on site	2"		pump jack			
S	1½ mile	5"		none			
S	5 miles	7"		windmill			
S	4½ mile	6"		cylinder			
S	5 miles	4"		windmill			
S	1½ miles	6"	poor	none			casing rusted off
DST	on site	6½"		none			
S	2 miles	6"	poor	none			oil test - casing rusted off
S	2½ miles	2"	poor	none			oil test

[illegible]

SOURCE B

DRAFT ENVIRONMENTAL STATEMENT FOR EDGEMONT URANIUM MINE TABLE 2.5.2-1

(Tennessee Valley Authority, 1979)

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Table 2.5.2-1

Summary of Wells Within a Four-Mile (6.5 km.) Radius of the
TVA Burdock, No. 1 Shaft Site

Well No.: Based on the Federal system of township and range. Each township within the project area is assigned a letter in consecutive order beginning with "A" in the northeast corner and ending with "Z" in the southern part. Similarly, wells are numbered in consecutive order within a township--for example B-1, B-2, etc. Location: Number based on township, range, section, 1/4 section, and 1/4 section. Aquifer: Qa, Quaternary alluvial deposits; K1, Cretaceous, Fall River Formation; K2, Cretaceous, Lakota Formation; Jm, Jurassic, Morrison Formation; Js, Jurassic, Sundance Formation; Trs, Triassic, Spearfish Formation; Perm, Permian, Minnekahta Limestone. Depth: Given in feet (ft.) and meters (m.) below land surface. Use Rate and Flow Rate: In gallons per minute (gpm) and liters per second (l/s). Elevation of Land Surface and Elevation of Water Surface: In feet (ft.) and meters (m.) above sea level. Superscript a indicates flow rate less than 1 gpm. Superscript b indicates estimated water surface elevations.

Well No.	Latitude	Longitude	Location	Aquifer	Depth		Use Rate		Flow Rate		Elevation				Remarks
					(ft.)	(m.)	(gal/min)	(l/s)	(gal/min)	(l/s)	Land Surf. (ft.)	Land Surf. (m.)	Water Surf. (ft.)	Water Surf. (m.)	
621 B-1	43°30'00"	103°58'57"	6-1-27Db	Qa	50	15	30	1.9	-	-	3715	1132	3700	1128	
622 B-2	43°29'58"	103°58'57"	6-1-27Db	Qa	46	14	30	1.9	-	-	3715	1132	3700	1128	
41 B-3	43°29'10"	103°58'43"	6-1-31Bd	-	-	-	-	-	12	.8	3605	1099	3610	1100	
58 B-4	43°29'09"	103°58'40"	6-1-33Bc	K1	550	168	-	-	2	.1	3630	1108	3630	1108	
49 B-4	43°28'51"	103°58'06"	6-1-34Bc	K1	350	107	-	-	-	-	3643	1116	-	-	Flowed until Triangle mine de-watered. 1/3 h.p. pump.
16 B-1	43°28'25"	103°56'47"	7-1-18B	K1	330	101	-	-	-	-	3695	1120	3747	1146	
36 B-2	43°28'32"	103°57'34"	7-1-24A	K1	780	238	10	.6	-	-	3749	1143	-	-	Water contains iron.
75 B-3	43°28'36"	103°58'15"	7-1-28B	K1	495	151	-	-	4	-	3705	1129	3705	1129	Unused.
64 B-4	43°28'18"	103°58'20"	7-1-29C	K1	280	85	6	.3	-	-	3658	1127	3671	1120	Water contains iron.
12 B-6	43°28'01"	103°58'22"	7-1-29C	K1	470	143	-	-	4	-	3675	1121	3680	1122	Unused.
13 B-6	43°28'34"	103°58'42"	7-1-29B	K1	500	152	-	-	2	.1	3660	1116	3661	1116	A.E.C. water analysis.
12 B-7	43°28'34"	103°58'00"	7-1-43A	K1	805	245	-	-	1	.06	3645	1111	3645	1111	
42 B-8	43°28'17"	104°01'19"	7-1-54C	K1	800	243	-	-	25	1.6	3600	1097	3610	1100	Flow rate in 1969, 30 gpm (1.9 l/s).
51 B-9	43°27'30"	103°58'53"	7-1-84A	K1	530	160	-	-	16	1.0	3615	1102	3620	1103	Water contains iron & sulphur.
10 B-10	43°27'53"	104°00'54"	7-1-90C	K1	827	251	-	-	8	.5	3700	1128	3701	1128	



TABLE 2.5.2-1 (continued)

Well No.	Latitude	Longitude	Location	Aquifer	Depth		Use Base		Flow Rate		Elevation				Remarks
					(ft.)	(m)	(gal/min)	(l/s)	(gal/min)	(l/s)	Land	Surf.	Water	Surf.	
											(ft.)	(m)	(ft.)	(m)	
1 D-11	43°27'43"	103°59'46"	7-1-90d	K1	600	183	-	-	1	.06	3624	1105	3631	1107	Water contains iron.
61 D-12	43°27'05"	103°57'47"	7-1-115c	K1	525	160	-	-	-	-	3700	1128	-	-	A.E.C. water analysis.
17 D-13	43°28'25"	103°56'53"	7-1-128d	K2	156	48	-	-	-	-	3750	1143	-	-	
10 D-14	43°27'04"	103°56'21"	7-1-120d	-	-	-	-	-	-	-	3838	1167	-	-	
10 D-15	43°26'53"	103°56'12"	7-1-135a	K1	200	61	-	-	-	-	3740	1140	3682	1116	
606 D-16	43°26'54"	103°56'24"	7-1-148b	-	-	-	-	-	8	-	3675	1120	3675	1120	
5 D-17	43°24'43"	103°58'25"	7-1-148a	K1	850	259	-	-	7	.4	3630	1106	3634	1108	Water contains iron.
4 D-18	43°28'23"	103°57'48"	7-1-148b	K1	280	85	1	.06	-	-	3610	1100	3596	1097	
4 D-19	43°26'26"	103°58'43"	7-1-150d	-	2264	690	-	-	-	-	3576	1090	3582	1091	
8 D-20	43°26'18"	103°58'58"	7-1-152d	K1	640	195	-	-	16	.9	3566	1084	3562	1085	A.E.C. water analysis.
20 D-21	43°26'18"	103°58'58"	7-1-152b	K1	630	192	-	-	4	.3	3555	1084	3555	1084	A.E.C. water analysis.
19 D-22	43°26'33"	104°03'06"	7-1-180c	K2	740	226	-	-	-	-	3700	1128	-	-	
21 D-23	43°25'48"	104°03'12"	7-1-180c	K2	910	277	-	-	16	.9	3580	1091	3582	1093	
3 D-24	43°25'42"	103°59'31"	7-1-228c	-	2400	732	-	-	3	.2	3648	1081	3560	1082	
9 D-25	43°25'55"	103°57'24"	7-1-234a	K1	90	27	-	-	3	.2	3625	1106	3625	1105	Flow rate 1989, 10 gpm (.6 l/s).
7002 D-26	43°26'02"	103°58'26"	7-1-238a	K1	500	152	-	-	5	.3	3574	1089	3574	1089	
7 D-27	43°26'03"	103°58'28"	7-1-238b	K1	200	61	3	.2	-	-	3574	1089	3561	1085	
8002 D-28	43°26'26"	103°57'48"	7-1-238c	K1	500	152	-	-	5	.3	3542	1080	3542	1080	Casing perforated in 10 ft (3 m.) intervals below elevations 3822 (882 m.) and 3384 (7031 m.).
8 D-29	43°25'27"	103°57'44"	7-1-238c	K1	240	73	-	-	1	.06	3542	1080	3542	1080	
503 D-30	43°25'24"	103°57'30"	7-1-238d	Js-PuK	1470	448	-	-	5	.3	3550	1082	3550	1082	
112-31	43°25'22"	103°57'07"	7-1-242b	Js-PuK	2480	756	-	-	6	.4	3577	1090	3577	1091	
70 D-32	43°25'22"	103°56'58"	7-1-252a	K1	375	114	-	-	2	.1	3500	1066	3500	1066	
33 D-33	43°24'42"	103°56'37"	7-1-252b	K1	96	29	-	-	1	.06	3510	1070	3510	1070	
54 D-34	43°24'44"	103°56'29"	7-1-252b	K1	90	28	-	-	1	.06	3528	1075	3528	1075	

D-14
not in
database

(65)

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TABLE 2.5.2-1 (continued)

Well No.	Latitude	Longitude	Altitude (ft)	Aquifer	Depth		Flow Rate		Elevation		Reports
					(ft)	(m)	(gal/min)	(l/s)	(ft)	(m)	
49	43°24'28"	103°56'58"	2725	KY	130	40	-	-	3510	1070	3510 ^b 1070
504	43°24'30"	103°56'21"	2750	KY	480	137	-	-	3508	1069	3508 ^b 1069
505	43°24'42"	103°57'53"	2750	KY	280	79	-	-	3530	1076	3530 ^b 1076
51	43°24'47"	103°59'27"	2740	KY	380	107	-	-	3550	1080	3550 ^b 1080
52	43°24'51"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
53	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
54	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
55	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
56	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
57	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
58	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
59	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
60	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
61	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
62	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
63	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
64	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
65	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
66	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
67	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
68	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
69	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
70	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
71	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
72	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
73	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
74	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
75	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
76	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
77	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
78	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
79	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
80	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
81	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
82	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
83	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
84	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
85	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
86	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
87	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
88	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
89	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
90	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
91	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
92	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
93	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
94	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
95	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
96	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
97	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
98	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
99	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090
100	43°25'01"	104°00'01"	2730	KY	600	183	-	-	3576	1090	3576 ^b 1090

Slight flow in 1969; no flow
in 1978.
1969 Flow, 15 gpm (.9 l/s);
no flow in 1978.

Unused.
Flow rate in 1969, 2 gpm (.1
l/s); no flow in 1978; unused.

E-7
not
in
database



POWERTECH (USA) INC.

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POWERTECH (USA) INC.

SOURCE C

SOUTH DAKOTA WELL COMPLETION REPORTS

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Hydro ID 2

NOTICE OF WELL CONSTRUCTION

1 of 1
7-15-16

(1) WELL CONSTRUCTION

Location of well, SE 1/4 SE 1/4 Section 16 Township 7S Range 1E

Well owner Peterson & Son, Inc. Edgemont, SD
(Name) (Address)

Date well drilling completed 11-17-81 Purpose of well Domestic
(domestic, irrigation, municipal, industrial, other)

WELL LOG

[illegible]

Attach sheet if more space is needed

Silver King Mines, Inc.

Name of Drilling Contractor

2) PUMP INSTALLATION

Company name and size of pump _____ NR _____

Type of pump _____ Capacity of installed pump _____

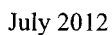
Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells on air-tight water surface measuring tube is required: See Section 48.408 of Chapter 48, MINNESOTA WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft. tube _____
tube material _____

Name of Pump Installation Contractor:





POWERTECH (USA) INC.

13 Recompilation

1 of 1

NOTICE OF WELL CONSTRUCTION

(1) WELL CONSTRUCTION

Location of well: NW 1/4 NW 1/4 Section 3 Township 7S Range 1E

Well owner: Kathryn Spencer (Name) Dewey Route Edgemont, SD 57735 (Address)

Date well drilling completed: 10-22-80 Purpose of well: Domestic (domestic, irrigation, municipal, industrial, other)

WELL LOG

(Litho Log Footages)

Depth to top of water producing aquifer	580	ft.
Depth to static water level	flows	ft.
Name of producing aquifer (if known)	Lakota	
Total depth of drill hole	625	ft.
Depth to bottom of casing	580	ft.
Casing information: In the space below show kind, size, weight, length per diameter, etc., for production casing and surface casing, if used.		
	5 1/2" 14 lbs/ft.	
	Random twenties	
Screen information: In the space below show length of screen below bottom casing, diameter and kind of screen or casing perforations.		
	45 ft. open hole	
If a flowing well, flow of completed well		
	1.00	G.P.M.

Attach sheet if more space is needed

Silver King Mines, Inc.

Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump: HR

Type of pump: Capacity of installed pump: G.P.M.

Depth of pump placement: ft., Date of pump installation:

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed: ft., tube diameter: tube material:

Name of Pump Installation Contractor

Hydro ID 38
Form H 4 9

DANIEL'S FINAL REPORT

1 of 1

OFFICE OF STATE ENGINEER
Pierre, South Dakota

Well No. _____
(do not fill in)

CUSTER COUNTY

Location: SW 1/4 Section 33 Twp. 6S Range 1E

Owner George Putnam Address Burdock, S. Dak.

Depth 494 Drawdown _____ Type Rig Used cable tool

Flow(gpm) _____ Pressure _____ Date Measured _____

Grd. Elev. _____ Water Level Below Ground Surface _____

Temperature _____ Character Water (soft, medium, hard)

Date Commenced _____ Date Completed 11/12/49

X	

Section _____

CASING DETAIL

<u>Type</u>	<u>Size</u>	<u>Length</u>	<u>Depth</u>
	4"	497	494

PERFORATIONS

<u>Type</u>	<u>Size</u>	<u>Length</u>	<u>Depth</u>
-------------	-------------	---------------	--------------

SCREEN

<u>Type</u>	<u>Size</u>	<u>Length</u>	<u>Depth</u>
-------------	-------------	---------------	--------------

Is there a seal between different size pipes? What kind?

WATER BEARING SANDS

From _____ To _____

SOURCE OF INFORMATION

PMA office, Fall River Co

DRILLER'S LOG

[illegible]

~~Sanded Driller~~ Roy Bone
 Address Hot Springs, S. Dak.

BY-1

1 of 1

PLEASE COMPLETE
ENTIRE FORM

WELL DRILLERS REPORT
Division of Water Rights
Department of Water & Natural Resources

6/60

Well Owner:

Name Francis & Paul Jozwick

Address Casper, Wyoming

Well Location:

North

Mark location with an "X"

W

E

1 mile

County Custer

NW 1/4 SW 1/4 Sec. 30 Twp. 6S Rg. 1E

Proposed Use:

☐ Domestic
☐ Municipal
☒ Test Holes
☐ Irrigation
☐ Industrial
☐ Stock

Method of Drilling:

☒ Forward Rotary
☐ Bored
☐ Jetted
☐ Reverse Rotary
☐ Cable
☐ Other

Well Construction:

Diameter of Hole 7 7/8

Depth 680

Casing ☒ Steel ☐ Concrete

☐ Plastic ☐ Other

If other, specify _____

Was casing end left open Yes

Was a well screen installed No

Describe Well Screen

Diameter _____ Material _____

Slot size _____

Was well gravel packed No

Was well grouted Yes

Was water sample taken No

Remarks: Cased w/14-5# 5 1/2" steel casing
Perforation completion.

Water Level Information:

Static water level _____ below land sur

If flowing: closed in pressure 28 PSI

rate of flow _____ 2 GPM

Controlled by:

☒ Valve
☐ Reducers
☐ Other

If other; specify _____

Well Test Data:

☐ Pumped
☐ Bailed
☐ Other

Describe: _____

Pumping Level Below Land Surface

_____ ft. After _____ Hrs. pumped

_____ " " _____ " "

_____ " " _____ " "

Well Log:

Formation	Depth	
	From	To
	0	15
Med. & dk gry sh	15	400
Dk gry sh	400	535
Intbd gry silt & clst	535	547
Gry-vfgr ss & clst	547	602
Clst	602	610
Vf, fgrss tr clst	610	673
Gry clst	673	680

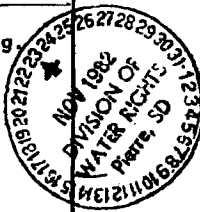
(Use Back If Necessary)

Date Completed: March 4, 1982

Driller: Contract Rig by Silver King Mines, Inc. 406

Driller's or Firm's Name Edgemont, SD 57735 License

Address _____





SOUTH DAKOTA WELL REHABILITATION REPORT

11-02

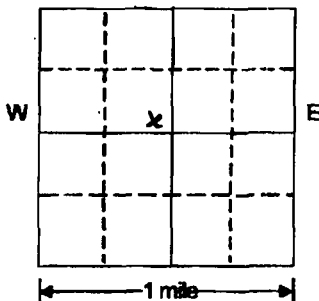
Location SE 1/4 NW 1/4 Sec 5 Twp 75 Rg 1E

County

North

FALL RIVER

Please mark well location with an "X"



Well owner:

Name

Putnam + Putnam, L.P.

Address

778 CEDAR ST.

City, State, Zip Dewey S.D. 57735-5011

Describe original construction if possible.

(Attach original log if available), DRILLED 1949
WELL DRILLED 580'
CASED 8" TO 220'
OPEN HOLED TO BOTTOM

Rehabilitation Completion Date 11-15-09

PROPOSED USE:



Domestic



Municipal



Stock



Irrigation



Industrial

Description of condition of well before rehabilitation:

CASING DETERIORATING ABOVE AND BELOW GROUND

RECEIVED

JAN - 8 2010

WATER RIGHTS PROGRAM

Description of rehabilitation work completed:

Swabbed Well For 310', Put 4" PVC casing Solid For 280' 30' of Screen
Put Shale Packer at 220' and Trimmy Line Presure Grouted Back To Surface
Reduced casing To 14" and Put on Ball Valve To control Well.

Re casing information: Material PVC Diameter 4 Inches Depth 300 Feet

Describe screen or perforations .25 Factory Slot Screen Location From 280 To 300
From _____ To _____

Grout: ☒ YES Describe grouting procedure and grout
☐ NO

Put Trimmy Line To 220' & Shale Packer
Pressured 44 Bags Cement Back To Surface

Well Test Data:

Specific capacity

Static water level

If a flowing well

GPM

Shut in

PSI

75

10

Flowing

This well rehabilitation was completed under license # 724 and this report is true and accurate.

Drilling firm: J+M DRILLING

Signature of Licensed Representative:

Jim McNamee

Signature of Well Owner:

Lloyd Putnam

Date: 1-4-2010

1-6-10



POWERTECH (USA) INC.

STATE OF SOUTH DAKOTA WELL DRILLERS REPORT

115 Replacement

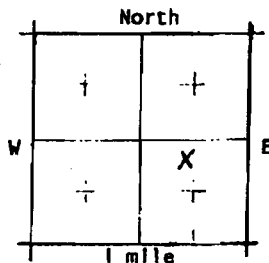
1 of 1

Location NW 1/4 SE 1/4 Sec 18 Twp 6 S Rg 1 E

County

CUSTER

Please mark well location with an "X"



Well Completion Date Oct 2 1984

PROPOSED USE:

☒ Domestic ☐ Municipal ☐ Test Holes
☐ Irrigation ☐ Industrial ☒ Stock

Method of Drilling:

ROTARY MUD

WELL CONSTRUCTION: 6" to 280'

Diameter of hole 4" inches Depth 360 feet

Casing: ☐ Steel ☒ Plastic ☐ Other
Specify 6" yellow pipe
4" SCH 40

Pipe Weight Diameter From To
54 200 lb/ft 6 inches 0 feet 280 feet
54 40 lb/ft 4 inches 160 feet 360 feet

Was a well screen used? ☒ Yes ☐ No

If Not Specify

Screen Type 4" PVC Slot Size 1/64"

Length 80' Diameter 4"

Was Casing left open end? ☒ Yes ☐ No

Was a Packer or seal used? ☒ Yes ☐ No

If so what material? RUBBER

Was well gravel packed? ☐ Yes ☒ No

Was well grouted? ☒ Yes ☐ No

Describe grouting procedure PUMPED 35

800 MIX DOWN INSIDE & UP OUTSIDE

To what depth? 180 Feet

What was grouting material? TAPE 11

If cement, how many sacks? 25

Location of packer(s) and screen or perforated pipe 30 ft screen 300-320 packer

280 Screen 300-360

WAS WELL PLUGGED OR ABANDONED? ☐ Yes ☒ No

If so how and with what material?

Well Owner:

Name BILLY HOLLERBECK

Address Becky R. Box 38 Edgecamp S.D

Well Log: Depth 5775'

Formation	From	To
<u>SHALE</u>	<u>0</u>	<u>80</u>
<u>FALL RIVER</u>	<u>80</u>	<u>220</u>
<u>EUSON</u>	<u>220</u>	<u>240</u>
<u>LAKOTA</u>	<u>240</u>	<u>360</u>

STATIC WATER LEVEL 0 Feet

If flowing: closed in pressure 6.45 PSI

GPM flow 65 through 6" inch pipe

Controlled by ☒ Valve ☐ Reducers ☐ Other

If other; specify

Can well be completely shut off? YES

WELL TEST DATA:

☐ Pumped

☐ Bailed

Describe:

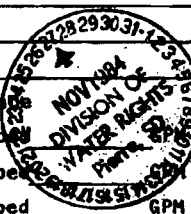
☐ Other

Pumping Level Below Land Surface

ft. After Hrs. pumped

ft. After Hrs. pumped

ft. After Hrs. pumped



Remarks: THIS IS ORDER TO CLO
WELL THAT WAS LEAKING CEMENTED
WELL THAT PUMPED 13 BASS IN
AT 160 FT.

This well was drilled under license # 415

and this report is true and accurate.

Drilling Firm DAVE DANCING

Signed by DAVE DANCING

Date Oct 18, 1984

the sent
12-6-84

WNR-836 4/82

HAM-4

PLEASE PRINT
ENTIRE FORM

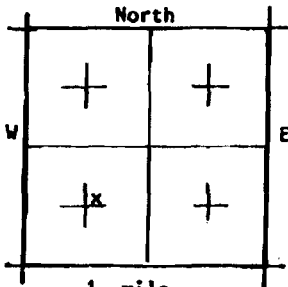
WELL DRILLERS REPORT
Division of Water Rights
Department of Water & Natural Resources

1 of 1

6/60

Well Owner:
Name Tennessee Valley Authority
Address _____

Well Location: North

Mark location with an "X"

County Custer
SW 1/4 NE 1/4 Sec. 17 Twp. 6S Rg. 1E

Proposed Use:
☐ Domestic ☐ Municipal ☒ Test
☐ Irrigation ☐ Industrial ☐ Stock
Holes

Method of Drilling:
☒ Forward Rotary ☐ Bored ☐ Jetted
☐ Reverse Rotary ☐ Cable ☐ Other

Well Construction:
Diameter of Hole 6 1/8
Depth 750
Casing ☒ Steel ☐ Concrete
☐ Plastic ☐ Other
If other, specify _____

Was casing end left open Yes
Was a well screen installed No
Describe Well Screen
Diameter _____ Material _____
Slot size _____
Was well gravel packed No
Was well grouted Yes
Was water sample taken No

Remarks: Cased w/.219 wall 4.1/2" steel casing.
Open hole completion.

Water Level Information:
Static water level 34' below land surface
If flowing: closed in pressure _____ PSI
rate of flow _____ GPM
Controlled by:
☐ Valve ☐ Reducers ☐ Other
If other; specify _____

Well Test Data:
☐ Pumped
☐ Bailed Describe: _____
☐ Other
Pumping Level Below Land Surface
_____ ft. After _____ Hrs. pumped _____ GPM
_____ " " " " " "
_____ " " " " " "

Well Log:

Formation	Depth	
	From	To
Alluvium	0	33
Gry shale	33	403
Intbd gry siltst & sh	403	416
Intbd gry vfgr ss & clst	416	485
Br fgr ss	485	507
Gr & rd vfgrss & gry clst	507	550
Rd f, mgrss	550	576
Dr brn clst	576	585
Rd mgrss	585	596
Intbd gry, brn clst & gry siltst	596	651
lt ortn f, mge ss	651	693
brn clst	693	695
O: f, m, cgr ss	695	742
gry clst	742	750

(Use Back if Necessary)

Date Completed: February 9, 1982

Driller:
Silver King Mines, Inc. 405
Driller's or Firm's Name License NO.
Edgemont, SD 57735
Address

Signed By _____ Date _____





POWERTECH (USA) INC.

Hydro ID 220

STATE OF SOUTH DAKOTA WELL DRILLERS REPORT

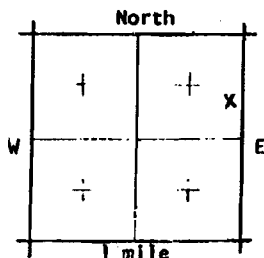
1 of 1

Location SE 1/4 NE 1/4 Sec 19 Twp 6S Rg 1E

County

CUSTER

Please mark well location with an "X"

Well Completion Date OCT 16 1984

PROPOSED USE:

☐ Domestic ☐ Municipal ☐ Test Holes
☐ Irrigation ☐ Industrial ☒ Stock

Method of Drilling:

ROTARY MUDWELL CONSTRUCTION: TO 520' TO 900'
Diameter of hole 6" inches Depth 520 feetCasing: ☐ Steel ☒ Plastic ☐ Other
Specify 6" VENTURE MARK 4" SEA TO 520'Pipe Weight Diameter From To
1b/ft 6" inches 0 feet 520 feet1b/ft 4" inches 500 feet 900 feetWas a well screen used? ☒ Yes ☐ No

If Not Specify

Screen Type PVC Slot Size 1/64"Length 60' Diameter 4"Was Casing 1-ft open end? ☒ Yes ☐ NoWas a Packer or seal used? ☒ Yes ☐ NoIf so what material? RUBBERWas well gravel packed? ☐ Yes ☒ NoWas well grouted? ☒ Yes ☐ NoDescribe grouting procedure Pressure Grout6" Pipe 0 to 520'To what depth? 520 feetWhat was grouting material? Type II CementIf cement, how many sacks? 100Location of packer(s) and screen or perforated pipe PACKER 780 SCREEN 780TO 100' & 840 - 880WAS WELL PLUGGED OR ABANDONED? Yes ☒ No

If so how and with what material?

Well Owner: MORRICE DEVICCE OPERATIONName BERNARD & LOUISE PARRISAddress Box 567 Casper Wyo 82602

Well Log:

Depth

Formation	From	To
<u>SHALE</u>	<u>0</u>	<u>480</u>
<u>FALL RIVER</u>	<u>480</u>	<u>600</u>
<u>FUSON</u>	<u>600</u>	<u>740</u>
<u>WYOMING</u>	<u>740</u>	<u>885</u>
<u>MORRISON</u>	<u>885</u>	<u>900</u>

STATIC WATER LEVEL 0 FeetIf flowing: closed in pressure 2 PSIGPM flow 16 through 6" inch pipeControlled by ☒ Valve ☐ Reducers ☐ Other

If other; specify

Can well be completely shut off? YES

WELL TEST DATA:

☐ Pumped☐ Bailed☐ Other

Describe:

Pumping Level Below Land Surface

ft. After Hrs. pumped GPM

ft. After Hrs. pumped GPM

ft. After Hrs. pumped GPM

Remarks:

NOTE THIS IS AN
 OFFSET TO OLD WELL, OLD
 WELL WAS CEMENTED OFF PUMPED
 16 BAGS CEMENT IN 200 FT

This well was drilled under license # 415

and this report is true and accurate.

DRILLING
 Drilling Firm

DRILLING
 Signed by

OCT 12 1984
 Date

12-6-84
 Date



POWERTECH (USA) INC.

Hydro ID 436

1 of 1

NOTICE OF WELL CONSTRUCTION

Custer

1) WELL CONSTRUCTION

Location of well: NW 1/4 NE 1/4 Section 20 Township 6S Range 1E

Well owner: Tennessee Valley Authority (Name) (Address)

Date well drilling completed: 8-18-81 Purpose of well: Observation (domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer
0-430	Blk sh	505 ft
430-495	18 gy clst & ss	Depth to static water level: 21.0 ft
495-520	ln & brn ss	Name of producing aquifer (if known): Fall River
520-530	Gy & brn-gy clst	Total depth of drill hole: 590 ft
530-545	Rd-brn & tn ss	Depth to bottom of casing: 505 ft
545-565	Rd-ppl clst	Casing information: In the space below show kind, size, weight, length per diameter, etc., for production casing and surface casing, if used.
565-590	Pk, ln & brn ss	4" blk iron 10#/ft
		Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.
		open hole 505-590
		If a flowing well, flow of completed well: NA G.P.M.

Attach sheet if more space is needed

Silver King Mines, Inc.

Name of Drilling Contractor

2) PUMP INSTALLATION

Company name and size of pump: HR

Type of pump: Capacity of installed pump: G.P.M.

Depth of pump placement: ft., Date of pump installation:

3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.409 of Chapter 46.4, MINNESOTA WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed: ft., tube diameter: tube material:

Name of Pumps Installation Contractor





POWERTECH (USA) INC.

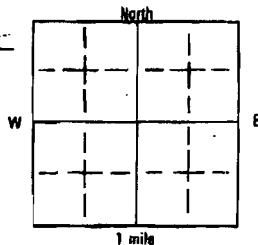
SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 10-85

Hydro ID 510
Section SE 1/4 SE 1/4 Sec 1/2 Twp 7 Rg 1

County
FALL RIVER

Please mark well location with an "X"



Well Completion Date JUNE 12 1988

PROPOSED USE:

☐ Domestic ☐ Municipal ☐ Test Holes
☐ Irrigation ☐ Industrial ☒ Stock

Method of Drilling:

Rotary Air + Mud

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
5 LB/FT	5 IN	0 FT	520 FT	7 1/2 IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN

GROUT:

Was the well grouted? ☒ YES ☐ NO

To what depth? 280 FT FEET

What is grouting material? CEMENT

If cement, number of sacks? 34 SACKS

Describe grouting procedure TREM LINE

What was grout weight? 1 BAG 7 GAL LB/GAL

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 5 IN Length 80 FEET

Material PUC

Slot Size .064 Set From 300 Feet To 340 Feet

Slot Size .064 Set From 480 Feet To 520 Feet

Slot Size _____ Set From _____ Feet To _____ Feet

Other information _____

Was a packer or seal used? ☒ YES ☐ NO

If so, what material? NEOPRENE

Describe packer(s) and location? 5 x 8 PACKERS

SET AT 280 + 300 FT TOP SCREEN

380 + 420 + 480 FT ABOVE

BOTTOM SCREEN

Was well disinfected upon completion? ☐ YES ☐ NO

Explain _____

Bacteriological analysis ☐ YES ☐ NO

Laboratory sent to _____

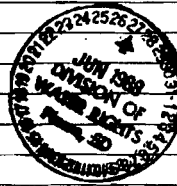
Well Owner:

Name LESCIE COATS

Address Danney St. Edgemont, SD 57735

Well Log: _____ Depth _____

Formation	From	To
<u>FALL RIVER</u>	<u>0</u>	<u>180</u>
<u>LAKOTA</u>	<u>180</u>	<u>530</u>
<u>MOHAWK</u>	<u>530</u>	<u>540</u>



STATIC WATER LEVEL 0 Feet

If flowing: closed in pressure 2 PSI

GPM flow 580 through 1 GAL 10 MIN inch pipe

Controlled by ☒ Valve ☐ Reducers ☐ Other

If other; specify _____

Can well be completely shut in? YES

WELL TEST DATA:

☐ Pumped AIR BAILED

☒ Bailed Describe: 10 GPM

☐ Other _____

Pumping Level Below Land Surface

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

REMARKS:

3 GPM MEASURED AT 320

10 GPM MEASURED FROM

500 FT SAND.

This well was drilled under license # 415

And this report is true and accurate.

Drilling firm Barry Drilling + Exp

Signature of License Representative:

Russell Barry

Signature of Well Owner:

Date _____

7-6-88



POWERTECH (USA) INC.

Hydro ID 609

INSTRUCTIONS

Location of well SW 1/4 Sec 174 Township 6S Range 1E

Well owner Tennessee Valley Authority, P. O. Box 49, Edgemont, South Dakota
(Name) (Address)

Date well drilling completed 6-26-78 Purpose of well Observation
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing equifer 840 ft.
0-20	Brown Soil	Depth to static water level
20-530	Gray Shale	Name of producing equifer (if known) Lakota
530-545	Gray Sandstone	Total depth of drill hole 1000 ft.
545-620	Lt. Gray & Brown Mudstone & Siltstone	Depth to bottom of casing 966 ft.
620-690	Lt. Gray Sandstone	Casing information: In the space below show kind, size, weight, lengths per diameter, etc. for production casing and surface casing, if used.
690-720	Dark Gray Shale w/Light Gray Siltstone	1" Scheduling 40 Black Iron
720-740	Gray Sandstone	
740-770	18 Dark Gray Shale, Gray-Green Mudstone	
770-820	Gray Sandstone	Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.
820-840	Gray Shale	
840-955	18 AA & Yellow-Brown Siltstone-Sandstone	Torch Slotted 903-966
955-975	Red & Yellow Sandstone	
975-1000	Green w/Variiegated Mudstone	

Attach sheet if more space is needed

Silver King Mines, Inc.

Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump _____ HP

Type of pump _____ Capacity of installed pump _____ G.P.M.

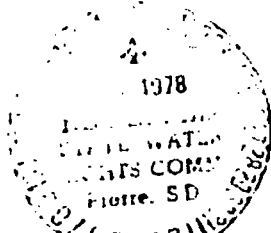
Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____ tube material _____

Name of Pump Installation Contractor





POWERTECH (USA) INC.

Hydro ID 810

Section 23 Township 6 Range 1E

Well owner Tennessee Valley Authority, P.O. Box 49, Edgemont, South Dakota

Date well drilling completed 6-27-78 Purpose of well Observation

(domestic, irrigation, municipal, industrial, other)

WELL LOG

Depth, top to bottom in feet	Description of layer	Depth to top of water-producing aquifer
0-20	Brown Sandy Soil	605
20-540	Gray Shale	Depth to static water level
540-605	Gray Siltstone	Name of producing aquifer (if known) <u>Fall River</u>
605-680	1B Gray Sandstone & Gray Shale	Total depth of drill hole <u>680</u>
		Depth to bottom of casing <u>672</u>
		Casing information in the space below show kind, size, weight, lengths per diameter, etc., for production casing and surface casing, if used
		<u>1" Scheduling 40 Black Iron</u>
		Screen information in the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations
		<u>Torch Slotted 630-672</u>
		If a flowing well, flow of completed well _____ G.P.M.

Attach sheet if more space is needed

Silver King Mines, Inc.

Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump _____ HP

Type of pump _____ Capacity of installed pump _____ G.P.M.

Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required. See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____

tube material _____

Name of Pump Installation Contractor





POWERTECH (USA) INC.

Hydro ID 610
SPZ-21 FR

2 of 2

NOTICE OF WELL CONSTRUCTION

(1) WELL CONSTRUCTION

Location of well: SW 1/4 NW 1/4 NE Section 29 Township 6S Range 1E

Well owner: Tennessee Valley Authority, P.O. Box 49, Edgemont, South Dakota
(Name) (Address)

Date well drilling completed: 6-27-78 Purpose of well: Observation
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer	ft.
0-20	Brown Sandy Soil	605	ft.
20-540	Gray Shale		ft.
540-605	Gray Siltstone		ft.
605-680	18 Gray Sandstone & Gray Shale		ft.

Casing information: In the space below show kind, size, weight, lengths per diameter, etc. for production casing and surface casing, if used.

1" Scheduling 40 Black Iron

Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.

Torch Slotted 630-672

If a flowing well, flow of completed well _____ G.P.M.

Attach sheet if more space is needed

Silver King Mines, Inc.

Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump _____ HP

Type of pump _____ Capacity of installed pump _____ G.P.M.

Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water measuring tube is required. See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____, tube material _____

Name of Pump Installation Contractor



POWERTECH (USA) INC.

Hydro ID 611

NOTICE OF WELL CONSTRUCTION

10/1-20

(1) WELL CONSTRUCTION

Custer

Location of well: SE 1/4 NE 1/4 Section 20 Township 6S Range 1E

Well owner: Tennessee Valley Authority (Name) (Address)

Date well drilling completed: 10-17-81 Purpose of well: Test (domestic, irrigation, municipal, industrial, other)

WELL LOG

Loggers, top to top in feet	Description of layer	Depth to top of water producing aquifer	694
0-440	Dk brn-gy shale	Depth to static water level	34.2
440-500	Gy & brn mudstone	Name of producing aquifer (if known)	Lakota
500-520	Lt red sandstone	Total depth of drill hole	815
520-565	Dk brn & gy-qn mdst	Depth to bottom of casing	694
565-600	Red sandstone	Casing information: In the space below show kind, size, weight, length by per diameter, etc., for production casing and surface casing, if used.	
600-625	Dk brn mdst-siltst		
625-645	Dk brn mdst		
645-690	Gy & brn mdst w/int'd rd siltst		
690-725	Red ss w/orng cht	Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.	
725-755	Red siltst		
755-800	Red ss w/wht, orng & gy chert pbl cgl		
		695-730	8 5/8" Johnson Well
		755-800	.030 Screen slot
			galvanized
		If a flowing well, flow of completed well: NA	

Attach sheet if more space is needed

Forward Drilling Company
Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump: Pioneer 6" HP 50
Type of pump: Submersible Capacity of installed pump: 325 G.P.M.
Depth of pump placement: 525 ft., Date of pump installation: 12-2-81

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.908 of Chapter 46.6, MINNESOTA WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed: 525 ft., tube diameter: 3/4"
tube material: poly



Great West Pump, Inc.
Name of Pump Installation Contractor



POWERTECH (USA) INC.

1 of 1

Hydro ID 612

NOTICE OF WELL CONSTRUCTION

For the State of Tennessee

(1) WELL CONSTRUCTION

Custer

Location of well: SE 1/4 NE 1/4 Section 20 Township 6S Range 1E

Well owner: Tennessee Valley Authority
(Name)

(Address)

Date well drilling completed: 8-14-81 Purpose of well: Observation
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer
0-425	Blk sh	692
425-495	18 gy clst & ss	Depth to static water level: 26.6
495-505	Rd & brn ss	Name of producing aquifer (if known): Lakota
505-525	Gy clst	Total depth of drill hole: 800
525-530	Rd & orng -brn clst	Depth to bottom of casing: 692
530-545	Brn & rd-brn ss	Casing information: In the space below show kind, size, weight, length per diameter, etc., for production casing and surface casing, if used.
545-555	Gy & wht sltst w/fy-gn clst	
555-585	Orng, rd & brn ss	
585-610	Gy-wht sltst w/gn clst	
610-640	Tn-gy ss	Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.
640-650	Gy clst & gy wht sltst	
650-700	Gy & gn clst	
700-730	Tn, orng & rd-brn ss	
730-745	18 Gy ss & sltst	open hole 692-800
745-800	Tn-brn ss	

If flowing well, flow of completed well: NA

Silver King Mines, Inc.

Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump: NA

Type of pump: Capacity of installed pump: G.P.M.

Depth of pump placement: ft., Date of pump installation:

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required. See Section 46.408 of Chapter 46.4, MINNESOTA WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed: ft., tube diameter:

tube material:

Name of Pump Installation Contractor



Hydro ID 613

1 of 1

NOTICE OF WELL CONSTRUCTION
~~The Well~~
Custer

(1) WELL CONSTRUCTION

Location of well: SE 1/4 NE 1/4 Section 213 Township 6S Range 1E

Well owner Tennessee Valley Authority
(Name) (Address)

Date well drilling completed 8-14-81 Purpose of well Observation
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Layer, top to top in feet	Description of layer	Depth to top of water producing aquifer
0-430	Blk sh	504
430-510	18 gy clst & ss	26.2
510-600	Tn-gy & rd-brn ss w/ gy, gn & rd clst	580
		504
Casing information: In the space below show kind, size, weight, length and diameter, size, for production casing and surface casing, if any.		
4" blk iron 10#/ft		
Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or screen perforations.		
open hole 504-580		
If a flowing well, flow of completed well		NA

Attach sheet if more space is needed

Silver King Mines, Inc.
Name of Drilling Contractor

2) PUMP INSTALLATION

Company name and size of pump _____

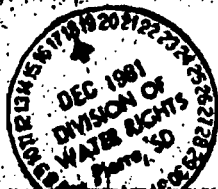
Type of pump _____ Capacity of installed pump _____

Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

- On some wells an air-tight water surface measuring tube is required. See Section 42.602 of Chapter 42, MINNESOTA WELL CONSTRUCTION STANDARDS.
- Show exact vertical length of water surface measuring tube, when installed, _____ ft. (Use standard _____ tube material _____).

Name of Pump Installation (Location)





POWERTECH (USA) INC.

Hydro ID 614

NOTICE OF WELL CONSTRUCTION

6.10.20

(1) WELL CONSTRUCTION

Custer

Location of well: SF 1/4 NE 1/4 Section 20 Township 6S Range R1

Well owner Tennessee Valley Authority
(Name) (Address)

Date well drilling completed 9-14-81 Purpose of well Observation
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer
0-440	Blk sh	609
440-505	18 gy clst & ss	Depth to static water level <u>32.2</u>
505-565	Rd & yw-brn ss w/rd-br & gy clst	Name of producing aquifer (if known) <u>Lakota</u>
565-575	Rd-brn clst	Total depth of drill hole <u>620</u>
575-600	Rd 7 rd-brn ss-siltst	Depth to bottom of casing <u>609</u>
600-620	18 gy clst & ss	Casing information: In the space below show kind, size, weight, length per meter, etc., for production casing and surface casing, if used.
		4" blk iron 10#/ft
		Screen information: In the space below show length of screen being bottom of casing, diameter and kind of screen or casing perforations.
		open hole 609-620
		If a flowing well, flow of completed well <u>NA</u>

Attach sheet if more space is needed

Silver King Mines, Inc.
Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump HR

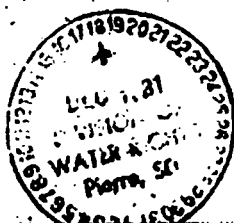
Type of pump HR Capacity of installed pump 0.25

Depth of pump placement ft. Date of pump installation 9-14-81

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required. See Section 46.408 of Chapter 46, MINNESOTA WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed ft. tube diameter 1/2"
tube material stainless steel



Name of Pump Installation Contractor



POWERTECH (USA) INC.

Hydro ID 615

NOTICE OF WELL CONSTRUCTION

1) WELL CONSTRUCTION

Custer

Location of well: SE 1/4 NE 1/4 Section 20 Township 6S Range 1E

Well owner: Tennessee Valley Authority (Name) (Address)

Date well drilling completed: 8-13-81 Purpose of well: Observation (domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer
0-435	Blk sh	712
435-505	Intbd gy clst, ss	39.7
505-525	Lt tn & brn ss	Name of producing aquifer (if known): Lakota
525-550	IB gy clst-ss	Total depth of drill hole: 800
550-590	IB rd brn & gy sltst & clst	Depth to bottom of casing: 712
590-600	Rd & brn ss	Casing information: In the space below show kind, size, weight, length per diameter, etc., for production casing and surface casing, if used.
600-620	IB gy-gn & rd-brn sltst & clst	4" blk Iron 100/ft
620-645	Gy-wht sltst	Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.
645-685	IB gy-wht sltst & pk sltst	open hole 712-800
685-695	Pk & brn ss w/gy clst	If a flowing well, flow at completed well: NA
695-800	Brn, orgn, tn, pk, rd & yw ss	

Attach sheet if more space is needed

Silver King Mines, Inc.

Name of Drilling Contractor

2) PUMP INSTALLATION

Company name and size of pump: NA

Type of pump: Capacity of installed pump: 0.2 gpm

Depth of pump placement: ft., Date of pump installation:

3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required. See Section 49.40B of Chapter 49A, MINNESOTA WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed: ft., tube diameter: 1/2"

Tube material: PVC

Name of Pump Installation Contractor





POWERTECH (USA) INC.

Hydro ID 616

1 of 1

NOTICE OF WELL CONSTRUCTION

John R. Rouse

CUSTER

1) WELL CONSTRUCTION

Location of well: SE 1/4 NE 1/4 Section 20 Township 6S Range R1

Well owner: Tennessee Valley Authority (Name) (Address)

Date well drilling completed: 9-15-81 Purpose of well: Observation (domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer	735
0-465	Blk sh	Depth to static water level	45.8
465-530	1B gy clst & ss	Name of producing aquifer (if known)	Lakota
530-550	Ad & yw-brn ss	Total depth of drill hole	835
550-605	1B gn sltst & gn-gy clst	Depth to bottom of casing	735
605-645	Gy clst w/gy-whit sltst	Casing information: in the space below show kind, size, weight, length, and diameter, etc., for production casing and surface casing, if used.	
645-680	Gy ss	4" blk iron 10#/ft	
680-720	Gy w/gn clst	Screen information: in the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.	
720-760	1B rd & yw-brn ss, gy sltst & rd-brn & brngy clst	open hole 735-835	
760-835	Tn ss	If a flowing well, flow of completed well	

Attach sheet if more space is needed

Silver King Mines, Inc.
Name of Drilling Contractor

2) PUMP INSTALLATION

Company name and size of pump: HR

Type of pump: Capacity of installed pump: G.P.M.

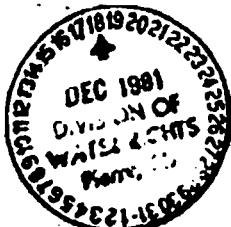
Depth of pump placement: ft., Date of pump installation:

3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required. See Section 46.406 of Chapter 46, MINNESOTA WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed: ft., tube diameter: tube material:

Name of Pump Installation Contractor



Hydro ID 617

6.1 - 20
1 of 1

NOTICE OF WELL CONSTRUCTION

~~J. M. Paine~~

Cluster

(1) WELL CONSTRUCTION

Location of well: SW 1/4 NE 1/4 _____ Section 20 Township 6S Range 1E

Well owner Tennessee Valley Authority
(Name)

Date well drilling completed 9-15-81 Purpose of well Observation
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Log no., top to top in feet	Description of layer	Depth to top of water producing aquifer	715
0-450	Blk sh	Depth to static water level	21.4
450-520	IB gy clst & ss	Name of producing aquifer (if known)	Lakota
520-555	Rd-brn & gy clst w/gy ss	Total depth of drill hole	810
555-570	Rd & brn ss	Depth to bottom of casing	715
570-625	IB gy sltst & gy, gn & rd clst	Casing information: In the space below show kind, size, weight, length, diameter, etc., for production casing and surface casing, if used.	
625-655	Gy ss	4" blk iron 100/ft	
655-740	IB gy sltst w/gy-gn & brn clst	Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.	
740-810	Yn, yw & rd-brn ss	open hole 715-810	
		If a flowing well, flow of completed well	

ALFRED HENRY | BORN 1924 IN CHICAGO

Silver King Mines, Inc.

Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump _____ HP _____

Type of pump _____ Capacity of installed pump _____

Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 40.402 of Chapter 40, MINNESOTA WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft. tube diameter _____

tube material _____



Name of Pump Testing/Testing Contractor:



POWERTECH (USA) INC.

Hydro ID 822

DWM-50

1 of 2

NOTICE OF WELL CONSTRUCTION

(1) WELL CONSTRUCTION

Location of well: NE 1/4 NE 1/4 Section 20 Township 6S Range 1E

Well owner: Tennessee Valley Authority (Name) (Address)

Date well drilling completed: 8-17-81 Purpose of well: Observation (domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer	
0-420	Blk sh	714	ft.
		Depth to static water level	49.7 ft.
420-490	1B gy clst & ss	Name of producing aquifer (if known)	Lakota
490-585	1B gy, pk & orgy sltst & rd-brn & gn clst	Total depth of drill hole	780 ft.
585-615	Gy-gn & rd-brn clst	Depth to bottom of casing	714 ft.
615-650	Gy-wht sltst	Casing information: In the space below show kind, size, weight, length per diameter, etc., for production casing and surface casing, if used. 4" blk iron 10#/ft	
650-690	Gy & gn clst		
690-735	Gy w/rd & ywbrn ss w/brn-gy clst		
735-778+	Tn & yw-brn ss		
		Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations. open hole 714-780	
		If a flowing well, flow of completed well NA G.P.M.	

Attach sheet if more space is needed

Silver King Mines, Inc.

Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump _____ HP

Type of pump _____ Capacity of installed pump _____ G.P.M.

Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.40B of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____, tube material _____

Name of Pump Installation Contractor



Castel

NOTICE OF WELL CONSTRUCTION

(1) WELL CONSTRUCTION

Location of well: NE 1/4 NE 1/4 Section 20 Township 6S Range R1

Well owner: Tennessee Valley Authority
(Name) (Address)Date well drilling completed: 8-17-81 Purpose of well: Observation
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer	
0-420	Blk sh	503	ft.
420-500	18 gy clst & ss	34.2	ft.
500-580	Gy, rd & tn ss w/gy & brn clst	580	ft.
		503	ft.
Casing information: In the space below show kind, size, weight, lengths per diameter, etc., for production casing and surface casing, if used.			
4" blk iron 10#/ft			
Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.			
open hole 503-580			
If a flowing well, flow of completed well NA G.P.M.			

Attach sheet if more space is needed

Silver King Mines, Inc.
Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump: HP

Type of pump: Capacity of installed pump: G.P.M.

Depth of pump placement: ft, Date of pump installation:

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed: ft, tube diameter: tube material:

Name of Pump Installation Contractor



Hydro ID 623

NOTICE OF WELL CONSTRUCTION

Cluster

(1) WELL CONSTRUCTION

Location of well: NE 1/4 NE 1/4 Section 2 Township 6S Range R1

Well owner Tennessee Valley Authority
(Name) (Address)

Date well drilling completed 8-17-81 Purpose of well Observation
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer	503
0-420	Blk sh	Depth to static water level	34.2
420-500	18 gy clst & ss	Name of producing aquifer (if known)	Fall River
500-580	Gy, rd & tn ss w/gy & brn clst	Total depth of drill hole	580
		Depth to bottom of casing	503
Casing information: In the space below show kind, size, weight, lengths per diameter, etc., for production casing and surface casing, if used.			
4" blk iron 100/ft			
Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.			
open hole 503-580			
If a flowing well, flow of completed well			

Attach sheet if more space is needed

Silver King Mines, Inc.
Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump _____ HP _____

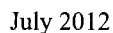
Type of pump _____ Capacity of installed pump _____ G.P.M. _____

Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

- On some wells an air-tight water surface measuring tube is required: See Section 48.400 of Chapter 48.4, MINIMUM WELL CONSTRUCTION STANDARDS.
- Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____, tube material _____.

Name of Pump Installation Contractor _____





Hydro ID 624

NOTICE OF WELL CONSTRUCTION

6-1-18 of 1

Cluster

1) WELL CONSTRUCTION

Location of well, SE 1/4 NE 1/4 Section 18 Township 6S Range 1E

Well owner Earl Darrow Edgemont, SD
(Name) (Address)

Date well drilling completed 7-30-81 Purpose of well Domestic
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in foot	Description of layer
0-20	Wh brn & gy clst and sltst
20-25	Gy clst & ywtn bent
25-35	Gy clst & ss
35-55	Gy clst
55-60	Gy ss
60-65	Brn & gy clst
65-70	Gy ss
70-95	Gy, blk, rd & orgn-br
95-115	Rd, orgn-brn & ppl ss
115-120	Gy clst w/ss

Attach sheet if more notes to include

Depth to top of water producing aquifer 90

Depth to static water level _____ 0

Name of producing aquifer (if known) Fall River

Total depth of drill hole 120

Depth to bottom of casing 120

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

Casing information in the space below show kind, size, weight, length per diameter, etc., for production casing and surface casing, if used.

160 4" PVC

Screen information: in the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.

slotted casing 90-115

If a flowing well, flow of completed well 0.2 gpm

Silver King Mines, Inc.

Name of Drilling Contractor

2) PUMP INSTALLATION

Company name and size of pump _____ HP _____

Type of pump _____ Capacity of installed pump _____

Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells on air-tight water surface measuring tube is required: See Section 46.400 of Chapter 46A, MINNESOTA WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____ tube material _____.

Name of Pump Installation Contractor _____



SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1
07-92

Location: SW 1/4 SW 23 Twp 6S Rg 1E
County: Clatsop North

Please mark well location with an "X"

Well Completion Date: Feb 98

1 Mile

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.): None ft. from None (identify source)

PROPOSED USE:

☒ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Air Rotary

CASING DATA: ☒ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT DIAMETER FROM TO HOLE DIAMETER
15.5 LB/FT 5 IN 0 FT 70 FT 7 1/8 IN
____ LB/FT ____ IN ____ FT ____ FT ____ IN
____ LB/FT ____ IN ____ FT ____ FT ____ IN

GROUTING DATA

GROUT Type Cement No. of Sacks 0 Grout Weight 0 lb./gal From 0 ft 30 ft
____ lb./gal ____ ft ____ ft

Describe grouting procedure pumped

SCREEN: ☒ Perforated pipe ☐ Manufactured

Diameter 5 IN Length 40 FEET

Material Steel

Slot Size 1/16 Set From 30 Feet to 70 Feet

Other information _____

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO

If so, what material? Rubber packer @ 30 ft

Describe packer(s) and location? _____

DISINFECTION: Was well disinfected upon completion? ☒ YES, How: Chlorinator

Laboratory sent to for water quality analysis _____ NO, Why Not? _____

Well Owner: Aloud & John Putnam
Business Name: Putnam & Putnam
Address: MC 59 Box 22
Edgmont SD 57135

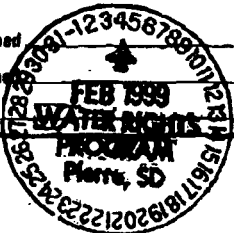
WELL LOG:

FORMATION	DEPTH	
	FROM	TO
<u>Sand & Gravel</u>	<u>0</u>	<u>75</u>
<u>Shale</u>	<u>75</u>	<u>80</u>

STATIC WATER LEVEL 20 Feet
If flowing: closed in pressure PSI
GPM flow through inch pipe
Controlled by ☐ Valve ☐ Reducers ☐ Other
Reduced Flowrate GPM
Can well be completely shut in?

WELL TEST DATA:
☐ Pumped
☐ Bailed
☒ Other
Describe: Air Lift
~~15~~ 15 - 20 gpm
Pumping Level Below Land Surface
 ft. After Hrs. pumped GPM
 ft. After Hrs. pumped GPM
If pump installed, pump rate GPM

REMARKS



This well was drilled under license # 603
And this report is true and accurate.
Drilling firm: Craig Updegraff Drilling
Signature of License Representative: Craig Updegraff
Signature of Well Owner or Equitable Property Holder: Putnam & Putnam Partnership by John A. Putnam
Date: 01.22.99



Hydro ID 657

1 of 1

NOTICE OF WELL CONSTRUCTION

WELL CONSTRUCTION

CUSTER

Location of well: NW 1/4 NE 1/4 Section 20 Township 6S Range 1E

Well owner: Tennessee Valley Authority

(Name)

(Address)

Date well drilling completed: 8-18-81

Purpose of well: Observation

(domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer
0-430	Blk sh	715
430-500	1B gy clst & ss	Depth to static water level: 42.4
500-550	Gy & rd-brn ss	Name of producing aquifer (if known): Lakota
550-580	Gy wht sltst w/gy-gn clst	Total depth of drill hole: 800
580-595	Rd, grng & yw-brn & gy ss	Depth to bottom of casing: 715
595-605	Gy wht sltst & gy-gn clst	Casing information: In the space below show kind, size, weight, lengths per diameter, etc., for production casing and surface casing, if used.
605-660	Gy ss w/gy sltst & gn clst	
660-690	Gy wht sltst & gn clst	4" blk iron 100/ft
690-700	Gy w/orng ss	
700-745	1B brn & gy, tr yw ss brn & gy clst	Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.
745-800	Brn-gy & rd ss	
		open hole 715-800

Attach sheet if more space is needed

If a flowing well, flow of completed well: NA g.p.m.

Silver King Mines, Inc.

Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump: HR

Type of pump: Capacity of installed pump: G.P.M.

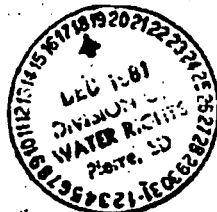
Depth of pump placement: ft., Date of pump installation:

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required. See Section 46.408 of Chapter 46A, MINNESOTA WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed: ft., tube diameter:

tube material:



Name of Pump Installation Contractor:



POWERTECH (USA) INC.

Hydro ID 662

1 of 1

NOTICE OF WELL CONSTRUCTION

Well Owner Tennessee Valley Authority, P. O. Box 49, Florence, South Dakota
(Name) (Address)

Date well drilling completed 7-26-78 Purpose of well Test
(Address, irrigation, municipal, industrial, other)

WELL LOG

Log's top to bottom feet	Description of layer	Depth to top of water producing aquifer	
0-30	Brown & Gray Soil	665	ft.
30-95	Brown-Gray Mudstone, Siltstone	Depth to static water level: + 240	ft.
95-135	18 Lt. Gray Sandstone, and Gray Mudstone	Name of producing aquifer (if known) Sundance	
135-205	Variegated Mudstone & Siltstone	Total depth of drill hole 880	ft.
205-280	Tan & Gray Sandstone	Depth to bottom of casing 780	ft.
280-305	Gray & Green Mudstone	Casing information: In the space below show kind, size, weight, length per diameter, etc., for production casing and surface casing, if used.	
305-335	Gray Sandstone		
335-400	18 Brown-Gray Mudstone, Gray Sandstone		
400-665	Gray, Brown & Green Mudstones		
665-780	18 Red-Brown Sandstone and Gray & Green Claystone	Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.	
780-840	Black Shale & Gray-Green Claystone		
840-880	Red Siltstone-Mudstone	Torch Slotted 666-780	

If a flowing well, flow of completed well 4 G.P.M.

Attach sheet if more space is needed

Silver King Mines, Inc.

Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump _____ HP

Type of pump _____ Capacity of installed pump _____ G.P.M.

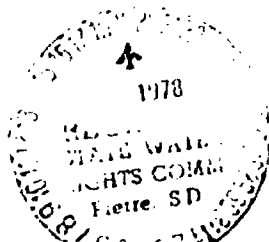
Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____, tube material _____

Name of Pump Installation Contractor



NOTICE OF WELL CONSTRUCTION

Well No. _____ Date _____ Locality _____ Range _____
 Owner _____ Tennessee Valley Authority, P. O. Box 49, Edgemont, South Dakota
 (Name) (Address)
 Date well drilling completed _____ 11-7-79 _____ Purpose of well _____ Observation _____
 (domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to bottom feet	Description of layer	Depth in top of water producing aquifer _____ 504 _____ ft.
0-20	Weathered Brown Clay and Silt	Depth to static water level _____ ft.
20-250	Dark Gray Shale	Name of producing aquifer (if known) _____ Lakota _____
250-375	Interbedded Gray Claystone and Lt. Gray Sandstone	Depth of drill hole _____ 550 _____ ft.
375-410	Dark Gray Claystone	Depth to bottom of casing _____ 504 _____ ft.
410-505	Lt. Gray-White Siltstone and Green Claystone	
505-550	Red-Brown Sandstone w/Gray Mudstone	

Blank information in the space below show kind, size, weight, lengths per diameter, etc., for production casing and surface casing, if used.

4" Schedules 40 Black Iron

Screen information in the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.

Open Hole 504-550

If a flowing well, flow of completed well _____ est. 40 _____ G.P.M.

Attach sheet if more space is needed

Silver King Mines, Inc.
 Name of Drilling Contractor

(2) PUMP INSTALLATION

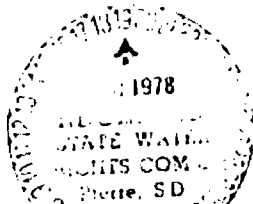
Company name and size of pump _____ HP _____
 Type of pump _____ Capacity of installed pump _____ G.P.M. _____
 Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____
 tube material _____

 Name of Pump Installation Contractor





POWERTECH (USA) INC.

Hydro ID 664

1 of 1

NOTICE OF WELL CONSTRUCTION

Name: Tennessee Valley Authority, P. O. Box 49, Edgemont, South Dakota
(Name) (Address)

Date well drilling completed: 11-7-78 Purpose of well: Observation
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Depth, top to bottom feet	Description of layer	Depth to top of water producing aquifer	
0-20	Weathered Brown Clay and Silt	315	ft.
20-250	Dark Gray Shale		ft.
250-360	Gray Sandstone w/Lt. Med. Gray Claystone & Lt. Gray Siltstone		ft.
		Depth to static water level	ft.
		Name of producing aquifer (if known)	Fall River
		Total depth of drill hole	360 ft.
		Depth to bottom of casing	315 ft.
Casing information in the space below show kind, size, weight, length per diameter, etc., for production casing and surface casing, if used.			
4 1/2" Scheduling 40 Black Iron			
Screen information in the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.			
Open Hole 315-360			
If a flowing well, flow of completed well est. 2 G.P.M.			

Attach sheet if more space is needed

Silver King Mines, Inc.
Name of Drilling Contractor

(2) PUMP INSTALLATION

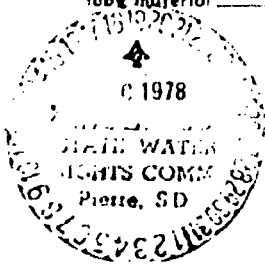
Company name and size of pump _____ HP
Type of pump _____ Capacity of installed pump _____ G.P.M.
Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____
tube material _____

Name of Pump Installation Contractor





POWERTECH (USA) INC.

Hydro ID 668

NOTICE OF WELL CONSTRUCTION

1 of 2

(1) WELL CONSTRUCTION

Location of well: NW 1/4 NE 1/4 Section 15 Township 7S Range 1E

Well owner: Jennesser Valley Authority - Box 49 - Edgemont, South Dakota
(Name) (Address)

Date well drilling completed: 1-31-77 Purpose of well: Test, Dewatering
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer	Depth to static water level	Name of producing aquifer (if known)	Total depth of drill hole	Depth to bottom of casing
0 - 15	Alluvium & brn sh	280, 480	Flowing	Fall River, Lakota	574	480
15 - 240	Dk gy fissile sh					
240 - 340	Dk gy sh, md gy cist					
340 - 365	Md gy-gn cist					
365 - 420	Wh-lt gy sltst-vfgrss					
420 - 445	Lt gn & gy cist					
445 - 475	AA w/tr lt gy & brn vf-fgrss					
475 - 485	Gy fgrss					
485 - 500	AA w/brn mdst					
500 - 560	Pk & org calc cem vfgrss					
560 - 574	Lt-dk gy mdst					

Casing information in the space below show kind, size, weight, lengths per diameter, etc., for production casing and surface casing, if used.

Schedule 40 Blk Iron 10" diameter

0 - 280

335 - 480

Screen information in the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.

Johnson Well Screen Stainless Steel .030 slot size

10" diam 280 - 335

8" diam 480 - 555

If a flowing well, flow of completed well: 35 G.P.M.

Attach sheet if more space is needed

Forward Drilling Co.

Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump: Pioneer # P 300 34T 6" HP 50

Type of pump: submersible Capacity of installed pump: 300 G.P.M.

Depth of pump placement: 455 ft, Date of pump installation: Feb. 10, 1977

(3) WATER SURFACE MEASURING TUBE

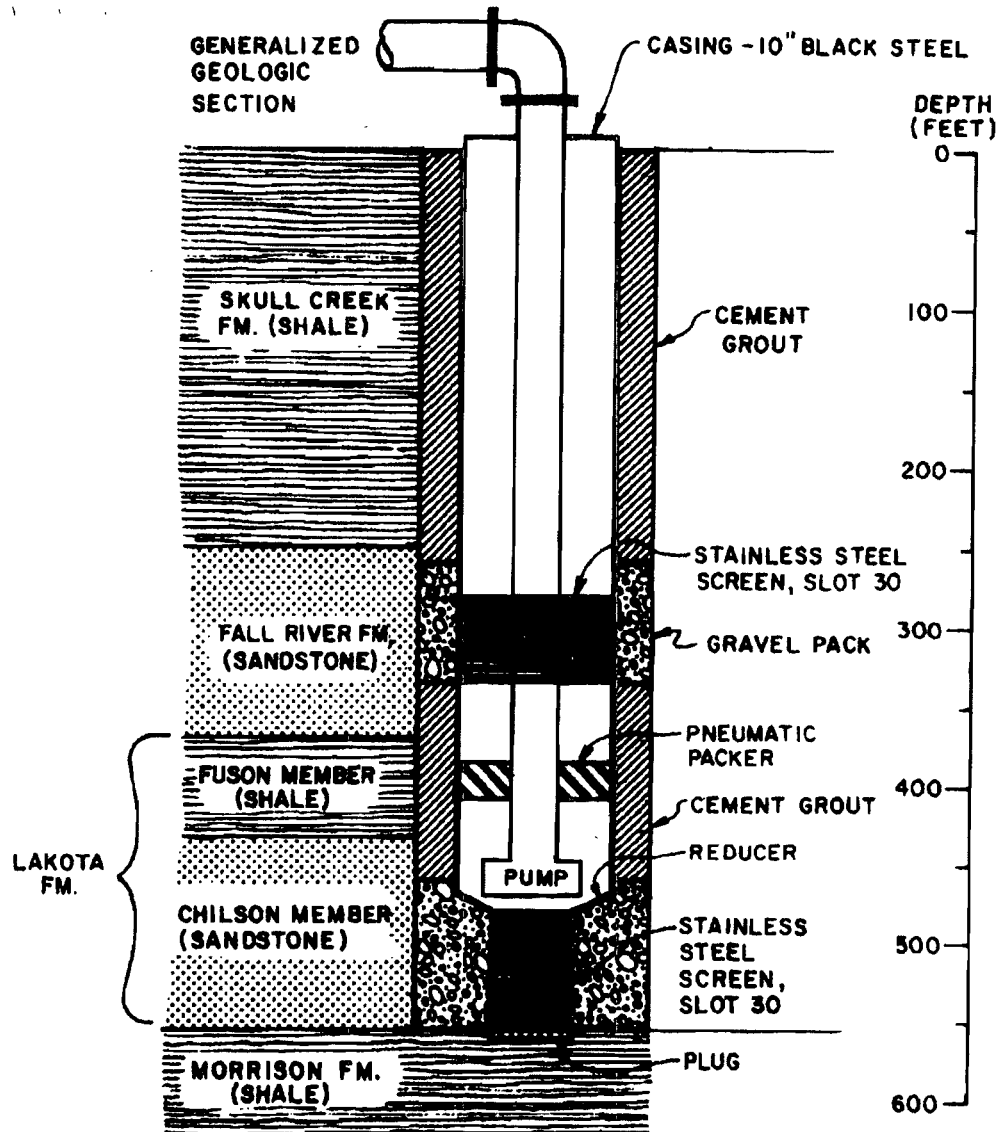
On some wells an air-tight water surface measuring tube is required. See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed: _____ ft, tube diameter: _____

tube material: _____

Forward Drilling Co.

Name of Pump Installation Contractor



Source: Analysis of Aquifer Tests Conducted at the Proposed Burdock Uranium Mine Site, Burdock, South Dakota, WR-28-1-520-109, TVA, Boggs and Jenkins, May 1980.

Figure 2 : Burdock Well Profile



POWERTECH (USA) INC.

Hydro ID 689

1011

NOTICE OF WELL CONSTRUCTION

Well owner Tennessee Valley Authority, P. O. Box 49, Edgemont, South Dakota
(Name) (Address)
Date well drilling completed 10-25-78 Purpose of well Observation
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer	
0-25	Brown Weathered Shale	510	ft.
25-235	Gray Shale	Depth to static water level	ft.
235-265	AA with Lt. Gray Sands	Name of producing aquifer (if known)	Lakota
265-335	Siltstone	Depth of drill hole	550
335-355	Brown Mudstone with Gray Sandstone & Gray-Green Mudstone	Depth to bottom of casing	510
355-370	Gray Shale & Sandstone	Casing information in the space below show kind, size, weight, length per diameter, etc., for production casing and surface casing, if used.	
370-390	Siltstone		
390-405	Tan-Gray Siltstone		
405-440	Gray & Green Shale	4 1/2" Black Iron Schedules 40	
440-475	Dark Brown Mudstone		
475-485	Lt. Green Claystone-Siltstone		
485-495	White Siltstone, Sandstone	Screen information in the space below show length of screen below bottom casing, diameter and kind of screen or casing perforations.	
495-510	Green Mudstone		
510-550	Tan Mudstone-Siltstone	Open Hole 510-550	
	Gray Sandstone, Brown Mudstone		
	Red-Brown SS	If a flowing well, flow of completed well est. 35 G.P.M.	

Attach sheet if more space is needed

Silver King Mines, Inc.
Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump _____ HP _____
Type of pump _____ Capacity of installed pump _____ G.P.M.
Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____
tube material _____

Name of Pump Installation Contractor



NOTICE OF WELL CONSTRUCTION

WELL

County _____ Township _____ Range _____
 Well owner _____ Tennessee Valley Authority, P. O. Box 49, Edgemont, South Dakota
 (Name) (Address)
 Date well drilling completed _____ 10-19-78 _____ Purpose of well _____ Observation
 (domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer	ft.
0-20	Weathered Brown Clay & silt	377	
20-250	Dark Gray Shale	Depth to static water level	
250-260	Interbedded Gray Clay-stone & Lt. Gray Sandstone	Name of producing aquifer (if known)	Lakota-Fuson
260-355	Gray Clay Stone	Total depth of drill hole	395
355-375	Lt. Gray-White Siltstone	Depth to bottom of casing	377
375-390	Gray & Green Shale	Casing information in the space below show kind, size, weight, lengths per diameter, etc., for production casing and surface casing, if used.	
390-395	Dark Brown Mudstone	4 1/2" Schedules 40 Black Iron	
Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.			
		Open Hole	377-395
		If a flowing well, flow of completed well	< 1 G.P.M.

Attach sheet if more space is needed

Attach sheet if more space is needed

Silver King Mines, Inc.
 Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump _____ HP _____
 Type of pump _____ Capacity of installed pump _____ G.P.M.
 Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____
 tube material _____

Name of Pump Installation Contractor



NOTICE OF WELL CONSTRUCTION

1 of 1

FILED

Owner: Tennessee Valley Authority, P. O. Box 49, Edgemont, South Dakota
(Name)

Date well drilling completed: 10-18-78 Purpose of well: Observation
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to bottom in feet	Description of layer	Depth to top of water producing aquifer	ft.
0-10	Weathered Brown Clay & Silt	300'	ft.
10-250	Dark Gray Shale	Depth to static water level	ft.
250-260	Interbedded Gray Claystone & Lt. Gray Sandstone	Name of producing aquifer (if known)	Fall River
260-295	Med. & Lt. Gray Claystone	Depth of drill hole	350
295-300	AA w/trace green & Red Brown Claystone	Depth to bottom of casing	300'
300-335	Lt. Gray Sandstone, Medium	Casing information in the space below show kind, size, weight, lengths per diameter, etc., for production casing and surface casing, if used	
335-350	Gray-Green Mudstone, Gray Shale & Sandstone	4 1/2" Scheduling 40 Black Iron	

Screen information: in the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.

Open Hole 300-350

If a flowing well, flow of completed well est. 2 G.P.M.

Attach sheet if more space is needed

Silver King Mines, Inc.

Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump _____ HP

Type of pump _____ Capacity of installed pump _____ G.P.M.

Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____

tube material _____

Name of Pump Installation Contractor



NOTICE OF WELL CONSTRUCTION

Well owner Tennessee Valley Authority, P. O. Box 49, Edgemont, South Dakota
(Name) (Address)
 Date well drilling completed 11-6-78 Purpose of well Observation
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer	
0-260	Dark Gray Shale	400	ft.
260-280	Gray Shale & Sandstone		ft.
280-350	Gray Sandstone-Silts long		ft.
350-355	Dark Brown Shale		ft.
355-395	Gray Shale & Sandstone		ft.
395-420	Gray-Green Mudstone		ft.
		Casing information: In the space below show kind, size, weight, length per diameter, etc., for production casing and surface casing, if used.	
		4½" Scheduling 40 Black Iron	
		Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.	
		Open Hole 400-420	
		If a flowing well, flow of completed well _____ G.P.M.	

Attach sheet if more space is needed

Silver King Mines, Inc.
Name of Drilling Contractor

(2) PUMP INSTALLATION

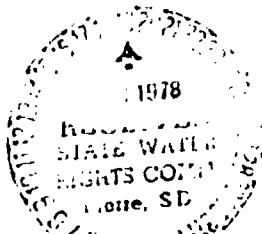
Company name and size of pump _____ HP
 Type of pump _____ Capacity of installed pump _____ G.P.M.
 Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____
 tube material: _____

Name of Pump Installation Contractor





POWERTECH (USA) INC.

Hydro ID 674

1 of 1

NOTICE OF WELL CONSTRUCTION

County _____ Township _____ Range _____
 Well Owner _____ Tennessee Valley Authority, P. O. Box 49, Edgemont, South Dakota
 (Name) (Address)

Date well drilling completed 11-5-78 Purpose of well Observation
 (domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer _____ ft.
0-10	Orange-Brown Weathered Shale	Depth to static water level _____ ft.
10-270	Dark Gray-Black Shale	Name of producing aquifer (if known) <u>Lakota</u>
270-280	AA w/Lt. Gray Siltstone	Total depth of drill hole <u>570</u> ft.
280-390	Interbedded Dark Gray Sandstone	Depth to bottom of casing <u>525</u> ft.
390-430	Dark Brown Mudstone	Casing information: in the space below show kind, size, weight, length per diameter, etc., for production casing and surface casing, if used.
430-455	w/Green-Gray Claystone	
455-470	Green w/Brown & Gray Claystone	
470-500	Dark Brown-Gray Mudstone, trace Green Claystone; Tan Sandstone	
500-525	Green Claystone w/White Lt. Tan Siltstone-Sandstone	
525-570	Gray-Brown Mudstone w/Tan Sandstone	Screen information: in the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.
	Gray Sandstone w/Gray-Brown Mudstone	

Open Hole 525-570

If a flowing well, flow at completed well est. 35 G.P.M.

Attach sheet if more space is needed

Silver King Mines, Inc.
 Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump _____ HP
 Type of pump _____ Capacity of installed pump _____ G.P.M.
 Depth of pump placement _____ ft., Date of pump installation _____

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____
 tube material _____

 Name of Pump Installation Contractor





POWERTech (USA) INC.

AMERICAN
ENGINEERING
TESTING, INC.

2 of 4

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	18-02617	BORING/WELL NUMBER	B-4/DB-GW876
PROJECT NAME	Dewey Burdock Monitor Well Installation	DATE DRILLED	9/25/07
LOCATION	Burdock, South Dakota	CASING TYPE/DIAMETER	2" ID Schedule 40 PVC
DRILLING METHOD	4.25" ID HSA	SCREEN TYPE	2" ID Schedule 40 PVC Slotted 0.010"
SAMPLING METHOD	Continuous	PACKING TYPE	#10-20 Silica Sand
GROUND ELEVATION		GROUT TYPE	Cement
TOP OF CASING		DEPTH TO WATER	17.50
LOGGED BY	CH	GROUND WATER ELEVATION	
REMARKS	Well was completed with a 4" Pro Top		

HNU (ppm)	Blow Count	RECOVERY (inches)	SAMPLER TYPE	INTERVAL	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	GW LEVEL	BORING ABANDONED
			CSTS 1		1	CS		TOPSOIL with organics, dark brown, dry		Concrete
			CSTS 2		2			SANDY SILT, red, dry		
					3					
			CSTS 3		4					
					5					Cement Grout
					6					
					7					
					8					
			CSTS 4		9					
					10					
					11					Bentonite Seal
					12					
			CSTS 5		13			SILTY SANDY GRAVEL with cobbles, red to brown, dry to moist		
			CSTS 6		14			Same wet at 17.5 feet		
					15					
					16					
					17					
					18					
			CSTS 7		19			Same saturated		
					20					
					21					
					22					
					23			End of Boring		Bottom of Well

AET ENVI 18-02617 MW.GPJ AET ENVI.GDT 11/2/07



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• ENVIRONMENTAL**

January 11, 2008

Mr. Ken Buhler
Department of Environment and Natural Resources (DENR)
Water Rights Division
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

Subject: South Dakota Water Well Completion Reports
Wells Installed for Powertech
Burdock, South Dakota
AET No. 18-02617

Dear Mr. Buhler:

Enclosed please find the well completion reports for five groundwater monitoring wells, DB-GW675, DB-GW676, DB-GW677, DB-GW678 & DB-GW679. The wells were completed to obtain information on the potential shallow groundwater impacts from previous uranium mining within the project area prior to initiating new uranium production activities within the Dewey-Burdock, South Dakota area. If you have any questions or need any additional information please contact me at (605) 388-0029.

Sincerely,



Clarke L. Knigge, CPRR
Environmental Scientist
Project Manager

CLK

attachments

pc: Mr. Cory Foreman, RESPEC

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AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER.

B-4 DB - GW 676
 W/ ORGANICS
 6" TOP SOIL - DK BROWN, DRY
 TO 5' → SANDY SILT, RED, DRY
 TO 10' → SILTY SAND, RED, DRY
 SAME TO 13'
 SILTY
 @ 13' → SANDY GRAVEL W/ CURBLES, RED TO BROWN, DRY TO MOIST
 SAME TO 20'; WET @ 17.5'
 Same to 22½' Sat.

Hydro ID 677

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 4 07-92

[illegible]



POWERTECH (USA) INC.

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2 of 4

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	18-02817	BORING/WELL NUMBER	B-2/DB-GW677
PROJECT NAME	Dewey Burdock Monitor Well Installation	DATE DRILLED	9/25/07
LOCATION	Burdock, South Dakota	CASING TYPE/DIAMETER	2" ID Schedule 40 PVC
DRILLING METHOD	4.25" ID HSA	SCREEN TYPE	2" ID Schedule 40 PVC Slotted 0.010"
SAMPLING METHOD	Continuous	PACKING TYPE	#10-20 Silica Sand
GROUND ELEVATION		GROUT TYPE	Cement
TOP OF CASING		DEPTH TO WATER	9.00
LOGGED BY	CH	GROUND WATER ELEVATION	
REMARKS	Well was completed with a 4" Pro Top		

HNU (ppm)	Blow Count	RECOVERY (inches)	SAMPLER TYPE	INTERVAL	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	GW LEVEL
			CSTS 1		1			SANDY SILT , medium grain, tan	
					2	CL			
					3				
			CSTS 2		4			SANDY SILT	
					5				
			CSTS 3		6			SILTY SAND , poorly sorted	
					7				
			CSTS 4		8			SILTY SAND , tan	
					9				
			CSTS 5		10			SAND , very fine grained, tan, wet	
					11				
					12				
			CSTS 6		13			SHALE (Belle Fourche), dark gray, fissile	
					14				

Concrete

Bentonite Seal

#10-20 Silica Sand Flush Threaded 2" PVC Screen 0.010" Slot

Bottom of Well

AET_EMA 18-02817 MW/OP-J AET_ENV/ODT 11/2/07



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Hydro ID 677

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January 11, 2008

Mr. Ken Buhler
Department of Environment and Natural Resources (DENR)
Water Rights Division
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

Subject: South Dakota Water Well Completion Reports
Wells Installed for Powertech
Burdock, South Dakota
AET No. 18-02617

Dear Mr. Buhler:

Enclosed please find the well completion reports for five groundwater monitoring wells, DB-GW675, DB-GW676, DB-GW677, DB-GW678 & DB-GW679. The wells were completed to obtain information on the potential shallow groundwater impacts from previous uranium mining within the project area prior to initiating new uranium production activities within the Dewey-Burdock, South Dakota area. If you have any questions or need any additional information please contact me at (605) 388-0029.

Sincerely,

Clarke L. Knigge, CPRR
Environmental Scientist
Project Manager

CLK

attachments

pc: Mr. Cory Foreman, RESPEC

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Hydro ID 677

4 of 4

DB-GW677

Location south of Putnam house

Construction Details

Total Depth	14.5'
Screen Interval	4.5 – 14.5'
Sand pack	3 – 14.5'
Bentonite	1 – 3'
Cement	0 – 1'

Water Level ~9' below surface

Lithology

0 – 4 ft	med tan, sandy silt
4 – 6 ft	sandy silt
6 – 7.5 ft	cobbles in silty sand, poorly sorted
7.5 – 9 ft	tan, silty sand
9 – 12.5 ft	wet, tan, very fine grained sand
12.5 -14.5 ft	dark gray, fissile shale (Belle Fourche Fm)

Hydro ID 678

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 407-92

Location SW NE SE Twp 7S Rg 1E
County Fall River

Please mark well location with an "X"

Long -104.00135 W
Lat 43.459121

Well Completion Date
9/25/2007

North

1 Mile

LOCATION:
Distance from nearest potential pollution source (septic tank, abandoned well,
feed lot, etc.)? _____ ft. from _____ (identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:
4 1/4 ID HSA

CASING DATA: ☐ Steel ☒ Plastic ☐ Other
If other describe PVC

PIPEWEIGHT DIAMETER FROM TO HOLE DIAMETER
____ LB/FT ____ IN ____ FT ____ FT ____ IN
____ LB/FT ____ IN ____ FT ____ FT ____ IN
____ LB/FT ____ IN ____ FT ____ FT ____ IN

GROUTING DATA
Grout Type No. of Sacks Grout Weight From To
____ lb./gal ____ ft. ____ ft.
____ lb./gal ____ ft. ____ ft.

Describe grouting procedure Top 1' filled w/ Concrete

SCREEN: ☐ Perforated pipe ☒ Manufactured
Diameter 2 IN Length 10 FEET
Material PVC
Slot Size 0.010 Set From 4 Feet to 14 Feet
Other information

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO
If so, what material? 2' Bentonite
Describe packer(s) and location? Above Sand Pack

DISINFECTED: Was well disinfected upon completion?
YES, How:
X NO, Why Not? Well not used for human or domestic animal consumption

Laboratory sent to for water quality analysis

Well Owner: PowerTech
Business Name: Same
Address: 145 N. Chicago Avenue, Suite C
Hot Springs, SD 57747

WELL LOG:

FORMATION FORM TO

See Attached Log

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STATIC WATER LEVEL = 9.6 Feet
If flowing: closed in pressure Not Flowing PSI
GPM flow _____ through _____ inch pipe
Controlled by ☐ Valve ☐ Reducers ☐ Other
Reduced Flowrate _____ GPM
Can well be completely shut in?

WELL TEST DATA:
☐ Pumped Describe: Developed using a bailer. Well did not
☒ Bailed bail down
☐ Other
Pumping Level Below Land Surface
_____ ft. After _____ Hrs. pumped _____ GPM
_____ ft. After _____ Hrs. pumped _____ GPM
If pump installed, pump rate _____ GPM

REMARKS
Well Designation DB - GW 67B

This well was drilled under license # 67B
And this report is true and accurate.
Drilling firm American Eng. Testing, Inc.
Signature of License Representative:
[Signature]
Signature of Well Owner or Equitable Property Holder:
[Signature]
Date: 11/2/07



POWERTECH (USA) INC.

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2 of 4

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	18-02617	BORING/WELL NUMBER	B-3/DB-GW678
PROJECT NAME	Dewey Burdock Monitor Well Installation	DATE DRILLED	8/25/07
LOCATION	Burdock, South Dakota	CASING TYPE/DIAMETER	2" ID Schedule 40 PVC
DRILLING METHOD	4.25" ID HSA	SCREEN TYPE	2" ID Schedule 40 PVC Slotted 0.010"
SAMPLING METHOD	Continuous	PACKING TYPE	#10-20 Silica Sand
GROUND ELEVATION		GROUT TYPE	Cement
TOP OF CASING		DEPTH TO WATER	~8.00
LOGGED BY	CH	GROUND WATER ELEVATION	
REMARKS	Well was completed with a 4" Pro Top		

HNU (ppm)	Blow Count	RECOVERY (feet)	SAMPLER TYPE	INTERVAL	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	GW LEVEL
			CSTS 1		1			<u>SILTY SAND</u> , very fine grained, red	
					2				
					3				
			CSTS 2		4			<u>SILTY SAND</u> , very fine grained, red	
					5				
					6				
					7				
					8				
			CSTS 3		9			<u>SILTY SAND</u> , very fine grained with 1-inch beds of medium to coarse sand	
					10				
					11				
					12				
					13				
					14				

AET BNA 18-02617 MW/GPJ AET ENV/GUT 11/2007



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January 11, 2008


Mr. Ken Buhler
Department of Environment and Natural Resources (DENR)
Water Rights Division
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

Subject: South Dakota Water Well Completion Reports
Wells Installed for Powertech
Burdock, South Dakota
AET No. 18-02617

Dear Mr. Buhler:

Enclosed please find the well completion reports for five groundwater monitoring wells, DB-GW675, DB-GW676, DB-GW677, DB-GW678 & DB-GW679. The wells were completed to obtain information on the potential shallow groundwater impacts from previous uranium mining within the project area prior to initiating new uranium production activities within the Dewey-Burdock, South Dakota area. If you have any questions or need any additional information please contact me at (605) 388-0029.

Sincerely,


Clarke L. Knigge, CPRR
Environmental Scientist
Project Manager

CLK

attachments

pc: Mr. Cory Foreman, RESPEC

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Hydro ID 678

4 of 4

DB-GW678

Location along Pass Creek west of Burdock

Construction Details

Total Depth	14.5'
Screen Interval	4.5 – 14.5'
Sand pack	3 – 14.5'
Bentonite	1 – 3'
Cement	0 – 1'

Water Level ~8' below surface

Lithology

0 – 9 ft	very fine grained, red, silty sand
9 – 14 ft	dominantly vfg silty sand with 1" beds of med to coarse sand (did not penetrate shale)

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2 of 4

BORINGWELL CONSTRUCTION LOG

PROJECT NUMBER 18-02817	BORINGWELL NUMBER B-5/DB-GW679
PROJECT NAME Dewey Burdock Monitor Well Installation	DATE DRILLED 8/25/07
LOCATION Burdock, South Dakota	CASING TYPE/DIAMETER 2" ID Schedule 40 PVC
DRILLING METHOD 4.25" ID HSA	SCREEN TYPE 2" ID Schedule 40 PVC Slotted 0.010"
SAMPLING METHOD Continuous	PACKING TYPE #10-20 Silica Sand
GROUND ELEVATION	GROUT TYPE Cement
TOP OF CASING	DEPTH TO WATER
LOGGED BY CH	GROUND WATER ELEVATION
REMARKS Well was completed with a 4" Pro Top	

HNU (ppm)	Blow Count	RECOVERY (inches)	SAMPLER TYPE	INTERVAL	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	GW LEVEL	BORING ABANDONED
			CSTS 1	1	1			TOPSOIL, dark brown, dry		Concrete
			CSTS 2	2	2			SANDY SILT, red, dry		
				3	3					
			CSTS 3	4	4			SILTY SAND, red to tan, dry to moist		
				5	5					
				6	6					
				7	7					
				8	8					
			CSTS 4	9	9					Cement Grout
				10	10					
				11	11					
				12	12					
			CSTS 5	13	13					
				14	14					
				15	15					
			CSTS 6	16	16			SAND WITH GRAVEL, red moist		
				17	17			CONCRETES, no recovery		Bentonite Seal
			CSTS 7	18	18					
			CSTS 8	19	19			SILTY SAND TO SAND, red to tan, moist		
				20	20					
				21	21					
				22	22					
			CSTS 9	23	23			SAND with GRAVEL, red, moist		
				24	24					
				25	25					
			CSTS 10	26	26			SANDY LEAN CLAY, red moist		
				27	27					
			CSTS 11	28	28			SAND WITH GRAVEL, red moist 6 inch gray layer of sand at 30 feet		#10-20 Silica Sand Flush Threaded 2" PVC Screen 0.010" Slot
				29	29					
				30	30					
				31	31					
			CSTS 12	32	32					
				33	33					
				34	34					
			CSTS 13	35	35			SHALE, black, moist		
				36	36					
				37	37					
				38	38					
				39	39					Bottom of Well

NET ENVI 18-02817 MW.GPJ NET ENVI.GDT 11/26/07



POWERTECH (USA) INC.

Hydro ID 679

3 of 4



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January 11, 2008

Mr. Ken Buhler
Department of Environment and Natural Resources (DENR)
Water Rights Division
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

Subject: South Dakota Water Well Completion Reports
Wells Installed for Powertech
Burdock, South Dakota
AET No. 18-02617

Dear Mr. Buhler:

Enclosed please find the well completion reports for five groundwater monitoring wells, DB-GW675, DB-GW676, DB-GW677, DB-GW678 & DB-GW679. The wells were completed to obtain information on the potential shallow groundwater impacts from previous uranium mining within the project area prior to initiating new uranium production activities within the Dewey-Burdock, South Dakota area. If you have any questions or need any additional information please contact me at (605) 388-0029.

Sincerely,

Clarke L. Knigge, CPRR
Environmental Scientist
Project Manager

CLK

attachments

pc: Mr. Cory Foreman, RESPEC

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B-5 Hydro ID 69B - GN679

4 of 4

6" Topsoil - DK Bm, Dry

To 5' Sandy Silt, Red Dry

To 10' Silty Sand, Rd to Tan, Dry to moist

To 15' Same Red

To 17' Same

17'-17 1/2' Sand w/ Gravel, Red, moist

17 1/2' - 18' Cobbles, no clay

To 25' Silty Sand to Sand, Rd to Tan, moist

To 27' Sand w/ gravel, Red, moist

To 29' Sandy tan Clay, Red, wet

To 30' Sand w/ gravel, Red, moist, 6" Gray layer of Sand.

To 35' Sand w/ gravel, Red, moist sat @ 34.

To 36 1/2' Same

To 39' Shale, Dk Black, moist

COMPILED BY:

REVIEWED BY:





POWERTECH (USA) INC.

NE 1/4 SW 1/4

Hydro ID 880

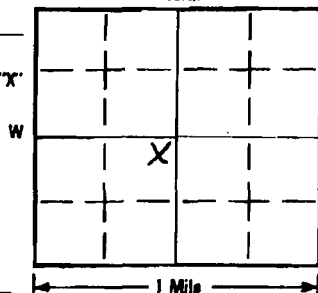
SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 11 07-92

Location SW 1/4 SW 1/4 Sec 11 Twp 75 Rg 1 ECounty Fall River

North

Please mark well location with an "X"



Well Completion Date

12-19-07

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? NONE PRESENT (identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mud RotaryCASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
SDR 21 LB/FT	6 IN	0 FT	426 FT	8 3/4 IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN

GROUTING DATA

Grout Type	No. of Sacks	Grout Weight	From	To
CMT	95.3	15.1 lb./gal	426 ft	0 ft
_____	_____	_____ lb./gal	_____ ft	_____ ft

Describe grouting procedure pump

SCREEN: ☐ Perforated pipe ☒ ManufacturedDiameter 4 1/2 IN Length 10 FEETMaterial PVCSlot Size 0.25 Set From 436 Feet to 426 FeetOther information Set with K PackerWAS A PACKER OR SEAL USED? ☒ YES ☐ NOIf so, what material? 6" K PackerDescribe packer(s) and location? Packer 406'

DISINFECTION: Was well disinfected upon completion?

YES, How: NANO, Why Not? NA

Laboratory sent to for water quality analysis

RespecWell Owner: Powertech USA IncBusiness Name: Powertech USA IncAddress: P.O. Box 723
Hot Springs S.D. 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Shall Creek Sh	0'	122'
Fall River SS	122'	250'
Fuson Sh	250'	317'
Lakota SS	317'	436'

STATIC WATER LEVEL 29 FeetIf flowing: closed in pressure NA PSI

GPM flow _____ through _____ inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced Flowrate _____ GPM

Can well be completely shut in? YES

WELL TEST DATA:

☐ Pumped Describe: Air lift at 385'☐ Bailed _____☒ Other _____

Pumping Level Below Land Surface

_____ ft. After _____ Hrs. pumped 240 cubic Feet GPM

_____ ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate _____ GPM

REMARKS Well DB-07-11-116lithology attached.

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JAN 14 2008

WATER RIGHTS PROGRAM

This well was drilled under license # 745

And this report is true and accurate.

Drilling firm DAVIS Drilling IncSignature of License Representative: Stan Davis

Signature of Well Owner or Equitable Property Holder:

Frank L. Powertech (USA) IncDate: 12-31-07



Hydro ID 880

2 of 11

DATE 10/10/07 COUNTY Full R. County STATE ID

[illegible]

PAGE 1 OF 2



PowerTech (USA) Inc.

Hydro ID 680

PowerTech (USA) Inc.

3 of 11

DRILLED WITH: AIR ☐ WATER ☐ HOLE NO. DAZ-11-11C

T.D. _____ LOCATION: _____

BIT SIZE _____

SAMPLE LOG BY _____ LEASE: (PROJECT) _____

DATE _____ COUNTY _____ STATE _____

DEPTH	LITHOLOGY	Cement	Grout	Allegation	SAMPLE DESCRIPTION				T=Trace 1=Minor 2=Moderate 3=Abundant
					L=Limstone (Lm) SOX Surf. Oxidation Rd. Reduced Rd. Reduction P=Pyrite (Pyr) P=Pyrite Ternish	POX=Primary Oxid. SOX=Base of Surf. Oxid. SOX=Secondary Oxid. T=Transition Zone T=Pyrite	(Amounts in Percent, %)	C=Carbon K=Kaolin Ch=Chert	
100									
110									
120									
130									
140									
150									
160									
170									
180									
190									
200									

PAGE 2 OF 5



POWERTECH (USA) INC.

PowerTech (USA) Inc.

Hydro ID 880

4 of 11

DRILLED WITH: AIR ☐ WATER ☐ HOLE NO. 0027-11-11C

T.D. _____ LOCATION: _____

BIT SIZE _____

SAMPLE LOG BY _____ LEASE: (PROJECT) _____

DATE _____ COUNTY _____ STATE _____

DEPTH	LITHOLOGY	Alteration Primary Oxidation Secondary Reduction Sulfidation	L. Limonite (Lm) SOX Sulf. Oxidation Rd. Reduced Rdt. Reduction P. Pyrite (Pyr) Py. Pyrite Ternary	SAMPLE DESCRIPTION (Amounts in Percent, %)		T = Trace 1 = Minor 2 = Moderate 3 = Abundant C = Carbon K = Kaolin S = Silica Ch = Chert
				POX = Primary Oxid. SOX = Sulf. Oxid. Rdt. Reduction T = Transition Zone Id = Feldspar		
200						
210						
220						
230						
240						
250						
260						
270						
280						
290						
300						

210-250'
Silty fine gr. sandstone, brownish gray, med. sorted, subm. cemented,
- mostly well sorted w/ some interbedded silty layers, reduced

CORE INTERVAL 250 - 255' 8"

255' 8" - 320'
SHALE with interbedded SILTSTONE (mudstone), mostly reddish gray
* med. brown



PowerTech (USA) Inc.

PowerTech (USA) Inc.

Hydro ID 680

5 of 11

DRILLED WITH: AIR ☐ WATER ☐

HOLE NO. 0007-11-11C

T.D. _____ LOCATION: _____

BIT SIZE _____

SAMPLE LOG BY _____ LEASE: (PROJECT) _____

DATE _____ COUNTY _____ STATE _____

DEPTH	LITHOLOGY	CARBON PYRITE OTHER	Alteration Primary Chlorite Secondary Oxidation	L=Limnites (Lam) SOX Surf Oxidation Rd. Reduced Rdt. Reduction P= Pyrite (Pyr) Py= Pyrite Tarnish	SAMPLE DESCRIPTION (Amounts in Percent, %)		T=Trace 1=Minor 2=Moderate 3=Abundant C=Carbon S=Steepled K=Kaolin Chl=Chert
					POX=Primary Oxid. SOX=Base of Surf. Oxid. TOX=Secondary Oxid. Tz=Transition Zone Vid= Feldspar		
300							
310							
320							
330							
340							
350							
360							
370							
380							
390							
400							

Handwritten notes:

300-360'
fin of sandstone, ll. brown - grayish brown, well sorted, med-subred,
- med silty from 335-360' med sorted, mostly reduced LSO ox.

360-410'
mostly shale with some silt interbeds, med. gray

PAGE 4 OF 5

Hydro ID 680

PowerTech (USA) Inc.

6 of 11

DRILLED WITH: AIR ☐ WATER ☐ HOLE NO. DEAT-11-11C

T.D. _____ LOCATION: _____

BIT SIZE _____

SAMPLE LOG BY _____ LEASE: (PROJECT) _____

DATE _____ COUNTY _____ STATE _____

DEPTH	LITHOLOGY	CARBON	PYRITE	Alteration	SAMPLE DESCRIPTION		T = Trace I = Minor 2 = Moderate 3 = Abundant
					L = Limonite (Lm) SOX = Surf. Oxidation Rd. Reduced Rdt. Reduction P = Pyrite (Pyr) Py = Pyrite Terrestrial	(Amounts in Percent, %) POX = Primary Oxid. SOX = Surf. Oxid. SOX = Secondary Oxid. Tn = Transition Zone Hg = Volcanic	
400							
410							
420							
430							
440							
450							
460							
470							
480							
490							
500							



PowerTech (USA) Inc.

Hydro ID 680

PowerTech (USA) Inc.

7 of 11

DRILLED WITH: AIR ☐ WATER ☒ HOLE NO. DB07-11-11C
T.D. 450' LOCATION: Sec 11, T7S, R1E 10' SE of 11-4C
BIT SIZE 6 1/4" to 3" core 4.5" bit
SAMPLE LOG BY DT LEASE: (PROJECT) Dewey Bridge
DATE 10/07/07 COUNTY Fall River STATE SD

DEPTH	LITHOLOGY	CARBON PYRITE OTHER	Alteration % Primary Oxidation	Reduction Secondary Oxidation	SAMPLE DESCRIPTION		T = Trace 1 = Minor 2 = Moderate 3 = Abundant
					L = Limonite (Lm) SOX Surf. Oxidation Rd. Reduced Rdt. Reduction P = Pyrite (Pyr) T = Pyrite Tarnish	(Amounts in Percent, %) POX = Primary Oxid. SOX = Base of Surf. Oxid. 2OX = Secondary Oxid. TZ = Transition Zone Fid = Foldover	
2500					Coke interbedded with ss @ 249.1' grey fine-grained, subrounded, pyritic, clean, well-sorted, trace silt, fgs ss. Colorless gge grains. Acc. pyrite.		
					E 250.4" to 250.5.5"		
2510					At 250, 9" contact black + dark-gray fissile shale + mudstone.		
2520							
2530							
2540					254.9" Increase in plastic clay content and decrease in fissility		
2550					255.2" grades quickly back to fine shale and mudstone.		
2560					255.9" End of core run.		
2570							
2580							
2590							
2600							

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PAGE 1 OF CORE



POWERTECH (USA) INC.

Hydro ID 680

PowerTech (USA) Inc.

8 of 11

DRILLED WITH: AIR ☐ WATER ☐

HOLE NO. DB07-11-11C

T.D. _____ LOCATION: _____

BIT SIZE 6 1/4"

SAMPLE LOG BY _____ LEASE: (PROJECT) _____

DATE _____ COUNTY _____ STATE _____

DEPTH	LITHOLOGY	CARBON	PYRITE	Alteration % Oxidation	Reduction Secondary Oxidation	SAMPLE DESCRIPTION		T = Trace 1 = Minor 2 = Moderate 3 = Abundant C = Carbon K = Koolin B = Bleached Ch = Chert
						L = Limonite (Lmn) SOX = Surt Oxidation Rd. Reduced Ret. Reduction P = Pyrite (Pyr) P = Pyrite Tarnish	(Amounts in Percent, %) POX = Primary Oxid. SOX = Surt Oxid. 2OX = Secondary Oxid. Tn = Transition Zone fid = Feldspar	
410						410'-413' H gray-gray low fissility SHALE / CLAYSTONE		
4110						410'-413' H gray-gray low fissility SHALE / CLAYSTONE		
4120								
4130						413'-419' H gray-gray SHALE, subparallel fissility, r. low length		
4140								
4150								
4160								
4170								
4180								
4190								
4200								

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* TOTAL RUN LENGTH 10'4" (GAINED 9'6")

PAGE 2 OF CORE



POWERTECH (USA) INC.

PowerTech (USA) Inc.

Hydro ID 680

9 of 11

DRILLED WITH: AIR ☐ WATER ☐ HOLE NO. 2007-11-11C

T.D. _____ LOCATION: _____

BIT SIZE _____

SAMPLE LOG BY _____ LEASE: (PROJECT) _____

DATE _____ COUNTY _____ STATE _____

DEPTH	LITHOLOGY	CARBON	PYRITE	Alteration %	SAMPLE DESCRIPTION		T: Trace	
					Primary Oxidation	Reduction	1: Minor	2: Moderate
420					L: Limonite (Lam) SOX Sert Oxidation Rd. Reduced Rdt. Reduction P: Pyrite (Pyr) Py: Pyrite Tornish	POX: Primary Oxid. SSOX: Sert of Sert. Oxid. SOX: Secondary Oxid. Tn: Transition Zone Fid: Feldspar	C: Carbon K: Koolin Ch: Chert	3: Abundant
420-421	H. gray-gray shale, subparallel fissility, v. low strength							
4210								
4220								
4230								
4240								
4250								
4260								
4270								
4280								
4290								
4300								

420-421 H. gray-gray shale, subparallel fissility, v. low strength

422-423 low angle slip plane 422-1" - 422-6" slip plane ~45"

424-300 st. willy, low gr. SANDSTONE: H. gray - H. brownish gray, med - well sorted, subang - subrounded, mostly subrounded, mostly well cemented, med. cemented 425-425' 3" + 426-426' 5.5", ss. lentic interbedded from 424-425' 8", continuous carbon layers from 426-426' 5.5", sect. pyrite

CONFIDENTIAL

* TOTAL RUN LENGTH 18' 7" MINIMUM 18' 0"

PAGE 3 OF 1000

POWERTECH (USA) INC.

DRILLED WITH: AIR ☐ WATER ☐ HOLE NO. 0807-11-11C 10 of 11

T.D. _____ LOCATION: _____

BIT SIZE _____

SAMPLE LOG BY _____ LEASE (PROJECT) _____

DATE _____ COUNTY _____ STATE _____

DEPTH	LITHOLOGY	CARBON	PYRITE	Alteration %	Reduction		Oxidation		L = Limonite (Low) SOX = Surf. Oxidation Rd. Reduced Rdt. Reduction P = Pyrite (Pyr) Py = Pyrite Tornish	SAMPLE DESCRIPTION (Amounts in Percent, %)		T = Trace 1 = Minor 2 = Moderate 3 = Abundant C = Carbon K = Kaolin B = Bleached Ch = Chert
					Primary	Secondary	Primary	Secondary		POX = Primary Oxid. SOX = Base of Surf. Oxid. SOX = Secondary Oxid. Ta = Transition Zone Vd = Feldspar		
430											430-431' SAMPLE WASHED AWAY	
4310											431-432' 6" x sl. silty, fine gr. SANDSTONE, ll. gray - ll. brownish gray, - well-sorted, sandy - subrounded, mostly subrounded, well-sorted, sat. pyrite	
4320												
4330											432' 6" - 433' 5" silty x. fine gr. SANDSTONE, ll. gray - ll. brownish gray, - med. sorted, sandy - subrounded, med. rounded - partly rounded, sat. pyrite, - thin, continuous, large scale column structure 432' 9" - 433' 6"	
4340											- calcite cement? - will need to test w/ acid, scattered qtz. grains - - touchstone "root beer" colored coating, for angle bedding evident by - alternating dk & lt. layers in sands. - 200 μ R/hr 435-436', 40 μ R/hr rest of sands	
4350												
4360												
4370												
4380											* below 8" SAA, but mostly fine gr. ss	
4390											438' 5" - 440' 0" SAMPLE WASHED AWAY	
4400												

CONFIDENTIAL

PAGE 4 OF 10

Hydro ID 680

PowerTech (USA) Inc.

11 of 11

DRILLED WITH: AIR ☐ WATER ☐ HOLE NO. 0007-11-11C

T.D. _____ LOCATION: _____

BIT SIZE _____

SAMPLE LOG BY _____ LEASE: (PROJECT) _____

DATE _____ COUNTY _____ STATE _____

DEPTH	LITHOLOGY	CARBON	PYRITE	Alteration %	SAMPLE DESCRIPTION		T = Trace 1 = Minor 2 = Moderate 3 = Abundant
					L = Limonite (Lms) SOX = Sulf. Oxidation Rd. Reduced Ret. Reduction P = Pyrite (Pyr) T = Pyrite Tarnish	POX = Primary Oxid. SSOX = Base of Sulf. Oxid. SOX = Secondary Oxid. Tn = Transition Zone Fid = Feldspar	
440					440 - 440'6" (CORE WASHED AWAY)		
4410					440'6" - 441'10" fine gr. sandstone, lt. gray - lt. brownish gray, med. well-sorted, subangular, mostly subrounded, well-sorted, thin, continuous carbon layers		
4420					441'10" - 442'10" fine med. gr. sandstone, lt. brownish gray - med. gray, poorly-sorted, subangular, sub. coarse gr. sand in mid - 444'0" med. coarse gr. sandstone 444'0" - 445'1", dominant coarse gr. at bottom, sub. pyrite, fine gr. ss 445'1" - 447'3", med. gr. ss 447'3" - 448'10"		
4430					lots of chert = coarse granular - angular		
4440					+ med. coarse gr. ss (444'0" - 445'1")		
4450					- 20 µR for all core		
4460					+ fine gr. ss (446'1" - 447'3")		
4470					+ med. gr. ss w/ sub. abundant coarse gr. (447'3" - 448'10")		
4480					- carbon from stringer @ 447'10"		
4490					448'10" - 449'7" (CORE LOSS)		
4500					+ TOTAL RUN LENGTH 9'7" RECOVERED 8'6"		

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POWERTECH (USA) INC.

Hydro ID 681

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 07-92

Location NE 1/4 NW 1/4 Sec 37 Twp 65 Rg 1E
County CUSTER

Please mark well location with an "X"

		X		

Well Completion Date

1-27-08

1 Mile

Well Owner: Power-Tech
Business Name: Power-Tech USA Inc.
Address: P.O. Box 723
Hot Springs, S.D. 57747

FORMATION	DEPTH	
	FROM	TO
<u>Gravelly Sandstone</u>	<u>0</u>	<u>470'</u>
<u>Fall River Sandstone</u>	<u>470'</u>	<u>585'</u>

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.): None Present ft. from None Present (identify source).

PROPOSED USE:

- ☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mud Rotary

CASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
<u>SDR 21 LB/FT</u>	<u>6 IN</u>	<u>0 FT</u>	<u>585 FT</u>	<u>8 3/4 IN</u>

GROUTING DATA

Grout Type	No. of Sacks	Grout Weight	From	To
<u>CMT</u>	<u>96</u>	<u>15.2 lb./gal</u>	<u>585 ft.</u>	<u>0 ft.</u>

Describe grouting procedure plug

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 3 IN Length 15 FEET

Material PVC

Slot Size .020 Set From 400 Feet to 585 Feet

Other information set K Packer

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO

If so, what material? 6" K Packer

Describe packer(s) and location? Pack. 575'

DISINFECTION: Was well disinfected upon completion?

YES, How:

Laboratory sent to for water quality analysis

☒ NO, Why Not? NA

Respec

STATIC WATER LEVEL 6.9 Feet

If flowing: closed in pressure 6.1 PSI

GPM flow 10 through 2 inch pipe

Controlled by ☒ Valve ☐ Reducers ☐ Other

Reduced Flowrate GPM

Can well be completely shut in? YES

WELL TEST DATA:

☐ Pumped Describe: Art. 1:1:1 at 575'

☐ Bailed

☒ Other

Pumping Level Below Land Surface

 ft. After Hrs. pumped GPM

 ft. After Hrs. pumped GPM

If pump installed, pump rate GPM

REMARKS Dewey Burdick RECEIVED

FEB 22 2008

WATER RIGHTS PROGRAM

This well was drilled under license # 745

And this report is true and accurate.

Drilling firm DAVIS Drilling Inc.

Signature of License Representative: Sta. Dan

Signature of Well Owner or Equitable Property Holder:

Date: 2/12/08

Hydro ID 682

7S

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1
07-92

Location SE 1/4 NW 1/4 Sec 11 Twp 65 Rg 1E
County _____ North

Full River

lease mark well location with an "X"

Well-Completion Date

2-21-08

LOCATION:

distance from nearest potential pollution source (septic tank, abandoned well, and lot, etc.)? _____ ft. from NONE PRESENT (identify source).

'PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mu. Return

ASING DATA: ☐ Steel ☒ Plastic ☐ Other

I other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
22 LB/FT	4 IN	0 FT	450 FT	6 3/4 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA

GROUT TYPE	No. of Sacks	GROUT WEIGHT	From	To
CMT	67	15.4 lb./gal	0 ft.	45 ft.
		lb./gal	ft.	ft.

Describe grouting procedure Pump

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 2 IN Length 10 FEET

Material PVC

Slot Size .020 Set From 460 Feet to 450 Feet

Other information Set K Packet

HAS A PACKER OR SEAL USED? ☒ YES ☐ NO

if so, what material? 4" R Machine

Describe packer(s) and location? PACHE, 440

DISINFECTION: Was well disinfected upon completion?

YES, Now:

laboratory sent to for water quality analysis

X NO. Why Not?

N 14



POWERTECH (USA) INC.

Hydro ID 683

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 107-92

Location: NW 1/4 SE 1/4 Sec. 29 Twp. 65 Rg. 1E
 County: CLUSTER
 Please mark well location with an "X"
 NE 1/4 SW 1/4
 Well Completion Date: 3-4-08
 1 Mile

Well Owner: Powertech
 Business Name: Powertech USA INC
 Address: P.O. Box 723
 Hot Springs SD 57747

FORMATION	DEPTH	
	FROM	TO
Skull Creek Shale	0	530
Fall River S.S.	530	650
RECEIVED MAR 24 2008 WATER RIGHTS PROGRAM		

LOCATION:
 Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.): NONE Present (Identify source).

PROPOSED USE:
☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mud Rotary

CASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe:

PIPEWEIGHT: SDR12 LB/FT DIAMETER: 4 IN FROM: 0 FT TO: 635 FT HOLE DIAMETER: 6 3/4 IN
 LB/FT IN FT FT IN
 LB/FT IN FT FT IN

GROUTING DATA

Grout Type: CMT No. of Sacks: 77 Grout Weight: 15.2 lb./gal From: 0 ft To: 635 ft
 lb./gal ft ft

Describe grouting procedure: pump

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter: 2 IN Length: 15 FEET

Material: PVC

Slot Size: 0.01 Set From: 650 Feet to: 635 Feet

Other information: Set K Packer

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO

If so, what material? 4" K Packer

Describe packer(s) and location? Packer 625'

DISINFECTION: Was well disinfected upon completion?

YES, How: X NO, Why Not? N/A

Laboratory sent to for water quality analysis

Respec

STATIC WATER LEVEL: 81.9 Feet
 If flowing: closed in pressure PSI
 GPM flow through inch pipe
 Controlled by ☐ Valve ☐ Reducers ☐ Other
 Reduced flow rate GPM
 Can well be completely shut in? Yes

WELL TEST DATA:

☐ Pumped Describe: Air lift at 620'
☐ Bailed
☒ Other

Pumping Level Below Land Surface

ft. After Hrs. pumped GPM

ft. After Hrs. pumped GPM

If pump installed, pump rate GPM

REMARKS

Dewey Burdock 7-29-7

This well was drilled under license # 745

And this report is true and accurate.

Drilling firm: Davis Drilling Inc

Signature of License Representative: Stan Davis

Signature of Well Owner or Equitable Property Holder:

Powertech

Date: 3/4/08



POWERTECH (USA) INC.

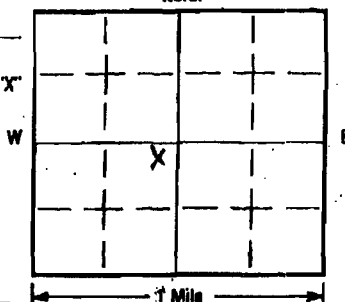
Hydro ID 684

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 07-92

Location NE 1/4 SW 1/4 Sec 11 Twp 75 S Rg 1E
County Fall River

Please mark well location with an "X"



Well Completion Date

2-13-08

Well Owner: Powertech
Business Name: Powertech USA Inc
Address: P.O. Box 723
Hot Springs SD 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
<u>Skull Creek Shale</u>	<u>0</u>	<u>102'</u>
<u>Fall River Sandstone</u>	<u>102'</u>	<u>238'</u>
<u>Fusion Shale</u>	<u>238'</u>	<u>300'</u>
<u>Lakota Sandstone</u>	<u>300'</u>	<u>423'</u>

RECEIVED

MAR 11 2008

WATER RIGHTS
PROGRAM

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? NONE ft. from Powertech (identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mud RotaryCASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
<u>SDR17</u> LB/FT	<u>4</u> IN	<u>0</u> FT	<u>413</u> FT	<u>6 3/4</u> IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN

GROUTING DATA

Grout Type	No. of Sacks	Grout Weight	From	To
<u>CM</u>	<u>66</u>	<u>122</u> lb./gal	<u>0</u> ft	<u>413</u> ft
_____	_____	_____ lb./gal	_____ ft	_____ ft

Describe grouting procedure pumpSCREEN: ☐ Perforated pipe ☒ ManufacturedDiameter 2 IN Length 10 FEETMaterial PVCSlot Size 020 Set From 423 Feet to 413 FeetOther information Set K PackerWAS A PACKER OR SEAL USED? ☒ YES ☐ NOIf so, what material? 4" K PackerDescribe packer(s) and location? Packer 403

DISINFECTION: Was well disinfected upon completion?

YES, How:

NO, Why Not?

NO

Laboratory sent to for water quality analysis

RespecSTATIC WATER LEVEL 28.8 Feet

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced Flowrate _____ GPM

Can well be completely shut in? YES

WELL TEST DATA:

☐ Pumped Describe: Ai-1.1 AT 400'☐ Bailed _____☒ Other _____

Pumping Level Below Land Surface

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate _____ GPM

REMARKS DEWEY Bunsuch 11-14 CThis well was drilled under license # 745

And this report is true and accurate.

Drilling firm DAVIS Drilling IncSignature of License Representative: Sh. Pa.

Signature of Well Owner or Equitable Property Holder:

PowertechDate: 2/17/08



POWERTECH (USA) INC.

Hydro ID 685

SOUTH DAKOTA WATER WELL COMPLETION REPORT

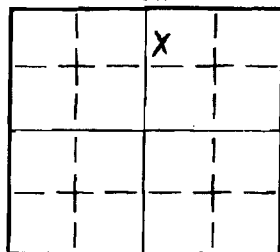
1 of 1 07-92

Location NW 1/4 NE 1/4 Sec 32 Twp 6S Rg 1E
County Carter North

Please mark well location with an "X"

Well Completion Date

2-4-08



1 Mile

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? ft. from NONE Present (identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mud Rotary

CASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
SDR 17 LB/FT	4 IN	545 FT	580 FT	6 3/4 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA

Grout Type	No. of Sacks	Grout Weight	From	To
CMT	77	112 lb./gal	0	580 ft
		lb./gal	ft	ft

Describe grouting procedure pump

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 2 IN Length 15 FEET

Material PVC

Slot Size .020 Set From 595 Feet to 580 Feet

Other information Set to Packer

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO

If so, what material? 4" K Packer

Describe packer(s) and location? Packer 570'

DISINFECTION: Was well disinfected upon completion?

YES, How:

X NO, Why Not?

NA

Laboratory sent to for water quality analysis

Kelpce

Well Owner: Powertech

Business Name: Powertech USA Inc

Address: P.O. Box 723

Hot Springs, SD 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Skull Creek shale	0	473'
Fall River Sandstone	473'	595'

RECEIVED

MAR - 6 2008

WATER RIGHTS PROGRAM

STATIC WATER LEVEL 0 Feet

If flowing: closed in pressure 6 PSI

GPM flow 15 through 2 Inch pipe

Controlled by ☒ Valve ☐ Reducers ☐ Other

Reduced Flowrate GPM

Can well be completely shut in? Yes

WELL TEST DATA:

☐ Pumped Describe: Air lift in 570'☐ Beiled☐ Other

Pumping Level Below Land Surface

ft. After Hrs. pumped GPM

ft. After Hrs. pumped GPM

If pump installed, pump rate GPM

REMARKS Dewey Bucklock 32-4C

This well was drilled under license # 745

And this report is true and accurate.

Drilling firm Davis Drilling Inc

Signature of License Representative: Stan Davis

Signature of Well Owner or Equitable Property Holder:

Powertech

Date: 2/27/08



POWERTECH (USA) INC.

7S

Hydro ID 886

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 07-92

Location ~~SW~~ X ~~NE~~ K Sec ~~36~~ Twp ~~65~~ Rg ~~1E~~
 County ~~NE~~ SW 11 North
 Fall River

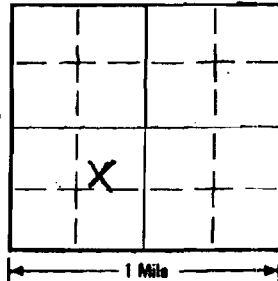
Please mark well location with an "X"

W

E

Well Completion Date

2-24-08



LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? _____ ft. from NONE (identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mud Rotary

CASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
SDR 17 LB/FT	4" IN	0 FT	419 FT	6 3/4" IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN

GROUTING DATA

Grout Type	No. of Sacks	Grout Weight	From	To
CMT	70	15.2 lb./gal	0 ft	418 ft
_____	_____	_____ lb./gal	_____ ft	_____ ft

Describe grouting procedure PumpSCREEN: ☐ Perforated pipe ☒ ManufacturedDiameter 2 IN Length 10 FEETMaterial PVCSlot Size .020 Set from 418 Feet to 428 FeetOther information Set K PackerWAS A PACKER OR SEAL USED? ☒ YES ☐ NOIf so, what material? 4" K PackerDescribe packer(s) and location? Packer 408'

DISINFECTION: Was well disinfected upon completion?

YES, How:

Laboratory sent to for water quality analysis

☒ NO, Why Not?

N/A

RespecWell Owner: PowertechBusiness Name: Powertech USA INCAddress: P.O. Box 723Hot Springs S.D. 57747

WELL LOG:

DEPTH

FORMATION

FROM

TO

Shull Creek Shale	0	120
Fall River SS	120	255
Fuson Shale	255	315
Lakota Sandstone	315	428

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MAR 11 2008

WATER RIGHTS PROGRAM

STATIC WATER LEVEL 32.6 Feet

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced Flowrate _____ GPM

Can well be completely shut in? Yes

WELL TEST DATA:

☐ Pumped Describe: Air Lift at 40s☐ Bailed☒ Other

Pumping Level Below Land Surface

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate _____ GPM

REMARKS

Dewey Burdick 7-11-15This well was drilled under license # 745

And this report is true and accurate.

Drilling firm DAVIS Drilling INCSignature of License Representative: Stan Davis

Signature of Well Owner or Equitable Property Holder:

PowertechDate: 2/24/08



POWERTECH (USA) INC.

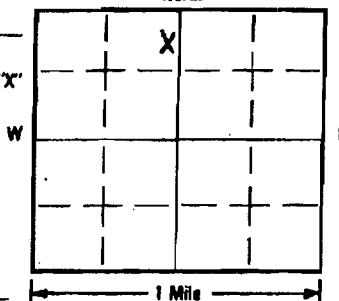
Hydro ID 687

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 07-92

Location NE 1/4 NW 1/4 Sec 32 Twp 6S Rg 1E
County Custer

Please mark well location with an "X"



Well Completion Date

2-6-08

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? _____ ft. from NONE Present (identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mud RotaryCASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT DIAMETER FROM TO HOLE DIAMETER
SDR 17 LB/FT 4 IN 0 FT 590 FT 6 3/4 IN

GROUTING DATA

Grout Type No. of Sacks Grout Weight From To
CMT 60 15.2 lb./gal 590 ft. 0 ft.

_____ lb./gal _____ ft. _____ ft.Describe grouting procedure padpSCREEN: ☐ Perforated pipe ☒ ManufacturedDiameter 2 IN Length 15 FEETMaterial PVCSlot Size .020 Set From 605 Feet to 590 FeetOther information SEL K PackerWAS A PACKER OR SEAL USED? ☒ YES ☐ NOIf so, what material? 4" K PackerDescribe packer(s) and location? Packer 580'

DISINFECTION: Was well disinfected upon completion?

YES, How: _____☒ NO, Why Not? N/ALaboratory sent to for water
quality analysisBispeckWell Owner: PowertechBusiness Name: Powertech USA IncAddress: P.O. Box 723Hot Springs SD 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
<u>Skull Creek Silt</u>	<u>0</u>	<u>480'</u>
<u>Fall River Sandstone</u>	<u>480'</u>	<u>605'</u>

RECEIVED
MAR - 6 2008
WATER RIGHTS
PROGRAMSTATIC WATER LEVEL 0 FeetIf flowing: closed in pressure 3 PSIGPM flow 5 through 2 inch pipeControlled by ☒ Valve ☐ Reducers ☐ Other _____

Reduced Flowrate _____ GPM

Can well be completely shut in? Yes

WELL TEST DATA:

☐ Pumped Describe: High lift at 580'☐ Bailed _____☒ Other _____

Pumping Level Below Land Surface

ft. After _____ Hrs. pumped _____ GPM_____
ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate _____ GPM

REMARKS Dewey Burdick 7-32-5This well was drilled under license # 745

And this report is true and accurate.

Drilling firm DAVID Drilling IncSignature of License Representative: Steve Davis

Signature of Well Owner or Equitable Property Holder:

PowertechDate: 2/27/08



POWERTech (USA) INC.

Hydro ID 688

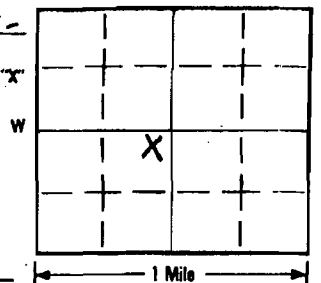
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SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 07-92

Location NE 1/4 SW 1/4 Sec 11 Twp 6S Rg 1E
County Fall River North

Please mark well location with an "X"



Well Completion Date

4-1-08

Well Owner: Power-Tech
Business Name: Power-Tech USA Inc
Address: P.O. Box 723
Hot Springs SD 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
<u>Skull Creek</u>	<u>0</u>	<u>128</u>
<u>Fall River</u>	<u>128</u>	<u>255</u>

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.): None Present (identify source).

PROPOSED USE:

- ☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

mud & Rotary

CASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT SDR 17 LB/FT 6 IN 0 FT 245 FT 8 1/4 IN
LB/FT IN FT FT IN
LB/FT IN FT FT IN

GROUTING DATA

Grout Type CM 1 No. of Sacks 45 Grout Weight 15.3 lb./gal From 0 ft. To 245 ft.
lb./gal ft. ft.

Describe grouting procedure Pump

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 3 IN Length 10 FEET

Material PVC

Slot Size 020 Set From 245 Feet to 255 Feet

Other information Set K packer

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO

If so, what material? 6" x 3" K Packer

Describe packer(s) and location? Packer set at 235'

DISINFECTION: Was well disinfected upon completion?

YES, How:

X NO, Why Not? NA

Laboratory sent to for water quality analysis

Reipes

STATIC WATER LEVEL 39 Feet

If flowing: closed in pressure PSI

GPM flow through inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced Flowrate GPM

Can well be completely shut in? Yes

WELL TEST DATA:

☐ Pumped Describe: At 115' at 230'
☐ Bailed
☐ Other

Pumping Level Below Land Surface

ft. After Hrs. pumped

ft. After Hrs. pumped

If pump installed, pump rate GPM

REMARKS

Dewey Bunduck

8-11-17

This well was drilled under license # 745

And this report is true and accurate.

Drilling firm Davis Drilling

Signature of License Representative: Stan Davis

Signature of Well Owner or Eligible Property Holder:

Date: 4/22/08

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PROGRAM



POWERTECH (USA) INC.

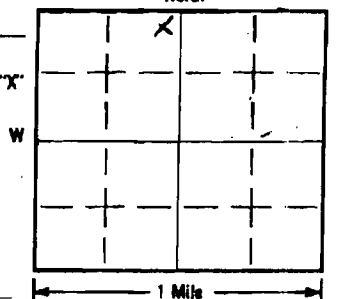
Hydro ID 689

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 07-92

Location NE 1/4 NW 1/4 Sec 32 Twp 65 Rg 1E
County Custer

Please mark well location with an "X"



Well Completion Date

3-11-08

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? _____ ft. from None Present (identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mud & RotaryCASING DATA: ☐ Steel ☒ Plastic ☐ Other

other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
58.17 LB/FT	6 IN	0 FT	715 FT	8 3/4 IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN

GROUTING DATA

Grout Type	No. of Sacks	Grout Weight	From	To
CMT	86	15.2 lb./gal	0 ft.	715 ft.
_____	_____	_____ lb./gal	_____ ft.	_____ ft.

Describe grouting procedure PumpSCREEN: ☐ Perforated pipe ☒ ManufacturedDiameter 3 IN Length 15 FEETMaterial PVCSlot Size 020 Set From 730 Feet to 715 FeetOther information Set K Pa. lineWAS A PACKER OR SEAL USED? ☐ YES ☐ NOIf so, what material? 6" K PackerDescribe packer(s) and location? Packer Set at 705'

DISINFECTION: Was well disinfected upon completion?

YES, How: _____

NO, Why Not? NA

Laboratory sent to for water quality analysis

RepaceWell Owner: PowertechBusiness Name: Powertech USA INCAddress: P.O. Box 723
Hot Springs, S.D. 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Shall Larch shale	0	475
Full River S.S.	475	620
Furn shale	620	665
Lakota S.S.	665	715

STATIC WATER LEVEL 0 FeetIf flowing: closed in pressure 23.5 PSIGPM flow 45 through 2 inch pipeControlled by ☒ Valve ☐ Reducers ☐ Other _____

Reduced Flowrate _____ GPM

Can well be completely shut in? Yes

WELL TEST DATA:

☐ PumpedDescribe: 1.1/12 AT 700'☐ Bailed☒ Other _____

Pumping Level Below Land Surface

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate _____ GPM

REMARKS

DEWET BU-BUCK
8-32-10 → 7-32-10This well was drilled under license # 745

And this report is true and accurate.

Drilling firm DAVIS Drilling, IncSignature of License Representative: Sh. DavisSignature of Well Owner or Equitable Property Holder: PowertechDate: 3/15/08



POWERTECH (USA) INC.

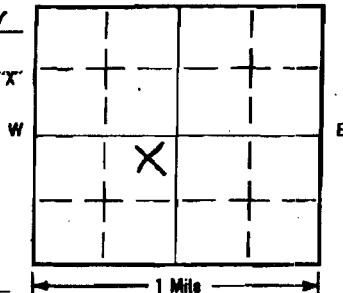
Hydro ID 690

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 07-92

Location NE 1/4 SW 1/4 Sec 11 Twp 6S Rg 1E
 County Fall River

Please mark well location with an "X"



Well Completion Date

4-15-08

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? None Present ft. from None Present (Identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

mud & Rotary

CASING DATA: ☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT 18 LB/FT 36 IN DIAMETER 0 FT 621 FT 8 3/4 IN HOLE DIAMETER
 LB/FT IN FT FT IN
 LB/FT IN FT FT IN

GROUTING DATA

Grout Type cm No. of Sacks 104 Grout Weight 15.2 lb./gal From 0 ft To 621 ft
 lb./gal ft ft

Describe grouting procedure PumpSCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 3 IN Length 10 FEET
 Material PVC

Slot Size .020 Set From 621 Feet to 631 Feet
 Other information Set in Packer

WAS A PACKER OR SEAL USED? ☒ YES ☐ NOIf so, what material? 6" x 3" K PackerDescribe packer(s) and location? Packer set at 611

DISINFECTION: Was well disinfected upon completion?

YES, How:

☒ NO, Why Not? NA

Laboratory sent to for water quality analysis

RespicWell Owner: PowertechBusiness Name: Powertech USA IncAddress: P.O. Box 723Hol Springs S.D 57747

WELL LOG:

DEPTH

FORMATION	FROM	TO
Skull Creek	0	115
Fall River	115	245
Fuson	245	310
Lakota	310	455
Morrison	455	560
UNK PAPA	560	621

STATIC WATER LEVEL 0 FeetIf flowing: closed in pressure 41 PSIGPM flow 14 through 2 inch pipeControlled by ☒ Valve ☐ Reducers ☐ OtherReduced Flowrate GPMCan well be completely shut in? Yes

WELL TEST DATA:

☐ PumpedDescribe: Artificial m 605☐ Bailed☐ Other

Pumping Level Below Land Surface

 ft. After Hrs. pumped GPM ft. After Hrs. pumped GPMIf pump installed, pump rate GPM

REMARKS

DEWEY Burdock8-11-18This well was drilled under license # 745

And this report is true and accurate.

Drilling firm

Davis Drilling

Signature of License Representative:

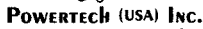
Stan Davis

Signature of Well Owner or Equitable Property Holder:

[Signature]

Date:

7/5/08



Hydro ID 691

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 **07-92**

Date: 5/10/88

July 2012

B-122

Appendix B

Hydro ID 692

SOUTH DAKOTA WATER WELL COMPLETION REPORT

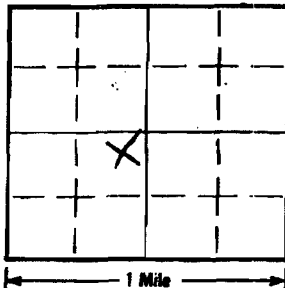
1 of 1 07-92

Location NE 1/4 SW 1/4 Sec 11 Twp 65 Rg 1E
County Fall River

Please mark well location with an "X"

Well Completion Date

4-16-08



LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? ft. from NONE Present (identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

mus & Rotary

CASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT DIAMETER FROM TO HOLE DIAMETER
SDR 17 LB/FT 6 IN 0 FT 325 FT 8 3/4 IN
LB/FT IN FT FT IN
LB/FT IN FT FT IN

GROUTING DATA

Grout Type No. of Sacks Grout Weight From To
GMT 58 15.2 lb./gal 0 ft 325 ft
lb./gal ft ft

Describe grouting procedure pump

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 3 IN Length 10 FEET

Material PVC

Slot Size .020 Set From 325 Feet to 335 Feet

Other information SET K Packer

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO

If so, what material? 6" x 3" K Packer

Describe packer(s) and location? Packer Set at 315

DISINFECTION: Was well disinfected upon completion?

YES, How:

X NO, Why Not?

NA

Laboratory sent to for water quality analysis

Respec

Well Owner: Power Tech

Business Name: Power Tech USA INC

Address: P.O. Box 723

Hot Springs S.D. 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Skull Creek	0	125
Fall River	125	250
Fusion	250	325
Lakota	325	335

STATIC WATER LEVEL 39.6 Feet

If flowing: closed in pressure PSI

GPM flow through inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced Flowrate GPM

Can well be completely shut in? YES

WELL TEST DATA:

☐ Pumped Describe: Airlift at 310

☐ Bailed

☐ Other

Pumping Level Below Land Surface

ft. After Hrs. pumped GPM

ft. After Hrs. pumped GPM

If pump installed, pump rate GPM

REMARKS

DEWEY Burdock

8-11-19

This well was drilled under license # 745

And this report is true and accurate.

Drilling firm Davis Drilling

Signature of License Representative: SK

Signature of Well Owner or Equitable Property Holder:

Date: 5/10/08

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POWERTECH (USA) INC.

Hydro ID 693

SOUTH DAKOTA WATER WELL COMPLETION REPORT

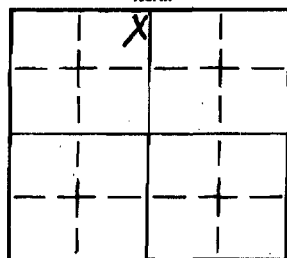
1 of 1 07-92

Location NE 1/4 NW 1/4 Sec 32 Twp 6S Rg 1E
County Custer

Please mark well location with an "X"

Well Completion Date

3-8-08



1 Mile

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well,

load lot, etc.)? ft. from None Present (identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mud Rotary

CASING DATA: ☒ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
18 LB/FT	6 IN	0 FT	910 FT	8 3/4 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA

Grout Type	No. of Sacks	Grout Weight	From	To
CMT	219	15.7 lb./gal	0 ft	910 ft
		lb./gal	ft	ft

Describe grouting procedure Pump M&S company

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 8 IN Length 20 FEET

Material PVC

Slot Size 020 Set From 910 Feet to 930 Feet

Other information Set to Parker

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO

If so, what material? 6" h Parker

Describe packer(s) and location? Packer set 890'

DISINFECTION: Was well disinfected upon completion?

YES, How:

Laboratory sent to for water quality analysis

NO, Why Not?

NA

Kesper

Well Owner: Power Tech

Business Name: Power Tech USA Inc

Address: P.O. Box 723

Hot Springs S.D. 57747

WELL LOG:

DEPTH

FORMATION

FROM

TO

Shall Creek Shale	0	475
Fall River S.S.	475	620
Fusion Shale	620	670
Lakota S.S.	670	765
Morrison Shale	765	865
UNKPAPA S.S.	865	910

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STATIC WATER LEVEL

0

WATER RIGHTS PROGRAM

Feet

If flowing: closed in pressure 55 PSI

GPM flow 2 through 2 inch pipe

Controlled by ☒ Valve ☐ Reducers ☐ Other

Reduced Flowrate GPM

Can well be completely shut in? Yes

WELL TEST DATA:

☐ Pumped

Describe: 1.111 at 845'

☐ Bailed☒ Other

Pumping Level Below Land Surface

ft. After Hrs. pumped GPM

ft. After Hrs. pumped GPM

If pump installed, pump rate GPM

REMARKS

DEWEY Burdock 8-32-11

This well was drilled under license # 745

And this report is true and accurate.

Drilling firm Davis Drilling Inc

Signature of License Representative: Stan Davis

Signature of Well Owner or Equitable Property Holder:

PowerTech

Date: 3/13/08



POWERTECH (USA) INC.

Hydro ID 694

SOUTH DAKOTA WATER WELL COMPLETION REPORT

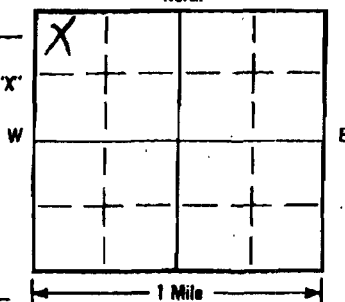
1 of 1 07-92

Location NW 1/4 NW 1/4 Sec 15 Twp 7S Rg 1E
County Fall River North

Please mark well location with an "X"

Well-Completion Date

3-22-08



LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? ft. from None Present (identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mud + Rotary

CASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
SDR 17 LB/FT	6 IN	0 FT	377 FT	8 3/4 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA

Grout Type	No. of Sacks	Grout Weight	From	To
CMT	59	15.2 lb./gal	0	377 ft
		lb./gal	ft	ft

Describe grouting procedure pump

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 3 IN Length 15 FEET

Material PVC

Slot Size 020 Set from 377 Feet to 392 Feet

Other information Set K Pa-hr

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO

If so, what material? 6" x 4" H Packer 4" x 3" Bell

Describe packer(s) and location? Packer Set at 362'

DISINFECTION: Was well disinfected upon completion?

YES, How:

NO, Why Not?

NA

Laboratory sent to for water quality analysis

Respec

Well Owner: Power Tech

Business Name: Power Tech USA INC

Address: P.O. Box 723

Hot Springs S.D. 57747

WELL LOG:

FORMATION

DEPTH

FROM

TO

Shall Creek Shale	0	295
Fall River S.S.	295	392

STATIC WATER LEVEL 0 Feet

If flowing: closed in pressure 7 PSI

GPM flow 2 through 2 inch pipe

Controlled by ☒ Valve ☐ Reducers ☐ Other

Reduced Flowrate GPM

Can well be completely shut in? Yes

WELL TEST DATA:

☐ Pumped

Describe: Air Lift at 360'

☐ Bailed☐ Other

Pumping Level Below Land Surface

ft. After Hrs. pumped

ft. After Hrs. pumped

If pump installed, pump rate

REMARKS

DEWET Burdock

8-15-3

This well was drilled under license # 745

And this report is true and accurate.

Drilling firm Davis Drilling

Signature of License Representative: Stan Davis

Signature of Well Owner or Equitable Property Holder:

Date: 4-1-08

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WATER RIGHTS PROGRAM



POWERTECH (USA) INC.

SE

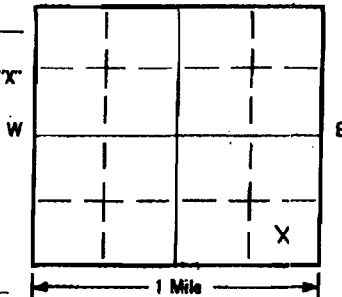
Hydro ID 695

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 07-92

Location SD SE 32 Twp 65 Rg 1E
County CUSTER

Please mark well location with an "X"



Well Completion Data

3-20-08

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, lead lot, etc.)? None Present ft. from (identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mud & RotaryCASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT DIAMETER FROM TO HOLE DIAMETER
508 17 LB/FT 6 IN 0 FT 493 FT 8 3/4 IN
____ LB/FT ____ IN ____ FT ____ FT ____ IN
____ LB/FT ____ IN ____ FT ____ FT ____ IN

GROUTING DATA

Grout Type CMT No. of Sacks 106.4 Grout Weight 15.1 lb./gal From 0 ft To 493 ft
____ lb./gal ____ ft ____ ftDescribe grouting procedure PumpSCREEN: ☐ Perforated pipe ☒ ManufacturedDiameter 3 IN Length 15 FEETMaterial PVCSlot Size 020 Set From 493 Feet to 508 FeetOther information Set K PackerWAS A PACKER OR SEAL USED? ☒ YES ☐ NOIf so, what material? 6" x 4" H-Packer 4" x 3" ballDescribe packer(s) and location? Packer Set at 493'

DISINFECTION: Was well disinfected upon completion?

YES. How:

Laboratory sent to for water quality analysis

☒ NO. Why Not?N/AWell Owner: PowertechBusiness Name: Powertech USA INCAddress: P.O. Box 723Hot Springs SD 57747

WELL LOG:

DEPTH

FORMATION

FROM

TO

Shull Creek Shale 0 415
Fall River S.S. 415 508STATIC WATER LEVEL 12 FeetIf flowing: closed in pressure 13 PSIGPM flow 3 through 2 inch pipeControlled by ☒ Valve ☐ Reducers ☐ Other

Reduced Flowrate _____ GPM

Can well be completely shut in? Yes

WELL TEST DATA:

☐ Pumped Describe: Air-lift AT 480'☐ Bailed☐ Other

Pumping Level Below Land Surface

____ ft. After _____ Hrs. pumped _____ GPM

____ ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate

REMARKS

Dewey Burdick8-32-13This well was drilled under license # 745

And this report is true and accurate.

Drilling firm Davis DrillingSignature of License Representative: Sta. Davis

Signature of Well Owner or Equitable Property Holder:

Date: 4-1-08RECEIVED
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POWERTECH (USA) INC.

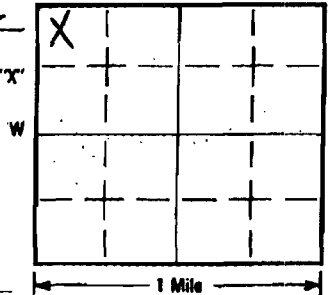
Hydro ID 696

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 07-92

Location NW 1/4 NW 1/4 Sec 15 Twp 7S Rg 1E
County Fall River North

Please mark well location with an "X"



Well Completion Data

3-21-08

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? _____ ft. from NONE Present (Identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mud & Rotary

CASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
SDR 17 LB/FT	6 IN	0 FT	572 FT	8 1/4 IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN

GROUTING DATA

Grout Type	No. of Sacks	Grout Weight	From	To
Cement	86	15.1 lb./gal	0 ft	572 ft
_____	_____	_____ lb./gal	_____ ft	_____ ft

Describe grouting procedure pump

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 3 IN Length 15 FEET

Material PVC

Slot Size .020 Set From 572 Feet to 587 Feet

Other information Set K Packer

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO

If so, what material? 6" x 4" K Packer 4" x 3" bell

Describe packer(s) and location? Packer set at 562'

DISINFECTION: Was well disinfected upon completion?

YES, How: _____

X NO, Why Not? NA

Laboratory sent to for water quality analysis

Respec

Well Owner: Power Tech

Business Name: Power Tech USA INC

Address: P.O. Box 723

Hot Springs, S.D. 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Shall Lurch Shale	0	295
Fall River S.S	295	425
Fusion Shale	425	475
Lakota	475	587

STATIC WATER LEVEL 0

Feet

If flowing: closed in pressure 15 PSI

GPM flow 60 through 2 inch pipe

Controlled by ☒ Valve ☐ Reducers ☐ Other

Reduced Flowrate _____ GPM

Can well be completely shut in? Yes

WELL TEST DATA:

☐ Pumped

Describe: AIRLIFT AT 560

☐ Bailed☐ Other

Pumping Level Below Land Surface

_____ ft. After _____ hrs. pumped _____ GPM

_____ ft. After _____ hrs. pumped _____ GPM

If pump installed, pump rate _____ GPM

REMARKS

Dewey Bundock

8-15-2

This well was drilled under license # 745

And this report is true and accurate.

Drilling firm DAVIS Drilling

Signature of License Representative: Stan Davis

Signature of Well Owner or Equitable Property Holder:

Dan Davis

Date: 4-1-08



POWERTECH (USA) INC.

4-2-08

SE

Hydro ID 697

SOUTH DAKOTA WATER WELL COMPLETION REPORT

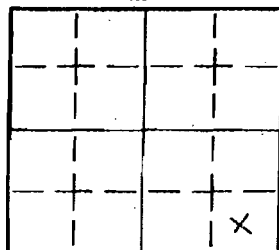
1 of 1 07-92

Location SW 1/4 SE 1/4 Sec 32 Twp 6S Rg 1E
County Custer

Please mark well location with an "X"

Well-Completion Date

3-18-08



1 Mile

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? ft. from NONE Project (identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mud & Bore-CASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other, describe

PIPEWEIGHT DIAMETER FROM TO HOLE DIAMETER
SDR 17 LB/FT 6 IN 0 FT 667 FT 8 3/4 IN
____ LB/FT ____ IN ____ FT ____ FT ____ IN
____ LB/FT ____ IN ____ FT ____ FT ____ IN

GROUTING DATA

Grout Type GMS No. of Sacks 112 Grout Weight 13.4 lb./gal From 0 ft. To 667 ft.
____ lb./gal ____ ft. ____ ft.Describe grouting procedure Pump, Bore Mix
CelluloseSCREEN: ☐ Perforated pipe ☒ ManufacturedDiameter 3 IN Length 15 FEETMaterial PVCSlot Size .020 Set From 667 Feet to 682 FeetOther information 1 Set h PackerWAS A PACKER OR SEAL USED? ☒ YES ☐ NOIf so, what material? 6" x 4" h Packer 4" 13" bellDescribe packer(s) and location? Packer set at 657

DISINFECTION: Was well disinfected upon completion?

YES, How:

Laboratory sent to for water quality analysis

X NO, Why Not?

NA

RespicWell Owner: PowertechBusiness Name: Powertech USA INCAddress: P.O. Box 723Hot Springs, SD 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
<u>Shull Creek Shale</u>	<u>0</u>	<u>415</u>
<u>Fall River</u>	<u>415</u>	<u>550</u>
<u>Fusion Shale</u>	<u>550</u>	<u>635</u>
<u>Lakota S.S.</u>	<u>635</u>	<u>682</u>

STATIC WATER LEVEL 0 FeetIf flowing: closed in pressure 40 PSIGPM flow 30 through 2 inch pipeControlled by ☒ Valve ☐ Reducers ☐ Other

Reduced Flowrate _____ GPM

Can well be completely shut in? Yes

WELL TEST DATA:

☐ Pumped Describe: Art. 1 1/2 in at 650'☐ Sealed☐ Other

Pumping Level Below Land Surface

____ ft. After _____ Hrs. pumped _____ GPM

____ ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate _____ GPM

REMARKS

Dewey Burdick
8-32-12This well was drilled under license # 745

And this report is true and accurate.

Drilling firm Davis Drilling IncSignature of License Representative: S. Davis

Signature of Well Owner or Equitable Property Holder:

Date: 4-1-08

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BROCKMAN



POWERTECH (USA) INC.

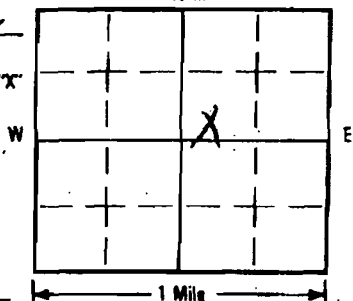
Hydro ID 698

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 07-92

Location SW 1/4 NE 1/4 Sec 2 Twp 75 Rg 1E
County Fall River North

Please mark well location with an "X"



Well Completion Date

3-25-08

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.) ft. from NONE Present (Identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

Mud & Rotary

CASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT DIAMETER FROM TO HOLE DIAMETER
SDR 21 LB/FT 6 IN 0 FT 180 FT 8 3/4 IN
LB/FT IN FT FT IN
LB/FT IN FT FT IN

GROUTING DATA

Grout Type No. of Sacks Grout Weight From To
CMJ 35 15.6 lb./gal 0 ft 180 ft
lb./gal ft ft

Describe grouting procedure pump

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 3 IN Length 25 FEET

Material PVC

Slot Size .020 Set From 190 Feet to 205 Feet

Other information Set K Packers

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO

If so, what material? 6" X 3" K Packers

Describe packer(s) and location? Packer Set at 170'

DISINFECTION: Was well disinfected upon completion?

YES, How:

NO, Why Not?

NO

Laboratory sent to for water quality analysis

Respec

Well Owner: POWER TECH

Business Name: POWER TECH USA INC.

Address: P.O. Box 723
Hot Springs S.D. 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
<u>Shall Creek Shale</u>	<u>0</u>	<u>75</u>
<u>Fall River S.S.</u>	<u>75</u>	<u>205</u>

STATIC WATER LEVEL 34.36 Feet

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced Flowrate _____ GPM

Can well be completely shut in? Yes

WELL TEST DATA:

☐ Pumped

Describe: Art. Lift at 165'

☐ Bailed

☐ Other

Pumping Level Below Land Surface

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate _____ GPM

REMARKS

Dewey Burdick

8-2-1

This well was drilled under license # 745

And this report is true and accurate.

Drilling firm DAVIS Drilling

Signature of License Representative: Steve Davis

Signature of Well Owner or Responsible Property Holder:

Date: 4/28/08

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POWERTECH (USA) INC.

Hydro ID 703

SOUTH DAKOTA WATER WELL COMPLETION REPORT

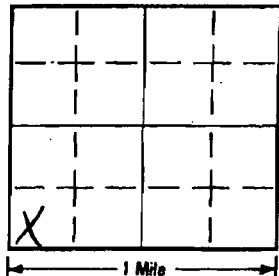
1 of 1 07-92

Location SW 1/4 SW 1/4 Sec 1 Twp 7S Rg 1E
County Fall River North

Please mark well location with an "X"

Well Completion Date

4-18-08



LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.): 200 ft. from Septic Tank (identify source).

PROPOSED USE:

☒ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Mud & Rotary

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT DIAMETER FROM TO HOLE DIAMETER
18 LB/FT 6 IN 0 FT 475 FT 8 1/4 IN
LB/FT IN FT FT IN
LB/FT IN FT FT IN

GROUTING DATA

Grout Type No. of Sacks Grout Weight From To
Cement 82 15.3 lb./gal 0 ft 475 ft
lb./gal ft ft

Describe grouting procedure pump

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 3 IN Length 50 FEET

Material PVC

Slot Size .020 Set From 475 Feet to 525 Feet

Other information SET R Pachic

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO

If so, what material? 6" x 3" K Pachic

Describe packer(s) and location? Packer SET AT 465'

DISINFECTION: Was well disinfected upon completion?

YES, How:

X NO, Why Not?

NA

Laboratory sent to for water quality analysis

Rispie

Well Owner: POWER TECH

Business Name: POWER TECH USA INC

Address: P.O. Box 723

Hot Springs S.D. 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Fall River	0	100
FUSON	100	150
Lakota	150	305
Mission	305	410
UNK PAPA	410	525

STATIC WATER LEVEL 110 Feet

If flowing: closed in pressure PSI

GPM flow through inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced Flowrate GPM

Can well be completely shut in? Yes

WELL TEST DATA:

☐ Pumped Describe: A-1:11 at 416☐ Bailed☐ Other

Pumping Level Below Land Surface

ft. After Mrs. pumped GPM

ft. After Mrs. pumped GPM

If pump installed, pump rate GPM

REMARKS

DEWEY Burdock

8-1-7

This well was drilled under license # 745

And this report is true and accurate.

Drilling firm DAVID Drilling, Inc

Signature of License Representative: Stan Darr

Signature of Well Owner or Equitable Property Holder:

5/5/08

Date:



POWERTECH (USA) INC.

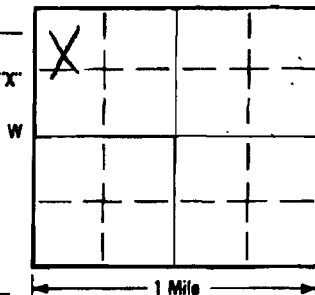
Hydro ID 704 Unkappa

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 07-92

Location NW 1/4 NW 1/4 Sec 5 Twp 7S Rg 1E
County Fall River North

Please mark well location with an "X"



Well Completion Date

4-29-08

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.): _____ ft. from NONE Present (identify source).

PROPOSED USE:

☒ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Mud & Rotary

CASING DATA: ☒ Steel ☐ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
18 LB/FT	6 IN	0 FT	915 FT	8 3/4 IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN

GROUTING DATA

Grout Type	No. of Sacks	Grout Weight	From	To
Cement	2003	153 lb./gal	0 ft	915 ft
_____	_____	_____ lb./gal	_____ ft	_____ ft

Describe grouting procedure: M&S Cementing

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 3" IN Length 40 FEET

Material PVC

Slot Size .020 Set From 915 Feet to 955 Feet

Other information: 5.2 K Packer

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO

If so, what material? 3' x 6" K Packer

Describe packer(s) and location? Packer Set 905

DISINFECTION: Was well disinfected upon completion?

YES, How: _____

Laboratory sent to for water quality analysis

NO, Why Not? _____

NA

Respec

Well Owner: Power-Tech

Business Name: Power-Tech USA INC

Address: P.O. Box 723

Hot Springs S.D. 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Skull Creek	0	455
Fall River	455	600
Fusion	600	655
Chata	655	735
Morrison	735	890
UNH PATT	890	955

STATIC WATER LEVEL

0

Feet

If flowing: closed in pressure

42

PSI

GPM flow 1/2 through

2

inch pipe

Controlled by ☒ Valve ☐ Reducers ☐ Other

Reduced Flowrate _____ GPM

Can well be completely shut in? Yes

WELL TEST DATA:

☐ Pumped

Describe: 1.1 L at 900'

☐ Bailed☐ Other

Pumping Level Below Land Surface

MAY 20 2008

MAY 20 2008

MAY 20 2008

If pump installed, pump rate

REMARKS

Dewey Burdock

8-5-1

This well was drilled under license #

745

And this report is true and accurate.

Drilling firm

DAVID DRILLING INC

Signature of License Representative:

Sh. Davis

Signature of Well-Owner or Equitable Property Holder:

Date:

5/5/08



POWERTECH (USA) INC.

Hydro ID 705

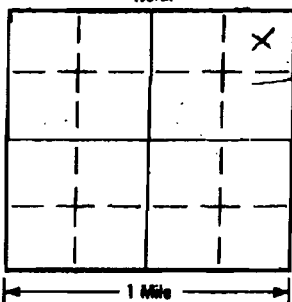
SOUTH DAKOTA WATER WELL COMPLETION REPORT

10-07-92

Location NE 1/4 NE 1/4 Sec 21 Twp 6S Rg 1E
County Custer

Please mark well location with an "X"

Well Completion Date

12-5-09

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? ft. from NONE present (Identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring wellMETHOD OF DRILLING: MUD Rotary
SS 2200CASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
<u>5.0 LB/FT</u>	<u>6 IN</u>	<u>0 FT</u>	<u>428 FT</u>	<u>8 3/4 IN</u>
<u>1.0 LB/FT</u>	<u>IN</u>	<u>FT</u>	<u>FT</u>	<u>IN</u>
<u>1.0 LB/FT</u>	<u>IN</u>	<u>FT</u>	<u>FT</u>	<u>IN</u>

GROUTING DATA

Grout Type	No. of Sacks	Grout Weight	From	To
<u>CMT</u>	<u>80</u>	<u>15.1 lb./gal</u>	<u>0 ft</u>	<u>428 ft</u>
		<u>lb./gal</u>	<u>ft</u>	<u>ft</u>

Describe grouting procedure PUMPSCREEN: ☐ Perforated pipe ☒ ManufacturedDiameter 3 1/2 IN Length 30 FEETMaterial PVCSlot Size .020 Set From 428 Feet to 458 FeetOther information 10" Black 418-428WAS A PACKER OR SEAL USED? ☒ YES ☐ NOIf so, what material? K-PackerDescribe packer(s) and location? SET AT 418

INSPECTION: Was well disinfected upon completion?

☒ YES, How: BLEACH☐ NO, Why Not? 1 gallon

Laboratory sent to for water quality analysis

Well Owner: PowertechBusiness Name: Powertech USA IncAddress: P.O. Box 723Hot Springs S.D. 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
<u>skull Creek</u>	<u>0</u>	<u>150</u>
<u>Fall River</u>	<u>150</u>	<u>328</u>
<u>Lakota (Fus. + ch. ss)</u>	<u>328</u>	<u>480</u>
<u>Morrison</u>	<u>480</u>	<u>550</u>
<u>Dark sand</u>	<u>550</u>	<u>600</u>

STATIC WATER LEVEL 115 Feet

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced Flowrate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☐ PumpedDescribe: Air-lift at 410'☐ Bailed☐ Other

Pumping Level Below Land Surface

_____ ft. After _____ hrs. pumped _____ GPM

_____ ft. After _____ hrs. pumped _____ GPM

If pump installed, pump rate _____ GPM

REMARKS

Well Was Overdrilled
 * Set CMT plug 460-600 *
 DENVER Burdick 9-21-1

This well was drilled under license # 745

And this report is true and accurate.

Drilling firm Davis Drilling Inc

Signature of License Representative:

Signature of Well Owner or Eligible Property Holder:

Date: 12/15/09

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POWERTECH (USA) INC.

Hydro ID 706

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 07-92

Location NE 1/4 NE 1/4 Sec 21 Twp 6S Rg 1E
County CUSTER North

Please mark well location with an "X"

Well Completion Date 12.5.09

1 Mile

Well Owner: PowerTech
Business Name: PowerTech USA Inc
Address: P.O. Box 723
Hot Springs S.D. 57711

WELL LOG:	DEPTH	
	FROM	TO
Shull Creek	0	150
Fall River	150	316
Lakota (Fogelbach)	316	328

LOCATION:
Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? NONE PRESENT (Identify source).

PROPOSED USE:
☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING: Mud Rotary
SS 2200

CASING DATA: ☐ Steel ☒ Plastic ☐ Other
If other, describe _____
PIPEWEIGHT DIAMETER FROM TO HOLE DIAMETER
5.88 lb/ft 6 in 0 ft 284 ft 8 1/4 in
lb/ft in ft ft in
lb/ft in ft ft in

GROUTING DATA
Grout Type CMT No. of Sacks 56 Grout Weight 15.1 lb/gal From 0 ft To 284 ft
lb/gal ft ft
Describe grouting procedure PUMP

SCREEN: ☐ Perforated pipe ☒ Manufactured
Diameter 3 in Length 30 FEET
Material PVC
Slot Size .020 Set From 284 Feet to 314 Feet
Other information 10' Blank 274-284

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO
If so, what material? K-Packer
Describe packer(s) and location? SET AT 274'

DISINFECTION: Was well disinfected upon completion?
☒ YES, How: BLEACH
1 gallon
☐ NO, Why Not?

STATIC WATER LEVEL 110 Feet
If flowing: closed in pressure _____ PSI
GPM flow _____ through _____ inch pipe
Controlled by ☐ Valve ☐ Reducers ☐ Other _____
Reduced Flowrate _____ GPM
Was well ever completely shut in?

WELL TEST DATA:
☐ Pumped Describe: Artificial 274'
☐ Bailed 5-10 GPM
☐ Other _____
Pumping Level Below Land Surface
_____ ft. After _____ hrs. pumped _____ GPM
_____ ft. After _____ hrs. pumped _____ GPM
If pump installed, pump rate _____ GPM

REMARKS
DEWEY Burdick 9-21-2

This well was drilled under license # 745
And this report is true and accurate.
Drilling firm Davis Drilling Inc
Signature of License Representative: [Signature]

Signature of Well Owner/Responsible Property Holder: [Signature]
Date: 12/15/09
RECEIVED
DEC 28 2009
WATER RIGHTS PROGRAM



POWERTECH (USA) INC.

Hydro ID 707

NE

SD EForm - 1621LD V1

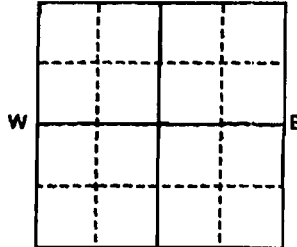
11-02

SOUTH DAKOTA WATER WELL COMPLETION REPORT

Location 1/4 NW 1/4 Sec 34 Twp 6S Rg 1ECounty Custer County

North

Please mark well location with an "X"



Well Completion Date

May 5, 2011

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
ft. from Unknown (Identify source)

PROPOSED USE:

☐ Domestic/Stock Irrigation ☐ Municipal Industrial ☐ Business Institutional ☒ Test holes Monitoring well

METHOD OF DRILLING:

3.25" HSA to 40.0'

4.25" HSA?

4.25"?

CASING DATA:

If other describe

☐ Steel ☒ Plastic ☐ Other

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	2.00 IN	0.0 FT	30.0 FT	3.25 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Cement	8	Lb/gal	0.0 Ft	28.0 Ft
Bentonite	1	Lb/gal	28.0 Ft	28.0 Ft

Describe grouting procedure

SCREEN:

Diameter 2.00 inches Length 10.0 FeetMaterial Sch 40 PVCSlot Size 0.010" Set From 30.0 Feet to 40.0 FeetOther information 12-20 Silica Sand from 28' to 40'WAS A PACKER OR SEAL USED? ☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How?Lab to which water ☒ No, Why Not? Monitoring well only.
quality sample sent for analysis

Well Owner: ...

Business Name: Powertech, Inc.Address: 145 N Chicago StreetCity, State, Zip: Hot Springs SD 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Topsoil - Silty Lean Clay with sand, brown, moist (CL)	0	0.5'
Silty Sand, red-bm, dry (SM)	0.5'	12'
Silty Lean Clay, red-bm, moist (CL)	12'	21'
Silty Gravel with sand, lt bm, moist to wet @35' (GM)	21'	40'

STATIC WATER LEVEL

FEET

If flowing: closed in pressure

PSI

GPM flow through inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate GPM

Can well be completely shut in?

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NOV 09 2011

WATER RIGHTS PROGRAM

WELL TEST DATA:

☐ Pumped Describe: NA☐ Bailed☐ Other

Pumping Level Below Land Surface

Ft. After Hrs. pumped GPM

Ft. After Hrs. pumped GPM

If pump installed, pump rate: GPM

REMARKS

Monitoring well 11-34-4

This well was drilled under license # 678 and this report is true and accurate.Drilling firm: American Engineering Testing, Inc.

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date:



Hydro ID 702
JOB NO. 17-124 VERTICAL SCALE 1" = 5' BORING NO. 35 WELL NO. 2 of 3
PROJECT power tech 11-34-4 11-34-4 MW.

Method of Advancing Boring

Continuous Sampling From _____ To _____

_____ In. Flite Auger To _____

3 1/4 In. Hollow Stem Auger to 40 _____

_____ In. Casing To _____

_____ In. Casing To _____

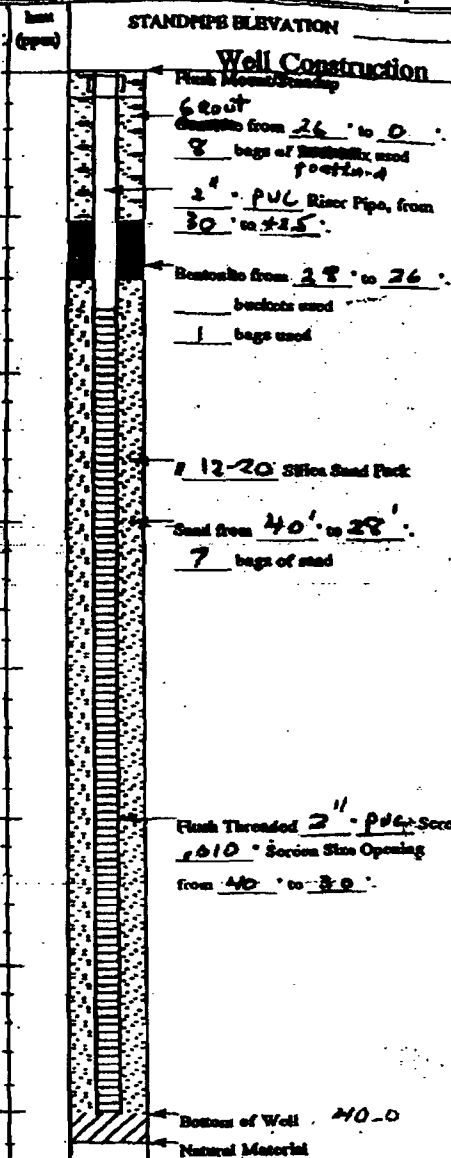
P. D. or C. O. Tube From _____ To _____

Jet With Water From _____ To _____

t with Drilling Mud From _____ To _____

State Plane NAD 27

441813 1032064

[illegible]

GEOTECHNICAL FIELD DATA SHEET

Project Number: 17-1211 Date: 5-5-11 Boring Number: 11-34-4
Project Location: REWEY Crew Chief: BTH
Boring Start Time: 10:55 Boring Completion Time: 15:00

Data Reviewed by:

Depth	Sample No./Depth	Grain Size	Moisture	Organics	Notes
0-5'	1				Topsoil - silty sand and moist organics (5m)
5'-12'	1				Silty sand - Reddish Brown clay (5m)
12'-21.0'	1				Silty sand - Reddish Brown rust c.
	1				Silty sand - Reddish Brown rust c.
	1				Moist to wet @ 35% (5m)
	1				E.O.B. 40'
	1				sat well
	1				1-10' SL
	1				3-10' R
	1				1-5' R
	1				2 bags sand 2-20
	1				1 bag bent chips
	1				
	1				
	1				

Method of Advancing Boring

Continuous Sampling From: _____ To: _____

In. Flite Auger To: _____

$4\frac{1}{2}$ In. Hollow Stem Auger To: 40

Jet With Drilling Mud From: _____ To: _____

Water Level Checks After Completion of Boring					
	Date	Time	Casing in Grid	W.L.	Cave
At Completion	5-5-11	10:55	—	32	3
1 st Rerecheck					
2 nd Rerecheck					

Additional space

PC GEOT 0001 104



POWERTECH (USA) INC.

Hydro ID 708

3 7S

SW SOUTH DAKOTA WATER WELL COMPLETION REPORT 11-02

Location $\frac{1}{4}$ NW $\frac{1}{4}$ Sec 34 Twp 66 Rg 1E

County Fall River
Custer County

North

Please mark well location with an "X"

May 4, 2011

Well Completion Date
May 5, 2011

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
ft. from Unknown (Identify source)

PROPOSED USE:
☐ Domestic/Stock Irrigation
☐ Municipal Industrial
☐ Business Institutional
☒ Test holes Monitoring well

METHOD OF DRILLING:
4.25" HSA to 22'-0" \leftarrow 30'

CASING DATA: ☐ Steel ☒ Plastic ☐ Other
If other describe 20

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	2.00 IN	0.0 FT	22.0 FT	4.25 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:
 Grout Type No. of Sacks Grout Weight From To
 Cement 1 100 lbs 0.0 FT 6.0 FT
 Bentonite 1 100 lbs 6.0 FT 10.0 FT
 Describe grouting procedure
 0 to 15 ft 15 to 20 ft

SCREEN: ☐ Perforated pipe ☒ Manufactured
 Diameter 2.00 Inches Length 10.0 Feet
 Material Sch 40 PVC
 Slot Size 0.010" Set From 12.0 Feet to 22.0 Feet
 Other information 12-20 Silica Sand from 40' to 22' \leftarrow 20 to 30 Feet

WAS A PACKER OR SEAL USED? ☐ Yes ☒ No
 If so, what material?
 Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?
☐ Yes, How?
☒ No, Why Not? Monitoring well only.
 Lab to which water quality sample sent for analysis

Well Owner: ...
 Business Name: Powertech, Inc.
 Address: 145 N Chicago Street
 City, State, Zip: Hot Springs SD 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Topsoil - Silty Lean Clay with sand, brown, moist (CL)	0	0.5'
Silty Lean Clay with sand, brn (CL)	0.5'	20'
Silty Gravel with sand, brn, wet (GM)	20'	22'

sl silty CLAY, dry, roots 0 - 22'
 silty, sandy, clayey, GRAVEL, wet 22-28'
 competent SHALE 28-30'

STATIC WATER LEVEL _____ FEET
 If flowing: closed in pressure _____ PSI
 GPM flow _____ through _____ Inch pipe
 Controlled by ☐ Valve ☐ Reducers ☐ Other
 Reduced flow rate _____ GPM
 Can well be completely shut in?

WELL TEST DATA: NA

☐ Pumped Describe: NA
☐ Bailed
☐ Other
 Pumping Level Below Land Surface
 _____ Ft. After _____ Hrs. pumped _____ GPM
 _____ Ft. After _____ Hrs. pumped _____ GPM
 If pump installed, pump rate: _____ GPM

REMARKS
 Monitoring well 11-3-2 \leftarrow 11-3-3
 20 to 30 Feet

This well was drilled under license # 678 and this report is true and accurate.
 Drilling firm: American Engineering Testing, Inc.
 Signature of License Representative: B. B. Hosh
 Signature of Well Owner or Equitable Property Holder:
 Date:

SOIL BORING AND MONITORING WELL LOG

Hydro ID 708

JOB NO. 17-1211

VERTICAL SCALE 1" = 5'

BORING NO. **306**

2 of 3
WELL NO. **10000**

2 of 3

PROJECT power tech

11-3-3

11-27-2

Boring No.	Date	Time
Boring Started	5-4-11	10:55
Boring Completed	11	15:00
Finished		
Pulling Casing	NA	NA
Boring Filled		NA
Depth to Frost		

Method of Advancing Boring

Continuous Sampling From _____ To _____

In. Flite-Auger To

3 1/4 In. Hollow Stem Auger to 30

In. Casing To

In. Casing To

P. D. or C. O. Tube From _____ To _____

Jet With Water From _____ To _____

Start with Drilling Mud From _____ To _____

Remarks

State Plane NAD 27
N 434098 E ~~120~~ 1030383

STANDPIPE ELEVATION

Well Construction

6 cent
Cans from 15 to 0
8 bags of Duxbury seed
21 PUL River Pipe, from
20 to 25

Bentonite from 20 to 15
_____ buckets used
1 bag used

12-20 Silver Sand Pack

Spaded from 30' to 20'.
7 bags of sand

Flank Threaded 2 - 1/4 - Screws
1010 - Screen Size Opening
 from 30 to 20 -

Bottom of Well : 30.0
Natural Material

[illegible]



POWERTECH (USA) INC.

Hydro ID 708

PowerTech (USA) Inc.

3 of 3

DRILLED WITH: AIR ☐ WATER ☐ HOLE NO. DB11-3-ALLUV-3

T.D. 30 LOCATION: 434097.55, 1039 582.506 - State Plane NAD27

BIT SIZE 4" FA

SAMPLE LOG BY LE LEASE: (PROJECT) Denny Burdick

DATE 5/4/11 COUNTY Fall River STATE SD

DEPTH	LITHOLOGY	CARBON	PYRITE	Alteration %	Reduction		Secondary Oxidation	SAMPLE DESCRIPTION (Amounts in Percent, %)		T=Trace 1=Minor 2=Moderate 3=Abundant		
					Primary Oxidation	Reduction		L=Limonite (Lm) SOX= Surf. Oxidation Rd. Reduced Ret. Reduction P= Pyrite (Pyr) Py= Pyrite Ternish	POX= Primary Oxid. SSOX= Sec of Surf. Oxid. SOX= Secondary Oxid. Ta= Transition Zone Tid= Feldspar	C=Carbon K=Kaolin	S=Bleached CH=Chert	
0-22'												
10												
20												
22-28'												
30												
28-30												
40												
50												
60												

Handwritten notes in log:
 0-22' silty CLAY, orange brown, dry, root roots
 22-28' silty, sandy, clayey, GRAVEL, pink/white/gray, nickel sized angular
 28-30' gravel & cherts, wet
 28-30' impure GRAY 15-gray
 TD @ 28' * drilled out to 8 1/2" w/ 4 1/4" HSA &
 converted to mm.



POWERTECH (USA) INC.

Hydro ID 709

SD EForm - 1621LD V1

11-02

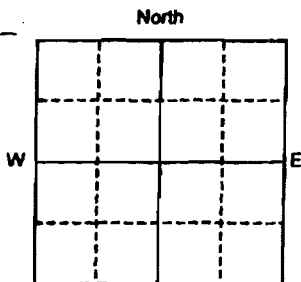
SOUTH DAKOTA WATER WELL COMPLETION REPORT

Location $\frac{1}{4}$ NW $\frac{1}{4}$ Sec 34 Twp 6S Rg 1E

Fall River

County Custer County

Please mark well location with an "X"



Well Completion Date

May 9, 2011

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
ft. from Unknown (Identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

4.25" HSA to 30.0'

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	2.00 IN	0.0 FT	28.0 FT	4.25 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Cement	7	Lb/gal	0.0 Ft	24.0 Ft
Bentonite	1	Lb/gal	24.0 Ft	28.0 Ft

Describe grouting procedure

26 to 28 Ft

SCREEN:

☐ Perforated pipe ☒ Manufactured

Diameter 2.00 Inches Length 10.0 Feet

Material Sch 40 PVC

Slot Size 0.010" Set From 28.0 Feet to 38.0 Feet

Other information 12-20 Silica Sand from 28' to 38' ← 28 to 38'

WAS A PACKER OR SEAL USED? ☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☐ Yes, How?☒ No, Why Not? Monitoring well only.

Lab to which water quality sample sent for analysis

Well Owner: ...

Business Name: Powertech, Inc.

Address: 145 N Chicago Street

City, State, Zip: Hot Springs SD 57747

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Topsoil - Silty Lean Clay with sand, brown, moist (CL)	0	0.5'
Silty Lean Clay with sand, bm (CL)	0.5'	35'
Silty Gravel with sand, bm, wet (GM)	35'	38'

STATIC WATER LEVEL

FEET

If flowing: closed in pressure

PSI

GPM flow

through

Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate GPM

Can well be completely shut in?

WELL TEST DATA:

☐ Pumped Describe: NA☐ Bailed☐ Other

Pumping Level Below Land Surface

Ft. After Hrs. pumped GPM

Ft. After Hrs. pumped GPM

If pump installed, pump rate: GPM

REMARKS

Monitoring well 11-15-4

RECEIVED

NOV 09 2011

WATER RIGHTS PROGRAM

This well was drilled under license # 678 and this report is true and accurate.

Drilling firm: American Engineering Testing, Inc.

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date:



NO. 17-12-11 VERTICAL SCALE 1" = 5' BORING NO. SB- WELL NO. 2 MW-
Hydro ID 709 pow fath 11-5-4 11-5-4
SHEET NO. 1

Boring No.	Date	Time
Boring Started	5-9-71	7:45
Boring Completed	11	
Finished Pulling Casing	11	12:30
Boring Filled		
Depth to Frost		

Continuous Sampling From _____ To _____

 In. Flite-Auger To

4 1/4 In. Hollow Stem Auger to 35.0

 In. Casing To

In. Casing To

P. D. or C. O. Tube From _____ To _____

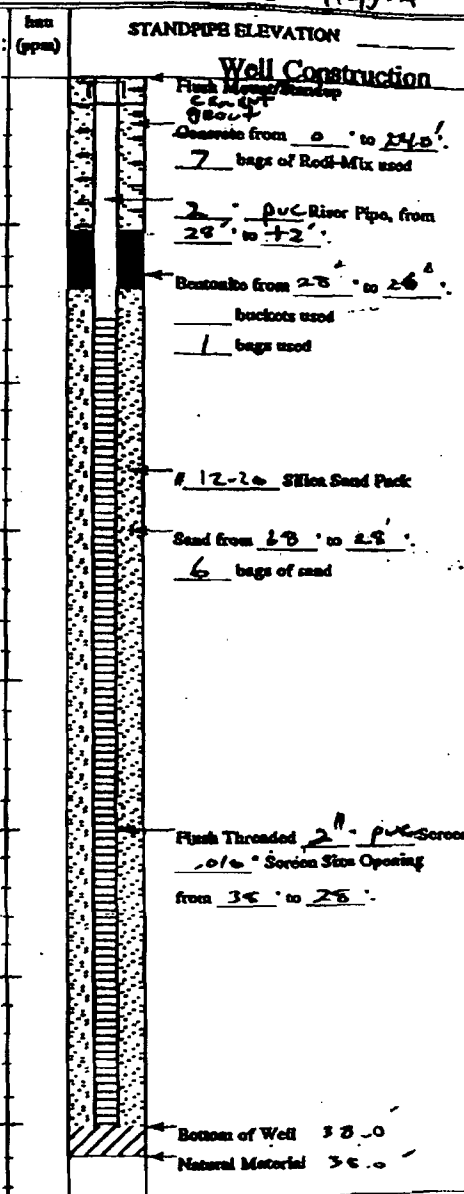
Jet With Water From _____ To _____

• with Drilling Mud From _____ To _____

Remarks

State Plane NAD 27

N 426 607 E 1029 415

[illegible]



POWERTech (USA) Inc.

Hydro ID 709

PowerTech (USA) Inc.

3 of 3

DRILLED WITH: AIR ☐ WATER ☐ HOLE NO. DA-15-ALLUV-4
 T.D. 40' LOCATION: 426609.639, 102944.805 State Park NAD27
 BIT SIZE 4" FA
 SAMPLE LOG BY LE LEASE: (PROJECT) Denny Burdock
 DATE 5/4/11 COUNTY Fall River STATE SD

DEPTH	LITHOLOGY	CARBON	PYRITE	OT Reduction	Alteration	SAMPLE DESCRIPTION	
						(Amounts in Percent, %)	T = Trace
					L = Limestone (Lms) SOX = Sulf. Oxidation Rd. Reduced Rd. Reduction P = Pyrite (Pyr) Py = Pyrite Terminus	POX = Primary Oxid. SOX = Sulf. Oxid. SOX = Secondary Oxid. Tn = Transition Zone Fld = Feldspar	1 = Minor 2 = Moderate 3 = Abundant C = Carbon K = Kaolin S = Bleached Chl = Chert
0-35'					silty, sandy, CLAY, lt-med brown, dry, scat roots, (Alder)		
35-40'					silty, sandy, heavy, GRAVEL, med brown, quartzite & chert pebbles, wet, (Alder) weathered GRAVELS @ 40' = TD		
					hole drilled out to 8'14" w/ 4 1/4 HSA & converted to MD.		

380-2

**Office of State Engineer
DOCUMENT FILE**

James Hawthorne

Custer

Ground Water Supply

Well No. 2

NW 1/4 NW 1/4 Sec. 17-6 & 1E

Custer County

Map No. **409-2**

No. **380-1**

Division No. **2**

Fall River District

PERMIT

to appropriate water from

Ground Water Supply

Custer County, South Dakota.

Name of applicant

James Hawthorne

Name of diversion works *Gordon*

Cliff Irrigation Project, sub No. 2

Date of first receipt at office of State

Engineer *June 29* 19*51*

Returned to applicant for correction

19

Corrected application received

19

Date of water right

June 29 19*51*

Recorded in Book *3* *Section 4*

One-fifth of work to be completed

Sept. 12 19*52*

Whole work to be completed

Sept. 12 19*53*

Final proof of use of water

Sept. 12 19*53*

Approved *Sept. 12* 19*53*

DEAN ... LOUGHS State Engineer.



POWERTECH (USA) INC.

Hydro ID 710

Map No. 109-2

2 of 12

Form 20-Application for Permit to Appropriate Water-Surface Ground Water D. P. Co. 6356

NO. 300-2

Water Division No. 2 Fall River
(Blanks to be filled by the State Engineer.)

RECEIVED
District 4 P.M.
JUN 20 1975

APPLICATION FOR PERMIT

To appropriate Water within the State of South Dakota OFFICE OF STATE ENGINEER
S. DAK.

(NOTE)-Draw a line through items not applicable.

2000
12-22-74

1. Name of applicant Barry L. Thompson, Henry C. Fellenbeck
Postoffice address Star Route, Edgemont 57735 County Deuel State S. Dak.

- I. If a corporation
- (a) Name of same
 - (b) Date and place of incorporation
 - (c) Amount of capital stock
 - (d) Amount paid in
 - (e) Names and address of directors:

(NOTE)-A certified copy of articles of incorporation must accompany the application.

II. Method of accomplishing the work and financial resources of the applicant:

- (a) Method of accomplishing work (Whether by contract, employment of others, or by direct labor) Direct labor
- (b) Cash on hand, \$ 5000.00 (c) Treasury stock, \$ none
- (d) Bonds to be issued, \$ none (e) Other resources, \$ none

2. Name of well Golden Cliff Irrigation Project Well No. 2
3. Quantity of water claimed 300 gal. per min.
4. Source of water supply (estimated depth) 375
5. Location of well (subdivision) Sec. 14, T. 14, R. 17, S. 1, E. 1
6. Annual periods during which water is to be used April 1 to Oct. 1
7. To be used for:

I. Irrigation or domestic use: Gravity, overhead sprinkling or combination system?

- (a) Number of acres to be irrigated 126.44 acres.
- (b) Legal subdivisions to be irrigated See List Attached
- (c) Statement as to domestic use (giving location, etc.) none

(NOTE)-A list of lands to be irrigated, giving each subdivision and fraction with acreage thereof, should be written here, or may be appended as a part of this application. Same must also be shown on accompanying map.

II. Stockwatering, mining, milling, power, fish culture, fire protection and public recreation:

- (a) Nature of use none
- (b) Amount of power to be generated horse power.
- (c) Location of plant
- (d) Method of developing power
- (e) Point where return water will be diverted to stream



POWERTECH (USA) INC.

Hydro ID 710

3 of 12

8. Estimated cost of works:

(a) Head gates, \$..... (b) Pumping plant, \$ 2000.00
(c) Flaming, \$..... (d) Canal-earth, \$..... Rock, \$.....
(e) Other structures Bips. 5000.00 \$ 8000.00 Total, \$ 12000.00

9. Description of works:

(a) Head gate: Width feet; height feet;
Material

(b) Log of well:

(To be completed when well is drilled)

FEET TO	FROM	LOG OF WELL
0 - 40		Shale and Top Soil
40 - 50		Dakota Sand
50 - 90		Fuson Formation
90 - 370		Lakota Sand
370 - 37		Missouri Formation

(c) Measuring device Pressure Gauge and Nozzle Size

(d) Canal: Total length Miles.

LOCATION BELOW HEADGATE	DEPTH	BOTTOM WIDTH	WIDTH AT GATE LINE	GRADE PER MILE
At Mile	..... feet	..... feet	..... feet	..... feet
At Mile	..... feet	..... feet	..... feet	..... feet
At Mile	..... feet	..... feet	..... feet	..... feet
At Mile	..... feet	..... feet	..... feet	..... feet
At Mile	..... feet	..... feet	..... feet	..... feet
At Mile	..... feet	..... feet	..... feet	..... feet

(Give dimensions where reductions in size are made.)

(e) Was water tested for irrigation purpose?

Result: Excellent

10. Time required for completion of work years.

11. Time required for complete application of water to the proposed beneficial use years.

12. Choice of newspaper for publication of notice of intention to appropriate Customer

Chronicle, Customer, S.Dak.

STATE OF SOUTH DAKOTA

County of as.

I, being first duly sworn
on my oath depose and say: That my relation to the above described, undertaking is that of owner,
that I have read the above and foregoing statement, and examined the map accompanying the same,
and that I know of my own personal knowledge that the matters herein stated and shown are true.

Signed Daniel Shaw Thorne

Subscribed and sworn to before me this 22 day of 1931

Edna F. Richardson
Notary Public (or other qualified officer.)



POWERTECH (USA) INC.

4 of 12

Hydrolics by State Engineer:

STATE OF SOUTH DAKOTA

County of Hughes }
Pierre, South Dakota, Sept. 12, 1951, 10.

This is to certify that the foregoing application was received at this office at 4:00 o'clock P. m. upon the 29th day of June, 1951, and that after examination it was found to comply with the South Dakota water laws, was published in accordance with the provisions thereof and consideration given to any and all information presented for compliance with the South Dakota water laws, was published in accordance with the provisions thereof and consideration given to any and all information presented.

NO PROTESTS WERE RECEIVED.

DEAN W. LOUCKS State Engineer.

Number of permit 340-2
Date of first receipt of application June 29, 1951
Date of return to applicant for correction 19
Date of receipt of corrected application 10
Date from which applicant may claim right June 29, 1951
Approved Sept. 12, 1951, Recorded in Book Page

This is to certify that I have examined the foregoing application for a permit to appropriate water of the State of South Dakota, and I hereby grant the same as stated herein, subject, however, to the following limitations and conditions:

- 1st. The equivalent of at least one-fifth, of the work above specified is to be completed on or before Sept. 12, 1952.
- 2nd. The whole of said work is to be completed on or before Sept. 12, 1953.
- 3rd. The limit of time for proof of beneficial use of water appropriated in accordance herewith is Sept. 12, 1953.
- 4th. The water appropriated shall be used for the purpose of Providing Irrigation.
- 5th. The prior right of all persons who, by compliance with the laws of the State of South Dakota, have acquired a right to the use of water must not be injuriously affected by this appropriation.
- 6th. The amount of the appropriation herein granted shall not exceed 1000 gallons per minute; neither shall it exceed the capacity of the above described system of diversion works, nor the least amount of water that experience may hereafter indicate as necessary for the production of crops in the exercise of the best husbandry; and further, said appropriation must be limited to not more than one-seventieth (1/70) of one cubic foot of water per second of time for each acre of land to which water is actually and beneficially applied for irrigation on or before Sept. 12, 1953; said water to be used during the following described annual period:

April 1 to October 1, Inclusive

Witness my hand this 12th day of Sept., 1951.

Certificate of Construction issued SEPTEMBER 9, 1951
Water License issued SEPTEMBER 9, 1951
DEAN W. LOUCKS State Engineer.



Location of Lands to be Irrigated by the Golden Cliff Irrigation
Well No. 2.

Location	Sec.	Twp.	Rge.	Acres
N 1/4 Sec. 17	17	6 S., 1 E.,		34.40
E 1/4 Sec. 17	17	6 S., 1 E.,		5.07
SW 1/4 Sec. 17	17	6 S., 1 E.,		35.25
SE 1/4 Sec. 17	17	6 S., 1 E.,		38.30
NE 1/4 Sec. 18	18	6 S., 1 E.,		10.46
Total,				126.48

DISCHARGE OF ONE SPRINKLER HEAD - TWO NOZZLES - 7/32 & 1/4 "

Pressure in Pounds

Discharge in GPM.

25	14.8
30	16.2
35	17.6
40	18.9
45	20.1
50	21.2
55	22.4
60	23.4



Hydro ID 710

8 of 12

Form 16

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 330-2

(1) WHEREAS, On the 20th day of June, A. D. 19 51
Darrol Hawthorne

made Water Right Application No. 380-2 for a permit to use 1.70 cubic feet per second of the waters
of artesian ground water
County of Custer, State of South Dakota, for irrigation

purpose; and
(2) WHEREAS, On the 12th day of September, A. D. 19 51
Permit No. 380-2 with a date of priority of June 27, 1951
was issued to said applicant for the diversion of said water, and provided for the completion of construction of the water
supply system therein described on or before the 12th day of September, A. D. 19 53 and for the
application to beneficial use of said water on or before the 12th day of September, A. D. 19 53

and, whereas, on the 25th day of November, 1975, the Permit was
transferred to Henry C. Mollenbeck

and:

(3) WHEREAS, It is hereby certified that the applicant has complied with the provisions of the laws of the State of South Dakota
relating to completion of the construction of the water supply system and is entitled to divert .85 cubic feet
per second of water for beneficial use and,

(4) WHEREAS, It is hereby certified that the applicant has complied with the provisions of the laws of the State of South Dakota
relating to the application of water to beneficial use of the following extent:

for irrigating 60 acres in the E1/4 NW1/4, Section 17, T8S, R1E



POWERTECH (USA) INC.

7 of 12

Hydro ID 710

(5) NOW, THEREFORE, By the virtue of the authority vested in us by the laws of the State of South Dakota, We hereby grant and confirm to

Henry C. Hellenbeck

of

Edgemont

the holder and owner of said permit No.

380-2

a water right, dating from

June 29, 1951

to use of

..85

cubic feet per second of the waters

of

artesian ground water

in the County of

Custer

and State of South Dakota, or so much thereof as may be necessary for the

purposes hereinbelow mentioned, to be diverted at

a point in the center of NW 1/4, Section 17, T6S, R1E

and conduct to and upon

60 acres in the E 1/4 NW 1/4, Section 17, T6S, R1E

for the purpose of

Irrigation

Subject to any limitations listed in Water Right Permit No. **380-2** and subject to the laws of the State of South Dakota.

WITNESS, My hand and seal of our office at Pierre, South Dakota

this **9th** day of **September** A. D.

Nineteen Hundred and

Seventy-seven

WATER RIGHTS COMMISSION

By:

John Hatch

Chief Engineer, Executive Officer

JOHN HATCH



Form 15.

Permit No. 300-2

Water Diversion No. 2 Fall River Water District

CERTIFICATE OF CONSTRUCTION

This is to Certify, That Henry C. Hollenback

the holder of

Permit No. 300-2, issued upon Application No. 300-2, bearing date of priority of June 29,
1931 authorizing the diversion of 1.78 cu. ft. per second of the waters of
artesian ground water County of Custer, State of South Dakota at
a point in the center of the NW 1/4, Section 17, T66, R1E

for irrigation

purposes, he has complied with the provisions of the laws of the State of South Dakota relating to proof of
completion of the works of diversion set out and described in said Permit; that said works are found in satisfactory
condition for diverting and conveying to the place of intended use 1.78 cu. ft. per second of water.

Date September 9, 1977

By:

WATER RIGHTS COMMISSION

John Hatch
JOHN HATCH, Chief Engineer



POWERTECH (USA) INC.

Hydro ID 710

9 of 12

9--Notice of Intent to appropriate Water

Nos. 379-2 & 380-2

(First Publication _____, 19____)

APPROPRIATION OF WATER

Office of State Engineer,

Pierre, S. Dak., July 10, 1951

Notice is hereby given that Darrel Hawthorne whose postoffice address is Dewey, South Dakota, has made applications in accordance with the provisions of the water laws of South Dakota for permits to appropriate for beneficial use as follows:

1000 gallons of water per minute of time from ground water supply through the Golden Cliff Irrigation Project, Well No. 1, the point of diversion of which is to be located in the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 6, Twp. 6S., Range 1E. 800 gallons of water per minute of time from ground water supply through the Golden Cliff Irrigation Project, Well No. 2, the point of diversion of which is to be located in the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 17, Twp. 6S., Range 1E. Said water to be used for the purpose of providing irrigation on the following described land: NW $\frac{1}{4}$ Sec. 17, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 18, NW $\frac{1}{4}$ Sec. 6, W $\frac{1}{2}$ NE $\frac{1}{4}$ Sec. 6, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 6, E $\frac{1}{2}$ SW $\frac{1}{4}$ Sec. 6, W $\frac{1}{2}$ SE $\frac{1}{4}$ Sec. 6, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 17, and NW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 7. T. 6S., R. 1E.

This application will be taken up by the State Engineer at his office at Pierre for consideration upon the 21st day of August 1951, at 10:00 A.M. All persons who believe that their prior rights would be injuriously affected, or that the allowance of the permit would be detrimental to the public welfare shall file such protest with the State Engineer in writing prior to the above date and may appear on the day above mentioned in person for the purpose of discussing further, the information presented.

Appropriate action will be taken by the State Engineer after suitable time has elapsed for the consideration of any or all information presented.

HCS:mt
Enc.
cc: Richardson

DEAN W. LOUCKS
State Engineer



POWERTECH (USA) INC.

Hydro ID 710
Form 12

10 of 12

Permit No. 380-2

Water Division 2 Fall River Water District

REPORT OF EXAMINATION OF WORKS
AND/OR APPLICATION OF WATER TO BENEFICIAL USE

TO: Water Resource Commission, State Office Building No. 2, Pierre, South Dakota 57501

I have this day made a thorough examination of the water use system constructed by Darrel
Hawthorne of Custer, SD holder
of Permit No. 380-2, bearing date of priority of June 29, 1951
authorizing the diversion of 1.78 cu. ft. per second of the waters of ground water
for irrigation purposes, in Custer County.

I have to report on the condition of the same as follows:

The Water Use System consists of,

A. Works used to divert the water:

376 foot flowing artesian well, steel cased; fill's storage dam,
15 foot high, 30 foot wide at the base and 50 foot in length
on the west side and 60 foot in length on the south side.

B. Works used to transport water to place of use,

Approx. 800 feet of natural ditch

C. Works used to apply water to beneficial use.

Flood irrigates by spreading

The system is in the following condition: Fair

The point of diversion is located Center of NW $\frac{1}{4}$, Sec. 17, T6S., R1E., B.H.M.

The works are capable of diverting and conveying to the place of use ~ 1.78

cu. ft. per second of water which is to be used for irrigation

Water has been put to beneficial use to the maximum extent as follows:

E $\frac{1}{2}$ of NW $\frac{1}{4}$ of Sec. 17, T6S., R1E., B.H.M.

comprising a total of 60 acres of land.

Henry C. Hollenback
Star Rt.
Edgemont, SD 57735

Date 8-25-75

Thomas A. Gardner
(Signature)

THOMAS A GARDNER
Water Resources Engineer



Form 20.

No. 380-2

NOTICE OF TRANSFER OF WATER PERMIT

TO: WATER RIGHTS COMMISSION

State Office Building No. 2
Pierre, South Dakota 57501

Date _____

This is to notify you that title to the lands described as follows:

E $\frac{1}{2}$ NW $\frac{1}{4}$ of Sec. 17, T6S., R1E., B.H.M.

formerly owned by Darrel Hawthorne

has been transferred to Henry C. Hollenbeck

together with any rights to the beneficial use of water thereon as evidenced by Water Right Permit No. 380-2 as provided for in Section 61.0127 of the 1960 Supplement to the South Dakota Code of 1939.

You are therefore hereby requested to file this "Notice of Transfer of Water Permit" in its appropriate file at the Office of Water Resources, Section 61.0127, as evidence of the change of ownership.

WATER RIGHTS COMMISSION

A fee of one dollar is herein attached to cover filing fees as required under Section 61.0159 of the 1960 Supplement to the South Dakota Code of 1939.

STATE OF SOUTH DAKOTA

County of _____

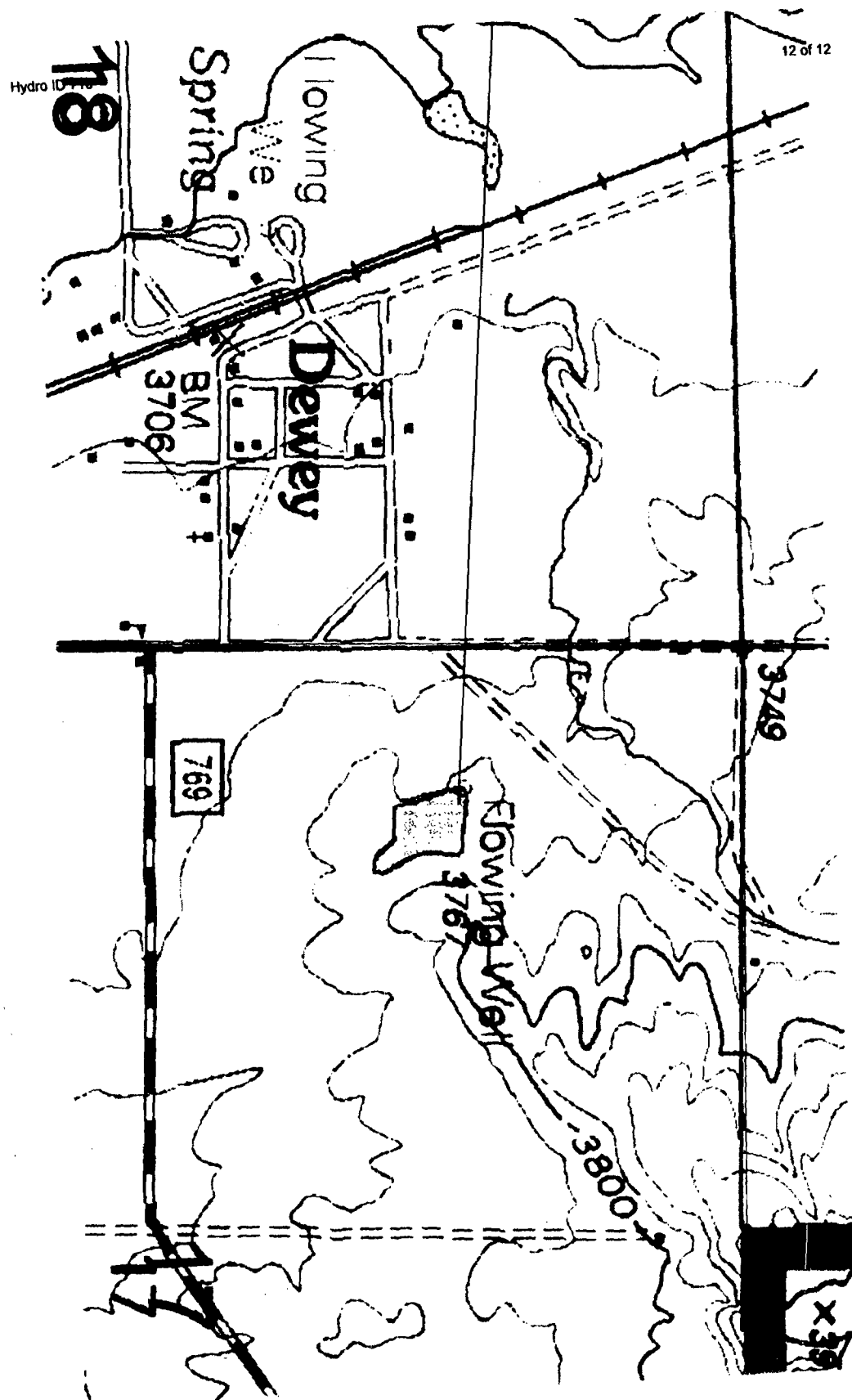
ss.

Henry C. Hollenbeck being first duly sworn on my oath depose and say: That my relation to the above described undertaking is that of Owner, that I have read the above foregoing statement, and I know of my own personal knowledge that the information herein stated is true.

Henry C. Hollenbeck
(Signed)

Subscribed and sworn to before me this 24th day of Nov, 1975

Geraldine B. Beard
(Notary Public)





POWERTECH (USA) INC.

Hydro ID 3026

SOUTH DAKOTA WATER WELL COMPLETION REPORT

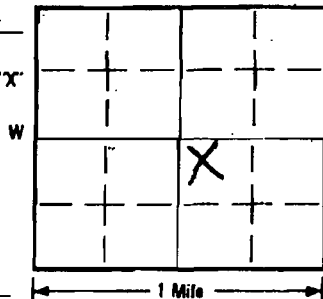
1 of 1 07-92

Location NW 1/4 56 1/4 Sec 1 Twp 7S Rg 1E
County Fall River North

Please mark well location with an "X"

Well Completion Date

3-26-08



LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? ft. from NONE PRESENT (identify source).

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☒ Monitoring well

METHOD OF DRILLING:

MUD + ACTION

CASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT DIAMETER FROM TO HOLE DIAMETER
SDR21 LB/FT 6 IN 0 FT 166 FT 8 1/4 IN
LB/FT IN FT FT IN
LB/FT IN FT FT IN

GROUTING DATA

Grout Type No. of Sacks Grout Weight From To
CM 34 152 lb./gal 0 ft 166 ft
lb./gal ft ft

Describe grouting procedure

Pump

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 3 IN Length 30 FEET

Material

PVC

Slot Size 1070 Set From 166 Feet to 196 Feet

Other information Set K Packer

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO

If so, what material? 6" x 3" K Packer

Describe packer(s) and location? Packer set at 156

DISINFECTION: Was well disinfected upon completion?

YES, How:

NO, Why Not?

NA

Laboratory sent to for water quality analysis

Respic

Well Owner:

Power Tech

Business Name:

Power Tech USA Inc

Address:

P.O. Box 723
Hot Springs S.D 57747

WELL LOG:

DEPTH

FORMATION

FROM

TO

Fall River

0

55

Fuson

55

80

Canku

80

166

STATIC WATER LEVEL

138

Feet

If flowing: closed in pressure

PSI

GPM flow through

inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced Flowrate

GPM

Can well be completely shut in?

Yes

WELL TEST DATA:

☐ Pumped

Describe:

A. 1.1 ft at 150'

☐ Bailed☐ Other

Pumping Level Below Land Surface

ft. After

Hrs. pumped

ft. After

Hrs. pumped

If pump installed, pump rate

GPM

REMARKS

Dewey Burdick

8-1-6

This well was drilled under license #

745

And this report is true and accurate.

Drilling firm

David Drilling

Signature of License Representative:

Steve Davis

Signature of Well Owner or Equitable Property Holder:

Date:

4/22/08



POWERTECH (USA) INC.

FORM U.W. 8
Rev. 7/83
FILING FEE SCHEDULE
ON REVERSE SIDE

36035081
50.00
6/11/07

STATE OF WYOMING
OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E CHEYENNE, WYOMING 82002
(387) 777-6163

1 of 4

APPLICATION FOR PERMIT TO APPROPRIATE GROUND WATER

APPLICATION FOR WELLS AND SPRINGS

Note: Only springs flowing 25 gallons per minute or less, where the proposed use is domestic and /or stock watering, will be considered as ground water appropriations.

FOR OFFICE USE ONLY

Temporary Filing No. U.W. 463-211

PERMIT NO. U.W. 183561
WATER DIVISION NO. 2 DISTRICT 1
U.W. DISTRICT Newcastle

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.
ALL ITEMS MUST BE COMPLETED BEFORE APPLICATION IS ACCEPTABLE

NAME AND NUMBER OF WELL or SPRING Putnam 21

1. Name of applicant(s) Putnam & Putnam, LLP Phone: (605) 662-7448
2. Address of applicant(s) 778 Cedar St. Dewey SD 57735
(MAILING ADDRESS) (CITY) (STATE) (ZIP)
3. Name & address of agent to receive correspondence and notices John A. Putnam
778 Cedar St. Dewey SD 57735 Phone: (605) 662-7448
(MAILING ADDRESS) (CITY) (STATE) (ZIP)

4. Use to which the water will be applied:

- ☐ Domestic: Use of water in 3 single family dwellings or less, noncommercial watering of lawns and gardens totaling one acre or less. Number of houses served? _____
- ☒ Stock Watering: Normal livestock use at four tanks or less within one mile of well or spring. Stockwatering pipelines and commercial feedlots are a miscellaneous use. Number of stock tanks? 1. Per call 7/11/07
- ☐ Irrigation: Watering of commercially grown crops (large-scale lawn watering of golf courses, cemeteries, recreation areas, etc., is miscellaneous use).
- ☐ Municipal: Use of water in incorporated Towns and Cities. Note 1: use of water in unincorporated towns, subdivisions, improvement districts, mobile home parks, etc. is classified as miscellaneous use. Note 2: a permit may be required by the Wyoming Department of Environmental Quality (WDEQ) if the well will be classified as a public water supply under the WDEQ's rules and regulations.
- ☒ Industrial: Long term use of water for the manufacture of a product or production of oil/gas or other minerals (oil field water flood operations, power plant water supply, etc.). (Describe in REMARKS)
- ☒ Miscellaneous: Any use of water not defined under previous definitions such as stock water pipelines, subdivisions, mine dewatering, mineral/oil exploration drilling, potable supplies in office, etc. Describe in Remarks. Note: a permit may be required by the WDEQ if the well will be classified as a public water supply under the WDEQ's rules and regulations.
- ☐ Coalbed Methane: Water produced in the production of coal bed methane gas. Note: wells used in the production coal bed methane will require a permit from the Wyoming Oil and Gas Conservation Commission.
- ☐ Monitor, Observation: Note: a WDEQ permit may be required Test Well: (Describe in REMARKS)

5. Location of the well or spring: (NOTE: Quarter-quarter (40 acre subdivision) MUST be shown. EXAMPLE: SE 1/4 NW 1/4 of Sec. 12, Township 14 North, Range 68 West.)
Niobrara County, SW 1/4 SW 1/4 of Sec. 28, T. 41 N., R. 60 W. of the 6th P.M. (W.R.L.M.).
Wyoming. If located in a platted subdivision, also provide Lot/Tract _____ Block _____ of the _____
Subdivision (or Add'n) of _____ Resurvey Location: Tract _____ (or Lot) _____

6. Estimated depth of the well or spring is 600 feet. Estimated production interval is Unknown to _____ ft.

7. (a) MAXIMUM instantaneous flow of water to be developed and beneficially used: 10 gallons per minute.
NOTE: If for domestic and / or stock use, this application will be processed for a maximum of 25 gallons per minute. For a spring, after approval of this application, some type of artificial diversion or improvement must be constructed to qualify for a water right.

(b) MAXIMUM volumetric quantity of water to be developed and beneficially used per calendar year: 5 Per call 7/11/07
Circle appropriate units: (Gallons) (Acre Feet) A four person family utilizes approximately one (1) acre-foot of water per year or 325,000 gallons.

8. Mark the point(s) or area(s) of use in the tabulation box below.

TABULATION BOX

TWP	RNG	SEC	NE 1/4	SE 1/4	NW 1/4	SW 1/4	SE 1/4	NW 1/4	SW 1/4	SE 1/4	NW 1/4	SW 1/4	SE 1/4	NW 1/4	SW 1/4	TOTAL
41	60	28											X			1 Stock Tank

Permit No. U.W. 183561 SEE REVERSE SIDE Book No. 1329 Page No. 61



POWERTECH (USA) INC.

2 of 4

9. If for irrigation use:
 a. Describe MAXIMUM acreage to be irrigated in each 40 acre subdivision in the tabulation box above.
 b. Land will be irrigated from this well only.
 c. Land is irrigated from existing water right(s) with water from this well to be additional supply. Describe existing water right(s) under REMARKS.

10. If for irrigation use, describe method of irrigation, i.e. center pivot sprinkler, flood, etc.:

11. The well or spring is to be constructed on lands owned by Futnam & Futnam, LLP
 (The granting of a permit does not constitute the granting of right-of-way. If any easement or right-of-way is necessary in connection with this application, it should be understood that the responsibility is the applicant's. A copy of the agreement should accompany this application, if the land is privately owned and the owner is not the co-applicant.)

12. The water is to be used on lands owned by Futnam & Futnam, LLP
 (If the landowner is not the applicant, a copy of the agreement relating to the usage of appropriated water on the land should be submitted to this office. If the landowner is included as co-applicant on the application, this procedure need not be followed.) NOTE: Water rights attach to the area(s) and/or point(s) of use.

REMARKS: Existing well is not currently active
referred to well as dug 1936

Under penalties of perjury, I declare that I have examined this application and to the best of my knowledge and belief it is true, correct and complete.

Robert L. Futnam, Jr. Signature of Applicant or Authorized Agent Date 07/06/07

THE LEGALLY REQUIRED FILING FEE MUST ACCOMPANY THIS APPLICATION

DOMESTIC AND/OR STOCK WATERING USES \$25.00

(Domestic use is defined as use of water in 3 single family dwellings or less, noncommercial watering of lawns and gardens totalling one acre or less.)

IRRIGATION, MUNICIPAL, INDUSTRIAL, MISCELLANEOUS, COAL BED METHANE \$50.00

MONITOR (For water level measurements or chemical quality sampling) or TEST WELL No Fee

IF WELL WILL SERVE MULTIPLE USES, SUBMIT ONLY ONE (THE HIGHER) FILING FEE.

THIS SECTION IS NOT TO BE FILLED IN BY APPLICANT

THE STATE OF WYOMING)

) ss

STATE ENGINEER'S OFFICE)

This instrument was received and filed for record on the 12th day of June, A.D. 20 07, at 9:18 o'clock AM.

Permit No. U.W. 130501

Robert L. Futnam, Jr.

for State Engineer

THIS IS TO CERTIFY that I have examined the foregoing application and do hereby grant the same subject to the following limitations and conditions:

This application is approved subject to the condition that the proposed use shall not interfere with any existing rights to ground water from the same source of supply and is subject to regulation and correlation with surface water rights, if the ground and surface waters are interconnected. The use of water hereunder is subject to the further provisions of Chapter 169, Session Laws of Wyoming, 1967, and any subsequent amendments thereto.

Granting of a permit does not guarantee the right to have the water level or artesian pressure in the well maintained at any specific level. The well should be constructed to a depth adequate to allow for the maximum development and beneficial use of ground water in the source of supply.

If the well is a flowing artesian well, it shall be so constructed and equipped that the flow may be shut off when not in use without loss of water into sub-surface formations or at the land surface.

Coal Bed Methane wells have Additional Conditions and Limitations on attachment sheet.
 This permit and accompanying notices serve to register an existing well and establish a valid water right for the same. Time limit for Completion of Construction and Completion of Beneficial Use is waived.

Approval of this application may be considered as authorization to proceed with construction of the proposed well or spring. A Statement of Completion will be filed within thirty (30) days of completion of construction, including pump installation.

Completion of construction and completion of the beneficial use of water for the purpose specified in item 4 of this application will be made by December 01, 2007.

The amount of appropriation shall be limited to the quantity to which permittee is entitled as determined at time of proof of application of water to beneficial use.

Witness my hand this 29th day of October, A.D. 20 07.

Charles Verplancke
 for PATRICK T. TYRRELL, State Engineer

October 16, 2007 - Statement of Completion on 1936 received.
 Beneficial Use assumed as of date of completion.



POWERTECH (USA) INC.
Hydro ID 5002

3 of 4

FORM U.W.8
Rev. 1/07

STATE OF WYOMING
OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002

(307) 777-6183

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black pen.

PERMIT NO. U.W. 183561 NAME OF WELL/SPRING Putnam 21

1. NAME OF OWNER PUTNAM & PUTNAM, LLP

2. ADDRESS 778 CEDAR ST
City DEWEY State SD Zip Code 57735 Phone No. 605-662-7448
Please check if address has changed from that shown on permit

3. USE OF WATER ☐ Domestic ☒ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☐ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) 1 stock tank

4. LOCATION OF WELL/SPRING SW 1/4 SW 1/4 Section 28 T. 41 N., R. 60 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone 13 Northing 7816400 Easting 574367 (meters) per
State Plane Coordinates: Zone _____ Northing _____ Easting _____ (feet) 102367
Land surface elevation (ft. above mean sea level) _____ Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☐ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled _____ Dug ☐ Driven ☐ Other _____
Describe _____

6. CONSTRUCTION Total depth of well/spring 639 ft.
Depth of static water level 0 ft. (below land surface) Casing height 2 ft. above ground
a. Diameter of borehole (bit size) 5 inches inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from _____ ft. to _____ ft.
Amount of cement/grout used _____ (example: 10 sacks) Type _____ (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☐ Factory screen
Type of perforator used _____
Size of perforations _____ inches by _____ inches.
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method _____ How long was well developed? _____
f. Was a filter/gravel pack installed? ☐ Yes ☐ No Size of sand/gravel _____
Filter/gravel pack installed from _____ ft. to _____ ft.
g. Was surface casing used? ☐ Yes ☐ No Was it cemented in place? ☐ Yes ☐ No
Surface casing installed from _____ ft. to _____ ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Un known

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) 1936

9. PUMP INFORMATION Manufacturer None Type _____
Source of power _____ Horsepower _____ Depth of pump setting or intake _____ ft.
Amount of water being pumped _____ gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year. 5 AE/yr per U.W. 5
*If these amounts exceed permitted amount an enlargement is required.

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well)
If artesian flow or spring, yield is 5 gal./min. Surface pressure is _____ lb./sq.inch, or _____ feet of water.
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☒ No

Permit No. U.W. 183561

Book No. 1329 Page No. 61

SEE REVERSE SIDE

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., spring box, cribbing, etc., is necessary to qualify for a water right) _____
12. PUMP TEST Was a pump test conducted? Yes ☐ No ☒
 If so, by whom _____
 Yield _____ gal./min. with _____ ft. drawdown after _____ hours
 Yield _____ gal./min. with _____ ft. drawdown after _____ hours
13. LOG OF WELL Total depth drilled 6.35 ft.
 Depth of completed well _____ ft. Diameter of well _____ inches
 Depth to first water bearing formation _____ ft.
 Depth to principal water bearing formation Top _____ ft. to Bottom _____ ft.

DRILL CUTTINGS DESCRIPTION

From Feet Surface	To Feet	Rock Type or Description	Formation	Water Bearing? (Yes or no)
		<u>Not Available</u>		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? Yes ☐ No ☒
15. QUALITY OF WATER INFORMATION
 Does a chemical and/or bacteriological water quality analysis accompany this form? Yes ☐ No ☒
 It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well (contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984).
 If not, do you consider the water as: Good ☐ Acceptable ☐ Poor ☐ Unusable ☐
- REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete

John A. Kuhn Signature of Owner or Authorized Agent Date 10.15.07

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 180361
 Date of Receipt OCT 19 2007 Date of Approval 10-29 2007
 Date of Priority June 12 2007
Cheryl Vuytack for State Engineer



POWERTECH (USA) INC.
NO MATCH SWSW 15-6S-1E SPENCER

1 of 1

SOUTH DAKOTA WATER WELL COMPLETION REPORT

07-92

Location SW SW 15 6S 1E
County Custer
Please mark well location with an "X"
Well Completion Date Jan 98
1 Mile

Well Owner: Don Spencer
Business Name: WCR 59 Box 74
Address: Edgemont SD 57735

WELL LOG:	DEPTH	
	FROM	TO
Mowry Shale	0	80
Newcastle Sand	80	140

LOCATION:
Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? None ft. from None (identify source).

PROPOSED USE:
☒ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:
Air Rotary

CASING DATA: ☐ Steel ☒ Plastic ☐ Other
If other describe _____
PIPEWEIGHT 200 LB/FT 5 IN 0 FT 140 FT 7/8 IN
_____ LB/FT _____ IN _____ FT _____ FT _____ IN
_____ LB/FT _____ IN _____ FT _____ FT _____ IN

GROUTING DATA
Grout Type Cement No. of Sacks 11 Grout Weight 600 lb./gal 0 ft. 80 ft. 80 ft.
Describe grouting procedure pumped

SCREEN: ☐ Perforated pipe ☒ Manufactured
Diameter 5 IN Length 60 FEET
Material PVC
Slot Size 25 Set From 80 Feet to 140 Feet
Other information _____

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO
If so, what material? Rubber packer @ 80 ft
Describe packer(s) and location? _____

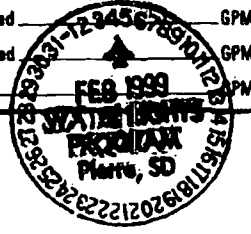
DISINFECTION: Was well disinfected upon completion? ☒ YES, How: Chlorine Tablets
Laboratory sent to for water quality analysis _____ NO, Why Not? _____

STATIC WATER LEVEL 90 Feet
If flowing: closed in pressure _____ PSI
GPM flow _____ through _____ inch pipe
Controlled by ☐ Valve ☐ Reducers ☐ Other _____
Reduced Flowrate _____ GPM
Can well be completely shut in? _____

WELL TEST DATA:
☐ Pumped Describe: Air lift 15-20 gpm
☐ Bailed
☒ Other
Pumping Level Below Land Surface _____ ft. After _____ Hrs. pumped _____ GPM
_____ ft. After _____ Hrs. pumped _____ GPM
If pump installed, pump rate _____ GPM

REMARKS

This well was drilled under license # 1003
And this report is true and accurate.
Drilling firm Jeff Miller Drilling
Signature of License Representative Jeff Miller
Signature of Well Owner or Eligible Property Holder: Don Spencer
Date: January 20, 1998





POWERTECH (USA) INC.
NO MATCH SWNE 18-6S-1E BNRR

1 of 23

Considered: _____

WATER PERMIT NO. 1954-2

MAP No. same

Name of Applicant Burlington Northern RR

Post Office Address Box 597 Alliance, Neb.

Amount of Water Claimed 0.17 cfs Total Acres N.A.

Source of Water Supply Ground water (one well ~ 250 ft)

Water to be used for Sanitary purposes in maintenance building County Custer

About 23 miles SW of Custer

PROOF OF PUBLICATION: Received April 14, 1986 Not Received _____

APPLICATION: Approved May 14, 1986 Subject to _____

F.F. & C.L. Adopted _____ Not Approved _____ Deferred _____

PRIORITY : Date Received 1-27-86 Fee \$150.00 Remarks _____

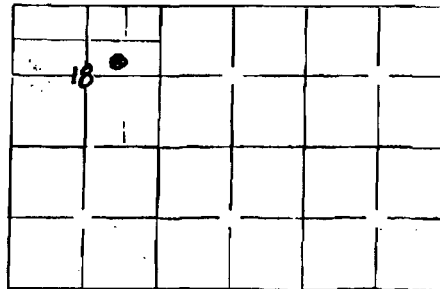
Corrected Application Received _____ Period of Annual Use Jan 1 to Dec 31

WATER QUALITY APPROVAL RECEIVED N.A. APPROVED/CONDITIONAL (Circle one)

WI-1 Description same as Application YES NO REMARKS _____

Diversion Point SW 1/4 NE 1 section 18 T6S-R1E

Land to be Irrigated N.A.



Well Log: Driller Poly Dalg. Licensed YES X NO _____

Depth of Well ~ 250 ft. REMARKS _____

Type of Map Plot PREPARED BY Burlington Northern Reviewed and the Number assigned on Feb. 4, 1986 By K.C. Larson

NO MATCH SWNE 18-6S-1E BNRR
FORM 2: Application for uses other than irrigation (type or print)

Mail to: Water Rights Div.
DWNRR, Foss Bldg.
Pierre, SD 57501
(605) 773-3352

No. 1984-2 Hydrologic Unit 10120107
Map No. Same Basin Upper Cheyenne
Newspaper Custer Co. Chronicle, Box 597, Custer (W80)

Application For Permit To Appropriate Water Within The State Of South Dakota

Check use of water: Industrial ☐ Commercial ☒ Municipal ☐ Other Common Distribution System ☐
Rural Water System ☐ Suburban Housing ☐ Geothermal Heat ☐ Institutional ☐ Recreational ☐
Domestic ☒ (above 18gpm) Other ☐

Type of Application: Check one or more of the following

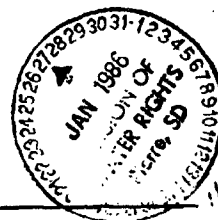
New ☒ Vested Right ☐ Future Use ☐ Change Use ☐

☐ Amend Permit No. _____ with old priority date retained

Change diversion point(s) ☐ Add diversion point(s) ☐ Other ☐

☐ Application to: Change diversion point(s) ☐ Add diversion point(s) ☐ on Permit No. _____

☐ Construction to use water reserved by Future Use Permit No. _____



1. Name of Applicant Burlington Northern R.R. Co. Phone No. Ext: 2238
Post Office Address Box 597, Alliance, State Ne 69301
(Street, R.R. or Box) Zip Code

2. Amount of water claimed (c.f.s.) 75 gpm (0.17 cfs)

3. Source of water supply Ground water

4. Location of point of diversion SW 1/4 NE 1/4 section 18 T6S-R1E

County Custer

5. Counties where water will be used Custer

6. Annual period during which water is to be used January 1 until December 31

7. Give a brief description of proposed project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)
Installing 12' X 48' modular Bldg. at Dewey, S.D. as headquarters for track gangs and signal maintainer. Will include 1-lavatory, 1-water closet with tank and 1-Electric water cooler. Water use will be very minimal

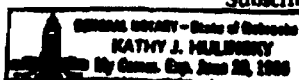
Attachments: Attach Form 2A if diversion from a well or dugout, or if storage of water, is proposed. Attach map (see instruction)

STATE OF SOUTH DAKOTA)
County of _____)

I, Burlington Northern Railroad Co. the applicant, certify that I have read the foregoing application, have examined the attached map and that the matters herein stated are true and that I intend, and am able to complete the necessary construction.

Signed [Signature]

Subscribed and sworn to before me this 30th day of December 19 85



[Signature]
Notary Public (or other qualified officer)



POWERTECH (USA) INC.

NO MATCH SWNE 18-6S-1E BNRR

3 of 23

WATER PERMIT

The Water Management Board hereby approves Water Permit Application No. 1954-2
Burlington Northern R.R. Co Box 597, Alliance
 (Applicant) (Post Office Address)
NE 59301 With the following qualifications.
 (State) (Zip Code)

The well casing shall be pressure grouted with cement (bottom to top) above the water producing formation (Fall River) and construction shall be in compliance with Water Management Board Well Construction Rules, Chapter 74:02:04.

The well approved under this Permit shall be valved and the flow reduced to the amount needed or to a minimum when not being used. The well shall also be equipped with a pressure gauge and a record kept of any pressure fluctuations. Such records shall be available to the Chief Engineer upon request. If this well is abandoned or the Permit cancelled, the well must be plugged in accordance with rules of the Water Management Board.

The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner, under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.

Date of first receipt of application January 27, 1986.

Date of return to applicant for correction, amendments or changes required January 28, 1986.

Date of receipt of corrected application Feb 3, 1986. Approved May 14, 1986.

The Water Management Board hereby approves this Water Permit No. 1954-2 authorizing the construction of the water use system and the placing of water to beneficial use as stated in the Application and as qualified in the Water Permit approval, subject, however, to the following limitations and conditions:

1. The date from which applicant may claim right is January 27, 1986.
2. The equivalent of at least one-fifth of the specified work is to be completed on or before October 14, 1988.
3. The whole of said work is to be completed on or before May 14, 1991.
4. The limit of time from proof of beneficial use of water appropriated in accordance herewith is May 14, 1995.
5. The water appropriated shall be used for the purpose of sanitary use in a maintenance building.
6. The prior right of all persons who, by compliance with the laws of the State of South Dakota, have acquired a right to the use of water must not be unlawfully impaired by this appropriation.
7. The amount of the appropriation herein granted shall not exceed .17 cubic feet per second; neither shall it exceed the capacity of the above described water supply system nor shall it exceed the amount of water needed for beneficial uses served and to which water is actually and beneficially applied for commercial use on or before May 14, 1995; said water to be used during the following described annual period: Jan 1 - Dec 31.

WATER MANAGEMENT BOARD

By: John Hatch
 Chief Engineer
 Division of Water Rights
 Dept. of Water and Natural Resources

JOHN HATCH

JUN 20 1986

19

**Supplemental Information**

4 of 23

(type or print in ink)

1. Well Information - Proposed construction SEE ATTACHED PLAN SHEET
- Drill Hole Diameter 8 3/4 Depth 200-250
6" HOE THROUGH LAKOTA SAND UNIT WITH 4" SCREEN
 - Casing Type PVC Diameter 6" ID Thickness SCH 200
 - Screen Type PVC Diameter 4" ID Thickness SCH 200
 - Gravel Pack Thickness NO Length of Gravel Pack NO
 - Depth to Top of Water Bearing Material TOP OF FALL RIVER 60' TOP OF LAKOTA 200-250
 - Depth of Water (ground surface to water level) WELL WILL BE ARTESIAN (EXPECT 20-40 GPM FLOW)
 - Distance to nearest existing domestic well: 300 FT

On applicants property BN PROPERTY On property owned by others _____

2. Dugout Information Estimates

- Surface Dimensions _____ Depth _____
- Depth to water (ground surface to water level) _____

3. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below. The locations of each dam should be shown on the map submitted with the application.

- If a private engineering firm or government agency was involved in the design of this dam please give their name and address

b) Freeboard _____

c) Crest Width _____

Crest Length _____

d) Height _____

e) Outlet Dimensions:

Pipe diameter _____

Spillway width _____

f) X & Y Slope

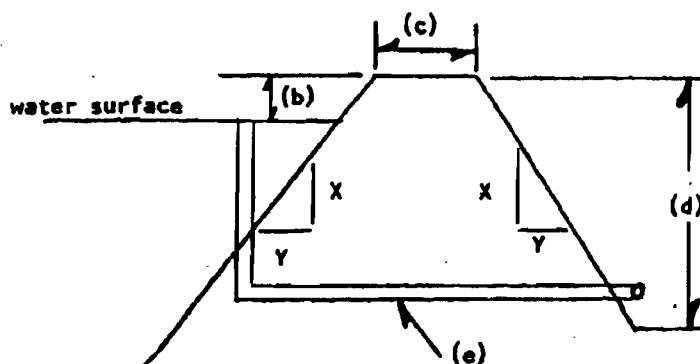
Upstream _____

Downstream _____

Surface Area of Impoundment _____

Storage _____ acre feet

Drainage area above dam _____



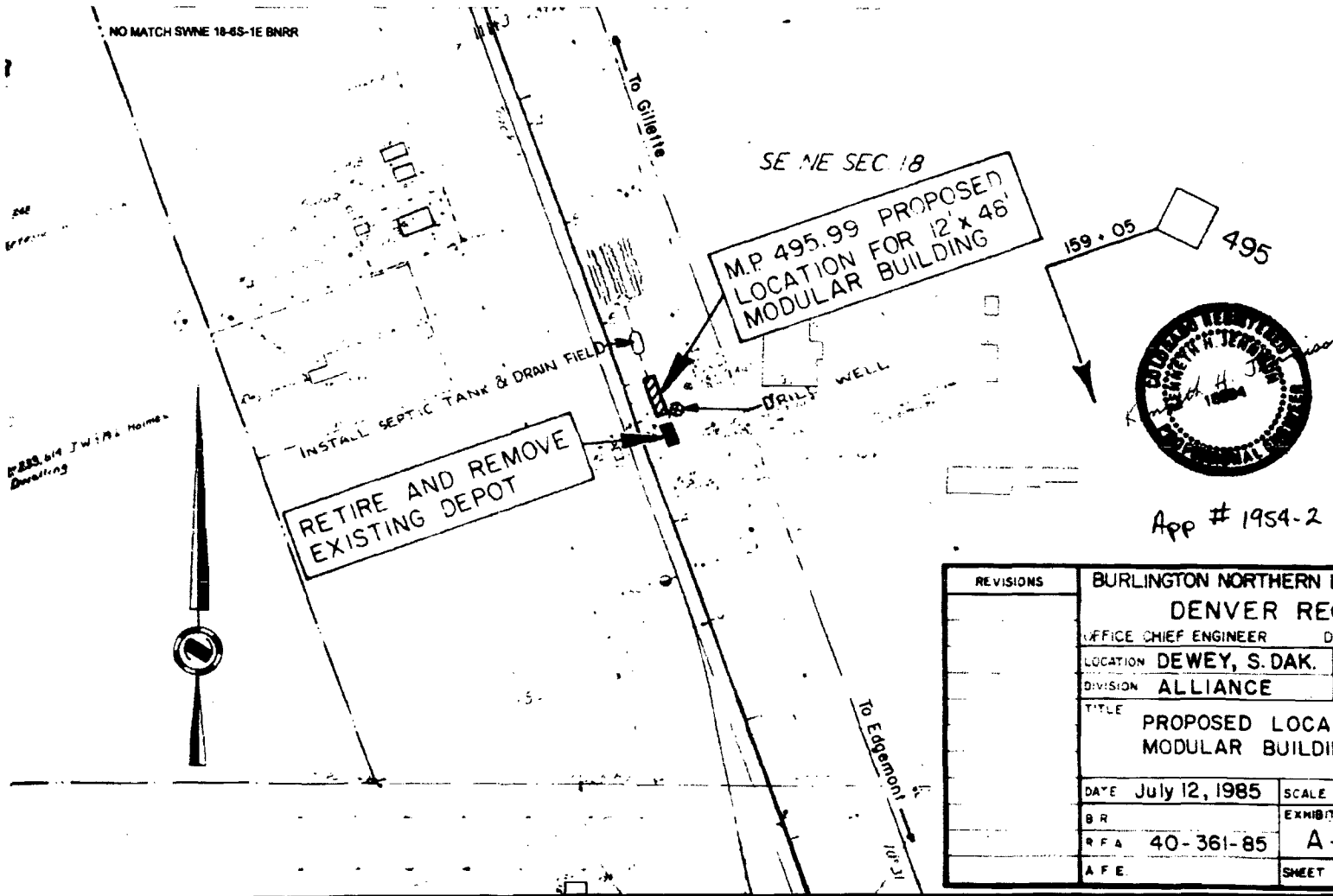
R. L. Wolsen for B.N. RR.
Signature of Applicant



July 2012

B-165

Appendix B

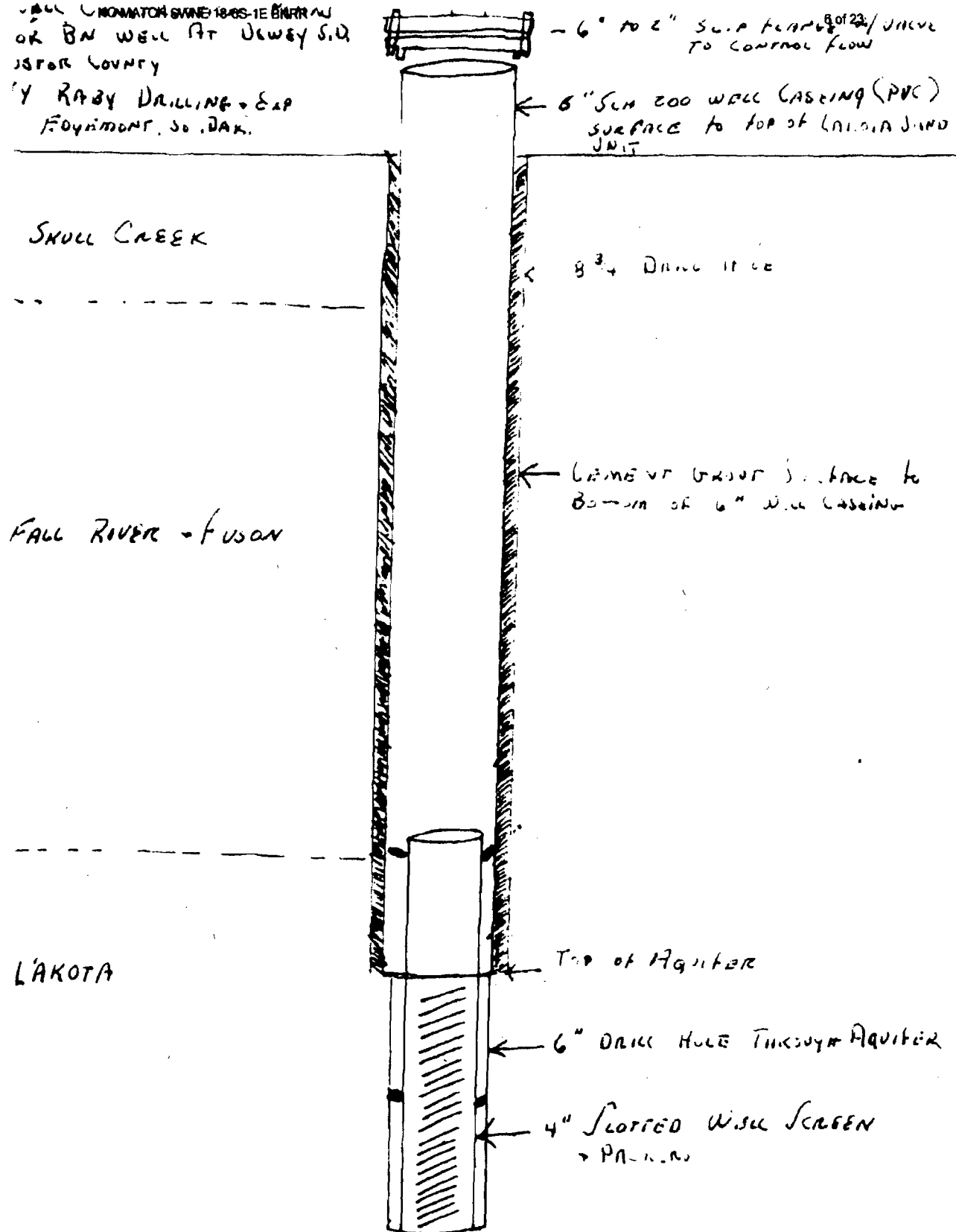


REVISIONS		BURLINGTON NORTHERN RAILROAD CO.	
		DENVER REGION	
		OFFICE CHIEF ENGINEER	DENVER, COLORADO
LOCATION	DEWEY, S. DAK.	MAP REF	D-4
DIVISION	ALLIANCE	DRAWN BY	SRS
TITLE		PROPOSED LOCATION FOR MODULAR BUILDING	
DATE	July 12, 1985	SCALE	1" = 100'
B R		EXHIBIT NO	
R F A	40-361-85		A-III-85
A F E		SHEET	1 OF 1



POWERTECH (USA) INC.

WELL MONITORING SYSTEMS
OR BN WELL AT DEWEY S.D.
JESSE COUNTY
Y RABY DRILLING & EXP
FOUNTAIN, S.D. DAK.



July 2012

B-167

Appendix B

NO MATCH SWNE 18-68-1E BNRR

RECEIPT

Division of Water Rights

South Dakota Department of Water and Natural Resources

7 of 23

No 4 10313-

Pierre, 19

RECEIVED OF the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. 1954-2 to Appropriate Water, to construct works and to put water to beneficial use	
Fee for Application for Permit No. to Appropriate Water for Future Use	
Fee to retain Future Use Permit No. after period of seven years.	
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No.	
Fee for Filing Transfer Form	
Fee for Filing Extension Request	
Fee for Certified Copy of	
Fee for Print Copy of Map	
Fee for Certifying	
Fee for (Any Other Work Provided by Law)	
Total	

By Chief Engineer



POWERTECH (USA) INC.

NO MATCH SWNE 18-83-1E BNRR

8 of 23

South Dakota
Department of
Water & Natural Resources

Joe Foss Building
623 East Capitol
Pierre, South Dakota 57501-3181

Water Rights Division
605 773-3352

January 28, 1986

Burlington Northern RR Co.
ATTN: R.L. Wolzen
Box 597
Alliance NE 68301

Mr. Wolzen:

I am in receipt of your water permit application in Custer County.
Before we can complete processing of your application we will need:

1. The amount of water you plan on utilizing from the well.
2. A filing fee based on water use.

0-45 gpm	\$50.00
45-75 gpm	150.00
75-150 gpm	225.00

When we receive the above information we can continue to process your application. If you have any questions, please contact this office.

Thank you,

KEVIN C LARSON
Natural Resources Engineer

KCL:ks



RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT

APPLICATION No. 1954-2, Burlington Northern Railroad

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Division, Department of Water and Natural Resources concerning Water Permit Application No. 1954-2, Burlington Northern Railroad, Box 597, Alliance NE.

The Chief Engineer is recommending APPROVAL of Application No. 1954-2 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) in the public interest with the following qualifications:

1. The well casing shall be pressure grouted with cement (bottom to top) above the water producing formation (Fall River) and construction shall be in compliance with Water Management Board Well Construction Rules, Chapter 74:02:04.

2. The well approved under this Permit shall be valved and the flow reduced to the amount needed or to a minimum when not being used. The well shall also be equipped with a pressure guage and a record kept of any pressure fluctuations. Such records shall be available to the Chief Engineer upon request. If this well is abandoned or the Permit cancelled, the well must be plugged in accordance with rules of the Water Management Board.

3. The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner, under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.

See the attached report for additional information.

JOHN HATCH, Chief Engineer
March 10, 1986



REPORT ON APPLICATION NO. 1954-2

BURLINGTON NORTHERN RAILROAD

February 6, 1986

Application No. 1954-2 proposes to appropriate 0.17 cfs from one well approximately 250 feet deep, located in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 18, T6S, R1E. Water will be used for sanitary purposes in a maintenance building.

Aquifer: Fall River Sandstone - Inyan Kara Group

The Fall River Sandstone is the youngest member of the lower Cretaceous aged Inyan Kara Group. The Fall River overlies the Fuson Shale member of the Lakota Formation. The Fuson acts as a leaky aquitard between the Fall River and Lakota aquifers. However, an aquifer test conducted approximately 5 miles south of the applicant's proposed well site suggests a direct hydrologic connection between the Lakota Formation and the Fall River Sandstone. The Lakota is composed of a crossbedded channel-filled sandstone, shale, some localized limestone, and thin conglomerate lenses. The Fall River consists of well-bedded, fine-grained sandstone and less abundant interbedded siltstone and claystone. Conformably overlying the Fall River is the Skull Creek Shale, which acts as a confining bed.

The Inyan Kara underlies approximately 360,960 acres of Custer County and contains an estimated 8,121,600 acre-feet of recoverable water in storage (Allen, 1984). The average annual recharge to the Inyan Kara has not been quantified and the source has not been identified. Possible sources of recharge include: Meteoric water and downward leakage through the overlying shale; water taken in at the outcrop; and upward migration of water from the underlying Paleozoic Limestones, along solution collapses and breccia pipes associated with fractures. The Inyan Kara aquifers are under artesian conditions, and wells completed in the Fall River and Lakota flow in this area.

The Division of Water Rights does not monitor any observation wells in this area, and there are few domestic wells from which information can be obtained.

Review of Existing Permits

Permit	Owner	Location
0181-2	Grand Island & Wyo Cent RR. Co.	Sec 18, T6S, R1E
0182-2	Grand Island & Wyo Cent RR. Co.	Sec 18, T6S, R1E
0183-2	Grand Island & Wyo Cent RR. Co.	Sec 18, T6S, R1E
379-2	Henery C Hollenbeck	Sec 6, T6S, R1E
380-2	Darrel Hawthorne	Sec 17, T6S, R1E

Conclusions

1. Water is available for appropriation from the Inyan Kara in the area of the proposed well.
2. Because the amount of water requested is minimal, there will be no significant impacts on the water levels in the aquifer.



Application No. 1954-2
Page 2

3. The well should be constructed according to the Well Construction Standards of South Dakota, Chapter 74:02:04.
4. The three permits held by Grand Island and Wyoming Central Rail Road divert water from three springs located near the applicant's proposed well site. Review of the geologic map of the area indicates the source of the springs may be the Inyan Kara (Brobst, 1961). If the specific capacity of the well is low and the springs are located high on the potentiometric surface, interference could be a problem.

KENT BUHLER
Natural Resources Engineer

References

- Allen, J.C., Iles, D.L., Petres, A.K., 1984, Analysis of Groundwater and Stream-flow Data, Western Dakotas Region of South Dakota, Tasks 3 & 4: Groundwater Resources Inventory, U.S. Army Corps of Engineers, DWNR, Division of Geologic Survey, Vermillion, SD, Contract DAWC 45-82-C-0151.
- Brobst, D.A., 1961, "Geology of the Dewey Quadrangle, Wyoming-South Dakota", Geology of Uranium Deposits in South Black Hills, Geological Survey Bulletin 1063-B.



DWNR 806-11/85

No. 1954-2

Instruction to Newspaper - Publish first publication of the following Notice on or before March 26, 1986 with 2nd publication 1 week later. The applicant is responsible for payment.

NOTICE OF HEARING on Application No. 1954-2 to Appropriate Water and/or to Amend Water Permit or Water Right No. _____

Notice is hereby given that Burlington Northern R.R. whose mailing address is Box 597, Alliance, Nebraska, ~~South Dakota~~ has made an application for a permit to appropriate 0.17 cubic feet per second from one well approximately 250 feet deep (Fall River Sandstone - Inyan Kara Group) located in the SW 1/4 Section 18-T6S-R1E. Water will be used for sanitary purposes in a maintenance building.

Pursuant to SDCL 46-2A-2, the Chief Engineer of the Water Rights Division recommends APPROVAL of Application No. 1954-2 because 1) unappropriated water is available, 2) will be no unlawful impairment of existing rights, 3) is beneficial use of water and 4) is in the public interest.

This application will be considered by the Water Management Board at Room 216, Joe Foss Building, 523 E. Capitol, Pierre, South Dakota, May 14 1986 at 10:00 am.

The recommendation of the Chief Engineer is not final or binding upon the Board and the Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application after it reaches a conclusion based upon facts presented at the public hearing. Any interested person who may be affected by a Board decision and who intends to participate in the hearing before the Board and present evidence or cross-examine witnesses according to SPC 2-26, 1986 must file a written petition with BOTH the applicant and the Chief Engineer by May 2, 1986. The petition may be informal, but it must include a statement describing the petitioners interest in the application, the reasons for the petitioner's opposition to or support of the application, and the signature and mailing address of the petitioner or his legal counsel if legal counsel is obtained. The applicant need not file a petition.

This application is made pursuant to the provisions of SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-15; 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17; 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15; 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2 46-5-30.4, 46-5-31; ~~(ground)~~ 46-6-3, 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14; ~~(future use)~~ 46-5-38 thru 46-5-40; ~~(transfer lands)~~ 46-5-30.4, 46-5-33 thru 46-5-35; ~~(10,000 AFA)~~ 46-5-30.1, 46-5-8.1; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15; ~~(future use)~~ 74:02:01:24 thru 74:02:01:25; ~~(10,000 AFA)~~ 74:02:01:15:02 thru 74:02:01:15:05.

This hearing is an adversary proceeding. The applicant or any person, after filing a petition, has the right to be present or to be represented by a lawyer. These and other due process rights will be forfeited if they are not exercised. Decisions of the Board may be appealed to the Circuit Court and the State Supreme Court as provided by law.

Any person wishing a copy of the Chief Engineer's recommendation, further information on this application or to assure access to the hearing by the handicapped can contact the Water Rights Division, DWNr, Joe Foss Bldg, Pierre SD (605 773-3352) for assistance prior to the hearing date. The time of the hearing will be automatically extended for at least twenty days upon written request of the applicant or any person who has filed a petition to oppose or support the application. The request for extension must be filed with the Chief Engineer by May 2, 1986.



POWERTECH (USA) INC.
NO MATCH SWNE 18-8S-1E BNRR

Form 1-1 Publication Notice
 to Appropriate Water

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA

COUNTY OF _____

_____ hereby

certifies that the above printed copy of the Application to Appropriate

Water was published in the _____

A newspaper published in the _____ with which
 the undersigned is connected, on the _____ day of _____, 1996.

_____ and State of South Dakota
 hereby certify that this was published in the following newspaper:

13 of 23

Notice of Hearing

NOTICE OF HEARING on Application No. 1954-2 to Appropriate Water

Notice is hereby given that Burlington Northern R. R. whose mailing address is Box 597, Alliance, Nebraska, has made an application for a permit to appropriate 0.17 cubic feet per second from one well approximately 250 feet deep (Fall River Sandstone - Jayne Kars Group) located in the SW 1/4 NE 1/4 Section 18 - T6S - R1E. Water will be used for sanitary purposes in a maintenance building.

Pursuant to SDCL 46-2A-2 the Chief Engineer of the Water Rights Division recommends APPROVAL of Application No. 1954-2 because 1) unappropriated water is available, 2) will be no material impairment of existing rights, 3) is beneficial use of water and 4) is in the public interest.

This application will be considered by the Water Management Board at Room 210, Joe Foss Building, 523 E. Capitol, Pierre, South Dakota, May 14, 1996 at 10:00 a.m.

The recommendation of the Chief Engineer is not final or binding upon the Board and the Board is authorized to 1) approve, 2) approve with conditions, 3) defer, or 4) deny this application. After it reaches a conclusion based upon facts presented at the public hearing, any interested person who may be affected by a Board decision and who intends to participate in the hearing before the Board and present evidence or cross-examine witnesses according to SDCL 1-05, must file a written position with SDCL 1-05 and the Chief Engineer. Any such position may be informal, but it must include a statement describing the petitioner's interest in the application, the reasons for the petitioner's opposition to or support of the application, and the signature and mailing address of the petitioner or his legal counsel if legal counsel is obtained. The applicant need not file a position.

This application is made by the provisions of SDCL 46-1-1 thru 46-1-2, 46-1-12 thru 46-1-13; 46-3-1, 46-3-4, 46-3-11, 46-3-13, 46-3-17; 46-3-21 thru 46-3-24, 46-3-25, 46-3-26, 46-3-27, 46-3-28, 46-3-29, 46-3-30, 46-3-31, 46-4-1, 46-4-3, 46-4-3.1, 46-4-4.1, 46-4-10, 46-4-13, 46-4-14; and Board Rules ARSD 74:02.01-01 thru 74:02.01-15.

This hearing is an adversary proceeding. The applicant or any person, after filing a position, has the right to be present or to be represented by a lawyer. These and other due process rights will be forfeited if they are not exercised. Decisions of the Board may be appealed to the Circuit Court and the State Supreme Court as provided by law.

Any person wishing a copy of the Chief Engineer's recommendation, further information on this application or to appear at the hearing by the undersigned can contact the Water Rights Division, DWRN, Joe Foss Bldg., Pierre SD (605 773-3352) for assistance prior to the hearing date. The time of the hearing will be automatically extended for at least thirty days upon written request of the applicant or any person who has the right to appear to oppose or support the application. The request for extension must be filed with the Chief Engineer by May 14, 1996.

8123 05-25-96
 04-02-96



POWERTECH (USA) INC.

NO MATCH SWNE 18-6S-1E BNRR

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Department of Water & Natural Resources

1984-2

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501

Water Rights Division
605 773-3352

JUN 20 1986

Burlington Northern Railroad Company
Box 597
Alliance, Nebraska 69301

Dear Sir:

Enclosed herewith is your Water Permit No. 1954-2 as approved by the Water Management Board authorizing you to construct your water diversion system and the water to beneficial use, not exceeding the limits as specified in said Water Permit No. 1954-2.

Also enclosed is Form 10, Notice of Completion of Works and Application of Water to Beneficial Use, which you are to complete and submit to the Chief Engineer when you have completed the system and/or have put the water to beneficial use. An inspection can then be scheduled so that your Water License may be issued to you, thus completing your acquisition of a Water Right.

Very truly yours,

JOHN HATCH, Chief Engineer
Water Rights Division

JH:MS

enclosure

PLEASE NOTE: Certain changes can be made in your permit within the five year construction period, usually without affecting the priority date provided an application to amend your permit is made within the five year period-i.e. changes in location or number of diversion points (wells) or location of land to be irrigated. Well locations for wells into the same aquifer can be moved up to 660 feet without application.

Applications to amend a permit after the five year construction period will be assigned a new priority date. Applications to change water sources, to add lands or increase original diversion rates, if approved will usually receive the date of the new application as a priority date regardless of the five year construction period.

WNR-809-5/83



POWERTECH (USA) INC.
NO MATCH SWNE 18-8S-1E BNRR

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NOTICE OF COMPLETION OF WORKS AND/OR
APPLICATION OF WATER TO BENEFICIAL USE

Post Office Alliance, NE.

Date July 2, 1986

TO: Water Rights
Joe Foss Building
Pierre, South Dakota 57501

Dear Sirs:

This is to inform you that I have completed the construction of the water diversion system and/or that I have put the water to beneficial use to maximum extent. It is going to be used, not exceeding the amounts as specified in Water Right No. 1954-2.

Water Right Permit No. 1954-2 states that the diversion system is to be constructed by 1-30-86, and that the water is put to beneficial use by 2-30-86.

The diversion system was completed on 1-22-86. Applying the water to beneficial use was completed on 3-15-86.

You may schedule an inspection so that the Certificate of Construction and/or the Water License may be issued, thus completing my acquisition of a water right.

R. J. Wagoner - Burlington Northern R.R.
(Signature)

WNR-810-7/79
Notice of Completion of Works and/or
Application of Water to Beneficial Use

NO MATCH SWNE 18-68-1E BNRR

1956-28

SOUTH DAKOTA WATER WELL COMPLETION REPORT

10-85

Location S.W. 1/4 NE 1/4 Sec 18 Twp 6S Rg 1E

County CUSTER

Please mark well location with an "X"

North

W E

1 mile

Well Completion Date Sp. 10-86

PROPOSED USE:

☒ Domestic ☐ Municipal ☐ Test Holes

☐ Irrigation ☒ Industrial ☐ Stock

Method of Drilling:

ROTARY MUD

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT DIAMETER FROM TO HOLE DIAMETER

5/8 200 LB/FT 6" IN 0 FT 240 FT 8 3/4 IN

1 1/2 200 LB/FT 4" IN 200 FT 340 FT 6" IN

_____ LB/FT _____ IN _____ FT _____ IN

_____ LB/FT _____ IN _____ FT _____ IN

GRAUT:

Was the well grouted? ☒ YES ☐ NO

To what depth? 240 FEET

What is grouting material? TYPE II CEMENT MIX

If cement, number of sacks? 40

Describe grouting procedure MIXED CEMENT SEAL TO 1 BAG CEMENT 4 1/2 % GEL PUMPED CEMENT THROUGH CASINGS & UP OUTSIDE

What was grout weight? 94 LBS TO 5 GAL LB/GAL

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 4 IN Length 100 FEET

Material 5/8 200 PVC

Slot Size .064 Set From 240 Feet To 340 Feet

Slot Size _____ Set From _____ Feet To _____ Feet

Slot Size _____ Set From _____ Feet To _____ Feet

Other information PACERS ON Casing 200 240 300

Was packer or sand used? ☒ YES ☐ NO

If so, what material? NEORENE

Describe packer(s) and location? PACERS ON SCAVEN
RESS FOR CENTRALIZERS AND POSSIBLE
SAND SCUFF

Was well disinfected upon completion? ☒ YES ☐ NO

Explain 2 GAL CEOROL MIXED WITH LAST BATCH
OUT.

Bacteriological analysis ☐ YES ☒ NO

Laboratory sent to _____

Well Owner: BN RAIL ROAD (ATTN) RL WOLZEN

Name BOX 97 ALLIANCE NEB 69301

Address

Well Log: _____ Depth _____

Formation

Formation	From	To
<u>SHULL CREEK SHALE</u>	<u>0</u>	<u>90</u>
<u>FALL RIVER</u>	<u>90</u>	<u>180</u>
<u>FUZON</u>	<u>180</u>	<u>190</u>
<u>LAKOTA SHALE LIMSTONE - CLAY</u>	<u>190</u>	<u>230</u>
<u>LAKOTA SANDSTONE</u>	<u>230</u>	<u>240</u>
<u>" "</u>	<u>240</u>	<u>330</u>
<u>SHALE 1 CLAY</u>	<u>330</u>	<u>340</u>

STATIC WATER LEVEL 0.5 FLOWING Feet

If flowing, closed in pressure 8 LBS PSI

GPM flow 16 through 6" inch pipe

Controlled by ☒ Valve ☐ Reducers ☐ Other

If other, specify _____

Can well be completely shut in? YES. SCAVEN SYSTEM

WELL TEST DATA:

☐ Pumped

☐ Boiled

☐ Other

Describe: _____


Pumping Level Below Land Surface

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

REMARKS:



This well was drilled under license # 415

And this report is true and accurate.

Drilling firm RABY DRILLING

Signature of License Representative: Richard P. Rabby

Signature of Well Owner: REPRESENTATIVE
x Richard L. Wolzen BNRR

Date OCT 1-86



POWERTECH (USA) INC.
NO MATCH SWNE 18-6S-1E BNRR

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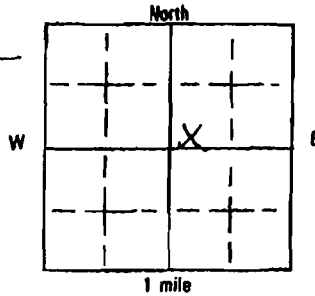
SOUTH DAKOTA WELL AND TEST HOLE PLUGGING REPORT

10-85

Location SW 1/4 NE 1/4 Sec 18 Twp 45 Rg 1E

County Custer

Please mark well location with an "X"



Well Owner:

Name Burlington Northern Santa Fee Railway

Address 80-44th Ave NE, Minneapolis, MN 55421

Plugging completion Date 7-31-98

CHECK APPROPRIATE BOX

EXISTING WELL ☒

TEST HOLE ☐

Well depth 340 ft.

Hole depth _____

Casing material steel

Hole size _____

Casing size(s) 8 5/8" O.D.

Casing condition good

Describe plugging procedure: pressure grouted through tremie line

Filled with cement grout bottom to top w/ 120 sacks

well is in a pit, top of casing at -4 ft

pit filled in with native material

Describe grout or plugging material: cement grout type I/II

6 gal. water / bag

Type of non-slip plug: none

This well or test hole was plugged under license # 331 And this report is true and accurate.

Drilling firm Taylor Drilling

Signature of Licensed Representative Ralph Taylor

Signature of Well Owner _____

Date _____



TRANSMITTAL LETTER

TO: Mr. Don Stroup
Water Rights Section
30 DEN 12

DATE: June 1, 2001
PROJECT NO _____
FROM: John Humble

Cordilleran Environmental Consultants, Inc.
7230 W. Ellsworth Ave.
Lakewood, CO 80226 (303) 274-5583
FAX (303) 274-9542

PROJECT NAME Well Abandonment - Dewey, SD

RESPONSE REQUIRE ☐ YES

☒ NO

WE ARE SENDING YOU VIA:

☐ EXPRESS COURIER ☐ MESSENGER SERV.
☐ U.S. EXPRESS MAIL ☐ HAND DELIVERY
☒ REGULAR MAIL ☐ OTHER

THE FOLLOWING:

ITEM NO.	NO. OF COPIES	DESCRIPTION
1	1	SD well and test hole plugging report

☐ FOR YOUR APPROVAL

☒ AS REQUESTED

☐ FOR YOUR INFORMATION

☐ FOR REVIEW AND COMMENT

OTHER _____

REMARKS _____



translet.wk1



CORDILLERAN
ENVIRONMENTAL
CONSULTANTS, INC.



POWERTECH (USA) INC.
NO MATCH SWNE 18-8S-1E BNRR

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**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

June 11, 2001

MEMO

To: File
From: 
Donald E. Stroup, DENR Natural Resources Project Engineer
Subject: Permit # 1954-2

I spoke with Burlington Northern Santa Fe Railway personnel at Alliance, NE and Edgemont, SD concerning the use of the well at their Dewey, SD depot. I was advised by the Train Master, Kenny White, at Edgemont that the depot was closed and the well was plugged. I requested and received the attached SD Well and Test Hole Plugging Report from Cordilleran Environmental Consultants. This permit can be cancelled.



October 22, 2001

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

NOTICE OF CANCELLATION

TO: R L Wolzen, Burlington Northern Railroad Company
PO Box 597, Alliance, NE 69301

FROM: Ron Duvall, Natural Resources Engineer
for Garland Erbele, Chief Engineer
Water Rights Program

SUBJECT: Cancellation of Water Permit No. 1954-2

Water Permit No. 1954-2 authorizes diversion of ground water for sanitary purposes in the maintenance building at the Dewey, South Dakota railroad depot. On June 11, 2001, Don Stroup, a staff engineer with our program, met with railroad personnel from Alliance, NE and Edgemont, SD concerning the use of the well at the depot. Don was advised by Kenny White at Edgemont that the depot was closed and the well had been plugged. The Chief Engineer of the Water Rights Program is recommending cancellation of Water Permit No. 1954-2, due to abandonment and/or forfeiture.

The Water Management Board will consider cancellation of Water Permit No. 1954-2 at 10:00 am, December 5, 2001, in the Floyd Matthew Training Center, Joe Foss Building, 523 E Capitol, Pierre, SD.

The recommendation of the Chief Engineer is not final or binding upon the Board. The Board is authorized to 1) cancel, 2) cancel portions of, 3) delay action on, or 4) take no action on Water Permit No. 1954-2 based upon facts presented at the public hearing. Our records show you to be the owner of property covered by this water permit. If you wish to oppose the cancellation and if you intend to participate in the hearing before the Board and present evidence or cross-examine witnesses according to SDCL 1-26, you must file a written petition with the Chief Engineer by November 26, 2001. The petition may be informal, but it must include a statement describing the reasons for your opposition to the cancellation, and your signature and mailing address or your legal counsel if legal counsel is obtained. The Board may consider any abandoned or forfeited water to be available for appropriation subject to the provisions of SDCL 46-1, 46-2, 46-2A and 46-5.

The hearing(s) will be conducted pursuant to the provisions of SDCL 46-1-1 thru 46-1-10, 46-1-14 thru 46-1-15; 46-2-3.1, 46-2-9, 46-2-11, 46-2-17; 46-5-36, 46-5-37, 46-5-37.1; 46-2A-1 thru 46-2A-7; and Board Rules ARSD 74:02:01:36 thru 74:02:01:41. These are contested cases pursuant to procedures contained in SDCL 1-26.



October 22, 2001
Burlington Northern Railroad Co
Page 2

These hearings are adversary proceedings. Any party has the right to be present or to be represented by a lawyer. These and other due process rights will be forfeited if they are not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law.

The time of the hearing will be automatically extended for at least twenty days upon your written request to the Chief Engineer after a petition has been filed to oppose the cancellation. If an extension is requested, the hearing on the cancellation will be continued until the next regular Board Meeting. Any request for extension must be filed with the Chief Engineer by November 26, 2001.

Prior to November 26, 2001, contact the Water Rights Program, Joe Foss Building, 523 E Capitol, Pierre, SD (605-773-3352) if assistance is needed with the following: 1) further information on the proposed cancellation; 2) to assure access to the meeting room for the handicapped; or 3) to obtain an interpreter for the hearing impaired.



POWERTECH (USA) INC.

NO MATCH SWNE 18-6S-1E BNRR



22 of 23

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

RECOMMENDATION OF CHIEF ENGINEER

FOR WATER PERMIT NO. 1954-2, BURLINGTON NORTHERN RAILROAD COMPANY

Pursuant to SDCL 46-2A-2 and 46-5-37.1, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit No. 1954-2.

The Chief Engineer is recommending cancellation of the above Water Permit due to abandonment and/or forfeiture. An investigation by Donald Stroup, June 11, 2001, found the well at the Dewey, SD depot had been plugged and the depot was closed.

RON DUVALL, Natural Resources Engineer
for Garland Erbele, Chief Engineer
October 22, 2001



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

December 7, 2001

1954-2

NOTICE

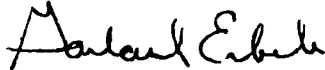
R L Wolzen
Burlington Northern Railroad Company
PO Box 597
Alliance, NE 69301

Dear Mr. Wolzen:

This will notify you that the Water Management Board cancelled Water Permit No. 1954-2 on December 5, 2001. The water permit had authorized use of ground water for sanitary purposes in the maintenance building at the Dewey, South Dakota railroad depot.

This action was taken under the conditions outlined in our notice to you dated October 22, 2001. If you have any questions concerning the Board action, please contact Genny McMath, with our program, at (605) 773-3352.

Sincerely,



Garland Erbele, Chief Engineer
Water Rights Program



748-79 Smith. & Assoc. Cornices #1
 10-31-78 (NENE (SEC 27) T&S 1R,
 S. D. K. 0-2 surfaces (6S 1R)
 2-76 Red silty shale streaks of Cyp.
 76 surface pipe set at 72 ft. Down
 5 ft. cemented with 18 inch Reg. Cement.
 Put from surface 9-26 15 ft. cement in
 pipe
 76-95 Red silty shale streaks of Cyp
 95-102 White & pink Cyp.
 107-151 Red silty shale
 151-191 White & gray Cyp.
 191-205 Red silty shale streaks of Cyp
 205-285 hard gray limy Cyp streaks of
 285-386 Red silty shale
 386-427 pink & light lavender limestone
 427-429 Red & lavender limy shale
 429-459 Red silty shale
 459-482 White Cyp. streaks of Red silty
 482-508 Red silty shale
 508-517 White Cyp. streaks of pink limestone
 517-520 Red silty shale test core
 520-559 Red sandy shale
 559-571 Pink limestone
 571-570 White & pink sand
 570-592 Ant. hydrate white
 592-621 Pink & lavender limestone
 621-638 Pink sandstone
 638-667 Buff limestone & pink sand
 667-723 Gray limestone
 723-727 Gray shale & ant. hydrate
 727-747 Gray Dolomite & blue shale
 747-784 Gray & pink dolomite
 64522 With 640 ft. 1/2 inch black pipe
 cemented @ 405 ft. cement 5 ft.



POWERTECH (USA) INC.

NO MATCH NWNE 28-8S-1E SKM

1 of 1

NOTICE OF WELL CONSTRUCTION

Custer

(1) WELL CONSTRUCTION

Location of well: NW 1/4 NE 1/4 Section 25 Township 6S Range 1E

Well owner: Silver King Mines Box 49 Edgemont South Dakota 57735
(Name) (Address)

Date well drilling completed: 7-14-80 Purpose of well: observation
(domestic, irrigation, municipal, industrial, other)

WELL LOG

Layer, top to top in feet	Description of layer	Depth to top of water producing aquifer
6-550	dkgy sh & mdst	800 ft.
550-599	interbed fgs & sh	Depth to static water level: Flowing ft.
599-619	fgss	Name of producing aquifer (if known): Lakota
619-622	mdst	Total depth of drill hole: 860 ft.
622-640	fgss	Depth to bottom of casing: 800 ft.
640-700	variegated mdst	Casing information: in the space below show kind, size, weight, length per diameter, etc., for production casing and surface casing, if used.
700-707	mdst & fgss	4 1/2" OD. Sch 40
707-716	fgss	Screen information: in the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.
716-731	mdst	
731-755	fgss w/ lss thin mdst layers	
755-767	mdst	
767-815	fgss	60 ft. open hole
815-820	mdst	shut in pressure 3160 PSI
820-844	fgss	If a flowing well, flow of completed well: G.P.M.
844-860	mdst	Silver King Mines #446 Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump: HP:

Type of pump: Capacity of installed pump: G.P.M.

Depth of pump placement: ft., Date of pump installation:

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 48.408 of Chapter 48A, MINNESOTA WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed: ft., tube diameter: tube material:

Name of Pump Installation Contractor



POWERTECH (USA) INC.

NO MATCH 2-7S-4E LINC

Form Search

Index 2802

County Fall River

Company _____

Sec. 2 T. 7S R. 1E

Drilled by _____

Date _____

Authority Mrs. Lynch (owner)

Type of log _____

Type of drill _____

Samples _____

Elevation _____

by _____

method _____

Remarks top information obtained locally April 1958

1st water - - - - -

Standing water - - - - -

Well flows size of stream.

Talks downed site of well from a distance. Possibly
in wrong. In argument, the well
can't be found.

2nd 44
Lynch is sure of well
information was the same as this
There is a well at depth of this
which is a well known to be

177
369



NO MATCH 20-7S-1E TUBBS

1 of 1

Robert Tubbs Feb. 4, 1977
Tubbs, S.D.
Fall River County Sec. 20 Twp. 25 Range 18

Total Depth 40' Static 26'
Dia. 30"

-3 to soil
3-26 sand
26-28 gravel
28-40 blue shale

— 150



Hydro ID Cross Reference			
Count	Powertech ID	Hydro ID	Log Date
1	DB07-11-2	682	5/24/2007
2	DB07-11-11C	680	10/16/2007
3	DB07-11-14C	684	11/2/2007
4	DB07-11-15	686	11/4/2007
5	DB07-29-7	683	11/19/2007
6	DB07-32-3C	681	11/27/2007
7	DB07-32-5	687	11/17/2007
8	DB08-32-10	689	1/26/2008
9	DB08-1-6	3026	3/24/2008
10	DB08-1-7	703	no date
11	DB08-2-1	698	3/21/2008
12	DB08-5-1	704	4/19/2008
13	DB08-11-17	688	3/25/2008
14	DB08-11-18	690	4/1/2008
15	DB08-11-19	692	4/4/2008
16	DB08-15-2	696	3/11/2008
17	DB08-15-3	694	3/19/2008
18	DB07-32-4C	685	12/4/2007
19	DB08-32-9C	691	1/15/2008
20	DB08-32-11	693	2/8/2008
21	DB08-32-12	697	2/26/2008
22	DB08-32-13	695	3/7/2008
23	DB09-21-1	705	11/19/2009
24	DB09-21-2	706	11/24/2009
25	DB-GW675	675	n/a
26	DB-GW676	676	n/a
27	DB-GW677	677	n/a
28	DB-GW678	678	n/a
29	DB-GW679	679	n/a
30	DB-11-34-ALLUV-4	707	n/a
31	DB-11-3-ALLUV-3	708	n/a
32	DB-11-15-ALLUV-4	709	n/a

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SOURCE D
SOUTH DAKOTA OIL AND GAS RECORDS

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Oil and Gas Search for: <i>api_no_ like '40 047 20045'</i>		
Page 1 of 1	Download Database (Excel spreadsheet format)	Page: 1

Record 1 of 1**Well Information**

API No:	40 047 20045	County:	FALL RIVER
Well Name:	PETRO LEWIS 5-22 PETERSON	Location:	SWNW 22-7S-1E
Permit No:	606	Total Depth:	2545
Operator Name:	PETRO-LEWIS CORPORATION	Bottom Hole:	Minnelusa
Permit Date:	10-21-1970	KB Elevation:	3542
Spud Date:	11-17-1970	Ground Elevation:	3534
Plug Date:	11-27-1970	Latitude:	43.429484
		Longitude:	-103.992869
Well Field	WILDCAT	Status	P&A
Class:	DRY HOLE	Type:	DRY HOLE

Formation Tops

Formation	Depth (ft.)
Fall River	324
Lakota	452
Morrison	700
Sundance	848
Goose Egg	1441
Spearfish	1704
Minnetakhta	1704
Opeche	1738
Minnelusa	1815
Converse	1838
Red Marker	2237
2nd Leo	2353

COUNTY: FALL RIVER
LEGAL LOCATION: SWNW 22-7N-1E
API NO: 40 047 20045
PERMIT NO: 606
WELL NAME: PETRO-LEWIS #5-22
PETERSON
OPERATOR: PETRO-LEWIS
CORPORATION
PERMIT ISSUED: 10/21/1970
PERMIT CLOSED: 12/29/1971
FILE LOCATION: 7N-1E-12 SWNW

TARGET CODES:

WELL HISTORY / CHECKLIST

PERMIT TO DRILL / INTENT TO DRILL

WELL INSPECTION / SCOUT REPORTS

OPERATOR'S TECHNICAL REPORTS / MAPS

ADMINISTRATIVE / SUNDRY REPORTS

CORRESPONDENCE

SURETY

MISCELLANEOUS

WELL HISTORY / CHECKLIST



Well History

Well Name Petro-Lewis #5-22 Peterson Permit No. 606

Location SWNW 22-7S-1E Fall River Date of Permit 10-21-70

Elev. 3534' Gr. API No. 40 047 20045

Confidential _____ **From** _____ **To** _____

Logs Received Dual Induction-Laterlog, Sonic-Gamma Ray

Cuttings Received _____ **Cores Received** _____

Drill Stem Records

Cap Plug and Marker Set

Surface Restored

Plugging Affidavit Signed _____ Date _____

Bond Released YES **Date** 12-29-71

Summary of Scout Reports

11-27-70 FVS Logging. Drilled to T.D.

6-21-71 BL Site approved.



WELL HISTORY

Well Name Petra Lewis # 5-22 Peterson Permit Number 606
Location SW 1/4 22-7a-1E Date of Permit Oct 22, 1970
Elevation 3542 KB API Number _____
Confidential Yes From 11-27-70 To 5-27-71
Logs Received Dual Ind, Sonic Gamma-Ray, Sample
Cuttings Received Yes Cores Received _____
Drill Stem Records Run Oct - No Copy 12-8-70

Cap Plug and Marker Set Approved June 23, 1971
Surface Restored Approved June 23, 1971
Plugging Affidavit Signed _____ Date _____
Bond Released _____ Date _____

Summary of Scout Reports

No Cuttings 29 Apr 1971

PERMIT TO DRILL / INTENT TO DRILL



State Pub. Co., Pierre

APPLICATION FOR PERMIT TO:

S. Dak. Oil & Gas Board
FORM 2

<input checked="" type="checkbox"/> DRILL	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> PLUG BACK	FARM OR LEASE NAME
<input type="checkbox"/> OIL WELL	<input type="checkbox"/> GAS WELL	<input type="checkbox"/> SINGLE ZONE	Peterson
			WELL NO.
			5-22
OPERATOR			FIELD AND POOL OR WILDCAT
PETRO-LEWIS CORPORATION			Wildcat
ADDRESS			NO. ACRES IN LEASE
1224 Denver Club Building, Denver, Colorado, 80202			1/4 SEC. TWP. RGE
LOCATION (to test from an established corner of the legal subdivision)			SW-NW Sec. 22, T7S, R1E
1980' FNL, 660' FWL, SW-NW Section 22, T7S, R1E			Fall River
Fall River County, South Dakota			NO. OF WELLS ETC.
NAME AND ADDRESS OF SURFACE OWNER			ROTARY OR CABLE TOOLS
Mrs. M. Lenore Peterson			Rotary
NAME AND ADDRESS OF CONTRACTOR			APPROXIMATE DATE WORK WILL START
Will follow			October 21, 1970
IF LEASE PURCHASED WITH ANY WELLS DRILLED, FROM WHOM PURCHASED (Name and address)			

PROPOSED CASING AND CEMENTING PROGRAM				
SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	NEW OR SECOND HAND	DEPTH
12-1/4"	8-5/8"	24#	New	165' Minimum To Surface

DESCRIBE PROPOSED OPERATIONS. IF PROPOSAL IS TO DEEPEN OR PLUG BACK, GIVE DATA ON PRESENT PRODUCTIVE ZONE AND PROPOSED NEW PRODUCTIVE ZONE. GIVE BLOW OUT PREVENTER PROGRAM IF ANY.

We propose to drill this well with rotary tools to an approximate depth of 2490' to test the Leo Sand. If commercial production is encountered a 5-1/2" OD 14# oil string will be run and cemented with sufficient cement to displace 1000'.

Certified Surveyors plat attached (3 copies)
Blanket drilling bond #1672873

SIGNED	<i>R. J. Doubek</i>	TITLE	Manager of Operations	DATE	10/7/70
DO NOT WRITE BELOW THIS LINE					
PERMIT NO.	666	CHECKED BY	<i>Patry H. ...</i>	School and Public Lands	Date
APPROVAL DATE	<i>October 2, 1970</i>	Secretary			
CONDITIONS:					
1. COMPLETE SET OF SAMPLES, AND CORES IF TAKEN, MUST BE SUBMITTED.					
2. SAMPLES, AND CORES IF TAKEN, BELOW DEPTH, MUST BE SUBMITTED.					

INSTRUCTIONS

General: This form is designed for submitting proposals to perform certain well operations, as indicated, on all types of lands and lease- for appropriate action by either a Federal or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Consult applicable Federal or State regulations, or appropriate officials, concerning approval of the proposal before operations are started.

If the proposal is to re-drill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate modifications.

If the well is to be, or has been, directionally drilled, so state and show by attached sheets. If necessary, the coordinate location of the hole in any present or objective productive zones.

File 3 copies of this form with Secretary, Oil & Gas Board, Pierre.

(*Sample location: 660' South and 660' East of the Northwest Corner of Section 16.)

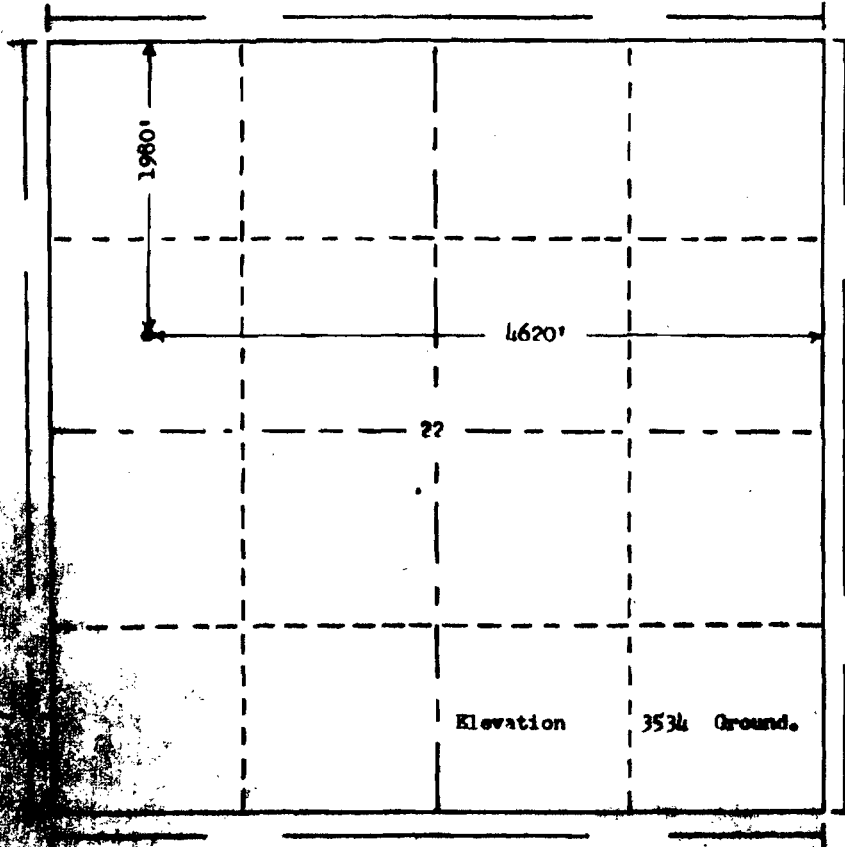


POWERTECH (USA) INC.

Hydro ID 3

8 of 88

R. 1 E.



T.
7
S.

Scale... 1" = 1000'

Surveyed by Elevation Company, Inc. of Denver, Colorado
in accordance with a request from Owen Stevens

Petre Lewis Corporation

to determine the location of #231 Driftwood Area

1980' x 4620'

Section 22 Township 7 S.

1 E. of the Black Hills

Meridian

Fall River

County,

South Dakota

I hereby certify that this plot is an
accurate representation of a correct
survey showing the location of
#231 Driftwood Area

Date: 7-20-70

[Signature]
Licensed Land Surveyor No. 1212 PE
State of South Dakota



POWERTECH (USA) INC.
Hydro ID 3

8 of 89

8. Dak. Oil & Gas Board
FORM 1

STAFF PWS. 68. 1. PWS. 68. 1.

ORGANIZATION REPORT

Full Name of the Company, Organization, or Individual

Petro-Lewis Corporation

Post Office Address (Box or Street Address)

1224 Denver Club Building, Denver, Colorado, 80202

Plan of Organization (State whether organization is a corporation, joint stock association, firm or partnership, or individual)

Corporation

If a re-organization, give name and address of previous organization

(1) If foreign corporation, give State where incorporated

(2) Name and postoffice address of State agent

(3) Date of permit to do business in state

May 28, 1970

Principal Officers or Partners (in partnership)
NAME

TITLE

POSTOFFICE ADDRESS

SEE THE ATTACHED SHEET.

DIRECTORS NAME

POSTOFFICE ADDRESS

SEE THE ATTACHED SHEET.

Executed this the 7th day of October, 19 70

State of Colorado

County of Denver

R. J. Doubek

Signature of Affiant R. J. Doubek

Before me, the undersigned authority, on this day personally appeared R. J. Doubek known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states, that he is duly authorized to make the above report and that he has knowledge of the facts stated herein, and that said report is true and correct.

Subscribed and sworn to before me this 7th day of October, 19 70.

SEAL

My commission expires

7.23, 1971

Betty J. Duron
Notary Public in and for Denver
County, Colorado

DO NOT WRITE BELOW THIS LINE



Hydro ID 3

10 of 69

PETRO-LEWIS CORPORATION

Attachment to Annual Corporate Report
Attachment dated May 15, 1970

Current Officers of the Corporation:

Title:	Name:	Street Address:	City:	State:
President	Jerome A. Lewis	3680 South Downing	Englewood	Colorado
Vice-President	Don E. Mettler	5741 East Nassau Place	Englewood	Colorado
Vice-President	Dwight C. Moorhead	1437 South Fairfax	Denver	Colorado
Vice-President	David A. Frawley	7343 E. Jefferson Drive	Denver	Colorado
Vice-President	Hal H. Wolfe	800 Lotus Way	Broomfield	Colorado
Vice-President	Herbert G. Allen			Colorado
Vice-President	Jim H. Hanlon	2195 Urban Drive	Lakewood	Colorado
Secretary-Treasurer	Robert B. Huffman	3162 South Gaylord	Englewood	Colorado

Current Directors of the Corporation:

Name:	Street Address:	City:	State:
Jerome A. Lewis	3680 South Downing	Englewood	Colorado
Don E. Mettler	5741 East Nassau Place	Englewood	Colorado
Ted P. Stockmar	15 Cherry Street	Denver	Colorado
W. Dale Schouweiler	5212 Indiana	Fort Wayne	Indiana
Cortlandt S. Dietler	888 Logan Street	Denver	Colorado
Carl K. Erpf	960 Park	New York	New York
James W. Vickers	346 North	Wichita	Kansas

July 2012

B-202

Appendix B

WELL INSPECTION / SCOUT REPORTS



POWERTECH (USA) INC.
Hydro ID 3

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SCOUT REPORT
South Dakota Geological Survey

Number 2

Date Scouted 6-21-71

Operator Petro-Lewis Permit Number 606

Farm/Lease Name #5-22 Peterson API Number 40 047 20045

SW Sec. 22, T. 7S, R. 1E, Fall River County

Elev. 3534, Est. T.D. 2490, Actual T.D. 2545, Spudded 11-18-70

Contractor A. L. Schlaikjer Geologist Al Nelson

WORK IN PROGRESS:

DEVELOPMENTS SINCE LAST VISIT:

FORMATION TOPS:

PLUGGING RECORD:

Date Plugged 11-27-70

CASING RECORD:

4 1/2 From 0 To 367 Feet _____ From _____ To _____ Feet
_____ From _____ To _____ Feet _____ From _____ To _____ Feet

REMARKS:

Site approved. Converted to water well, good running well. Area restored and policed.

SCOUTED BY Ross Lamphere
Ross Lamphere, Ass't. Geologist

Fred V. Steece, Jr.
Fred V. Steece, Principal Geologist



POWERTECH (USA) INC.

Hydro ID 3

13 of 89

SCOUT REPORT
South Dakota Geological SurveyNumber 1Date Scouted 11-27-70Operator Petro-Lewis Permit Number 506Farm/Lease Name # 5-22 Peterson API Number 40 047 20045SWNW Sec. 22 T. 7S R. 1E Fall River CountyElev. 3534 Gr. Est. T.D. 2490 Actual T.D. 2545 Spudded 11-18-70Contractor A. L. Schlaikjer Geologist Al Nelson

WORK IN PROGRESS:

Logging

DST #1-2381-2395: IHP 1111, FH 1106, IF 20, FF20, IF 30, FF 75, SIP 963, SIP₂ 907, Flow, 15 min, SIP. 15 min, Flow₂ 45 min, SIP₂ 15 min, BHT 96°, mud wt. 9.5, viscosity 60; tool opened w/very weak blow and remained op 5 min, tool op w/very weak blow 1/4" under water, remained for 10 min, then intermittent blow. Rec: 140 fluid; 60' GCM w/sulfur smell, 80' water w/acum of oil and sulfur smelling gas; water flow throughout test; Resistivity: water 40.62 pf cl content 18,000ppm mud pit spl 2.6 @ 60 of cl content 2,500 ppm.

DEVELOPMENTS SINCE LAST VISIT:

Drilled to T.D.

FORMATION TOPS: (Al Nelson)

Fall River-----324	Gooseegg-----1441	2nd Converse-----1961-1991
Fuson-----452	Forellels-----1599	3rd Converse-----2076-2094
Lakota-----469	Glendo-----1618	4th Converse-----2154-2165
Morrison-----700	Minnekahta-----1704	Red Marker-----2237-2247
Sundance-----848	Opeche-----1738	2nd Leo-----2353
Lak-----966	Minnelusa-----1815	Des Moines-----2416
Basal Sund Sd-----1061	1st Converse-----1838	
Spearfish-----1174	Massive Anhydrite 1911-1942	

PLUGGING RECORD:

Date Plugged 11-27-70

40 sax--2410-2300 Leo
30 sax--1850-1750 Converse
30 sax--1130-1030 Basal Sand

CASING RECORD:

From _____ To _____ Feet	From _____ To _____ Feet
From _____ To _____ Feet	From _____ To _____ Feet

REMARKS:

Plugged back to Morrison, 1/2 casing ran to 367 and well completed as water well for Peterson farm; flow approx. 25.35 gal per min.

SCOUTED BY Fred V. Steece

Fred V. Steece, Principal Geologist



Peterson Lewis #5-2 Peterson
SW NW 22-7S-1E Fall River
1980 FNL and 4620 FEL

14 of 89

10-29-70

No activity, location
staked, but no work
done.

PERMIT: 606 (10-21-70)

11-19-70

API: 40 047 20045

ELEV: 3534 Gr 3542 KB

CONTR: A.L. Schlaepfer 5662-7249

GEOL: Al Nelson Edgemont

ENGR: W.J. Mc Peters

SPUD: 11-18-70 (1:15 AM)

EST T.D.: 2490

CASING: 8 5/8 - 167

CORES: None

DST'S: 2381-2395

LOGS: DIL & Sonic GR

T.D.: 2545 Drlr 2544 Cog

PLUG: 11-27-70

Phone call from
Al Nelson saying
well was started and
that he would let
me know when
ready to plug.
Said, Petroleum plans
3 tests in Edgemont
area.

11-26-70

Nelson called saying
would be logging
late tonight, ready
to plug in A.M.



Hydro ID 3

15 of 69

Plug Program :

40 day — 2410-2300 Leo

30 day — 1850-1750 Cawea

30 day — 1130-1030 Band

plan to run 360 — 4 1/2
casing and convert to
water well. Schlumberger w/
do them before they
tear down.

DST #1 (Leo Sand)
2391-2395:

HP 1111, FH 1106, IF 20

FF 20, IF 30, FF 75, SIP, 963,

SIP, 907, Flow 1.5 min,

SIP 1 1/2 min, Flow 2.45 min,

SIP, 15 min, BHT 96, Mud

cut 9.5, viscosity 60; Tool
opened with a very weak

flow and remained

op 5 min, tool op w/ very weak

flow 1/4" under water,

remained for 10 min, then

intermittent flow. By passed

tool to see if plugged; Rec

140 fluid; 60' gas 6 CM

w/ sulfur smell, 80' water at

seam of oil & sulfur smelling

gas. Water flowed through

out test.

Resistivity: water .4 @ 62

of Cl content 18,000 ppm

mud pit spl 2.6 @ 60 of

Cl content 2000 ppm



Formation - ops

Kd	324
Fuson	447 452
Lakota	508 469
Morr.	700
Sand	848
Lak	966
Basal Sh.	1061
Spear	1174
Goosey	1441
Forelle Lime	1599
Gleado Sh	1618
Mk	1704
Opeche	1738
Minnelusa	1815
Comerse	1838
Massive Halysite	1911
Base	1942
2 nd Converse	1961 - 1991

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3 rd Conw	2076 - 2094
4 th Conw	2154 - 2165
Basal conw	2226
Red Mark	2237 - 2247
2 nd Leo	2353 -
Des Moines	2416
TD	2545
	2544

Drill
Log

Site Imp.

Converted to H₂O well
is a good running well.
Area is restored
not real level. are
paved.



OPERATOR'S TECHNICAL REPORTS / MAPS



POWERTECH (USA) INC.

Hydro ID 3

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PHONE 522-1206 AREA 303

VIRG'S TESTERS, INC.

BOX 712 STERLING, COLORADO

Contractor A. L. Schlaikjer, Inc. Top Choke 1"
 Rig No. 4 Bottom Choke 9/16"
 Spot SW-NW Size Hole 7 7/8"
 Sec. 22 Size Rat Hole None
 Twp. 7 S Size & Wt. D. P. 3 1/2" 13.30
 Rng. 1 E Size Wt. Pipe None
 Field Wildcat I. D. of D. C. 2 1/4"
 County Fall River Length of D. C. 512'
 State South Dakota Total Depth 2395'
 Elevation 3534' "Ground" Interval Tested 2381-2395
 Formation "2nd Leo" Sand Type of Test Straight
 Tool Open @ 10:00 A.M.
 Flow #1 5 Min. SIP #1 15 Min. Flow #2 45 Min. SIP #2 15 Min.
 Flow #3 Min. SIP #3 Min. Flow #4 Min. SIP #4 Min.
 B. H. T. 96° Gravity
 Mud Wt. 9.0 Viscosity 60

TOOL SEQUENCE

2373-----

2381-----

TD 2395-----

Operator Petro-Lewis Corp.
Address See DistributionWell Name and No. Peterson #5-22
Ticket No. 0706

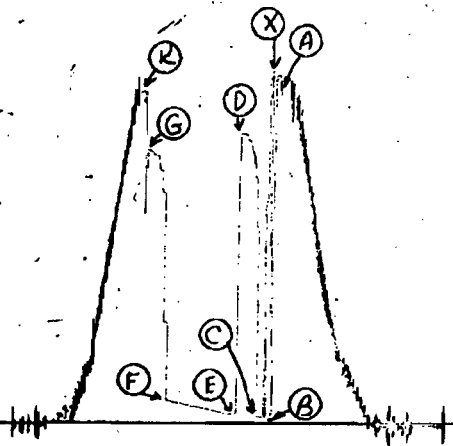
Date 11-25-70

DST No. 1
No. Final Copies 10

PRD Make <u>Kuster AK-1</u>			
No. <u>1153</u>	Cap. <u>2000</u>	@ <u>2361</u>	
Press	Field	Corrected	
IH	A	1111	1102 ✓
FH	K	1106	1100 ✓
Flow #1-IF	B	20	1 ✓
FF	C	20	21 ✓
SIP #1	D	963	969 ✓
Flow #2-IF	E	30	31 ✓
FF	F	75	76 ✓
SIP #2	G	907	914 ✓
Flow #3-IF	H	None	Taken
FF	I	"	"
SIP #3	J	"	"
Pressure Below Bottom Packer Blsd To			
Our Tester: <u>Lloyd Welty</u>			
Witnessed By: <u>S. A. Nelson</u>			

T-0786

R-4153-N



RECOVERY IN PIPE

DID WELL FLOW - Gas No Oil No Water No

140' Total fluid

60' Gas-cut mud with a sulphur smell = .29 Bbl.

80' Water with a scum of oil & sulphur smelling gas = .39 Bbl.

REMARKS:

1st Flow - Very weak blow throughout period.

2nd Flow - Tool opened with a very weak blow (1/4" under water), remained for 10 minutes, then decreased to intermittent blow for remainder of test.

By-passed tool after 50 minutes (point "X") to see if it was plugged.

Well had 3" to 4" water flow from annulus throughout test. 3' fillup on bottom.

Breakdown of Shut-in curves not practical because of very bad stair-stepping on Shut-in curves, caused by tight formation.

TIGHT HOLE



POWERTECH (USA) INC.

Hydro ID 3

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Phone 822-1206

VIRG'S TESTERS, INC.

Box 712 - Sterling, Colo.

Fluid Sample Report

Date 11-25-70 Ticket No. 0786
Company Petro-Lewis Corp.
Well Name & No. Peterson #5-22 DST No. 1
County Fall River State South Dakota
Sampler No. 02 Test Interval 2381-2395

Pressure in Sampler 11 PSIG BHT 96 OF

Total Volume of Sampler: 2150 cc.
Sample: 2150 cc.
Oil: 10 cc.
Water: 2140 cc.
Mud: None cc.
Gas: None cu. ft.
Other: None

Resistivity

Water: 4 @ 62° of Chloride Content 17,200 ppm.

Mud Pit Sample 2.6 @ 60° of Chloride Content 2,550 ppm.

Gas/Oil Ratio Gravity °API @ OF

Where was sample drained Rig Floor

Remarks:

**DISTRIBUTION OF FINAL DST REPORTS**

Company Operating Well Petro-Lewis Corp. Tkt. No. 0786
Lease Peterson Well No. 5-22 Field Wildcat
County Fall River State South Dakota Sec. 22 Twp. 7 S Rng. 1 E Spot SW-NW
DST. No. 1 Date of Test 11-25-70 Interval Tested 2381-2395

BE SURE AND SHOW CORRECT ADDRESS AND NUMBER OF COPIES. STATE ADDRESS TO WHICH ORIGINAL CHART WILL BE MAILED.

- ✓ Original & 5 copies: Petro-Lewis Corp., 1224 Denver Club Bldg., Denver, Colo. 80202
- ✓ 2 copies: Amarillo Oil Co., Box 151, Amarillo, Texas 79105
- ✓ 1 copy: George Wolf, 811 1st Nat'l Bank Bldg., Casper, Wyo. 82601
- ✓ 1 copy: John Trotter, 313 Consolidated Royalty Bldg., Casper, Wyo. 82601
- 1 copy: Al Nelson, 408 Majestic Bldg., Denver, Colo. 80202

Our Tester _____ Approved by _____

G. ALLAN NELSON
CONSULTING PETROLEUM GEOLOGIST
408
ROOM 408, MAJESTIC BLDG. CODE 303
255-7750 Res. 322-0325
DENVER, COLORADO, 80202

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1971

GEOLOGICAL WELL REPORT

PETRO-LEWIS
#5-22 PETERSON

C SW NW SEC. 22, T. 7 S., R. 1 E.
FALL RIVER COUNTY, SOUTH DAKOTA
(Wildcat)

INDEX

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Hole Deviation Surveys	30
Bit Record	31
Drilling Progress Summary	32

WELL DATA

LOCATION: 4620' from the East line and 1980' from the North line, C SW NW of Section 22, Township 7 South, Range 1 East, Fall River County, South Dakota.

ELEVATION: 3534 ground (before and after grading).
3542 kelly bushing (7.6' from ground to K.B.).
(Surveyed by Powers, 7-24-70).

TYPE WELL: Wildcat (Driftwood Canyon Prospect).

SPUD DATE: 1:15 A. M., November 18, 1970.

COMPLETION DATE: Approximately 5:00 P. M., November 27, 1970
(Finished plugging).

CASING RECORD: Ran 4 joints of new 8 5/8" surface casing, totalling 167', 8 round, 20 pound. Cemented with 100 sax regular cement with 3% Calcium chloride (Plug down at 10:15 A. M., November 18, 1970. Cement circulated). Pipe set at 177 K. B.

TOTAL DEPTH: 2545 Driller.
2544 Schlumberger.

DEEPEST FORMATION PENETRATED: Pre-Second Leo Sand (Des Moines or older).

DEPTH DATUM: 3542 K. B.

WELL STATUS: Plugged and abandoned (Landowner ran pipe into Dakota Sand to complete as flowing water well from Dakota-Lakota).

MUD PROGRAM: Mixed mud while drilling surface hole to combat lost circulation in river bed sands and gravels; mixed gel. Came out from under surface with native mud and gel and water and a 32-33 vis. Make-up water from nearby Beaver Creek.

WELL DATA (Continued)

Jetted pits at 953 in Sundance in order to convert to red bed type mud. Added 4 sacks of Caustic, 2 sacks of Soda Ash, and 6 sacks of Stabil-Vis. Requirements: 32-35 vis., wt. low as possible. On first trip below surface at 1086 in Sundance hole was flowing a 2" stream of water.

HOLE SIZE: 12 1/4" from surface to 178.
7 7/8" from 178 to 2545 T. D.

CORES: (None).

DRILL-STEM TEST: D.S.T. #1 2379-93 P. D. (Second Leo Sand).

LOGS: Ran Schlumberger Dual Induction-Laterolog first, running a logarithmic 5" and a logarithmic 2" from 2544 T. D. up above the Minnekahta. Then dropped back to bottom and came up to 1736 just above base of Opeche with another logarithmic 5" (repeat) and a linear 2". From above the Minnelusa ran a linear 2" and a linear 5" to base of surface casing at 177 K. B.

Second logs run consisted of the Borehole Compensated Sonic Log with Gamma Ray-Caliper Logs. Ran 5" Sonic, etc., from 2544 T. D. up above Minnelusa to 1732. Then ran a 5" repeat over same interval to see if variance was above 2%. Sonic was repeating good in Minnelusa so continued all the way out to base of surface casing at 177 K. B., running a 5" and 2".

At approximately 1700 added 2 sacks of C.M.C. (Driscose) to lower water loss to 10 cc. or less going into Minnelusa Converse section. At 2206 in lower Converse added 1320 gallons of #2 Diesel to speed drilling and prevent drill column getting stuck in hole. At approximately 2150 added 2 sacks of C.M.C. to lower water loss to 5 cc. or less for drilling Leo Section of Minnelusa. In this part

WELL DATA (Continued)

of section vis. was 38-40, wt. 9.9, Ph. 9.5 or more. Raised vis. to 72 for D.S.T. of Second Leo Sand.

Raised vis. with Gel and detergent for logging at 2545 T. D. Could not get vis. above 44 due to Dakota-Lakota water flow in upper hole; had no problems logging.

Mud furnished by American Mud Company, Gillette, Wyoming. Mud checks on location made every 1-2 days by engineer, Dick Myers, Gillette.

Est. mud bill at 2540, 5' above T. D.:
\$3,344.35.

Logging truck and personnel from Gillette, Wyoming. Engineer: Mr. Golas. (Calculations in rear of report).

PLUGGING RECORD:

40 sacks from 2420 to 2300 across Red Marker.
30 sacks from 1850 to 1750 across top of Converse.

30 sacks from 1130 to 1030 across Basal Sand of Sundance.

Cementing by Halco.

Finished plugging at approximately 5:00 P.M., November 27, 1970. (Left Dakota-Lakota open for flowing water well for landowner; contractor ran pipe into Dakota).

**CONTRACTOR AND
RIG EQUIPMENT:**

Schlaikjer Drilling Company, Newcastle, Wyoming.

Pusher: C. W. McPeters, part owner.

Rig. No. 4.

Spencer-Harris 6000 - Made in 1969 (trailer-mounted rig).

Spencer-Harris 97' derrick (pulls doubles) and trailer.

Bethlehem S-45E with 15" double T. W. in Hydromatic.

WELL DATA (Continued)

- 1 335 H.P. Cummins Diesel engine powering drawworks.
- 1 D-300 Emsco mud pump, 7 1/4" x 14", with 5 1/2" liners.
- 2 6-71 (twins) G.M.C. engines with H.D. gear box, 300 H.P., powering mud pump. Space-Saver Cameron S.S. 8" blow-out preventer with 2 valve Cameron hydraulic closing unit.
- 19 5 1/2" O.D. drill collars with 2 1/4" bore.
- 6,000' 3 1/2" I.F. Reed drill pipe with square shoulder tool joints.
Caterpillar D-315 generator with 25 K.W. gas engine standby.
32' trailer house.
- 1 auxiliary 4 x 6 Gardner-Denver mud-mixing pump.
New General Electric 2-way radio system on rig, in pusher's car, and in Newcastle office.

SAMPLE STORAGE:

Samples were shipped to American Stratigraphic in Casper where library cut will be made. Operator's complimentary cut will be sent to South Dakota Geological Survey as required.

**DRILLING TIME
RECORDS:**

Original copy of Geolograph 1' drilling time charts is on file in Denver office of G. A. Nelson.

LOG FORMATION TOPS

All depths are measured from 3542 K. B.

<u>FORMATION</u>	<u>DEPTH</u>	<u>DATUM</u>
LOWER CRETACEOUS	Surface	
MOWRY SHALE	Surface	
MUDDY SAND (NEWCASTLE)	(Behind pipe in surface hole)	
SKULL CREEK SHALE	(Behind pipe in surface hole)	
DAKOTA FORMATION (FALL RIVER FORMATION)	324	+3218
FUSON SHALE (FUSON MEMBER OF LAKOTA FORMATION)	452	
LAKOTA SANDS	469	+3073
UPPER JURASSIC	700	+2842
MORRISON FORMATION	700	+2842
SUNDANCE FORMATION	832	+2710
REDWATER SHALE MEMBER	832	
LAK MEMBER	966	
TENTATIVE HULETT SAND	1061	
BASE OF SAND	1092	
TENTATIVE STOCKADE BEAVER SHALE	1092	
TENTATIVE TOP OF BASAL SAND	1144	
TRIASSIC	1174	+2368
SPEARFISH FORMATION	1174	+2368
PERMIAN	1441	+2101

LOG FORMATION TOPS (Continued)

<u>FORMATION</u>	<u>DEPTH</u>	<u>DATUM</u>
GOOSE EGG FORMATION	1441	+2101
FORELLE LIME MEMBER	1594	
GLENDON SHALE MEMBER	1618	
MINNEKAHTA LIME MEMBER	1704	+1838
OPECHE SHALE MEMBER	1738	
MINNELUSA FORMATION (REWORKED MINNELUSA)	1815	+1727
UPPER MINNELUSA (PERMIAN)	1815	+1727
FIRST CONVERSE SAND	1838	+1704
MASSIVE ANHYDRITE	1911	
BASE ANHYDRITE	1942	
SECOND CONVERSE SAND	1961	
BASE OF SAND	1991	
TENTATIVE TOP OF THIRD CONVERSE SAND	2089	+1453
BASE OF SAND	2094	
FOURTH CONVERSE SAND	2154	+1388
BASE OF SAND	2165	
BASAL CONVERSE SAND	2226	
RED MARKER	2237	+1305
BASE RED MARKER	2247	
PENNSYLVANIAN	2247	+1295
MIDDLE MINNELUSA (LEO SECTION)	2247	+1295
VIRGIL	2247	+1295
MISSOURI	2353	+1189
SECOND LEO SAND	2354	+1188



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LOG FORMATION TOPS (Continued)

<u>FORMATION</u>	<u>DEPTH</u>	<u>DATUM</u>
BASE OF SANDS	2396	
DES MOINES (?)	2416	+1126
TOTAL DEPTH DRILLER	2545	
TOTAL DEPTH SCHLUMBERGER	2544	

SAMPLE LITHOLOGIC DESCRIPTION

All depths are from 3542 K. B.

All sample depths following have been corrected for lag, and then matched to drilling time breaks wherever possible. *Sample lithology is then matched to log lithology so all lithology following matches log.

All shows are underlined with a solid line. Possible shows are shown with a dashed line.

<u>DEPTH</u>	<u>LITHOLOGY</u>
Surface	LOWER CRETACEOUS
Surface	MOWRY SHALE
	(Surface pipe to 177 K. B.; Muddy Sand or Newcastle Sand probably behind surface pipe).
	(Samples below are caught and described every 30').
180-200	Silty shale, steel gray, very soft Skull Creek; muddy cave: sandstone, gray, dark gray, shaly, dirty, limy, glauconitic, biotitic, very hard and tight; trace light gray inoceramus prism veinlet on same gray shale; trace sandstone, light gray, very fine, soft, porous; no fluorescence.
200-32	Same shale.
232-64	Same dark steel gray, very soft shale.
264-324	Same shale; trace light brown inoceramus prisms; trace loose pyrite.
324 (+3218)	DAKOTA FORMATION (FALL RIVER FORMATION)
324-28	Abundant sandstone, light gray, lot of sandstone laminated with black silty shale, no show, slightly dirty, very fine to fine, well-cemented, poor visible porosity, hard to soft, also gray; sandstone, fine, soft, porous, no show, white, friable; loose pyrite, crystalline to sandy with embedded sand grains; all with no fluorescence.



328-54

Shaly siltstone, light gray with thin blackish shaly laminations; sandstone, fine, slightly sugary, visible porosity, some glauconite, no show, soft, also very fine, light gray, few carbonaceous spots; also dark gray, very shaly siltstone; sandstone has spotty white cementation; no fluorescence; in stoppered shell vial Dakota cuttings above 354 are cut in C. Tet. solution with no fluorescence in resulting solution; this indicates no oil in samples.

354-78

Abundant shaly siltstone, dark gray; some friable, porous sand as above, no show; first traces of waxy clay, tannish light gray, grayish brown and gray (possibly Fuson); lot of small black carbonaceous spots and streaks in siltstone, no visible porosity, no show, no fluorescence.

378-452

Same dark gray shaly siltstone and fine light gray sandstone as above with good porosity, soft, white clay spots, no show; limited same waxy clay, tannish gray mottled with black (Fuson?); very shaly siltstone, gray mottled blackish, hard, tight; gray waxy clay.

452

FUSON SHALE

452-55

Abundant very soft clay, waxy, light gray, tannish light gray, whitish; grayish light green, very waxy, very soft; part sandy where light gray.

455-469

Same whitish, light gray clay; also mostly grayish purple and red.

469 (+3073)

LAKOTA SANDS

469-98

Abundant snow white sandstone, highly kaolinitic with abundant white waxy clay cementation, no show, non-calcareous, very fine to fine, no visible porosity, mushy soft, abundant pyrite, few fine grains (Lakota top marked by extremely fast drilling).

498-522

Same as above, mostly loose sand grains, clear, very fine to fine to fine-plus, unconsolidated, few medium grains; very abundant pyrite; limited light gray sandstone, no show, fine, cleaner, friable, porous; all with no fluorescence; shale breaks of very waxy clay, bluish white, very pale green; trace chert, smoky gray with tiny white spots, very coarse, subangular.

- 522-45 Traces sandstone, slightly tannish light gray possibly stained, very fine to mostly fine, excellent visible porosity, friable, no fluorescence; abundant very sandy lime, grayish tan, very hard, dense, earthy; abundant loose pyrite, limited medium crystalline, mostly very sandy with embedded sand grains, very fine to fine, part all fine-plus; abundant chert, light gray translucent, tan; loose clear quartz sand grains, fine to medium to medium-plus.
- 545-77 All very dark gray shale (sand on log), slightly waxy, almost black, part slightly sandy; traces conglomeratic sandstone, clean, very sugary, fine to medium, no show; trace loose clear chert, coarse, angular, also frosted, milky white; ironstone (?) stringer, tannish brown, part very sandy, dense, very hard (Morrison-type shale).
- 577-620 Same greenish black shale, slightly waxy, very soft; trace chert, clear, angular, very coarse; traces brown sand, very fine, very well-cemented, no show, no visible porosity, very hard, tight, limy.
- 620-48 Abundant pebbles, mostly very coarse-plus, sub-angular, brown, milky white, clear angular; loose pyrite (pebbles surface cave?); same shale.
- 648-62 (Poor sample, mostly cave).
- 662-700 Loose chert, clear, pink opaque, yellow, subangular, very coarse to pebble size; loose sand grains, very poorly sorted very fine, fine, medium, coarse, very coarse, mostly clear; abundant loose pyrite.
- 700 (+2842) JURASSIC
- 700 (+2842) MORRISON FORMATION
- 700-42 Abundant pale green waxy clay, very soft, with embedded tan lime spots.
- 742-74 Same green clay; increasing tan dense lime.
- 774-803 Same green clay, becoming dark gray; limited limestone stringers, tan with green spots; traces sandstone, gray, light gray, very fine to fine, no show, no visible porosity, hard, tight, limy cementation.
- 803-32 Limestone, very light tan, cream, very dense, very hard; traces dark brown limestone, highly microfossiliferous, hard; trace sandstone, cream, very limy, very fine, very well-cemented, scat-

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tered orange grains, no visible porosity, hard, tight.

832 (+2710) SUNDANCE FORMATION

832 REDWATER SHALE MEMBER

832-33 Trace dark gray shaly siltstone, highly glauconitic with dark green grains, very soft; trace shaly siltstone, greenish gray, highly glauconitic, very fine and finer grains.

833-86 (Missing samples).

886-920 Silty shale, dark gray, very soft; very shaly sand to siltstone, dark gray, very, very fine where sand, very silty, highly biotitic and glauconitic, very soft, no porosity.

920-40 Waxy shale, pale green, very soft; dense limestone stringer, light gray, very hard; sandstone, light gray, very fine and finer, limy, scattered dark green glauconite grains, slightly soft.

940-66 Same waxy green shale; same very, very fine sandstone, cream, limited glauconite, no show, soft to slightly soft, no porosity.

966 LAK MEMBER OF SUNDANCE

966-70 Very shaly sand, dark orange, very fine and finer, excellent sorting, no visible porosity, no show, slightly soft; very silty shale, orange red, soft.

970-98 Same sand, orange brown, very fine, no show, soft.

998-1002 Waxy shale, dark gray to blackish.

1002-52 Black waxy shale, very soft.

1052-61 TENTATIVE HULETT SAND

1061-76 (Circulated 20" sample at 1076 before trip for bit in prospective zone). Traces light gray sandstone, very, very fine, excellent sorting, no show, friable, porous; also slightly greenish light gray sandstone, very fine to very, very fine, excellent sorting, no show, glauconitic, porous, soft to slightly soft where more cemented, no fluorescence.

1076-92 Same as above, becoming slightly shalier grayish; trace very pale green waxy shale laminations on sand; all with no show; trace light gray sandstone, very fine, excellent sorting, no show, well-cemented but porous, soft; all with no fluorescence.



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1092	TENTATIVE STOCKADE BEAVER SHALE
1092-1144	(Shale on log).
1144	TENTATIVE TOP OF BASAL SAND OF SUNDANCE
1144-74	Sandstone, clean, friable, excellent visible porosity; traces tannish light gray sandstone, very fine, excellent sorting, spotty clay cementation in part.
1174 (+2368)	TRIASSIC
1174 (+2368)	SPEARFISH FORMATION
1174-1207	Smooth shale, red, part silty, all soft.
1207-37	Abundant silty shale, brownish red, finely biotitic, few small light gray spots.
1237-68	Same silty shale, orange red, brownish red, finely biotitic, soft to slightly soft.
1268-1304	Same shale, traces sandy.
1304-36	Same shale, trace greenish gray large spot.
1336-67	Same shale and silty shale.
1367-97	Same shale; trace fibrous white anhydrite veinlet in shale.
1397-1441	Same silty shale, brownish red, orange red; traces loose white fibrous anhydrite; traces white anhydrite inclusions in shale.
1441 (+2101)	PERMIAN
1441 (+2101)	GOOSE EGG FORMATION
1441-48	(7' of slower drilling). (Probably anhydrite --none visible in samples).
1448-61	Silty shale, brick red; small round light green spots in smooth red shale.
1461-81	Silty shale, brick red.
1481-96	Anhydrite, white, orange white, dense, hard.
1496-1524	Silty shale, orange red, white anhydrite inclusions; anhydrite, white, grayish white, dense, hard; white fibrous anhydrite trace, veinlet.
1524-94	Same shale, orange red, few small round light green spots; anhydrite interbeds, white, gray, dense, as above.
1594	FORELLE LIME MEMBER OF GOOSE EGG



1594-98	Abundant anhydrite, white mottled violet dense, hard; trace dolomite, bright orange adjacent to cream, dense, hard.
1598-1604	Anhydrite, white mottled with purple, dense, hard, becoming very shaly dark purple.
1604-14	Trace tan lime, dense, flaky; traces pink dolomitic lime to limy dolomite.
1614-18	Traces limestone, dolomitic limestone, cream, dense, very hard; trace dark tan dense lime.
1618	GLENDON SHALE MEMBER OF GOOSE EGG
1618-25	Shale, silty, finely sandy, dark orange, soft to hard.
1625-41	Same shale, very silty, few anhydrite inclusions and streaks.
1641-48	Same shale.
1648-59	Same shale; trace whitish anhydrite inclusion.
1659-67	Same as above; few white anhydrite inclusions, few small light green round spots.
1667-77	Same orange red silty shale with few white anhydrite inclusions.
1677-90	Same as above, trace anhydrite as veinlet on shale.
1690-1708	(Missing due to no circulation for sample just before trip at 1708 in nonprospective zone).
1704 (+1838)	MINNEKAHTA LIME MEMBER OF GOOSE EGG
1708-13	Limestone, cream to white chalky soft grading into tannish brown dense hard; trace light red slightly chalky limestone; trace dark orange anhydrite, very hard.
1713-22	Pink dense limestone, hard; tannish pink limestone, dense, hard; also lime, chalky white to dense tan.
1722-38	(Missing).
1738	OPECHE SHALE MEMBER OF GOOSE EGG
1738-40	Silty shale, brownish red, reddish brown.
1740-49	(Poor sample, mostly cave).
1749-59	Silty shale, orange, orange red, soft to slightly soft.
1759-69	Silty shale, brick red, soft.
1769-79	Silty shale, brick red, soft to slightly soft, few greenish gray spots.



- 1779-89 Top 4' white anhydrite, microcrystalline, soft, to dense gray; bottom 6' same silty shale as above, few white anhydrite inclusions, small round green spots also; trace very sandy anhydrite to anhydritic sand trace, light gray, fine to fine-plus grains which powder under pressure.
- 1789-1815 Same brick red silty shale with few green small round spots; abundant white anhydrite, microcrystalline, part dense gray, hard.
- 1815 (+1727) MINNELUSA FORMATION (REWORKED MINNELUSA)
- 1815 (+1727) UPPER MINNELUSA (PERMIAN)
- 1815-16 Trace very shaly sand, fine, orange, soft, no show, no visible porosity; trace dark brown possibly stained sand, very quartzitic, very fine, excellent sorting, no visible porosity, very hard and tight, tiny pyrite specks, very well-cemented, to quartzite, no fluorescence.
- 1816-27 (No consolidated sand). Loose sand grains, light orange clear, poorly sorted very fine to fine to medium to medium-plus, also all clear, subround to round.
- 1827-33 Trace grayish tan possibly stained sand, very fine, well sorted, very well-cemented, no visible porosity, dolomitic cementation in part, trace pyrite speck; traces very anhydritic sandstone, conglomeratic, very poorly sorted very fine to fine to medium grains, light orange grains, * like those disintegrated just above, in white anhydrite matrix, no show, very well-cemented, no visible porosity, hard to slightly soft; all with no fluorescence.
- 1833-38 Trace same shaly sand as above, very fine to fine grains in orange red shaly matrix, no visible porosity, very well-cemented, no show, slightly soft, light orange clear grains when disintegrated, no fluorescence.
- 1838 (+1704) FIRST CONVERSE SAND
- 1838-43 (Fast drilling of 1+\"/>

	calcareous, loosely consolidated; traces dark red very shaly sandstone, very fine, well-cemented, less porous, no show, same as white sand but abundant red silty shale spots; all with no fluorescence.
1843-52	Same as above, mostly clean, white, light gray sugary sandstone, very anhydritic cementation, non-calcareous, fine to fine-plus, clear round to subround grains, excellent visible porosity, traces red shaly sandstone, very fine; all with no show, no fluorescence.
1852-56	(Slower drilling, tighter sand). (Poor sample due to abundant Sundance cave from water flow uphole). Traces same white sandstone, no show, fine, friable, no show, excellent visible porosity, no fluorescence.
1856-70	(Mostly very rapid drilling like very soft, porous sand). (Very poor sample, all cave, no visible sand or sand grains).
1870-94	(Same rapid drilling like very soft, porous sand). (Very poor sample, all cave, no visible sand nor sand grains).
1894-1911	(Top slower drilling like tight sand or anhydrite-dolomite; bottom fast drilling like soft, porous sand).
1911	MASSIVE ANHYDRITE
1911-21	Anhydrite, all hard, white finely crystalline to denser tannish cream, grading into very anhydritic dolomite, pinkish tan, and chalky white limestone; also white anhydrite mottled with orange to reddish denser anhydrite.
1921-29	Anhydrite, snow white, microcrystalline, slightly soft, to denser gray, hard, with tiny round white spots embedded; trace red silty shale on white anhydrite; trace white anhydrite with red shaly anhydritic dolomite.
1929-42	(Circulated 20" sample at 1945 just before trip for bit). Very dense hard anhydrite, white to denser orange red to purplish red; also chalky dolomite, dark pink, silty, limy where whiter, all purplish pink, slightly soft.
1942	BASE OF ANHYDRITE
1942-45	(Missing due to intentionally not circulating longer).



1945-56

(Poor sample, mostly cave following trip at 1945). Dolomite, anhydritic dolomite, tan, cryptocrystalline, distinctive tiny red silty shale spots scattered in part.

1956-60

(Missing).

1960-61

Tan anhydritic dolomite; mostly pink slightly silty anhydritic dolomite with light red shaly streaks, few small clear finely crystalline anhydrite spots.

1961

SECOND CONVERSE SAND

1961-65

Trace sandstone, light orange, very fine to fine, well-cemented but soft, no show, anhydritic cementation, light orange clear grains, no fluorescence, trace dolomitic cementation, porous, few small white spots.

1965-85

(1965 top of best porosity, breakdown to less than 1"/ft. from 1965 to 1968, same from 1970 to 1977, and from 1930 to 1985). (Very poor sample, mostly Sundance cave). Trace sandstone, white, very fine, friable, excellent visible porosity, no show; trace reddish orange sandstone, very fine, excellent sorting, shaly, no visible porosity, no show, silty; all with no fluorescence; trace same light orange sandstone; loose grains very fine to fine, light orange clear, subround.

Increasing sandstone, tannish light gray, possibly stained, as above, very fine, well-sorted, porous, friable, becoming less sorted very fine to fine, slightly dolomitic cementation, slightly yellowish, clear grains slightly yellowish, subround to round; trace pink silty well-cemented, soft; all with no fluorescence; sandstone, light orange white, very fine to fine, friable, soft, excellent visible porosity, no show, no fluorescence.

(Representative cuttings from Second Converse Sand were cut in C. Tet. in stoppered shell vial; resulting solution had no fluorescence, indicating no oil in cuttings).

1985-88

(Drills like sand but slower than above, suggesting less porous sand). (Poor sample, abundant cave). Trace sandstone, pinkish light gray, very fine, good sorting, porous, friable, no show, few tiny white spots like clay; traces sandstone, snow white with abundant clay cementation, no

1988-91	porosity, no show, non-calcareous, very fine to fine-plus, clear grains, round, friable. Trace fairly clean light gray sandstone, sugary very fine to fine-plus, excellent visible porosity, friable, no show.
1991	BASE OF SECOND CONVERSE SAND
1991-2006	Trace very anhydritic dolomite to dolomitic lime, grayish brown, slightly cherty, with tiny black spots of possible microfossils; trace light brown limestone, hard, brittle, dense; trace chalky limestone, light brown, mottled with light green shale, highly microfossiliferous with tiny round "bugs."
2006-18	Limestone, silty, chalky, grayish tan to tannish gray with small blackish spots, also tannish light gray to whitish chalkier with same black spots, slightly soft to hard and brittle where grayer (* good pre-Second Converse Sand marker bed).
2018-26	(Slower drilling, harder). (Poor sample, unusable, all cave).
2026-41	(Poor sample, cave). Traces very anhydritic dolomite, light to dark greenish brown, cryptocrystalline, intermingled with snow white anhydrite, microcrystalline; trace dark brown limestone, cherty, dense, with trace round microfossil fragment.
2041-46	Silty dolomite to limestone, tan, light tan, grayish tan denser, part lighter tan anhydritic denser; trace very dense limestone, cherty, tannish brown, highly microfossiliferous with cream "bugs" in brown limestone matrix, with encrusting waxy; trace chalky limestone, green shaly.
2046-59	Silty limestone, dolomitic, chalky, dark tan, light tan, cream, slightly soft where chalky to hard where dark tan.
2059-69	Anhydrite, white to tannish white, finely crystalline, denser dark gray.
2069-75	Abundant orange red dolomite (?) with anhydrite inclusions; top anhydrite, white to brown; trace brown limestone, slightly silty, hard, brittle; bottom faster drilling possibly sandstone with some porosity: loose sand grains, very fine to fine, clear.
2075-86	Anhydritic dolomite, greenish dark tan, dense, cryptocrystalline, slightly limy on fresh surface,



- 2086-89 hard, brittle, part siltier, greenish gray,
 slightly soft to soft.
 Snow white anhydrite.
- 2089 TENTATIVE THIRD CONVERSE SAND
- 2089-94 Abundant greenish white quartzite, also gray,
 grading into greenish white sandstone and white
 sandstone, very fine, excellent sorting, all
 very well-cemented, no visible porosity, very
 hard and tight where quartzitic to soft where
 greenish white silty to white silty; trace white
 sandstone, very fine to fine, anhydritic; all
 with no show; non-calcareous, anhydritic; less
 of shaly light red sandstone mottled with same
 white sandstone, few fine grains; all with no
 fluorescence.
- 2094 BASE OF THIRD CONVERSE SAND
- 2094-2115 Abundant anhydrite, snow white finely crystalline
 to denser tan to limited brown dolomitic; shale
 break, brick red; trace very shaly sand, light
 red with pale green spot, very silty, very soft,
 no show, no visible porosity, very fine sand
 grains in a silty shale matrix.
- 2115-25 Same brown and white anhydrite; shaly sandstone
 streaks as above, red and white mottled, very
 fine, hard, tight, no show, no visible porosity.
- 2125-54 Same white anhydrite with brown to gray denser
 parts.
- 2154 (+1388) FOURTH CONVERSE SAND
- 2154-65 Abundant well-cemented sand, 50% white, pinkish
 white, anhydritic-looking, very fine, excellent
 sorting, no visible porosity, no show, slightly
 soft to some hard; 50% same sand but light red
 to dark pink, no show; white more anhydritic spot
 in red sand; all possibly slightly dolomitic, no
 fluorescence; trace white sandstone, cleaner,
 very fine, soft, porous, no show.
- 2165 BASE OF FOURTH CONVERSE SAND
- 2165-66 Anhydrite, white, gray denser; silty limestone,
 pinkish tan, soft to hard, white anhydrite spot,
 few dark purple silty shale streaks; dense brown

- dolomite grading into chalky limestone, tannish cream.
- 2166-76 Traces limestone to dolomite, creamy white, slightly soft to hard; silty dolomite to limy dolomite, pinkish cream, purplish shaly streaks, soft to slightly soft, becoming anhydritic dolomite, reddish purple, dense, hard.
- 2176-89 (Missing).
- 2189-92 Very anhydritic dolomite, few small limy spots, pink to light red with few small red silty shale spots, very cherty and hard, brittle, semi-crystalline, trace clear crystalline anhydrite veinlet on dolomite.
- 2192-2201 Abundant brick red shale, silty shale, smooth, with small round green spots; anhydrite, white, denser pink, light red; cream dolomite to limy dolomite, becoming very anhydritic dolomite as above, pink, light red, few yellow spots.
- 2201-12 Abundant anhydrite, snow white, finely crystalline.
- 2212-24 Anhydritic dolomite, tannish pink, small reddish spots, cherty, hard, brittle.
- 2224-26 Anhydrite, white to denser gray; abundant brick red shale with small green round spots, soft; anhydritic dolomite, pink, cherty, to limestone, hard, brittle.
- 2226 BASAL SAND OF CONVERSE
- 2226-37 Traces sandstone, white, pinkish white, very fine, few fine grains, no show, well-cemented, soft, anhydritic to traces of dolomitic cementation, no fluorescence, poor or less visible porosity, purplish part.
- 2237 (+1305) RED MARKER
- 2237-47 (All faster drilling 3"-4"/ft.). Shale, smooth, brick red, also silty; trace white anhydrite veinlet in shale; small round green spots in red shale.
Typical shiny, splintery Red Marker, platy, very soft.
- 2247 BASE OF RED MARKER
- 2247 (+1295) PENNSYLVANIAN

- 2247 (+1295) MIDDLE MINNELUSA (LEO SECTION)
- 2247 (+1295) VIRGIL
- 2247-56 (Faster drilling from 2250 to 2256 like well-cemented sand). Trace light red sand (cave?), very fine to fine, no show, slightly soft, poor porosity, pinkish clear grains; remainder of interval anhydritic dolomite, cream chalky to hard tan dense, dolomite is slightly limy. Trace sand, brown possible staining, very fine, excellent sorting, friable, porous, very limy, no rainbows on acid, no fluorescence.
- 2256-66 (Dries like anhydrite and dolomite--poor sample).
- 2266-77 (Poor sample, mostly Red Marker cave; drills slow like anhydrite and dolomite). Traces very well-cemented sand, purplish white, very fine, few fine grains, no show; trace snow white sandstone (cave?), very well-cemented, very fine, white clay cementation, slightly soft, no show; trace tannish gray possibly stained sandstone, very fine to fine to fine-plus, friable, porous, clear grains, clay cementation; all with no fluorescence. (All sand may be cave).
- 2277-79 Traces anhydritic dolomite, tan, cherty, hard, dark tan; traces sandstone, white, cream-white, very fine, silty, soft, no show, possibly porous, no fluorescence, few fine grains, anhydritic cementation.
- 2279-81 (Missing due to no circulation for sample at 2281 just before trip for bit in slow drilling).
- 2281-85 Silty dolomite, gray, very silty, limy, some black spots; sandstone streaks, white, light gray, very fine, well-cemented, few black shale spots, no show, no visible porosity, soft.
- 2285-90 (Slightly faster drilling like sand). Traces white sandstone, very fine, good sorting, well-cemented, poor to no visible porosity, no show, slightly salt and pepper with few blackish grains scattered, soft; trace cleaner white sandstone, less cemented, no show, porous, friable, very fine, excellent sorting; all with no fluorescence (shale break on log).
- 2290-93 Dolomite, part slightly limy, tan to brown, flaky, no show, no porosity.
- 2293-2302 (Slightly faster drilling). Trace chalky cream dolomite, slightly soft to soft, limy.



2302-05 Same dark tan dolomite as 2290 to 2293, limy.
2305-10 (Slightly faster drilling, like sand). Traces sandstone, white, very anhydritic-looking, abundant white cementation, silty, very fine, few fine grains, angular to subround, few purplish shaly spots, no show, soft; traces white sand, very fine, few fine grains, no show, silty, white, possibly some porosity.

2310-16 Same dark tan dolomite as 2290 to 2293.
2316-26 (Very poor unusable sample, almost all cave, not screened). (All drills very slow like hard dolomite, possibly anhydrite also).

2326-36 Dolomite, anhydritic dolomite, brown where more anhydrite, also dark gray dense to dark gray siltier.

2336-47 (Very poor sample, almost all cave). (All drills slow like dolomite above). Traces white sandstone, probably in streaks, light gray, no show, well-cemented, very fine; part less cemented very fine to fine friable with porosity (cave?).

2347-51 (Circulated 20" sample at 2351 before trip for bit). Anhydrite, white to tan, finely crystalline, grading into dark tan dolomite and limy dolomite.

2351-53 Same as above.

2353 (+1189) MISSOURI

2353-54 (Highly radioactive shale on log).

2354 (+1188) SECOND LEO SAND

2354-57 Loose sand grains, very fine, clear, also fine; trace clean sandstone, light gray, very fine, good visible porosity, friable, no show.

2357-60 (Drills 4" to 5"/ft.). Traces well-cemented sand, very fine, no show, poor visible porosity, soft, light gray, white, slightly silty, no fluorescence; loose sand grains, very fine, fine, clear grains, round to subround.

2360-64 (Circulated 20" sample at 2365). Limited sandstone, white, light gray, well-cemented, shaly, very fine, no show; part less cemented with some porosity, friable, no show; 2% light brown possibly stained, cleaner less cemented, very fine, soft, porous; all with no fluorescence (5 1/2"/ft.).

2364-65 (Circulated 30" sample at 2365). Same well-cemented sand, very fine, no show, few fine grains, anhy-

- dritic-looking cementation; trace same cleaner sand, very fine, very light brownish possibly stained, porous, friable.
- * All above sand from 2354 to 2365 has no hydrocarbon cut nor fluorescence after cutting representative cuttings in C. Tet. in stoppered shell vial.
- 2365-66 Traces clean sandstone (probably above 2365), friable, excellent visible porosity, no show, light gray, so soft disintegrates when picked up with tweezers; trace friable white sandstone, abundant white cementation like clay, very fine to abundant fine, porous, clear grains, no show, loosely consolidated, non-calcareous; trace same well-cemented sand, very fine sand as above; all with no fluorescence; trace white sandstone, very fine, excellent sorting, well-cemented, no show, soft; trace light tan possibly stained sandstone, fine to very fine, limy, porous, friable.
- 2366-73 Dolomite stringer, grayish dark tan; greenish gray anhydritic dolomite to dolomitic lime; trace sandstone, light tan possibly stained, no live oil on freshly broken surface, friable, excellent visible porosity, salt and pepper with scattered dark gray shale grains, clear to slightly frosted grains, non-calcareous.
- 2373-75 (Circulated 20" sample at 2378). 75% jet black shale, coaly, strong hydrocarbon odor.
- 2375-78 25% gray chalky dolomite.
* Representative sand cuttings from 2354 to 2373 were cut in C. Tet. with no fluorescence in resulting solution, indicating no live oil in cuttings.
- 2378-82 (Top 2' are 2"/ft., bottom 2' are 1"/ft.). Abundant sandstone, light to medium tan oil staining when wet, dries to fair or better tan stain, definite abundant tiny brown live oil spots scattered, 80% fair yellowish fluorescence to 20% with good bright yellow fluorescence, anhydritic to dolomitic cementation, silty, very fine, good visible porosity, friable.
- 2382-93 (Circulated 20" sample at 2393). Abundant sandstone, light gray with tannish cast plus tiny dark brown live oil spots scattered, limy cementation, very fine to fine more sugary, friable, excellent visible porosity, acid cuts immediate rainbows, clear subround quartz grains; sandstone soaked with tan oil stain in very fine, cemented sand-



- stone, some spotty white cementation like clay, tiny dark brown live oil stains scattered, acid brings out tiny dark brown oil bubbles, fair or better visible porosity, soft to slightly soft.
* Representative cuttings of show zone were cut in C. Tet. in cork stoppered shell vial: there was no fluorescence in solution until several hours later when it was a faint grayish to yellowish.
- 2393-96 (Sand on log).
- 2396 BASE OF SECOND LEO SANDS
- 2396-2404 Chalky limy dolomite to dolomitic lime, cream-tan, denser tan also, few grayish streaks; limited associated anhydrite, finely crystalline white.
- 2404-15 Slightly silty dolomite, very finely sandy, grayish dark tan, minute pyrite specks.
- 2415-17 Coaly black shale, hard, brittle (probably a radioactive shale marker on log).
- 2416 DES MOINES (?)
- 2417-26 Abundant red shale in fast drilling breaks, orange red, silty to finely sandy, abundant small round light green spots in shale, with few anhydrite inclusions; remainder anhydritic dolomite, gray, few small limy streaks, part dark gray very shaly with few dark green spots; limited very sandy dolomite, limy, gray, flaky; limited sand streaks, gray, very well-cemented, no show, no porosity, hard, tight, very fine to fine; trace white sandstone, lot cleaner, very fine to fine, well-cemented, no show, possibly porous, soft (cave?).
- 2426-29 (Fast drilling shale break at 2429 to 2430). Same anhydritic dolomite, light grayish tan with dark gray shaly spots, minute pyrite specks, also dark tan with blackish spots, trace gray very sandy.
- 2429-30 Possibly jet black coaly shale (highly radioactive shale on log).
- 2430-35 Same as from 2426 to 2429.
- 2435-46 Shale break from 2440 to 2441, orange red smooth plain to silty; same anhydritic dolomite, gray to tan, less of silty limy dolomite, light gray, chalky; few sandstone streaks, grayish brown, slightly quartzitic-looking, very fine, very well-cemented, no show, poor to no visible poros-



- ity, part slightly soft; trace gray sandstone, very shaly and well-cemented, no show, no visible porosity, very fine to fine.
- 2446-53 Dolomite, limy dolomite, grayish tan to tan, cryptocrystalline, some associated white anhydrite, hard, brittle, few pyrite specks.
- 2453-55 Faster drilling plus shale on log.
- 2455-56 Sandstone stringer, white, fine, no show, very well-cemented, no visible porosity, same but shalier tannish gray, soft where white.
- 2456-59 Abundant sandstone, (possibly Third Leo Sand), snow white, very fine, fine, good sorting, no show, porous, anhydritic-looking, dolomitic to anhydritic cementation, part hard and tight, grayish yellow to yellow fluorescence, probably from dolomitic cementation, soft, part all fine grained.
- 2459-73 No odor in fresh sackfull, same sandstone as above; part softer, cleaner, more porous, trace more porous with slight tannish possible staining, same fair or better fluorescence; trace fine sandstone, sugary, friable, excellent visible porosity; becoming gray slightly quartzitic, poorly sorted fine to few medium grains, hard, tight.
- 2473-85 Abundant anhydrite, snow white, grayish where denser; abundant red shale, orange red, plain, silty, soft to slightly soft, few small light gray round spots.
- 2485-91 (Missing due to no circulation for sample before trip at 2491).
- 2491-2501 Mostly shaly dolomite, gray, dark gray, tannish dark gray, part limy, with abundant associated snow white anhydrite, finely crystalline; thin sand beds, white, light gray, fine, fairly clean, good visible porosity, no show, slightly soft, some black carbonaceous streaks; also dark gray shaly sand, soft, fine, porous to nonporous, black carbonaceous streaks; all with no fluorescence.
- 2501-10 Faster drilling sand, traces sand, white, very well-cemented, no show, very fine, no visible porosity to limited porosity, soft to slightly soft, possible faint grayish fluorescence.
- 2510-14 Limy dolomite to dolomitic lime, tannish brown, silty, blackish spots in part, also light gray; tan dense dolomitic lime to limy dolomite, hard, brittle.



2514-18	(Missing due to no circulation for sample just before trip at 2518).
2518-26	* First chert, trace, smoky gray translucent, very coarse and angular, also light brown translucent; sandstone, white, light gray, very well-cemented, poor visible porosity, very fine, well-sorted, slightly soft, part light gray less cemented; part white hard and tight; all limy, all with no show; limy dolomite, very light tan, cherty, hard, brittle, also dark tan limy dolomite, cryptocrystalline; white anhydrite; sand in top 7'.
2526-31	Brick red shale break with few small round light green spots; dolomite, sandy dolomite, gray, dark gray, mottled blackish in part, part limy dolomite; same chert; sandstone streaks, shaly, quartzitic, light gray to gray, very well-cemented, no show, no visible porosity, slightly soft.
2531-38	Chert, tan, milky white, angular, coarse; same quartzitic sandstone streaks, brownish gray; finely sandy limy dolomite to dolomitic lime, tannish brown.
2538-43	(Circulated 30" sample at 2543 T. D.). Chert, angular, very coarse, tan to light gray milky; limy dolomite to limestone, tannish brown, dense plain to cryptocrystalline; sandstone, white, very fine, very well-cemented, no show, no visible porosity, light gray, tannish light gray tighter, slightly limy, becoming brown quartzitic, <u>good yellow fluorescence</u> from limy mineralization.
2545	TOTAL DEPTH DRILLER
2544	TOTAL DEPTH SCHLUMBERGER

Samples examined and described on location by G. Allan Nelson.

DRILL-STEM TEST

D.S.T. #1 2379-2393 P. D. * (Corrected uphole 2' by matching lithology and drilling time to log).
(2381-2395 drillers depths at time test was run).
Zone tested: Lower of 2 Second Leo Sand benches.
November 25, 1970. Open hole conventional test.
Top packer at 2371 corrected.
Bottom packer at 2379 corrected.
Top choke 1". Bottom choke 9/16".
Hole size 7 7/8". 3 1/2" drill pipe.
2 1/4" I.D. of drill collars; 542' of drill collars.
Mud wt. 9.5. Vis. 60.
Packers held and did not leak. No cushion.

Tool opened with a very weak blow and remained open 5"; very weak blow throughout period. Tool reopened with a very weak blow (1/4" under water); remained for 10", then intermittent blow throughout rest of test. (By-passed tool after 50" to see if it was plugged--before opening. Well had 3" to 4" water flow from annulus throughout test--from Dakota-Lakota. 3' fillup on bottom).

Recovered: 60' gas-cut mud with a sulfur smell=.29 bbl.
80' water with scum of oil and sulfur
smelling gas=.39 bbl.
140' Total Fluid

Pressures following are office-corrected:

Initial hydrostatic	- 1102
Final hydrostatic	- 1100
5" Initial flow	- 4 to 21
45" Final flow	- 31 to 76
15" Initial shut-in	- 969
15" Final shut-in	- 914

Fluid Sample Report:

Pressure in sampler	- 11 psig
BHT	- 96° F.
Total volume of sampler	- 2150 cc.
Sample	- 2150 cc.
Oil	- 10 cc.
Water	- 2140 cc.
(No mud or gas)	



DRILL-STEM TEST (Continued)

Resistivity -

Water - .4 @ 62° = 17,200 ppm chlorides

Mud pit sample - 2.6 @ 60° = 2,550 ppm
chlorides

Testing done by Virg's Testers, Gillette, Wyoming.

Tester: Lloyd Welty.

Checked periodically during test for combustability;
would not burn. No gas to surface.



SCHLUMBERGER LOG CALCULATIONS

Calculations were performed by Mike Golas, Schlumberger engineer on location.

<u>DEPTH</u>	<u>Rt</u>	<u>POROSITY</u> <u>(from Sonic)</u>	<u>Rw</u>	<u>Sw</u>	<u>FORMATION</u>
1062	29	22%	1.6 @ 80°	100%	Tentative Hulett Sand
1074	33	23	"	"	"
1078	31	23	"	"	"
1866	50	18	1.3 @ 88°	78%	First Converse Sand
1871	45	17	"	90	"
1878	55	16	"	"	"
1885	40	18	"	"	"
1966	45	15	"	100%	Second Converse Sand
1970	35	17	"	"	"
1980	35	17	"	"	"
2376	35	6	.34 @ 88°	"	Second Leo Sand
2378	26	25	("way too high")	42	"
2380	35	10	.34 @ 88°	92	"
2382	42	5	"	100	"
2384	30	6	"	"	"
2386	21	6	"	"	"
2388	25	9	"	"	"
2458	6.5	11	"	"	Pre-Second Leo
2460	5.5	14	"	"	"
2462	6.5	8	"	"	"
2464	6.0	7	"	"	"
2466	5.0	15	"	"	"
2468	6.5	10	"	"	"

HOLE DEVIATION SURVEYS

Surveys were made using a TOTCO instrument with a 7° maximum.

<u>DEPTH</u>	<u>DEVIATION</u>	<u>FORMATION</u>
178	1/4°	Skull Creek
1086	1	Tentative Hulett Sand
1691	1	Glendo Shale
1939	1	Massive Anhydrite
2188	1	Pre-Fourth Converse
2282	1 (?)	Upper Leo
2352	1	Basal Virgil

BIT RECORD

12 1/4" bit from surface to 178. All bits below 178 are 7 7/8".

<u>RUN NO.</u>	<u>MAKE</u>	<u>TYPE</u>	<u>FROM</u>	<u>TO</u>	<u>FEET</u>	<u>HOURS</u>	<u>FORMATION AT BASE OF RUN</u>
1A	HTC	OSC3 (RR)	0	178	178	5 1/2	Skull Creek
1	"	OSC1GJ	178	1086	908	18	Tentative Hulett
2	"	"	1086	1707	621	14	Minnekahta
3	"	OSC1G	1707	1939	232	11 1/4	Massive Anhydrite
4	Reed	YS1G	1939	2091	152	12 1/2	Third Converse
5	-	-	2091	2189	98	13 1/4	Pre-Fourth Converse
6	HTC	OWV	2189	2282	93	"	Upper Leo
7	Reed	YMG	2282	2352	70	13	Basal Virgil
8	"	"	2352	2395	43	5 1/2	Second Leo Sand
9	-	-	2395	2493	98	14	Pre-Second Leo
10	-	-	2493	2520	27	3	"
11	-	-	2520	2545			
				T.D.	25	3 1/4	"


DRILLING PROGRESS SUMMARY

Drilling depths as of 7 A. M. each date.

<u>DATE</u>	<u>NO. OF DAYS</u>	<u>P.D. DEPTH</u>	<u>FORMATION AT P. D.</u>	<u>STATUS</u>
Nov. 17, 1970	-	-	-	Rigging up rotary tools.
18	1/2	105	Skull Creek	Drilling surface hole.
19	1 1/2	821	Morrison	Drilling.
20	2 1/2	1681	Goose Egg	"
21	3 1/2	2040	Upper Minnelusa	"
22	4 1/2	2189	"	Trip for bit.
23	5 1/2	2284	Middle Minnelusa	Drilling.
24	6 1/2	2374	"	"
25	7 1/2	2395	"	Starting out to put tool on -- D.S.T. #1.
26	8 1/2	2493	"	Trip for bit.
27	9 1/2	2545 T.D.	"	Logging.

(Finished plugging at
5:00 P. M., November 27).

Respectfully submitted,


G. Allan Nelson, Consultant
Denver, Colorado
January 26, 1971



Hydro ID 3

STATE
South Dakota
COUNTY
FALL RIVER
TOWNSHIP
1620' FEL & 1980'
FNL, C SW NW
75. 1E
2544 Schlum.
Schlumberger
Nov. 18, 1970
Nov. 27, 1970
Wildcat - Drift
3542 KH Wind Canyon
DWA. Prospect.
Ran 4 jts. of road 570' sfc
cass, totalling 160'. 8 rd. 200
Cass. of 100' & 100' each
100' out 100' 1772.
nelson

[illegible]



Hydro ID 3



ADMINISTRATIVE / SUNDRY REPORTS

FORM 100-1, 10-66

S. Dak. Oil & Gas Board
FORM 7

PLUGGING RECORD

Operator Petro-Lewis Corporation		Address 1224 Denver Club Building, Denver, Colorado, 80202	
Name of Lessee Peterson	Well No. 5-22	Field & Reservoir Wildcat	
Location of Well 1980' FNL and 660' FVL SW-1/4 Section 22, T2S, R1E		County Fall River	
Applying to drill this well was filed in name of Petro-Lewis Corporation	Has this well ever produced oil or gas No	Character of well at completion (initial production): Oil (bbls/day) ---- Gas (MCF/day) ---- Dry? Yes	
Date plugged: 11/27/70	Total depth 2544' Logger	Amount well producing when plugged: Oil (bbls/day) ---- Gas (MCF/day) ---- Water (bbls/day) ----	
Name of each formation containing oil or gas, indicate which formation open to well-bore at time of plugging	Fluid content of each formation	Depth interval of each formation	Size, kind & depth of plugs used indicate zones squeeze cemented, giving amount cement.

CASING RECORD

Size pipe	Put in well (ft.)	Pulled out (ft.)	Left in well (ft.)	Give depth and method of parting casing (shot, rigged, etc.)	Packers and spacers
8-5/8"	167'	None	167'		

Was well filled with mud-laden fluid, according to regulations? ☐ Indicate deepest formation containing fresh water.

In addition to other information required on this form, if this well was plugged back for use as a fresh water well, give all pertinent details of plugging operations to base of fresh water sand, perforated interval to fresh water sand, name and address of surface owner, and attach letter from surface owner authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.

USE REVERSE SIDE FOR ADDITIONAL DETAIL

Executed this the **15th** day of **February**, 1971
 State of **Colorado**
 County of **Denver**

R. J. Dzubek
 Signature of Affiant

Before me, the undersigned authority, on this day personally appeared **R. J. Dzubek**, known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states, that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.

Subscribed and sworn to before me this **15th** day of **February**, 1971.

SEAL
 My commission expires **September 24, 1974**

Elsie J. Stone
 Notary Public in and for **Colorado**

Approved: **December 23, 1971** DO NOT WRITE BELOW THIS LINE
 Date

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA
Robert L. ... Secretary

Date: **Dec 28, 1971**
Dwight Williams
 State Geologist

Note: File 3 copies of this form with Secretary, Oil & Gas Board, Pierre.





S. Dak. Oil & Gas Board
FORM 4

WELL COMPLETION OR RECOMPLETION REPORT AND LOG				FARM OR LEASE NAME	
TYPE OF COMPLETION <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Dry Hole <input type="checkbox"/> New Well <input type="checkbox"/> Work-Over <input type="checkbox"/> Deepen <input type="checkbox"/> Plug Back <input type="checkbox"/> Same Zone <input type="checkbox"/> Diff Zone				Peterson	
				WELL NO.	
OPERATOR Petro-Lewis Corporation				5-22	
ADDRESS 1224 Denver Club Building, Denver, Colorado, 80202				FIELD AND POOL OR WILDCAT	
LOCATION (In feet from nearest lines of section or legal subdivision where possible) Surface 1980' FNL and 660' FNL, SW-NW, Section 22, T7S, R1E Top prod. interval Fall River County, South Dakota At total depth				Wildcat	
				NO. ACRES IN LEASE	
				M. N. SEC. TWP. RGE.	
				SW-NW Section 22, T7S, R1E	
				COUNTY	
				Fall River	
PERMIT NO. 606	DATE ISSUED 10/21/70	PREVIOUS PERMIT NO. ----	DATE ISSUED ----		
DATE SPUNDED 11/17/70	DATE T.D. REACHED 11/27/70	DATE COMPL. (Ready to Prod.) P&A 11/27/70	ELEVATIONS (DP, RKB, RT, GR, etc.) Gr. Elev. 3534'	ELEV. CASINGHEAD FLOE.	
TOTAL DEPTH (MD & TVD) 2544' Logger	PLUG. BACK T.D. (MD & TVD) -----	IF MULTIPLE COMPL. HOW MANY -----	INTERVALS DRILLED BY XXXX	ROTARY TOOLS	CABLE TOOLS
PRODUCING INTERVAL(S), THIS COMPLETION, TOP, BOTTOM, NAME (MD & TVD)*				DATE DIRECTIONAL SURVEY SUBMITTED	
Dry Hole				None	
TYPE ELECTRIC AND OTHER LOGS RUN (Circle those filed)				WAS WELL CORED	
Dual Induction Laterolog, Compensated Porabola Sonic - Gamma Ray				No	
CASING RECORD (Report all strings set in well)					
CASING SIZE 8-5/8"	DEPTH SET (MD) 167' KB	HOLE SIZE 12-1/4"	WEIGHT LBS./FT. 20#	PURPOSE Surface casing	SACKS CEMENT 100 sk.
				AMOUNT PULLED None	
LINER RECORD					
SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)	
None					
TUBING RECORD					
SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)	
None					
PERFORATION RECORD					
DEPTH INTERVAL (MD)	HOLE PER FT.	SIZE AND TYPE	PURPOSE	AMOUNT AND KIND OF MATERIAL USED	DEPTH INTERVAL (MD)
None					
PRODUCTION					
DATE FIRST PRODUCTION	PRODUCING METHOD (Flowing, gas lift, pumping, etc. & type of pump)			WELL STATUS (Prod. or shut-in)	
Dry Hole				P&A 11/27/70	
DATE OF TEST	HOURS TESTED	CHOKED IN	PRODUCTION FOR TEST	OIL, bbl.	GAS, Mcf.
FLOW, TUBING PRESSURE	CASING PRESSURE	CALCULATED 24-HOUR RATE	OIL, bbl.	GAS, Mcf.	WATER, bbl. & %
DISPOSITION OF GAS (sold, used for fuel, vented, etc.)				TEST WITNESSED BY	
LIST OF ATTACHMENTS					
I hereby certify that the foregoing and attached information is complete and correct as determined from all available records.					
SIGNED <u>R. J. Doubek</u>		TITLE <u>Manager of Operations</u>		DATE <u>2/15/71</u>	
DO NOT WRITE BELOW THIS LINE					
See Instructions On Reverse Side					
OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA					
Secretary					



CORRESPONDENCE



POWERTECH (USA) INC.

Hydro ID 3

81 of 89



AMERICAN STRATIGRAPHIC COMPANY

17 NORTH 21ST STREET • BILLINGS, MONTANA 59101 • PHONE 226-7647

November 18, 1971

NOV 22 1971

South Dakota Geological Survey
Attn: Dr. Duncan McGregor
Science Center, University
Vermillion, South Dakota 57069

Gentlemen:


Sample cuts on the following wells are being sent
to you today:

Petro-Lewis Corp. #14-14 Childers
14-8S-2E, Fall River Co., S. D.

Petro-Lewis Corp. #5-22 Peterson
22-7S-1E, Fall River Co., S. D.

Petro-Lewis Corp. #3-7 Trotter-Federal
7-9S-2E, Fall River Co., S. D.

Very truly yours,


Fred McGotter
Manager



POWERTECH (USA) INC.

Hydro ID 3

62 of 69



SOUTH DAKOTA GEOLOGICAL SURVEY

Science Center, University
Vermillion, South Dakota 57069
624-4471

Western Field Office
615 Birch Ave.
Rapid City, South Dakota 57701

JUN 24 1971

(605) 394-2229

June 23, 1971

Dr. Duncan J. McGregor
State Geologist
South Dakota Geological Survey
Science Center USD
Vermillion, South Dakota 57069

Dear Duncan,

On June 21, 1971 we inspected the sites of the following oil tests and find that they have been satisfactorily restored. The wells are as follows:

Permit

606 Petro-Lewis #5-22 Peterson, SWNW 22-17N-1E, Fall River County
614 Petro-Lewis #14-14 Childers, SESW 14-8S-2E, Fall River County
631 Webb Resources #11-16 Zuehlke, SSE 11-11-4E, Fall River County

As soon as all other requirements have been met I recommend the release of bond.

Sincerely,

Fred V. Steece
Principal Geologist

FVS/dme
cc: Petro-Lewis Corporation
Webb Resources, Inc.



POWERTECH (USA) INC.

January 13, 1971

Mr. Fred V. Steece
Western Field Office
615 Birch Ave.
Rapid City, South Dakota

Dear Fred:

I am enclosing the following logs:

1 Sonic log - Gamma ray and 1 Dual Induction-Laterolog for
Petro-Lewis 5-22 Peterson well, Fall River County
1 Induction-Electrical log and 1 Sonic log - Gamma ray for
Lee Banks #1-23 Federal-Richards in Butte, County
1 Microlaterolog and 1 Sonic log - Gamma ray for Consolidated
#1 Tribal well in Corson County
1 Induction-electrical log for Consolidated #1 Tribal well
in Corson County.

Sincerely,

(Mrs.) Ruth Lynch
Accounting Clerk

For the State Geologist

Encl.

Small log



POWERTECH (USA) INC.

Hydro ID 3

64 of 69

DEC 16 1970

Western Field Office
615 Birch Avenue
Rapid City, South Dakota 57701
(605)394-2229

December 15, 1970

Mrs. M. Lanore Peterson
Star Route
Edgemont, South Dakota

Dear Mrs. Peterson,

Thank you for your letter of December 11, 1970 regarding the Webb Resources #5-22 Peterson oil test, located on your land in SW 1/4 & 1/4 Sec. 22, T. 7S., R. 1E., Fall River county, South Dakota. The letter is fine as far as it goes, however it is incomplete.

I have enclosed the original and three carbon copies of a suggested substitution to your letter. If you approve of this please date and sign the original and two carbon copies and send them to:

South Dakota Oil and Gas Board, Capitol Office Building, Pierre,
South Dakota 57501

Mr. J. W. Grimes, Chief Engineer, South Dakota Water Resources Comm.,
Capitol Office Building, Pierre, South Dakota 57501

Fred V. Steece, Principal Geologist, Geological Survey, Western
Field Office, 615 Birch Avenue, Rapid City, South Dakota 57701

The other copy is for your files.

Sincerely

Fred V. Steece
Principal Geologist

FVS/dms

cc: Dr. Duncan J. McGregor
State Geologist



POWERTECH (USA) INC.

Hydro ID 3

65 of 89

DEC 15 1970

Western Field Office
815 Birch Avenue
Rapid City, South Dakota 57701

(605) 394-2229

December 14, 1970

Mr. J. W. Grimes
Chief Engineer
South Dakota Water Resource Comm.
Capitol Office Building
Pierre, South Dakota 57501

Dear Joe,

Friday, December 11, 1970, I spoke with Don Driscoll on the telephone with regard to an oil test in Fall River county that has recently been converted to a water well. The well is the Petro-lands #5-22 Petersen located in S44W 22-7S-1E Fall River (permit 608). The well was drilled from November 18 to November 27, 1970 and completed as a water well in the Fall River formation on November 28, 1970. The well has 167 feet of 8 3/8 surface casing cemented from top to bottom and was completed with 389 feet of 4 1/2 inch casing suspended inside the larger casing. The original depth of the well was 2545 feet and was plugged back to 1030, which plugs through the Basal Sundance sand and allows the well to take advantage of the maximum sand development of the Fall River and Lakota. The plugging record is as follows:

40 sec--2410-2200 across the Leo sand
30 sec--1860-1750 across the Converse sand
30 sec--1130-1030 across the Basal Sundance sand

If there is further information you need on this well, please let me know.

Sincerely

Fred V. Steco
Principal Geologist

cc: Dan J. McGregor
State Geologist

Miss Alma Larson
Secretary, Oil and Gas Board



SURETY



POWERTECH (USA) INC.

Hydro ID 3

87 of 89

State Pub. Co., Pierre

S. Dak. Oil & Gas Board
FORM 2

BOND NO. 1672873

BOND

KNOW ALL MEN BY THESE PRESENTS,

That
we: **PETRO-LEWIS CORPORATION, 1224 Denver Club Building, Denver, Colorado 80202**
of the _____ In the _____
County of: **Denver** State of: **Colorado**
as Principal,
and **THE TRAVELERS INDEMNITY COMPANY**
of **Hartford, Connecticut**

as surety, authorized to do business in the State of South Dakota as surety, are held and firmly bound unto the State of South Dakota in the sum of **\$20,000.00**, lawful money of the United States, for which payment, well and truly to be made, we bind ourselves, and each of us, and each of our heirs, executors, administrators or successors, and assigns jointly and severally, firmly by these presents.

The condition of this obligation is that whereas the above bounden principal proposes to drill a well or wells for oil, gas, or stratigraphic purposes in and upon the following described land situated within the State, to wit:

ANY AND ALL LOCATIONS WITHIN THE STATE OF SOUTH DAKOTA

(May be used as blanket bond or for single well)

NOW, THEREFORE, if the above bounden principal shall comply with all of the provisions of the laws of this State and the rules, regulations and orders of the Oil and Gas Board of the State, especially with reference to the proper plugging of said well or wells, and filing with the Oil and Gas Board of this State all notices and reports required by said Board, and the restoration of the surface, in the event said well or wells do not produce oil or gas in commercial quantities, or cease to produce oil or gas in commercial quantities, then this obligation shall be terminated by the Board, the same shall be and remain in full force and effect.

Penal sum of

TWENTY THOUSAND AND NO/100 (\$20,000.00) DOLLARS-

Witness our hands and seals, this _____ day of _____

PETRO-LEWIS CORPORATION

By **R. A. Frawley** Principal

Witness our hands and seals, this **17th** day of _____

July, 1970



G.A. Talbert, Inc.
SURETY BONDS AND INSURANCE
TWELVE HUNDRED LINCOLN STREET
DENVER, COLORADO 80202
AREA CODE 303/732-1370

THE TRAVELERS INDEMNITY COMPANY

By **G. A. Talbert** Attorney-in-Fact

(If the principal is a corporation, the bond should be executed by its duly authorized officer, with the seal of the corporation affixed. When principal or surety executes this bond by agent, power of attorney or other evidence of authority must accompany the bond.)

DO NOT WRITE BELOW THIS LINE

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

Approved _____

Date

October 21, 1970

Wm. H. Fisher, Jr., Secretary

Consolidated to South Dakota

Francis S. Schmidt
Agent at **Rapid City, South Dakota 57701**

Note: File 2 copies of this form with Secretary, Oil & Gas Board, Pierre.



MISCELLANEOUS



**NO MISCELLANEOUS
INFORMATION FOR THIS WELL
AS OF 5/18/2011**



Oil and Gas Search for: <i>api_no_ like '40 047 05093'</i>		
Page 1 of 1	<u>Download Database</u> (Excel spreadsheet format)	Page: 1

Record 1 of 1

Well Information

API No:	40 047 05093	County:	FALL RIVER
Well Name:	SUPERIOR OIL 1 PETERSON 44-15	Location:	SESE 15-7S-1E
Permit No:	382	Total Depth:	2264
Operator Name:	SUPERIOR OIL COMPANY	Bottom Hole:	Minnelusa
Permit Date:	02-18-1965	KB Elevation:	3585
Spud Date:	02-20-1965	Ground Elevation:	3576
Plug Date:	03-05-1965	Latitude:	43.436899
		Longitude:	-103.977905
Well Field	WILDCAT	Status	P&A
Class:	DRY HOLE	Type:	DRY HOLE

Formation Tops

<u>Formation</u>	<u>Depth (ft.)</u>
Dakota Mud	185
Lakota	371
Morrison	471
Sundance	670
Minnekahta	1518
Opeche	1557
Minnelusa	1645
Red River	2108

COUNTY: FALL RIVER
LEGAL LOCATION: SESE 15-7N-1E
API NO: 40 047 05093
PERMIT NO: 382
WELL NAME: SUPERIOR OIL #1
PETERSON (44-15)
OPERATOR: THE SUPERIOR OIL
COMPANY
PERMIT ISSUED: 02/18/1965
PERMIT CLOSED: 10/21/1966
FILE LOCATION: 7N-1E-15 SESE

TARGET CODES:

WELL HISTORY / CHECKLIST

PERMIT TO DRILL / INTENT TO DRILL

WELL INSPECTION / SCOUT REPORTS

OPERATOR'S TECHNICAL REPORTS / MAPS

ADMINISTRATIVE / SUNDRY REPORTS

CORRESPONDENCE

SURETY

MISCELLANEOUS

WELL HISTORY / CHECKLIST



WELL HISTORY

Well Name Superior Oil #1 Peterson 44-15 Permit No. 382
Location SESE 15-7S-1E - Fall River Date of Permit 2-18-65
Elev. 3576 Gr. API No. _____
Confidential _____ From _____ To _____
Logs Received _____
Cuttings Received _____ Cores Received _____
Drill Stem Records _____

Cap Plug and Marker Set _____
Surface Restored _____
Plugging Affidavit Signed _____ Date _____
Bond Released _____ Date 10-21-66

Summary of Scout Reports

2-19-65 First report
2-24-65 Spudded 2-20-65
3-4-65 Plugged
3-5-65 Planned to convert test to water well
4-9-65 Pits not filled - Rig still on location
5-25-65 Mud pits not filled - Rig moved from location
7-30-65 Pits not filled
7-1-66 Pits not filled



Hydro ID 4

Superior #1 (44-12) Peterson
 660 FSL, 660 FEL
 SESE, -15-7S-1 E
 Fall River Co

Surface + mineral owner.
 F.A. Peterson
 Etgemont, S.Dak.

Contractor: Barnhart Drilling Co.
 Casper, Wyo.

Elev: 3576 ^{gt}
 3585 K.B.

Est 7.0. 2500 1st Sec.

Perm. it: 2-18-65 #382.

Plan to Set 500' 8 5/8, Cement test
 1st Sec. + Run dual induction - hole only
 + GRS

Underflow about 400

EL. Error #7 Reinbar.

971' 8 5/8

March 2, 1965

Coring at 2175'

© 217.9

986.54 of 85/8

W/ 450 of 4 in.
 + 125 sub

Cement 971

Dave Benson - G. S.

5 of 83

2-19-65

John Ryan of P.I.
 Called + said Barnhart
 was Contractor + they were
 on location.

2-20-65

Dugan Called at 11:00
 A.m. said Barnhart was
 Contractor + had spudded
 at 1:30 AM 2-20-65
~~Drill was in hole~~
 Don Brainer - Eng. pusher.
 (Wagon will not be out until
 near midnight)

Not TITC
 nothing will be tiled.

Feb 24, 1965

© 974

Spud by P. Peterson

mk

Top Log E.

Dak 185

Set 371

mm 471

Sum 670

1 771 top Sum end.

Sample top

mk. - 1527

ml - 1652

Lak + Sum flowed.

1st Sec being Cored.

est. D. 2500



PERMIT TO DRILL / INTENT TO DRILL



State Pub. Co., Pierre

APPLICATION FOR PERMIT TO:

S. Dak. Oil & Gas Board
FORM 2

<input checked="" type="checkbox"/> DRILL	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> PLUG BACK	FARM OR LEASE NAME: Peterson
<input checked="" type="checkbox"/> OIL WELL	<input type="checkbox"/> GAS WELL	<input type="checkbox"/> SINGLE ZONE		WELL NO. #1 (44-15)
<input type="checkbox"/> MULTIPLE ZONE			FIELD AND POOL OR WILDCAT
OPERATOR The Superior Oil Company			NO. ACRES IN LEASE 2846.03
ADDRESS P. O. Box 200, Casper, Wyoming			% SEC. TWP. RGE SE SE 15-75-1E
LOCATION (In feet from an established corner of the legal subdivision) 660' FSL & 660' FEL Sec. 15-75-1E			COUNTY Fall River
NAME AND ADDRESS OF SURFACE OWNER F. A. Peterson Edgemont, South Dakota		ELEVATION 3576 G.L. PROPOSED DEPTH 2500'	NO. OF WELLS ETC. ROTARY OR CABLE TOOLS Rotary
NAME AND ADDRESS OF CONTRACTOR Unknown		APPROXIMATE DATE WORK WILL START 2-27-65	

IF LEASE PURCHASED WITH ANY WELLS DRILLED, FROM WHOM PURCHASED (Name and address)

PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	NEW OR SECOND HAND	DEPTH	SACKS OF CEMENT
12-1/4"	8-5/8"	24#	New	500	300

DESCRIBE PROPOSED OPERATIONS. IF PROPOSAL IS TO DEEPEN OR PLUG BACK, GIVE DATA ON PRESENT PRODUCTIVE ZONE AND PROPOSED NEW PRODUCTIVE ZONE. GIVE BLOW OUT PREVENTER PROGRAM IF ANY.

- (1) The Superior Oil Company proposes to drill a 2500' 1st Leo Sand test at the above location.
- (2) Will set 8-5/8" csg. at 500' & cmt. to surface.
- (3) Will drill 7-7/8" hole to total depth.
- (4) Will catch 10' samples from base of surface to TD.
- (5) Expect to core & test the 1st Leo Sand plus any other zones that have significant shows.
- (6) Will run Dual Induction-Laterolog & GRS logs from TD to base of surf. csg.
- (7) Should commercial production be encountered, 5-1/2" casing will be cemented through the productive zone.

SIGNED: *J. P. Burke* TITLE: District Engineer DATE: 2-11-65

DO NOT WRITE BELOW THIS LINE

CHECKED BY: *Bernard Linn* 2/17/65
School and Public Lands

APPROVAL DATE: *2/17/65* Secretary

CONDITIONS:

- COMPLETE SET OF SAMPLES, AND CORES IF TAKEN, MUST BE SUBMITTED.
IF SAMPLES, AND CORES IF TAKEN, BELOW DEPTH, MUST BE SUBMITTED.

INSTRUCTIONS

General: This form is designed for submitting proposals to perform certain well operations, as indicated, on all types of lands and leases for appropriate action by either a Federal or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations (consult applicable Federal or State regulations, or appropriate officials, concerning approval of the proposal before operations are started).

If the proposal is to re-drill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations.

If the well is to be, or has been, directionally drilled, so state and show by attached sheets. If necessary, the coordinate location of the hole in any present or objective productive zones.

File 3 copies of this form with Secretary, Oil & Gas Board, Pierre.

(*Sample location: 660' South and 660' East of the Northwest Corner of Section 16.)

TRI-STATE COMPANY

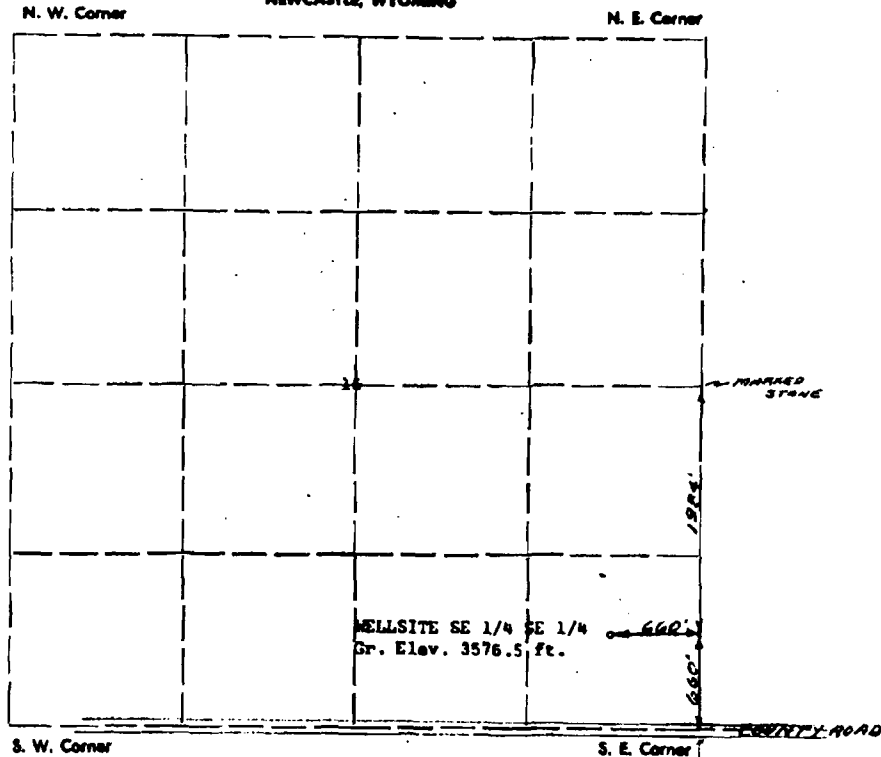
X 797

746-67

Hydro ID 4

NEWCASTLE, WYOMING

8 of 83



I, Lawrence T. Price, of Newcastle, Wyoming, Certify
that in accordance with a request from J. P. Dulka
of Casper, Wyoming, for The Superior Oil Company
P. O. Box 200, Casper, Wyoming

I made a survey (date) February 9 1965
for the location and elevation of the Peterson No. 1 (44-15) oil
well site

As shown on above map, the well site is in center SE 1/4 SE 1/4
Section 15, Township 7 South WYOMING Range 1 East WYOMING
Fall River County, South Dakota Elevation is 3576.5 feet
above mean sea level before dozing.

Lawrence T. Price
Licensed Surveyor No. 1311



WELL INSPECTION / SCOUT REPORTS

STATE GEOLOGICAL SURVEY

Scout Report

Date Scouted 7/1/66

Owner Superior Oil Company

Designation of well #1 Peterson (44-15)

Location: Sec. 15 T. 7 N. S. R. 1 E. W.

Fall River County, S. D. Total depth 2264 feet

Casing Record:

8 5/8 971 Ft. Ft.

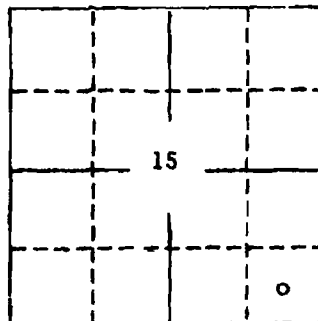
 Ft. Ft.

Work in progress at time of visit:

None

Developments since last visit:

None



Remarks and recommendations:

Pits not filled

Scouted by Earl Cox, Geologist

Approved by Duncan J. McGregor

Duncan J. McGregor, State Geologist



POWERTECH (USA) INC.

Hydro ID 4

11 of 63

Permit No. 382

STATE GEOLOGICAL SURVEY

Scout Report

Date Scouted July 30, 1965

Owner Superior Oil Company

Designation of well #1 Peterson (44-15)

Location: Sec. 15 T. 7 N. S. R. 1 E. W.

Fall River County, S. D. Total depth 2264 feet

Casing Record:

8 5/8 971 Ft. Ft.

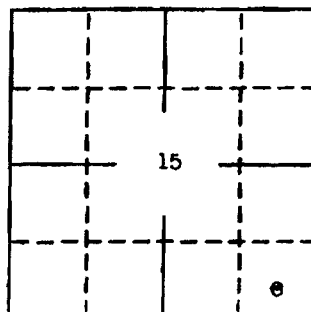
 Ft. Ft.

Work in progress at time of visit:

None

Developments since last visit:

None



Remarks and recommendations:

Pits not filled

Scouted by Earl Cox, Geologist

Approved by 
Duncan J. McGregor, State Geologist



POWERTECH (USA) INC.

Hydro ID 4

Permit ^{12 of 63}No. 382

STATE GEOLOGICAL SURVEY

Scout Report

Date Scouted May 25, 1965

Owner Superior Oil Company

Designation of well #1 Peterson (44-15)

Location: Sec. 15 T. 7 N. S. R. 1 B. W.
Fall River County, S. D. Total depth 2,264 feet

Casing Record:

8 5/8 971 Ft. Ft.

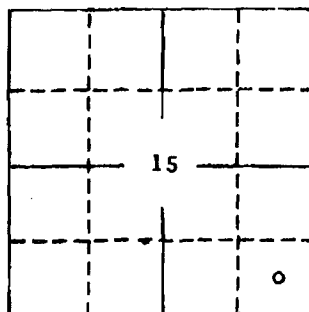
 Ft. Ft.

Work in progress at time of visit:

None

Developments since last visit:

Rig moved from location



Remarks and recommendations:

Mud pits not filled

Scouted by Earl Cox, Geologist

Approved by *Duncan J. McGreger*
Duncan J. McGreger, State Geologist



POWERTECH (USA) INC.

Hydro ID 4

Permit No. ^{13 of 63} 382

STATE GEOLOGICAL SURVEY

Scout Report

Date Scouted April 9, 1965

Owner Superior Oil Company

Designation of well #1 Petersen (44-15)

Location: Sec. 15 T. 7 N. S. R. 1 E. W.

Fall River County, S. D. Total depth 2264 feet

Casing Record:

8 5/8 971 Ft. Ft.

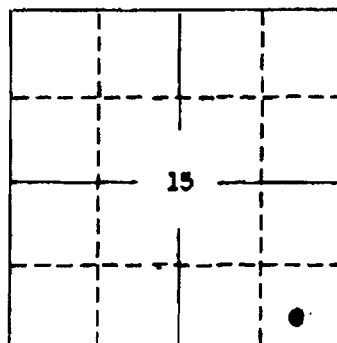
 Ft. Ft.

Work in progress at time of visit:

None, well is flowing at about 10 gpm

Developments since last visit:

A three-inch control valve is in place on the well head.



Remarks and recommendations:

Pits have not been filled.
Rig is still over location.

Scouted by Earl Cox, Geologist

Approved by

Duncan J. McGregor
Duncan J. McGregor, State Geologist



POWERTECH (USA) INC.

Hydro ID 4

Permit No. ^{14 of 63} 382

STATE GEOLOGICAL SURVEY

Scout Report

Date Scouted March 5, 1965

Owner Superior Oil Company

Designation of well #1 Peterson (44 - 15)

Location: Sec. 15 T. 7 N. S. R. 1 E. W.

Fall River County, S. D. Total depth 2264 feet

Casing Record:

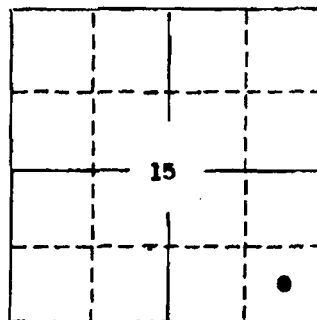
8 5/8 971 Ft. Ft.

 Ft. Ft.

Work in progress at time of visit:

An artesian flow at the base of the surface casing flushed out the top of the cement plug resulting in a 20-30 gpm flow of fresh water.

Developments since last visit:



Remarks and recommendations:

The flow is contained by a valve at the surface and it is planned to convert the test to a water well.

Scouted by Earl Cox, Geologist

Approved by *Duncan J. McGregor*

Duncan J. McGregor, State Geologist

STATE GEOLOGICAL SURVEY

Scout Report

Date Scouted March 4, 1966

Owner Superior Oil Company

Designation of well #1 Peterson (44 - 15)

Location: Sec. 15 T. 7 N. S. R. 1 E. N.

Fall River County, S. D. Total depth 2264 feet

Casing Record:

8 5/8 971 Ft. Ft.

 Ft. Ft.

Work in progress at time of visit:

Plugged as follows:

25 sacks 1970-1920 3rd Converse sand
35 sacks 1715-1645 Top Minnelusa
30 sacks Base surface casing 1020-950

Developments since last visit:

Core #1 2175-2221 anhydrite, Core #2 2221-22644, anhydrite essentially. Leo Sand very tight. No permeability or porosity. Run sonic-gamma ray log and dual induction laterolog (971-T.D.). Run E-log and micro-log prior to setting surface casing. Water flow of about 40 gpm at 890-905 and also a flow after drilling out from under surface casing.

Remarks and recommendations:

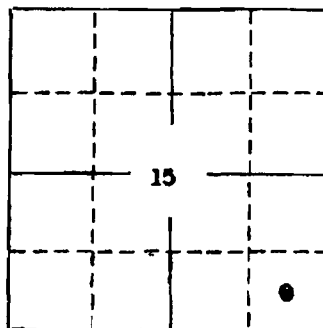
Tentative log tops:

Minnekahta - 1518	3rd converse - 1942
Opeche - 1557	Red marker - 2108
Minnelusa - 1645	Base of 1st Leo - 2254
2nd Converse - 1777	T. D. - 2264

Scouted by Earl Cox, Geologist

Approved by Duncan J. McGregor

Duncan J. McGregor, State Geologist





POWERTECH (USA) INC.

Hydro ID 4

16 of 63
Permit No. 392

STATE GEOLOGICAL SURVEY

Scout Report

Date Scouted March 2, 1965

Owner Superior Oil Co.

Designation of well #1 Peterson

Location: Sec. 15 T. 7 N. S. R. 1 E. NE

Fall River County, S. D. Total depth 2179 feet

Casing Record:

8 5/8 971 Ft. Ft.

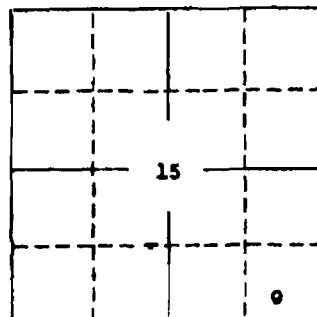
 Ft. Ft.

Work in progress at time of visit:

Coring at 2179 (1st Leo Sand)

Developments since last visit:

Set 971' of 8 5/8" surface casing with 575 sacks.
Drilled from 974-2175.
Cored from 2175-2179.



Artesian flows were encountered in the Lakota and Sundance.

Remarks and recommendations:

E log tops:

Dakota - 185

Lakota - 371

Morrison - 471

Sundance - 670

Top Sundance Sand - 771

Sample Tops:

Minnakahta - 1527

Minnelusa - 1652

Scouted by Earl Cox, Geologist

Approved by Duncan J. McGregor

Duncan J. McGregor, State Geologist

Elevations: 3576 gd; 3585 K.B.

Hydro ID 4

17 of 83
Permit No. 382

STATE GEOLOGICAL SURVEY

Scout Report

Date Scouted Feb. 24, 1965

Owner Superior Oil Co.

Designation of well #1 Peterson (44-15)

Location: Sec. 15 T. 7 N. S. R. 1 E. NW.

Fall River County, S. D. Total depth 974 feet

Casing Record:

 Ft. Ft.

 Ft. Ft.

Work in progress at time of visit:

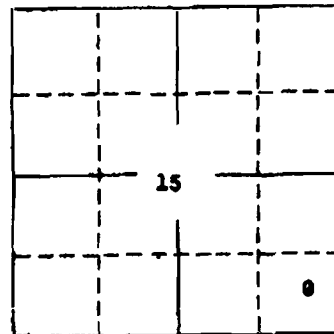
Drilling at 974'.

Developments since last visit:

Spudded 2-20-65.

Drilled from 0 - 974.

Run electric log to locate water sands.



Remarks and recommendations:

Over 900 feet of surface casing will be set to case off artesian flows.

Scouted by Earl Cox, Geologist

Approved by 

Duncan J. McGregor, State Geologist



POWERTECH (USA) INC.

Hydro ID 4

Permit No. ^{18 of 63} 382

STATE GEOLOGICAL SURVEY

FIRST REPORT

Scout Report

Date Scouted Feb. 19, 1965

Owner Superior

Designation of well #1 (44-15) Peterson

Location: Sec. 15 T. 7 N. S. R. 1 E. NW.

Fall River County, S. D. Total depth 0 feet

Casing Record:

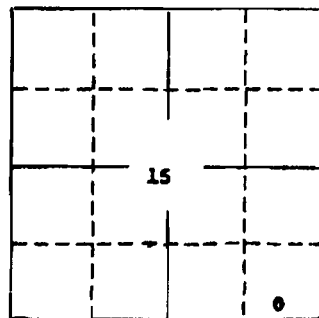
 Ft. Ft.

 Ft. Ft.

Work in progress at time of visit:

Petroleum information informed me by phone that Barnhart Drilling Company was the contractor and they were on location.

Developments since last visit:



Remarks and recommendations:

Scouted by Earl Cox, Geologist

Approved by 
Duncan J. McGregor, State Geologist



POWERTECH (USA) INC.

Hydro ID 4

8:45 AM

March 4, 1970

Don Brown Called. Found
Reached 2264 & found
the sand very fine & red
shows. plan to log &
then fly

petroleum plan 662-6222

Sanin log - gamma ray log
1st & 2nd lateral log on surface
then induction lateral log.

tentative log top

MLC - 1518

Qp - 1557

ML - 1645

2nd casing 1777

3rd " 1742

Red marker - 2108

Base of table 2254

T.P. 2264

exp. core / 1970-1970

3rd Core. 1970-1920 25at

T.ML 1715-1645 35at

Exp. core 1020-950 30at

90. at

7:30-8:00

7:45 A.M. to check
fly.

662-7244

Room 7.

Don Brown

18 of 63

Case 7. 2175-2228

only but. Dec 44

Case 2 2228-2264

only part - essentially

Good well at

870-905 or 925

27 ft. 168 ft/min

fly
to surface core

7.20
4.5
1.5

45

30 at - 7.20-7.45

1020-950

25 at - 1970-1920

3rd casing
3rd top 1645-1715

970 Am Strat will process
Samples

March 5, 1970

Brown Called at 10:00 AM

I finally got hold of him at

about 7:00 AM. He said

a flow of water had been

seen flowing a 2" stream

at an estimate of 20 gpm.

Had put valve at surface

& shut in.

A sand zone immediately

below surface had apparently

been lost. (A flow was

observed when drilled

out from under surface)

Rig had been run down

& part hoisted off for

repair. We decided

to put steel Bak fly

at base of casing &

put 10 ft. cement at top

of it.

March 6, 1965

Called Brown @ 8:30 AM
He said he was just
some water was coming
from base of surface. Said
inside went to Sam from
floor. I said couldn't
be done but would
see McInry about it.
Brown said a alternative
that would save them
money would be to pump
60 dy down hole and
shoot in after reaching
the sand. This would
draw about 100' of
Grout in casing &
pump would have
to pump it out. I
said this would be
a satisfactory alternative.
Brown would be
done in week of 10 days
after they evaluate well.

April 9, 1965

Most said down. Nothing
found. pits not filled or
filled. Head & water was
on well head & was
flowing about 5-10 gpm

May 25, 1965

By gas from location
pits not filled

no change July 30, 1965

Sept. 2, 1965

no change. water from
well flowing into
Mud pits.

July 1, 1966

no change.

9-9-66

no change

using cement would cost
about 500.00. They said
they about 1000.

Dryer - pronounced Dika

3-8-65

Called McInry, Dan Brown,
Francis Peterson, and Mr.
Dryer and all agreed to
conduct plan to water well.
I will get letter from
Peterson that he request
a concession

3-17-65

Called Peterson as he had
not sent back signed letter
saying he want to consent to
a water well. He said had
received 4. put value on
it for a week & then
had dropped to 6 gpm. He
was going to sign letter & return.

Hydro ID 4

Remediation 382

Superior II / Peterson

SE 1/4, Sec 15, T17S, R. 1E
Fall River Co

Geological

spudded

Elc - 3576, 3577 KB

Contractor - Rockwell Drill Co

2-14-65

P.I. told Earl that Bille
was at site.

2-24-65

Spudded a well. Drill Mod /
c 1479 + ran 1-1/2 hrs to locate well.
in dr. Over 400' of surface was
be set to core off surface of ground

3-2-65

Set 971 feet of 8 1/2" + force with 5000
saps + drilled to 2175' (cored from
2175' - 2179' (1st sec). Flow was
encountered in R1 + finished

(over)



POWERTECH (USA) INC.

1-10-63 Hydro 154 184, 11-23 of 63
 471, 11-23 of 63
 sample type - Mineral bath 154
 Mineral bath 154

3-4-6

Plugged. Core #1 211, 221
 Core #2 232, 233, 234, 235
 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Tops

Mineral bath 1518 2nd Core 1518
 ap 1518 2nd Core 1518
 Mineral bath 1518 2nd Core 1518
 2nd Core 1518 TD 22.64

3-10-63

Admission from at base of surface of rock
 not correct plug resulting in a flow of 10-15
 gpm. Flow contained by valve + well comes to
 its maximum.

3-10-63

Tellurium from base to 2nd Core 1518
 2nd Core 1518



Hydro ID 4.

23 of 63

Received 2 copies of letter for
Vance Peterson and J. L. Lee.
re: flow out of hole as well
could be connected to the hole.
Also 2 copies of cost analysis.

4-9-65

Hole flowing at about 10 gpm.
Control valve is in place. Pits
are filled & may be at the
location.

5-10-65

Letter from Ed saying don't release
and because pits not filled even
though for which has assumed
responsibility for well.

5-25-65

Rig moved from location. Pits
not filled.

7-30-65

Pits not filled

10-1-65

Letter from W. L. Thompson saying water
in pits and water running out pits.



POWERTECH (USA) INC.

Hydro ID 4 1-24 of 63 - 6
Letter from Carl to [unclear] saying
asked for Peterson in [unclear]
Peterson not filed 7-1-66
9-28-66
Received release request by
Peterson for file 9-30-66
Letter from Carl saying OK to
release bond



Hydro ID 4

25 of 63

WELL: *Superior #1 & 2*

LOCATION:

LOGS RECD:

TOPL:

GEOLOGIC: *2 copies 5/10/66*

ELECTRIC, FIELD:

FINAL: *23 copies 5/10/66*
23 copies 5/10/66

RADIO,

FIELD:

FINAL: *23 copies 5/10/66*

OTHERS: *3 copies 5/10/66*

CUTTINGS RECD: *5/10/66*

CORES RECD: *2 copies of core 5/10/66*

DRILL STEM DATA RECD: ~~*2 copies 5/10/66*~~

CAP PLUG CHECKED: *converted to water well*

MUD PITS FILLED: *Superior signed release*

PLUGGING AFFIDAVIT SIGNED:

1 photocopy each of form 407 (L. and S. 2/2/66)

BOND RELEASED: *to Hall for Davis signature 10-7-66*

10-21-66

OPERATOR'S TECHNICAL REPORTS / MAPS



POWERTECH (USA) INC.

Hydro ID 4

27 of 83

CAVE

Preliminary Report

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

THE SUPERIOR OIL
COMPANY

Page No.

MAR 11 1965

CORE ANALYSIS RESULTS

ENGINEERING
CAPPER

Company SUPERIOR OIL COMPANY Formation MINNELOUSA File RP-4-1363
Well NO. 1 PETERSON Core Type DIAMOND CONV. Date Report 3-4-65
Field WILDCAT Drilling Fluid WATER BASE Analysts JMM
County FALL RIVER State S. DAKOTA 3576 Gr Location SE SE 15-7S-1E

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY	POROSITY PER CENT	REGIONAL SATURATION PER CENT	PORE TOTAL	SAMPLE DESCRIPTION AND REMARKS	
1	2217-13	0.16	2.7	7.4	63.1	SD, GRY, V/FN-FN, CALC.	
2	19-19	0.24	2.6	0.0	65.5	SD, GRY, V/FN-FN, CALC.	
3	2153	0.10	2.2	0.0	77.2	SD, GRY, V/FN-FN, SL/DOL.	
4	2212	0.10	1.3	0.0	84.5	SD, GRY, V/FN-FN, SL/DOL.	
5	2221	<0.1	0.5	0.0	40.0	SD, GRY, V/FN-FN, SL/CALC.	
6	2239	0.10	2.8	0.0	68.0	SD, GRY, FN-MED, SL/CALC.	
7	2249	0.10	1.9	0.0	47.3	SD, GRY, FN-MED, SL/CALC.	

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representation as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

Superior Oil Company, 44-15 Petersen Description by: D. A. Bentain
C SE SE Section 15, T 7 S, R 1 E
Fall River County, South Dakota

Elevation: 3576G, 3585KB

974- 980 Shaly siltstone, dark reddish brown, calc, NS.
980- 990 Siltstone, ss, NS.
990-1000 Siltstone, ss, NS.
1000-1010 Siltstone, dark reddish brown, calc, NS.
1010-1020 Siltstone, dark reddish brown, calc, NS.
1020-1030 Siltstone, dark reddish brown, calc, NS.
1030-1040 Shaly siltstone, dark reddish brown, calc, NS.
1040-1050 Shaly siltstone, dark reddish brown, calc, NS.
1050-1060 Shaly siltstone, dark reddish brown, calc, with
minor anhydrite, NS.
1060-1070 Shaly siltstone, dark reddish brown, calc, with
minor anhydrite, NS.
1070-1080 Shaly siltstone, dark reddish brown, calc, NS.
1080-1090 Shaly siltstone, dark reddish brown, calc, NS.
1090-1100 Shaly siltstone, dark reddish brown, calc, NS.
1100-1110 Shaly siltstone, dark reddish brown, calc, NS.
1110-1120 Shaly siltstone, dark reddish brown, calc, NS.
1120-1130 Shaly siltstone, dark reddish brown, calc, NS.
1130-1140 Shaly siltstone, dark reddish brown, calc, NS.
1140-1150 Shaly siltstone, dark reddish brown, calc, NS.
1150-1160 Shaly siltstone, dark reddish brown, calc, NS.
1160-1170 Shaly siltstone, dark reddish brown, calc, NS.
1170-1180 Shaly siltstone, dark reddish brown, calc, with
minor anhydrite, NS.
1180-1190 Shaly siltstone, dark reddish brown, calc, with
minor anhydrite, NS.
1190-1200 Shaly siltstone, dark reddish brown, calc, NS.
1200-1210 Shaly siltstone, dark reddish brown, calc, NS.
1210-1220 Shaly siltstone, dark reddish brown, calc, with
minor anhydrite, NS.
1220-1230 Shaly siltstone, dark reddish brown, calc, with
minor anhydrite, NS.
1230-1240 Shaly siltstone, dark reddish brown, calc, with
minor anhydrite, NS.
1240-1250 Shaly siltstone, dark reddish brown, calc, with
minor anhydrite, NS.



Superior Oil Company, 44-15 Petersen
C SE SE Section 15, T 7 S, R 1 E
Fall River County, South Dakota
Page 2

- 1250-1260 Shaly siltstone, dark reddish brown, calc, with minor anhydrite, NS.
- 1260-1270 Shaly siltstone, dark reddish brown, calc, with minor anhydrite, NS.
- 1270-1280 Shaly siltstone, dark reddish brown, calc, with minor anhydrite, NS.
- 1280-1290 Shaly siltstone, dark reddish brown, calc, with 10% anhydrite, NS.
- 1290-1300 Shaly siltstone, dark reddish brown, calc, with 10% anhydrite, NS.
- 1300-1310 Shaly siltstone, dark reddish brown, calc, with minor anhydrite, NS.
- 1310-1320 Shaly siltstone, dark reddish brown, calc, with minor anhydrite, NS.
- 1320-1330 Shaly siltstone, dark reddish brown, calc, with 25% anhydrite, NS.
- 1330-1340 Shaly siltstone, dark reddish brown, slightly calc, with 30% anhydrite, NS.
- 1340-1350 Anhydrite, white, crystalline with shaly siltstone as, NS.
- 1350-1360 Anhydrite, white, crystalline with shaly siltstone as, NS.
- 1360-1370 Anhydrite, white, crystalline, decreasing with siltstone as above, NS.
- 1370-1380 Shaly siltstone, dark reddish brown, calc, with 25% anhydrite, NS.
- 1380-1390 Shaly siltstone, dark reddish brown, calc, with 25% anhydrite, NS.
- 1390-1400 Shaly siltstone, dark reddish brown, calc, with 10% anhydrite, NS.
- 1400-1410 Anhydrite, white, crystalline with shaly siltstone as, NS.
- 1410-1420 Anhydrite and shaly siltstone, aa, 50-50, NS.
- 1420-1430 Anhydrite and shaly siltstone, aa, 50-50, NS.
- 1430-1440 Shaly siltstone, dark reddish brown, slightly calc, with minor anhydrite, NS.
- 1440-1450 Shaly siltstone, dark reddish brown, calc, with minor anhydrite, NS.
- 1450-1460 Shaly siltstone, dark reddish brown, calc, with minor anhydrite, NS.
- 1460-1470 Shaly siltstone, dark reddish brown, slightly calc, with minor anhydrite, NS.



Superior Oil Company, 44-15 Petersen
C SE SE Section 15, T 7 S, R 1 E
Fall River County, South Dakota
Page 3

- 1470-1480 Shaly siltstone, dark reddish brown, slightly calc, with minor anhydrite, NS.
- 1480-1490 Shaly siltstone, dark reddish brown, slightly calc, with minor anhydrite, NS.
- 1490-1500 Shaly siltstone, dark reddish brown, slightly calc, with minor anhydrite, NS.
- 1500-1510 Shaly siltstone, dark reddish brown, slightly calc, with minor anhydrite, NS.
- 1510-1520 Shaly siltstone, dark reddish brown, calc, with minor anhydrite, NS.
- 1520-1530 40% Shaly siltstone, aa, with 10% white anhydrite and 20% dolomite, pink, very fine granular to dense, slow effervescence, NS.
- 1530-1540 Shaly siltstone, anhydrite and dolomite, aa, in equal parts. The dolomite is varicolored - white, pink, tan, NS.
- 1540-1550 Sample aa, with minor calcareous purple shale, NS.
- 1550-1560 Sample aa, with minor calcareous purple shale, NS.
- 1560-1570 Sample aa, with no purple shale, NS.
- 1570-1580 Sample aa, NS.
- 1580-1590 Sample aa, NS.
- 1590-1600 Sample aa, NS.
- 1600-1610 Silty shale to siltstone, reddish brown, slightly calc, with minor anhydrite, NS.
- 1610-1620 Silty shale to siltstone, reddish brown, slightly calc, with minor anhydrite, NS.
- 1620-1630 Silty shale to siltstone, reddish brown, slightly calc, with minor anhydrite, NS.
- Note The Opache lithology is similar to the pre-Minnekahta with the exception that the silt grains seem generally smaller.
- 1630-1640 Shaly siltstone, reddish brown, calc, with minor anhydrite, NS.
- 1640-1650 Sample aa, with sandy siltstone, reddish brown, slightly calc, soft and sandstone, gray to pink, fine grained, non-calc poor porosity, NS.
- 1650-1660 Sample aa, with sandstone, pink to white, fine to medium grained, fair sorting, slightly calc, poor porosity, grains appear to have secondary overgrowths, NS.
- 1660-1670 Sandy siltstone, reddish brown, and sandstone aa, NS.
- 1670-1680 Sample aa, with sandy siltstone predominant, NS.
- 1680-1690 Sample aa, with sandstone increasing to 30%, NS.

Superior Oil Company, 44-15 Petersen
C SE SE Section 15, T 7 S, R 1 E
Fall River County, South Dakota
Page 4

- 1690-1700 Sample aa, with sandstone increasing to 30%, with minor anhydrite, NS.
- 1700-1710 Sample aa, with sandstone increasing to 30%, with minor anhydrite, NS.
- 1710-1720 Sample aa, with sandstone increasing to 30%, with minor anhydrite, NS.
- 1720-1730 60% Anhydrite, white, crystalline with silty shale, reddish brown and minor sandstone, NS.
- 1730-1740 Sample aa, NS.
- 1740-1750 Dolomite, white to pink, dense, with anhydrite aa, NS.
- 1750-1760 Dolomite, white to pink to gray, dense, with anhydrite aa, NS.
- 1760-1770 Sandy siltstone, reddish brown, calc, with minor anhydrite, NS.
- 1770-1780 Sandy siltstone, reddish brown, calc, with minor anhydrite, NS.
- 1780-1790 Sandy siltstone, reddish brown, calc, with minor sandstone, white to pink, fine grained, angular, well sorted, poor porosity anhydrite cement, NS.
- 1790-1800 Sandy siltstone and sandstone aa, with anhydrite, NS.
- 1800-1810 Shale, reddish brown with siltstone and anhydrite aa, NS.
- 1810-1820 Limestone, mottled gray, dense, with lithology aa, NS.
- 1820-1830 Limestone, mottled gray, dense, with lithology aa, NS.
- 1830-1840 Shaly siltstone, reddish brown, slightly calc, with limestone and anhydrite aa, NS.
- 1840-1850 Sample aa, NS.
- 1850-1860 Sample aa, with minor white sandstone, fine grained, poor porosity, NS.
- 1860-1870 Limestone aa, with shaly siltstone and anhydrite aa, NS.
- 1870-1880 Limestone aa, with shaly siltstone and anhydrite aa, NS.
- 1880-1890 Limestone aa, with shaly siltstone and anhydrite aa, NS.
- 1890-1900 Shaly siltstone increasing in proportion to limestone and anhydrite with minor sandstone, white very fine grained, angular, no porosity, grains are anhydrite encased, NS.
- 1900-1910 Sample aa, NS.
- 1910-1920 Shaly siltstone to silty shale, reddish brown, soft calc, and anhydrite, white, granular with minor limestone, pink, dense, NS.
- 1920-1930 60% Shaly siltstone aa, 30% anhydrite aa, 10% limestone aa, NS.



Superior Oil Company, 44-15 Petersen
C SE SE Section 15, T 7 S, R 1 E
Fall River County, South Dakota
Page 5

1930-1940 Sample aa, NS.

1940-1950 Silty shale, reddish brown, slightly calc, soft with minor anhydrite, NS.

1950-1960 Silty shale, reddish brown, slightly calc, soft with minor anhydrite and sandstone, white, very fine grained, non-calc, tight, NS.

1960-1970 Silty shale and minor anhydrite aa, no sandstone, NS.

1974 Lost circulation - No sample 1970-1980.

1980-1990 75% cave, 25% sample aa, NS.

1990-2000 75% cave, 25% sample aa, NS.

2000-2010 75% cave, 25% sample aa, NS.

2010-2020 30% cave and silty shale, reddish brown, non-calc, soft with minor anhydrite and limestone, NS.

2020-2030 Sample aa, with sandstone, pink, fine to very fine grained, sub-angular, fair sorting dolomite cement, poor porosity, NS.

2030-2040 Sandstone aa, NS.

2040-2050 Sandstone aa, except very fine to medium grained sub-rounded poor sorting, poor porosity, NS.

2050-2060 Sandstone aa.

2060-2070 Anhydrite, white, with minor dolomite, pink and gray, dense and sandstone aa, with one chip shaly siltstone, red, slightly calc, hard, NS.

2070-2080 Sample aa, with 10% siltstone aa, NS.

2080-2090 Sample aa, with 10% siltstone aa, NS.

2090-2100 Anhydrite and limestone aa, NS.

2100-2110 Anhydrite and limestone aa, with sandstone white to lavender, very fine to fine grained, poor sorting, slightly calc to non-calc, NS.

2110-2120 Dolomite, tan to grey, dense; anhydrite, white, crystalline, shale, red, soft; sandstone white to lavender, very fine to fine grained, poor sorting, slightly calc to non-calc, tight, NS.

2120-2130 Sample aa, with sandstone white, very fine to fine grained, fair sorting, rounded, slight effervescence, fair porosity, NS.

2130-2140 Dolomite and shale aa, with white sandstone aa, NS.

2140-2150 Increasing white sandstone with shale aa, NS.

2150-2160 Shale aa, with dolomite aa and decreasing sandstone aa, with minor black shale, soft, slightly calc, NS.

2160-2170 Sample aa, with increasing black shale and limestone, NS.

2170-2175 Sample aa, NS.

2175-2221 Core #1, see detailed description.

2221-2264 Core #2, see detailed description.
Total Depth 2264'.

The Superior Oil Company, #44-15 Peterson
C 8E 8E Section 15, T 7 S, R 1 E
Fall River County, South Dakota

CORE #1 2175-2221 Cored 46 feet, Recovered 44 feet.

2175-76	Dolomite, black, finely crystalline, tight, NS.
2176-77	Anhydrite and dolomite, mottled light and dark gray, coarsely crystalline, tight, NS.
2177-78	Anhydrite, light to dark gray, tight, NS.
2178-79	Anhydrite, aa, with reddish-brown dolomite mottling, tight, NS.
2179-80	Dolomite, light gray, finely crystalline with minor clear anhydrite crystals and black shale mottling, NS.
2180-81	Dolomite, light gray, dense, mottled with clear anhydrite and red spots, NS. Some of the anhydrite has the curved shape of shell fragments.
2181-82	Sample aa, NS.
2182-83	Sandstone, gray, very fine-grained, subrounded, dolomitic and anhydritic cement, hard and tight, NS.
2183-84	Sample aa, NS.
2184-85	Anhydrite, mottled white and gray, tight, NS.
2185-86	Shale, dark gray, anhydritic, NS.
2186-87	Anhydrite, gray, very finely crystalline, dolomitic and very silty, NS.
2187-88	Anhydrite, light gray, sandy, very fine grained, NS.
2188-89	Sandstone, light gray, very fine to medium-grained, poorly sorted, dolomitic and anhydritic, tight, NS.
2189-90	Sandstone, light gray, very fine to medium-grained, poorly sorted, dolomitic and anhydritic, tight, NS.
2190-91	Sandstone, light gray, very fine to medium-grained, poorly sorted, dolomitic and anhydritic, tight, NS.
2191-92	Sandstone, light gray, very fine to medium-grained, poorly sorted, dolomitic and anhydritic, tight, NS.
2192-93	Sandstone, light gray, very fine to fine-grained, anhydritic cement, tight, NS.
2193-94	Anhydritic, gray with white dolomite mottling, tight, NS.
2194-95	Anhydrite, gray and white mottled, NS.
2195-96	Anhydrite, gray and white mottled, NS.
2196-97	Anhydrite, gray and white mottled, NS.



Superior, #44-15 Peterson
Core #1
Page 2

2197-98	Anhydrite, gray and white mottled, NS.
2198-99	Anhydrite, gray and white mottled, NS.
2199-2200	Anhydrite, gray and white mottled, NS.
2200-01	Anhydrite, gray and white mottled, NS.
2201-02	Anhydrite, gray and white mottled, NS.
2202-03	Anhydrite, aa, mottled with reddish-brown dolomite, tight, NS.
2203-04	Sample aa, NS.
2204-05	Sample aa, NS.
2205-06	Anhydrite, mottled light and dark gray, NS.
2206-07	Anhydrite, mottled light and dark gray, NS.
2207-08	Anhydrite, mottled light and dark gray, with minor dolomite, NS.
2208-09	Anhydrite, mottled light and dark gray and black, with minor dolomite, NS.
2209-10	Anhydrite, aa, with $\frac{1}{4}$ -inch tan dolomite layers, no dip, tight, NS.
2210-11	Dolomite, gray, finely crystalline, with veinlets of black anhydrite, tight, NS.
2211-12	Thin laminae of black anhydrite and light gray sandy dolomite, tight, NS.
2212-13	Sandstone, black, very fine-grained, with anhydrite cement, tight, NS.
2213-14	Anhydrite, mottled light and dark gray with tan dolomite mottling, NS.
2214-15	Dolomite, tan to light gray, mottled with dark gray anhydrite, tight, NS.
2215-16	Black shale, anhydritic with gray anhydrite laminae, NS.
2216-17	Black shale, anhydritic, NS.
2217-18	Dolomite, light gray, very finely crystalline, very sandy, very fine to fine-grained, NS.
2218-19	Sandstone, light gray, very fine to medium-grained, subrounded, fair sorting, dolomite cement, tight, NS.

The Superior Oil Company, #44-15 Peterson
C 8E 8E Section 15, T 7 S, R 1 E
Fall River County, South Dakota

CORE #2 2221-2264 Cored 43 feet. Recovered 43 feet.

2221-22	Sandstone, gray, very fine to medium-grained, sub-rounded, fair sorting, dolomitic and anhydritic cement, tight, NS.
2222-23	Sandstone, dark gray, very fine to fine-grained, good sorting, anhydritic cement, tight, NS.
2223-24	Anhydrite, mottled gray, NS.
2224-25	Anhydrite, mottled gray, NS.
2225-26	Anhydrite, mottled gray, NS.
2226-27	Anhydrite, mottled gray, NS.
2227-28	Anhydrite, mottled gray, NS.
2228-29	Anhydrite, mottled gray, NS.
2229-30	Anhydrite, mottled gray, NS.
2230-31	Anhydrite, mottled gray, NS.
2231-32	Anhydrite, mottled gray, NS.
2232-33	Anhydrite, mottled gray, NS.
2233-34	Dolomite, gray, dense with spots of anhydrite; yellow fluorescence in hairline fractures; very slight and very slow cut with acetone. Strong sulfur odor.
2234-35	Dolomite, aa, tight, NS. Sulfur odor.
2235-36	Dolomite, aa, tight with increasing amount of anhydrite, NS.
2236-37	Anhydrite, gray, dense, NS.
2237-38	Dolomite and anhydrite, gray, very finely crystalline, very sandy, fine to very fine grains, slight porosity, NS.
2238-39	Sandstone, fine to medium-grained, rounded to sub-rounded, fair sorting, dolomitic and anhydritic cement. Trace of porosity. NS.
2239-40	Anhydrite, gray, very sandy, tight, NS.
2240-41	Anhydrite, gray, very sandy, tight, NS.
2241-42	Anhydrite, gray, very sandy, tight, NS.
2242-43	Anhydrite, gray, very sandy, tight, NS.
2243-44	Sandstone, gray, very fine to fine-grained, sub-rounded, fair sorting, dolomitic and anhydritic cement, tight, NS.



Superior, #44-15 Peterson
Core #2
Page 2

2244-45	Sandstone, aa, tight, NS.
2245-46	Sandstone, gray, fine to medium-grained, anhydritic cement, tight, NS.
2246-47	Anhydrite, black, silty, tight, NS.
2247-48	Anhydrite, black, silty, tight, NS.
2248-49	Anhydrite, gray, dolomitic, tight, NS.
2249-50	Sandstone, gray, very fine to fine-grained, sub-rounded, anhydritic cement, tight, NS.
2250-51	Sandstone, gray, very fine to fine-grained, sub-rounded, anhydritic cement, tight, NS.
2251-52	Sandstone, gray, very fine to fine-grained, sub-rounded, anhydritic cement, tight, NS.
2252-53	Sandstone, gray, very fine to fine-grained, sub-rounded, anhydritic cement, tight, NS.
2253-54	Sandstone, gray, very fine to fine-grained, sub-rounded, anhydritic cement, slight porosity, NS.
2254-55	Anhydrite, mottled gray, dense, with streaks of tan dolomite and very fine-grained pyrite, tight, NS.
2255-56	Anhydrite, mottled gray, dense with streaks of tan dolomite, tight, NS.
2256-57	Sample aa, NS.
2257-58	Sample aa, NS.
2258-59	Sample aa, NS.
2259-60	Dolomite, light gray, dense, tight, NS.
2260-61	Dolomite, light gray, dense, tight with small spots of anhydrite, NS.
2261-62	Sample aa, NS.
2262-63	Sample aa, with minor spots of very finely crystalline pyrite, NS.
2263-64	Sample aa, NS.



POWERTECH (USA) INC.

Hydro ID 4

FILE

37 of 63

SOUTH DAKOTA STATE GEOLOGICAL SURVEY

COUNTY

DATE

By

TOWNSHIP

RANGE

7S

1E

N

E

S

36	35	32	33	34	35	36	37
1	6	5	4	3	2	1	6
12	17	18	9	10	11	12	7
13	18	17	16	15	14	13	18
24	19	20	21	22	23	24	19
25	30	29	28	27	26	25	30
36	37	32	33	34	35	36	37
1	6	5	4	3	2	1	6



ADMINISTRATIVE / SUNDRY REPORTS



POWERTECH (USA) INC.

Hydro ID 4

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MAR 7 5 1966

S. Dak. Oil & Gas Board
FORM 7

State Pub. Co., Pierre

PLUGGING RECORD

Operator The Superior Oil Company		Address P. O. Box 200, Casper, Wyoming	
Name of Lessee Peterson		Well No. 1 (44-15)	Field & Reservoir Wildcat
Location of Well 660' FSL & 660' FEL C SE SE 15-7S-1E		Sec-Twp-Rge or Block & Survey	County Fall River
Application to drill this well was filed in name of The Superior Oil Co.	Has this well ever produced oil or gas No	Character of well at completion (initial production): Oil (bbls/day) Gas (MCF/day) Dry? Yes	
Date plugged: March 5, 1965	Total depth 2264'	Amount well producing when plugged: Oil (bbls/day) Gas (MCF/day) Water (bbls/day)	
Name of each formation containing oil or gas. Indicate which formation open to well-bore at time of plugging	Fluid content of each formation	Depth interval of each formation	Size, kind & depth of plugs used. Indicate zones spaced cemented, giving amount cement

CASING RECORD

Size pipe	Put in well (ft.)	Pulled out (ft.)	Left in well (ft.)	Give depth and method of parting casing (shot, ripped etc.)	Packers and shoes
8-5/8"	971	None	971		Guide shoe @ 971, float collar @ 937 & basket @ 688'.

Was well filled with mud-taken fluid, according to regulations?
Yes

Indicate deepest formation containing fresh water
Bsl. Sundance Sd.

In addition to other information required on this form, if this well was plugged back for use as a fresh water well, give all pertinent details of plugging operations to base of fresh water sand, perforated interval to fresh water sand, name and address of surface owner, and attach letter from owner authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.

Mr. Earl J. Cox of the State Geological Survey supervised the plugging operations. This well was plugged & abandoned in the following manner:
 Plug #1 - Equalized through open end DP 25 sx reg. cmt. from 1970' to 1920'
 Plug #2 - Equalized through open end DP 35 sx reg. cmt. from 1715' to 1645'
 Plug #3 - Equalized through open end DP 30 sx reg. cmt. w/2% CaCl₂ from 1020' to 950'
 Removed csg. head & capped well as requested by land owner in attached letter.
 The pits have been fenced and the location will be cleaned & leveled when the pits dry up.

USE REVERSE SIDE FOR ADDITIONAL DETAIL

Executed this the 18th day of March, 1965	State of Wyoming	County of Natrona	J. P. Dufka	Signature of Affiant
Before me, the undersigned authority, on this day personally appeared J. P. Dufka known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states, that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.				
Subscribed and sworn to before me this 18th day of March, 1965				
SEAL	Notary Public in and for County, _____			
My commission expires June 18, 1967				
DO NOT WRITE BELOW THIS LINE				
Approved _____	OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA			
Date 2/1/66	Secretary			

Approved for release of bond

Date Oct 10, 1966

Dist: State Board (2)
State Geologist (1)

State Geologist

Note: File 2 copies of this form with Secretary, Oil & Gas Board, Pierre.

S. Dak. Oil & Gas Board
FORM 4

WELL COMPLETION OR RECOMPLETION REPORT AND LOG						FARM OR LEASE NAME	
TYPE OF COMPLETION <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input checked="" type="checkbox"/> Dry Hole <input checked="" type="checkbox"/> New Well <input type="checkbox"/> Work-Over <input type="checkbox"/> Deepen <input type="checkbox"/> Plug Back <input type="checkbox"/> Same Zone <input type="checkbox"/> Diff Zone OPERATOR The Superior Oil Company ADDRESS P. O. Box 200, Casper, Wyoming LOCATION (in feet from nearest lines of section or legal subdivision where possible) Surface 660' FSL & 660' FEL Sec. 15. Top prod interval At total depth 660' FSL & 660' FEL Sec. 15						Peterson	
						WELL NO.	
						1 (44-15)	
						FIELD AND POOL OR WILDCAT	
						Wildcat	
						NO. ACRES IN LEASE	
						2846.03	
						N 4 SEC TWP. RGE.	
						C SE SE 15-7S-1E	
						COUNTY	
						Fall River	
PERMIT NO.		DATE ISSUED		PREVIOUS PERMIT NO.		DATE ISSUED	
P 2		2-18-65					
DATE SCHEDULED		DATE T.D. REACHED		DATE COMPL. (Ready to Prod.)		ELEVATIONS (DF, RKB, RT, GR, etc.)	
3-20-65		3-3-65		P & A 3-5-65		3585' KB	
TOTAL DEPTH (MD & TVD)		PLUG. BACK T.D. (MD & TVD)		IF MULTIPLE COMPL. HOW MANY		INTERVALS DRILLED BY	
2260' MD						0' to 2260'	
PRODUCING INTERVAL(S), THIS COMPLETION, TOP, BOTTOM, NAME (MD & TVD)						DATE DIRECTIONAL SURVEY SUBMITTED	
TYPE ELECTRIC AND OTHER LOGS RUN (Circle those filed)						WAS WELL CORED	
LLS, Microlog, Dual Induction - LL & GRS (All filed)						Yes	
CASING RECORD (Report all strings set in well)							
CASING SIZE	DEPTH SET (MD)	HOLE SIZE	WEIGHT LBS./F.	PURPOSE	SACKS CEMENT	AMOUNT PULLED	
6-5/8"	971	12-1/4"	24#	Surface	625	None	
LINER RECORD							
SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT	SCREEN (MD)	SIZE	TUBING RECORD	
						DEPTH SET (MD) PACKER SET (MD)	
PERFORATION RECORD							
DEPTH INTERVAL (MD)	HOLES PER FT.	SIZE AND TYPE	PURPOSE	ACID, SHOT, FRAC. CEMENT SQUEEZE, ETC.			
				AMOUNT AND KIND OF MATERIAL USED			
PRODUCTION							
DATE FIRST PRODUCTION		PRODUCING METHOD (Flowing, gas lift, pumping, size & type of pump)			WELL STATUS (Prod or shut in)		
DATE OF TEST		HOLES TESTED	THROCK SIZE	PRODUCTION FOR TEST	OIL, Bbls.	GAS, Mcf.	WATER, Bbls. & %
							OIL GRAVITY API (Cont.)
FLOW TYPING PRESSURE		CASING PRESSURE	CALCULATED 24-HOUR RATE		OIL, Bbls.	GAS, Mcf.	WATER, Bbls. & %
							GAS-OIL RATIO
DISPOSITION OF GAS (sold, used for fuel, vented, etc.)						TEST WITNESSED BY	
LIST OF ATTACHMENTS							
1 copy all E-logs, 1 copy Core Analysis, 1 copy ltr. from land owner							
I hereby certify that the foregoing and attached information is complete and correct as determined from all available records							
SIGNED		TITLE				DATE	
J. P. Sucka		District Engineer				3-15-65	
DO NOT WRITE BELOW THIS LINE							
*See Instructions On Reverse Side							
Approved		OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA					
Date		Secretary					

Dist: State Board (3) w/1 copy all attachments.
State Geologist (1) w/2 copies all attachments.



INSTRUCTIONS

General: This form is designed for submitting a complete and correct well completion report and log on all types of lands and leases to either a Federal agency or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Supplemental instructions by local Federal and/or State offices will govern the use of this form.

If not filed prior to the time this summary record is submitted, copies of all currently available logs (drillers, geologists, sample and core analysis, all types electric, etc.), formation and pressure tests, and directional surveys, should be attached hereto, to the extent required by applicable Federal and/or State laws and regulations. All attachments should be filed on this form, see last blank.

If this well was directionally drilled, show both the location at the surface and at total depth from nearest town, where possible; also show the locations at the top and at the bottom of any zone for which production data are reported in space 23, and any zone open for injection or disposal. Use this reverse side if more space is needed. (MD-Measured Depth, TVD-True Vertical Depth)

*Indicate which elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments.

If this well is completed for separate production from more than one zone (multiphase completion), so state in the correct space and show the producing interval, or intervals, top(s), bottom(s) and zone(s) (if any) for only the zone reported in the blanks under PRODUCTION. Submit a separate completion report on this form for each interval (zone) to be separately produced.

Stuck Column: Attached supplemental records for this well should show the details of any multiple stage cementing and the location of the cementing tool.

File 3 copies of this form with Secretary, Oil and Gas Board, Pierre.

SUMMARY OF WATER BONES AND NON-COMMERCIAL OIL OR GAS BONES						GEOLOGIC MARKERS		
(Note: If well was directionally drilled, show both measured and true vertical depths for section and markers listed)								
KIND OF FORMATION	DEPTH TO TOP		DEPTH TO BOTTOM		CONTENTS: PRODUCTIVE RATE, IF KNOWN	NAME	DEPTH TO TOP	
	MEAS. DEPTH	TRUE VERT. DEPTH	MEAS. DEPTH	TRUE VERT. DEPTH			MEAS. DEPTH	TRUE VERT. DEPTH
Lakota Sd.	371		425		30 bbls. wtr./hr.	Dakota	185'	
Sundance Sd.	771		905		25 bbls. wtr./hr.	Lakota	371'	
Bsl. Sundance Sd.	966		1007		15 bbls. wtr./hr.	Harrison	571'	
						Sundance	670'	
						Sundance Sd.	771'	
						Minnekahta	1518'	
						Opeche	1557'	
						Minnelusa	1845'	
						Red Marker	2108'	

SP 14

4 DI copy



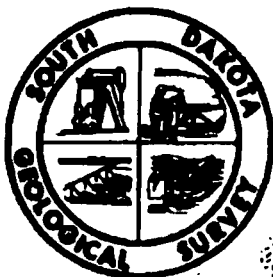
CORRESPONDENCE



POWERTECH (USA) INC.

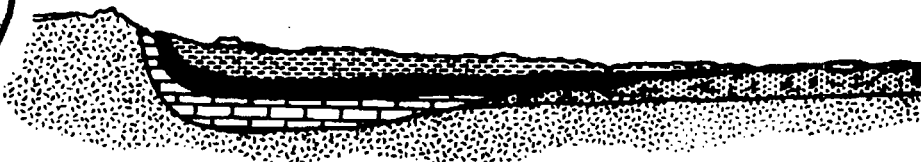
Hydra ID 4

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SCIENCE CENTER, UNIVERSITY OF SOUTH DAKOTA CAMPUS,
VERMILLION, 57069, PHONE 624-4471

WESTERN FIELD OFFICE, 208 GAY BUILDING, BELLE FOURCHE,
BOX 187, 57717, PHONE 692-3121



Western Field Office
October 12, 1966

OCT 13 1966

Mr. Merlin J. Tipton
Assistant State Geologist
State Geological Survey
Vermillion, South Dakota

Dear Tip:

In going through my files, I find that my records show the following oil tests have met all requirements and can now be released from bond coverage:

- ✓ Superior #1 Peterson (44-15)
Fall River County, South Dakota
- ✓ Gulf #1 Dahlke
Jones County, South Dakota
- ✓ Gulf #1 Sandy
Jones County, South Dakota
- ✓ Gulf #1 Wolf-State
Lyman County, South Dakota.

Sincerely,

Earl Cox

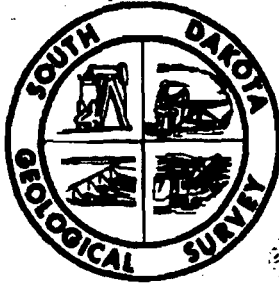
Earl Cox
Senior Geologist

EC:rk

DUNCAN J. MCGREGOR
DIRECTOR AND STATE GEOLOGIST
VERMILLION

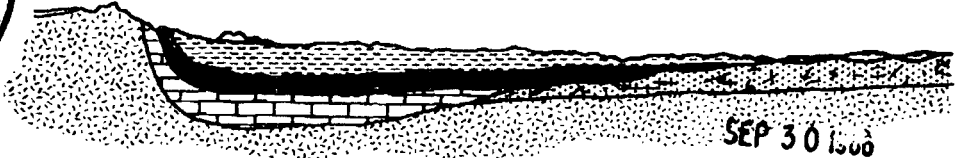
MERLIN J. TIPTON
ASSISTANT STATE GEOLOGIST
VERMILLION

EARL J. COX
SENIOR GEOLOGIST
BELLE FOURCHE



SCIENCE CENTER, UNIVERSITY OF SOUTH DAKOTA CAMPUS,
VERMILLION, 57069, PHONE 624-4471

WESTERN FIELD OFFICE, 208 GAY BUILDING, BELLE FOURCHE,
BOX 187, 57717, PHONE 892-3121



Western Field Office
September 29, 1966

Dr. Duncan McGregor
State Geologist
State Geological Survey
Vermillion, South Dakota

Re: Superior #1 Peterson (44-15)
SESE-15-7S-1E
Fall River County, South Dakota
Permit No. 382

Dear Duncan:

I have received a copy of the RELEASE, signed by Francis Peterson, and the letter showing two copies of the RELEASE has been sent you by Superior Oil Company.

My records show all required samples, logs and records have been received by your office. The RELEASE, completes all requirements and it is recommended the bond covering this location be terminated.

Sincerely,

Earl Cox
Engineering-Petroleum Geologist

EC:rk

DUNCAN J. MCGREGOR
DIRECTOR AND STATE GEOLOGIST
VERMILLION

MERLIN J. TIPTON
ASSISTANT STATE GEOLOGIST
VERMILLION

EARL J. COX
SENIOR GEOLOGIST
BELLE FOURCHE



POWERTECH (USA) INC.

Hydro ID 4

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THE SUPERIOR OIL COMPANY

SUPERIOR BUILDING
P. O. BOX 200
CASPER, WYOMING 82601

September 26, 1966

SEP 28 1966

State Geological Survey
Science Center
University of South Dakota Campus
Vermillion, South Dakota

Re: Peterson No. 1 (44-15)
C SE SE Sec. 15-7S-1E
Fall River Co., South Dakota
Permit No. 382


Gentlemen:

Attached are two (2) copies of a letter agreement executed by Mr. Francis A. Peterson releasing us from all surface damages in connection with the drilling of the above referenced well.

We shall appreciate your approval of our abandonment of this location and the attendant release from bond requirement.

Very truly yours,

THE SUPERIOR OIL COMPANY


J. P. Duka

JPD:sn

Attached

cc w/attach.: Mr. Earl Cox
South Dakota Geological Survey
Western Field Office
Belle Fourche, South Dakota



POWERTECH (USA) INC.

Hydro ID 4

48 of 63

THE SUPERIOR OIL COMPANY

SUPERIOR BUILDING
P. O. BOX 200
CASPER, WYOMING 82601
September 20, 1966

RST	_____
JCH	_____
EJW	_____

FILE	_____

THE SUPERIOR OIL
COMPANY

SEP 20 1966

ENGINEERING
CASPER

THE SUPERIOR OIL
COMPANY

SEP 26 1966

LAND DEPARTMENT
CA. PER, WYOMING

Mr. Francis A. Peterson
Edgemont, South Dakota

Re: Peterson #1 (44-15)
C SE SE 15-7S-1E
Fall River County, South Dakota
Permit #382

Dear Mr. Peterson:

Reference is made to Assignment and Agreement dated March 16, 1965 whereby we assigned to you the well in the SE SE 15-7S-1E and you assumed the responsibility for the well.

Regarding the reserve mud pit used in connection with said well, you have informed us that you wish to use it for a reservoir and will take it over, relieving us of any further clean up work or concern about surface damages of any kind arising out of the drilling of the well mentioned above.

If you agree with the foregoing, please sign in the space provided below and return one copy of this letter to us in the enclosed self-addressed envelope.

Very truly yours,

THE SUPERIOR OIL COMPANY

R. S. Troost

A. S. Troost
District Landman

RST/b
enc.

ACCEPTED AND AGREED TO
THIS 23 DAY OF Sept., 1966.

Francis A. Peterson
FRANCIS A. PETERSON



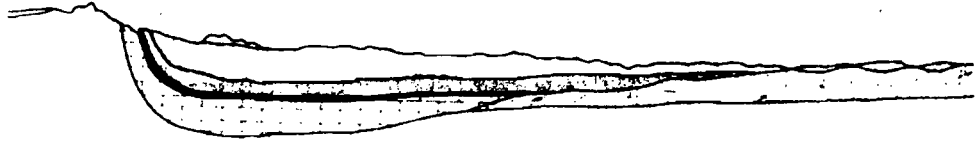
POWERTECH (USA) INC.

Hydro ID 4



SEP 13 1966 47 of 83
SCIENCE CENTER, UNIVERSITY OF SOUTH DAKOTA CAMPUS,
VERMILLION, 57069, PHONE 624-4471

WESTERN FIELD OFFICE, 208 GAY BUILDING, BELLE FOURCHE,
BOX 187, 57717, PHONE 892-3121



Western Field Office
September 12, 1966

Mr. Robert Schoon
Geologist
State Geological Survey
Vermillion, South Dakota

Dear Bob:

Would you check the file on the Superior #1 Peterson, in
Fall River County, and see if Superior has sent us a copy of
the RELEASE, signed by the land owner.

Sincerely,

Earl Cox

Earl Cox
Engineering-Petroleum Geologist

EC:rk

*P.S. Also how you need sample from the
Tenneco #1-8 Monticello, Fall River County*

E. Cox

DUNCAN J. MCGREGOR
DIRECTOR AND STATE GEOLOGIST
VERMILLION

MERLIN J. TIPTON
ASSISTANT STATE GEOLOGIST
VERMILLION

EARL J. COX
SENIOR GEOLOGIST
BELLE FOURCHE



POWERTECH (USA) INC.

Hydro ID 4

48 of 63

NOV 1 1965

Western Field Office
October 29, 1965

Mr. J. P. Dujka
Superior Oil Company
P. O. Box 200
Casper, Wyoming

Re: Superior #1 Peterson (44-15)
SESE-15-7S-1E
Fall River County, So. Dakota
Permit No. 382

Dear Mr. Dujka:

Thank you for your October 27 letter. A release from Mr. Peterson will meet all requirements covering cleaning up of the above location. If a copy of the release is sent to me, it will expedite bond termination.

Sincerely,

Earl Cox
Engineering-Petroleum Geologist

EC:sm



POWERTECH (USA) INC.
Hydro ID 4

48 of 63

Western Field Office
October 7, 1965

Mr. J. P. Dujka
Superior Oil Company
P. O. Box 200
Casper, Wyoming

Re: Superior #1 Peterson (44-15)
SESE-15-7S-1E
Fall River County, So. Dakota
Permit No. 382

Dear Mr. Dujka:

I visited the above location September 2 and found that the wellhead valve was open and water was running into the mud pit.

As you plan to fill the pit after it dries up, you may wish to contact the landowner and have him either close the valve or divert the water so it will not enter the pit.

Sincerely,

Earl Cox
Engineering-Petroleum Geologist

EC:sn



POWERTECH (USA) INC.

Hydro ID 4

50 of 63

July 13, 1965

**Mr. Earl Cox
State Geological Survey
P. O. Box 187
Belle Fourche, South Dakota 57717**

Dear Earl:

**I am enclosing the electric log and dual induction laterolog
on the Superior Peterson #1 (44-15) well in Fall River County,
and carbon copies of the scout reports that Bob Schoon turned
in last week.**

Sincerely yours,

**Janet J. McDonough
Senior Stenographer**

Enclosures

MAY 13 1965

SOUTH DAKOTA

State Water Resources Commission

STATE OFFICE BUILDING

PIERRE, SOUTH DAKOTA

May 12, 1965

Mr. Francis A. Peterson
Edmonton, South Dakota 57735

Re: Superior #1 Peterson (46-15)
SD# SD# 15-78-1E
Fall River County, S.D.
Permit No. 392

Dear Mr. Peterson:

In as much as the requirements for converting your oil test well to a water well have been done, as specified by the State Geological Survey, the Water Resources Commission hereby assumes jurisdiction of the well as a water well.

Sincerely,

J. V. PALMER

JVC/BM/lw

cc: ✓ Dr. Duncan McGregor, State Geologist, Vermillion, S.D.
Mr. Earl Cox, Belle Fourche, S.D.
Oil and Gas Board, Pierre, S.D.



MAY 11 1965

Western Field Office
Belle Fourche, South Dakota
May 10, 1965

Mr. Joe Grimes
Water Resources Commission
State Office Building
Pierre, South Dakota

Re: Superior #1 Peterson (44-15)
SE SE-15-75-1E
Fall River County, South Dakota
Permit No. 382

Dear Mr. Grimes:

The above oil test is on land owned by Francis A. Peterson. He made arrangements to convert the test to a water well. The well has 971 feet of 8 5/8 inch surface casing, cemented with 575 sacks of cement. The base of the casing is just above the lowest Sundance sand. Immediately below the sand is a cement plug. Additional plugs were placed so as to isolate the Minnelusa sands in the hole. A three inch control valve is in place on the wellhead and when last visited, the well was flowing about 10 gpm of fresh water.

Enclosed is a letter from Mr. Peterson asking that conversion of the oil test to a water well be approved. Peterson agrees to assume full liability for any subsequent plugging that might be required.

If the Water Resources Commission will accept jurisdiction of this test as a water well, please so inform the Oil and Gas Board with a copy of your letter to the State Geologist.

Sincerely,

Earl Cox
Engineering-Petroleum Geologist

EC:sn

cc: Secretary, Oil and Gas Board w/enc.

State Geologist w/enc.

P.S. to Duncan: Even though the Water Resources Commission accepts jurisdiction the pits have not been filled at this location and it is suggested that we not approve the bond release until they have been filled. Earl



POWERTECH (USA) INC.

Hydro ID 4

MAY 10 1965
53 of 63

THE SUPERIOR OIL COMPANY

SUPERIOR BUILDING
P. O. BOX 200
CASPER, WYOMING 82602

May 7, 1965

State Geological Survey
Science Center
University of South Dakota Campus
Vermillion, South Dakota

Re: Peterson #1 (44-15)
C SE SE 15-7S-1E
Fall River County
South Dakota
Permit #382

Gentlemen:

Attached are two copies each of the core and sample description on the above test.

Today we received a copy of the transmittal letter from American Stratigraphic Company showing they have sent you the samples for this well. As stated on the plugging record, the mud pits have been fenced and will be filled and leveled when they dry up.

If you need any further information or reports, please let us know.

Yours very truly,

THE SUPERIOR OIL COMPANY


J. P. Dujka

RLH/jr

cc: Mr. Earl Cox
South Dakota State Geological Survey
Western Field Office
Belle Fourche, South Dakota



POWERTECH (USA) INC.

Hydro ID 4

54 of 63

MAY 7 1965



AMERICAN STRATIGRAPHIC COMPANY

17 NORTH 51ST ST. • BILLINGS, MONTANA • ALPINE 9-7847

May 4, 1965

State of South Dakota Geological Survey
Science Center
Vermillion, South Dakota

Attention: Dr. Duncan McGregor
State Geologist

Gentlemen:

We are shipping you today via motor freight samples on the following well:

✓ Superior, #1 Peterson
15-7S-1E
Fall River County, South Dakota.

Very truly yours,

AMERICAN STRATIGRAPHIC COMPANY

Fred McCotter
Fred McCotter
Manager

PMc/be

cc: Mr. Jerry Davis, Superior Oil Company, Box 200, Casper, Wyoming.

Hydro ID 4

55 of 63



**SOUTH DAKOTA
STATE GEOLOGICAL SURVEY**

SCIENCE CENTER
University of South Dakota Campus
VERMILLION 57008
Phone 604-4471

Western Field Office
Belle Fourche, South Dakota
April 15, 1965

DUNCAN J. McNEEGON
Director and State Geologist
MERLIN J. TIPTON
Assistant State Geologist

Mr. J. P. Dujka
Superior Oil Company
P.O. Box 200
Casper, Wyoming

Re: Superior #1 Peterson (44-15)
SEKSEK-15-75-1E
Fall River County, So. Dakota
Permit No. 382

Dear Mr. Dujka:

In checking our files, at Vermillion, I find we still need two copies each of the core and sample description on the above test. These records should be sent in within thirty days of completion of the test.

Before the bond can be released, the rig must be removed from the location, the samples sent in and the mud pits either filled or a release obtained from Mr. Peterson.

This letter is merely to inform you of the status of our files and to outline our requirements. It is hoped Superior will see fit to do additional work in South Dakota and be assured of our future cooperation.

Sincerely,



Earl Cox
Engineering-Petroleum Geologist

EC:sn



POWERTECH (USA) INC.

Edgemont, South Dakota
March 10, 1965

Mr. Joe Grimes
Water Resource Commission
Pierre, South Dakota

Re: Superior #1 Peterson(44-15)
SEKSEK-15-7S-1E
Fall River County, So. Dakota
Permit No. 382

Dear Mr. Grimes:

I wish to convert the above oil test, on my land, to a water well. The water to be used will come from the sand zone immediately below the surface casing. A cement plug is in place, immediately below the water zone. The lower portion of the hole has been plugged according to specifications of the State Geological Survey.

Should conversion of the oil test to a water well be approved, I agree to assume full liability for any subsequent plugging that might be required.

Sincerely,

Francis A. Peterson



SOUTH DAKOTA
STATE GEOLOGICAL SURVEY
SCIENCE CENTER
University of South Dakota Campus
VERMILLION 57069
Phone 624-4471

Western Field Office
Belle Fourche, South Dakota
March 9, 1965

MAR 10 1965

DUNCAN J. MCGREGOR
Director and State Geologist

MERLIN J. TIPTON
Assistant State Geologist

Mr. Francis A. Peterson
Edgemont, South Dakota

Re: Superior #1 Peterson(44-15)
SE~~4~~SE~~4~~-15-7S-1E
Fall River County, So. Dakota
Permit No. 382

Dear Mr. Peterson:

Enclosed is a letter and three copies made out to Mr. Grimes, of the Water Resource Commission, stating you wish to convert the above oil test to a water well. Please sign the original and all copies, and return to me in the stamped, addressed envelope.

As soon as you get the valve in place, at the wellhead, please let me know so it can be inspected. An envelope is enclosed for your use.

Sincerely,



Earl Cox
Engineering-Petroleum Geologist

EC:sn



POWERTECH (USA) INC.

Hydro ID 4

58 of 63

Edgemont, South Dakota
March 4, 1965

Dr. Duncan McGregor
State Geologist
State Geological Survey
Vermillion, South Dakota

Re: Superior #1 Peterson (44-15)
SE $\frac{1}{4}$ SE $\frac{1}{4}$ -15-7S-1E
Fall River County, So. Dak.
Permit No. 382

Dear Sir:

The above oil test on my land is to be plugged and abandoned. It is requested that the test be plugged in a manner so that I can easily go back into it at a future date and perforate the casing and tap the artesian water flow that is behind the casing.

To be specific, it is requested that approval be granted to weld or screw a cap on the top of the surface casing in place of the abandonment marker. It is also requested that the ten sack surface plug not be placed.

Should the test be plugged in the above manner, I agree to assume full liability for any subsequent plugging that might be required.

Sincerely,

F. A. Peterson



POWERTECH (USA) INC.

Hydro ID 4

59 of 63

FEB 24 1965

SOUTH DAKOTA

State Water Resources Commission

STATE OFFICE BUILDING

PIERRE, SOUTH DAKOTA

February 23, 1965

Mr. F. A. Peterson
Edgemont, South Dakota

Dear Mr. Peterson:

I have been advised that the Superior Oil Company has obtained a Permit to Drill for Oil and Gas on your land in Section 18, T 7 S, R 1 E.

Occasionally, owners of land consider converting abandoned oil wells into water wells. Please advise me whether or not you intend to convert the oil well drill hole on your land into a water well if water is encountered and the drill hole is abandoned as an oil well.

If you are considering making a water well out of the abandoned oil well drill hole, special considerations are necessary to comply with the State's oil and water laws. The abandoned oil hole must be properly plugged and the water well properly constructed. All conversion work will be at your expense. The cost will vary, depending upon the characteristics of the drill hole, but such cost will be in the neighborhood of \$5,000 or more. Usually another driller and drill rig will have to be arranged for. This other drill rig and casing and other materials will have to be on hand to take over immediately after the special oil well plugging is completed, because the drill hole cannot be left open for any appreciable length of time without spoiling it. Approval of plans for construction of the water well will be required, and a bond covering proper construction may be required. Also, a water right may be required. All of these arrangements take considerable time to accomplish.

Please advise me immediately if you plan to convert the oil well drill hole into a water well. We both hope that a producing oil well results from the drill hole on your land; however, if not and you are planning on a water well, we must start making arrangements now.

Sincerely,

J.W. GRIMES
Chief Engineer

JW/m
cc Oil & Gas Board, State Capital, Pierre, S.D.
Dr. Duncan McGregor, State Geologist, University of S.D. ✓
Vermillion, South Dakota



POWERTech (USA) INC.

Hydro ID 4

60 of 63

SURETY



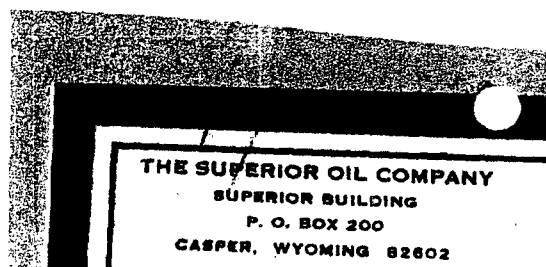
NO SURETY INFORMATION FOR THIS WELL AS OF 5/18/2011



MISCELLANEOUS

2205 Superior Oil Co. #1 Peterson
2264 15-7 S-1 E, Fall River Co.
0 " "
2205

5/10/65





Oil and Gas Search for: <i>api_no_ like '40 047 20065'</i>		
Page 1 of 1	Export Options (temporarily unavailable)	Page: 1

Record 1 of 1

Well Information

API No:	40 047 20065	County:	FALL RIVER
Well Name:	PRC 21-14 PETERSON	Location:	NENW 14-7S-1E
Permit No:	741	Total Depth:	2266
Operator Name:	POWER RESOURCES CORPORATION	Bottom Hole:	Minnelusa
Permit Date:	12-03-1975	KB Elevation:	3647
Spud Date:	12-11-1975	Ground Elevation:	3639
Plug Date:	12-26-1975	Latitude:	43.447765
		Longitude:	-103.968121
Well Field	WILDCAT	Status	P&A
Class:	DRY HOLE	Type:	DRY HOLE

Formation Tops

<u>Formation</u>	<u>Depth (ft.)</u>
Morrison	322
Spearfish	890
Goose Egg	1178
Minnekahta	1425
Opeche	1465
Minnelusa	1569
Red Marker	1984
2nd Leo	2100



COUNTY: FALL RIVER
LEGAL LOCATION: NENW 14-7N-1E
API NO: 40 047 20065
PERMIT NO: 741
WELL NAME: PRC #21-14 PETERSON
OPERATOR: POWER RESOURCES
CORPORATION
PERMIT ISSUED: 12/03/1975
PERMIT CLOSED: 01/23/1976
FILE LOCATION: 7N-1E-14 NENW

TARGET CODES:

WELL HISTORY / CHECKLIST

PERMIT TO DRILL / INTENT TO DRILL

WELL INSPECTION / SCOUT REPORTS

OPERATOR'S TECHNICAL REPORTS / MAPS

ADMINISTRATIVE / SUNDRY REPORTS

CORRESPONDENCE

SURETY

MISCELLANEOUS



WELL HISTORY / CHECKLIST

BOND RELEASE CHECKLIST

Well Name & Location		Permit # 741
PRC #21-14 Peterson NENW 14-7S-1E, Fall River County		API #40 047 20065
Bond # 4288541	Date Issued Dec. 3, 1975	Date released Aug. 25, 1976

Surface Restoration

- ☒ Pits filled
☒ Site level
☒ Site policed
☐ Dry-hole marker solid, sealed, correctly inscribed
☐ No dry-hole marker desired, letter in WFO files from surface owner
☒ (Converted to water well, owner's responsibility) *FK*

Paperwork Filed

- ☐ Form 4 (Completion or Recompletion Report)
☐ Form 6 (Sundry Notices and Report on Wells)
☒ Form 7 (plugging Report)

Geological Information Filed

- ☒ Well Logs: IES, SNP, DIL, GR, NEUT, CALIP, Cement Bond, Temp, Micro, Laterlog, SM Dens. *BCSL*
☐ DST charts and reports
☒ Geologist's Report
☐ Results of coring and core analyses
☒ Set of 10-foot sample cuttings (check with Bob Schoon)

*have been
received at
Vermillion
1-15-76
Jus*

DATE

8-25-76

CHECKED BY

Jus

PERMIT CHECKLIST

Well Name and Location:	Permit # 741
PRC #21-14 Peterson	API #40 047 20065
NENW 14-7S-1E, Fall River	Bond # 4288541

Paperwork Filed with WFO

- ☒ Organization Report
- ☒ Application
- ☒ Bond
- ☒ Permit fee

The Following Papers sent to Operator:

- ☒ Permit (Form 2a)
- ☒ Receipt for \$100 permit fee
- ☒ Cover letter explaining material sent

Permit Fee Filed:

- ☒ Permit fee w/Cash Receipts Transmittal Form sent to State Treasurer

Notification of New Permit sent to:

- ☒ Dr. Duncan J. McGregor
- ☒ Mr. Vern W. Butler
- ☒ Dr. Allyn Lockner
- ☒ Mr. George Kane

DATE Dec. 3, 1975 CHECKED BY Jan Miller



PERMIT TO DRILL / INTENT TO DRILL



POWERTECH (USA) INC.
Hydro ID 5

7 of 44

3

State Pub. Co., Pierre

APPLICATION FOR PERMIT TO:

S. Dak. Oil & Gas Board
FORM 2

☒ DRILL ☐ DEEPEN ☐ PLUG BACK
☒ OIL WELL ☐ GAS WELL ☐ SINGLE ZONE
☐ MULTIPLE ZONE

FARM OR LEASE NAME

M. Canote Peterson

WELL NO.

12-14 # 21-14

FIELD AND POOL, OR WILDCAT

Wildcat

NO. ACRES IN LEASE

971.32

SEC. TWP. RGE.

N 14-75-1E

COUNTY

Fall River

OPERATOR
Powertech Resources Corporation

ADDRESS

1660 S. Albion St. Suite 827 Denver, Colorado 80222

LOCATION: In feet from an established corner of the legal subdivision.

*660 ft. NORTH
1983 ft. WEST
Section 14-75-1E*

NAME AND ADDRESS OF SURFACE OWNER

*M. Canote Peterson
State Route, Edgemont, S. Dakota 57735*

ELEVATION

3639.62

PROPOSED DEPTH

2500

NO. OF WELLS ETC.

None

ROTARY OR CABLE TOOLS

Rotary

APPROXIMATE DATE

WORK WILL START

December 3, 1975

NAME AND ADDRESS OF CONTRACTOR

*FAIRSWORTH and Kaiser
P.O. Box 940*

Newcastle, Wyoming

IF LEASE PURCHASED WITH ANY WELLS DRILLED, FROM WHOM PURCHASED (Name and address)

- NO -

PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	NEW OR SECOND HAND	DEPTH	SACKS OF CEMENT
<i>12 1/8"</i>	<i>8 5/8"</i>	<i>28</i>	<i>Second hand</i>	<i>150</i>	<i>150</i>

DESCRIBE PROPOSED OPERATIONS IF PROPOSAL IS TO DEEPEN OR PLUG BACK. GIVE DATA ON PRESENT PRODUCTIVE ZONE AND PROPOSED NEW PRODUCTIVE ZONE. GIVE BLOW OUT PREVENTER PROGRAM IF ANY.

Drill a 7 1/8" hole from bottom of surface casing to estimated total depth of 2500. Will test the Leo zones of Minnelusa Formation. Drill stem test any zones with shows of oil & gas. If commercial production indicated will set 5 1/2" casing 100 feet below prospective pay zone, perforate, and complete.

SIGNED *Richard H. Sandham* TITLE *Vice President-Land* DATE *Nov. 28 1975*

WELL NO. <i>741</i>	DATE <i>December 3, 1975</i>	CHECKED BY <i>Fred J. Hance</i>	DATE
CONDITIONS		SUPERVISOR	
COMPLETE SET OF SAMPLES AND CORES IF TAKEN MUST BE SUBMITTED.		DEPTH MUST BE SUBMITTED.	
SAMPLES AND CORES IF TAKEN, BELOW			
STATE GEOLOGICAL SURVEY			
WESTERN FIELD OFFICE			

INSTRUCTIONS

General: This form is designed for submitting proposals to perform certain well operations, as indicated, on all types of lands and leases for appropriate action by either a Federal or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. General applicable Federal or State regulations, or appropriate officials, concerning approval of the proposal before operations are started.

If the proposal is to re-drill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate modifications.

If the well is to be, or has been, directionally drilled, so state and show by attached sheets, if necessary, the coordinate location of the hole in any present or objective productive zones.

(*Sample location: 660' South and 660' East of the Northwest Corner of Section 14.)

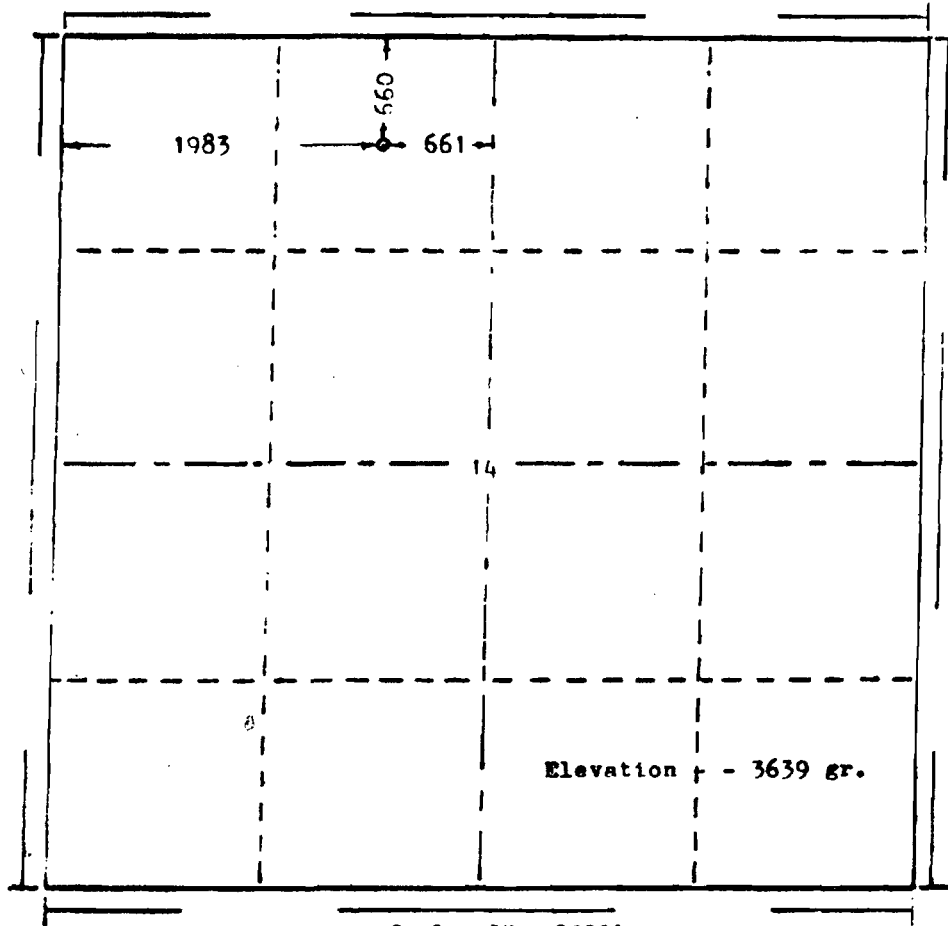


POWERTECH (USA) INC.

Hydro ID 5

8 of 44

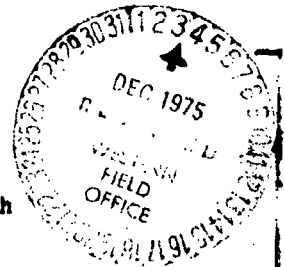
R. 1 E



T.
7
S

Scale: 1" = 1000'

#21-14 Jus
Thomas E. Nelson, of Casper, Wyoming
has in accordance with a request from Mr. Bassham
for Power Resources Corporation
determined the location of ~~#12-14~~ M. Lenore Peterson
to be C NE NW Section 14, Township 7 South
Range 1 East of the Black Hills Meridian
Fall River County, South Dakota



I hereby certify that this plat is an
accurate representation of a correct
survey showing the location of
~~#12-14~~ M. Lenore Peterson
#21-14 Jus

Date: 11-29-75

T. Nelson
Licensed Land Surveyor No. 1200
State of South Dakota

SDHY 100, 00, 10000

S. Dak. Oil & Gas Board
FORM 1

ORGANIZATION REPORT

Full Name of the Company, Organization, or Individual

Power Resources Corporation

Post Office Address (Box or Street Address)

1660 S. Action St. Suite 227, Denver, Colo. 80222

Plan of Organization (State whether organization is a corporation, joint stock association, firm or partnership, or individual)

Corporation

If a reorganization, give name and address of previous organization

NONE

(1) If foreign corporation, give State where incorporated

WYOMING

(2) Name and postoffice address of State agent

*OT Corporation System
319 S. Coteau St.
Pierre, S. Dakota 57501*

(3) Date of permit to do business in state

December 1995

Principal Officers or Partners (if partnership)
NAME

TITLE

POSTOFFICE ADDRESS

Robert V. Bailey

President

*1660 S. Action
Suite 227, Denver, Colo 80222*

Milton O. Childers

Executive Vice President

" " "

Richard A. Bassham

Vice President - Land

" " "

John F. Trotter

Secretary - Treasurer

307 Congress Bldg, Casper, WY 82401

DUPLICATE NAME

POSTOFFICE ADDRESS

Robert V. Bailey

1660 S. Action, Suite 227, Denver, Colorado

Milton O. Childers

" " " " "

Richard A. Bassham

" " " " "

John F. Trotter

307 Congress Bldg, Casper, WY 82401

Clavis E. Rodalondea

152 N. Durbin " "

Executed this the *22* day of *November*, 1975

State of *WYOMING*

County of *Nathonia*

Before me, the undersigned authority, on this day personally appeared *Richard A. Bassham*, known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states that he is duly authorized to make the above report and that he has knowledge of the facts stated herein, and that said report is true and correct.

Subscribed and sworn to before me this *22* day of *November*, 1975

Notary Public in and for *WYOMING*
County of *Nathonia*
My Commission Expires June 28, 1976

Richard A. Bassham Jr.
Notary Public in and for *NATHONIA*
County, *WYOMING*

DO NOT WRITE BELOW THIS LINE

Approved *12-3-75*
Date

Oil and Gas Board of the
State of South Dakota

Frederick V. Steele
Superintendent





WELL INSPECTION / SCOUT REPORTS



POWERTECH (USA) INC.

Hydro ID 5

11 of 44

SOUTH DAKOTA GEOLOGICAL SURVEY
Western Field Office

SCOUT REPORT

Number 2

Date Scouted 7-27-76

Operator Power Resources Corporation

Permit Number 741

Farm/Lease Name #21-14 Peterson

API Number 40 047 20065

NENW Sec. 14 T. 7S R. 1E

County Fall River

Elev. 3638 Est. T.D. -

Actual T.D. 2284 Spudded 12-11-75

Contractor Farnsworth & Kaiser

Geologist Al Nelson

SCOUT'S OBSERVATION:

DST RECORD:

Open pipe at surface with mud
all around it remains at site.
Bags of cement and other refuse strewn
about. No indication of completion as
water well.

FORMATION TOPS:

PLUGGING RECORD:

DATE PLUGGED/COMPLETED _____

CASING RECORD:

SITE INSPECTION:

_____ From _____ To _____

Approved X

_____ From _____ To _____

Not Approved _____

REMARKS: No open mud pits. Water well piping is probably subsurface. Mess
probably belongs to the rancher.

SCOUTED BY James E. Ellithorpe
James E. Ellithorpe, Field Assistant

Fred V. Steece
Fred V. Steece, Supervisor



POWERTECH (USA) INC.

Hydra ID 5

12 of 44

Y PRC #21-14 Peterson

12-26-75

NENW 14-7S-1E Fall River
660 FNL & 1983 FWL

Al Nelson called
for plugging approval
we worked out follow-
ing plug program

PERMIT: 741 (12-3-75)

API: 40 047 20065

ELEV: 3639 Gr.

CONTR: Farmworth & Kansas

GEOL: Al. Nelson

ENGR:

SPUD: 12-11-75

EST T.D. 2500 (Leo)

CASING: 8 5/8 - 160 (to 152)

CORES: None

DST'S: None

LOGS: BCSL, DIL

T.D.: 2269 (DIL) 2267 (Log)

PLUG: 12-26-75

40 max: 2020-1900 ^{Red marker}
40 max: 1600-1500 ^{Top}
30 max: 950-850 ^{Basal Sandstone}
no surface plug
as well will be
completed as a
water well.

Formation Tops (Nelson)

Fulton	178
Worison	339
Sundance	571
Basal Sd	862

Power Resources Corp, Denver
John Trotter & George Wolf, principals

Specific	877
Boone Egg	1180
Minehead	1428
Minehead	1571
1st Comp	1571
2nd Comp	1648
2nd Comp	1696
2nd Comp	1988
2nd Comp	2039
2nd Comp	2269
TD	2269
7	2776

Visited site to see if
converted to water well
If impossible to tell,
Site is a waste.

OPERATOR'S TECHNICAL REPORTS / MAPS



POWERTECH (USA) INC.

Hydro ID 5

14 of 44 - 741

G. ALLAN NELSON
CONSULTING PETROLEUM GEOLOGIST
ROOM 408, MAJESTIC BUILDING
(303) 622-7750 FAX 312-0326
DENVER, COLORADO 80202



GEOLOGICAL WELL REPORT

POWER RESOURCES CORPORATION

#21-14 LENORE PETERSON

NE NW SEC. 14, T.7S., R.1E.,

FALL RIVER COUNTY, SOUTH DAKOTA

Wildcat

WELL DATA

Location: 1983' from the West line and 660' from the North line, G NE NW Sec. 14, Township 7 South, Range 1 East, Fall River County, South Dakota.

Elevation: 3639 ground.
3647 K.B.

Type Well: Wildcat.

Spud Date: 10:00 P.M., December 11, 1975.

Completion Date: 9:00 P.M., December 26, 1975.

Casing Record: Ran 8 5/8" surface casing. Set at 152 ground. Cemented with 125 sacks of regular cement with 3% Calcium chloride. Pipe set at 152 ground, 24" casing.

Total Depth: 2269 Driller.
2267 Schlumberger.

Deepest Formation Penetrated: Lower Leo Section.

Depth Datum: 3647 K.B.

Well Status: Plugged and abandoned (left as water well for landowner).

Mud Program: Drilled out from under surface with water. Continued drilling with native mud down to 1070 in Spearfish red beds. Converted to a red bed between 1070 and 1283 in the Goose Egg formation after setting stuck at 1283. Added 1 sack of soda ash, 5 Rayvan, 4 caustic soda, 1 can suf-drill, and 25 sacks of gel. Above 1283 a water-flow was continually thinning mud, particularly when mud pump was shut down on trips for bit. Between 1625 in the Converse Massive Anhydrite and 1729 in middle Converse tourly treatment was Gel, 1 sack caustic soda, 1 soda ash, 1 Rayvan, and mud weight was 9.4-9.6 and vis. was 36 to 37. At 2045 to 2078 in upper Leo wt. was 9.7 and vis. was 46, with tourly treatments of 1 sack of soda ash, 1 Rayvan, 1 caustic soda, and 4 CMC to get water loss down to 5 cc. or less before Second Leo was reached at approximately 2100. At 2105 in Second Leo Sand main objective wt. was 10.0, vis. 36, and water loss 6.0. Water flow from up the hole continued to create problems in maintaining good quality mud. Logs were run without any hole trouble. Wt. was 10.3, vis. 85, and water loss 7.2. Mud furnished by Pro-Mud, Casper; Phil Hogan, engineer.



Hole Size: 12 $\frac{1}{4}$ " from surface to 168.
7 7/8" from 168 to 2269 T.D. Driller.

Cores: (None).

Drill-Stem Tests: (None).

Logs: Schlumberger Borehole Compensated Sonic Log was run from T.D. up to base of surface casing on a 5" scale 40-70-100, and on a 5" scale 40-90-140 from T.D. up to 1400 above Mimmekahta. Gamma Ray Log and Caliper Log were also run with Sonic Log. Two repeats were run from T.D. up to 1980 first and then from T.D. up to 1400 on a 40-90-140 scale. Dual Induction Laterolog was run second and did not work. 8 hours were spent waiting for a second tool to arrive. A 2" scale was run from T.D. to base of surface pipe, and a 5" scale over same interval was also run, with a repeat from T.D. up to 1900.
Engineer: Don Marquez, Gillette.

Plugging Record: 40 sacks from 2020 to 1900 across the Red Marker.
30 sacks from 1600 to 1500 across top of the First Converse Sand.
30 sacks from 950 to 850 across Basal Sand of the Sundance.
Cementing by Halco, Gillette
(No plug-in surface pipe since left as water well).

Contractor and Rig Equipment: Farnsworth & Kaiser, Newcastle, Wyoming.
U-34 rig.
3 $\frac{1}{2}$ " IF drill pipe.
5 $\frac{1}{2}$ " drill collars totaling 341'.
Mud pump GD FX2 with 6" liners and 16" stroke.
Radios on rig and at Newcastle base plus in pusher's pickup.
Mud pump trailer-mounted.
Rig trailer-mounted.
Buzz Farnsworth, pusher-owner.

Sample Storage: One out of samples were sent to American Stratigraphic in Casper. sent
One out of samples were to the South Dakota Geologic Survey in Vermillion.

Drilling Time Records: Original copy of Star Recording 1' drilling time charts is on file in Denver office of G.A. Nelson.

LOG FORMATION TOPS

All depths are measured from 3647 K.B.

<u>FORMATION</u>	<u>DEPTH</u>	<u>DATUM</u>
LOWER CRETACEOUS		(In first samples at 184 K.B.)
TENTATIVE FUSON SHALE (LAKOTA TOP INDETERMI- NATE)	178	
UPPER JURASSIC	339	
MORRISON FORMATION	339	
SUNDANCE FORMATION	571	
REDWATER SHALE MEMBER	571	
LAK MEMBER	690	
TENTATIVE HULETT SAND	795	
STOCKADE BEAVER SHALE	817	
BASAL SAND OF SUNDANCE	862	
TRIASSIC	877	
SPEARFISH FORMATION	877	
PERMIAN	1180	
GOOSE EGG FORMATION	1180	
POKELLE LINE MEMBER	1320	
GLENDO SHALE MEMBER	1338	
MINNEKAHTA LINE MEMBER	1428	
OPICONE SHALE MEMBER	1471	
MINNELUSA FORMATION	1571	-2076
UPPER MINNELUSA (PERMIAN)	1571	-2076
FIRST CONVERSE SAND	1571	-2076
BASE OF SAND	1648	
MASSIVE ANHYDRITE	1648	
BASE OF ANHYDRITE	1696	
SECOND CONVERSE SAND	1696	
BASE OF SECOND CONVERSE SAND	1722	
RED MARKER	1988	-1659
BASE OF RED MARKER	1992	



POWERTECH (USA) INC.

Hydro ID 5

LOG FORMATION TOPS

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<u>FORMATION</u>	<u>DEPTH</u>	<u>DATUM</u>
PENNSYLVANIAN	1992	-1663
MIDDLE MINNELUSA (LEO SECTION)	1992	-1663
SECOND LEO SAND	2099	-1548
BASE OF SAND	2130	
TOTAL DEPTH DRILLER (STRAP)	2269	
TOTAL DEPTH SCHLUMBERGER	2267	

**SAMPLE LITHOLOGIC DESCRIPTION**

All depths are from 3647 K.B.

All sample depths following have been corrected for lag, and then matched to drilling time breaks wherever possible. **Sample 11 ology is then matched to log lithology so that all lithology following matches log.

All shows are underlined with a solid line. Possible shows are underlined with a dashed line.

DEPTH**LITHOLOGY**

LOWER CRETACEOUS (In first samples caught below surface pipe at 184 K.B.)

TENTATIVE FUSON 178 (LAKOTA TOP INDETERMINATE)
(In first samples caught below surface pipe at 184 K.B.)

(Samples following are caught at 10" intervals)

184-86	Abundant variegated clay, red, maroon, dark gray, purple, light green; limited sand, white, no show, no porosity, very well-cemented, very fine to fine, limy, poorly sorted, slightly soft, abundant white clay-fill.
186-97	Same variegated clay; very shaly sand, very silty, very fine, abundant clay cementation, part very fine to fine with poor sorting, no porosity, very soft.
197-204	Same red, maroon, purple waxy clay, also light green, noticeable brownish gray; purple very sandy clay; limited very shaly sand as above.
204-10	(Very fast drilling) Traces pale green sand with abundant waxy clay cementation, very fine, silty, very soft, no show, also white.
210-30	Same as above (fast drilling).
230-34	(Very slow drilling like hard formation) Trace tannish brown very shaly sand, hard, tight, very fine, excellent sorting, no porosity, noncalcareous.
234-41	(Fast drilling) Waxy clay, red, maroon, violet, tan, pale green.
241-52	Same clay, also distinctive very dark chocolate brown; loose sand grains, poorly sorted very fine to fine to medium, subround.
252-59	Same red, violet waxy clay, some dark gray; same loose sand grains, clear, poorly sorted.
259-70	Same clay; traces green shaly sand, very fine to fine, very soft, silty, trace angular med grained orange quartz grain.
270-88	Same clay; abundant light red very shaly sand, waxy clay cementation, very fine, very soft; first trace chert, whitish, light gray, very coarse and coarser, subangular. (Top 12' very, very fast drilling like high porosity) Purplish maroon waxy shale, clay, light to dark gray; abundant very shaly sand, light red, very silty, clay cementation, very fine, soft.

SAMPLE LITHOLOGIC DESCRIPTION (Con.)

- 288-99 (Top 6' very fast drilling) Same as above.
 299-311 (Basal 4' hard drilling) Shaly sand, dark green, very hard and tight, very well-cemented, no porosity, very fine, well-sorted.
 311-18 Abundant clay-filled sand, light red, very fine, silty, mushy soft; shale breaks, waxy clay, light green, red.
 318-39 Same; green sand, shaly, very fine to fine, tight, no porosity.
 539 MORRISON 339-50 Abundant dark gray silty shale, shale, slightly waxy in part.
 350-61 Same blackish shale, clay; loose calcite like from veinlet, white, gray, dark gray, in abundance.
 361-66 Same shale.
 366-78 Same shale, also dark green waxy, few streaks quartzitic sand, shaly, dark green, hard, very well-cemented, very fine, soft in part.
 378-92 Increasing greenish dark gray shale, clay, also very dark gray.
 Clay, slightly waxy, very dark gray to greenish dark gray, soft.
 392-7 Same waxy clay, grayish green to greenish dark gray, traces red.
 1-414 Same, also very dark gray clay; intermingled with sandy lime stringer(s), white to gray (Very slow drilling in basal part like lime).
 414-19 Same clay, very dark gray to greenish dark gray.
 419-28 (Fast drilling) Waxy clay, dark gray, greenish gray, soft, grayish green.
 428-34 Waxy clay, mostly grayish green, very soft.
 434-44 (Very fast drilling) Same.
 444-59 Same, also dark gray.
 459-69 Waxy clay, dark gray to greenish dark gray.
 469-79 Same, with trace white kaolinitic sand, very soft, very fine, no show, excellent sorting.

571 SUNDANCE FORMATION

571 REDWATER SHALE MEMBER
699 LAK MEMBER

- 699 699-710 Waxy clay, grayish green to greenish gray, dark gray, platy, very soft; sand streaks, greenish light gray, very silty, very, very fine, very soft, poor porosity, scattered fine glauconite.
 710-16 Same clay and sand; also light tan sand, very fine, silty, soft, no show, porous, excellent sorting.
 716-30 Same gray to green waxy clay, very soft; limited sand, light tan, very fine and finer, soft, porous, excellent sorting, no show.
 730-37 Very waxy clay, dark gray, greenish gray, grayish green, very soft; same soft tan sand, very fine, silty, no show; limited orange sand, very fine, well-sorted, shaly, soft, no show.

SAMPLE LITHOLOGIC DESCRIPTION (Con.)**795 TENTATIVE HULETT SAND****817 STOCKADE BEAVER SHALE**

823-31 Sandstone, greenish white, very fine, excellent sorting, no show, no porosity, fine glauconite scattered, abundant tiny white spots of clay scattered, soft to very soft, also tiny black specks scattered, limy (Hulett cave).

831-46 Shale, silty shale, gray, greenish gray, platy, very soft, also darker gray; sand streaks, same sand as above, no show, part yellow limonite stained (Hulett cave).

846-57 Same soft waxy shale, grayish green to greenish gray; sand streaks, greenish gray, light gray, no show, poor porosity, very well-cemented, silty, very soft, very fine, excellent sorting, fine glauconite, limy.

857-62 Same alternating shale and sand as above, no show.

862 BASAL SAND OF SUNDANCE

862-72 (Very rapid drilling of 7" in 4") Basal sand of Hulett: sandstone, light greenish gray to yellowish greenish gray, no show, very fine, excellent sorting, porous, very soft, fine glauconite and black specks scattered, no fluorescence.

872-77 Dark gray very waxy shale, very soft; trace also black with pyrite spot; trace tannish gray mottled purplish maroon.

877 TRIASSIC**877 SPEARFISH FORMATION**

877-99 (Samples up at 900 in less than 22"; red bed top marked by faster drilling from 2 1/2" /ft. above red bed top to 2" /ft. below red bed top) Abundant brick red silty shale, very silty, very soft, fine black biotite specks scattered; limited smooth red shale; trace white medium crystalline to coarsely crystalline anhydrite.

SAMPLE LITHOLOGIC DESCRIPTION (Con.)

- 1528-34 Plain shale to silty shale, brick red, soft in lower part; top 4' anhydrite, white, tan, microcrystalline.
- 1534-44 (Missing).
- 1544-49 Same red silty shale, soft.
- 1549-56 Anhydrite, white, to tan denser to limited orange.
- 1556-71 Silty shale, light red, brick red, soft.
- 1556-71 Same shale.
- 1571(-2076 MINNELUEA FORMATION
- 1571(-2076 UPPER MINNELUEA (PERMIAN)
- 1571-90 (Sample surfacing off bottom at 1590 in more than 15" and less than 45") (Top 10' very fast drilling like high porosity and bottom 5' fast drilling like good porosity) Abundant sandstone, light yellow, pinkish yellow, soft, no show, good visible porosity, poorly sorted very fine to fine to fine-plus, anhydritic-looking, clear grains, subround.
- 1590-93 Anhydrite stringer, white to tan to gray denser, crypto-crystalline.
- 1593-1602 (Fast drilling like very porous sand) Same sand as above, light yellow, pinkish possible from red bed mud contamination, poorly sorted very fine to fine to fine-plus, porous, no show, no fluorescence, friable.
- 1602-07 (Slower drilling like tight or hard streak) Possible anhydrite stringer, tan denser to white.
- 1607-15 (Very fast drilling of 1"/ft. like high porosity) Sandstone, light yellow, fair sorting, very fine to fine, clear grains, soft, good visible porosity, no show, anhydritic-looking, trace limy; trace light red shaly sandstone, very fine to mostly fine, abundant tiny red shale specks.
- 1615-35 Abundant loose sand grains, very poorly sorted, very fine to fine to few medium grains, clear grains, mostly light yellowish to less of light orange coloration (slower drilling like more cemented, less porosity); sand is cave; white anhydrite, finely crystalline.
- 1635-45 Same as above; anhydrite is in top 17' and sand is in bottom 3' of fast drilling.
- 1645-48 (Continued fast drilling) Same loose sand grains as above.
- 1648 (Slightly slower drilling like sand is transitional to anhydrite below)
- 1648 BASE OF FIRST CONVERSE SAND
- 1648 MASSIVE ANHYDRITE
- 1648-60 (Slower drilling 11"/ft.) Anhydrite, tannish light gray, finely crystalline.
- 1696 BASE OF MASSIVE ANHYDRITE
- 1696 SECOND CONVERSE SAND
- 1696-98 Abundant sandstone, light orange, orange, very fine, good sorting, porous, soft, no show, traces whitish clay-fill scattered, clear grains but light orange, subround.
- 1698-1702 Increasingly abundant light orange sand, no show, soft, porous, very fine, well-sorted, anhydritic cementation.



SAMPLE LITHOLOGIC DESCRIPTION (Con.)

1702-1722 (Below top 3' very fast drilling begins: 1"/ft.)
Same light orange sandstone, very fine to fine, soft,
porous, no show, anhydritic cementation, clear light
orange grains, fair sorting, noncalcareous.

1722 BASE OF SECOND CONVERSE SAND

1806-13 Snow white sand, no show, well-cemented, poor porosity,
very fine to fine, fair sorting, anhydritic-looking
cementation, clear grains, soft to slightly soft, no
fluorescence.

1813-24 Same white sand as above, no show, poor porosity due
to being very well-cemented, abundant white clay-fill,
soft.

SAMPLE LITHOLOGIC DESCRIPTION (Con.)**1988(-165)RED MARKER**

1988-92 (At 1990 samples coming off bottom in less than 38")
(Red Marker marked by typical faster drilling from
10"/ft. above Marker to 2,4,3"/ft. in it) Abundant shale,
shiny, splintery, platy, red, maroon, purplish red, very
soft.

1992 BASE OF RED MARKER**1992(-166)PENNSYLVANIAN****1992(-166)MIDDLE MINNELUSA (LEO SECTION)**

1992-2002 Abundant dolomite, tan to dark tan, anhydritic dolomite,
less of red, lighter tan slightly chalky softer, darker
tan and reddenser, harder; associated white anhydrite
in 20%.

2002-12 (4' below top is 4' of faster drilling like possible
shale break) Abundant silty shale, brick red, orange red,
very soft; same dolomite and anhydritic dolomite and white
anhydrite, with dolomite becoming violet to tan with pur-
ple shale spots in part; sand streaks, white, very well-
cemented, no show, limited, no visible porosity, very
fine to fine, clear grains, anhydritic cementation, non-
calcareous, soft, possibly a granular anhydrite; fast drilling is

2012-22 Dolomite, tan, pink, violet, dense, hard, becoming an-
hydritic dolomite, tan, finely crystalline; sand streak(s), sd.
white, very fine, well-sorted, no show, no porosity, tight,
few fine grains, trace mostly fine grained.

2022-32 Very distinctive blackish brown to greenish brown dolo-
mite with tiny blackish spots which in part are embedded
clear sand grains, slightly chalky-looking, noncalcareous, hard;
20% finely crystalline snow white anhydrite with dark
greenish brown dolomite and tan dense anhydrite.

2032-41 Same dolomite as above, becoming mostly snow white an-
hydrite with part tan denser and few brown sandy streaks
with no porosity, tight.

2041-52 Same as above.

2052-62 Hard snow white to denser gray anhydrite; hard, dense
tan to tannish brown to brown mottled red dolomite and
anhydritic dolomite, part slightly crystalline; tannish
gray very, very finely sandy dolomite, silty, with dark
maroon to purplish maroon shaly spots.

2062-71 Anhydritic dolomite, dark tan, dense, very hard, crypto-
crystalline, with anhydrite, snow white, very finely
crystalline.

2071-84 Dolomite, anhydritic dolomite, tan with purplish tan in
part, few purplish red tiny shale spots in part; associ-
ated white anhydrite as above; limited violet chalky
dolomite.

2084-92 Tan to dark tan anhydritic dolomite, dense, hard, cryp-
to-crystalline, also purplish to maroon shale spots in
part; 5% sandstone, light gray to tannish gray, poorly
sorted very fine to fine, very well-cemented, no porosity,
tight, mostly dolomitic, trace limy, soft to hard, scat-
tered purplish tiny shale spots.



SAMPLE LITHOLOGIC DESCRIPTION (Con.)

- 2092-99 Anhydritic dolomite, tannish brown, very finely sandy, hard, with associated snow white anhydrite, microcrystalline, limited gray denser.
- 2099(-1548) SECOND (Very slow drilling like hard formation) (Drills at 19" LEO BAND to 28"/ft. in sand versus 16"/ft. above and below sand)
- 2099-2113 Abundant sandstone, light gray, very silty, very well-cemented, no show, no visible porosity, tight, poorly sorted, part mostly very fine, part mostly fine with few medium grains, limy to dolomitic; two out of 25 cuttings with traces of yellow fluorescence on each end only, two other cuttings with golden yellow fair fluorescence throughout opposite tan staining in all of of one cutting and tan staining in 50% of other cutting, subround grains, tiny possible oil droplets not detectable after crushing, good yellow fluorescence in 2 stained pieces after crushing.
- 2113-21 Trace first chert in Leo, light gray, translucent, angular, very coarse and coarser; same light gray sand, no show, very silty, very well-cemented, also gray more cemented, mostly very fine, few fine grained streaks, limited same sand grayer slightly quartzitic, no fluorescence.
- 2121-30 Sandstone, very silty, light gray, very fine, excellent sorting, very well-cemented, no show, no porosity, soft, in 40-50%; sandstone, 30-40%, grayish tan staining, very fine to mostly fine, well-cemented, poor or less porosity, soft, noncalcareous; limited gray denser sand, slightly quartzitic, very fine, hard, tight; limited fine to fine-plus sand, white, soft, porous, no show; all with no fluorescence.
- 2130 BASE OF **first jet black coaly shale, coal, mostly brownish black SECOND LEO BAND firm to hard, blocky from 2121 to 2124.
- 2130-42 All tan dense dolomite, anhydritic dolomite, hard, brittle, tile, with few white anhydrite spots and veinlets, cryptocrystalline.
- 2142-52 Same as above but darker brown, greenish brown, dense, cryptocrystalline, with 10% snow white anhydrite; trace round white anhydrite spots in tan dolomite matrix.
- 2152-63 Same dolomite and minor amounts of anhydrite as above; also silty dolomite to lime, greenish tan, soft.
- 2163-69 Silty shale, orange redbrick red, soft; abundant very shaly siltstone, medium gray, no show, no porosity, dolomitic to limy, soft to limited hard; white anhydrite veinlet intersecting siltstone, medium crystalline.
- 2169-82 Second jet black coaly shale, coal, brownish black, firm, slightly soft; silty red shale break(s) as above, soft; mostly dolomite to anhydritic dolomite, tan, gray, dark gray, some brown, mostly dense to cryptocrystalline, anhydrite is from 2171 to 2182.
- 2182-93 Dolomite, anhydritic dolomite, tan, grayish tan, very cherty, dense, cryptocrystalline in part; grading into very sandy dolomite to very dolomitic sand, tan to grayish tan, very poorly sorted very fine to fine to few medium grains, very well-cemented, no porosity.

SAMPLE LITHOLOGIC DESCRIPTION (Con.)

- 2193-2202 Same dolomite and anhydritic dolomite, becoming darker brown cryptocrystalline; also chalky dolomite to lime, cream, light tan grayish, light gray; abundant shale, orange red, silty, soft; minor amount of anhydrite, white to brownish denser; shale probably in faster drilling lower few feet.
- 2202-12 Same dolomite and abundant red shale as above; increasing snow white anhydrite, very finely crystalline; traces quartzitic sand, white to gray where tighter, very fine, excellent sorting, very well-cemented, no porosity, hard, tight.
- 2212-21 Abundant snow white anhydrite, part gray denser; abundant orange red silty shale as above, very soft; minority Dolomite to limestone, grayish tan, cryptocrystalline, hard, brittle, trace dark gray irregular streaks, trace fine pyrite specks.
- 2221-32 20% brick red shale, orange red, soft, silty; very finely sucrosic silty limy dolomite to limestone, tan, grayish tan, tannish gray, hard; minority snow white anhydrite, microcrystalline to gray denser.
- 2132-40 Very finely sucrosic dolomite, dark gray, less of brown; 15% white anhydrite; 5% or less limited streak of sand, white, light gray, gray, quartzitic, very well-cemented, no show, no porosity, tight.
- 2140-54 Sucrosic limestone, dolomitic lime, var, very finely sandy lime, tan, greenish tan; traces anhydritic sand, white, light gray, no show, no porosity, very well-cemented, very fine, well-sorted; 15% white anhydrite.
- 2154-63 Same as above, with limestone, becoming same white sand, very fine, well-sorted, very well-cemented, no show, no porosity, anhydritic-looking.
- 2163-68+ (Missing because when 45" circulated samples were caught at T.D. no more cuttings were coming since hole was all cleaned out.

2269 TOTAL DEPTH DRILLER(STRAP)

2267 TOTAL DEPTH SCHLUMBERGER

HOLE DEVIATION SURVEYS

Surveys were made using a Sure Shot Model B with a 7° maximum reading.

<u>Depth</u>	<u>Deviation</u>	<u>Formation</u>
160.....	3 1/4°	-----
268.....	"	Lakota ?
547.....	1/2	Morrison
779.....	1	Sundance LAK member
1283.....	1 1/2	Goose Egg
1526.....	"	Opeche
2162.....	1 3/4.....	Lower Leo

BIT RECORD

12 1/2" bit from surface to 168. All bits below 168 are 7 7/8".

<u>Run No.</u>	<u>Make</u>	<u>Type</u>	<u>From</u>	<u>To</u>	<u>Feet</u>	<u>Hours</u>	<u>Formation @ Base of Run</u>
1	Smith	DZF RR	168	1037	869	28	Spearfish
2	"	DGF	1037	1526	489	24 3/4	Opeche
3	HTC	OSG10					
		Bitip	1526	1655	129	9 1/2	Massive Anhydrite.
4	Smith	V2J	1655	1750	95	12 1/2	Pre-Second Converse.
5	HTC	J22 RR	1750	1974	224	37 1/2	Basalmost Converse.
6	"	J33 RR	1974	2162	188	46	Pre-Second Leo Sand.
7	"	J65 RR	2162	2269 T.D.	17'	---	Lower Leo Section.

DRILLING PROGRESS SUMMARY

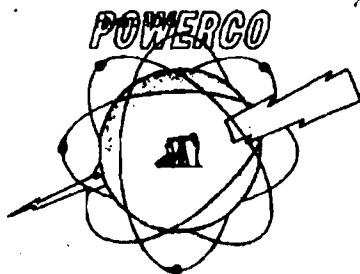
Drilling depths as of 8 A.M. each day.

<u>Date</u>	<u>No. of Days</u>	<u>P.D. Depth</u>	<u>P.D.</u>	<u>Footage Drilled Last 24 hours</u>	<u>Status</u>
Dec. 8, 1975	--	----	----	----	Moving.
9	--	----	----	----	Move & rig up.
10	--	----	----	----	Rig up.
11	--	----	----	----	" to drill
15	1	168	-----	168	rathole.
16	2	391	Morrison	223	Work on rig.
17	3	1038	Spearfish	647	Drilling.
18	4	1437	Minnekahta	399	Service rig.
19	5	1665	Massive Anhydrite	228	Check B.O.P.
20	6	1764	Pre-Second Conv.	99	Drilling.
21	7	1882	Lower Converse	118	-----
22	8	1974	Basal Converse	92	Drilling.
23	9	2077	Upper Leo	103	Trip for bit.
24	10	2162	Pre-Second Leo	85	Drilling.
25	11	2210	Lower Leo	48	"
26	12				"

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Respectfully submitted,

B. Allen Nelson



POWER RESOURCES CORPORATION

Power Resources Corporation
#21-14 M. Lenore Peterson
NE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 14, T. 7S, R. 1E
Fall River County, S. Dakota
Elevation: Gr. 3639, KB 3647
Well Permit #741

DAILY DRILLING REPORT

11/29/75	Surveyed and staked location
12/02/75	Graded location and dug pits
12/08/75	Moving in rotary tools
12/09/75	Moving in and rigging up
12/10/75	Finished rigging up
12/11/75	Prep to spud
12/12/75	Spudded at 10:00 P.M., 12/11/75 Ran 8-5/8" 28# surface casing. Cemented with 125 sacks regular cement with 3% calcium chloride. Plug down at midnight - good returns. Pipe set at 152 Gr. Shut down - waiting on crews.
12/16/75	Drilling @ 397'. 3/4" @ 268'. 8 drill collars. Weight on bit - 15,000#. Rotary speed - 100 rpm.
12/17/75	1037' - Drilling. 3/4" @ 541', 1" @ 779'.
12/18/75	1437' - Drilling. 1 1/4" @ 1002'. Sample tops: Morrison - 322' Spearfish - 890' Goose Egg - 1178' No shows.
12/19/75	1660' - Drilling. 1 1/4" - 1526'. Sample Top: Minnekahta - 1425' Drilling in 1st Converse sand. Mud Wt. - 9.4; Visc. - 36.
12/20/75	1765' - Drilling
12/21/75	1890' - Drilling
12/22/75	1974' - Drilling
12/23/75	2078' - Drilling



1660 So. Albion, Suite 827, Denver, Colorado 80222 303 759-5660

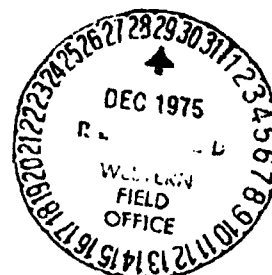
• 200 PAGES OF DRILLING LOGS AND RECORDS AVAILABLE FOR SALE •



Power Resources Corporation
#21-14 M. Lenore Peterson
NE&NW 1/4 Sec. 14, T. 7S, R. 1E
Fall River County, S. Dakota
Elevation: Gr. 3639, KB 3647
Well Permit #741

DAILY DRILLING REPORT cont'd.

12/24/75 2162' - drilling. Sample Top: 2nd Leo - 2100' (+1547)
ss, tite, some oil stn, poor P&P
Drilling to est. total depth of 2285' and log.



1660 So. Arden, Suite B27, Denver, Colorado 80222 303 759-5660
• ~~XXXXXXXXXXXXXXXXXXXXXXXXXXXX~~



ADMINISTRATIVE / SUNDRY REPORTS

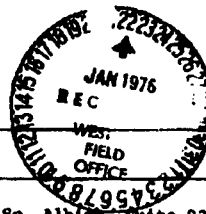


POWERTECH (USA) INC.

Hydro ID 5

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STATE AND LOCAL FORMS

State Oil & Gas Board
FORM 7

PLUGGING RECORD

Operator POWER RESOURCES CORPORATION		Address 1660 So. Albion, Suite 827, Denver, CO 80222	
Name of Lessee Lenore Peterson	Well No. 21-14	Field & Reservoir Wildcat	
Location of Well NRMW Sec. 14 - T. 7 S. - R. 1 E.		Sec-Twp-Rgn or Block & Survey	County Fall River
Application to drill this well was filed in name of Power Resources Corporation	Has this well ever produced oil or gas No	Character of well at completion (initial production): Oil (bbls/day) _____ Gas (MCF/day) _____	Dry? Yes
Date plugged: December 2, 1975	Total depth 2266	Amount well producing when plugged: Oil (bbls/day) _____ Gas (MCF/day) _____	Water (bbls/day) None
Name of each formation containing oil or gas, indicate which formation open to well-bore at time of plugging	Field content of each formation	Depth interval of each formation	Slip, kind & depth of plugs used indicate where liquids encountered, giving amount cement.
Morrison		339	
Basal Sundance Sand		862	950-850 30 Sacks
First Converse Sand		1571	1650-1500 30 Sacks
Base 2nd Converse Sand		1722	1900-2020 40 Sacks
2nd Leo Sand		2099-2113	Traces Yellow Fluorescence

CASING RETURN

Size pipe	Put in well (ft.)	Put out (ft.)	Left in well (ft.)	How depth and method of part, including (short, rigged etc.)	Partners and share
8-5/8	152	-0-	152		

Was well filled with mud-laden fluid, according to regulations? ☐ Indicate deeper formation containing fresh water. ☐

In addition to other information required on this form, if this well was plugged back for use as a fresh water well, give all pertinent details of plugging operations to base of fresh water sand, perforated interval in fresh water sand, name and address of surface owner, and attach letter from surface owner authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.

Well plugged back to 850. Land owner, Lenore Peterson, Star Route, Edgemont, So. Dakota, has furnished letter to So. Dakota Geological Survey at Rapid City requesting use of well as a fresh water well. Mr. G. Allen Nelson has presented a detailed Geologic Well Report by letter dated 2 January 1976.

SEE REVERSE SIDE FOR ADDITIONAL DETAILS

Executed this the 12th day of January , 1976	<i>G. Allen Nelson</i> Signature of Agent
State of Colorado County of Denver	
Before me, the undersigned authority, on this day personally appeared _____ known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn, depose and say that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.	
Subscribed and sworn to before me this 12th day of January , 1976.	
My Commission expires Sept. 29, 1979 My commission expires	<i>My Commission expires Sept. 29, 1979</i> Notary Public in and for Colorado County Denver, Colo
Approved Jan. 23, 1976 _____ Supervisor, Western Field Office	



CORRESPONDENCE



Peterson and Son, Inc.
Edgemont, South Dakota 57735
April 21, 1976

Mr. Fred Steece
South Dakota Geological Survey
308 West Boulevard
Rapid City, South Dakota 57701

Dear Sir:

I am writing in regard to your letter of February 26, 1976, concerning the well converted to our use. We are using the well as a flowing well to water livestock. The well was completed by adding a 8 5/8 inch pipe to the existing casing and reducing this pipe to 4 inches with a one inch outlet. Approximately 100 feet of plastic pipe carries the water to the tank. We have not had the water analyzed.

If you have any further questions, feel free to contact us.

Sincerely,

Debrah Peterson

Debrah Peterson
Secretary





POWERTECH (USA) INC.

Hydro ID 5

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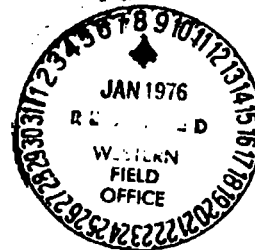
January 7, 1976

Fred Steece

South Dakota Geological Survey

308 West Blvd.

Rapid City, South Dakota 57701



Dear Sir:

I, M. Lenore Peterson, accept full responsibility for the oil test well known as #21-14 Peterson located on my land in ~~NE~~ Section 14 Township 7S. Range 1E. Fall river County, South Dakota as it is being left for a water well. Relieving Power Resources of their responsibilities with their bond.

The top of the highest plug is 850 feet and it has an 8 5/8" casing to 152 feet below ground level.

Sincerely,

M. Lenore Peterson

M. Lenore Peterson

Star Route

Edgemont, S.D. 57735

cc: John Trotter



December 3, 1975

Mr. P. A. Bassham, Vice President
Power Resources Corporation
1660 S. Albion, Suite 827
Denver, Colorado 80222

Dear Mr. Bassham:

Enclosed is your copy of Permit #741 (form 2a) and approved application to drill (form 2) covering the Power Resources Corporation #21-14 Peterson oil test in Fall River County, South Dakota. A copy of the permit should be posted at the well site. Also enclosed is a receipt for your \$100 permit fee. Please make drilling progress reports to the Western Field Office at least weekly.

May I wish you success in your drilling venture and if there is anything I can do to be of help, please let me know.

Sincerely,

Fred V. Steece
Supervisor, Western Field Office

FVS/jlm
cc: Dr. Duncan J. McGregor
Enc. 3

December 3, 1975

Mr. David Volk
State Treasurer
Capitol Office Building
Pierre, S. D. 57501

Dear Mr. Volk:

Enclosed is a check in the amount of \$100 from Power Resources Corporation to cover the drilling fee for permit #741 for an oil test in Fall River County. This check is for deposit in the general fund and a Cash Receipts Transmittal form is enclosed for the same amount.

Sincerely,



Fred V. Stacey
Supervisor, Western Field Office

FVS/jlm
Enc. 2
cc: Dr. Duncan J. McGregor



SURETY



POWERTECH (USA) INC.

Hydro ID 5

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State Pub. Co., Pierre

S. Dak. Oil & Gas Board
FORM 3

BOND NO. 809878

BOND

KNOW ALL MEN BY THESE PRESENTS,

That **Energy Reserves Group, Inc.**

WE: **Sedgwick** In the **Kansas**
County of: State of:

as Principal, **Seaboard Surety Company**

and **New York, N. Y.**

as surety, authorized to do business in the State of South Dakota as surety, are held and firmly bound unto the State of South Dakota in the sum of ~~(\$20,000.00)~~ **\$20,000.00**, lawful money of the United States, for which payment, well and truly to be made, we bind ourselves, and each of us, and each of our heirs, executors, administrators or successors, and assigns jointly and severally, firmly by these presents.

The condition of this obligation is that whereas the above bounden principal proposes to drill a well or wells for oil, gas, or stratigraphic purposes in and upon the following described land situated within the State, to wit:

Any land situated within State of South Dakota

(May be used as blanket bond or for single well)

Blanket Bond

NOW, THEREFORE, if the above bounden principal shall comply with all of the provisions of the laws of this State and the rules, regulations and orders of the Oil and Gas Board of the State, especially with reference to the proper plugging of said well or wells, and filing with the Oil and Gas Board of this State all notices and records required by said Board, and the restoration of the surface, in the event said well or wells do not produce oil or gas in commercial quantities, or cease to produce oil or gas in commercial quantities, then this obligation shall be terminated by the Board, the same shall be and remain in full force and effect.

Penal sum of

Twenty Thousand and 00/100 Dollars (\$20,000.00)

Witness our hands and seals, this **21st** day of **April, 1976**

Energy Reserves Group, Inc.

By **R. D. Orr** Principal
Vice President

Witness our hands and seals, this **21st** day of **April, 1976**

Seaboard Surety Company

By **James W. Bily** Surety
Attorney-in-fact

(If the principal is a corporation, the bond should be executed by its duly authorized officers, with the seal of the corporation affixed. When principal or surety executes this bond by agent, power of attorney or other evidence of authority must accompany the bond.)

DO NOT WRITE BELOW THIS LINE

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA
Supervisor

Approved **May 11, 1976**
Date

Countersigned in South Dakota **McKEAN / STANTON**

By **Paul M. McKean**
Agent at **Pierre, S. D.**

PAUL M. McKEAN

Note: File 3 copies of this form with Secretary, Oil & Gas Board, Pierre.



SEABOARD STREET COMPANY

House: Orange

39 of 44

100

New York, New York

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That SEABOARD SURETY COMPANY, a corporation of the state of New York, has made, constituted and appointed and by these presents does make, constitute and appoint A. C. Ambrose or A. C. Eichert or James A. Evans or Robert C.

of _____, Kansas
 its true and lawful Attorney-in-Fact, to make, execute and deliver on its behalf insurance policies, surety
 bonds, undertakings and other instruments of similar nature as follows: Without limitation,

That all such policies, surety bonds, undertakings and instruments for said purposes, when duly executed by the aforesaid Attorney-in-Fact, shall be binding upon the said Company as fully and to the same extent as if signed by the duly authorized officers of the Company and sealed with its corporate seal; and if the acts of said Attorney-in-Fact, pursuant to the authority hereby given, are hereby ratified and confirmed.

This apartment is made pursuant to the following By-Laws which were duly adopted by the Board of Directors of the said Company on December 8th, 1927, and are still in full force and effect:

APPLICABLE VIII. SECTION 1:

10. "Deeds, bonds, recognizances, stipulations, contracts of surety, underwriting undertakings and instruments relating thereto, and all other contracts, bonds, recognizances, stipulations, contracts of surety and underwriting undertakings of the Company, and all other contracts and other writings relating in any way thereto or to any claim or loss thereunder, shall be signed by the officers of the Company on behalf of the Company."

and by the Chairman of the Board, the President, a Vice President or a Resident Vice President and, by the Secretary and Assistant Secretary, a Resident Secretary or a Resident Assistant Secretary; or

The _____ is an Attorney and act for the Company authorized and authorized by the Chairman of the Board the President or a Vice President to make such signature, or

and by such other officers or representatives of the Board may from time to time determine

The _____ of the Company shall if appropriate be affixed thereto by any such officer, Attorney-in-Fact or representative.

IN WITNESS WHEREOF, SEABOARD SURETY COMPANY has caused these presents to be signed by one of its Vice-Presidents, and its corporate seal to be hereunto affixed and duly attested by one of its Assistant Secretaries, this 14th day of June, 1963.

4800

SEABOARD SECURITY COMPANY.

By John C. Whiteside
Vice-President

(Sgt) Joan Lynch Assistant Secretary

STATE OF NEW YORK }
COUNTY OF NEW YORK } ss.:

On this 13th day of August, 1975, before me personally appeared _____, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed. He is a Vice-President of SEAR, INC. and the company he described, and he executed the foregoing instrument, and he acknowledged to me that he is a Vice-President of the said Company; that the seal affixed to said instrument is such corporate seal as is authorized by the Board of Directors of said Company; and that he signed his name to said instrument by like authority.

State of New York
No. 43-4568755 Qualified in Richmond County
Court Clerk filed in New York County

Notary Public
Notary Seal

CERTIFICATE

I, James H. Young, Assistant Secretary of SEABOARD STEEL COMPANY, do hereby certify that the original Power of Attorney of which the foregoing is a full, true and correct copy, is in full force and effect on the date it was recorded and I do further certify that the Vice President who executed the said Power of Attorney was one of the Officers of the SEABOARD STEEL COMPANY, as provided for in the By-Laws of the Company as amended and as provided in Article VIII, Section 1, of the Constitution of SEABOARD STEEL COMPANY.

This document may be signed and read by facsimile under and by authority of the following resolution of the Board of Directors of SLABOARD SURVEY COMPANY:

Section 9.01(d), (2) that the use of a printed facsimile of the corporate seal of the company and of the signature of an authorized Secretary or any certification of the correctness of a copy of an instrument executed by the President or a Vice President pursuant to Article VIII, Section 1, of the By Laws appointing and authorizing an attorney-in-fact to sign in the name and on behalf of the company surety bonds, underwriting and ratables or other instruments described in said Article VIII, Section 1, with like effect as if such seal and such signature had been manually affixed and made, hereby is authorized and approved."

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the corporate seal of the Company this _____ day of _____, 2007.



John H. H. H.



POWERTECH (USA) INC.
Hydro ID 5

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State Pub. Co., Pierre

S. Dak. Oil & Gas Board
FORM 3

BOND NO. 4501

BOND

KNOW ALL MEN BY THESE PRESENTS,

That
we
of the
County of
in Principal,
and
of
HARTFORD ACCIDENT AND INDEMNITY COMPANY
HARTFORD, CONN.

is hereby authorized to do business in the State of South Dakota as surety, we hold and firmly bound unto the State of South Dakota in the sum of ~~(Twenty)~~ **(\$20,000.00)** lawful money of the United States, for which payment, well and truly to be made, we bind ourselves, and each of us, and each of our heirs, executors, administrators or successors, and assigns jointly and severally, firmly by these presents.

The condition of this obligation is that whereas the above bounden principal proposes to drill a well or wells for oil, gas, or stratigraphic purposes in and upon the following described land located within the State to wit:

Section 14, R. 1 East, Fall River County, South Dakota

Sec. 14, C. NE NW

Well No. #21-14 M. Lenore Petersen

NOW, THEREFORE, if the above bounden principal shall comply with all of the provisions of the laws of this State and the rules, regulations and orders of the Oil and Gas Board of the State, especially with reference to the proper plugging of said well or wells, and filing with the Oil and Gas Board of this State all notices and records required by said Board, and the restoration of the surface, in the event said well or wells do not produce oil or gas in commercial quantities, or cease to produce oil or gas in commercial quantities, then this obligation shall be terminated by the Board, the same shall be and remain in full force and effect.

Witness our hand

Five Thousand and no/100----- (\$5,000.00)

Witness our hands and seals, this 1st day of

Attest:

[Signature]

John E. Proffers, Secretary

December 1975
POWER RESOURCES CORP.

[Signature]

Richard A. Gaschman, V.P.

Principal

Witness our hands and seals, this 1st day of

December 1975

Hartford Accident and Indemnity Co.

[Signature]

Walt Forbes, attorney-in-fact, Surety
130 South Weymouth, Casper, Wyo. 82601

If the principal is a corporation, the bond should be executed by its duly authorized officers, with the seal of the corporation affixed. When principal or surety executes this bond by agent, power of attorney or other evidence of authority must accompany the bond.

DO NOT WRITE BELOW THIS LINE

Approved 12-3-75
Date

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

[Signature]
Superintendent

Contracted in South Dakota

By *[Signature]*

Agent

Note: 2 - 10 of this form with Secretary Oil & Gas Board, Pierre



MISCELLANEOUS

**NO MISCELLANEOUS
INFORMATION FOR THIS WELL
AS OF 5/18/2011**



ORIGINAL WELL CONSTRUCTION DURING OPERATION			PLUGGING AND ABANDONMENT CONSTRUCTION		
API No. 4004720085 14-7S-1E					
Surface			Surface		
		125 sx cement to surface			125 sx cement to surface
		Surface Casing 8 5/8", 24#, set @ 152'			Surface Casing 8 5/8" set @ 152' No Plug in Surface Pipe since left as a water well
			30 sx 850'-950' (Sundance)		
			30 sx 1500'-1600' (1st Converse Sand)		
			40 sx 1900'-2020' (2nd Leo)		
Perforations None (DH)					
Hole Size Unknown					
		Total Depth 2267'			Total Depth 2267'
			Feet of cement from Plugging Report Mud wt. 10.3 #/gal		



Oil and Gas Search for: api_no_ like '40 033 05219'		
Page 1 of 1	<u>Download Database</u> (Excel spreadsheet format)	Page: 1

Record 1 of 1

Well Information

API No:	40 033 05219	County:	CUSTER
Well Name:	CARTER 1	Location:	SWSE 19-6S-1E
Permit No:	H31-3	Total Depth:	405
Operator Name:	CARTER OIL COMPANY	Bottom Hole:	Fall River
Permit Date:	01-01-1931	KB Elevation:	
Spud Date:	01-01-1931	Ground Elevation:	3690
Plug Date:	01-01-1931	Latitude:	43.508820
		Longitude:	-104.042397
Well Field	WILDCAT	Status	P&A
Class:	DRY HOLE	Type:	DRY HOLE

Formation Tops

<u>Formation</u>	<u>Depth (ft.)</u>
Fall River	395

Submittal Requirements for Building Permit Application Communication Tower:

Evidence of Ownership: * A copy of a recorded deed from the Clerk & Recorder's Office.

Proof/Issuance of Address: * Required prior to beginning construction. To apply for an address, the cost of the permit is \$75.00 & permits can be obtained at the Building Department. Questions may be directed to the Planning & Zoning Department @ 276-7360.

County Driveway Access Permit & Inspection Report Approved by District Supervisor: * Required prior to beginning construction. The cost of the permit is \$55.00 & permits can be obtained at the Building Department. If there's an existing driveway, it's required that a driveway inspection be performed by a Road & Bridge designee. Questions may be directed to the Road & Bridge Department @ 276-7320.

State Highway Access Permit: * Required prior to beginning construction. If access is taken from a state highway, questions may be directed to the Colorado Department of Transportation, Region 2 Access Management Unit @ (719)-546-5407.

Plot Plan: ** May be prepared by applicant & must be legible. Plot plan must contain the following: Any questions regarding the property set-backs, please call Planning & Zoning @ 719-276-7360.

- Configuration of lot & all property dimensions.
- Location on lot & the dimensions of all structures. Identify each structure as "existing" or "proposed."
- Setback distances from proposed structures to all property lines & to any existing buildings.
- Location & name of any public or private roads which adjoin or trespass property.
- Location that driveway enters property from public or private road. Driveway will determine "front" of property.
- North arrow clearly visible.

Foundation Design: ** Any & all foundation designs must be prepared, signed, & sealed by an engineer or architect licensed by the State of Colorado.

Construction Details: ** Details must identify structural components & must verify compliance with the 2006 International Residential Code &/or 2006 International Building Code & 2006 International Energy Conservation Code. May be prepared by applicant & may be drawn or in written form. Details must identify structural components such as floor support beam sizes, floor joist size & spacing, wall stud size & spacing, header sizes for all openings, roof assembly components or engineering from truss manufacturer, etc. Roof snow load depends on the construction elevation. Where special conditions exist, the building official is authorized to require additional construction documents to be prepared, signed & sealed by an engineer licensed in the State of Colorado. For identification purposes, every page must contain the client's name & construction address.

Fire Department Permit: * Required only if in the Cañon City, Colorado Area Fire Protection District.

Drainage Study: ** Must be prepared, signed, & sealed by a Colorado licensed professional engineer.

- <http://www.dora.state.co.us/electrical/onlinepermitsystem.htm>
- State Electrical Inspector: Robert Brant - (719)-275-2816
- <http://www.dora.state.co.us/plumbing/forms.htm#info>
- State Plumbing Inspector: Gary Hartsuiker - (719)-269-1255
- Colorado Division of Water Resources: <http://water.state.co.us/default.htm>

*(1) / **(2) - Indicates number of copies to be submitted.
INCOMPLETE OR FAXED SUBMITTALS WILL NOT BE ACCEPTED.

Revised 02/20/2009  By Direction of the Building Official

Submittal Requirements for Building Permit Application Communication Tower:

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- <http://www.dora.state.co.us/electrical/onlinepermitsystem.htm>
- State Electrical Inspector: Robert Brant - (719)-275-2816
- <http://www.dora.state.co.us/plumbing/forms.htm#info>
- State Plumbing Inspector: Gary Hartsuiker - (719)-269-1255
- Colorado Division of Water Resources: <http://water.state.co.us/default.htm>

*(1) / **(2) - Indicates number of copies to be submitted.
INCOMPLETE OR FAXED SUBMITTALS WILL NOT BE ACCEPTED.

Sample Analysis Report

CLIENT: Exterran
P. O. Box 6795
Sheridan, WY 82801

Date Reported: 2/1/2012
Report ID: S1201249001

Project: Lance Oil & Gas-Kinney Draw
Lab ID: S1201249-002
Client Sample ID: Treated Water Pond
Station ID: DP_WY0056081_019_TWP

Work Order: S1201249
Collection Date: 1/18/2012 11:15 AM
Date Received: 1/18/2012 4:30 PM
Matrix: Water
COC: 4479

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Field						
pH	7.73			s.u.	01/18/2012 1115	Field
pH (SCADA)	7.70				01/18/2012 1115	Field
Conductivity	1845			µmhos/cm	01/18/2012 1115	Field
Conductivity (SCADA)	1987			µmhos/cm	01/18/2012 1115	Field
Chloride	32.0			mg/L	01/18/2012 1115	Field
Temperature	55.8			°F	01/18/2012 1115	Field
General Parameters						
pH	8.4	0.1		s.u.	01/20/2012 1949 MZ	SM 4500 H B
Electrical Conductivity	1970	5		µmhos/cm	01/20/2012 1949 MZ	SM 2510B
Total Dissolved Solids (180)	1200	10		mg/L	01/30/2012 1316 ARF	SM 2540
Solids, Total Dissolved (Calc)	1200	10		mg/L	01/27/2012 925 ALA	SM 1030E
Alkalinity, Total (As CaCO3)	1030	5		mg/L	01/20/2012 1949 MZ	SM 2320B
Hardness, Calcium/Magnesium (As CaCO3)	20	1		mg/L	01/27/2012 925 ALA	SM 2340B
Sodium Adsorption Ratio	50.9	0.1			01/27/2012 925 ALA	Calculation
Anions						
Alkalinity, Bicarbonate as HCO3	1220	5		mg/L	01/20/2012 1949 MZ	SM 2320B
Alkalinity, Carbonate as CO3	20	5		mg/L	01/20/2012 1949 MZ	SM 2320B
Alkalinity, Hydroxide as OH	ND	5		mg/L	01/20/2012 1949 MZ	SM 2320B
Chloride	36	1		mg/L	01/19/2012 1220 AMB	EPA 300.0
Fluoride	1.4	0.1		mg/L	01/20/2012 1949 MZ	SM 4500FC
Sulfate	ND	1		mg/L	01/19/2012 1220 AMB	EPA 300.0
Cations						
Calcium	4.8	0.5		mg/L	01/19/2012 1538 DG	EPA 200.7
Magnesium	1.9	0.5		mg/L	01/19/2012 1538 DG	EPA 200.7
Potassium	18.7	0.5		mg/L	01/19/2012 1538 DG	EPA 200.7
Sodium	518	0.1		mg/L	01/19/2012 1538 DG	EPA 200.7
Cation/Anion-Milliequivalents						
Calcium	0.23	0.01		meq/L	01/27/2012 925 ALA	SM 1030E
Magnesium	0.15	0.01		meq/L	01/27/2012 925 ALA	SM 1030E
Potassium	0.47	0.01		meq/L	01/27/2012 925 ALA	SM 1030E
Sodium	22.53	0.01		meq/L	01/27/2012 925 ALA	SM 1030E
Hardness	ND	0.01		meq/L	01/27/2012 925 ALA	Calculation

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

- Value exceeds Maximum Contaminant Level
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by a contract laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL
- O Outside the Range of Dilutions

Reviewed by: 
Adrien Aletti, Project Manager

Page 3 of 4

Sample Analysis Report

CLIENT: Exterran
P. O. Box 6795
Sheridan, WY 82801

Date Reported: 2/1/2012
Report ID: S1201249001

Project: Lance Oil & Gas-Kinney Draw
Lab ID: S1201249-002
Client Sample ID: Treated Water Pond
Station ID: DP_WY0056081_019_TWP

Work Order: S1201249
Collection Date: 1/18/2012 11:15 AM
Date Received: 1/18/2012 4:30 PM
Matrix: Water
COC: 4479

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Cation / Anion Balance						
Cation Sum	23.41	0.01		meq/L	01/27/2012 925 ALA	SM 1030E
Anion Sum	21.78	0.01		meq/L	01/27/2012 925 ALA	SM 1030E
Cation-Anion Balance	3.58	0.01		%	01/27/2012 925 ALA	SM 1030E
Dissolved Metals						
Barium	0.248	0.005		mg/L	01/19/2012 1254 MS	EPA 200.8
Total Metals						
Barium	0.255	0.005		mg/L	01/19/2012 1259 MS	EPA 200.8

These results apply only to the samples tested.

RL - Reporting Limit

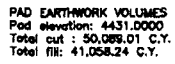
Qualifiers:

- * Value exceeds Maximum Contaminant Level
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by a contract laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL
- O Outside the Range of Dilutions

Reviewed by: A. Aleotti
Adrien Aleotti, Project Manager

Page 4 of 4





Oil and Gas Search for: api_no_like '40 033 05221'		
Page 1 of 1	<u>Download Database</u> (Excel spreadsheet format)	Page: 1

Record 1 of 1

Well Information

API No:	40 033 05221	County:	CUSTER
Well Name:	CARTER 2	Location:	SWSE 19-6S-1E
Permit No:	H32-2	Total Depth:	420
Operator Name:	CARTER OIL COMPANY	Bottom Hole:	Fall River
Permit Date:	01-01-1932	KB Elevation:	
Spud Date:	01-01-1932	Ground Elevation:	3690
Plug Date:	01-01-1932	Latitude:	43.508820
		Longitude:	-104.042397
Well Field	WILDCAT	Status	P&A
Class:	DRY HOLE	Type:	DRY HOLE

Formation Tops

<u>Formation</u>	<u>Depth (ft.)</u>
Red River	300

Page 1 of 1 (goto top)

Page: 1



COUNTY: CUSTER
LEGAL LOCATION: SWSE 19-6S-1E
API NO: 40 033 05221
PERMIT NO: H32-2
WELL NAME: CARTER #2
OPERATOR: CARTER OIL COMPANY
PERMIT ISSUED:
PERMIT CLOSED:
FILE LOCATION: 6S-1E-19 SWSE

TARGET CODES:

WELL HISTORY / CHECKLIST
PERMIT TO DRILL / INTENT TO DRILL
WELL INSPECTION / SCOUT REPORTS
OPERATOR'S TECHNICAL REPORTS / MAPS
ADMINISTRATIVE / SUNDRY REPORTS
CORRESPONDENCE
SURETY
MISCELLANEOUS



WELL HISTORY / CHECKLIST



**NO WELL HISTORY OR
CHECKLIST FOR THIS WELL
AS OF 9/21/2011**



PERMIT TO DRILL / INTENT TO DRILL



**NO PERMIT TO DRILL OR INTENT
TO DRILL FOR THIS WELL
AS OF 9/21/2011**



WELL INSPECTION / SCOUT REPORTS



**NO WELL INSPECTION OR SCOUT
REPORTS FOR THIS WELL
AS OF 9/21/2011**



OPERATOR'S TECHNICAL REPORTS / MAPS



**NO OPERATOR'S TECHNICAL
REPORTS OR MAPS FOR THIS WELL
AS OF 9/21/2011**



ADMINISTRATIVE / SUNDRY REPORTS

**NO ADMINISTRATIVE OR SUNDRY
REPORTS FOR THIS WELL
AS OF 9/21/2011**



CORRESPONDENCE



**NO CORRESPONDENCE FOR
THIS WELL AS OF 9/21/2011**

SURETY



NO SURETY INFORMATION FOR THIS WELL AS OF 9/21/2011



MISCELLANEOUS



POWERTech (USA) Inc.
API ID 40 033 05221

18 of 20

Carter #2
Drig Date 1931
T. D. 405 Water Well
Surface - Graneros
395-405 Dak. Water

NE SW SE 19-6S-1E

From USGS files, Newcastle



POWERTECH (USA) INC.

API ID 40 033 05221

19 of 20

9

No.	Date	Name	Location	Eleva- tion	Total Depth	Green- horn	Da- kota	Fall River
<u>Custer County--continued</u>								
7	1931	Carter #1	SW SE 19-6S-1E	3690±	405			395?
8	1932?	Carter #2	SW SE 19-6S-1E	3690±	420			300?
9	1956	Continental #1 Harrison	SW SE 24-3S-8E	3208K	1544	662	1100	1507
10	1956	Continental #1 Larson	SW SE 33-2S-8E	3252K	953		548	940
11	1963	Dodgin #1 Coffing	SE NE NW 34-6S-2E	4211	1367			
12	1963	Dodgin #1 Cornellison	SW NW 26-5S-1E	4116K	763			
13	1946	Over #1 Government- Christian	NE SW 30-5S-1E	4332	851			
14	1950	Fairburn #1	SE 19-4S-8E	3260±	7401			630±
15	1957	Gary #1 Bohling	NE SE 21-3S-10E	2864K	2500	1559	2002	2430
16	1957	Gary #1 O'Neill	SW NW 23-3S-11E	2804K	2565	1551	2040	2510
17	1957	Gary #1 Wilsey	NW SW 30-3S-10E	3017K	2510	1619	2025	2471
18	1957	Gary #1 Young	NE NW 21-4S-8E	3465K	1605	600	1113	1538
19	1934	Gokel #1 Govern- ment-Halterman	SW NW 1-6S-1E	4040±	1047			
20	1956	Great Western Eyres #1 Coffing	SW SW 27-6S-2E	4141	1378			
21	1958	Harris #1 Rothleutner	NE SW 7-6S-2E	4040±	1200			



POWERTECH (USA) INC.

10

Winne- Santa	Minne- lusa	Madi- son	Devo- nian	Red River	Pre- Cam- brian	Logs	Remarks	No.
-----------------	----------------	--------------	---------------	--------------	-----------------------	------	---------	-----

Custer County--continued

						s		7
						s		8
						E,ML	Cored 1100-1225,1240-93	9
								10
630						GRN	Production from 1379-1385	11
184	350					GRN	Oil show 745-54	12
	140					s		13
						s	Water at 740± with oil	14
						E,ML,S		15
						E,ML,S		16
						E,ML,S		17
						E,ML,S		18
	141					D,s	Oil show 682-704, Gas show 805-7,908-12	19
568	640					GRN	Oil show 1365, DST 1357- 68	20
407	500					E,S		21

Circ. 35



Oil and Gas Search for: <i>api_no_ like '40 047 05089'</i>		
Page 1 of 1	<u>Download Database</u> (Excel spreadsheet format)	Page: Prev 1 Next

Record 1 of 1

Well Information

API No:	40 047 05089	County:	FALL RIVER
Well Name:	SUN 1 LANCE NELSON	Location:	NESE 21-7S-1E
Permit No:	356	Total Depth:	3057
Operator Name:	SUN OIL COMPANY	Bottom Hole:	Madison
Permit Date:	01-27-1964	KB Elevation:	3535
Spud Date:	02-04-1964	Ground Elevation:	3526
Plug Date:	02-22-1964	Latitude:	43.425795
		Longitude:	-103.997224
Well Field	WILDCAT	Status	P&A
Class:	DRY HOLE	Type:	DRY HOLE

Formation Tops

<u>Formation</u>	<u>Depth (ft.)</u>
Fall River	366
Lakota	562
Morrison	653
Sundance	850
Spearfish	1152
Minnekahta	1726
Opeche	1764
Minnelusa	1838
Red Marker	2272
2nd Leo	2384
3rd Leo	2618
Madison	2989

COUNTY: FALL RIVER
LEGAL LOCATION: NESE 21-7N-1E
API NO: 40 047 05089
PERMIT NO: 356
WELL NAME: SUN #1 LANCE-NELSON
OPERATOR: SUN OIL COMPANY
PERMIT ISSUED: 01/27/1964
PERMIT CLOSED: 09/02/1964
FILE LOCATION: 7N-1E-21 NESE

TARGET CODES:

WELL HISTORY / CHECKLIST

PERMIT TO DRILL / INTENT TO DRILL

WELL INSPECTION / SCOUT REPORTS

OPERATOR'S TECHNICAL REPORTS / MAPS

ADMINISTRATIVE / SUNDRY REPORTS

CORRESPONDENCE

SURETY

MISCELLANEOUS

WELL HISTORY / CHECKLIST



POWERTECH (USA) INC.

WELL HISTORY

Well Name Sun #1 Lance-Nelson Permit No. 356
Location NESE 21-7S-1E - Fall River Date of Permit 1-27-64
Elev. 3526.0' API No. _____
Confidential X From _____ To 8-21-64
Logs Received _____
Cuttings Received _____ Cores Received _____
Drill Stem Records _____

Cap Plug and Marker Set 2-28-64
Surface Restored 5-12-64
Plugging Affidavit Signed _____ Date _____
Bond Released _____ Date 9-2-64

Summary of Scout Reports

2-1-64 No equipment at location - First report
2-7-64 Spudded 2-4-64
2-22-64 Plugged
2-28-64 Rig moved out - Marker placed - Mud pits not filled
5-12-64 Mud pits filled & surface restored

PERMIT TO DRILL / INTENT TO DRILL



POWERTECH (USA) INC.

State Pub. Co., Pierre

APPLICATION FOR PERMIT TO:

S. Dak. Oil & Gas Board
FORM 2

<input checked="" type="checkbox"/> DRILL	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> PLUG BACK	FARM OR LEASE NAME Lance - Nelson Estate
<input type="checkbox"/> OIL WELL	<input type="checkbox"/> GAS WELL	<input type="checkbox"/> SINGLE ZONE	WELL NO. 1
<input type="checkbox"/> MULTIPLE ZONE			FIELD AND POOL, OR WILDCAT Wildcat
OPERATOR Sun Oil Company			NO. ACRES IN LEASE 40
ADDRESS P. O. Box 1798 (mailing Address) 800 Security Life Bldg. Denver, Colorado Phone: 266-2181			1/4 SEC. TWP. RGE NE SE Sec. 21-7S-1E
LOCATION (In feet from nearest lines of section or legal subdivision, where possible): 1980' North of South Line & 660' West of East Line of Section 21, Township 7S, Range 1E, Fall River, South Dakota			COUNTY Fall River County
NAME AND ADDRESS OF SURFACE OWNER First National Bank of Black Hills, Trustee of the Nelson Estate		ELEVATION 3526.0'	NO. OF WELLS ETC. none
		PROPOSED DEPTH 3200	ROTARY OR CABLE TOOLS Rotary Tools
NAME AND ADDRESS OF CONTRACTOR Unknown		APPROXIMATE DATE WORK WILL START January 16, 1964	

IF LEASE PURCHASED WITH ANY WELLS DRILLED, FROM WHOM PURCHASED (Name and address)

PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	NEW OR SECOND HAND	DEPTH	SACKS OF CEMENT
12-1/4"	8-5/8"	24#	New	200'	150
7-7/8"	4-1/2"	9.5#	New	3200'	200

DESCRIBE PROPOSED OPERATIONS. IF PROPOSAL IS TO DEEPEN OR PLUG BACK, GIVE DATA ON PRESENT PRODUCTIVE ZONE AND PROPOSED NEW PRODUCTIVE ZONE. GIVE BLOW OUT PREVENTER PROGRAM IF ANY

Principal Objective is Minnelusa Ss

Certified Location Plat Attached

Check in the amount of \$100.00 covering the drilling permit fee attached.

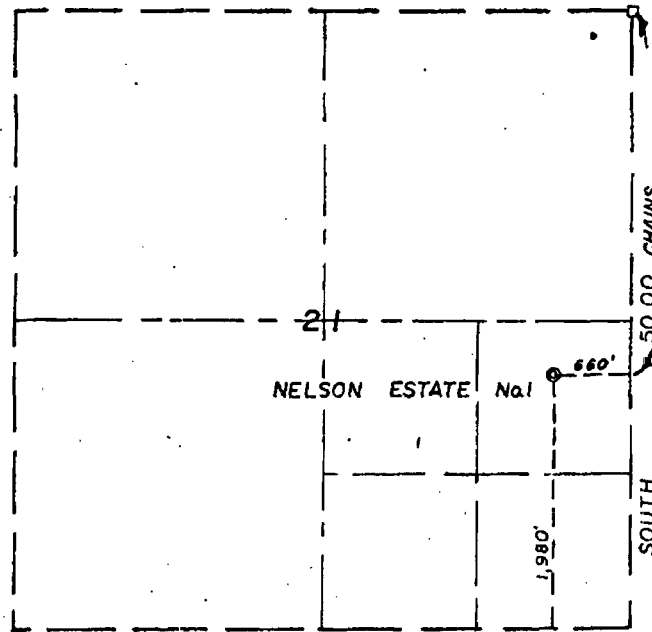
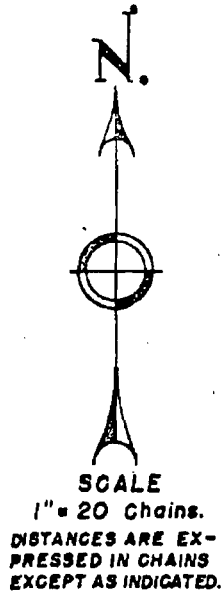
A \$5000 bond from our South Dakota agent will be submitted in the very near future.

Please wire your approval to drill this well to the undersigned when everything is in order.

SIGNED <i>W. J. Turner</i>	TITLE Div. Supt. - Oper. Dept.	DATE January 7, 1964
DO NOT WRITE BELOW THIS LINE		
PERMIT NO. 356	CHECKED BY <i>James P. ...</i>	DATE 1/9/64
APPROVAL DATE January 27, 1964	Secretary	
CONDITIONS:		
<input checked="" type="checkbox"/> COMPLETE SET OF SAMPLES, AND CORES IF TAKEN, MUST BE SUBMITTED.		
<input type="checkbox"/> SAMPLES, AND CORES IF TAKEN, BELOW DEPTH, MUST BE SUBMITTED.		

*See Instructions On Reverse Side

SECTION 21
T.7S., R.1E, EAST OF THE BLACK HILLS MERIDIAN
FALL RIVER COUNTY, SOUTH DAKOTA



LEGEND

U.S. Government Brass Cap Corner.....
Original stone corner, properly marked, firmly set.....
Iron pipe set at proportionate distance.....
Corner established by others as indicated.....
Dependent Resurvey.....
Pratracton.....
Well location.....

ELEVATIONS:

LOCATION 3526.0
R.P. 100' N. 3526.6
100' S. 3526.5
100' E. 3526.4
100' W. 3526.3

SURVEY AND PLAT BY
WORTHINGTON, LENHART & ASSOCIATES, INC.
200 South Lowell St., Casper, Wyoming
Direct solar lines and chained distances. Ref. Book No. 247, P. 64

PLATTED FIELD NOTES OF SURVEY
MARKING WELL LOCATION
NE 1/4 SE 1/4, SECTION 21
FOR

SUN OIL COMPANY CASPER, WYOMING

Dated: 1-6-64
Work Order NO. 1-2-A4

William G. Ladd
Certified true and correct, Surveyor.
SOUTH DAKOTA REG. NO. 1255



WELL INSPECTION / SCOUT REPORTS

STATE GEOLOGICAL SURVEY

Permit Number 356

Scout Report

Date scouted May 12, 1964

Owner. Sun Oil Company

Designation of well. . . #1 Lance-Nelson

Location: Sec. 21 T. 7 N. 3 E. 1

. Fall River County, S. D. Total Depth . . 3,057 feet

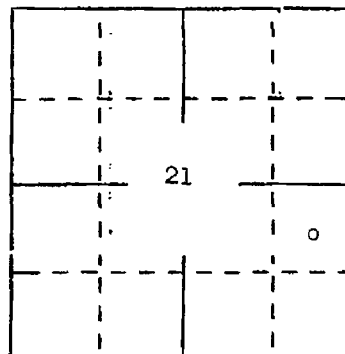
Casing Record:

8 5/8 269 Ft. Ft.

 Ft. Ft.

Work in progress at time of visit:

None

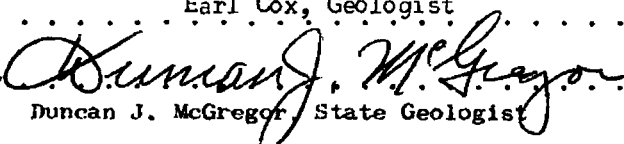


Developments since last visit:

Mud pits have been filled and the surface satisfactorily restored.

Remarks and recommendations:

Scouted by. Earl Cox, Geologist

Approved by 
Duncan J. McGregor, State Geologist

STATE GEOLOGICAL SURVEY

Scout Report

Date scouted . . . February 28, 1964

Owner. Sun Oil Company

Designation of well. #1 Lance-Nelson

Location: Sec. 21 T. 7 N. S. R. 1 E. W.

. Fall River County, S. D. Total Depth . . . 3057 feet

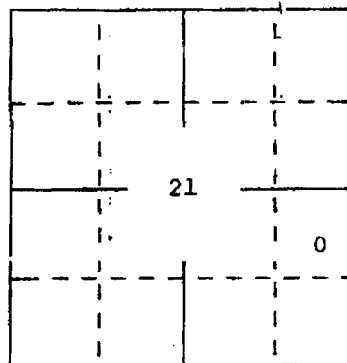
Casing Record:

8 5/8" 269 Ft. Ft.

 Ft. Ft.

Work in progress at time of visit:

None



Developments since last visit:

Rig moved from location.
Abandonment marker placed.

Remarks and recommendations:

Mud pits not filled.

Scouted by. Earl Cox, Geologist

Approved by 
Duncan J. McGregor, State Geologist

All information on this
test may be released
immediately to anyone.

STATE GEOLOGICAL SURVEY

Permit No. 356

Scout Report

Date scouted February 22, 1964

Owner. Sun Oil Company

Designation of well. #1 Lance-Nelson

Location: Sec. 21 T. 7 M. S. 1 E. W.

. . . Fall River County, S. D. Total Depth . . 3057 feet (T.D.)

Casing Record:

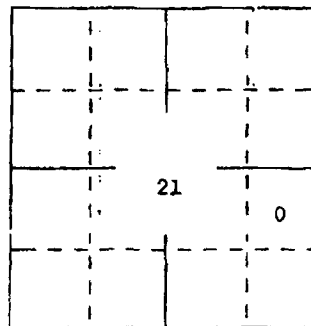
8 5/8" 269 Ft. Ft.
 Ft. Ft.

Phone: Work in progress at time of visit:

Plugged as follows:

25 5x	2977-3057	Madison
25 5x	2360-2440	2nd Leo Sand
25 5x	1800-1880	Minnelusa
25 5x	820- 900	Top Sundance
40 5x	330- 460	Top Dakota
25 5x	220- 290	Bottom Surface Casing
10 5x	Surface Plug	

Developments since last visit:



Drilled from 2916'-3057'.

Run laterolog and gamma ray sonic logs.

Remarks and recommendations:

Log Tops:

Dakota - 368	Gypsum Springs - 1151	2nd Leo - 2384
Lakota - 562	Spearfish - 1186	3rd Leo - 2618 (?)
Morrison - 653	Minnelusa - 1842	Madison - 2990
Sundance - 850	Red Marker - 2271	T.D. - 3057

Scouted by. Earl Cox, Geologist

Approved by Duncan J. McGregor
Duncan J. McGregor, State Geologist

STATE GEOLOGICAL SURVEY

Scout Report

Hold this information confidential
until well is plugged.

Date scouted . February 20, 1964

Owner. Sun Oil Company

Designation of well. #1 Lance-Nelson

Location: Sec. 21 T. 7 N. S. R. 1 E. W.

. Fall River County, S. D. Total Depth . . 2916 feet

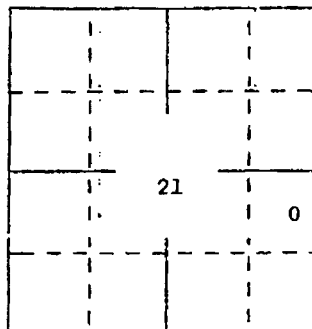
Casing Record:

8 5/8" 269 Ft. Ft.

 Ft. Ft.

Work in progress at time of visit:

Drilling at 2916.



Developments since last visit:

DST #1 2315-33. Shut in 30 min., open 60 min., shut in 40 min.

Recovered 15 feet drilling mud.

Shut in pressures - 15-27

Flow pressures - 15-27

Hydro Static pressures - 1211-1143

Temp. - 67° (oil show in samples 2318-25)

DST #2 2390-2400. (Second Leo) Shut in 30 min; open 60 min; shut in 30 min.

~~Remarks-and-recommendations:~~

Recovered 2036' black sulphur water, slightly gas cut.

Shut in pressures 1026-1026

Flow pressures 144-884

Hydrostatic pressures 1341-1241

Temp. - 84°

Scouted by. Earl Cox, Geologist

Approved by 

Duncan J. McGregor, State Geologist

STATE GEOLOGICAL SURVEY

Scout Report

Date scouted . February 14, 1964

Owner. Sun Oil Company

Designation of well. . #1 Lance-Nelson

Location: Sec. 21 T. 7 N. S. . R. 1 E. N.

. . . Fall River County, S. D. Total Depth . . 2333 feet

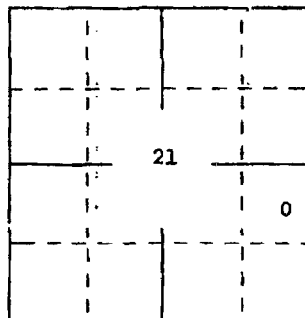
Casing Record:

8 5/8" 269 Ft. Ft.

 Ft. Ft.

Work in progress at time of visit:

Preparing to drill stem test at 2333' after
obtaining oil show.



Developments since last visit:

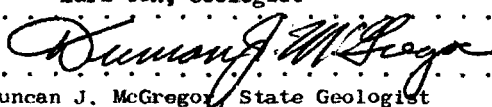
Drilled from 300-2333'.

Elevation: Gd - 3526
KB - +8.5

Remarks and recommendations:

Sample Tops: Dakota - 370 Minnekahta - 1727
 Morrison - 710 Opeche - 1795
 Sundance - 870 Minnelusa - 1840
 Spearfish - 1186 Red Marker - 2272

Scouted by. Earl Cox, Geologist

Approved by 
Duncan J. McGregor, State Geologist

STATE GEOLOGICAL SURVEY

Scout Report

Date scouted February 7, 1964 .

Owner. Sun Oil Company

Designation of well. #1 Lance - Nelson.

Location: Sec. 21 T. 7 N. S. 1 E. W.

. . . Fall River County, S. D. Total Depth . . 300 feet

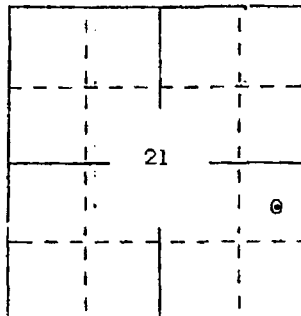
Casing Record:

8 5/8 269 Ft. Ft.

 Ft. Ft.

Work in progress at time of visit:

Preparing to drill out from under surface casing



Developments since last visit:

Spudded: February 4, 1964

Set 269' of 8 5/8" surface casing with 175 sacks.

Remarks and recommendations:

Scouted by. . . Earl Cox, Geologist.

Approved by 
Duncan J. McGregor, State Geologist



POWERTECH (USA) INC.
FIRST REPORT

STATE GEOLOGICAL SURVEY

Scout Report

Date scouted February 1, 1964

Owner. Sun Oil Company

Designation of well. #1. Lance, Nelson

Location: Sec. 21 T. 7 N. S. R. 1 E. W.

. . . Fall River County, S. D. Total Depth . . . 0 feet

Casing Record:

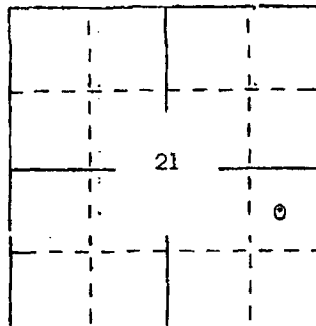
_____ Ft. _____ Ft.

_____ Ft. _____ Ft.

Work in progress at time of visit:

None

Developments since last visit:



Remarks and recommendations:

Pits not dug.

No equipment at location

Scouted by. Earl Cox, Geologist

Approved by *Duncan J. McGregor*

Duncan J. McGregor, State Geologist



POWERTECH (USA) INC.

Temp Mark. Kopp ML Conf.

SUN #1 LANCE - NELSON

1980' NSL + 660 WEL.

NESE - 21-75-1E

Fall River Co.

SUN Oil Co

Danvers, Colo. Phone - 266-2181

Surface owner - 1st Nat Bank
Trustee of Nelson-Estate.

Elev: 84-3526

K.B. - 8.5

Permit: 1-27-64

Est. T.D. - 3200 ML

Contractor: - Bernhardt

Feb. 1, 1964

Kept on equipment at
Location.

Feb. 20, 1964

② 2916

appart to T.D. of 2941

2886 Madison Top (?)

DST #1 2315-33

30" - 41" - 40"

fine bitum. dist.

100' - 15' mud.

OSP 15' - 27

FP 15' - 27

HP 1211 - 1143

oil shown at 2318-25

DST #2 2390-2400

30" - 1" - 30"

open with grey fluv for 30m.

to fine black bit. dist.

Ran 2036 black sulphur

water, slightly frothy

OSP 1026 - 1026

FP 144 - 884 HP 1341-1242

HP 1341 12.12 TEMP 84°

Feb. 7, 1964

Spur: Feb. 4, 1964

Set 8 3/8" 269 1/2 (75' 20')

Drilling out from under.

Feb. 14, 1964

③ 2333

preparing to DST. of show.

Sample tops:

Dak 370

Morrison 710

Sandover 870

Sp. 1186

Mk 1727 (P)

Op 1795 (P)

ML 1846

R. Marker. 2272

Est. T.D. 3200 or 50' into horizon

Will run laterology +
gamma ray down.

7 3/8" hole.

2nd leg

try out

try Sandover.

Dak

50' or better surface.

2-21-64

Jonston Called at note + said
were about ready to fly.

T.D. 3057

by tops from laterology + gamma ray

Dak 368

Lak 562

Morrison - 653

Sandover 850

Gypsum Springs 1151

Spangish 1186 OP 1770

Mk. 1760(?) ML 1842

or 1760(?)



POWERTECH (USA) INC.

Ref Madison 2271
2nd Leo 2384
3rd Leo 2618 (?)
Madison 2770

John called at midnite & said
20 ft up Madison should
have play as it had 23%
porosity. I said yes & the
these plugs were placed Saturday
2-22-64

25-24 2977-3057 Madison
25-24 2nd Leo 2360-2440
25-24 ml 1800-1880
25-24. Jan. Lane top 820-900
40-24. Exp. Oak 330-460
25-24 230-290 Rth. Sepu.
1-24 Auger plug.

2-28-64

Rig zone. Pits not filled
Make up. Does not have
NESE on it - but guess it's OK.

May 13, 64
pits filled O.K. & filled
& ground leveled.

Sept. 9, 1964

Frank Neigh Day OK to
Release everything on this
test.

~~July 30~~



WELL; - *Sur #1 Large Mellon*

LOCATION; - *NE SE sec 21, T7S, R1E*

LOGS RECD; -

TOPS; -

GEOLOGIC; - *completion Report (2)*
3-9-64

ELECTRIC, FIELD; -

FINAL; - *LL, 2 copies*
3-6-64

RADIO, FIELD; - *1 copy RIMWLS*

FINAL; - *Lois - CR*
(2 copies) 3-7-64

OTHERS; - *1 copy RIMWLS*

CUTTINGS RECD; - *3-27-64*

CORES RECD; -

DRILL STEM DATA RECD; - *see*
completion Report

CAP PLUG CHECKED; - *OK 2-28-64*

PLUGGING AFFIDAVIT SIGNED; -

see plugging Rec (form 7) 2-28-64

see form 6 (7-9-64)

Bank released 9-2-64



Released - 2-22-64

Sun #1 Lance - Nelson

NE, SE, sec 21, T.7S.; R1E
Fall River Co.

elev. 3526.0

2-1-64

Pits not dug: No equip
met at location.

2-7-64

Spudded 2-4-64 &
set 269' of 8 5/8" surface csg.

2-14-64

Preparing to drill stem test
at 2333' after obtaining oil show
spl. tops:

Kd - 370

Mannehalte - 1727

Mowion - 710

Opeke - 1715

Surdas - 870

Muhnelina - 1840

Spentil - 1186

Red Mariv - 2272

2-20-64

Drilling at 2916

DST #1 2315-33 Rec. 15' drilling mud

SIP-15-17, FP-15-17, HP-1211-1143

(oil show in sampler 2318-25) Temp 67°

DST #2 2390-2400 (second loc)

Res. 2036' black sulphur H₂O, ethy gas cut

SIP 1026-1026, FP 144-884, HP 144-1291

Temp 84°

2-22-64

Plugged

Drilled from 2916-3057, ran 4 ft

+ GR - some logs

logs

KH-368

Gyp temp - 1151

2-ster - 2384

KL-562

Plumb 210 - 1186

8" - 2618?

Mercurion - 653

Thimble - 1842

Mercurion - 2990

Leakdown - 850

RM - 2271

T.D. 3057

2-28-64

Reg moved from loc.

mud - placed

Pits not filled

5-12-64

Mud pits filled

OPERATOR'S TECHNICAL REPORTS / MAPS



POWERTECH (USA) INC.

WELL COMPLETION REPORT

SUN OIL CO.

#1 LANCE-NELSON ESTATE

NE SE, SEC. 21, T. 7S., R. 1E.

FALL RIVER COUNTY, SOUTH DAKOTA

Eldred D. Johnson
3025 Alma Ave.
Casper, Wyoming
Phone: 234-3568



POWERTECH (USA) INC.

#1 Tence-Nelson Estate
NE 1/4 Sec. 21-7S-1E
Fall River County, S.D.

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#1 Lance-Nelson Estate
NE 1/4 Sec. 21-76-1E
Fall River County, S.D.

SYNOPSIS

OPERATOR: Sun Oil Co.

WELL: #1 Lance-Nelson Estate

LOCATION: NE SE; 1900 HSL, 660 WEL (not center location)
Sec. 21, T. 78., R. 1E.
Fall River County, South Dakota

ELEVATION: 3526 Gr., 3535 KB

SPUDDED: February 4, 1964 (9:00 P.M.)

CEASED DRILLING: February 21, 1964 (12:30 P.M.)

COMPLETED: February 22, 1964 (7:00 A.M.)

STATUS: P & A

TOTAL DEPTH: 3057 Driller; 3057 Log

CASING: 8-5/8" surface casing set @ 269 w/175 sacks

HOLE SIZE: 9" from below surface casing to 620'.
8-3/4" from 620' to 802'. 7-7/8" from 802' to T.D.

CONTRACTOR: Barnhart Drilling Co. - Rig #1
Tool Pusher - Lyle Robinson
Drillers - H. H. Wilson, Floyd P. Reed, Sam Rinard

DRILLING MUD: Magnet-Cove Parium Corp.; Low PH Gel-Chemical
Mud Engineers - Morris Carroll, George Brown,
J. Martin

LOST CIRCULATION: Lost circulation for 5 1/2 hours @ 2125'. Lost
approximately 500 bbl. mud.
Lost Circulation while making trip @ 2523. Lost
approximately 200 bbl. mud.

CORING: No cores cut

DRILL STEM TESTS: DST #1 2315-33 (1st Leo (?) Zone)
Rec. 15' drilling mud
DST #2 2390-2400 (2nd Leo)
Rec. 2036' SGC black sulphur water
Johnston Testers Inc.
Test Engineer - Jimmie Hulac; Gillette, Wyo.

LOGS: Schlumberger Well Surveying Corp.
Laterolog from 3057 to 269; Sonic Log-Gamma
Ray Caliper from 3057 to 269
Log Engineer: Ted Campen

SAMPLES:All samples were delivered to American
Stratigraphic Co., Casper, Wyoming.GEOLOGIST RELEASED:

February 22, 1964

CHRONOLOGICAL HISTORY

<u>Date</u>	<u>8:00 A.M. Depth</u>	<u>Data</u>
2-4-64	Rigging up	Spudded 9:00 P.M. this date
2-5-64	Drilling surface hole @ 127	Made 187'
2-6-64	Drilling surface hole @ 772	Made 585' Drilled surface hole to 802 @ 9:45 A.M. Made 32'. No water flow was encountered so surface hole was reamed out to 12 1/4" to a depth of 272'. Ran 8-5/8" surface casing to 269' w/175 sax. Plug down @ 4:30 PM this date.
2-7-64	Nippling up	Drilled out cement and cleaned out to 802'. Began drilling new hole @ 5:30 PM this date. Encountered water flow of 10-12 bbl./hr. White @ 900
2-8-64	Trip for bit #4 @ 1102'	Made 220'
2-9-64	Drilling @ 1486'	Made 384'
2-10-64	Drilling @ 1745'	Made 259'
2-11-64	Drilling @ 1942'	Made 197'
2-12-64	Drilling @ 2079'	Made 137' Lost circulation for 5 1/2 hrs. @ 2125'. Lost approximately 500 bbl. mud before regaining circulation.
2-13-64	Drilling @ 2210'	Made 131'
2-14-64	Trip for bit #13 @ 2310'	Made 100'
2-15-64	Pulling DST #1	DST #1 2315-2333. Rec. 15' @ mud, no show.
2-16-64	Trip for DST #2 @ 2400'	Made 90' DST #2, 2390-2400. Rec. 2036' SGC sulph. wtr.
2-17-64	Drilling @ 2438'	Made 88' Lost circulation while making trip @ 2523'. Lost approximately 200 bbl. mud



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#1 Sance-Nelson Estate
NE SE Sec. 21-7S-1E
Fall River County, S.D.

2-18-64 Drilling @ 2607'
2-19-64 Drilling @ 2752'
2-20-64 Drilling @ 2891'
2-21-64 Drilling @ 3005'

Made 119'

Made 145'

Made 139'

Made 114'

Drilled to TD of 3057 @ 12:30 PM this date. Made 52'. Ran Schlumberger Laterolog and Gamma Ray-Sonic-Caliper log from 3057 to 269'.

TD 3057 driller
3057 Log

2-22-64 P & A

Set 25 sack plug from 2977-3057 across top of Madison. Set 25 sack plug from 2360-2440 across 2nd Leo.
Set 25 sack plug from 1800-1880 across top of Minnelusa
Set 25 sack plug from 820-900 across top of Sundance.
Set 40 sack plug from 330-460 across top of Dakota.
Set 25 sack plug from 220-290 in base of surface pipe.
Set 10 sack plug with regulation marker in top of surface pipe.
Rig released @ 7:00 AM P & A.



POWERTECH (USA) INC.

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#1 L. de-Nelson Estate
NE SE Sec. 21-7S-1E
Fall River County, S.D.

BIT RECORD

<u>Bit No.</u>	<u>Size</u>	<u>Make</u>	<u>Type</u>	<u>Serial #</u>	<u>Depth Out</u>	<u>Footage</u>	<u>Hours Run</u>
1	9	Smith	S5N	Re-Run	620	374	10-1/4
2	8-3/4	HTC	OSCLG	Re-Run	802	132	6-1/2
3	7-7/8	Smith	DT2G	Re-Run	1102	300	12
4	7-7/8	CP	ES2G	14067	1423	321	12-1/4
5	7-7/8	CP	ES2G	15569	1618	195	17-3/4
6	7-7/8	Reed	YT1A	134234	1815	197	15-1/2
7	7-7/8	Reed	YT1R	D34627	1916	101	7-1/4
8	7-7/8	HTC	OWL	39185	2000	84	9
9	7-7/8	Smith	SV2	60727	2038	38	6-1/4
10	7-7/8	HTC	OWC	98482	2162	127	14
11	7-7/8	Reed	YMR	331353	2250	88	15-1/2
12	7-7/8	HTC	OWL	38519	2310	60	11-3/4
13	7-7/8	CP	EHL	10557	2371	61	11-1/2
14	7-7/8	Smith	C2	69423	2461	90	10-3/4
15	7-7/8	Smith	C2	69459	2523	62	9-1/2
16	7-7/8	Reed	YH1	131688	2593	70	10-1/4
17	7-7/8	HTC	W7	35485	2680	87	14-1/4
18	7-7/8	Smith	L4	64483	2757	77	11-1/2
19	7-7/8	CP	EHL	194044	2867	110	14-1/2
20	7-7/8	CP	EHL	12792	2941	74	9-3/4
21	7-7/8	HTC	W7	35478	2997	56	7-3/4
22	7-7/8	Reed	YH	21582	3057	60	5-3/4

DEVIATION SURVEYS

<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
72'	1/4°	1618'	1-1/4°
130'	1/4°	1815'	1°
328'	1/4°	1916'	1-1/2°
474'	3/4°	2000'	1-1/4°
538'	1/2°+	2162'	1-3/4°
620'	1/4°	2310'	1-3/4°
741'	3/4°	2371'	1-3/4°
802'	1/2°	2593'	2-1/4°
994'	1°	2757'	2-1/2°
1102'	3/4°	3057'	3°
1423'	3/4°		

DRILL STEM TEST DATA

DST #1, 2315-2333 (1st Leo (?) Zone)

ISI 30 minutes. Open 1 hour. FSI 40 minutes.

Tool opened with a very slight blow and died

Recovered 15' drilling mud.

ISIP	15#	IFP	15#	IHP	1211#
FSIP	27#	FFP	27#	FHP	1143#

B.H.T. 67°F.

DST #2, 2390-2400 (2nd Leo)

ISI 30 minutes. Open 1 hour. FSI 30 minutes

Tool opened with a good blow for 30 minutes, decreased to fair blow at end of test.

Recovered 2036' slightly gas cut black sulphur water.

ISIP	1026#	IFP	144#	IHP	1341#
FSIP	1026#	FFP	384#	FHP	1242#

B.H.T. 84°F.

Drill stem tests by Johnston Testers, Inc.

Engineer: Jimmie Hulse, Gillette, Wyoming

SCHLUMBERGER POROSITY AND WATER SATURATION DETERMINATIONS

Dakota 450-460

SP = +10 R11 = 35
 $\Delta+$ = 115 Rw = 2.4
 ϕ = 27% Sw = 75-80%

Lakota 590-600

SP = +10 R11 = 50
 $\Delta+$ = 115 Rw = 2.5
 ϕ = 27% Sw = 70%

Sundance 1080-1090

SP = +10 R11 = 48
 $\Delta+$ = 100 Rw = 2.4
 ϕ = 21% Sw = 100%

Converse 1850-1900

SP = +10 R11 = 48
 $\Delta+$ = 100 Rw = 2.4
 ϕ = 21% Sw = 100%

Converse 1970-1980

SP = +20 R11 = 200
 $\Delta+$ = 75 Rw = 3.0
 ϕ = 14% Sw = 90%

Converse 2106-2138

R11 = 30
 $\Delta+$ = 84 Rw = .41
 ϕ = 17% Sw = 61-78%

1st Leo (?) Zone 2318-2325

SP = -10 R11 = 75
 $\Delta+$ = 65 Rw = .80
 ϕ = 11% Sw = 87%

2nd Leo 2400-2420

R11 = 13 Rw = .60 @ 60°
 $\Delta+$ = 110 Rw = .38 @ 100°
 ϕ = 29% Sw = 70%

3rd (?) Leo 2685-2690

SP = +35 R11 = 30
 $\Delta+$ = 83 Rw = 5.0
 ϕ = 20% Sw = 100%

Pahasapa 3030-3040

SP = -45 R11 = 200
 $\Delta+$ = 35 Rw = 4.0
 ϕ = 22% Sw = 85%

SAMPLE DESCRIPTION

Samples were examined under the binocular microscope with 9X eyepiece and 1X, 2X, and 3X objective lenses during the drilling of the well, February, 1963. 30' samples were caught from surface to 600'. 10' samples were caught from 600' to T.D. The samples description is condensed from the well-site description and adjusted to the E-Log depths.

<u>From</u>	<u>To</u>	<u>Feet</u>	<u>Description</u>
Surface	45	45	Stream gravel; red, pink, orange chert and quartz granules and pebbles, unconsolidated.
45	260	215	Shale, very dark gray to black, firm to hard, slightly micaceous, bentonitic to siliceous, silty. Trace of dark brown, hard, slightly calcareous siltstone in interval 150-180. Scattered traces of calcite and selenite fragments.
260	270	10	Sandstone, medium gray, very fine grained, sub-angular, poor sorting, clay filled, very heavily glauconitic, poor P & P, no show.
270	366	96	Shale, very dark gray to black, firm to hard, some soft, silty, slightly micaceous, bentonitic in part.
<u>Dakota sandstone</u>			366 (+3169) log
366	400	34	Sandstone, white-light gray, very fine grained, sub-angular, clay filled, fairly friable, poor P & P, no show, interbedded with shale, very dark gray to black, firm to hard, some soft, silty, micaceous.
400	425	25	Shale, as above, very dark gray to black, with some interbedded streaks of sandstone, as above, white, hard and calcareous in part.
425	450	25	Sandstone, white, fine to very fine grained, sub-angular, hard, calcareous in part, poor P & P, interbedded with shale, as above, very dark gray to black, silty, also some medium gray, smooth, somewhat waxy, in part variegated with brown to tan shale.
450	500	50	Sandstone, white, fine to very fine grained, sub-angular, glauconitic in part, fair P & P to very hard and tight. Spotty bright yellow fluorescence with fair to good cut in sample 450-480. Some interbedded medium gray to green claystone, waxy, smooth, with floating sand grains, and some scattered gray to black silty shale, as above. Abundant brown siderite pellets in sample 450-480. Scattered pyrite and very abundant loose very coarse quartz grains at base of interval.



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#1 La. Nelson Estate
NE SE Sec. 21-7S-1E
Fall River County, S.D.

<u>From</u>	<u>To</u>	<u>Feet</u>	<u>Description</u>
500	562	62	Sandstone, white to gray, medium to very coarse grained, conglomeritic, sub-rounded to sub-angular, extremely friable, being mostly loose grains in samples, no show. Some traces of interbedded shale, variegated medium gray, lavender, olive green, trace pink, smooth, somewhat waxy, some light green shale with floating sand grains.
<u>Lakota sandstone</u>			562 (+2973) log
562	600	38	Sandstone, white to gray, fine to coarse grained, conglomeritic, sub-rounded to sub-angular, poor sorting, extremely friable, excellent P & P, some scattered fairly bright yellow fluorescence, poor to fair cut. Some interbedded shale, as above, variegated, purple, gray, green, rust-brown, waxy.
600	653	53	Sandstone, white to fine to coarse grained, conglomeritic, poor sorting, sub-rounded, extremely friable, excellent P & P, slight trace of stain, spotty bright yellow fluorescence, poor cut at base of interval. Some interbedded shale, variegated as above, but mostly gray and lavender.
<u>Morrison formation</u>			653 (+2882) log
653	690	37	Shale, medium gray, firm, smooth and waxy, some silty, with some variegated shale, as above, and sandstone white, fine to very coarse grained, conglomeritic, sub-rounded, poor sorting, very friable, good to excellent P & P, some scattered fairly bright yellow fluorescence with poor to fair cut at base of interval. At top of interval is some yellow to yellow-brown sandstone, very fine grained, sub-rounded to sub-angular, micaceous, hard to friable, calcareous. Scattered pyrite fragments throughout interval.
690	720	30	Shale, as above, medium to dark gray, some variegated, with some sandstone, white, fine to very coarse grained, conglomeritic, sub-rounded, very friable, good to excellent P & P, some scattered bright yellow fluorescence with fair to good cut at top of interval. Trace white, fine grained, fairly hard, clay filled sandstone. Slight trace hard, brown, silty, crystalline limestone. Some very coarse red and yellow chert grains.



<u>From</u>	<u>To</u>	<u>Feet</u>	<u>Description</u>
720	750	30	Shale, medium to dark gray, some variegated, firm, smooth, waxy and sandstone, conglomeratic, as above, very friable, and some white to light gray, fine to very fine grained, sub-angular to sub-rounded, clay filled, friable to hard and tight, slightly micaceous, slightly glauconitic in part, no show. Fairly abundant pyrite at top of interval.
750	780	30	Shale, medium to dark gray and greenish gray, firm, blocky, fairly smooth, somewhat waxy, becoming silty in part. Some medium to dark gray and dark grayish brown, hard, silty, very argillaceous limestone, increasing toward base of interval. Scattered traces of calcite fragments. Slight trace of pyrite.
780	850	30	Limestone, light to medium gray, some gray-green, hard, very argillaceous, grading to and interbedded with shale, medium to dark gray, calcareous to very calcareous, silty in part, mostly smooth and waxy. Some bright green shale, smooth waxy, some with floating sand grains at bottom of interval some very argillaceous limestone shows fairly bright yellow fluorescence but no cut. Also at base of interval is some sandstone, white to bright green, very fine grained, sub-angular to sub-rounded, friable, calcareous, clay matrix, fair to good P & P, some dull to fairly bright yellow fluorescence, no cut.
<u>Sundance formation</u>			850 (+2685) log
850	880	30	Shale, medium gray to grayish-brown, soft, silty, some carbonaceous inclusions, also bright green waxy shale, interbedded with sandstone, white to medium gray and green, very fine grained, sub-rounded, clay matrix, silty fairly friable, becoming glauconitic, fair to good P & P, no show. Some hard, gray, very argillaceous limestone at top of interval.
880	920	40	Shale, medium to dark gray and grayish-brown, soft, silty, calcareous in part, also light to dark, soft lavender shale, slightly silty, slightly calcareous in part. Some interbedded sandstone, light gray to green, very fine grained, sub-rounded, glauconitic, clay matrix, calcareous, hard to soft and friable, no show.



<u>From</u>	<u>To</u>	<u>Feet</u>	<u>Description</u>
920	970	50	Shale, variegated, medium gray, green, maroon, lavender, red, some olive green, firm to soft, silty to waxy, calcareous, interbedded with sandstone, as above, gray to green, very fine grained, sub-rounded, glauconitic, calcareous, no show.
970	990	20	Siltstone, rust-red, sandy, soft, shaly and sandstone, rust-red, very fine grained, sub-angular to sub-rounded, very silty, friable, no show. Some variegated shale, as above.
990	1050	60	Sandstone and siltstone, rust-red, as above, and sandstone, light to medium gray and gray green, very fine grained, sub-angular to sub-rounded, glauconitic slightly calcareous, friable, no show. Some interbedded shale, variegated as above, becoming predominately gray, soft to firm, smooth and waxy to silty. Some bright green waxy shale with floating sand grains.
1050	1100	50	Sandstone, light gray to green, some very light tan, very fine grained, sub-angular to sub-rounded, clay filled in part, becoming glauconitic at base of interval, calcareous, friable, fair to good P & P, no show. Some interbedded shale, gray as above, some variegated.
1100	1152	52	Shale, medium to dark gray, firm to soft, slightly silty, calcareous, with some light green and lavender variegated shale, as above.
<u>Gypsum Spring formation</u>			1152 (+2383) log
1152	1186	34	Shale, medium to dark gray and grayish-brown, some green and lavender, soft, slightly silty, calcareous. Some scattered sandstone, white, fine to very fine grained, friable, calcareous, no show. (The above description of the Gypsum Spring is what was observed in the samples. From the drilling time, however, it would appear that the interval is made up predominantly of gypsum or anhydrite. This interval drilled at the rate of .25 minutes per foot as compared to 1.45 minutes per foot both immediately above and below the Gypsum Spring. The log also looks like gypsum, especially since the caliper shows a washed out zone at this interval.)



<u>From</u>	<u>To</u>	<u>Feet</u>	<u>Description</u>
<u>Spearfish formation</u>			1186 (+2349) log
1186	1290	104	Siltstone, brick red, becoming bright brick red in lower 2/3 of interval, sandy, shaly in part, slightly calcareous with interbedded dark brick red shale, silty, slightly calcareous. Trace of white crystalline to earthy anhydrite near base of interval.
1290	1350	60	Siltstone, bright brick red, firm to hard, sandy, calcareous, becoming anhydritic, and some shale, brick red to redish-brown, hard, silty, slightly calcareous. Some traces of anhydrite, white, soft, sucrose to earthy, some clear and crystalline.
1350	1450	100	Siltstone, and shale, as above, becoming only slightly calcareous, interbedded with thin stringers of anhydrite, white, soft, sucrose to earthy, some crystalline to fibrous.
1450	1500	50	Siltstone, bright red-orange, becoming darker in lower 1/2 of interval, sandy, hard, slightly calcareous to non-calcareous, anhydritic, and some brick-red, silty shale, as above, and some interbedded anhydrite, as above.
1500	1600	100	Anhydrite, white, firm to hard, brittle, sucrose to crystalline, also soft and earthy, interbedded with siltstone and shale, as above, non-calcareous.
1600	1620	20	Anhydrite, white, firm to hard, sucrose to crystalline, brittle.
1620	1640	20	Dolomite, white, light gray, pink, light purple, very fine to microcrystalline, hard, brittle, dull to light yellow fluorescence, no cut. Some interbedded siltstone bright, red-orange, sandy, anhydritic.
1640	1680	40	Interbedded siltstone, bright red-orange as above, and dolomite, white, pink, purple, fine to microcrystalline, silty in part, light to dull yellow fluorescence, no cut.
1680	1726	46	Siltstone, as above, red-orange, sandy anhydritic. Scattered traces of dolomite and anhydrite, as above.



Part II

#1 Lance-Nelson Estate

NE SE Sec. 21-781E

Fall River County, S.D.

<u>From</u>	<u>To</u>	<u>Feet</u>	<u>Description</u>
<u>Minnekahta limestone</u>			1726 (+1809) log
1726	1764	38	Limestone, white to gray, pink, hard, brittle, very fine to microcrystalline, dull to light yellow fluorescence, no cut, grading to dolomite pink to light purple, hard, brittle, microcrystalline, dull to light yellow fluorescence, no cut.
<u>Opache shale</u>			1764 (+1771) log
1764	1800	36	Dolomite, white-light gray, pink, hard, brittle, microcrystalline, with some traces of limestone as above, dolomitic, dull yellow fluorescence, no cut, interbedded with siltstone, red-orange to brick-red, sandy, anhydritic and some brick-red silty shale.
1800	1838	38	Siltstone, red-orange to brick-red, firm, sandy, dolomitic, shaly in part, with some scattered dolomite, as above, and anhydrite, white, sucrose.
<u>Minnelusa formation</u>			1838 (+1697) log
1838	1895	57	Sandstone, pink to white, fine to medium grained, sub-rounded to sub-angular, well sorted, friable, good to excellent P & P, no show. Toward base of interval sandstone becomes dark pink to red, slightly harder, clay filled, dolomitic, poor to fair P & P. Trace of interbedded dolomite, as above, at top of interval.
1895	1960	65	Dolomite, white, pink, light gray, trace of purple, hard, brittle, fine to microcrystalline, sandy in part, very slight trace of brown stain, dull yellow fluorescence, no cut. Some interbedded shale, dark gray to black, and grayish-green, firm to soft, silty to smooth and somewhat waxy, sandy in part.
1960	1990	30	Sandstone, pink to red-orange, some white, fine grained, sub-angular to sub-rounded, well sorted, anhydrite filled, friable, poor to fair P & P, some good P & P, no show. Abundant anhydrite, white, soft to very soft, granular to earthy.
1990	2030	40	Limestone, mottled medium to dark gray, hard, fine to microcrystalline, some medium crystalline, silty to sandy, becoming dolomitic and grading to dolomite, dull yellow fluorescence, no cut. Some scattered shale, medium gray to black, also lavender and green, smooth, fairly soft, somewhat waxy, with some floating sand grains. Some scattered soft, white, earthy to sucrose anhydrite.



<u>From</u>	<u>To</u>	<u>Feet</u>	<u>Description</u>
2030	2060	30	Dolomite, mottled medium to dark gray, some light gray, hard, limey, brittle, very fine to fine crystalline, scattered dull fluorescence, no cut. Some interbedded limestone at base of interval, very fine to microcrystalline, hard, brittle, silty to sandy, dull fluorescence, no cut.
2060	2070	10	Sandstone, pink to purple, fine to very fine grained, sub-angular to sub-rounded, clay filled, dolomitic, hard and brittle to friable, poor to fair P & P, no show, with dolomite, white to pink, some purple, very fine to microcrystalline, hard, light yellow fluorescence, no cut. Scattered coarse yellow chert grains.
2070	2080	10	Siltstone, bright red-orange, hard, sandy, dolomitic, with some bright red-orange silty shale, and abundant very soft, white, earthy anhydrite.
2080	2100	20	Shale, medium to dark gray, some green, firm, smooth to silty, with some anhydrite, soft to firm, sucrose to earthy. Some sandstone, as above.
2100	2160	60	Sandstone, white, fine to medium grained, some very fine grained, sub-rounded, well sorted, anhydritic in part, friable to extremely friable, good to excellent P & P, no show, with some interbedded shale, medium gray to grayish-green, some light green, firm, smooth and waxy to silty.
2160	2210	50	Dolomite, white to gray, pink, purple, very fine to microcrystalline, hard, brittle, scattered dull to light yellow fluorescence, no cut. Some interbedded white, dolomitic anhydrite at top of interval, very fine crystalline, firm to hard. Scattered white chert grains.
2210	2230	20	Sandstone white, fine to medium grained, sub-angular to sub-rounded, well sorted, very friable, anhydritic, fair to good P & P, no show, and dolomite, as above, hard, microcrystalline, fair light yellow fluorescence, no cut. Some soft white earthy anhydrite.
2230	2272	42	Dolomite, white to light gray, some pink and purple, very fine to microcrystalline, hard, limey, light to dull yellow fluorescence, no cut, with interbedded shale, gray to greenish gray, soft, silty to waxy. Some scattered streaks of sandstone, white to pink and light purple, fine grained, dolomitic, anhydritic, firm to somewhat friable, no show. Some very soft white, earthy anhydrite, and scattered yellow chert grains.



Page 13
 #1 Lance-Nelson Estate
 NE SE Sec. 21-7S-1E
 Fall River County, S.D.

<u>From</u>	<u>To</u>	<u>Feet</u>	<u>Description</u>
<u>"Red Marker"</u>			2272 (+1263) log
2272	2280	8	Shale, red, soft, flaky, smooth with silky metallic luster.
2280	2318	38	Dolomite, white to gray, pink, very fine to microcrystalline, hard, trace of medium brown stain, trace faint fluorescence, no cut, with some interbedded sandstone, white to pink and purple, fine to medium grained, sub-angular to sub-rounded, dolomitic, anhydritic, hard to fairly friable, poor P & P, no show. Some sandstone at base of interval, white to pink, fine to medium grained, sub-rounded to sub-angular, well sorted, friable, dolomitic in part, some faint yellow fluorescence, <u>trace very faint cut.</u>
2318	2333	15	Dolomite, dark gray, fine crystalline, hard to somewhat porous, shaly in part, scattered dark brown stain, <u>fairly bright yellow gold fluorescence, good bright yellow gold cut,</u> with some sandstone, white fine grained, sub-rounded, dolomitic in part, hard to friable with fairly abundant loose grains, fairly even light brown stain, pale yellow fluorescence, faint light yellow cut.

Circulated samples @ 2333'

Dolomite, as above, more light brown stain, and sandstone, as above, light stain, pale fluorescence, more abundant loose grains in sample. Entire sample gives fair to bright light yellow cut.

D.S.T. #1, 1st Leo (?) Zone 2315-2333 (See page 5 for data on DST #1)

2333	2384	51	Shale, dark to very dark gray, some grayish-green, firm, waxy, silty in part, with some interbedded dolomite, white to gray, tan, very fine to microcrystalline, hard. Some stringers of sandstone, white fine to very fine grained, hard, dolomitic, poor P & P, no show.
<u>2nd Leo Sandstone</u>			2384 (+1151) log
2384	2390	6	Sandstone, medium gray, very fine grained, sub-angular, hard, dolomitic, poor P & P, no show, becoming softer, somewhat friable, with slight fluorescence, no cut.



Page 1b

#1 Land - Nelson Estate

NE SE Sec. 21-7S-1E

Fall River County, S.D.

<u>From</u>	<u>To</u>	<u>Fect</u>	<u>Description</u>
2390	2400	10	(Circulated 30 minutes for samples) Sandstone, white, fine grained, sub-rounded, well sorted, friable, good P & P, fair light brown stain, even fairly bright light yellow fluorescence, fair to good cut. Sulphur odor in sample.
<u>DST #2, 2nd Log, 2390-2400 (See page 5 for data on DST #2)</u>			
2400	2430	30	Sandstone, white, fine to medium grained, sub-rounded, well sorted, friable to extremely friable, good to excellent P & P, even light brown stain at top of interval becoming spotty, fairly bright to dull yellow fluorescence, good to poor cut.
2430	2460	30	Shale, dark to very dark gray, some greenish gray, firm, waxy to silty, with dolomite, gray to pink, tan, fine to microcrystalline, hard, limey, silty in part. Some interbedded sandstone, white, fine to medium grained, sub-rounded, friable, to very friable, good to excellent P & P, slight trace light brown stain, faint to fair light yellow fluorescence, trace fair to good cut. Scattered traces hard, black, brittle, silty shale.
2460	2500	40	Dolomite, tan to dark gray, fine crystalline, hard, limey, silty to sandy in part, with interbedded medium to dark gray, firm waxy to silty shale and, very hard black, brittle, silty shale. Some traces of interbedded sandstone, white to light gray, fine to very fine grained, sub-angular to sub-rounded, hard, dolomite matrix, poor P & P, very slight trace of fluorescence, no cut.
2500	2515	15	Sandstone, white, fine to very fine grained, sub-rounded to sub-angular, hard and dolomitic in part, becoming friable, with good P & P, some very light brown stain, faint yellow fluorescence, very slight trace of cut, sulphur odor.
2515	2580	65	Dolomite, gray to dark gray, fine to very fine crystalline, hard, silty to sandy, limey and anhydritic in part, with interbedded shale, medium to dark gray, firm to hard, with some scattered shale, black, very hard, brittle, silty. Some scattered sandstone, white to light gray, fine to very fine grained, sub-rounded to sub-angular, hard and dolomitic to friable, no P & P to good P & P, trace fair light yellow fluorescence, no cut.



Page 15

#1 Lance-Nelson Estate
NE SE Sec. 21-7S-1E
Fall River County, S.D.

<u>From</u>	<u>To</u>	<u>Feet</u>	<u>Description</u>
2580	2618	38	Dolomite, dark gray to tan, hard, silty to sandy, and sandstone, white to gray, fine grained, sub-rounded to sub-angular, hard, dolomitic, some friable, poor to fair P & P, some scattered even brown stain, very poor to fair yellow fluorescence, no cut.
<u>3rd Leo (?) sandstone</u>			2618 (+917)
2618	2650	32	Sandstone, white to gray, very fine grained, sub-angular to sub-rounded, dolomitic, friable, poor to fair P & P, dull to fair yellow fluorescence, no cut, with dolomite, tan, gray, white, fine to microcrystalline, hard, limey, sandy, dull to fair yellow fluorescence, no cut.
2650	2680	30	Sandstone, white to light gray, very fine to fine grained, sub-rounded, very calcareous, hard to friable, poor to fair P & P, poor light yellow fluorescence, no cut, with some interbedded limestone, white, hard, microcrystalline, very sandy, and dolomite, tan, gray, hard, microcrystalline, very limey, fair light yellow fluorescence, no cut. Abundant very soft, white, earthy anhydrite near top of interval.
2680	2700	20	Sandstone, white, fine to very fine grained, sub-rounded to sub-angular, calcareous to very calcareous, hard to friable, poor to fairly good P & P, no fluorescence on porous sand, to fairly bright light yellow fluorescence on hard and tight sand, no cut. Some dolomite, dark gray to brown, hard, very fine crystalline, silty in part, somewhat limey. Scattered red, yellow, orange and white chert fragments.
2700	2730	30	Shale, dark maroon to red, soft to firm, silty, some green shale inclusions, interbedded with sandstone, white to light gray, very fine grained, sub-rounded to sub-angular, hard and dolomitic to friable and very calcareous, anhydritic, no P & P to fairly good P & P, very faint fluorescence, no cut. Abundant anhydrite at top of interval, white, soft and earthy to firm and sucrose.
2730	2760	30	Sandstone, white to gray and greenish gray, with maroon speckling, very fine grained, sub-angular to sub-rounded, calcareous to very calcareous, firm to friable, scattered faint fluorescence, no cut, with interbedded dolomite, tan to gray, microcrystalline, hard, fairly bright fluorescence, no cut, and some limestone, white, very fine to microcrystalline, hard.



<u>From</u>	<u>To</u>	<u>Feet</u>	<u>Description</u>
2760	2795	35	Shale, variegated red, green, maroon, lavender, soft to firm, silty, sandy in part and calcareous in part, interbedded with limestone, white to light gray and tan, very fine to microcrystalline, hard, shaly in part. Some scattered yellow and orange chert fragments.
2795	2848	53	Limestone, white, light gray, very light pink, light lavender, very fine to microcrystalline, hard to very hard, with abundant orange, tan, and lavender chert, some interbedded shale, variegated gray to dark gray, green, red and green mottled, firm and waxy to soft and silty. Some soft, white, earthy anhydrite in upper half of interval.
2848	2870	22	Sandstone, white to tan, fine to medium grained, sub-angular, calcareous, very conspicuous bright green glauconite grains, hard to friable, poor P & P, no show, interbedded with variegated shale and tan, hard limestone, as above.
2870	2905	35	Limestone, light tan to light gray, some lavender, and very light green, very fine to microcrystalline, trace of floating sand grains, hard, shaly in part, dolomitic in upper half of interval, some pale yellow fluorescence, no cut. Fairly abundant scattered yellow, orange, red, and some white chert.
2905	2917	12	Anhydrite, white, very soft, earthy and abundant chert, mottled scarlet and light gray.
2917	2965	48	Limestone, light tan to light gray, fine to very fine crystalline, hard, some lithographic, very hard and siliceous, with some interbedded shale, variegated, gray, red, purple, firm smooth, somewhat waxy. Scattered, chert, red, gray, orange, yellow. Bryozoan (?) fragment in sample 2930-40.
2965	2989	24	Shale, variegated red, gray, green, purple, red-orange, soft, silty to sandy, anhydritic in part. Some limestone, as above, light tan to light gray, hard. Trace purple dolomitic limestone with floating sand grains.



Page --

#1 La. Je-Nelson Estate
NE SE Sec. 21-7S-1E
Fall River County, S.D.

<u>From</u>	<u>To</u>	<u>Feet</u>	<u>Description</u>
<u>Pahasapa limestone</u>			2989 (+546) log
2989	3057	68	Limestone, white to light gray, some light tan, becoming pink at base of interval, fine to very fine crystalline, some traces medium to coarse crystalline, firm brittle, some soft and earthy. Some limestone has very fine purple speckling.

Circulated for logs @ 3057

30 min. circulation	Limestone, white to light gray and light pink, fine to very fine crystalline, some medium to coarse crystalline and darker pink, firm to hard, brittle. Trace coarse white calcite rhombs.
1 hour circulation	Limestone, as above, white to light gray and pink, trace tan, fine to very fine crystalline, trace medium to coarse crystalline, fairly hard, brittle. Fairly abundant variegated shale cavings.
1½ hour circulation	Limestone, as above. Sample mostly cavings.
T.D. 3057 Driller (+478) 3057 Log (+478)	Drilling time was kept on an Eastman Star drilling time recorder and the original chart was delivered to the Sun Oil Co., district office in Casper, Wyoming.

ELECTRIC LOG TOPS

<u>Formation</u>	<u>Depth</u>	<u>Datum (K.B.)</u>
Dakota sandstone	366	+3169
Lakota sandstone	562	+2973
Morrison formation	653	+2882
Sundance formation	850	+2685
Gypsum Spring formation	1152	+2383
Spearfish formation	1186	+2349
Minnekahta limestone	1726	+1809
Opeche shale	1764	+1771
Minnelusa formation	1838	+1697
"Red Marker"	2272	+1263
2nd Leo sandstone	2384	+1151
3rd Leo (?) sandstone	2618	+ 917
Pahasapa limestone	2989	+ 546
T.D.	3057	+ 478



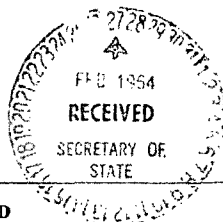
PLUGGING RECORD

Set 25 sack plug across top of Phasapa from 2977-3057.
Set 25 sack plug across 2nd Leo from 2360-2440
Set 25 sack plug across top of Minnelusa from 1800-1880.
Set 25 sack plug across top of Sundance from 820-900.
Set 40 sack plug across top of Dakota from 330-460.
Set 25 sack plug in base of surface pipe from 220-290.
Set 10 sack plug with regulation marker in top of surface pipe.

ADMINISTRATIVE / SUNDRY REPORTS



POWERTECH (USA) INC.



STATE PUB. CO., PIERRE

S. Dak. Oil & Gas Board
FORM 7

PLUGGING RECORD

Operator Sun Oil Company		Address P. O. Box 1798, Denver, Colorado	
Name of Lease Lance-Nelson Estate		Well No. 1	Field & Reservoir Wildcat
Location of Well NE SE Sec. 21-7S-1E		Sec-Twp-Rge or Block & Survey	County Fall River
Application to drill this well was filed in name of Sun Oil Company	Has this well ever produced oil or gas no	Character of well at completion (initial production): Oil (bbls/day) - Gas (MCF/day) - Dry? X	
Date plugged: 2-22-64	Total depth 3057'	Amount well producing when plugged: Oil (bbls/day) - Gas (MCF/day) -	Water (bbls./day) -
Name of each formation containing oil or gas. Indicate which formation open to wellbore at time of plugging	Fluid content of each formation	Depth interval of each formation	Size, kind & depth of plugs used. Indicate zones squeeze cemented, giving amount cement.
None			

CASING RECORD

Size pipe	Put in well (ft.)	Pulled out (ft.)	Left in well (ft.)	Give depth and method of parting casing (shot, ripped, etc.)	Packers and shoes
8-5/8"	269	None	269	-	Surface Casing Remains in hole

Was well filled with mud-laden fluid, according to regulations? **yes** Indicate deepest formation containing fresh water. **Unknown (possibly the Pahasapa Zone ?)**

In addition to other information required on this form, if this well was plugged back for use as a fresh water well, give all pertinent details of plugging operations to base of fresh water sand, perforated interval in fresh water sand, name and address of surface owner, and attach letter from surface owner authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.

USE REVERSE SIDE FOR ADDITIONAL DETAIL

Executed this the 24th day of February, 1964
 State of Colorado
 County of Denver
 Before me, the undersigned authority, on this day personally appeared W. J. Turner known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states, that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.
 Subscribed and sworn to before me this 24th day of February, 1964
 SEAL My Commission expires July 9, 1966
 My commission expires _____
 Notary Public in and for State of Colorado City and County of Denver, Colorado

DO NOT WRITE BELOW THIS LINE
 Approving Sept 2-1964 OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA
 Date Secretary

See Instructions On Reverse Side

*Approved for Release Board
 Summary W. J. Turner
 cc: Sun Oil Co.
 9-3-64*

July 2012

B-437

Appendix B



POWERTECH (USA) INC.

INSTRUCTIONS

File 3 copies of this form with Secretary, Oil and Gas Board, Pierre.

Our GasPer Office will submit copies of all logs run, complete well history along with other pertinent information in the near future.

Log Tops:	
Dakota	366
Lakota	562
Morrison	653
Sundance	850
Gypsum Springs	1152
Spearfish	1186
Minnekahta	1726
Opeche	1764
Minnelusa	1838
Red Marker	2272
Amsden	2848
Pahasapa	2989
	3057' TD

356

S. Dak. Oil & Gas Board
FORM 6

STATE AND LOCAL TAXES

SUNDRY NOTICES AND REPORT ON WELLS		FARM OR LEASE NAME
SUNDRY NOTICES AND REPORT ON WELLS		Lance - Nelson
		WELL NO.
		1
		FIELD AND POOL, OR WILDCAT
		Wildcat
		NO. ACRES IN LEASE
		40
		1/4 SEC. TWP. RGE.
		NE SE Sec. 21-7S-1E
		COUNTY
		Fall River
<input type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> _____ <input checked="" type="checkbox"/> DRY		
OPERATOR		
Sun Oil Company		
ADDRESS		
P.O. Box 1798, Denver, Colorado		
LOCATION (In feet from nearest lines of section or legal subdivision, where possible)		
1980 NSL and 660 WEL NE SE Sec. 21 - 7S - 1E		
ELEVATIONS (D.F., R.K.B., R.T., G.R.D., etc.; how determined)		
3526.0 Grd.		
INDICATE BELOW BY CHECK MARK NATURE OF REPORT, NOTICE OR OTHER DATA		
NOTICE OF INTENTION TO:		
TEST WATER SHUT-OFF	<input type="checkbox"/>	SHOOT OR ACIDIZE
FRACTURE TREAT	<input type="checkbox"/>	REPAIR WELL
MULTIPLE COMPLETE	<input type="checkbox"/>	PULL OR ALTER CASING
ABANDON	<input type="checkbox"/>	
SUBSEQUENT REPORT OF:		
WATER SHUT-OFF	<input checked="" type="checkbox"/>	SHOOTING OR ACIDIZING
FRACTURE TREATMENT	<input type="checkbox"/>	REPAIRING WELL
ALTERING CASING		
(Note: Report results of multiple completion on Well Completion or Recompletion and Log Form—Form 4)		
DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work)		

Subsequent report of cleared location:

This well was P & A 2-22-64 and the pits have been filled and leveled and location has been cleaned up and the well site is now ready for final abandonment, inspection and approval.

I hereby certify that the foregoing as to any work or operation performed is a true and correct report of such work or operation.

SIGNED W. J. Turner TITLE Div. Supt. - Oper. Dept. DATE 7-1-64

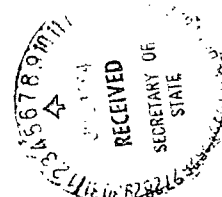
DO NOT WRITE BELOW THIS LINE

Approved July 7, 1964 OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

CONDITIONS, IF ANY: Albert Turner Asst. Secretary

See Instructions On Reverse Side

(cc: Sun Oil Co
7-8-64





POWERTECH (USA) INC.

CORRESPONDENCE



SOUTH DAKOTA
STATE GEOLOGICAL SURVEY

SCIENCE CENTER
University of South Dakota Campus
VERMILLION 57069
Phone 624-4471
Western Field Office
Belle Fourche, South Dakota
August 21, 1964

AUG 24 1964

DUNCAN J. McGREGOR
Director and State Geologist
MERLIN J. TIPTON
Assistant State Geologist

Dr. Duncan McGregor
State Geologist
Vermillion
South Dakota

RE Sun #1 Lance-Nelson
NE $\frac{1}{4}$ SE $\frac{1}{4}$ -21-7S-1E
Fall River County, South Dakota
Permit No. 356

Dear Duncan:

The six months confidential period on information from
the above test has now terminated and all information may be
released.

Sincerely,



Earl Cox
Engineering-Petroleum Geologist

EC:cr

DJ
Send form 6 + 7 to
Dr. McGregor for signing
DJ



POWERTECH (USA) INC.

August 10, 1964

Mr. Earl J. Cox
State Geological Survey
Box 208
Belle Fourche, South Dakota

Dear Earl:

Please find enclosed the Sonic Log and Laterolog for
Sun Lance #1 Nelson, Fall River County, Sec. 21-7S-1E.

Sincerely yours,


(Mrs.) Donna Jean Hedges
Administrative Assistant

For the State Geologist

Enclosures

MAY 18 1964



SOUTH DAKOTA
STATE GEOLOGICAL SURVEY

SCIENCE CENTER
University of South Dakota Campus
VERMILLION 57069
Phone 624-4471

DUNCAN J. MCGREGOR
Director and State Geologist
MERLIN J. TIPTON
Assistant State Geologist

Western Field Office
Belle Fourche, South Dakota
May 15, 1964

Dr. Duncan McGregor
State Geologist
Science Center
Vermillion, South Dakota

Dear Duncan:

Re: Sun #1 Lance-Nelson
NE¼ SE¼ -21-7S-1E
Fall River County, South
Dakota
Permit #356

As shown by the attached Scout report, the above location meets our requirements.

If your office has received the samples, and two copies each of the sample descriptions, two drill stem tests and the logs (laterolog, gamma ray sonic), the bond can be released.

As information on this test is Confidential, both sets of records should be kept at Vermillion until August 22, 1964, when the Confidential period ends.

You may wish to wait until August 22, before recommending the bond released.

Sincerely,



Earl Cox
Engineering-Petroleum Geologist

EC:cr

Enc



March 27, 1964

Mr. Fred McCotter
American Stratigraphic Company
17 North 31st Street
Billings, Montana

Dear Mr. McCotter:

We received the samples in good shape yesterday
from the following wells:

Cities Service #1 Carl Wagner
NW NW 13-5N-29E
Stanley County, South Dakota

Cities Service #1-A Phipps
NW SW 4-2S-23E
Jackson County, South Dakota

Sun Oil Company #1 Lance-Nelson
21-7S-1E
Fall River County, South Dakota

Thank you very much.

Sincerely yours,

Merlin J. Tipton
Assistant State Geologist

MJT:jmd



POWERTECH (USA) INC.

MAR 12 1964



SOUTH DAKOTA
STATE GEOLOGICAL SURVEY

SCIENCE CENTER
University of South Dakota Campus
VERMILION 57069
Phone 624-4471

DUNCAN J. McGRIGOR
Director and State Geologist
MERLIN J. TIPTON
Assistant State Geologist

Belle Fourche, South Dakota
March 11, 1964

Dear Duncan,

I have your March 10 letter ~~XX~~ with the mention that Frank Neighbor wants the logs on the Sun #1 Lance-Nelson kept confidential.

The Rules, page 3/42, state that all records shall be kept ~~XXXX~~ confidential for six months if requested in writing by the owner.

I am ~~XX~~ always careful to check with the geologist, engineer, or operator, to see if information I obtain when scouting is confidential. Even if no letter has been written, if I am verbally asked to keep the information confidential, I treat it as such, and so mark the scout sheets.

The geologist on the Sun #1 Lance-Nelson test told me several times it was not a title hole. Sun themselves gave out the sample tops and DST results to Rineharts. However, now that Sun has changed their mind on this, we are obligated to hold the information until August 21, 1964, unless Sun approves the release before that. Neighbor seems to want only the mechanical logs kept confidential, but to be on the safe side I suppose the whole file should be considered confidential. Under the circumstances, any information we might have released prior to Neighbor's letter cannot be considered a violation.

The method followed in the past seems to have worked satisfactorily and we have not had any hard feelings or misunderstandings about this to my knowledge. I believe we would get adverse reactions from the oil industry if we made it a policy not to release any information for six months on "non Confidential" tests.

Sincerely,

Earl Cox
Earl Cox



POWERTECH (USA) INC.

March 10, 1964

Mr. Earl Cox
State Geological Survey
P. O. Box 208
Belle Fourche, South Dakota

Dear Earl:

I just received your two memos telling us (1) that you are about to make your move, and (2) the fact that you are getting together with Mr. Hanson about pictorial coverage on your big article on petroleum in South Dakota. Both of these are very good, and I feel that this will materially improve not only the physical space of the Geological Survey in our Western Field Office, but certainly will get the meaning and worth of our organization before the public.

I just got a letter from Frank Neighbor relative to the Sun Oil Company Lance Nelson Estate #1, in which he sent me copies of the logs. He wrote a P. S., saying that he wanted these logs kept confidential as they have not released them to date. I note on some of the scout reports that information you submitted on the Sun Wells carried no confidential word at the top. I was wondering if this were an oversight, or if they have actually waited until now before they declared it confidential. I am wondering if we should adopt a policy that all records we get from these oil companies are held confidential for the six-month period from close of operation. On the other hand, I realize this may hold up getting information out, particularly if the company doesn't mind if it is released. This presents a bit of a problem, because since they have not seen fit to mark the information you got for scout confidential, we may have given out some information that we shouldn't have.

You might ponder this and give me your ideas on what to do about it.

Sincerely yours,

Duncan J. McGregor
State Geologist

DJM:jmd



POWERTECH (USA) INC.

March 10, 1964

Mr. Frank Neighbor
District Exploration Manager
411 Petroleum Building
P. O. Box 1732
Casper, Wyoming

Dear Frank:

Reference is made to your letter of March 5, 1964, in which you attached a P. S., requesting that we keep the logs confidential until released by you.

This letter is to inform you that because of your request, we have so placed your logs in confidential file, and they will remain there for six months from the date of completion of the Lance-Nelson Estate #1 well.

Seeing your signature at the bottom of the letter made me feel homesick for Salt Lake City. You may or may not remember me, but back in the early '50's I was working with Darwin Quigley for the Sinclair Oil and Gas Company. At that time you and Lou Wells held the fort down on the third floor in the Newhouse Building.

If and when I am in Casper, and I hope it won't be too long before I am, I will certainly make an effort to look you up and at least say "hi".

Sincerely yours,

Duncan J. McGregor
State Geologist

DJM:jmd



POWERTECH (USA) INC.

SUN OIL COMPANY

ROCKY MOUNTAIN DIVISION
DENVER CLUB BUILDING
P. O. BOX 1788
DENVER 1, COLORADO

MAR 9 - 1964

WM. WALMSLEY
MANAGER

March 5, 1964

REPLY TO:
DISTRICT OFFICE
411 PETROLEUM BUILDING
P. O. BOX 1732
CASPER, WYOMING

Dr. Duncan McGregor
State Geologist
Science Center
Vermillion, South Dakota

Re: Sun Oil Co. Lance Nelson Estate # 1
Section 21, T. 7 S., R. 1 E.
Fall River County, South Dakota

Dear Sir:

Enclosed you will please find the following information on
the subject well:

- 1: Two Copies - Well History by Eldred Johnson
Consulting Geologist
- 2: Two Copies - Final Print - Sonic Gamma Ray Log
By Schlumberger
- 3: Two Copies - Final Print - Laterolog
By Schlumberger

If additional copies are needed please do not hesitate to call
on us. American Stratigraphic Company as per your requirements
has been instructed to furnish you with a cut of the samples.

Very truly yours,

SUN OIL COMPANY

Frank Neighbor
District Exploration Manager

FN/mk
Enc.

P.S. We would appreciate your keeping the logs confidential,
since we have not released these logs to-date.



POWERTECH (USA) INC.

SOUTH DAKOTA

JAN 30 1964

State Water Resources Commission

STATE OFFICE BUILDING
PIERRE, SOUTH DAKOTA

January 29, 1964

**First National Bank of Black Hills
(as Trustee of the Nelson Estate)
Hot Springs, South Dakota**

Gentlemen:

I have been advised that the Sun Oil Company has obtained a Permit to Drill for Oil and Gas on your land in Section 21, T 7 S, R 1 E.

Occasionally, owners of land consider converting abandoned oil wells into water wells. Please advise me whether or not you intend to convert the oil well drill hole on your land into a water well if water is encountered and the drill hole is abandoned as an oil well.

If you are considering making a water well out of the abandoned oil well drill hole, special considerations are necessary to comply with the State's oil and water laws. The abandoned oil hole must be properly plugged and the water well properly constructed. All conversion work will be at your expense. The cost will vary, depending upon the characteristics of the drill hole, but such cost will be in the neighborhood of \$5,000 or more. Usually another driller and drill rig will have to be arranged for. This other drill rig and casing and other materials will have to be on hand to take over immediately after the special oil well plugging is completed, because the drill hole cannot be left open for any appreciable length of time without spoiling it. Approval of plans for construction of the water well will be required, and a bond covering proper construction may be required. Also, a water right may be required. All of these arrangements take considerable time to accomplish.

Please advise me immediately if you plan to convert the oil well drill hole into a water well. We both hope that a producing oil well results from the drill hole on your land; however, if not and you are planning on a water well, we must start making arrangements now.

Sincerely,

J.W. GRIMES
Chief Engineer

JWG/bw

cc State Oil and Gas Board, Secretary of State, State Capitol, Pierre, S.D.
✓ State Geologist, Dr. Duncan McGregor, Vermillion, S.D.



POWERTECH (USA) INC.

SURETY

NO SURETY INFORMATION FOR THIS WELL AS OF 5/18/2011



POWERTECH (USA) INC.

MISCELLANEOUS



POWERTECH (USA) INC.



INVOICE

AMERICAN STRATIGRAPHIC COMPANY

1820 BROADWAY, DENVER • 512 E. YELLOWSTONE, CASPER • 17 NO. 31ST ST., BILLINGS

MAR 21 1964

March 19, 1964

NC 1078

State of South Dakota Geological Survey
Attn: Dr. Duncan McGregor, State Geologist
Science Center
Vermillion, South Dakota

P. O. No.

SOUTH DAKOTA SAMPLES N/C

Cities Service #1 Carl Wagner
NW NW 13-5N-29E
Stanley Co., South Dakota

N

N/C

Cities Service #1-A Phipps
NW SW 4-2S-23E
Jackson Co., South Dakota

Sun Oil Company #1 Lance-Nelson
21-7S-1E
Fall River Co., South Dakota

PLEASE NOTE:

We are shipping these samples via
United Buckingham. Please let us
know when you receive them.

Handwritten signature: Fred McElatter



POWERTECH (USA) INC.

Lance Nelson *Sun*
Edgemont Herald Tribune
February 27, 1964

Sun abandons second oil test

The Sun Oil Company plugged and abandoned their No. 1 Lance-Nelson oil test in Fall River County last Friday, Feb. 22, according to a report released this week by Earl Cox, Belle Fourche, Engineering-Petroleum Geologist of the State Geological Survey. This was the second oil test in the Edgemont area which Sun has made unsuccessfully within the past few months.

Cox said oil and gas shows were found in the Minnelusa sands by Sun in this latest test, but were not present in commercial quantities. The Company has not indicated if additional tests are planned for South Dakota, he said.

Drilling continues at the Carpenter No. 1 Cox test near the Barker Dome Field. A depth of 1530 feet had been reached by February 20, Cox reported. Information on this test is confidential and the only part being released to the public is the drilling depth.



POWERTECH (USA) INC.

Sun

Rapid City Journal
February 25, 1964

RC 25-64
**Fall River Oil
Test Abandoned
By Sun Oil Co.**

BELLE FOURCHE — Sun Oil Company plugged and abandoned its Number One Lance-Nelson oil test in Fall River County Friday, according to Earl Cox, engineering-petroleum geologist for the State Geological Survey in Belle Fourche.

Cox said the test reached a depth of 3,057 feet.

Oil and gas shows were found in the Minnelusa sands but were not present in commercial quantities.



Cox said Sun Oil Co. has not indicated if additional tests are planned in South Dakota.

Drilling continues at the Carpenter Number One Cox

test near the Barker Dome field in Fall River County.

A depth of 1,530 feet had been reached Feb. 20, but Cox said information on the test is confidential and the only information being released concerns drilling depth.



POWERTECH (USA) INC.

Sun

Edgemont Herald Tribune
February 13, 1964

Sun Oil gets permit for second test well

Earl Cox, Engineering-Petroleum Geologist of the State Geological Survey, Belle Fourche last week announced that the State Oil and Gas Board granted a permit January 27 to the Sun Oil Company to drill their No. 1 Lance-Nelson Oil and gas test in Fall River County. The location is twelve miles northwest of Edgemont and will reach an estimated depth of 3200 feet. The test is seven miles east of the West Mule Creek Oil Field in Wyoming and eight miles southwest of the Barker Dome Oil Field in Custer County, South Dakota.

This test will be the second recent wildcat to be drilled by Sun Oil Company in Fall River County. Sun plugged and abandoned their No. 1 Government test a month ago after reaching a dept of 3250 feet. The No. 1 Government test was located six miles west of Edgemont.



POWERTECH (USA) INC.

Shen

Rapid City Journal
January 31, 1964

Wildcat Well In Fall River Set

Sun Oil Co. was granted a permit Monday to drill an oil and gas test well in Fall River County 12 miles northwest of Edgemont, according to Earl Cox, geologist with the State Geological Survey.

The State Oil and Gas Board issued the permit for the well, the No. 1 Lance Nelson, with drilling estimated to reach a depth of 3,200 feet.

The test is seven miles east of the West Mule Creek Oil Field in Wyoming and eight miles southwest of the Barker Dome Oil Field in Custer County.

The test will be the second recent wildcat to be drilled by Sun Oil Co. in Fall River County. The company plugged and abandoned their No. 1 government test a month ago after reaching a depth of 3,250 feet. This test was located six miles west of Edgemont.



POWERTECH (USA) INC.

Shen
Rapid City Journal
December 24, 1963

Sun Oil Starts Wildcat Well Near Edgemont

EDGEMONT — Sun Oil Company has set surface casing and was drilling below the 913-foot level last week at its No. 1 NCRA-Government oil well 5½ miles west of Edgemont.

The projected 3,200-foot Minnelusa wildcat is 14 miles southwest of the Barker Dome field in Fall River County, according to C. W. Sanders, owner of C. W. Sanders and Associates of Rapid City, a petroleum exploration and consulting firm.

Sanders said the information came from Rineharts Oil Report, a daily publication issued from Denver.

The wildcat was started Dec. 13 and surface casing was set at 199 feet.

In Stanley County, Cities Service Oil Co., was making hole below 2,230 feet at its No. 1 Carl Wagner well. The projected 2,500-foot wildcat is 12 miles northwest of Pierre.



Oil and Gas Search for: api_no_ like '40 047 05095'		
Page 1 of 1	<u>Download Database</u> (Excel spreadsheet format)	Page: 1

Record 1 of 1

Well Information

API No:	40 047 05095	County:	FALL RIVER
Well Name:	DOLEZAL 1 DARROW	Location:	SESE 2-7S-1E
Permit No:	361	Total Depth:	2447
Operator Name:	GEORGE DOLEZAL JR	Bottom Hole:	Minnelusa
Permit Date:	07-03-1964	KB Elevation:	3797
Spud Date:	07-24-1964	Ground Elevation:	3792
Plug Date:	08-19-1964	Latitude:	43.466062
		Longitude:	-103.958032
Well Field	WILDCAT	Status	P&A
Class:	DRY HOLE	Type:	DRY HOLE

Formation Tops

<u>Formation</u>	<u>Depth (ft.)</u>
Dakota Mud	120
Lakota	300
Morrison	425
Sundance	640
Spearfish	918
Goose Egg	1240
Minnekahta	1479
Opeche	1520
Minnelusa	1616
Red Marker	2032



POWERTECH (USA) INC.

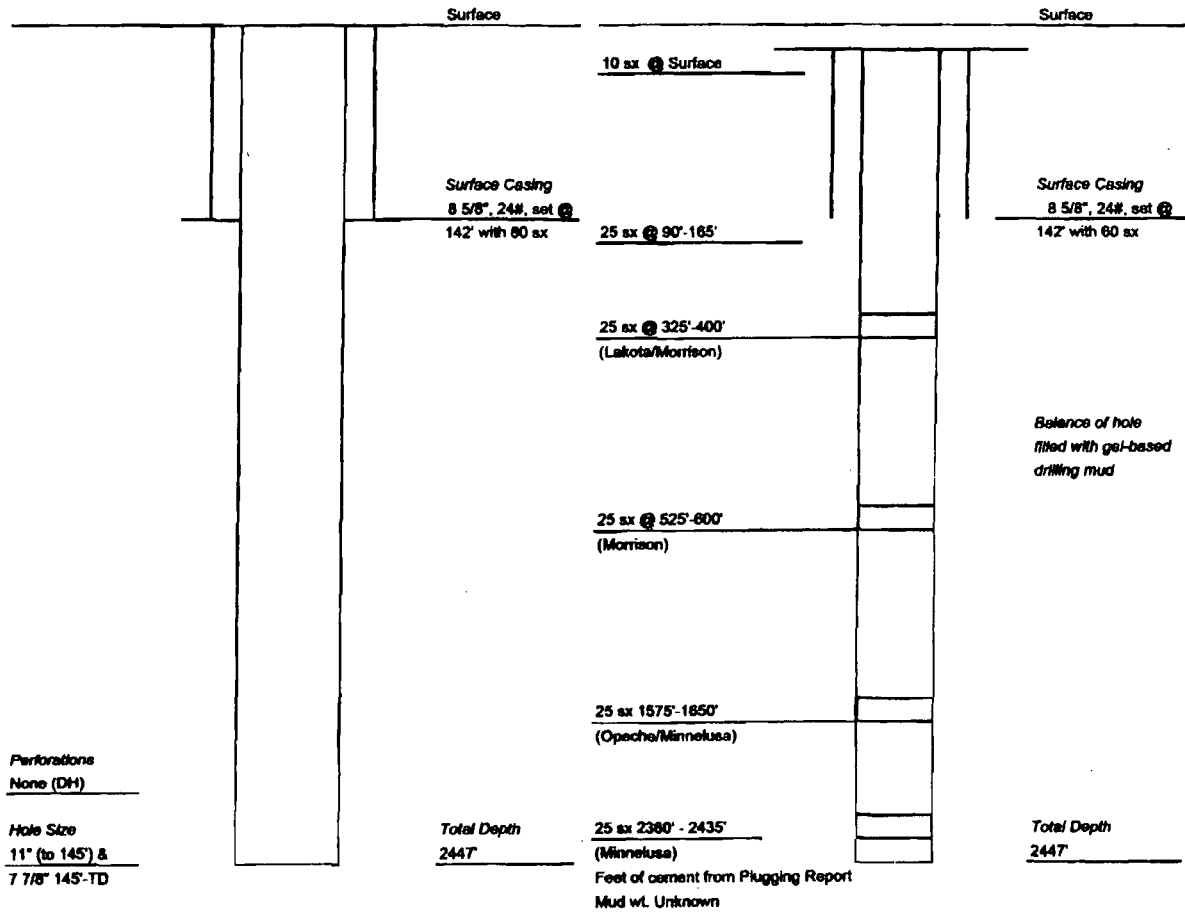
API ID 40 047 05095

2 of 63

ORIGINAL WELL CONSTRUCTION DURING OPERATION

PLUGGING AND ABANDONMENT CONSTRUCTION

API No. 4004705095
2-7S-1E





POWERTECH (USA) INC.

API ID 40 047 06096

3 of 63

STATE OF S. DAKOTA

S. Dak. Oil & Gas Board
FORM 7

PLUGGING RECORD

Operator <u>George Colossal, Jr.</u>		Address <u>1121 Tower Building, Denver, Colorado</u>	
Name of Lessee <u>George Colossal, Jr.</u>	Well No. <u>1</u>	Field & Reservoir <u>Wildcat</u>	
Location of Well <u>Section 2, T. 2 N., R. 10 E., S. 10 E.</u>	Sec-Twp-Rng or Block & Survey	County <u>Weld</u>	
Application to drill this well was filed in name of <u>George Colossal, Jr.</u>	Has this well ever produced oil or gas <u>NO</u>	Character of well at completion (initial production): Oil (bbls./day) _____ Gas (MCF/day) _____ Dry? <u>✓</u>	
Date plugged: <u>August 10, 1965</u>	Total depth <u>2,447'</u>	Amount well producing when plugged: Oil (bbls./day) _____ Gas (MCF/day) _____ Water (bbls./day) _____	
Name of each formation containing oil or gas. Indicate which formation open to well-bore at time of plugging	Fluid content of each formation	Depth interval of each formation	Size, kind & depth of plugs used. Indicate zones squeezed, cemented, giving amount cement.

CASING RECORD

Size pipe	Put in well (ft.)	Pulled out (ft.)	Left in well (ft.)	Give depth and method of setting casing (shot, rigged etc.)	Packers and shoes
<u>2-1/2"</u>	<u>142'</u>	<u>None</u>	<u>142'</u>		

Was well filled with mud-laden fluid, according to regulations? Yes

Indicate deepest formation containing fresh water.

In addition to other information required on this form, if this well was plugged back for use as a fresh water well, give all pertinent details of plugging operations to base of fresh water zone, perforated interval to fresh water sand, name and address of surface owner, and attach letter from surface owner authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.

USE REVERSE SIDE FOR ADDITIONAL DETAIL

Executed this the 27th day of August, 1965

State of _____ County of _____

Before me, the undersigned authority, on this day personally appeared George Colossal, Jr. known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on each state, that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.

Subscribed and sworn to before me this 26th day of August, 1965

SEAL _____

My commission expires _____

Notary Public in and for State of Colorado

County, State of Colorado

Approved March 12, 1965 Date

DO NOT WRITE BELOW THIS LINE

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

Alma Larson Secretary

See Instructions On Reverse Side

Approved for release of bond
Date March 9, 1965
Donna M. Ruge
State Engineer



INSTRUCTIONS

API ID 40 047 05095

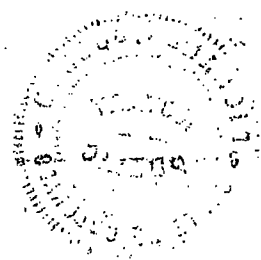
File 3 copies of this form with Secretary, Oil and Gas Board, Pierre.

4 of 63

Cement plugs set as follows:

25 sacks	-	2435' to 2360'
25 sacks	-	1650' to 1575'
25 sacks	-	500' to 325'
25 sacks	-	400' to 325'
25 sacks	-	165' to 90'

Dry hole marker and 10 sacks at surface.
Balance of hole filled with gel-base drilling mud.



SUMMARY OF WELL DATA

Operator: George Dolezal Jr., Sun Oil Co., etal.
Lease: No. 1 Earl Darrow
Location: C SE SE Section 2, T. 7S. R. 1E.
660' FSL 660' FEL
Fall River County, South Dakota.
Elevation: Ground 3792'
K. B. 3797'
Contractor: Baker Drilling Company
Rig No. 3 - Sullivan draw works
Tool Pusher: Jim Baker
Drillers: Don Garhart
Ed Buchannan
Spud Date: July 24, 1964
Completion Date: August 19, 1964
Casing: 140' 8-5/8" used 24# @ 142' ground
with 60 sacks of regular cement.
Hole Size: 11" cable tool hole to 145'
7-7/8" from 145' to total depth.
Mud: Mo-Mar Mud Company
Casper, Wyoming
J. M. Bunces Engineer
Gel base
Logging: Drilling time: From surface casing
to total depth (Geolograph)
Schlumberger: Dual Induction-Laterlog
147' to 2442'
Schlumberger: Sonic Log-Gamma Ray
147' to 2441'
Samples: 10-foot samples 140 - 2100 feet
5-foot samples 2100 - 2250 feet
10-foot samples 2250 - 2450 feet
Samples on file at AmStrat in Denver.
Geology: Well site geology by S. D. Ayres
Lost Circulation: Lost minor amounts of mud from 1630'
to total depth.

SUMMARY OF WELL DATA (continued)

Total Depth: 2450' - Driller
2446' - Schlumberger

Status: Plugged and Abandoned

Plugs: 2435' to 2360' - 25 sacks
1650' to 1575' - 25 sacks
600' to 525' - 25 sacks
400' to 325' - 25 sacks
165' to 90' - 25 sacks
Dry-hole marker and 10 sacks at surface.

Drill Stem Tests: Schlumberger Formation Tester
1688' to 1690.5' Converse sand.
Tool open 30 minutes
Tool shut in 23 minutes
Recovered 600 cc mud
Pressures 0

Cores: Core #1-2155' to 2206'.
First Leo zone (see sample desc.)

ELECTRIC LOG FORMATION TOPS

<u>Formation</u>	<u>Depth</u>	<u>Datum</u>
Fuson	300	+3497
Lakota	350	+3447
Morrison	425	+3372
Sundance	640	+3157
Spearfish	918	+2879
Goose Egg	1240	+2557
Minnekahta	1479	+2318
Opeche	1520	+2277
Minnelusa	1616	+2181
Red Shale Marker	2032	+1765

GEOLOGICAL SUMMARY

The subject well was drilled to a total depth of 2450 feet within a sand that would possibly correlate with the Third Leo sandstone of the Pennsylvanian stratigraphic section in the Lance Creek field.

The Dakota sandstone between the base of the surface casing and 300 feet gave no indications of oil staining

COUNTY: FALL RIVER
LEGAL LOCATION: SESE 2-7S-1E
API NO: 40 047 05095
PERMIT NO: 361
WELL NAME: DOLEZAL #1 DARROW
OPERATOR: GEORGE DOLEZAL, JR.
PERMIT ISSUED: 07/03/1964
PERMIT CLOSED: 03/12/1965
FILE LOCATION: 7S-1E-2 SESE

TARGET CODES:

WELL HISTORY / CHECKLIST

PERMIT TO DRILL / INTENT TO DRILL

WELL INSPECTION / SCOUT REPORTS

OPERATOR'S TECHNICAL REPORTS / MAPS

ADMINISTRATIVE / SUNDRY REPORTS

CORRESPONDENCE

SURETY

MISCELLANEOUS



WELL HISTORY / CHECKLIST



WELL HISTORY

Well Name Dolezal #1 Darrow Permit No. 361
Location SESE 2-7S-1E - Fall River Date of Permit 7-3-64
Elev. 3792 Gr. API No. _____
Confidential X From 8-20-64 To 2-18-65
Logs Received _____
Cuttings Received _____ Cores Received _____
Drill Stem Records _____

Cap Plug and Marker Set 10-2-64
Surface Restored 10-21-64
Plugging Affidavit Signed _____ Date _____
Bond Released _____ Date 3-12-65

Summary of Scout Reports

7-8-64 First visit - rig was not at location
8-3-64 Snudded 7-24-64
9-19-64 plugged
10-2-64 Marker has been placed - mud pits not filled.
10-21-64 Mud pits filled & surface smoothed.

Wireline test 1688 - 1690.5, Op 30, SI 23, Rec. 600 cc Mud, Press zero.



PERMIT TO DRILL / INTENT TO DRILL



POWERTECH (USA) INC.
API ID 40 047 05095

11 of 83

State Pub. Co., Pierre

APPLICATION FOR PERMIT TO:

S. DAK. OIL & GAS BOARD
FORM 2

<input checked="" type="checkbox"/> DRILL	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> PLUG BACK	FARM OR LEASE NAME
<input checked="" type="checkbox"/> OIL WELL	<input type="checkbox"/> GAS WELL	<input type="checkbox"/> SINGLE ZONE	Carl Larrow
<input type="checkbox"/> MULTIPLE ZONE			WELL NO.
OPERATOR			No. 1
George Dolzal, Jr.			FIELD AND POOL OR WILDCAT
ADDRESS			Wildcat
1111 Power building, Denver 2, Colorado			NO. ACRES IN LEASE
LOCATION (In feet from nearest lines of section or legal subdivision, where possible):			400
937.5 feet North - 450 feet from the southeast corner			4 1/2 SEC. TWP. 100E
of Section 2, Township 7 South, Range 1 East			Sec. 2 Twp. 100E
			COUNTY
			Fall River
NAME AND ADDRESS OF SURFACE OWNER		ELEVATION	NO. OF WELLS ETC.
Carl Larrow, Dewey, South Dakota		2792	2
NAME AND ADDRESS OF CONTRACTOR		PROPOSED DEPTH	ROTARY OR CABLE TOOLS
Baker Drilling Company, Casper, Wyoming		2450 ft.	Rotary
			APPROXIMATE DATE WORK WILL START
			July 10, 1964

IF LEASE PURCHASED WITH ANY WELLS DRILLED, FROM WHOM PURCHASED (Name and address)

PROPOSED CASING AND CEMENTING PROGRAM					
SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	NEW OR SECOND HAND	DEPTH	SACKS OF CEMENT
12 1/2 inch	3-5/8 inch	24 lbs.	new	150 feet	100

DESCRIBE PROPOSED OPERATIONS. IF PROPOSAL IS TO DEEPEN OR PLUG BACK, GIVE DATA ON PRESENT PRODUCTIVE ZONE AND PROPOSED NEW PRODUCTIVE ZONE. GIVE BLOW OUT PREVENTER PROGRAM IF ANY

Principal objective is the Leo Sands of the Minnelusa formation. Proposed to drill to 2450 feet, or to a point 400 feet below the top of the Leo marker and test any zones having significant shows of oil or gas

SIGNED <i>George Dolzal</i>	TITLE Operator	DATE July 1, 1964
DO NOT WRITE BELOW THIS LINE		
PERMIT NO. 301	CHECKED BY <i>Edward Linn</i>	7/3/64
APPROVAL DATE July 3, 1964	Secretary	
CONDITIONS:		
1) COMPLETE SET OF SAMPLES AND CORES IF TAKEN, MUST BE SUBMITTED.		
2) SAMPLES AND CORES IF TAKEN, BELOW DEPTH, MUST BE SUBMITTED.		

*See Instructions On Reverse Side

882 100



TRI-STATE COMPANY

N. W. Corner

S. W. Corner

S. E. Corner

I, Joseph Dodd, of Missouri, do hereby certify that in accordance with a request from State of Missouri, of Denver, Colo., for the

I made a survey (date) July 1911 for the location and elevation of the center of the of Section 2, T7N, R1E, Missouri

As shown on above map, the center of the Section 2, Township 7N, Range 1E, Missouri State



WELL INSPECTION / SCOUT REPORTS



SCOUT REPORT

Well Name: Dolezal #1 Darrow Permit Date: 7-3-64
Location: 7S-1E-2 SESE, Fall River Permit #: 361
Directions: 933.5 FNL and 450 west of SE corner API: 40 047 05095
Spud Date: 7-24-64 Plug Date: 8-19-64
Elevation: 3792 Total Depth: 2446

DATE					
Dry Hole Mark					
Marker Correct					
Marker Sturdy					
Marker Capped					
Fences Up					
Pits Back Fill					
Site Leveled					
Site Smoothed					
Site Seeded					
Site Clean					
Roads Reclaim					
Approved by					
Not Approved					

Remarks:

7- 8-64: Mud pits has not been dug. Rig was not at location
8- 3-64: Casing 8 5/8 142 feet. By phone from Dolezal - drilling at 977 in Spearfish.
Spudded July 24, 1964, set 142' 8 5/8 surface casing with 60 sacks, drilled 0-977'. Geologist Sam Ayres.
8- 6-64: Drilling at 1700 in Minnelusa, drilled from 977-1700. Sample tops:
Lakota 320, Morrison 407, Sundance 600, Spearfish 932,
Minnekahta 1472, Opeche 1508
8-13-64: Coring at 2163, drilled from 17-0-02155, Cored from 2155-2163
8-18-64: Drilling at 2429 and preparing to log, drilled from 2162-2429
8-19-64: Plugged 2435-2360 25 sacks Leo Sand
1650-1575 25 sacks Top Minnelusa
600- 525 25 sacks top Sundance
400- 325 25 sacks top Lakota
165- 90 25 sacks base surface casing
10 sacks surface plug



cored 2155-2206 no shows, DST #1 1688-90 12(?) recovered only a little drilling mud-formation tight, drilled 2206-2446, run induction-laterolog and gamma ray sonic. Tentative log tops:

Fuson-300, Lakota-350, Morrison-460, Sundance-640, Basal Sundance sand-866, Triassic-918, Minnekahta-1479, Opeche-1520, Minnelusa-1578, Red Marker-2032, 3rd Leo-2400

9-21-64: Abandonment marker had been placed, mud pits filled and surface smoothed satisfactorily.

signed by Earl Cox

STATE GEOLOGICAL SURVEY

Scout Report

Date scouted . September 21, 1964

Owner Dolezal

Designation of well . . . #1 Darrow

Location: Sec. 2 T. 7 N. S. R. 1 E. N.

. Fall River County, S. Dak. Total Depth . 2446 feet

Casing Record:

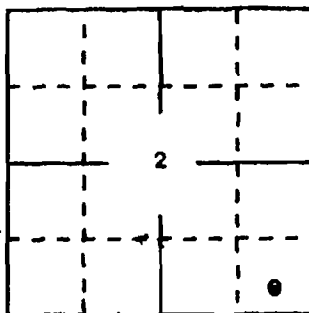
8 5/8 142 Ft. Ft.

 Ft. Ft.

work in progress at time of visit:

None

Developments since last visit:



Mud pits had been filled and surface smoothed satisfactorily

Remarks and recommendations:

Scouted by Earl Cox, Geologist

Approved by Duncan J. McGregor
Duncan J. McGregor, State Geologist

STATE GEOLOGICAL SURVEY

Scout Report

Date scouted . Sept. 2, 1964 . . .

Owner Dolezal

Designation of well . #1 Darrow

Location: Sec. 2 T. 7 N. S. R. 1 E. W.

. . Fall River County, S. Dak.

Total Depth . 2446 . . feet

Casing Record:

8 5/8 142 Ft. Ft.

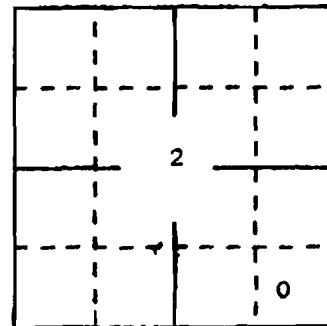
 Ft. Ft.

work in progress at time of visit:

None

Developments since last visit:

Abandonment marker had been placed.



Remarks and recommendations:

Mud pits not filled.

Scouted by Earl Cox, Geologist

Approved by *Duncan J. McGregor*
Duncan J. McGregor, State Geologist



POWERTECH (USA) INC.

API ID 40 047 05095

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Permit No. 361

STATE GEOLOGICAL SURVEY

Scout Report

Date scouted August 19, 1964

Owner. Dolezal

Designation of well. . #1 Darrow

Location: Sec. 2 T. 7 N. S. R. 1 E. W.

. . . . Fall River. . . . County, S. D. Total Depth . . 2446. . . . feet

Casing Record:

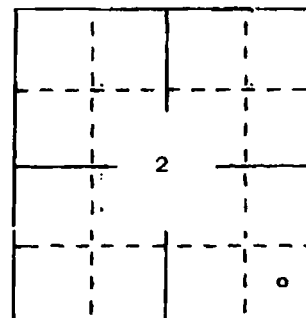
8 5/8 142 Ft. Ft.

Ft. Ft.

Plugged as follows:

Work in progress at time of visit:

2435-2360	25 sacks	Leo Sand
1650-1575	25 sacks	Top Minnelusa
600-525	25 sacks	Top Sundance
400-325	25 sacks	Top Lakota
165-90	25 sacks	Base surface casing
	10 sacks	Surface plug



Developments since last visit:

Cored 2155-2206 No shows
 Dst#1 1688-90 $\frac{1}{2}$ (?) Recovered only a little drilling mud - formation tight
 Drilled 2206-2446
 Run induction-Laterolog and gamma ray sonic

Remarks and recommendations:

Tentative log tops:

Fuson - 300	Minnekahta - 1479
Lakota - 350	Opeche - 1520
Morrison - 460	Minnelusa - 1578
Sundance - 640	Red Marker - 2032
Basal Sundance Sand - 866	3rd Leo - 2400
Triassic - 918	

Scouted by. Earl Cox, Geologist

Approved by Duncan J. McGregor State Geologist



STATE GEOLOGICAL SURVEY

Scout Report

Date scouted . August 18, 1964

Owner Dolezal

Designation of well . . #1 Darrow

Location: Sec. 2 T. 7 M. S. R. 1 E. W.

. . . Fall River County, S. Dak. Total Depth . . 2429 . . feet

Casing Record:

8 5/8 142 Ft. Ft.

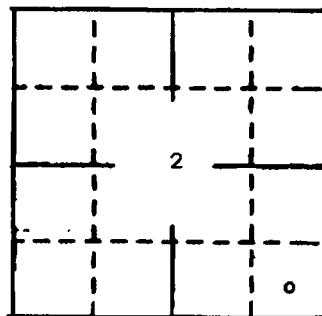
 Ft. Ft.

Work in progress at time of visit:

Drilling at 2429 and preparing to log

Developments since last visit:

Drilled from 2163-2429 (details later)



Remarks and recommendations:

Scouted by Earl Cox, Geologist

Approved by *Duncan J. McGregor*
Duncan J. McGregor, State Geologist



STATE GEOLOGICAL SURVEY

Scout Report

Date scouted August 13, 1964

Owner Dolezal

Designation of well . . #1 Darrow

Location: Sec. 2 T. 7 N. S. R. 1 E. N.

. . . Fall River County, S. Dak. Total Depth 2163 . . feet

Casing Record:

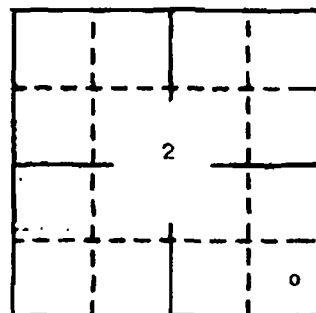
8 5/8 142 Ft. Ft.
 Ft. Ft.

Work in progress at time of visit:

Coring at 2163

Developments since last visit:

Drilled from 1700-2155
Cored from 2155-2163



Remarks and recommendations:

Scouted by Earl Cox, Geologist
Approved by *Duncan J. McGregor*
Duncan J. McGregor, State Geologist



POWERTECH (USA) INC.

API ID 40 047 05085

21 of 83

Permit No. 361

STATE GEOLOGICAL SURVEY

Scout Report

Date scouted August 6, 1964.

Owner Dolezal

Designation of well . . #1 Darrow

Location: Sec. 2 T. 7 N. S. R. 1 E. W.

. Fall River. County, S. Dak. Total Depth 1700 .feet

Casing Records:

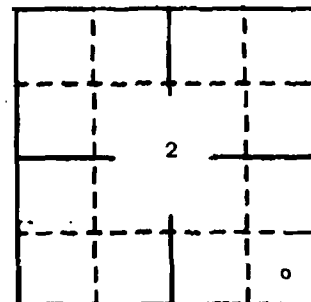
8 5/8 142 Ft. Ft.
 Ft. Ft.

Work in progress at time of visit:

Drilling at 1700 in Minnelusa

Developments since last visit:

Drilled from 977-1700



Remarks and recommendations:

Sample tops: Lakota 320
Morrison 407
Sundance 600
Spearfish 932

Minnekahta 1472
Opeche 1508

Scouted by Earl Cox, Geologist

Approved by *Duncan J. McGregor*
Duncan J. McGregor, State Geologist

STATE GEOLOGICAL SURVEY

Scout Report

Date scouted August 3, 1964.

Owner Dolezal

Designation of well . . #1 Darrow

Location: Sec. 2 T. 7 N. S. R. 1 E. W.

. . Fall River County, S. Dak. Total Depth . 977 . . . feet

Casing Record:

8 5/8 142 Ft. Ft.
 Ft. Ft.

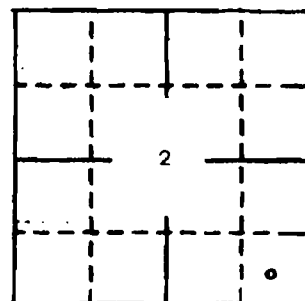
Work in progress at time of visit:

By phone from Dolezal

Drilling at 977 in Spearfish

Developments since last visit:

Spudded July 24, 1964
Set 142' 8 5/8" surface casing with 60 sacks.
Drilled 0-977'



Remarks and recommendations:

Geologist: Sam Ayres, Rainbow Motel, Edgemont, South Dakota

Scouted by Earl Cox, Geologist

Approved by Duncan J. McGregor State Geologist



POWERTech (USA) INC.

API ID 40 047 05095
First Report

23 of 63

Permit No. 361

STATE GEOLOGICAL SURVEY

Scout Report

Date scouted . July 8, 1964 .

Owner . . . Dolezal

Designation of well . #1 Darrow

Location: Sec. 2 T. 7 N. S. R. 1 E. W.

. County, S. Dak. Total Depth . . . 0 . feet

Casing Record:

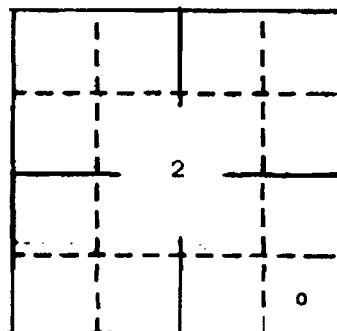
_____ Ft. _____ Ft.

_____ Ft. _____ Ft.

Work in progress at time of visit:

Mud pits had not been dug
Rig was not at location

Developments since last visit:



Remarks and recommendations:

Scouted by . . . Earl Cox, Geologist

Approved by *Duncan J. McGregor*
Duncan J. McGregor, State Geologist



POWERTECH (USA) INC.

API ID 40 047 00055

7:20 PM, 18, 4 -
T.D. 2446

25.4 3435 - 2360 base.

25.4 1575 - 1650 T.ML

25.4 585 - 600 T. Sun.

25.4 325 - 400 Lab.

~~25.4 165 - up surface.~~

25 165 - up surface.

Tarp

135 at.

Loggs. Evaluation - Saturday

7 3/8 hole

Coned 2155 - 2206 -
no shows.

Room 11 - Sonloges

Chuck Reiling - Superior

Hyatt Ave. 662-7312

Dst #1
1688 - 902

~~20.4 165 - up surface.~~
No recovery at all
way til.

Aug 19, 1964
Dst #1 Run
to test plugged.

Confidential
Log logs - tentative.

24 of 83

300 Fusion
350 Lab
460 Max.
640 Sun
870 Base of Sandstone 50.
718 Fusion
1479 mk
1580 OP
1578 ML
2032 Red marker
2400 3rd Leo
2nd Leo

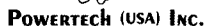
T.D. 2446

~~20.4 165 - up surface.~~
to 20.4 165
Sept 2, 1964

Marker in O.K.
pits not filled.

Sept. 2, 1964
Letter from Dolezal. Wants
to continue keeping samples
& Schlumberger Log Confidential.

Sept. 21, 1964
pits filled & surface
levelled satisfactorily



API ID 40 047 05085

25 of 63

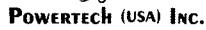
Plan to Start July 10

Caring at 2155-63
no 103+ or other Cars
Taken.
was smiling as she tho
thought that Caring was
fun. Caring at 30 min
off.

Aug 3, 1964
Phone call from Bolezal
Spurred July 24
Set 85° - 14.2° G.L. 6024
morning } Aug 3 at 977 in Spanish
Real: 105 am Ayres - Rainbow

② 2429 and will
be about 10 more
feet or less.
Gomna Bay Basin
w/ Caliche & dual
induction laterolog.

~~Exalted
King plain
20 lbs of - 25
egg milk 25
egg Skunk 25
Lake 25
box sugar 25
100 sugar + Milk
Should pay by Sunday
- the pay.~~



July 8, 1904
 Found quite hot day. sig not out
 incision

Bullby - 1750 - 5.6.18
- tape

Coming at 2163
 Leaving at 2429



Hull skipped

Course 2155 - 2200 (in line)

DST # 1 1688 - 90% empty, 3.11

Pan inclination - feathering 2 R

TID 244

Temp:

gun 300

gun 918

Laird - 350

Thermohisto 1479

Thermohisto - 400

spec. 1520

Laird - 640

Thermohisto 1178

Laird - 860

Thermohisto - 2032

3.5 hrs - 2400

7-2-64

Abandonment marks placed; mud
pits not filled.

9-21-64

Mud pits filled + surface
restored.



API ID 40 047 05095

28 of 63

WELL:- *Do-Orgal H 12-1-65*

LOCATION:-

LOGS RECD:-

TOPS:-

GEOLOGIC:- *copy with completion logs*

ELECTRIC, FIELD:-

FINAL:- *2 End L-L*

RADIO, FIELD:-

FINAL:- *2 same OK*

OTHERS:- *2 Mm test*

CUTTINGS RECD:- *2-9-65*

CORES RECD:- *2-9-65*

DRILL STEM DATA RECD:-

CAP PLUG CHECKED:- *OK*
Mud pits filled

PLUGGING AFFIDAVIT SIGNED:- *3-10-65*

*1 copy of 505 from 4-1-65 to 4-1-65
1 copy of 406 + 3 copies from 4-1-65 to 3-1-66*

OPERATOR'S TECHNICAL REPORTS / MAPS



POWERTECH (USA) INC.

API ID 40 047 05095

30 of 63

George Dolezal Jr., Sun Oil Co., et al

No. 1 Earl Darrow

Fall River County

South Dakota

Contents

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Drilling Time	11
Coring Time	12

SUMMARY OF WELL DATA

Operator: George Dolezal Jr., Sun Oil Co., etal.

Lease: No. 1 Earl Darrow

Location: C SE SE Section 2, T. 7S. R. 1E.
660' FSL 660' FEL
Fall River County, South Dakota.

Elevation: Ground 3792'
I. B. 3797'

Contractor: Baker Drilling Company
Rig No. 3 - Sullivan draw works
Tool Pusher: Jim Baker
Drillers: Don Garhart
Ed Buchanan

Spud Date: July 24, 1964

Completion Date: August 19, 1964

Casing: 140' 8-5/8" used 24# @ 142' ground
with 60 sacks of regular cement.

Hole Size: 11" cable tool hole to 145'
7-7/8" from 145' to total depth.

Mud: Mo-Mar Mud Company
Casper, Wyoming
J. M. Bunce Engineer
Gel base

Logging: Drilling time: From surface casing
to total depth (Geolograph)

Schlumberger: Dual Induction-Laterlog
147' to 2442'

Schlumberger: Sonic Log-Gamma Ray
147' to 2441'

Samples: 10-foot samples 140 - 2100 feet
5-foot samples 2100 - 2250 feet
10-foot samples 2250 - 2450 feet

Samples on file at AmStrat in Denver.

Geology: Well site geology by S. D. Ayres

Lost Circulation: Lost minor amounts of mud from 1630'
to total depth.

**SUMMARY OF WELL DATA (continued)**

Total Depth: 2450' - Driller
2446' - Schlumberger

Status: Plugged and Abandoned

Plugs: 2435' to 2360' - 25 sacks
1650' to 1575' - 25 sacks
600' to 525' - 25 sacks
400' to 325' - 25 sacks
165' to 90' - 25 sacks
Dry-hole marker and 10 sacks at surface.

Drill Stem Tests: Schlumberger Formation Tester
1688' to 1690.5' Converse sand.
Tool open 30 minutes
Tool shut in 23 minutes
Recovered 600 cc mud
Pressures 0

Cores: Core #1-2155' to 2206'.
First Leo zone (see sample desc.)

ELECTRIC LOG FORMATION TOPS

<u>Formation</u>	<u>Depth</u>	<u>Datum</u>
Fuson	300	+3497
Lakota	350	+3447
Morrison	425	+3372
Sundance	640	+3157
Spearfish	918	+2879
Goose Egg	1240	+2557
Minnekahta	1479	+2318
Opeche	1520	+2277
Minnelusa	1616	+2181
Red Shale Marker	2032	+1765

GEOLOGICAL SUMMARY

The subject well was drilled to a total depth of 2450 feet within a sand that would possibly correlate with the Third Leo sandstone of the Pennsylvanian stratigraphic section in the Lance Creek field.

The Dakota sandstone between the base of the surface casing and 300 feet gave no indications of oil staining



GEOLOGICAL SUMMARY (continued)

or fluorescence.

No indications of oil and/or gas were noted in the Lakota horizon.

The Canyon Spring sandstone of the Sundance was missing.

A circulated sample of the First Converse sandstone at 1638 feet showed no oil staining. A circulated sample of a Converse sand at an electric log depth of 1690' showed no indication of oil or gas staining.

Minor amounts of lost circulation occurred from 1650' to total depth but this did not noticeably effect the drilling or the samples.

The First Leo sandstone was cored, no effective or reservoir sands were found and no staining was noted.

No effective sands or staining was found in the Second Leo zone.

The Third Leo zone did contain some possible reservoir sands but no staining or fluorescence was noted .

Because of electric log interpretation a Schlumberger formation test was made on the Converse sand from 1688 feet to 1690.5 feet.

No shows of oil and/or gas and the lack of reservoir beds in the Leo zones led to the decision to abandon this well without further testing.


E. D. Ayres

6

3.

SAMPLE DESCRIPTION

Surface - Skull Creek
10-foot samples between 140 and 2100 feet.
Samples have been corrected for lag.

- 140 - 180 Sand, fine grained, sub-rounded, vitreous, friable, white, well sorted, good permeability and porosity. Some gray friable siltstone. No show.
- 180 - 200 Siltstone, medium gray, friable.
- 200 - 230 Shale, light to pale gray, silky, waxy, bentonitic.
- 230 - 250 Sand, fine to coarse grained, conglomeritic, poorly sorted in part, with white to pale green matrix, rounded to angular. No shows.
- 250 - 260 Shale, medium to dark gray.
- 260 - 300 Sand, fine grained, friable, clay-filled, white to pale green, slightly glauconitic. No shows. Traces of dark gray to red to rose to yellow silty shale.

300 TOP FUSON SHALE

- 300 - 330 Shale, silty, slightly conglomeritic, yellow.
- 330 - 350 Shale, as above, traces of sand, fine to medium grained, calcareous. Traces of good porosity. No show.

350 TOP LAKOTA

- 350 - 380 Sand, fine to medium grained, vitreous to frosted, slightly calcareous, pink to red. No show. Some traces of shale.
- 380 - 425 Sand, fine to very coarse grained, vitreous to coated, friable, clay-filled, mostly red, poorly sorted, sub-rounded, numerous free floating sand grains, conglomeritic. No shows.

425 TOP MORRISON

- 425 - 450 Shale, gray to green to yellow. Quite waxy, traces of gray bentonite.
- 450 - 460 Sand, fine grained, angular, frosted, hard, poorly sorted, tight. No show.
- 460 - 490 Shale, dark gray to dark green, waxy, soft.
- 490 - 520 Shale, green, waxy, bentonitic. Trace of pyrite. Traces of calcite crystals and white crystalline limestone.
- 520 - 550 Shale, green, as above. Red to maroon silty shale.

550 - 570

**SAMPLE DESCRIPTION (continued)**

- 550 - 620 Shale, light gray to green, traces of buff to gray dense limestone. Traces of white sandy limestone.
- 620 - 640 Shale, medium to dark gray.
- 640 **TOP SUNDANCE**
- 640 - 700 Shale, light gray to green, silty. Traces of green glauconitic, fine grained, friable sandstone. No show.
- 700 - 750 Sand and shale, as above. Trace + of sand, fine grained, white, friable, slightly calcareous. No show.
- 750 - 870 Sand, fine to medium grained, vitreous to coated, friable, white to gray to pink to red, slightly calcareous, traces of good porosity. No show. Shale, gray to green to red to purple. Silty in part.
- 870 - 920 Shale, silty, red, gray to green. Traces of sand, as above.
- 918 **TOP SPEARFISH**
- 920 - 1000 Red silty shale.
- 1000 - 1110 Red silty shale, traces of red silty sand. No show.
- 1110 - 1240 As above. Traces of white anhydrite, buff to white limestone and calcite.
- 1240 **TOP GOOSE EGG**
- 1240 - 1250 Anhydrite, white.
- 1250 - 1280 Shale, red, very silty to sandy, very hard and brittle.
- 1280 - 1480 Anhydrite, white, sucrosic, interbedded with red silty shale. Traces of dolomite.
- 1480 **TOP MINNEKAHTA**
- 1480 - 1520 Dolomite - limestone, gray to buff to white to pink to purple. Micro-crystalline to dense, some sucrosic. No show. Good mineral fluorescence, no cut.
- 1520 **TOP OFEGHE**
- 1520 - 1560 Shale, red to purple, silty to a sandy shale to a silty sand, fine grained, friable, coated. No show.

**SAMPLE DESCRIPTION (continued)**

- 1560 - 1590 Red silty shale, as above and white sucrosic anhydrite, slightly dolomitic.
- 1590 - 1620 Red silty to sandy shale to a red, hard, brittle, very fine grained silty sand.
- 1616 TOP MINNELUSA
- 1620 - 1660 Sand, medium grained, rounded to sub-rounded, vitreous to frosted, friable, white to pink to red, good porosity in part, clay-filled in part, fairly well sorted. Red sand is dolomitic. Sand becomes more red at the base. No show.
- 1660 - 1680 Anhydrite, gray, hard, dense.
- 1680 - 1690 Sand, medium grained, rounded to sub-rounded, vitreous to frosted, friable, slightly dolomitic. red. Traces of good porosity. No show.
- 1690 - 1750 Anhydrite, gray, hard, dense. Traces of red and gray silty shale. Traces of dolomite and sand.
- 1750 - 1775 Shale, red to gray, silty. Traces of sand. Traces of medium grained, well sorted, friable, clay-filled red to pink sand. No show.
- 1775 - 1830 Dolomite, buff to gray, fairly hard, sucrosic.
- 1830 - 1855 Dolomite - anhydrite, buff to gray, micro-crystalline, very hard.
- 1855 - 1865 Sand, medium to coarse grained, rounded to sub-rounded, vitreous to frosted, friable, poorly sorted, white, clay-filled, dolomitic, poor porosity. No show.
- 1865 - 1880 Dolomite, buff to gray, traces of pink.
- 1880 - 1905 Dolomite, buff to white, dense. Traces of sand and anhydrite.
- 1905 - 1915 Sand, medium grained, dolomitic and anhydritic. No show.
- 1915 - 1940 Anhydrite, white to buff to pink. Some gray.
- 1940 - 1960 Dolomite, buff to pink to red, mostly pink, hard, dense. 20% buff to red very dolomitic sand, very hard,
- 1960 - 2000 Dolomite, as above with increase in fairly friable sand as above. No show.
- 2000 - 2020 Anhydrite, white to buff to gray.
- 2020 - 2030 Dolomite, buff to gray to pink.

SAMPLE DESCRIPTION (continued)

2030

TOP RED SHALE MARKER

- 2030 - 2042 Shale, red to pink to yellow, fissile, metallic luster.
2042 - 2070 Dolomite, white to buff to gray to pink, hard and dense.
2070 - 2085 Dolomite, gray, very hard, micro-crystalline. Shale, very black, hard, brittle.
2085 - 2125 Dolomite, dark gray to black, some brown and tan, micro-crystalline. Chert, vitreous, angular, some smoky. Dark gray to black dolomitic shale with oily taste. No cut or fluorescence.

Five foot samples from 2100 to 2250 feet.

- 2125 - 2145 Dolomite, as above, with no chert. Traces of a poorly sorted dolomitic sand. No show.
2145 - 2151 Dolomite, medium to dark gray, micro-crystalline, hard, slightly anhydritic.

Core #1 2155 to 2206 feet is adjusted up four feet in depth to fit the electric log.

- 2151 - 2152.5 Sand, gray, fine grained, well sorted, anhydrite filled, hard, tight, no porosity. No show.
2152.5 - 2153 Sand, gray, fine grained, well sorted, trace of porosity, slightly dolomitic, No show.
2153 - 2158 Dolomite, gray, hard, dense, micro-crystalline. Slightly shaley.
2158 - 2160.5 Shale, black, carbonaceous, micaceous, hard.
2160.5 - 2167 Sand, gray to greenish gray, fine grained, anhydrite and dolomite filled, well sorted, hard, tight, no porosity. No show.
2167 - 2171 Anhydrite, gray, hard.
2171 - 2176 Shale, black, micaceous, carbonaceous, with occasional anhydrite streaks.
2176 - 2180 Shale, black, carbonaceous, micaceous, with sulfur odor.
2180 - 2188.5 Sand, gray to greenish gray, fine grained, anhydrite and dolomite filled, well sorted, hard, tight, no porosity. No show.
2188.5-2189.5 Shale, gray, hard.

**SAMPLE DESCRIPTION** (continued)

- 2189.5 - 2194 Sand, gray to greenish gray, fine grained,
anhydrite and dolomite filled, well sorted,
hard, tight, no show.
2194 - 2202 Dolomite, gray to brown, anhydritic,
trace of vuggy porosity.

End of core #1

- 2202 - 2206 Shale, black, carbonaceous, micaceous.
2203 - 2218 Dolomite, gray, dense.
2218 - 2220 Shale, black, micaceous, carbonaceous.
2220 - 2228 Dolomite, gray, dense.
2228 - 2230 Shale, black, carbonaceous, micaceous.
2230 - 2238 Dolomite, gray, dense.
2238 - 2242 Shale, black, carbonaceous, micaceous.
2242 - 2250 Sand, fine to medium grained, rounded,
vitreous to frosted, hard to friable,
anhydrite filled and dolomite filled,
tight. No show.

Ten foot samples from 2250 to 2450 feet. Total depth.

- 2250 - 2268 Dolomite, gray, hard.
2268 - 2272 Black silty shale with oily taste.
2272 - 2298 Dolomite, gray, hard, traces of sand
and anhydrite as above.
2298 - 2300 Black silty shale.
2300 - 2325 Dolomite, gray to dark gray, hard, dense,
traces of sand as above.
2325 - 2395 Sand, fine grained, rounded, frosted,
very calcareous, lime or dolomite matrix.
Very dense, tight, buff to tan. No show.
Traces of medium grained, rounded, frosted,
friable, slightly clay-filled sandstone.
Trace of porosity, white. No show.
2395 - 2400 Dolomite, gray, dense.
2400 - 2450 Sand, fine to medium grained, mostly
fine, rounded, frosted, calcareous, friable.
Trace to fair porosity, white to buff to
gray. No show.
2450 **Total Depth.**

Chronological History

7-24-64- C Spudded 11" cable tool surface hole.
7-27-64 Set 140 feet of 8-5/8" used 24# pipe
with 60 sacks of regular cement at 142
feet ground. Plug down 10:00 P.M.
7-28-64 Waiting on rotary
7-29-64 Waiting on rotary
7-30-64 Waiting on rotary
7-31-64 Moving in rotary and rigging up.
8- 1-64 Finished rigging up. Drilled out from under
surface @ 6:30 P.M. Drilled to 415 feet.
8- 2-64 Drilled to 530 feet, made trip for bit #2.
Drilled to 572 feet, made trip for bit #3.
Drilled to 925 feet
8- 3-64 Drilled to 977 feet, made trip for bit #4.
Strapped out of hole and found a 33 foot
error. 977 feet equals 1010 feet. Drilled
to 1217 feet, started trip for bit #5.
8- 4-64 Finished trip for bit #5. Drilled to 1341
feet. Made trip for bit #6. Drilled to 1410
feet.
8- 5-64 Drilled to 1525 feet. Made trip for bit #7.
Drilled to 1590 feet.
8- 6-64 Drilled to 1622 feet. Made trip for bit #8.
Drilled to 1752 feet.
8- 7-64 Drilled to 1756 feet. Made trip for bit #9.
Began mudding up. Drilled to 1834. Made
trip for bit #10. Drilled to 1845 feet.
8- 8-64 Drilled to 1875 feet. Made trip for bit #11.
Drilled to 1933 feet.
8- 9-64 Drilled to 1942 feet. Made trip for bit #12.
Drilled to 1987 feet. Started trip for bit
#13.
8-10-64 Finished trip for bit #13. Drilled to 2036
feet. Made trip for bit #14. Drilled to
2075 feet.
8-11-64 Drilled to 2091 feet. Made trip for bit
#15. Drilled to 2116 feet.
8-12-64 Drilled to 2125 feet. Made trip for bit
#16. Drilled to 2155 feet. Came out of hole
to go in with core barrel for core #1.
8-13-64 Cored from 2155 feet to 2200 feet.
8-14-64 Cored from 2200 feet to 2206 feet. Reamed
core hole. Drilled to 2250 feet. Twisted off.
8-15-64 Recovered fish. Drilled to 2275 feet with
bit #19.
8-16-64 Drilled to 2285 feet. Made trip for bit #20.
Drilled to 2309 feet. Made trip for bit #21.
Drilled to 2318 feet.

CHRONOLOGICAL HISTORY (continued)

8-17-64 Drilled to 2341 feet. Made trip for bit #22.
 Drilled to 2400 feet.
 8-18-64 Drilled to 2429 feet. Made trip for bit #23.
 Drilled to 2450 feet. Ran logs.
 8-19-64 Ran Schlumberger Formation Test #1. P. & A.

BIT RECORD

No.	Size	Make	From	To	Footage	Hours
1	7-7/8	Retip	140	530	390	8.50
2	7-7/8	Retip	530	605	75	2.00
3	7-7/8	Retip	605	1010	405	11.25
4	7-7/8	Retip	1010	1217	207	12.50
5	7-7/8	Retip	1217	1341	124	11.50
6	7-7/8	Retip	1341	1525	184	22.00
7	7-7/8	Retip	1525	1622	97	7.50
8	7-7/8	Retip	1622	1756	134	14.00
9	7-7/8	Retip	1756	1834	78	14.00
10	7-7/8	Retip	1834	1875	41	11.50
11	7-7/8	Retip	1875	1942	67	11.50
12	7-7/8	Retip	1942	1987	45	11.50
13	7-7/8	Retip	1987	2036	49	14.50
14	7-7/8	Retip	2036	2091	55	16.00
15	7-7/8	Retip	2091	2125	34	14.00
16	7-7/8	Retip	2125	2155	30	11.50
17	7-27/32	Christ. Diam.	2155	2206	51	24.00
18	7-7/8	Retip	2206	2250	46	14.00
19	7-7/8	Retip	2250	2285	35	12.50
20	7-7/8	Retip	2285	2309	24	8.25
21	7-7/8	Retip	2309	2341	32	10.50
22	7-7/8	Retip	2341	2429	88	17.00
23	7-7/8	Retip	2429	2450	21	2.75

DEVIATION SURVEYS

<u>Depth</u>	<u>Degrees</u>	<u>Depth</u>	<u>Degrees</u>
977	1	1834	1/2
1217	3/4	1942	3/4
1525	3/4	2125	3/4
		2341	3/4

DRILLING TIME - FIVE-FOOT INTERVALS

150 - 200	5	4	4	4	8	8	9	6	6	6
200 - 250	7	4	3	2	5	5	4	4	3	3
250 - 300	2	3	4	4	3	3	6	7	5	3
300 - 350	3	3	3	4	4	4	5	3	3	3
350 - 400	2	1	2	1	3	3	3	2	2	2
400 - 450	3	17	9	6	10	8	7	8	20	19
450 - 500	8	9	11	6	7	6	8	6	8	7
500 - 550	8	8	8	8	11	10	9	12	15	10
550 - 600	8	10	17	11	13	14	17	17	15	8
600 - 650	8	9	5	7	6	5	6	6	6	9
650 - 700	6	5	6	7	9	8	6	6	5	5
700 - 750	4	5	5	4	7	9	8	4	7	5
750 - 800	5	4	7	5	5	5	5	6	7	5
800 - 850	5	5	5	5	6	6	10	8	5	5
850 - 900	7	5	6	5	5	5	7	7	7	5
900 - 950	6	6	7	8	6	6	10	13	11	12
950 - 1000	11	16	16	16	15	13	13	15	13	15
1000 - 1050	16	16	13	17	12	16	18	15	14	15
1050 - 1100	11	12	15	16	17	10	10	11	12	12
1100 - 1150	10	12	17	19	20	22	25	18	16	18
1150 - 1200	20	20	20	23	21	23	22	25	25	18
1200 - 1250	20	23	25	21	23	19	22	23	28	30
1250 - 1300	20	20	24	21	25	26	27	28	28	20
1300 - 1350	30	35	39	28	25	38	39	40	23	22
1350 - 1400	25	31	27	28	37	22	38	30	28	40
1400 - 1450	39	35	38	33	33	37	46	38	38	34
1450 - 1500	38	36	40	38	40	45	43	38	31	27
1500 - 1550	25	30	35	30	17	16	16	16	14	13
1550 - 1600	14	18	23	18	22	24	21	22	25	27
1600 - 1650	26	30	68	53	38	15	9	9	14	15
1650 - 1700	7	10	12	15	32	25	20	18	15	18
1700 - 1750	47	44	50	50	51	60	71	70	60	60
1750 - 1800	90	18	14	18	24	26	48	40	28	28
1800 - 1850	28	50	106	110	100	99	100	49	60	95
1850 - 1900	92	100	76	66	100	40	38	40	40	42
1900 - 1950	47	43	42	50	67	78	81	93	55	35
1950 - 2000	93	103	103	85	101	75	97	75	45	85
2000 - 2050	90	90	97	98	100	120	120	43	41	44
2050 - 2100	45	73	73	70	80	108	165	120	75	70
2100 - 2150	103	136	140	160	167	80	100	137	122	100
2150 - 2200	135	Cored								
2200 - 2250	Cored		50	82	80	92	72	115	140	145
2250 - 2300	52	74	103	112	80	135	195	45	70	110
2300 - 2350	130	140	85	80	110	108	127	110	37	42
2350 - 2400	32	50	45	48	82	75	68	62	70	58
2400 - 2450	95	77	32	34	37	60	38	52	25	25



CORING TIME

Minutes per foot

2155 - 2160	30	33	17	28	39	30	11	15	27	29
2160 - 2170	29	26	42	43	39	23	27	30	28	27
2170 - 2180	31	30	29	30	28	14	12	20	16	15
2180 - 2190	19	15	24	31	20	25	20	34	35	33
2190 - 2200	41	35	20	37	29	41				

ADMINISTRATIVE / SUNDRY REPORTS

STATE OF S.D. FORM 4

S. Dak. Oil & Gas Board
FORM 4

**WELL COMPLETION OR RECOMPLETION
REPORT AND LOG**

FARM OR LEASE NAME

Carl Jarrow
WELL NO.

TYPE OF COMPLETION

☐ Oil Well ☐ Gas Well ☒ Dry Hole
☐ New Well ☐ Work-Over ☐ Deepen ☐ Plug Back ☐ Same Zone ☐ Diff Zone

FIELD AND POOL OR WILDCAT

OPERATOR

George Kozel, Jr.

**MINERAL
NO. ACRES IN LEASE**

ADDRESS

1121 Power Building, Denver, Colorado 80202

LOCATION (in feet from nearest lines of section or legal subdivision where possible)

Surface 660' FSL - 660' FSL

Top prod. interval

At total depth

Full River

PERMIT NO.

61

DATE ISSUED

July 1, 1964

PREVIOUS PERMIT NO.

DATE ISSUED

DATE STOPPED

July 24, 1964

DATE T.D. REACHED

August 19, 1964

DATE COMPLE.

Ready to Prod.

ELEVATIONS

292' Ord. - 320' FSL

ELEV. CASINGHEAD

FLGE

TOTAL DEPTH

660' FSL

PLUG BACK

T.D. 660' FSL

IF MULTIPLE COMPLE.

HOW MANY

INTERVALS

1-5' to 1-4' FSL

ROTARY TOOLS

5 to 1-5'

CABLE TOOLS

5 to 1-5'

PRODUCING INTERVAL(S), THIS COMPLETION, TOP, BOTTOM, NAME (MD & TAD)*

DATE DIRECTIONAL SURVEY SUBMITTED

One

TYPE ELECTRIC AND OTHER LOGS RUN (Circle those filed)

Gamma Ray - Sonic and Dual Induction - Laterolog

WAS WELL CORED

Yes

CASING RECORD (Report all strings set in well)

CASING SIZE	DEPTH SET (MD)	HOLE SIZE	WEIGHT LBS. FT	PURPOSE	SACKS CEMENT	AMOUNT PULLED
8-5/8"	142'	11"	24	Surface	60	None

LINER RECORD				TUBING RECORD		
SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT	SIZE	DEPTH SET (MD)	PACKER SET (MD)

PERFORATION RECORD				ACID, SHOT, FRAC, CEMENT SQUEEZE, Etc.	
DEPTH INTERVAL (MD)	HOLES PER FT.	SIZE AND TYPE	PURPOSE	AMOUNT AND KIND OF MATERIAL USED	DEPTH INTERVAL (MD)

PRODUCTION

DATE FIRST PRODUCTION **PRODUCING METHOD** (Flowing, gas lift, pumping, size & type of pump) **WELL STATUS** (Prod. or Shut-in)

DATE OF TEST **HOURS TESTED** **CHOKED SIZE** **PRODUCTION FOR TEST** **OIL, bbls.** **GAS, Mcf.** **WATER, bbls. & G.** **OIL GRAVITY-API (60°F)**

FLOW TUBING PRESSURE **CASING PRESSURE** **24-HOUR RATE** **OIL, bbls.** **GAS, Mcf.** **WATER, bbls. & G.** **GAS-OIL RATIO**

DISPOSITION OF GAS (Used for fuel, vented, etc.) **TEST WITNESSED BY**

LIST OF ATTACHMENTS

Two copies final well completion report by G. D. Ayres, including

sample descriptions, etc.

I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED

George Kozel, Jr.

TITLE

Owner

DATE

Aug. 27, 1964

Approved 11/11/64

Date

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

Secretary

INSTRUCTIONS

General: This form is designed for submitting a complete and correct well completion report and log on all types of lands and leases to either a Federal agency or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Supplemental instructions by local Federal and/or State offices will govern the use of this form. If not filed prior to the time this summary record is submitted, copies of all currently available logs (drilling, geologic, sample and core analysis, all types electric, etc.), formation and pressure tests, and directional surveys, should be attached hereto, to the extent required by applicable Federal and/or State laws and regulations. All attachments should be filed on this form, see last blank.

If this well was directionally drilled, show both the location at the surface and at total depth from nearest lines, where possible; also show the locations at the top and at the bottom of any zone for which production data are reported in space 23, and any zone open for injection or disposal. Use this reverse side if more space is needed. (MID-Measured Depth, TVD-True Vertical Depth.)

*Indicate which elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments.

If this well is completed for separate production from more than one zone (multiple-zone completion), so state in the correct space and show the producing interval, or intervals, top(s), bottom(s) and name(s) (if any) for only the zone reported in the blanks under PRODUCTION. Submit a separate completion report on this form for each interval (zone) to be separately produced.

"Wells Comment": Attached supplemental records for this well should show the details of any multiple stage cementing and the location of the cementing tool.

File 3 copies of this form with Secretary, Oil and Gas Board, Pierre.



SUMMARY OF WATER ZONES AND NON-COMMERCIAL OIL OR GAS ZONES						GEOLOGIC MARKERS		
(Note: If well was directionally drilled, show both measured and true vertical depths for zones and markers listed)								
KIND OF FORMATION	DEPTH TO TOP		DEPTH TO BOTTOM		CONTENTS; PRODUCTIVE RATE, IF KNOWN	NAME	DEPTH TO TOP	
	MEAS. DEPTH	TRUE VERT. DEPTH	MEAS. DEPTH	TRUE VERT. DEPTH			MEAS. DEPTH	TRUE VERT. DEPTH
						Dakota	120'	
						Fuson	300'	
						LaKota	350'	
						Morrison	425'	
						Sundance	640'	
						Spearfish	918'	
						Goose Egg	1240'	
						Minnekahta	1479'	
						Opeche	1520'	
						Minnelusa	1616'	
						"Red Marker"	2032'	



POWERTECH (USA) INC.
API ID 40 047 05005

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STATE OF S.D. FORM 7

S. Dak. Oil & Gas Board
FORM 7

PLUGGING RECORD

Operator <u>George Dolzal, Jr.</u>		Address <u>1121 Tower Building, Denver, Colorado</u>	
Name of Lease <u>Carl Jarrow</u>		Well No. <u>1</u> Field & Reservoir <u>Wildcat</u>	
Location of Well <u>Sec 34, T14N, R10E, S10E, Section 2-7-81</u>		Sec-Twp-Rge or Block & Survey <u>Sec 34, T14N, R10E, S10E, Section 2-7-81</u>	
Application to drill this well was filed in name of <u>George Dolzal, Jr.</u>		Character of well at completion (Initial production): Oil (bbls/day) _____ Gas (MCF/day) _____ Dry? <u>Yes</u>	
Date plugged <u>August 19, 1964</u>		Amount well producing when plugged: Oil (bbls/day) _____ Gas (MCF/day) _____ Water (bbls/day) _____	
Total depth <u>2,447'</u>		Depth interval of each formation <u>None</u>	
Name of each formation containing oil or gas. Indicate which formation open to wellbore at time of plugging.		Size, kind & depth of plugs used. Indicate zones squeeze cemented, giving amount cement.	

CASING RECORD

Size Pipe	Run in well (ft.)	Build out (ft.)	Left in well (ft.)	Give depth and method of parting casing (shot, ripped, etc.)	Packers and Stems
5-5/8"	142'	None	142'		

Was well filled with mud/cement fluid, according to regulations? Yes

Indicate if open formation containing fresh water _____

In addition to other information required on this form, if this well is plugged back for use as a fresh water well, give all pertinent details of plugging operations to base of fresh water sand, perforated interval to fresh water sand, name and address of surface owner, and attach letter from surface owner authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.

USE REVERSE SIDE FOR ADDITIONAL DETAIL

Executed this the 27th day of August, 1964

State of COLORADO

County of DENVER

Before me, the undersigned authority, on this day personally appeared George Dolzal, Jr. known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.

Subscribed and sworn to before me this 27th day of August, 1964

SEAL. My commission expires May 26, 1968

Notary Public in and for State of Colorado

DO NOT WRITE BELOW THIS LINE

Approved _____ Date _____

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

Secretary _____

See Instructions On Reverse Side

Approved for release of bond
Date March 7, 1965
William J. McHugh
Notary Public



POWERTECH (USA) INC.

API10 40 D47 05095

47 of 83

S. Dak. Oil & Gas Board
FORM 6

**SUNDRY NOTICES AND
REPORT ON WELLS**

FARM OR LEASE NAME

Carl Larrow
WELL NO.

☐ OIL WELL ☐ GAS WELL ☒ DRY

FIELD AND POOL, OR WILDCAT

OPERATOR

Location

ADDRESS George Holzner, Jr.

NO. ACRES IN LEASE

1121 Power Bldg., Denver, Colo. 80202

SEC. TWP. RGE.

LOCATION (in feet from nearest lines of section or legal subdivision, where possible)

600' FOL - 650' FOL

240

ELEVATIONS (D.F., H.K.B., R.T., G.R., etc.; how determined)

2792' Ground; 2797' A.S.

Carl Larrow

INDICATE BELOW BY CHECK MARK NATURE OF REPORT, NOTICE OR OTHER DATA

NOTICE OF INTENTION TO		SUBSEQUENT REPORT OF	
TEST WATER SHUT-OFF	SHOOT OR MUDZEE	WATER SHUT-OFF	SHOOTING OR MUDZEE
FRACURE TREAT	REPAIR WELL	FRACURE TREATMENT	REPAIRING WELL
MULTIPLE COMPLETE	PILE OR MUD CASING		ALPHING CASING
ABANDON			

DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including a forecast date of starting any proposed work)

Drilled to 2,847 feet total depth in the Minnelusa formation. No shows of oil or gas were encountered. Set the following cement plugs as recommended by Mr. Earl Cox of the State Geological Survey:

15 sacks	-	2435' to 2460'
15 sacks	-	1650' to 1575'
15 sacks	-	600' to 525'
15 sacks	-	400' to 325'
15 sacks	-	165' to 90'

Dry hole marker and 10 sacks at surface.
Balance of hole filled with gel-base drilling mud.

I hereby certify that the foregoing as to any work or operation performed is a true and correct report of such work or operation

SIGNED *George Holzner, Jr.* TITLE OWNER DATE AUGUST 11, 1964

DO NOT WRITE BELOW THIS LINE

Approved _____ OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

CONDITIONS, IF ANY. _____ Secretary

See Instructions On Reverse Side

8 31 64
10 10 10 10



CORRESPONDENCE



POWERTECH (USA) INC.

API ID 40 047 05095



**SOUTH DAKOTA
STATE GEOLOGICAL SURVEY**

**SCIENCE CENTER
University of South Dakota Campus
VERMILION 57000
Phone 685-4471**

**Western Field Office
Belle Fourche, South Dakota
February 18, 1965**

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FEB 19 1965

**DUNCAN J. MCGREGOR
Director and State Geologist
MERLIN J. TIFFIN
Assistant State Geologist**

**Dr. Duncan McGregor
State Geologist
Vermillion
South Dakota**

**Re: Dolezal #1 Darrow
SE4SE4-2-7S-1E
Fall River County, South Dakota
Permit No. 361**

Dear Duncan:

The six month confidential period on the above test terminates today, and all information may now be released to anyone wanting it.

The marker pipe has been placed and the mud pits satisfactorily filled and smooth. My file indicated that all required logs and records have been sent in by Mr. Dolezal.

If you have received the samples of this test, I believe the bond can be released.

Sincerely,

**Earl Cox
Engineering-Petroleum Geologist**

EC:sn

cc: Secretary, Oil and Gas Board



February 18, 1965

Mr. Earl Cox
State Geological Survey
P. O. Box 208
Belle Fourche, South Dakota

Dear Earl:

On February 9, 1965, we received from Amstrat the following samples:

Phillips Petroleum #1-"A" Njos, Sec. 34, T. 23 N., R. 3 E.,
Harding County; core and intervals 50-3270, 3270-6330,
6330-9620.

✓Sun Oil et al #1 Earl Darrow, Sec. 2, T. 7 S., R. 1 E., Fall
River County; core and interval 150-2450.

Consolidated Royalty #1 Wulf-Ideen-USA, Sec. 15, T. 8 S.,
R. 2 E., Fall River County; interval 0-2472.

Mule Creek #1-4410 Clark, Sec. 10, T. 8 S., R. 9 E., Fall
River County; interval 186-2871 and 1 box cores.

Colonial Oil Co. #1 Howard Bailey, Sec. 18, T. 9 S., R. 8 E.,
Fall River County; interval 220-2692.

Today in the mail we received notice of shipment on February 16,
1965, of the following samples: 1 box, Consolidated Royalty Oil et
al #1 Ideen-Federal, SW SW 15-88-2E, Fall River County. We have
not yet received this shipment.

Sincerely yours,

Merlin J. Tipton
Assistant State Geologist

MJT:jmd



POWERTECH (USA) INC.

API ID 40 047 05095

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November 13, 1964

Mr. Earl J. Cox
State Geological Survey
Box 208
Belle Fourche, South Dakota

Dear Earl:

I am enclosing a copy of the Dual Induction-Laterolog and
Sonic Log-Gamma Ray for Deleval #1 Darrow, Fall River County,
Sec. 2, T. 7S, R. 1E.

Sincerely yours,

(Mrs.) Donna Jean Hedges
Administrative Assistant

For the State Geologist

Enclosures

Donna Jean Hedges



POWERTECH (USA) INC.

API ID 40 047 05095



**SOUTH DAKOTA
STATE GEOLOGICAL SURVEY**

**SCIENCE CENTER
University of South Dakota Campus
VERMILLION 57000
Phone 685-4471**

NOV 5 52 1964

**DUNCAN J. MCGREGOR
Director and State Geologist
MERLIN J. TIPTON
Assistant State Geologist**

**Western Field Office
Belle Fourche, South Dakota
November 4, 1964**

**Dr. Duncan McGregor
State Geologist
Vermillion
South Dakota**

**Re: Dolezal #1 Darrow
SE $\frac{1}{4}$ SE $\frac{1}{4}$ -2-7S-1E
Fall River County, South Dakota
Permit No. 361**

Dear Duncan:

**Enclosed for your files is one copy each of the following
logs: sonic-gamma ray, dual induction-laterolog, formation
tester.**

Sincerely,

**Earl Cox
Engineering-Petroleum Geologist**

EC:cr



SOUTH DAKOTA
STATE GEOLOGICAL SURVEY

SCIENCE CENTER
University of South Dakota Campus
VERMILLION 57000
Phone 685-4471

Western Field Office
Belle Fourche, South Dakota
September 22, 1964

SEP 23 1964

DUNCAN J. MCGREGOR
Director and State Geologist
MERLIN J. TIPTON
Assistant State Geologist

Dr. Duncan McGregor
State Geologist
Science Center
Vermillion, South Dakota

Re: Delezel #1 Darrow
SE $\frac{1}{4}$ SE $\frac{1}{4}$ -2-7S-1E
Fall River County
South Dakota
Permit No. 361

Dear Duncan:

The pits have been filled and the marker pipe placed at the above location.

After the samples have been received, it would seem that the bend can be released on this test.

Sincerely,

A handwritten signature in cursive script that reads "Earl Cox".

Earl Cox
Engineering-Petroleum Geologist

EC:cr



POWERTECH (USA) INC.

API ID 40 047 05095

.54 of 63

Western Field Office
Belle Fourche, South Dakota
September 1, 1974

Mr. George Dolezal, Jr.
Tower Building
1700 Broadway
Denver 2, Colorado

RE: Dolezal #1 Darrow
SE 1/4, 2-7-1E
Fall River County
South Dakota
Permit No. 361

Dear Mr. Dolezal:

I see details of the above test have been released to
Rinehart's.

If information from this test is no longer confidential,
I would appreciate you writing me to this affect.

Sincerely,

Earl Cox
Engineering-Petroleum Geologist

EC:cr



POWERTECH (USA) INC.
API ID 40 047 05095

55 of 63



SOUTH DAKOTA STATE GEOLOGICAL SURVEY

SCIENCE CENTER
University of South Dakota Campus
VERMILION 57069
Phone 624-4471

DUNCAN J. MCGREGOR
Director and State Geologist
MERLIN J. TIPTON
Assistant State Geologist

Western Field Office
Belle Fourche, South Dakota
August 21, 1964

Mr. George Dolezal, Jr.
1121 Tower Building
Denver 2
Colorado

FE: Dolezal #1 Harrow
S 4 SE 4-2-7S-1E
Fall River County
South Dakota
Permit No. 361

Dear Mr. Dolezal:

I have received from Schlumberger one copy of logs run on the above test.

We require two copies of all logs and records on oil or gas tests. Logs and records are required within 30 days of completion of the test. This letter is only to inform you of the status of our records at this time.

I appreciate the cooperation given by Mr. Ayres and hope you plan additional work in South Dakota.

Sincerely,

Earl Cox
Engineering-Petroleum Geologist

EC:cr

cc: Duncan McGregor



POWERTECH (USA) INC.
API ID 40 047 05095

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SOUTH DAKOTA
STATE GEOLOGICAL SURVEY

SCIENCE CENTER
University of South Dakota Campus
VERMILLION 57009
Phone 685-4471

Western Field Office
Belle Fourche, South Dakota
August 20, 1964

DUNCAN J. MCGREGOR
Director and State Geologist
MERLIN J. TIPTON
Assistant State Geologist

Dr. Duncan McGregor
State Geologist
Vermillion
South Dakota

RE: Dolezal #1 Darrow
SE $\frac{1}{4}$ SE $\frac{1}{4}$ -2-7S-1E
Fall River County
South Dakota
Permit No. 361

Dear Duncan:

We have been asked to keep information on this test
confidential for the six months period, unless released
sooner by the operator.

Sincerely,

Earl Cox
Engineering-Petroleum Geologist

EC:cr

JUL 8^{57 863} 1964

SOUTH DAKOTA

State Water Resources Commission

STATE OFFICE BUILDING
PIERRE, SOUTH DAKOTA

July 7, 1964

Mr. Earl Darrow
Dewey, South Dakota

Dear Sir:

I have been advised that ~~Mr~~ George Dalezal, Jr. ^{121 Tower Bldg. Denver,} has
obtained a Permit to Drill for Oil and Gas on your land in Section 2,
T 7 S, R 1 E.

Occasionally, owners of land consider converting abandoned oil wells into water wells. Please advise us whether or not you intend to convert the oil well drill hole on your land into a water well if water is encountered and the drill hole is abandoned as an oil well.

If you are considering making a water well out of the abandoned oil well drill hole, special considerations are necessary to comply with the State's oil and water laws. The abandoned oil hole must be properly plugged and the water well properly constructed. All conversion work will be at your expense. The cost will vary, depending upon the characteristics of the drill hole, but such cost will be in the neighborhood of \$5,000 or more. Usually another driller and drill rig will have to be arranged for. This other drill rig and casing and other materials will have to be on hand to take over immediately after the special oil well plugging is completed, because the drill hole cannot be left open for any appreciable length of time without spoiling it. Approval of plans for construction of the water well will be required, and a bond covering proper construction may be required. Also, a water right may be required. All of these arrangements take considerable time to accomplish.

Please advise me immediately if you plan to convert the oil well drill hole into a water well. We both hope that a producing oil well results from the drill hole on your land; however, if not and you are planning on a water well, we must start making arrangements now.

Sincerely,

J.W. GRIMES
Chief Engineer

JWG/bw

cc State Geologist
Oil & Gas Board



POWERTECH (USA) INC.
API ID 40 047 05095

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SOUTH DAKOTA STATE GEOLOGICAL SURVEY

SCIENCE CENTER
University of South Dakota Campus
VERMILLION 57000
Phone 624-4471

DUNCAN J. MCGREGOR
Director and State Geologist
MERLIN J. TIPTON
Assistant State Geologist

Western Field Office
Belle Fourche, South Dakota
July 6, 1964

Mr. George Dolezal, Jr.
1121 Tower Building
Denver 2, Colorado

RE: Dolezal #1 Darrow
SEM SEM-2-7S-1E
Fall River County, South
Dakota
Permit No. 361

Dear Mr. Dolezal:

The Secretary of the Oil and Gas Board has forwarded me a copy of your approved permit to drill a test. This will be an interesting test and we will watch it with interest.

During the drilling of oil tests in the State, I scout them periodically. Our Rules require the use of a blow-out preventer, on wildcat tests as spelled out in Paragraph 2, Section A, Page 10, of the Rules and Regulations which states:

"In all unproven areas, (wildcat wells) all drilling wells shall be equipped with a mastergate, or its equivalent, an adequate blow-out preventer, together with a flow line valve of the proper size and working pressure. The entire control equipment shall be in good working condition at all times."

It is a pleasure to welcome you to South Dakota and wish you success in your test.

Sincerely,

Earl Cox
Engineering-Petroleum Geologist

EC:cr

Cc: Secretary Oil and Gas Board
State Geologist



SURETY



NO SURETY INFORMATION FOR THIS WELL AS OF 5/18/2011

MISCELLANEOUS



Buffalo Times Herald

August 13, 1964

8-13-64

STATE OIL DRILLING ACTIVITY ON INCREASE

Oil well drilling activity in South Dakota is expected to increase with the granting last week of four permits. Dr. Duncan McGregor, State Geologist, reports that the Oil and Gas Board has granted permits to the Consolidated Royalty Company, Casper, Woming, for two tests in Fall River county. One test, the No. 1 Ideen-Federal, is three miles southwest of Edgemont on the H. C. Porter ranch. The test will reach an estimated depth of 3300 feet and test the Leo sands of the Minnelusa Formation. The other permit to Consolidated is located eight miles southeast of Edgemont on the Kenneth Helsel ranch, and will also test the Leo sands.

Drilling continues on the Dolezal No. 1 Darrow test, and had reached a depth of 1700 feet on August 6. The test is located fourteen miles northwest of Edgemont.

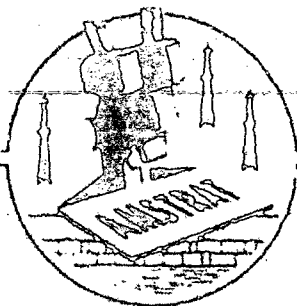
Gulf Oil has been granted two permits. One location is nine miles southeast of Murdo, on the Don Hight ranch. The other is twelve miles south of Murdo on the Russell Olson ranch. On August 10 the Olson test was in the process of being drilled, but no further information was being released at that time.

Buffalo Times Herald

July 2012

B-521

Appendix B



VOICE

AMERICAN STRATIGRAPHIC COMPANY

1820 BROADWAY, DENVER • 524 E. YELLOWSTONE, CANYON • 17 NO. 100 ST. DENVER

February 1, 1965

NC 1786

South Dakota State Geological Survey
Attn: Dr. Duncan McGregor
Science Center
University of South Dakota
Vermillion, South Dakota

P. O. NO.

SOUTH DAKOTA WELLS N/C

2 Boxes
1 Box
1 Box
1 Box
1 Box

Phillips #1-A Njos, 34-23N-3E, Harding Co.
Sun Oil et al, #1 Earl Darrow, 2-7S-1E, Fall River Co.
Consolidated Royalty #1 Wolf-Ideen-USA, 15-8S-2E, Fall River Co.
Mule Creek #1-4410 Clark, 10-8S-9E, Fall River Co.
Colonial Oil Co., #1 Howard Bailey, 18-9S-6E, Fall River Co.

NC

Shipped by:

United Brotherhood

2-9-65

PowerTech (USA) Inc.





Oil and Gas Search for: <i>api_no_ like '40 047 05147'</i>		
Page 1 of 1	<u>Download Database</u> (Excel spreadsheet format)	Page: 1

Record 1 of 1

Well Information

API No:	40 047 05147	County:	FALL RIVER
Well Name:	CONROY 1 PETERSON	Location:	NWSE 22-7S-1E
Permit No:	408	Total Depth:	2400
Operator Name:	CONSOLIDATED ROYALTY OIL CO	Bottom Hole:	Minnelusa
Permit Date:	11-22-1965	KB Elevation:	3533
Spud Date:	12-11-1965	Ground Elevation:	3522
Plug Date:	12-24-1965	Latitude:	43.429674
		Longitude:	-103.983142
Well Field	WILDCAT	Status	P&A
Class:	DRY HOLE	Type:	DRY HOLE

Formation Tops

<u>Formation</u>	<u>Depth (ft.)</u>
Minnekahta	1610
Minnelusa	1690
Converse	1741
Red Marker	2158
2nd Leo	2290

Page 1 of 1 (goto [top](#))

Page: 1

COUNTY: **FALL RIVER**
LEGAL LOCATION: **NWSE 22-7N-1E**
API NO: **40 047 05147**
PERMIT NO: **408**
WELL NAME: **CONROY #1 PETERSON**
OPERATOR: **THE CONSOLIDATED
ROYALTY OIL COMPANY**
PERMIT ISSUED: **11/22/1965**
PERMIT CLOSED: **06/14/1966**
FILE LOCATION: **7N-1E-22 NWSE**

TARGET CODES:

WELL HISTORY / CHECKLIST

PERMIT TO DRILL / INTENT TO DRILL

WELL INSPECTION / SCOUT REPORTS

OPERATOR'S TECHNICAL REPORTS / MAPS

ADMINISTRATIVE / SUNDRY REPORTS

CORRESPONDENCE

SURETY

MISCELLANEOUS



WELL HISTORY / CHECKLIST



WELL HISTORY

Well Name Conroy #1 Peterson Permit No. 408
Location NWSE 22-7S-1E Fall River Date of Permit 11-22-65
Elev. 3522 Gr. API No. _____
Confidential _____ From _____ To _____
Logs Received _____
Cuttings Received _____ Cores Received _____
Drill Stem Records _____

Cap Plug and Marker Set 12-28-65
Surface Restored 12-28-65
Plugging Affidavit Signed _____ Date _____
Bond Released _____ Date 6-14-66

Summary of Scout Reports

12-16-65 First visit Spudded 12-11-65
12-24-65 Plugged
12-28-65 Marker in place - pits filled and location smoothed



PERMIT TO DRILL / INTENT TO DRILL



State Pub. Co., Pierre

APPLICATION FOR PERMIT TO:

S. Dak. Oil & Gas Board
FORM 3

<input checked="" type="checkbox"/> DRILL	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> PLUG BACK	FARM OR LEASE NAME: F. A. Peterson
<input type="checkbox"/> OIL WELL	<input type="checkbox"/> GAS WELL	<input type="checkbox"/> SINGLE ZONE	WELL NO. No. 1
<input type="checkbox"/> MULTIPLE ZONE			FIELD AND POOL OR WILDCAT Wildcat
OPERATOR THE CONSOLIDATED ROYALTY OIL COMPANY			NO. ACRES IN LEASE 1840 acres
ADDRESS P. O. Box 605 Casper, Wyoming 82602			SEC. TWP. RGE C NW 1/4 Section 22-7S-1E
LOCATION (In feet from an established corner of the legal subdivision) 1980' from East Line and 1980' from South Line of Section 22, Township 7 South, Range 1 East, B.H.M.			COUNTY Fall River
NAME AND ADDRESS OF SURFACE OWNER Francis A. Peterson P. O. Box 5, Burdock, South Dakota		ELEVATION 3522' PROPOSED DEPTH 2600'	NO. OF WELLS ETC One (1) ROTARY OR CABLE TOOLS Rotary
NAME AND ADDRESS OF CONTRACTOR Bullock and Barnhart P. O. Box 2426 Casper, Wyoming 82602		APPROXIMATE DATE WORK WILL START November 15, 1965	
IF LEASE PURCHASED WITH ANY WELLS DRILLED, FROM WHOM PURCHASED (Name and address) None			

PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	NEW OR SECOND HAND	DEPTH	SACKS OF CEMENT
12-1/4"	8-5/8"	24 lb.	New	1050'	750'
We plan to set surface casing in Spearfish formation to shut off anticipated water flows from the Dakota and Sundance formations.					

DESCRIBE PROPOSED OPERATIONS, IF PROPOSAL IS TO DEEPEN OR PLUG BACK, GIVE DATA ON PRESENT PRODUCTIVE ZONE AND PROPOSED NEW PRODUCTIVE ZONE. GIVE BLOW OUT PREVENTER PROGRAM IF ANY.

Blow Out Preventer: Schaffer 12" Series 900 Mechanical doublegate.

A 7-7/8" hole will be drilled from the base of the surface casing to total depth. In the event oil or gas production is indicated, either 4-1/2" or 5-1/2" casing will be set through the productive zone or zones and cemented with an appropriate amount of cement. In the event this test is abandoned then the hole will be plugged in accordance with the Regulations of the State Oil and Gas Board.

Anticipated Formation Tops: Dakota 205'; Lakota 398'; Sundance 687'; Basal Sundance 996'; Goose Egg 1295'; Minnekahta 1537'; Opeche 1578'; Minnelusa 1615'; Converse Anhydrite 1742'; Red Marcker 2130'; 2nd Leo 2255'.

SIGNED: *[Signature]* TITLE President DATE November 17, 1965

DO NOT WRITE BELOW THIS LINE

PERMIT NO. 4123

CHECKED BY *[Signature]* 11/19/65
School and Public Lands Date
Ann Hickworth, Assistant Secretary

APPROVAL DATE

CONDITIONS

(2) COMPLETE SET OF SAMPLES, AND CORES IF TAKEN, MUST BE SUBMITTED.

(3) SAMPLES, AND CORES IF TAKEN, BELOW DEPTH, MUST BE SUBMITTED.

INSTRUCTIONS

General: This form is designed for submitting proposals to perform certain well operations, as indicated, on all types of lands and leases for appropriate action by either a Federal or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Consult applicable Federal or State regulations, or appropriate officials, concerning approval of the proposal before operations are started.

If the proposal is to re-drill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations.

If the well is to be, or has been, directionally drilled, so state and show by attached sheets. If necessary, the coordinate location of the hole in any present or objective productive zones.

File 3 copies of this form with Secretary, Oil & Gas Board, Pierre.

(*Sample location: 800' South and 600' East of the Northwest Corner of Section 10.)

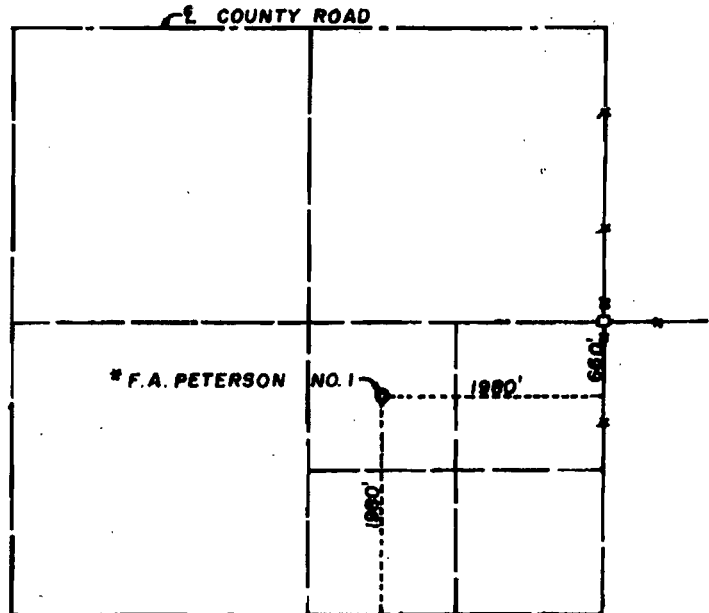
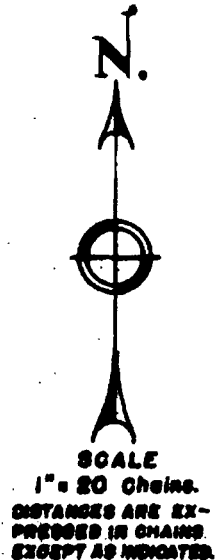


POWERTECH (USA) INC.

API ID 48 047 05147

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**SECTION 22
T.7S.-R.1 E., BLACK HILLS MER.
FALL RIVER COUNTY, SOUTH DAKOTA**



LEGEND

U.S. Government Brass Cap Corner.....
Original stone corner, properly marked, firmly set.....
Iron pipe set at proportionate distance.....
Corner established by others as indicated.....
Dependent Resurvey.....
Protraction.....
Well location.....

**ELEVATIONS:
Before grading**

LOCATION 3522
R.P. 100' N. 3521
R.P. 100' S. 3522
R.P. 100' E. 3522
R.P. 100' W. 3522

ELEV'S. REFERRED TO:
U.S.G.S. BM TTI WBR 1949
Elev. 3563

SURVEY AND PLAT BY
WORTHINGTON, LENHART & ASSOCIATES, INC.
200 South Lowell St., Casper, Wyoming
Direct solar lines and chained distances. Ref. Book No. 225, R 08

**PLATTED FIELD NOTES OF SURVEY
MARKING WELL LOCATION
NW 1/4 SEC. 22
FOR**

CON ROY - SUN - FROST, CASPER, WYOMING

10-29-1948

* Revised 11-4-'85

JMG

William G. Ladd
Certified true and correct
SOUTH DAKOTA REG. 1908 L.S.



WELL INSPECTION / SCOUT REPORTS



Permit No. 408

STATE GEOLOGICAL SURVEY

Scout Report

Date Scouted 12-28-65

Owner ConRoy

Designation of well #1 Peterson

Location: Sec. 22 T. 7 N. S. R. 1 E. W.
Fall River County, S. D. Total depth 2400 feet

Casing Record:

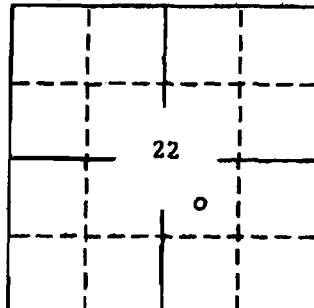
14 30 Ft. Ft.

8 5/8 1125 Ft. Ft.

Work in progress at time of visit:
None.

Developments since last visit:

Abandonment marker in place. Pits filled and location smoothed.



Remarks and recommendations:

Rig stacked at location.

Scouted by Earl Cox, Geologist

Approved by Duncan J. McGregor
Duncan J. McGregor, State Geologist



Permit No. 408

STATE GEOLOGICAL SURVEY

Scout Report

Date Scouted 12-24-65

Owner ConRoy

Designation of well #1 Peterson

Location: Sec. 22 T. 7 N. S. R. 1 E. W.

Fall River County, S. D. Total depth 2400 feet

Casing Record:

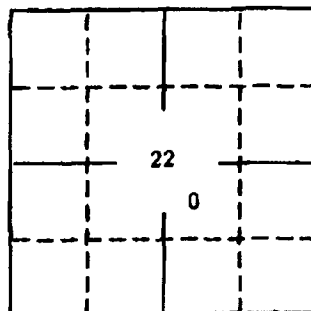
14 30 Ft. Ft.

8 5/8 1125 Ft. Ft.

Work in progress at time of visit:
Plugged as follows:
1925 - 1850 25 sacks 3rd Converse
1195 - 1120 25 sacks Base Surface casing.

Developments since last visit:

Run Dual Induction and Sonic Gamma Ray log
AmStrat will process samples
No cores taken, no shows observed, no tests run.



Remarks and recommendations:

Sample tops:
Minnakahta - 1610
Minnelusa - 1690
2nd Converse - 1741
3rd Converse - 1871
4th Converse - 2020
Red Marker - 2158
2nd Leo - 2290 (tite - no shows)

Scouted by Earl Cox, Geologist

Approved by Duncan J. McGregor

Duncan J. McGregor, State Geologist



POWERTECH (USA) INC.
API ID 40 047 05147

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First Report

Permit No. 408

STATE GEOLOGICAL SURVEY

Scout Report

Date Scouted 12-16-65

Owner ConRoy

Designation of well #1 Peterson

Location: Sec. 22 T. 7 N. 8 R. 1 E. W.

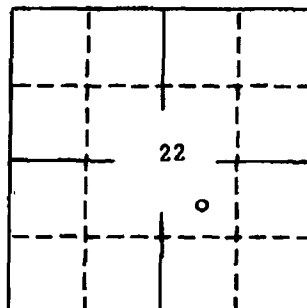
Fall River County, S. D. Total depth 1140 feet

Casing Record:

14" 30 Ft. Ft.

8 5/8 1125 Ft. Ft.

Work in progress at time of visit:
Had just finished cementing surface casing.



Developments since last visit:

Spudded: 12-11-65

Set 30 feet of 14" conductor pipe with 11 sacks.

Set 1125 feet of 8 5/8 surface casing at 1136 with 850 sacks.

Slight flow from basal Sundance that was controlled with heavy mud.

Remarks and recommendations: Sample tops:

Dakota 260

Lakota 460

Morrison 560

Sundance 750

Spearfish 1122

Elevation: 3522 gd.
3533 K. B.

Scouted by Earl Cox, Geologist

Approved by

Duncan J. McGregor, State Geologist



POWERTECH (USA) INC.

API ID 40 047 05147

Camp #1 Peterson
1980 FEL, 1980 FSL.
NWSE - 22-75-1E
Fall River.

Bullock & Barnhart
Casper.

Francis A. Peterson
Bullock, S. Dak.

Elev: 3522 9d.
3533 R.B.

Est T.R. 2600
(1050' surface)

Perm. t: 11-22-65 #408

Slight flow local sandstone.
Hanson estimated 500 p.m. in
zone.

12-23-65

Casper Called 6:00 P.M. Rudy
to log & then plug. Peterson
wants surface plug left off for
possible use as a water
well. Et Rode said would
sever marker on but not
cement.

12-24-65

Plugged.

1925-1850 25' at 3rd Cav.
1195-1120 25' at Base

Sample tops:

mt 1610

mt 1650

2nd Cav. 1741

3rd Cav. 1871

4th Cav. 2000

Red Mt. - 2158

2nd Cav 2270 + 10' in house

T.D. 2400 1970

12-16-65 12 of 48

Spud: 12-10-65

~~Drilled~~

Set 14" Conductor at 30'
+ Cemented with 1124.

Drilled 15 3/4' hole to 1140'

Sample tops:

Date 260

Lab 460

Men 560

Sum 750

Top Sp 1122

Run 1125.36' 8 3/4" J.L.

Set 1136.36' w/ 8500 y

Good Return.

WOC 12:30 12-16-65

run Camp, test on show

Run final induction &
Sonic Gamma Ray Caliper

Cm Strat will process sample

12-28-65

Marker in OK. pits filled
& variation in depth.
Rig Staked at location

3-9-66

Vermillion kind sample



API ID 40 047 05147

~~2130146~~ # 408

Can - Roy #1 Retention

C NW 1/4 SE 1/4 Sec. 22, T 15, R 1E
Hall River Co.

Spudded 12-11-65
Elev 3522 gch
Hole
Contractor

12-16-65
Set 30' of 14" csg. to 1125' of 8 7/8"
@ 1130 feet. Slight flow from base
of sandstone controlled with mud.
Logs: Kd 260, K1 460, Mmms 500,
Litho 750, Spud log 1122,
12-24-65

Gravelled to 2400 & plugged.
Red dust and 4 lines - K.R. Am
that will process samples. No
cores, tests or shows. Info: Minn. 1610
Minn. 1610, 2nd Cor - 1741, 3rd Cor - 1811
4th Cor - 2020, RM - 2158, 2nd Cor 1290



POWERTECH (USA) INC.

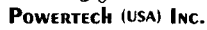
API ID 40 047 05147

12-27-68
14 of 48

letter from cat to Althaus saying
need request in writing to come surface
make paper

12-28-68

made in place. Data filled &
smoothed. Dig started



BOND RELEASED: 6-14-66

OPERATOR'S TECHNICAL REPORTS / MAPS



POWERTECH (USA) INC.
API ID 40 047 05147

17 of 46
ConRoy #1 F. A. Peterson
C NE SE 22 T7S R1E
Fall River Co., South Dakota

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ConRoy #1 F. A. Peterson
C NE SE 22 T7S R1E
Fall River Co., South Dakota

SUMMARY

Operator: The Consolidated Royalty Oil Company
Name: #1 F. A. Peterson
Location: C NE SE Sec 22, Twp 7 South, Rge 1 East, Fall River
County, South Dakota
Elevation: 3522 GR., 3533 K.B.
Spud: December 10, 1965 Complete: December 24, 1965
Status: Plugged and abandoned

Geologic Record:

<u>Formation</u>	<u>Spl. Top</u>	<u>Schl. Top</u>	<u>Datum</u>
Dakota	260	260	+3273
Fuson	380	383	+3150
Lakota	460	458	+3075
Morrison	520	524	+3009
Sundance	740 ?	753	+2780
Canyon Springs	1110	1106	+2427
Spearfish	1120	1120	+2413
Goose Egg	1420	1371	+2162
Minnekahta	1600	1613	+1920
Opeche	1650	1648	+1885
Minnelusa	1690	1685	+1848
2nd Converse SS	1740	1741	+1792
Converse Anhy	1810	1821	+1712
3rd Converse SS	1870	1870	+1663
4th Converse SS	2020	2024	+1509
Red Marker	2160	2166	+1367
2nd Leo SS	2290	2295	+1238
<u>Total Depth:</u>	2400	2400	

Formation Tests: None

Cores: None

Logs: By Schlumberger, Newcastle, Wyoming

Sonic & Cal	5" (1')	1136-2393
Gamma Ray	5"	300-2393
Dual Ind - LL	2"	1136-2394
	5"	1136-2394



POWERTECH (USA) INC.

API ID 40 047 05147

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ConRoy #1 F. A. Peterson
C NE SE 22 T7S R1E
Fall River Co., South Dakota

SUMMARY (Cont'd.)

<u>Drilling Mud:</u>	Mo-Mar Mud Company, Casper, Wyoming
<u>Drilling Contractor:</u>	Barnhart & Bullock Drilling Company, Casper, Wyoming
<u>Geologic Supervision:</u>	James D. Copen, Consulting Geologist, Casper, Wyoming



ConRoy #1 F. A. Peterson
C NE SE 22 T7S R1E
Fall River Co., South Dakota

GEOLOGIC RECORD

Remarks

The test was proposed primarily to investigate a permeability pinch-out of the Second Leo Sandstone member of the Minnelusa. The test was located approximately midway between a down-dip dry hole having 40 feet of permeable sandstone which was wet with a show of oil and two up-dip dry holes, both of which had no permeable sand. One of the up-dip tests had good oil staining in the Second Leo. Secondary objectives were the Canyon Springs member of the Sundance and the several Converse sands of the upper Minnelusa. The test was proposed to drill to a total depth of 2500 feet; or 300 feet below the Red Marker.

In drilling, a normal sequence of formations was encountered. The Second Leo was found to be thin, dolomitic, tight and had no shows. The various Converse sandstones were found to be nicely developed but had no shows. There were no cores or formation tests.

The test was plugged and abandoned at a depth of 2400 feet; approximately 240 feet below the Red Marker.

Sample Description

Samples from the surface hole (0-1140') are generally poor to useless, being predominantly material which was recirculated by the very heavy drilling mud used to control water flows. Samples were caught both from the pilot hole and while reaming. The descriptions below are partly of each, depending on which seemed the most representative. Samples from 1140 to total depth were of uniformly good quality. Sample intervals are 10 feet with the exceptions noted below. The samples are in possession of the American Stratigraphic Company, Billings, Montana.

20' Samples

100-260 Sh - drk gry to blk, fisl; occas silt strk; Pyr

DAKOTA 260

260-300 SS - gry partly mottled blk, wh, fmg, v/firm w/poor to no porosity, occas blk sh prtng, NS; Pyr

Begin 10' Samples

300-310 Sh - gry to brn-blk, partly mottled w/blk carb material;
SS - as abv grdg to Siltst; Pyr



ConRoy #1 F. A. Peterson
C NE SE 22 T7S R1E
Fall River Co., South Dakota

GEOLOGIC RECORD (Cont'd.)

310-340 SS - wh to lt gry mottled and banded w/blk, fg, vht, NS;
little Sh - a/a; Pyr
340-360 SS - a/a grdg to v/argill Siltst; little Sh - v/lt gry,
wxy to silty; few Siderite pellets; Pyr
360-370 Same a/a w/free Sd - fmg, NS
370-380 Same a/a w/abun free Sd; little SS - clr, fmg, v/fri,
ex porosity, NS; Pyr

FUSON 380

380-420 Sh - lt gry, wh, pale lvndr, wxy; decr SS - a/a
420-430 Sh - v/drk gry w/brn cast, wxy
430-440 Sh - a/a; Sh - wh, pale grn, wxy
440-460 Sh - pale grn to wh, v/sdy, wxy; little Sd - free; Sh a/a

LAKOTA 460

460-480 Sd - free, fcg, poor sorting; NS; Sh - a/a; Pyr
480-500 Same a/a; little Sh - pale grn, sdy grading to SS-pale
grn, v/argill, NS; Pyr

Begin 20' Samples

500-520 SS - fmg, fri, porous, NS; SS - wh, pale grn, v/argill; abun
free Sd; Sh - brite grn, wh, gry, blk, sdy; entire spl
balled-up w/gry Bent

MORRISON 520

520-560 Sh - blu-grn to brn-gry, wxy; little SS - clr, mcg, v/fri
& porous, NS; abun free sd
560-580 Siltst - dead wh w/thin even bands of blk carb Sh; Sh - blk,
silty; ls - drk gry, dns; abun Pyr
580-600 Same a/a; Sd - free, mvsg, ang to rd, NS; Pyr
600-660 SS - gry, vf-vsg, v/Pyrte, fri, argill, poor porosity, NS;
Sh - a/a; abun free Sd
660-910 Samples this interval were composed 100% of recirculated
material, one fragment of grn, glauc siltstone observed
in 740-760 sample is thought to be near the top of the
Sundance

Resume 10' Samples

910-920 Mostly recirc material; Siltst - red-brn, v/argill & soft
920-980 SS & Siltst - red-brn to wh, fcg, partly w/ex porosity, NS
980-1040 SS - lt gry-grn, fmg, partly w/ex porosity, NS; Sh - blu-gry,
wxy



POWERTECH (USA) INC.

API ID 40 047 05147

ConRoy #1 F. A. Peterson^{22 of 48}
C NE SE 22 T7S R1E
Fall River Co., South Dakota

GEOLOGIC RECORD (Cont'd.)

1040-1090 Sh - blu-gry, wxy, blocky; little SS a/a
1090-1110 Poor samples, apparently same a/a

CANYON SPRINGS 1110

1110-1120 Poor spl; abun free sd - fvcg, clr qtz, lrg frns are
well rdd, NS

SPEARFISH 1120

1120-1140 Same a/a; increasing SS & Siltst - red-brn, vfg, argill,
tite
1140-1150 No sample
1150-1160 Same a/a w/occas Anhy

Begin 20' Samples

1160-1180 Same a/a
1180-1420 Siltst - red-brn a/a grading to Sh of same clr; occas Anhy

GOOSE EGG 1420

1420-1580 Anhy - wh, buff, dns to xln; Siltst & Sh - red-brn
1580-1600 Siltst & Sh - red-brn w/little Anhy

MINNEKAHTA 1600

1600-1640 Ls - wh, pnk, viol, dns; abun Anhy & Sh a/a

Resume 10' Samples

1640-1650 Same a/a

OPECHE 1650

1650-1690 Sh - brite red-brn, earthy; little Ls & Anhy a/a

MINNELUSA 1690

1690-1700 Sh - brite red-brn a/a, partly sdy; Dolo - red-brn, dns;
Anhy - wh, xln
1700-1720 Sh - red-brn a/a, bcmg silty; abun Anhy - wh
1720-1740 Silt & Sh a/a becoming sdy, no porosity, NS; abun Anhy



GEOLOGIC RECORD (Cont'd.)

SECOND CONVERSE SANDSTONE 1740

1740-1746 SS - wh, tan, orng, fmg, argill, tite w/rare porosity, NS;
Sh & Anhy a/a
Circ 1746 Same a/a, NS
1746-1760 Same a/a, NS
1760-1790 SS - wh, pnk, orng, mcg, ex porosity in part, NS; little
Sh & Anhy a/a
1790-1810 SS - a/a to viol, mg, argill & tite, NS; Sh & Anhy a/a

CONVERSE ANHYDRITE 1810

1810-1840 Anhy - wh, buff, dns, xln; Dolo - pnk, viol; Sh - brite
red w/occas grn mottling; diminishing SS a/a
1840-1870 Dolo - gry, viol, dns, gran; Anhy & Sh a/a

THIRD CONVERSE SANDSTONE 1870

1870-1876 SS - wh to orng, mg, partly argill, v/fri, fair porosity,
NS; Sh, Anhy & Dolo a/a
Circ 1876 Same a/a, NS
1876-1890 SS - same a/a to red, fmg, v/argill & tite; NS; Sh, Anhy
& Dolo a/a
1890-1900 Same a/a w/decr SS
1900-1940 Dolo - tan, wh, gry mottled blk, dns to gran; little SS,
Sh & Anhy a/a
1940-1970 Dolo - a/a w/abun smoky cht; little Anhy & Sh a/a
1970-1980 Dolo - a/a to tan, brn; abun Anhy
1980-2000 SS - wh, mg, dolotc, hd & tite, NS; Dolo - a/a to wh, pnk;
abun Anhy
2000-2020 Dolo & Anhy a/a

FOURTH CONVERSE SANDSTONE 2020

2020-2030 SS - clr, mg, fri, porous, NS; Dolo & Anhy a/a
Circ 2035 SS - wh, mg, fri, porous, abun free Sd, NS; Sh, Dolo &
Anhy a/a
2035-2040 Same a/a
2040-2060 Anhy - wh to brn, dns to xln; little Dolo - tan, pnk;
diminishing SS a/a
2060-2070 Same a/a w/abun free Sd - mcg, NS
2070-2100 Dolo - tan, pnk, viol, dns, gran; little Anhy, Sh & SS a/a
2100-2110 Anhy - wh, dns, xln; Dolo - tan, pnk; abun Sh - red
2110-2120 Dolo - wh mottled viol, dns; little Anhy & Sh a/a
2120-2130 Same a/a w/free Sd
2130-2160 Same as 2110-20 w/little SS - wh to lvndr, fg, poor porosity,
NS



ConRoy #1 F. A. Peterson
C NE SE 22 T7S R1E
Fall River Co., South Dakota

GEOLOGIC RECORD (Cont'd.)

RED MARKER 2160

2160-2170 Same a/a w/little "Red Marker" Sh - red, lvndr, splntry,
sub-metallic, specular sheen
2170-2180 Abun "Red Marker" Sh w/Dolo, Anhy & SS a/a
2180-2190 Dolo - wh, tan, gran to dns; abun Anhy; little "Red Marker"
Shale
2190-2200 Little SS - wh mottled viol, mg, tite, NS; Dolo, Anhy &
abun "Red Marker" Sh
2200-2210 Sh - dead blk, v/hd & brtl, fisl; Same a/a
2210-2220 Same a/a w/Dolo - lt to drk gry, gran to earthy
2220-2260 Dolo - tan, brn, wh, pnk; little Anhy; little SS - wh, fmg,
tite, NS; Sh a/a
2260-2270 SS - gry, fmg, dolotc, tite, NS; Dolo, Anhy & Sh a/a

Begin 5' Samples

2270-2275 Dolo - gry to drk brn, microxln; SS - a/a, NS
2275-2285 Dolo - a/a; little Anhy - wh
2285-2290 Sh - blk, brittle, flakey; tr SS - gry, fmg, dolotc, tite,
NS

SECOND LEO SANDSTONE 2290

2290-2300 SS - gry, fmg, v/dolotc grading to sdy dolo, tite, NS;
little Anhy - wh, xln
2300-2311 Dolo - med gry, fn xln
Circ 2314 Sh - blk, silty, brittle
2314-2320 Dolo - med gry, microxln, prtly w/setrd sd grns
2320-2325 SS - gry to wh, fmg, v/dolotc, tite, NS

Resume 10' Samples

2325-2335 Dolo - gry to wh, microxln, tite; Anhy - gry, sdy
2335-2345 Sh - blk, silty, hd
2345-2355 Dolo - gry, microxln, hd
2355-2363 Dolo - a/a w/abun Anhy - wh, xln
Circ 2363 SS - gry, mg, v/dolotc, tite, NS
2363-2375 Dolo - med gry, microxln; little Anhy - wh, xln
2375-2385 Sh - blk & drk brn, silty, carb
2385-2390 Dolo - med gry, microxln; little SS - wh to buff, fmg,
dolotc, tite, NS
2390-2400 SS - a/a, NS
2400 TOTAL DEPTH



ConRoy #1 F. A. Peterson
C NE SE 22 T7S R1E
Fall River Co., South Dakota

DRILLING RECORD

Remarks

The original proposal was to drill a 12-1/4-inch surface hole to a depth of approximately 1050 feet and set surface casing at that point to shut off water flows which were anticipated from the Dakota, Lakota and Sundance Sandstones. From under surface a 7-7/8-inch hole was to be drilled to the total depth of approximately 2600 feet.

In practice, 30 feet of 14-inch conductor pipe was set in 30 feet of 17-1/4-inch hole. 8-3/4-inch pilot hole was drilled 30-645 feet, followed by 7-7/8-inch pilot hole 645-906 feet; reamed 12-1/4 inch from 30-847 feet; 7-7/8-inch pilot hole 906-1140 feet and reamed 12-1/4-inch from 947-1140 feet. 8-5/8-inch surface pipe was set at 1136 feet resulting in a successful water shut-off. The balance of the hole was drilled 7-7/8-inch to the total depth of 2400 feet. Lost circulation was encountered momentarily at 2025 feet, but was cured by the addition of lost circulation material. Because of deviation problems, 5-1/2 days were required to drill and ream the surface hole. Casing was set and the balance of the test was drilled in 8 days.

The test was drilled with a Unit U-34 rig utilizing two 671 GM Diesel draw works motors (300 HP) and a 214P Oil Well 7-1/4" x 14" mud pump with two 6-110 GM Diesel motors (600 HP).

Well History

12-10-65	Rig up; drill 30' of 17-1/4" conductor hole and set 30' of 14" conductor pipe
12-11-65	Drill 8-3/4" surface hole 30-663'
12-12-65	Drill 8-3/4" surface hole 633-645'; drill 7-7/8" surface hole 645-852'
12-13-65	Drill 7-7/8" surface hole 852-906'; ream surface hole 30-565' to 12-1/4"
12-14-65	Ream surface hole 565-847' to 12-1/4"
12-15-65	Drill 7-7/8" surface hole 906-1140'; ream 847-947' to 12-1/4"
12-16-65	Ream surface hole 947-1140 to 12-1/4"; set surface casing; W.O.C.
12-17-65	W.O.C.; drill cement 1093-1140; drill 7-7/8" hole 1140-1340'
12-18-65	Drill 7-7/8" hole 1340-1656'
12-19-65	Drill 7-7/8" hole 1656-1919'
12-20-65	Drill 7-7/8" hole 1919-2046'
12-21-65	Drill 7-7/8" hole 2046-2198'
12-22-65	Drill 7-7/8" hole 2198-2301'
12-23-65	Drill 7-7/8" hole 2301-2400' total depth; prepare to log
12-24-65	Run logs; plug and abandon



POWERTECH (USA) INC.
API ID 40 047 05147

26 of 46
ConRoy #1 F. A. Peterson
C NE SE 22 T7S R1E
Fall River Co., South Dakota

DRILLING RECORD (Cont'd.)

Bit Record

Bit #	Size	Make	Type	In	Out	Footage
1	8-3/4	HTCo	OSC3	30	646	Dr 616'/12 hrs.
2	7-7/8	HTCo	OSC3	646	845	Dr 199'/16 hrs.
3	7-7/8	HTCo	OWC	845	906	Dr 61'/ 7 hrs.
4	7-7/8	HTCo	LW3	906	1120	Dr 214'/16 hrs.
5	7-7/8	HTCo	LW3	1120	1140	Dr 20'/ 2 hrs.
6	12-1/4	Smith	DT	29	667	Rm 638'/16 hrs.
7	12-1/4	Smith	DT	667	847	Rm 180'/ 7 hrs.
8	12-1/4	HTCo	OSC3	847	1140	Rm 293'/ 8 hrs.
9	7-7/8	Smith	K2PJ	1140	1462	Dr 322'/12 hrs.
10	7-7/8	Reed	YS1R	1462	1656	Dr 194'/ 8 hrs.
11	7-7/8	Smith	K2PJ	1656	1854	Dr 198'/12 hrs.
12	7-7/8	HTCo	OWVJ	1854	1948	Dr 94'/10 hrs.
13	7-7/8	Smith	T2J	1948	2046	Dr 98'/12 hrs.
14	7-7/8	Reed	YMR	2046	2153	Dr 107'/13 hrs.
15	7-7/8	Reed	YHGJ	2153	2228	Dr 75'/12 hrs.
16	7-7/8	HTCo	OWV	2228	2273	Dr 45'/ 8 hrs.
17	7-7/8	Smith	LW4	2273	2321	Dr 48'/ 9 hrs.
18	7-7/8	HTCo	OWC	2321	2400	Dr 79'/10 hrs.

Casing Record

30' of 14" spiral weld conductor pipe at 30' w/10 sx
1125.36' of 8-5/8" surface casing at 1136.36 KB w/850 sx

Mud Program

The surface hole (30-1140') was drilled with weighted mud in anticipation of water flows from the Dakota, Lakota and Sundance Sandstones. The mud was maintained at an average weight of 11 lb/gal and an average viscosity of 50 sec/qt.

After surface casing, the balance of the hole was drilled with mud having the following average characteristics:

Weight	10.4 lb/gal
Viscosity	38 sec/qt
Water Loss	13 cc. API

A momentary loss of circulation occurred at 2025' in the 4th Converse Sandstone. The condition was remedied with very little loss of mud by the addition of lost circulation material. No further trouble was encountered.



POWERTech (USA) INC.
API ID 40 047 05147

27 of 46
ConRoy #1 F. A. Peterson
C NE SE 22 T7S R1E
Fall River Co., South Dakota

DRILLING RECORD (Cont'd.)

Plugging Record

Used 50 sacks of cement to plug as follows:

1925-1850 w/25 sacks
1195-1120 w/25 sacks

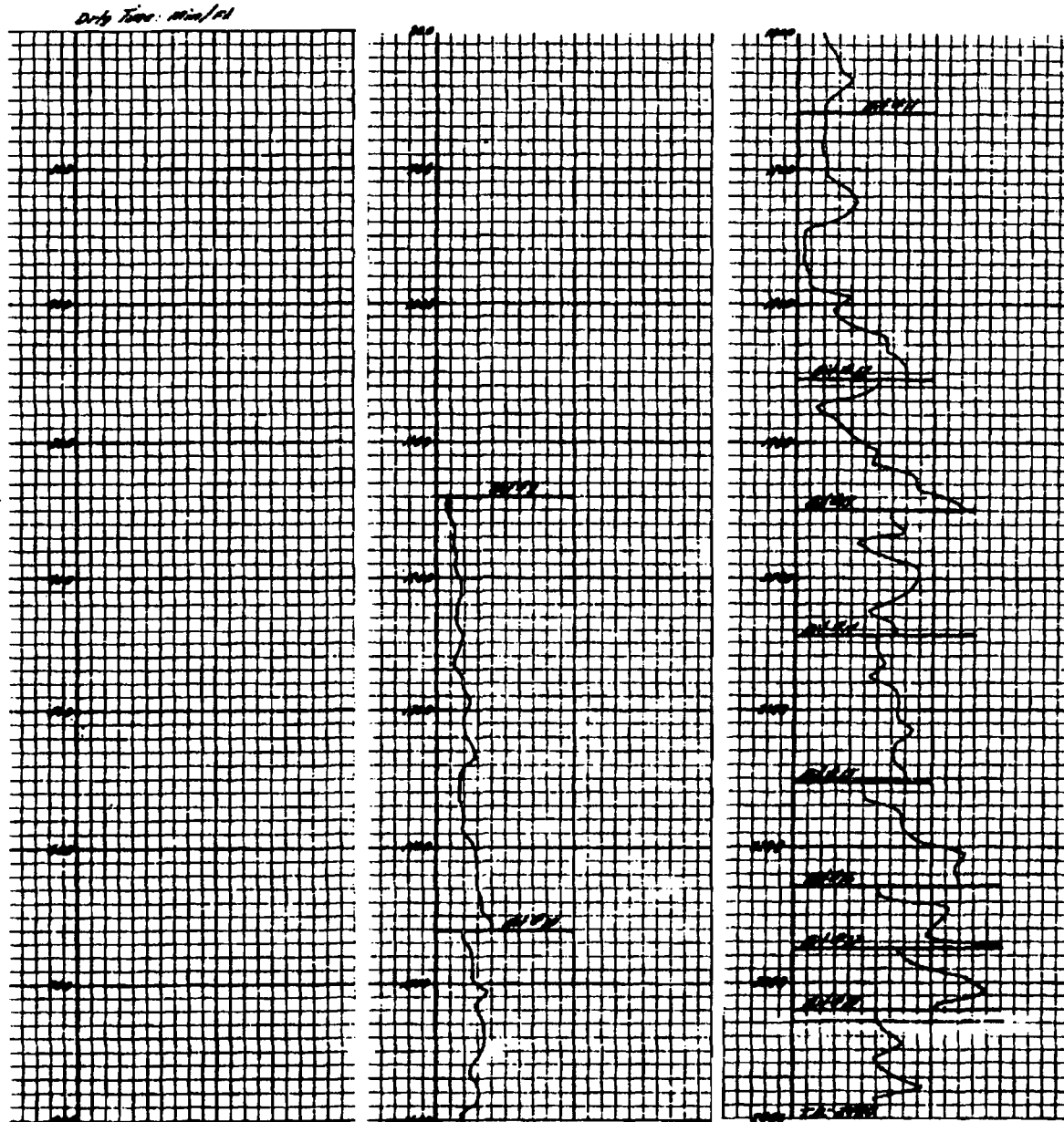
In lieu of a surface plug, a cap was screwed and tack-welded to the surface casing to permit later re-entry for conversion to a water well.



POWERTECH (USA) INC.
API ID 40 047 05147

28 of 48
CONROY #1 PETERSON
NE SE 22 T7S R1E
FALL RIVER Co., So.

PENETRATION RATE





ADMINISTRATIVE / SUNDRY REPORTS



POWERTECH (USA) INC.
API ID 40 047 05147

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5. Dak. Oil & Gas Board
FORM 7

STATE OF S.D. - PIERRE

PLUGGING RECORD

Operator THE CONSOLIDATED ROYALTY OIL COMPANY		Address P. O. Box 605, Casper, Wyoming 82601	
Name of Lessee F. A. Peterson	Well No. 1	Field & Reservoir Wildcat	
Location of Well 1980' FEL and 1980' FSL of Section 22-7S-1E		Sec-Twp-Rge or Block & Survey	County Fall River
Application to drill this well was filed in name of THE CONSOLIDATED ROYALTY OIL COMPANY	Has this well ever produced oil or gas No	Character of well at completion (Initial production): Oil (bbls./day) - - Gas (MCF/day) - - Dry? Yes	
Date plugged: 12-24-65	Total depth 2400'	Amount well producing when plugged: Oil (bbls./day) - - Gas (MCF/day) - - Water (bbls./day) - -	
Name of each formation containing oil or gas. Indicate which formation open to well-bore at time of plugging No oil or gas. Refer to well summary and sample description for details	Fluid content of each formation	Depth interval of each formation	Size, kind & depth of plugs used. Indicate zones squeeze cemented, casing amount cement 1925' to 1850' - 25 sz. 1195' to 1125' - 25 sz.

CASING RECORD

Size pipe	Put in well (ft.)	Pulled out (ft.)	Left in well (ft.)	Casing depth and method of parting casing (shot, ripped, etc.)	Packets and other
8-5/8"	1125.36'		All		Guide shoe, float collar and six centralizers

Was well filled with mud-laden fluid, according to regulations?

Yes

Indicate deepest formation containing fresh water

Basal Sundance from 1102'-1120'

In addition to other information required on this form, if this well was plugged back for use as a fresh water well, give all pertinent details of plugging operations to base of fresh water sand, perforated interval to fresh water sand, name and address of surface owner, and attach letter from surface owner authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.

With the verbal approval of Mr. Earl Cox, State Engineer, the cement plugs normally set in the bottom and top of the surface casing were omitted to allow the surface owner, Mr. Francis A. Peterson, P.O. Box 5, Burdock, South Dakota to convert the cased surface hole into a water well pending approval of Oil and Gas Board and Water Resources Commission. The water producing sands of the Dakota-Lakota series, Sundance and Basal Sundance formations were successfully cased off with 8-5/8" 24 lb. casing set in the Spearfish @ 1128' ground level. The surface casing string was cemented to surface with 850 sacks of cement with good returns of cement slurry (estimate 50 bbls.) flowing to reserve pit during displacement. No additional water zones were encountered while drilling below the surface casing to total depth. A casing protector with the abandonment marker welded on top has been screwed into the top casing collar at ground level and tack welded to permit later re-entry for conversion to a water well.

USE REVERSE SIDE FOR ADDITIONAL DETAIL

Executed this the **13th** day of **January**, 19**66**

State of **WYOMING**
County of **NATRONA**

Edward F. Rorke
Signature of Affiant

Before me, the undersigned authority, on this day personally appeared **Edward F. Rorke** known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states, that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.

Subscribed and sworn to before me this **13th** day of **January**, 19**66**

SEAL

My commission expires **May 13, 1967**

Edward F. Rorke
Notary Public in and for **NATRONA**
County, **WYOMING**

DO NOT WRITE BELOW THIS LINE

Approved **6-14-66**
Date

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA
Robert J. Brown Secretary

June 13, 1966
William J. Gieger
Notary Public

Note: File 2 copies of this form with Secretary, Oil & Gas Board, Pierre.



POWERTECH (USA) INC.
API ID 40 047 05147

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STATE OF S.D. FORM

S. Dak. Oil & Gas Board
FORM 4

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

FARM OR LEASE NAME

F. A. Peterson
WELL NO.

TYPE OF COMPLETION

☐ Oil Well ☐ Gas Well ☒ **DRY AND ABANDONED**
☐ New Well ☐ Work-Over ☐ Deepen ☐ Plug Back ☐ Same Zone ☐ Diff Zone

1
FIELD AND POOL OR WILDCAT

Wildcat

OPERATOR

THE CONSOLIDATED ROYALTY OIL COMPANY

NO. ACRES IN LEASE

1840 acres

ADDRESS

P. O. Box 645, Cooper, Wyoming 82601

U. S. SEC. TWP. RGE

LOCATION (In feet from nearest lines of section or legal subdivision where possible)*

C 34-25E, Sec. 22-7N-1E

Surface

1980' FRL and 1980' FRL of Section 22-7N-1E, NW

Top prod. interval

COUNTY

At total depth

Fall River

PERMIT NO.

408

DATE ISSUED

11-22-63

PREVIOUS PERMIT NO.

DATE ISSUED

DATE SPUDDED

12-11-63

DATE T.D. REACHED

12-23-63

DATE COMPL.

(Ready to Prod)

ELEVATIONS

3522' or - 3535' MSL

ELLY CASINGHEAD

FLGE

TOTAL DEPTH

2400'

PLUG BACK

T.D. (MD & TVD)

IF MULTIPLE COMPL.

HOW MANY*

INTERVALS

DRILLED BY

ROTARY TOOLS

0' to 2400'

CABLE TOOLS

None

PRODUCING INTERVALS, THIS COMPLETION, TOP, BOTTOM, NAME (MD & TVD)*

None

DATE DIRECTIONAL

SURVEY SUBMITTED

TYPE ELECTRIC AND OTHER LOGS RUN (Circle these filed)

Sonic Log-Gamma Ray with Caliper, Dual Induction-Laterolog

WAS WELL CORKED

No

USING RECORD (Report all strings set in well)

CASING SIZE

8-5/8"

DEPTH SET (MD)

1136'

HOLE SIZE

12-1/4"

WEIGHT LBS. FT.

24 lb.

PURPOSE

Surface casg.

SACKS CEMENT

850

AMOUNT CURED

None

LINER RECORD

SIZE

TOP (MD)

BOTTOM (MD)

SACKS CEMENT

SCREEN (MD)

SIZE

TUBING RECORD

DEPTH SET (MD)

PACKER SET (MD)

PERFORATION RECORD

DEPTH INTERVAL (MD)

HOLS PER FT.

SIZE AND TYPE

PURPOSE

AUTO. SHOT. FLAC. CEMENT SQUEEZE, Etc.

AMOUNT AND KIND OF

MATERIAL USED

DEPTH INTERVAL (MD)

PRODUCTION

DATE FIRST PRODUCTION: PRODUCING METHOD (Flowing, gas lift, pumping, size & type of pump) WELL STATUS (Prod. or shut in)

DATE OF TEST (HOURS TESTED) CHOKER SIZE PRODUCTION OIL, BBL. GAS, Mcf. WATER, BBL. & % OIL GRAVITY API (Comp) FOR TEST

FLOW TUBING PRESSURE CASING PRESSURE CALCULATED 24-HOUR RATE OIL, BBL. GAS, Mcf. WATER, BBL. & % OIL GRAVITY API (Comp)

DISPOSITION OF GAS (sold, used for fuel, vented, etc.)

TEST WITNESSED BY

LIST OF ATTACHMENTS

2 copies Well History

2 prints Sonic Log-Gamma Ray with Caliper

2 prints Dual Induction-Laterolog

I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED: **Edward F. Rother**

TITLE: **Production Superintendent**

DATE: **1-13-66**

DO NOT WRITE BELOW THIS LINE

*See Instructions On Reverse Side

Approved

Date

1-14-66

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

Charles L. Smith, Secretary



CORRESPONDENCE



POWERTECH (USA) INC.

March 9, 1966

Mr. Earl J. Cox
South Dakota Geological Survey
Box 187
Relle Fourche, South Dakota

Dear Earl:

Reference is made to your letter of March 7, 1966, addressed to Mr. Bill Lewis, Buena Drilling Company, concerning the Deane #1 Holloway-State Well.

In the fifth paragraph, you stated that you assumed the various required reports had been sent to our office. We have received everything except two copies of the dual-induction log, and two copies of the sonic gamma-ray log.

Sincerely,

Merlin J. Nipton
Assistant State Geologist

MJT:bm

P. S. We received the samples from the following wells today.

Consolidated Royalty #1 Potroon	Consolidated Royalty #1 Childers
NW SE 22-7S-1E	8-03-2E
Pall River County	Pall River County

Consolidated Royalty #1 Superior-USA
10-9S-2E
Pall River,



January 31, 1966

Mr. Earl J. Cox
State Geological Survey
P. O. Box 187
Belle Fourche, S. Dak.

Dear Earl:

I am enclosing a dual induction-laterolog and sonic log and a ray for each of the following wells:

Conkoy #1 U.S.A. Superior
Fall River County

Conkoy #1 Childers
Fall River County

Conkoy #1 Peterson
Fall River County

Pennaco #1 USA-Ideen
Fall River County

Sincerely,

(Mrs.) Ruth Lynch
Bookkeeper

For the State Geologist

Inclosures 6



January 10, 1966

Re: ConRoy #1 Peterson
Fall River County

Mr. Earl J. Cox
State Geological Survey
Box 187
Belle Fourche, South Dakota

Dear Earl:

I think you are quite right that we do not need to involve Joe Grimes in taking over this particular well at this time. I think that it is advisable for us to keep close check with Mr. Peterson to see that he does fulfill the requirements of getting a permit to convert the well to water and to make sure that Joe is involved when such a conversion does take place.

As long as the marker has been placed and the mud pits filled and with Mr. Peterson's release I think we can say that all things have been fulfilled in qualifying this well for release as soon as we have received the information as stated in your letter.

I am being flooded with letters giving viewpoints about our changes in Rules and Regulations. At this time it appears that Gulf is definitely in the minority in their thinking and certainly the more letters that I can get to validate a particular position, that will be the direction in which I have to advise the board. When the time does come that a decision needs to be made, I want to sit down with you and go over all the correspondence to arrive at an adequate recommendation to give to the board for any rule changes. Possibly this could be done in Pierre sometime.

Earl, I want to express my sincere and deepest appreciation, as I have done to the personnel here, on your kindness in giving me the bowling ball this past Christmas. It does my heart a lot of good to know that the employees are behind the activities of the Survey 100% and you can be sure that I am going to do my utmost to see that the people in the Survey are given every benefit possible from the standpoint of improving the situation both in work and time.



Mr. Earl J. Cox

Page 2

January 10, 1966

I have to go to Pierre this Wednesday to appear before the appropriations committee. The Governor does want to give us money for another ground water geologist. Although I did not ask for this money, the pressure outside has caused the administration to see fit to bend to this request and therefore asked me to give them a modest sum for inclusion in our budget to enhance our ground-water program. The sum that I asked for was \$18,650.00 to be divided between salary O & M and direct match moneys for the USGS.

I feel somewhat remiss in the fact that E. Y. Berry responded to your letter about those plats to this office. I mislaid the correspondence and have just now found it. When you hear from Billings, I think it would be nice to write E. Y. Berry and inform him as to whether or not you achieved this material. His letter is enclosed.

Sincerely,

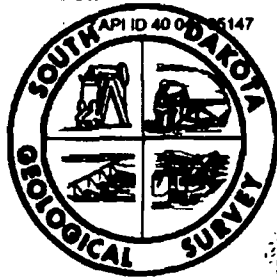
Duncan J. McGregor
State Geologist

DJM:bm

Enc.



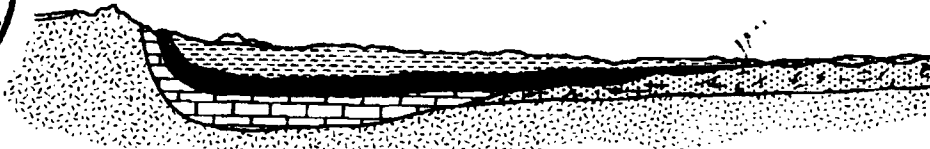
POWERTECH (USA) INC.



SCIENCE CENTER, UNIVERSITY OF SOUTH DAKOTA CAMPUS,
VERMILLION, 57069, PHONE 624-4471

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WESTERN FIELD OFFICE, 208 GAY BUILDING, BELLE FOURCHE,
BOX 187, 57717, PHONE 692-3121



Western Field Office
January 6, 1966

Dr. Duncan McGregor
State Geologist
State Geological Survey
Vermillion, South Dakota

Re: Conroy #1 Peterson
NWSE-22-7S-1E
Fall River County, So. Dakota
Permit No. 408

Dear Duncan:

Enclosed is an original and copy of a letter from the landowner of the above test that is self-explanatory. Peterson's letter is addressed to you, rather than Joe Grimes, as the test may not be converted for a long time and it would seem pointless to have the Water Resources Commission assume jurisdiction of the well at this time. However, we can go through the procedure of turning it over to the Water Resources Commission if you feel this is the proper action to take.

The marker has been placed and the pits filled and smoothed. The location can be released from bond coverage after we have received the following:

One set of samples
Two copies of the dual induction log
Two copies of the sonic-gamma ray log
Two copies of the sample description
Final plugging forms.

Sincerely,

Earl Cox
Engineering-Petroleum Geologist

EC:sn

DUNCAN J. MCGREGOR
DIRECTOR AND STATE GEOLOGIST
VERMILLION

MERLIN J. TIPTON
ASSISTANT STATE GEOLOGIST
VERMILLION

EARL J. COX
SENIOR GEOLOGIST
BELLE FOURCHE



Burdock, South Dakota
December 28, 1965

JAN -7 1966

Dr. Duncan McGregor
State Geologist
State Geological Survey
Vermillion, South Dakota

Re: Conroy #1 Peterson
NWSE-22-7S-1E
Fall River County, So. Dakota
Permit No. 408

Dear Dr. McGregor:

At my request, the ten sack surface plug was eliminated in plugging the above test. It is planned that some time in the future, the surface casing in the hole will be perforated and the test made into an artesian water well.

Should the test be converted to a water well, in the future, I agree to assume full liability for any subsequent plugging that might be required.

Sincerely,


Francis A. Peterson



POWERTECH (USA) INC.

API ID 40 047 05147

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Burdock, South Dakota
December 28, 1965

Dr. Duncan McGregor
State Geologist
State Geological Survey
Vermillion, South Dakota

Re: Conroy #1 Peterson
NWSE-22-7S-1E
Fall River County, So. Dakota
Permit No. 406

Dear Dr. McGregor:

At my request, the ten sack surface plug was eliminated in plugging the above test. It is planned that some time in the future, the surface casing in the hole will be perforated and the test made into an artesian water well.

Should the test be converted to a water well, in the future, I agree to assume full liability for any subsequent plugging that might be required.

Sincerely,

Francis A. Peterson



POWERTECH (USA) INC.

API ID 40 047 05147

DEC 28 1965

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Western Field Office
December 27, 1965

Mr. Francis A. Peterson
P. O. Box 5
Burdock, South Dakota

Re: Conroy #1 Peterson
MSE-22-7S-1E
Fall River County, So. Dakota
Permit No. 408

Dear Mr. Peterson:

Following your request, the top rock surface plug was not placed when the above test was plugged. To leave out this plug, it is necessary that you request it in writing.

Enclosed is an original and two copies of a letter to the State Geologist requesting that the surface plug not be required. Please sign the original and two copies and return them to me in the enclosed addressed envelope.

Sincerely,

Earl Cox
Earl Cox
Engineering-Petroleum Geologist

EO:sn

SOUTH DAKOTA
State Water Resources Commission

STATE OFFICE BUILDING
PIERRE, SOUTH DAKOTA

November 24, 1965

Francis A. Peterson
P. O. Box 5
Burdock, South Dakota

I have been advised that the Consolidated Royalty Oil Co. has
obtained a Permit to Drill for Oil and Gas on your land in Section 22,
T 7 S, R 1 E.

Occasionally, owners of land consider converting abandoned oil wells
into water wells. Please advise me whether or not you intend to convert the
oil well drill hole on your land into a water well if water is encountered
and the drill hole is abandoned as an oil well.

If you are considering making a water well out of the abandoned oil
well drill hole, special considerations are necessary to comply with the
State's oil and water laws. The abandoned oil hole must be properly plugged
and the water well properly constructed. All conversion work will be at
your expense. The cost will vary, depending upon the characteristics of the
drill hole, but such cost will be in the neighborhood of \$5,000 or more.
Usually another driller and drill rig will have to be arranged for. This
other drill rig and casing and other materials will have to be on hand to
take over immediately after the special oil well plugging is completed,
because the drill hole cannot be left open for any appreciable length of
time without spoiling it. Approval of plans for construction of the water
well will be required, and a bond covering proper construction may be re-
quired. Also, a water right may be required. All of these arrangements
take considerable time to accomplish.

Please advise me immediately if you plan to convert the oil well drill
hole into a water well. We both hope that a producing oil well results from
the drill hole on your land; however, if not and you are planning on a water
well, we must start making arrangements now.

Sincerely,

J.W. GRIMES
Chief Engineer

JWG/bw

cc Oil & Gas Board, Pierre, South Dakota
Dr. Duncan McGregor, State Geologist, Vermillion, S.D.



S. NCE CENTER, UNIVERSITY (SOUTH DAKOTA CAMPUS,
VERMILLION, S7069, PHONE 824-4471

WESTERN FIELD OFFICE, 208 GAY BUILDING, BELLE FOURCHE,
BOX 187, 57717, PHONE 822-3121

NOV 5 1965



Western Field Office
November 4, 1965

Dr. Duncan McGregor
State Geologist
State Geological Survey
Vermillion, South Dakota

Dear Duncan:

Just a note to let you know that Consolidated Royalty Oil
Company will make application for permits on the following locations:

Conroy #1 Childers
NESE-9-8S-2E
Fall River County

Conroy #1 Peterson
NWSE-22-7S-1E
Fall River County

Conroy #1 Superior-USA
SESE-10-9S-2E
Fall River County

The first well will test the basal Sundance formation. The
other two will test the second Lee Sand.

Consolidated Royalty is in the process of obtaining a \$20,000
blanket bond. This would indicate that further tests are planned.

Sincerely,

Earl Cox
Engineering-Petroleum Geologist

EC:sa

DUNCAN J. MCGREGOR
DIRECTOR AND STATE GEOLOGIST
VERMILLION

MERLIN J. TIPPON
ASSISTANT STATE GEOLOGIST
VERMILLION

EARL J. COX
SENIOR GEOLOGIST
BELLE FOURCHE



POWERTECH (USA) INC.

API ID 40 047 05147

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SURETY

NO SURETY INFORMATION FOR THIS WELL AS OF 5/18/2011



MISCELLANEOUS

July 2012

B-567

Appendix B



INVOICE

AMERICAN STRATIGRAPHIC COMPANY

1020 BROADWAY, DENVER • 924 E. YELLOWSTONE, CASPER • 17 NO 3107 ST BILLINGS

March 2, 1966

NC 1825

South Dakota Geological Survey
Attn: Dr. Duncan McGregor
Science Center
Vermillion, South Dakota

P. O. No.

SOUTH DAKOTA SAMPLE SITS

Consolidated Royalty #1 Peterson
NW SE 22-7S-1E
Fall River County, South Dakota

Consolidated Royalty #1 Childers
9-8S-2E
Fall River County, South Dakota

Consolidated Royalty #1 Superior - USA
10-9S-2E
Fall River County, South Dakota

N/C

PowerTech (USA) Inc.





Oil and Gas Search for: api_no_ like '40 047 20071'

Page 1 of 1

Export Options
(temporarily unavailable)

Page: 1

Record 1 of 1

Well Information

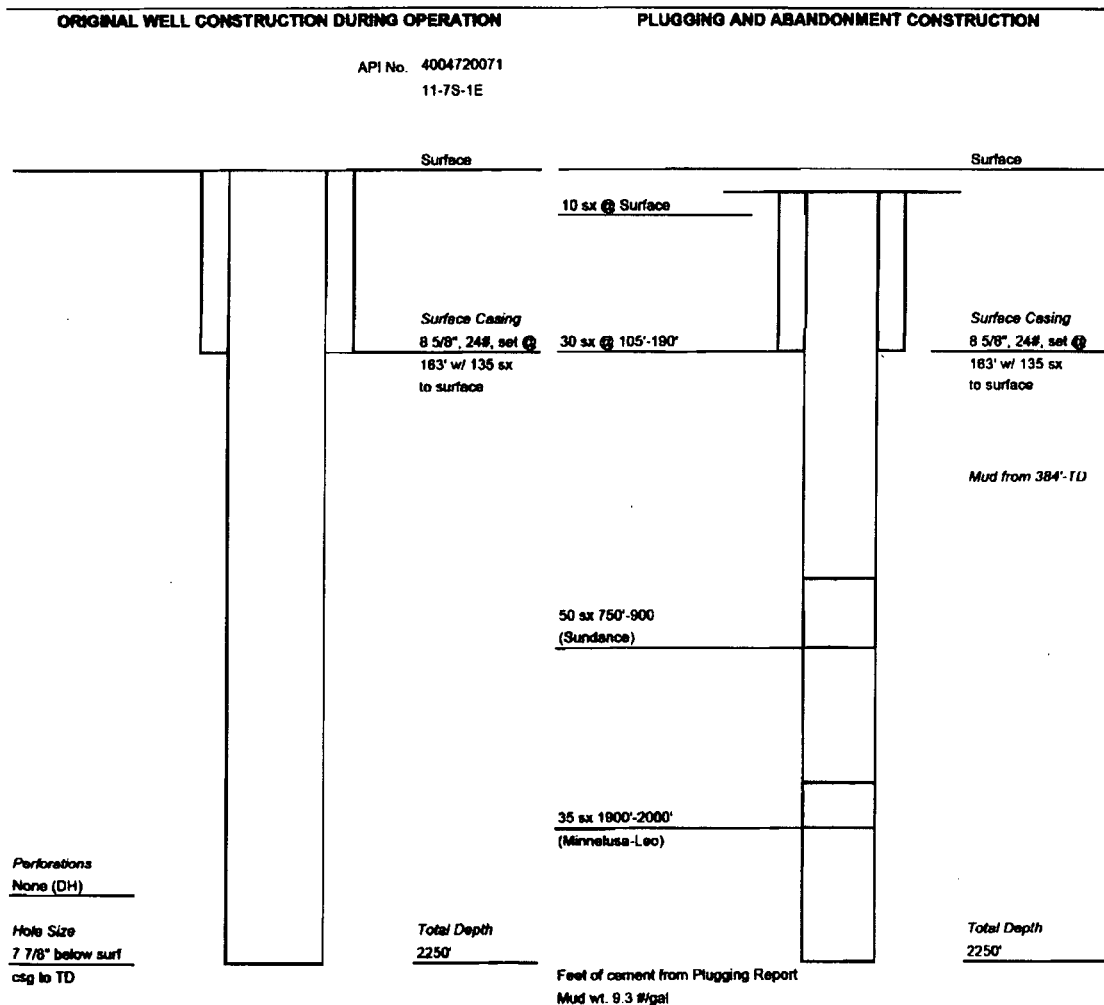
API No:	40 047 20071	County:	FALL RIVER
Well Name:	ARC 34-11 PETERSON	Location:	SWSE 11-7S-1E
Permit No:	776	Total Depth:	2250
Operator Name:	AQUARIUS RESOURCES CORPORATION	Bottom Hole:	Minnelusa
Permit Date:	11-10-1976	KB Elevation:	3689
Spud Date:	12-09-1976	Ground Elevation:	3679
Plug Date:	12-22-1976	Latitude:	43.451453
		Longitude:	-103.963826
Well Field	WILDCAT	Status	P&A
Class:	DRY HOLE	Type:	DRY HOLE

Formation Tops

Formation	Depth (ft.)
Morrison	406
Sundance	570
Spearfish	866
Goose Egg	1158
Minnekahta	1412
Opeche	1452
Converse	1552
Red Marker	1952
1st Leo	1964
2nd Leo	2062
3rd Leo	2168

Page 1 of 1 (goto top)

Page: 1 Next





POWERTECH (USA) INC.

API ID 40 047 20071

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FORM 7-66 1-6-77

Oil and Gas Report
Form 7

SUNDREY NOTICES AND REPORT ON WELLS		FARM OR LEASE NAME Peterson
		WELL NO. 34-11
<input type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> _____ <input checked="" type="checkbox"/> DRY		FIELD AND POOL, OR WILDCAT Wildcat
OPERATOR AQUARIUS RESOURCES CORPORATION		NO. ACRES IN LEASE 1080.00
ADDRESS 307 Conroy Building, Casper, Wyoming 82601		U. S. BLM. TWP. RGE. SW SE 11-7S-1E
LOCATION (Its not from nearest hole of section, or near intersection, where possible) 660' FSL, 2217' FEL Section 11-7S-1E		COUNTY Fall River
ELEVATIONS (D.P., M.B., N.Y., O.R., etc.; how determined) 3679' Gr., 3689' K.B.		

INDICATE BELOW BY CHECK MARK NATURE OF REPORT, NOTICE OR OTHER DATA			
NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	<input type="checkbox"/>	SHOOT OR ACIDIZE	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	REPAIR WELL	<input type="checkbox"/>
MULTIPLE COMPLETS	<input type="checkbox"/>	PULL OR ALTER CASING	<input type="checkbox"/>
ABANDON	<input checked="" type="checkbox"/>		

(Note: Report results of multiple completion on Well Completion or Intervention Form Log Form - FORM 9)

DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work)

Water was encountered in all porous zones drilled. The Leo sand had excellent porosity but yielded sulphur water when tested. Proposed plugging as approved by telephone is as follows:

- 35 sx 1900-2000 Minnelusa-Leo
- 50 sx 750- 900 Sundance
- 30 sx 105- 190 base of surface casing
- 10 sx Surface plug & erect dry hole marker

I hereby certify that the foregoing as to any work or operation performed is a true and correct report of such work or operation.

SIGNED John F. Trotter TITLE President DATE December 23, 1976

Approved Jan. 4, 1977 DO NOT WRITE BELOW THIS LINE
Date
OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA
Frederick J. [Signature]
CONDITIONS, IF ANY: See Instructions On Reverse Side Supervisor



Synopsis

Operator: Aquarius - Double U - Powerco

Well: #34-11 Peterson

Location: C/SW SE; 660' FSL, 2217' FEL
Section 11, T. 73., R. 1E.
Fall River County, South Dakota

Area: Wildcat (Driftwood Canyon Prospect)

Elevation: 3679' Ground, 3689' K.B.

Spudded: December 9, 1976 (7:30 A.M.)

Ceased Drilling: December 22, 1976 (3:30 A.M.)

Completed: December 23, 1976 (12:30 A.M.)

Status: P & A

Total Depth: 2250' driller, 2248' log

Casings: 8-5/8" surface casing set @ 163'

Hole Size: 7-7/8" below surface to TD

Contractor: A. O. Bullock Drilling Co. - Rig #1
Tool Pusher - Ray Cottrell
Drillers - Larry Malligan, D. F. Ellsworth, Chuck Sides

Drilling Mud: Wyoming Mud Co., Casper, Wyo.
Gel-Chemical from 384' to TD
Engineer - Bruce Johnson

Lost Circulation: Lost Circulation for 5 1/2 hours @ 384'.

Coring: No cores cut.

Drill Stem Tests: Halliburton Services
DST #1; 2nd Leg, 2060'-2082' (adjusted to log from 2068'-2090')
Rec. 125' muddy water, 1838' black sulfur water.
Engineer - D. H. Rook, Gillette, Wyoming

Logs: Seblunberger Well Surveying Corp.
Ran Dual Induction-Latentlog from 2248' to base of surface casing.
Ran Borehole Compensated Sonic Log w/caliper from 2248' to base of surface casing. Ran Gamma Ray log from base of surface casing to surface.
Engineer - Craig Rang, Gillette, Wyo.

Samples: All samples were delivered to American Stratigraphic Co., Casper, Wyo., for shipment to their Billings, Montana office where a cut will be made for the South Dakota State Geologist.



COUNTY: FALL RIVER
LEGAL LOCATION: SWSE 11-7S-1E
API NO: 40 047 20071
PERMIT NO: 776
WELL NAME: ARC #34-11 PETERSON
OPERATOR: AQUARIUS RESOURCES
CORPORATION
PERMIT ISSUED: 11/10/1976
PERMIT CLOSED: 01/05/1977
FILE LOCATION: 7S-1E-11 SWSE

TARGET CODES:

WELL HISTORY / CHECKLIST

PERMIT TO DRILL / INTENT TO DRILL

WELL INSPECTION / SCOUT REPORTS

OPERATOR'S TECHNICAL REPORTS / MAPS

ADMINISTRATIVE / SUNDRY REPORTS

CORRESPONDENCE

SURETY

MISCELLANEOUS



WELL HISTORY / CHECKLIST

BOND RELEASE CHECKLIST

Well Name & Location		Permit # 776
Aquarius #34-11 Peterson SWSE 11-7S-1E - Fall River		API # 40 047 20071
Bond # 19-130-1584-76	Date Issued Sept. 20, 1976	Date Released

Surface Restoration

- ☒ Pits filled
- ☒ Site level
- ☒ Site policed
- ☒ Dry-hole marker solid, sealed, correctly inscribed
- ☐ No dry-hole marker desired, letter in WFO files from surface owner

Paperwork filed

- ☐ Form 4 (Completion or Recompletion Report)
- ☒ Form 6 (Sundry Notices and Report on Wells)
- ☒ Form 7 (Plugging Report) (included on Form #6)

Geological Information Filed

- ☒ Well Logs: LES, SGP, DIL, GR, REFL, CALHT, Current Bond, Temp, Micro, Lithology, SM Dens SONIC
- ☒ DST Charts and Reports
- ☒ Geologist's Report
- ☐ Results of coring and core analyses (None cut)
- ☒ Set of 10-foot sample cuttings (check with Bob Schoon) (samples received @ Vermillion)

DATE

2-5-79

CHECKED BY

John Fricke

PERMIT CHECKLIST

Well Name and Location:	Permit # <u>776</u>
Aquarius #34-11 Peterson	API # <u>40 047 20071</u>
SWSE 11-7S-1E - Fall River	Bond # <u>19-0130-1584-76</u>

Paperwork filed with WFO

- ☒ Organization Report
- ☒ Application
- ☒ Bond
- ☒ Permit Fee

The Following Papers sent to Operator:

- ☒ Permit (Form 2a)
- ☒ Receipt for \$100 permit fee
- ☒ Cover letter explaining material sent

Permit Fee Filed:

- ☒ Permit fee w/Cash Receipts Transmittal Form sent to State Treasurer

Notification of New Permit sent to:

- ☒ Dr. Duncan J. McGregor
- ☒ Mr. Vern W. Butler
- ☒ Dr. Allyn Lockner
- ☒ Mr. George Kane

DATE November 11, 1976 CHECKED BY Jean Miller, Secretary, WFO



PERMIT TO DRILL / INTENT TO DRILL



State Pub. Co., Pierre

APPLICATION FOR PERMIT TO:

S. Dak. Oil & Gas Board
FORM 2☒ DRILL☐ DEEPEN☐ PLUG BACK

FARM OR LEASE NAME

☐ SINGLE ZONEPeterson
WELL NO.☒ OIL WELL☐ GAS WELL☐ MULTIPLE ZONE

34-11

OPERATOR

FIELD AND POOL OR WILDCAT

AQUARIUS RESOURCES CORPORATION

Wildcat

ADDRESS

NO. ACRES IN LEASE

307 Conroy Building, Casper, Wyoming 82601

1080.00

LOCATION (by lot from an established corner of the legal subdivision)

SEC. TWP. R. 10E

1/ 660' from South line
2217' from East line
Section 11-7S-1E

SW SE 11-7S-1E

COUNTY

Fall River

NAME AND ADDRESS OF SURFACE OWNER

ELEVATION

NO. OF WELLS ETC.

Peterson and Son, Inc.

3679' Gr.

None

Edgemont, South Dakota 57735

PROPOSED DEPTH

ROTARY OR CABLE TOOLS

NAME AND ADDRESS OF CONTRACTOR

Rotary

A. O. Bullock Drilling Company

APPROXIMATE DATE

P. O. Box 821

WORK WILL START

Casper, Wyoming 82602

November 10, 1976

IF LEASE PURCHASED WITH ANY WELLS DRILLED FROM WHOM PURCHASED (Name and address)

No

PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	NEW OR SECOND HAND	DEPTH	BAKES OF CEMENT
12 1/4"	8-5/8"	24#	New	150'	125
7-7/8"	5-1/2"	15.5#	New	2300'	75

DESCRIBE PROPOSED OPERATIONS. IF PROPOSAL IS TO DEEPEN OR PLUG BACK, GIVE DATA ON PRESENT PROTECTIVE ZONE AND PROPOSED NEW PROTECTIVE ZONE. GIVE BLOW OUT PREVENTER PROGRAM IF ANY.

Drill a 7-7/8" hole from bottom of surface casing to estimated total depth of 2300 feet. Will test the Leo zones of Minnelusa formation. Drillstem test any zones with shows of oil and gas. If commercial production indicated will set 5 1/2" casing to total depth, perforate and complete.

A double ram, hydraulically operated preventer (Shaffer 10" API Series 900) will be installed and will be tested to a minimum of 500 psi for 15 minutes prior to drilling out from under the surface casing. Deficiencies, if any, will be corrected before drilling ahead. The blowout equipment will be checked daily by opening and closing the pipe rams and blind rams.

SIGNED

John P. Trotter

TITLE

President

DATE

November 4, 1976

DO NOT WRITE BELOW THIS LINE

RECEIVED NOV 11 1976

NOV 10 1976

CHECKED BY

Supervisor

CONDITIONS

COMPILE SET OF SAMPLES AND CORES IF TAKEN. MUST BE SUBMITTED

SAMPLES AND CORES IF TAKEN, BELOW

DEPTH, MUST BE SUBMITTED

Exception to statewide spacing pattern allowed for topographic reasons (see Bullock 7; quad.) - PWS

INSTRUCTIONS

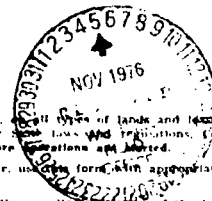
General: This form is designed for submitting proposals to perform certain well operations, as indicated, and is to be used by either a Federal or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Consult applicable Federal or State regulations, or appropriate officials, concerning approval of the proposal before operations are started.

If the proposal is to drill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notation.

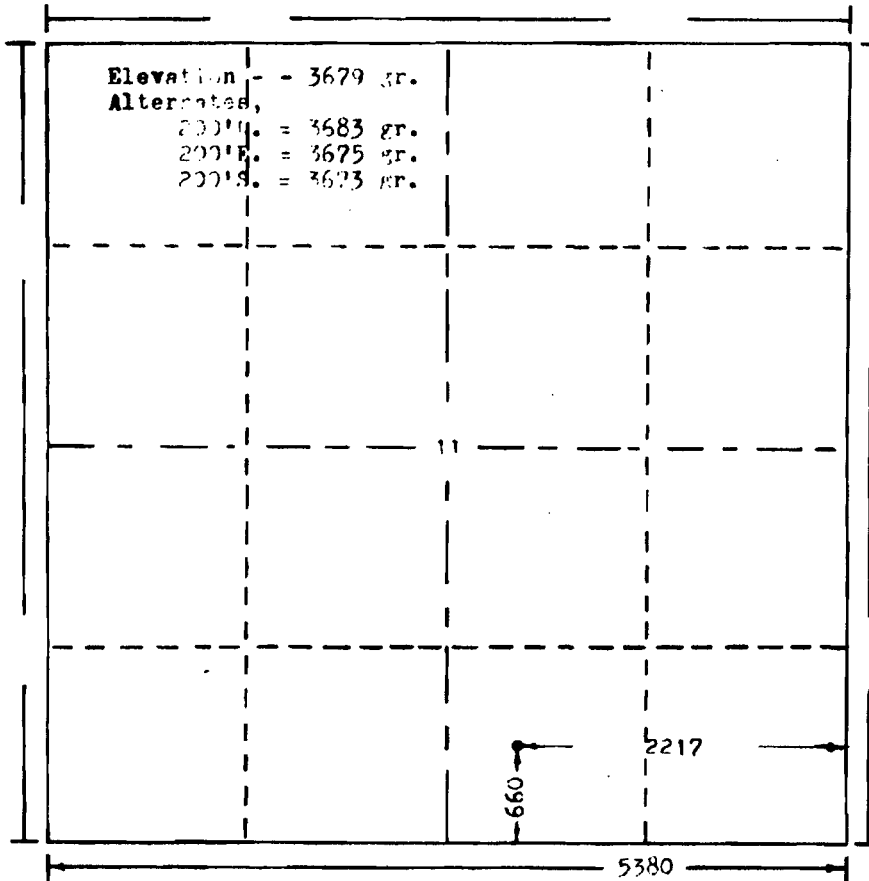
If the well is to be, or has been, directionally drilled, so state and show by attached sheets. If necessary, the coordinates of the hole in any present or objective productive zones.

File 3 copies of this form with Secretary, Oil & Gas Board, Pierre.

*Sample location: 660' South and 660' East of the Northwest Corner of Section 10.



R. 1 E



T.
7
S.

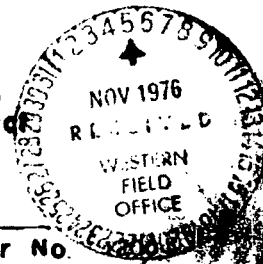
Scale... 1" = 1000'

Powers Elevation Company, Inc. of Denver, Colorado
has in accordance with a request from Mr. Trotter
for Aquarius Resources Corporation
determined the location of #34-11 Peterson
to be 660FS & 2217FE Section 11 Township 7 S.
Range 1 E. of the Black Hills Meridian
Fall River County, South Dakota

I hereby certify that this plat is an
accurate representation of a correct
survey showing the location of
#34-11 Peterson

Date: 9-22-76

T. Talen
Licensed Land Surveyor No.
State of South Dakota



WELL INSPECTION / SCOUT REPORTS

SOUTH DAKOTA GEOLOGICAL SURVEY
Western Field Office

SCOUT REPORT

Number 3
Date Scouted 5/31/78
Operator Aquarius Resources Corporation Permit Number 776
Farm/Lease Name #34-11 Peterson API Number 40 047 20071
SWSE Sec. 11 T. 7S R. 1E County Fall River
Elev. 3689 Kb Est. T.D. --- Actual T.D. 2250 Spudded 11-09-76
Contractor --- Geologist Eldred Johnson

SCOUT'S OBSERVATION:

DST RECORD:

Pits filled, landscape recontoured, wild grass and shrubs taking over, no seed planted. Dry hole marker sound, sealed, and properly labeled.

Site Approved.

FORMATION TOPS:

PLUGGING RECORD:

DATE PLUGGED/COMPLETED 12-22-76

CASING RECORD:

8 5/8 From 0 To 163
From --- To ---

SITE INSPECTION:

Approved X
Not Approved ---

REMARKS:

SCOUTED BY

John Fricke
John Fricke, Geologist
Field Assistant

Fred V. Steece
Fred V. Steece, Supervisor
Western Field Office



Agitation # 34-11 12/12/10



8/1/11

11/11

Swamp 11-25-10 Fall River



SOUTH DAKOTA GEOLOGICAL SURVEY
Western Field Office

SCOUT REPORT

Number 2

Date Scouted 6-15-77

Operator Aquarius Resources Corporation

Permit Number 776

Farm/Lease Name #34-11 Peterson

API Number 40 047 20071

SWSE Sec. 11 T. 7S R. 1E

County Fall River

Elev. 3689 Kb Est. T.D. -

Actual T.D. 2250 Spudded 11-09-76

Contractor A. O. Bullock

Geologist Fldred Johnson

SCOUT'S OBSERVATION:

DST RECORD:

The site has not been restored. Mounds of dirt surround a pit that is practically dry. There is no fence and plenty of garbage is laying on the ground. A dry hole marker is in place and is solid, sealed and correctly marked. Near the marker pole is a small open hole and trench that should be filled in. The area has not been leveled or policed and therefore at this time cannot be approved.

FORMATION TOPS:

PLUGGING RECORD:

DATE PLUGGED/COMPLETED 12-22-76

CASING RECORD:

From _____ To _____

From _____ To _____

SITE INSPECTION:

Approved _____

Not Approved X

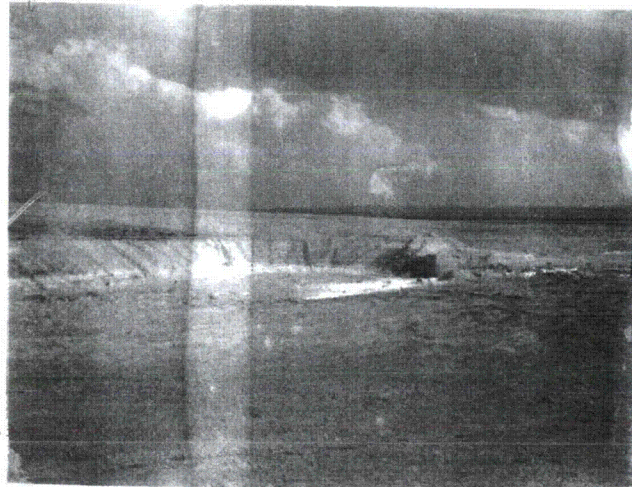
REMARKS: The site is difficult to locate since the road leading up to the drilling area is for the most part covered with grass and also because the uranium companies have made so many roads in their exploration efforts, which inevitably lead in the wrong direction. (3 pictures).

SCOUTED BY

Fred V. Steece
Fred V. Steece, Supervisor

David R. Johnston
David R. Johnston, Geologic Assistant

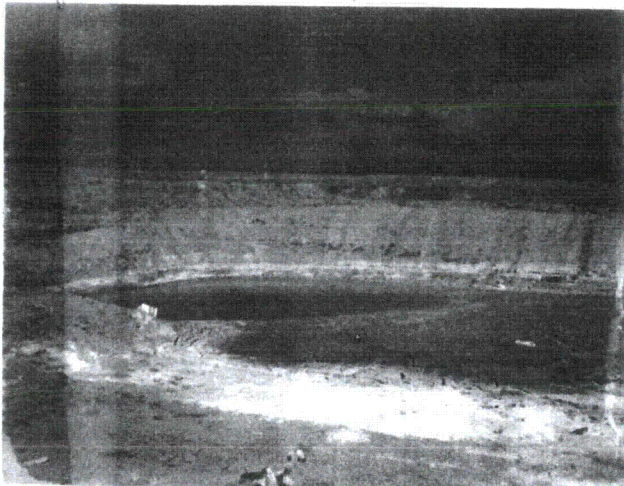
Aquarius Resources Corp #34-11 Peterson - 776



SW 1/4 Sec 11-75-1E

Fall River County

Aquarius Resources Corp #34-11 Peterson - 776



SW 1/4 Sec 11-75-1E

Fall River County

Aquarius Resources Corp #34-11 Peterson - 776



SW 1/4 Sec 11-75-1E

Fall River County



POWERTECH (USA) INC.

API ID 40 047 20071

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SOUTH DAKOTA GEOLOGICAL SURVEY
Western Field Office

SCOUT REPORT

Operator 1/ Aquarius Resources Corporation Number 1
Farm/Lease Name #34-11 Peterson Date Scouted 12-22-76
SWSE Sec. 11 T. 7S R. 1E Permit Number 776
County Fall River API Number 40 047 20071
Elev. 3689 Kb Est. T.D. - Actual T.D. 2250 Spudded 11-09-76
1/ Contractor A. O. Bullock Geologist Eldred Johnson

SCOUT'S OBSERVATION:

Preparing to plug.

DST RECORD:

DST #1: 2068-2090: 2nd Leo
Recovered 1963 water (125 MW, 1838 Blk.
sulf. water)
RW = 2.16@ 48°F = 1200 ppm ce.

FORMATION TOPS:

Morrison	406	Opeche	1452	1st Leo	1964
Sundance	570	1st Converse	1552	2nd Leo	2062
Basal sand	819	Conv. Anhyd	1630	3rd Leo	2168
Spearfish	866	2nd Converse	1677		
Gooseegg	1158	3rd Converse	1764		
Minnekahta	1412	Red Marker	1952		

PLUGGING RECORD:

35 sax: 2000-1900 Red Marker
50 sax: 900- 750 Basal Sundance
25 sax: 190- 120 Base Surface
10 sax: Surface plug w/marker

DATE PLUGGED/COMPLETED 12-22-76

CASING RECORD:

8 5/8 From 0 To 163
From _____ To _____

SITE INSPECTION:

Approved _____
Not Approved _____

REMARKS:

(W/135 sax)

SCOUTED BY

Fred V. Steece, Supervisor

1/ Casper, Wyoming.



POWERTECH (USA) INC.

API ID 40 047 20071

12 - 18 47.6

✓ Aquarius Res. Corp. # Peterson
34-11A
SWSE 11-75-1E Fred River
660 FSL & 2217 FEL

MIRT

Progress Report

PERMIT: 776 (11-10-76)

12-06

MIRT

API: 40 047 20071

12-7

MIRT

ELEV: 3679 Gr., 3689 KB

12-8

RURT

CONTR: A.O. Bullock (Casper)

12-9

Spud

GEOL: Eddred Johnson

12-16

set surface

ENGR:

12-11

386 foot circ.

SPUD: 12-9-76 (7:30 AM)

12-12

486 drlg

EST T.D.: 2300

12-13

688 drlg

CASING: 8 5/8 - 153 @ 164 KB

12-14

967 drlg

CORES: none

12-15

1243 drlg

DST'S: #1: 2068-2094, 2nd 12' (2nd)

12-16

1515 drlg

LOGS:

12-17

1663 drlg

T.D.: 2250 drlg 23

PLUG: 12-22-76

✓ Casper



ABLIQ 40 047 2007+

Formation Top: (Spl) Formation Top: (Eldred Johnson)

Minnekahta	1407	Morrison	406
Opeche	1454	Gondance	570
1 st Converse	1540	(Basal Ad)	819
Converse Anhyd	1636	Spearfish	866
		Gossage	1158
12-22-76		Minnekahta	1412

Call from Eldred Johnson, wanting plugging instr. & outlined the following:

3500x: 2000 - 1900	1 st Leo	1964
5000x: 900 - 750	2 nd Leo	2062
2500x: 190 - 120	3 rd Leo	2168
1000x: Surf plug w/ marker T.D.		2250

DS #1: 2068 - 2090, 1 st Leo	Rec 1963 water (125)	ppm
MW, 1838 Bk surface water) Almost flower, some clay almost off scale.	RW = 2.16 @ 48°F = 1200 (C)	
6-15-77	Site has not been restored	
	Minerals of dirt surrounding pit that is practically dry	
	No fence, lot of garbage	
	Any hole marker solid sealed & correctly marked	
	should be leveled and polished	
	DEJ	

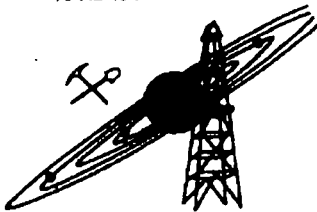
OPERATOR'S TECHNICAL REPORTS / MAPS



POWERTECH (USA) INC.

API ID 40 047 20071

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AQUARIUS RESOURCES CORPORATION

John F. Trotter, President

Aquarius Resources Corporation
#34-11 Peterson
C SW SE Sec. 11, T. 7S., R. 1E.
Fall River County, South Dakota
Elev. - Gr. 3679', KB 3689'
Well Permit #776

DAILY DRILLING REPORT

12/06/76 Moving equipment to #34-11 Peterson

12/07/76 Moving equipment to drillsite

12/08/76 Rigging up

12/09/76 Finished rigging up and started drilling rat hole @ 2:00 A.M.
Spudded surface hole @ 7:30 A.M. Drilled 12 1/4 in. hole to 164 ft. K.B.
Set 153 ft. of 24# 8-5/8" casing @ 164 ft. K.B. with 135 sx cement,
2% CaCl₂

12/10/76 Finished setting surface casing, plug down @ 1:00 A.M. Good returns
to surface. W.O.C. Expect to drill out early this afternoon.

Drilled out at midnight.

12/11/76 8:00 A.M. - PTD - 319'. Lost circulation @ 386'

12/12/76 8:00 A.M. - PTD - 486'. Drilling. Made trip for bit @ 447'

12/13/76 8:00 A.M. - PTD - 688' - drilling.

12/14/76 8:00 A.M. - PTD - 967' - drilling in the red beds.
Drilled 279' in last 24 hours.

12/15/76 8:00 A.M. - PTD - 1243' - drilling. Drilled 276 ft. in last 24 hours.
Repairing mud pump - 8 hours. M.W. - 9.6; Visc. - 31
Made trip for bit #4 @ 978 ft.

12/16/76 8:00 A.M. - PTD - 1515' - drilling. Drilled 272 ft. in last 24 hours.

12/17/76 8:00 A.M. - PTD - 1663' - drilling. M.W. - 9.1, Visc. - 32
Drilled 148' in last 24 hours. Tripped for bit @ 1553'.
Dropped one drill collar - lost approximately 6 hours fishing.
Sample tops: Minnekahta - 1407' (+2282)
Opeche - 1454' (+2235)
1st Converse - 1540' ?
Converse Anhydrite - 1636' (+2053)

12-06-76 Moving equipment to #34-11 Peterson



307 Conroy Building • Casper, Wyoming 82601 • (307) 265-9025



	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing	6"	2.75"	1'	
Reversing Sub				
Water Cushion Valve				
Drill Pipe	4 1/2"	3.826"	1795'	
Drill Collars	6 1/4"	2.25"	242'	
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	.87"	6.65'	2039'
Dual CIP Sampler	5"	.75"	5'	2044'
Hydro-Spring Tester				
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3"	4'	2045'
Hydraulic Jar	5"	1.5"	5'	
VR Safety Joint	5"	1"	2.5'	
Pressure Equalizing Crossover				
Packer Assembly	7"	1.53"	6'	2060'
Distributor	5"	1.68"	2'	
Packer Assembly	7"	1.53"	6'	2068'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint	5"	1.5"	4'	
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5"	2.37"	12'	
Blanked-Off B.T. Running Case	5"	3"	4'	2086'
Total Depth				2090'



POWERTECH (USA) INC.

API ID 40 047 20071

776
23 of 47

GEOLOGICAL REPORT AND WELL HISTORY

Aquarius - Double U - Powerco

#34-11 Peterson

Section 11, T. 7S., R. 1E.

Fall River County, South Dakota



Eldred D. Johnson
830 Trigood Dr.
Casper, Wyoming 82601
Phone: 23 4-8568



POWERTECH (USA) INC.
API ID 40 047 20071

24 of 47
#34-11 Peterson
Sec. 11-73-1E
Fall River County, S. D.

I N D E X

	<u>Page</u>
Synopsis	1
Chronological History	2
Bit Record	3
Deviation Surveys	3
Drill Stem Test Data	4
Schlumberger Log Analysis	4
Electric Log Tops	5
Sample Descriptions	5



POWERTECH (USA) INC.

API ID 40 047 20071

#34-11 Peterson 25 of 47
Sec. 11-7S-1E
Fall River County, S. D.

Synopsis

Operator: Aquarius - Double U - Powerco

Well: #34-11 Peterson

Location: C/SW SE; 660' FSL, 2217' FSL
Section 11, T. 7S., R. 1E.
Fall River County, South Dakota

Area: Wildcat (Driftwood Canyon Prospect)

Elevation: 3679' Ground, 3689' K.B.

Spudded: December 9, 1976 (7:30 A.M.)

Ceased Drilling: December 22, 1976 (3:30 A.M.)

Completed: December 23, 1976 (12:30 A.M.)

Status: P & A

Total Depth: 2250' driller, 2248' log

Casing: 8-5/8" surface casing set @ 163'

Hole Size: 7-7/8" below surface to TD

Contractor: A. O. Bullock Drilling Co. - Rig #1
Tool Pusher - Ray Cottrell
Drillers - Larry Halligan, D. F. Ellsworth, Chuck Sides

Drilling Mud: Wyoming Mud Co., Casper, Wyo.
Gel-Chemical from 384' to TD
Engineer - Bruce Johnson

Lost Circulation: Lost Circulation for 5 1/2 hours @ 384'.

Coring: No cores cut.

Drill Stem Tests: Halliburton Services
DST #1; 2nd Leg, 2060'-2082' (adjusted to log from 2068'-2090')
Rec. 125' muddy water, 1838' black sulfur water.
Engineer - D. R. Rook, Gillette, Wyoming

Logs: Schlumberger Well Surveying Corp.
Ran Dual Induction-Lateralog from 2248' to base of surface casing.
Ran Borehole Compensated Sonic Log w/caliper from 2248' to base of
surface casing. Ran Gamma Ray log from base of surface casing to
surface.
Engineer - Craig Rang, Gillette, Wyo.

Samples: All samples were delivered to American Stratigraphic Co., Casper,
Wyo., for shipment to their Billings, Montana office where a cut
will be made for the South Dakota State Geologist.



Page 2
 #34-11 Peterson
 Sec. 11-78-1E
 Fall River County, S. D.

Chronological History

<u>Date</u>	<u>8:00 A.M. Depth</u>	<u>Data</u>
12/8/76	Rigging up	
12/9/76	Drilling surface hole	Spudded @ 7:30 A.M. Drilled 12 $\frac{1}{2}$ " surface hole to 163' @ 8:30 P.M.
12/10/76	PTD 163', W.O.C.	Made 163' Set 8-5/8" surface casing @163' K.B. w/135 sacks regular cement, 3% CaCl ₂ , $\frac{1}{4}$ # Flo Celes per sack. Plug down @ 1:00 A.M. W.O.C. Began drilling cement @ 6:00 P.M.
12/11/76	Drilling @ 319'.	Made 156'. Drilled out from under cement @ 2:00 A.M. Lost circulation @ 384' @ 8:45 A.M. Regained circulation and resumed drilling @ 2:45 P.M.
12/12/76	Drilling @ 486'.	Made 167'. Shut down @ 5:45 P.M. to repair pump. Resumed drilling @ 10:30 P.M.
12/13/76	Drilling @ 688'.	Made 202'.
12/14/76	Drilling @ 968'	Made 280'. Started trip @ 978' @ 10:00 A.M. Resumed drilling @ 6:30 P.M. after trip & working on pump for 4-3/4 hrs.
12/15/76	Drilling @ 1234'.	Made 266'.
12/16/76	Drilling @ 1517'.	Made 283'. Started trip @ 1553' @ 1:00 P.M. Dropped bottom hole drill collar to bottom @ 3:00 P.M. Fished out drill collar w/rig overshot and resumed drilling @ 11:45 P.M.
12/17/76	Drilling @ 1663'.	Made 146'.
12/18/76	Drilling @ 1823'.	Made 160'. Started trip @ 1852' @ 1:45 P.M. Spent 4-3/4 hrs replacing carrier bearing in torque converter. Resumed drilling @ 8:45 P.M.
12/19/76	Drilling @ 1939'.	Made 116'.
12/20/76	PTD 2086'. W.O.O.	Made 147'. Reached 2086' @ 5:30 A.M. Circulated samples & W.O.O. for DST till 8:30. Drilled to 2092' @ 9:00. Started out of hole for DST #1 @10:00 A.M. SLM 2092 - 9090

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Began picking up test tools @ 1:00 P.M. On bottom testing @ 4:20 P.M. Finished testing @ 7:00 P.M. Out of hole w/test tools @ 11:00 P.M. DST #1; 2nd Leo, 2068-2090. Rec. 125' muddy water, 1838' blkok sulfur water.

12/21/76 Drilling @ 2133'.

Made 49'.
Resumed drilling after test @ 3:45 A.M.

12/22/76 TD 2250' going in hole w/logging tool.

Made 117'.
Reached TD of 2250' @ 3:30 A.M. Started out of hole for logs @ 5:00 A.M. Began rigging up loggers @ 7:30 A.M. Ran Dual Induction Laterolog from 2248' to base of surface casing. Ran Borehole Compensated Sonic log w/caliper from 2248' to base of surface casing. Ran Gamma Ray log from base of surface casing to surface. Finished logging @ 1:00 P.M. Prep to P & A.

12/23/76 TD 2250' driller 2248' log

Set 35 sack plug from 1900'-2000' across "Red Shale Marker".
Set 50 sack plug from 750'-900' across Basal Sundance sandstone.
Set 30 sack plug across casing shoe from 105'-190'.
Set regulation marker in top of surface casing w/10 sacks.
Plug down @ 12:30 A.M.
P & A

Bit Record

<u>Bit No.</u>	<u>Size</u>	<u>Make</u>	<u>Type</u>	<u>Serial #</u>	<u>Depth Out</u>	<u>Feet</u>	<u>Mrs Run</u>
1	7-7/8	Hughes	OSC3-J	1-Y3708	447	284	29
2	7-7/8	Hughes	J-44	Re-Run	978	531	49 1/2
3	7-7/8	Hughes	OW4-J	RD475	1553	575	42
4	7-7/8	Hughes	J-33	Re-Built	1852	299	36 1/2
5	7-7/8	Hughes	J-55	Re-Run	2250	398	56

Deviation Surveys

<u>Depth</u>	<u>Deviation</u>
1850	2 1/2°



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Drill Stem Test Data

DST #1; 2nd Leo sandstone, 2060'-2088' (adjusted to log from drillers depth of 2068'-2090')

Open 11 min. SI 30 min. Open 60 min. SI 60 min.
 Tool opened on pre-flow w/very strong blow, off bottom of 5 gal. bucket in 30 sec., remained steady for 11 min. Tool re-opened on final flow off bottom of 5 gal. bucket, began gradually decreasing after 12 min., decreased to surface bubbles after 44 min., decreasing to intermittent surface bubbles @ end of test.

No gas - to - surface.

Recovered 1963' fluid; 125' muddy water, 1838' black sulfur water. $R_w = 2.16 @ 48^{\circ} F$.
 1200 ppm chlorides.

Sample chamber contained 2175 cc black sulfur water, 0# pressure

pre-flow			final flow		
IFP 294#	ISIP 882#		IFP 593#	IHP 979#	
FFP 588#	FSIP 882#		FFP 882#	FHP 983#	

BHT $78^{\circ} F$.

Tested by Halliburton Services
 Engineer - D. R. Rook, Gillette, Wyo.

Schlumberger Log AnalysisHulett sandstone

Depth	Rw	Rt	ϕ	Sw
708	2.5	20	30%+	80%
718	2.5	18	30%+	70%

Basal Sundance sandstone

Depth	Rw	Rt	ϕ	Sw
870-885	5.0	20	30%+	100%

1st Converse sandstone

Depth	Rw	Rt	ϕ	Sw
1592	8	8	30%+	70%

2nd Converse sandstone

Depth	Rw	Rt	ϕ	Sw
1686	3.5	50	28%	100%
1728	3.5	150	12%	100%

2nd Leo sandstone

Depth	Rw	Rt	ϕ	Sw
2078	2.0	25	30%+	80%
2088	2.0	18	30%+	85%

Engineer - Craig Bang, Gillette, Wyo.

Electric Log Tops

<u>Formation</u>	<u>Depth</u>	<u>Datum (K.B.)</u>
Morrison formation	406	+3283
Sundance formation	570	+3119
Basal Sundance sandstone	866	+2823
Spearfish formation	888	+2801
Goose Egg formation	1158	+2531
Minnekahta limestone	1412	+2277
Opeche shale	1452	+2237
1st Converse sandstone	1552	+2137
Converse anhydrite	1630	+2059
2nd Converse sandstone	1677	+2012
3rd Converse sandstone	1764	+1925
"Red Shale Marker"	1952	+1737
1st Leo sandstone zone	1964	+1725
2nd Leo sandstone zone	2062	+1627
3rd Leo sandstone zone	2168	+1521
TD	2248	+1441

Sample Descriptions

Samples were examined under the binocular microscope during the drilling of the well in December, 1976, using 10X eyepiece and 1X and 2X objective lenses. 10' samples were caught from under surface to TD. Sample quality was generally fair to good. The following sample descriptions were condensed from the well-site description with the depths adjusted to the E-log to compensate for lag.

<u>From</u>	<u>To</u>	<u>Feet</u>	<u>Description</u>
1350	1412	62	Sh, red orange, soft, silty, interbedded w/red orange siltst, soft - firm, sdy, anhy & scatt anhy, wht, fn - v fn xln, soft - firm, sucrosic - massive.
<u>Minnekahta limestone</u>			1412 (+2277) log
1412	1436	24	Dol, cream - lt tan, some lavender gray, v fn - microxln, anhy, liney in part, firm - hrd, brittle, w/anhy, wht - pink, v fn xln, massive, some sucrosic, firm.
1436	1452	16	Ls, cream - wht, some pink, v fn - microxln, anhy in part, firm - hrd, brittle, w/anhy, wht, fn - v fn xln, sucrosic, some massive, soft - firm.
<u>Opeche shale</u>			1452 (+2237) log
1452	1490	38	Sh, drk rust red, soft, silty, anhy.
1490	1515	25	Sh ss, w/interbedded anhy, wht, v fn xln, sucrosic, some massive, soft - firm.
1515	1535	20	Sh, rust red, soft, silty, anhy, grading to siltst, rust red - red red orange, firm, sdy, shly, anhy.
1535	1552	17	Sh, rust red, soft, silty, anhy & some rust red - red orange, shly, sdy, siltst ss, interbedded w/lss, wht - cream & tan, v fn -



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microxln, firm - hrd, brittle, anhy, w/some anhy, wht, v fn xln, sucrosic, soft.

1st Converse sandstone 1552 (+2137) log

1552	1580	28	Ss, wht - lt pink & buff, fn - med grn, s ang - s rnd, anhy filled in part, sli dolo, firm - fri, fr - gd, some poor P & P, NS. Scatt anhy, wht, v fn xln, massive, some sucrosic, firm.
1580	1600	20	Ss, wht - pink & buff, some red @ base of interval, fn - med grn, s ang - s rnd, anhy filled in part, sli dolo, poor - gd P & P, NS. Some scatt anhy aa.
1600	1630	30	Ss, red - pink, some wht, fn grn, some med, s ang - s rnd, anhy filled, dolo in part, firm - fri, poor - fr, some gd P & P, NS.

Converse anhydrite 1630 (+2059) log

1630	1660	30	Anhy, wht, v fn xln, firm, some hrd, massive - sucrosic.
1660	1677	17	Anhy wht, fn - v fn xln, massive, some sucrosic, firm - soft, w/dol, pink, v fn - microxln, hrd, brittle, anhy.

2nd Converse sandstone 1677 (+2012) log

1677	1682	5	Ss, red - buff, fn grn, some med, s rnd - s ang, anhy filled, silty in part, dolo, firm - fri, no - poor P & P, NS.
1682	1690	8	Ss, lt red orange - buff, fn grn, some med, s rnd - s ang, anhy filled, dolo, firm - fri, poor - fr P & P, NS.
1690	1720	30	Ss, lt red orange, fn grn, some med, anhy filled, fri, no - poor P & P, NS, w/anhy, wht, v fn xln, sucrosic - massive, firm - soft.
1720	1736	16	Dol, lt gry w/blk mottling, & tan v fn granular, firm, limey, somewhat brittle.
1736	1750	14	Dol, tan - lt gry, some blk mottling, v fn - microxln, firm - hrd, brittle, limey w/some anhy, wht, fn - v fn xln, massive - sucrosic, firm - soft.
1750	1764	14	Anhy, wht - gry, fn - v fn xln, massive, some sucrosic, firm - hrd, some soft w/some scatt aa, wht, fn grn, s rnd - s ang, anhy filled, dolo, hrd, firm, some fri, no P & P, fat - poor lt yell fluor, no cut.

3rd Converse sandstone 1764 (+1925) log

1764	1774	10	Ss, wht, fn grn, s rnd - s ang, anhy filled, dolo, firm - fri, no - poor P & P, some fnt fluor, no cut, w/anhy aa, wht - gry, fn - v fn xln, massive, some sucrosic, firm - hrd, some soft.
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1774	1796	24	Dol, tan - gry, some brn, v fn granular, some v fn - microxln, firm - hrd, brittle, limey w/some anhy, wht - brn, some gry, fn - v fn xln, massive, some sucrosic, firm - hrd, some soft. Scatt stringers of ss, wht - pink, fn grn, s rnd - s ang, anhy filled, dolo, firm - fri, no - poor P & P, some poor - fr lt yell fluor, no cut.
1796	1810	14	Dol, lt pink - cream & v lt gry, v fn - microxln, firm - hrd, brittle, anhy w/scatt ss, wht, fn grn, s rnd - s ang, anhy filled, firm - fri, no - poor P & P, fnt, tr fr lt yell fluor, no cut.
1810	1860	50	Anhy, wht - gry, fn - v fn xln, massive - sucrosic, firm - hrd, some soft w/some interbedded dol, pink - cream & lt tan - gry, v fn - microxln, some granular, firm - hrd, brittle, anhy in part, w/scatt stringers of ss, wht - lt gry, some buff, s rnd - s ang anhy filled, dolo, firm - fri, no - poor P & P, sli tr fr fluor, no cut, 99% NS.
1860	1884	24	Sh, rust red, soft, silty, anhy, sli dolo, interbedded w/dol, tan - gry, some lavender, v fn - microxln & granular, firm - hrd, brittle, anhy.
1884	1926	42	Dol lt tan - lavender pink & lt gry, v fn - microxln, firm - hrd, brittle, anhy, w/anhy wht, v fn - fn xln, massive - sucrosic, firm - soft. Scatt interbedded sh, drk rust red, soft, silty, sli dolo, anhy & some scatt ss, wht - v lt pink, fn grn, s rnd - s ang, anhy filled, dolo, firm - fri, poor - fr P & P, NS.
1926	1938	12	Dol, cream - lt tan, & pink - lt gry, v fn - microxln, hrd - firm, brittle, anhy, limey.
1938	1952	14	Dol, lt gry - tan & pink, v fn - microxln, firm - hrd, brittle, anhy, limey in part, sdy in part, w/ss, wht - lt pink, fn grn, some med, s rnd - s ang, anhy filled, dolo, firm - fri, poor P & P, tr fnt - poor fluor, no cut.
<u>"Red Shale Marker"</u>			1952 (+1737) log
1952	1964	12	Sh, rust red w/metallic luster from finely disseminated mica, v soft, fissile w/some interbedded ls @ base of interval, tan - cream, some pink, v fn - microxln, firm - hrd, brittle, dolo, & anhy, wht, v fn - fn xln, massive - sucrosic, firm - soft.
<u>1st Leo sandstone zone</u>			1964 (+1725) log
1964	1976	12	Dol, lt tan, v fn - microxln, hrd - firm, brittle, anhy.
1976	2000	24	Ss, wht - med gry & v lt pink, fn grn, s rnd - s ang, anhy filled, dolo, firm - fri, no - poor P & P, sli tr blk dead oil stn, tr fnt fluor, no cut, mostly NS, w/scatt dol, pink - cream, v fn - microxln, hrd - firm, anhy, brittle.



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2000	2020	20	Dol, med gry - gry brn, w/blk mottling, v fn granular - v fn xln, firm - hrd, brittle, anhy, liney & anhy w/brn mottling, v fn xln, massive, some sucrosic, firm, w/some ss, med gry - tan, fn grn, s rnd - s ang, anhy filled, dolo, firm - fri, no P & P, some tr blk dead oil stn, poor - fr lt yell fluor, no cut.
2020	2046	26	Dol tan - brn & gry, v fn - microxln, some granular, hrd - firm, brittle, anhy, somewhat liney w/interbedded anhy, wht w/some brn mottling, fn - v fn xln, massive, some sucrosic, firm - soft.
2046	2062	16	Dol, tan - gry brn, v fn xln - granular, firm - hrd, anhy, somewhat liney, brittle w/ss, wht - tan, fn grn, some med, s rnd - s ang, anhy filled in part, dolo, firm - fri, no - fr P & P, some tr blk dead oil stn, sli tr brn oil (?) stn, fnt lt yell fluor, no cut. Some tr hrd blk carb, silty sh @ base of interval.
<u>2nd Leo sandstone zone</u>			2062 (+1627) log
2062	2072	10	Dol tan - lt gry, v fn xln, edy, hrd, brittle, grding in part to v dolo ss, w/interbedded wht ss, fn grn, s rnd - s ang, anhy filled in part, dolo in part, firm - fri, poor - fr P & P, fnt - poor fluor, no cut.
2072	2102	30	Ss, wht - clear, fn - med grn, s rnd - s ang, anhy matrix, sli dolo, fri, fr - gd P & P, sli tr blk dead oil stn, fnt lt yell fluor, no cut.

Samples were circulated @ 2076' and 2082' for 1 hr @ each point before DST #1
DST #1; 2060'-2082' (adjusted to log from 2068'-2090' driller's depth)
(See page 4 for DST data)

2102	2110	8	Ss, lt gry, fn grn, s rnd - s ang, anhy filled, dolo, firm, no P & P, poor - fr lt yell fluor, no cut.
2110	2146	36	Dol, med gry - brn & tan, v fn - microxln, hrd, brittle w/scatt anhy, wht, v fn xln, massive - sucrosic, & some scatt ss, lt gry, fn grn, s rnd - s ang, anhy filled, dolo, firm, no P & P, poor - fr lt yell fluor, no cut. Some interbedded sh, hrd, blk, carb, silty, brittle.
2146	2168	22	Dol, med gry - grn brn, some tan, v fn - microxln, some v fn granular, firm - hrd, brittle, anhy, w/some scatt ss, lt med gry, fn grn, s rnd - s ang, anhy filled, dolo, firm, no P & P, poor - fr fluor, no cut. Scatt blk, car silty, sh, firm - hrd.

3rd Leo sandstone zone 2168 (+1521) log

2168	2178	10	Ss, wht, fn grn, s rnd - s ang, anhy filled, sli dolo, firm - fri, no - poor P & P, fnt lt yell fluor, no cut.
2178	2204	26	Dol, tan, v fn - microxln, firm - hrd, brittle, anhy w/anhy, wht, fn - v fn xln, massive, some sucrosic, firm - soft. Some blk carb silty sh @ base of interval, firm - hrd.



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2204	2250	46	Dol, tan - gry crn. v fn - microxin & v fn granular, firm - hrd, brittle w/some interbedded - wht, fn - v fn xln, massive - sucrosic, firm - soft. Some scatt stringers of ss, wht - lt gry & tan, fn grn, s rnd - s ang, anhy filled, solo, firm - hrd, no P & F, or blk dead oil stn, fnt - fr, some gd lt yell fluor, no cut.
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Samples circulated for 1 hr @ TD before logging

TD 2250' drilled
2248' log

Drilling time was kept on a Geolograph drilling time recorder. A drilling time log was constructed for each 2' interval on a scale of 5" = 100' from 1300' to TD. The original drilling time chart and the drilling time log were delivered to the offices of Aquarius Resources Corp., Jasper, Wyo.

Eldred M. Johnson



POWERTECH (USA) INC.

TICKET NO. 771061

AP 110/40 047 20071				
	O. D.	I. D.	LENGTH	34 847 DEPTH
Drill Pipe or Tubing	6"	2.75"	1'	
Reversing Sub				
Water Cushion Valve				
Drill Pipe	4 1/2"	3.826"	1795'	
Drill Collars	6 1/4"	2.25"	242'	
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	.87"	6.65'	2039'
Dual CIP Sampler	5"	.75"	5'	2044'
Hydra-Spring Tester				
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3"	4'	2045'
Hydraulic Jar	5"	1.5"	5'	
VR Safety Joint	5"	1"	2.5'	
Pressure Equalizing Crossover				
Packer Assembly	7"	1.53"	6'	2060'
Distributor	5"	1.68"	2'	
Packer Assembly	7"	1.53"	6'	2068'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blended-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint	5"	1.5"	4'	
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Well Anchor				
Drill Collars				
Flush Joint Anchor	5"	2.37"	12'	
Blended-Off B.T. Running Case	5"	3"	4'	2086'
Total Depth				2090'

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EQUIPMENT DATA

LITTLE'S BOOKS 200 07/04

July 2012

B-602

Appendix B

POWERTECH (USA) INC.



Gauge No.		48		Depth		2045'		Clock No.		9984		12 hour		Ticket No.		771061	
First Flow Period		First Closed in Pressure				Second Flow Period		Second Closed in Pressure				Third Flow Period		Third Closed in Pressure			
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$	PSIG Temp. Corr.		
0	.0000	288	.0000		624	.0000	651	.0000		880							
1	.0199*	389	.0068**		836	.0738***	790	.3950		882							
2	.0332	462	.0203		857	.1408	847										
3	.0465	523	.0338		863	.2079	868										
4	.0597	576	.0473		868	.2749	876										
5	.0730	624	.0608		870	.3419	878										
6			.0744		872	.4090	880										
7			.0879		874												
8			.1014		876												
9			.1149		876												
10			.1284		878												
11			.1420		878												
12			.1555		880												
13			.1690		880												
14			.1825		880												
15			.1960		880												

Gauge No.		47		Depth		2086'		Clock No.		9479		12 hour	
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	
0	.0000	337	.0000		635	.0000	676	.0000		894			
1	.0199*	415	.0068**		849	.0731***	806	.3920		898			
2	.0332	479	.0204		870	.1395	860						
3	.0465	538	.0340		877	.2059	881						
4	.0597	587	.0476		883	.2723	890						
5	.0730	635	.0612		888	.3387	891						
6			.0747		888	.4050	894						
7			.0883		888								
8			.1019		890								
9			.1155		892								
10			.1291		892								
11			.1427		894								
12			.1563		894								
13			.1699		894								
14			.1835		894								
15			.1971		894								

Reading Interval 2 2 10 Minutes

REMARKS: *First interval is equal to 3 minutes. ** = 1 minute *** = 11 minutes.

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SPECIAL PRESSURE DATA

L1776E-6 80079 79C 6/74



LEASE INFORMATION LESSOR NAME: <u>PETERSON</u> LESSOR ADDRESS: <u>34-11</u> LESSOR CITY: <u>WELL</u> LESSOR STATE: <u>1</u> LESSOR ZIP: <u>2058 - 2090</u> LESSOR PHONE: <u>2058 - 2090</u> LESSOR SIGNATURE: <u>AQUARIUS RESOURCES CORPORATION</u> LESSOR DATE: <u>11-75</u> LESSOR COUNTY: <u>NORTH OF EDGEMONT</u> LESSOR TOWNSHIP: <u>FULL RIVER</u> LESSOR SECTION: <u>1 E</u> LESSOR ACRES: <u>1</u> LESSOR SURVEY: <u>SOUTH DAKOTA</u>	
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POWERTECH (USA) INC.

API HD 40-047 2007-1						37 of 47
Casing perf.		Bottom choke		Surf. temp. °F		Ticket No. 771061
Gas gravity		Oil gravity		GOR		
Spec. gravity		Chlorides		ppm Res.		°F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED						
Date Time	a.m. p.m.	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
1300						On location
1315						Made up tools
1355						Started in hole
1615						Opened tool with a strong blow at bottom of bucket, remained same until closed in.
1625						Closed tool, blow died in 9 minutes.
1655						Opened tool with blow at bottom of bucket, after 12 minutes appeared to start decreasing.
						In 28 minutes had 1" off bottom of bucket.
						In 35 minutes had 9½" into bucket
						In 37 minutes had 2½" in bucket
						In 38 minutes had 1½" in bucket
						In 40 minutes had 1" in bucket
						In 42 minutes - 1/2" in bucket
						In 44 minutes had surface bubbles.
						Remained same until closed in.
1755						Closed tool - dead.
1855						Pulled loose with no trouble.

FORM 100-10-PRINTED IN U.S.A.

PRODUCTION TEST DATA

LITTLE'S BOOKS 80-07-04



ADMINISTRATIVE / SUNDRY REPORTS

S. Dak. Oil & Gas Board
FORM 7

PLUGGING RECORD

Operator AQUARIUS RESOURCES CORPORATION		Address 307 Conroy Building, Casper, Wyoming 82601	
Name of Lessee Peterson	Well No. 34-11	Field & Reservoir	
Location of Well C 3W SE Section 11-7S-1E		Sec-Twp-Rge or Block & Survey	County Fall River
Application to drill this well was filed in name of Aquarius Resources Corp.	Has this well ever produced oil or gas No	Character of well at completion (initial production): Oil (bbls/day) Gas (MCF/day) Dry? Yes	
Date plugged December 23, 1976	Total depth 2250'	Amount well producing when plugged Oil (bbls/day) Gas (MCF/day)	Water (bbls/day) None
<p>Indicate each formation containing oil or gas. Indicate which formation is open to well bore at time of plugging.</p> <p>Fluid content of each formation.</p> <p>Length interval of each formation.</p> <p>Depth and depth of plugging.</p>			
Minnelusa-Loo	sulphur water	1964	50 SX 1964-2000
Converse	Gyp water	1552	
Sundance-basal	water	819	50 SX 750-900
Base Surf. Csg.	-	162	25 SX 130-140
Top Surf. Csg.	-	Dry hole marker	10 SX

Casing Record			
Size pipe	Put in well (ft.)	Put out (ft.)	Left in well (ft.)
6-5/8"	162 ft.		162 ft.
Give depth and nature of part containing what ripples etc.			

Indicate deepest formation containing fresh water.
Fall River-Lakota

Indicate whether information required on this form, if this well was plugged back for use as a fresh water well, give all pertinent details of plugging operation to base of fresh water sand, perforated interval, to fresh water sand, name and address of surface owner, and attach certificate authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.

Fall River-Lakota	- behind surface casing in part	Minnelusa:	
Converse	- 406	Converse	1552
Sundance	- 570	Red Marker	1952
basal sand	- 819	Loo	1964
Spearfish	- 866	Total Depth	2250 dril. & SCH.
Goose Egg	- 1158		
Minnelusa	- 1412		
Opache	- 1452		

USE REVERSE SIDE FOR ADDITIONAL DETAIL.

Filed this the 30th day of December, 1976

State of Wyoming

County of Natrona

Before me, the undersigned authority, on this day personally appeared John F. Trotter, known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states, that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.

Subscribed and sworn to before me this 30th day of December, 1976

Notary Public

My Commission Expires 11/1/77

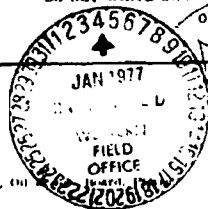
Notary Public in and for Natrona County, Wyoming

Approved Jan. 5, 1977

State

Oil and Gas Board of the State of South Dakota

Supervisor



Note: 1 - 2 copies of this form with Secretary, Oil

S. Dak. Oil & Gas Board
FORM 6

**SUNDY NOTICES AND
REPORT ON WELLS**

<p><input type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> ----- <input checked="" type="checkbox"/> DRY</p> <p>OPERATOR AQUARIUS RESOURCES CORPORATION</p> <p>ADDRESS 367 Conroy Building, Casper, Wyoming 82601</p> <p>LOCATION (To foot from nearest lines of section or legal subdivision. State possible) 600' FSL, 2217' FEL Section 11-7S-1E</p> <p>ELEVATIONS (D.P., M.B., R.V., ORD., etc.: how determined) 3679' G.L., 3689' K.B.</p>	<p>FARM OR LEASE NAME Peterson</p> <p>WELL NO. 34-11</p> <p>FIELD AND POOL OR WILDCAT Wildcat</p> <p>NO. ACRES IN LEASE 1080.00</p> <p>SEC. TWP. R. N. E. S. W. E. 11-7S-1E</p> <p>COUNTY Fall River</p>
---	---

INDICATE BELOW BY CHECK MARK NATURE OF REPORT, NOTICE OR OTHER DATA

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	<input type="checkbox"/>	SHOOT OR ACIDIZE	<input type="checkbox"/>	WATER SHUT-OFF	<input type="checkbox"/>	SHOOTING OR ACIDIZING	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	REPAIR WELL	<input type="checkbox"/>	FRACTURE TREATMENT	<input type="checkbox"/>	REPAIRING WELL	<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>	PULL OR ALTER CASING	<input type="checkbox"/>			ALTERING CASING	<input type="checkbox"/>
ABANDON	<input checked="" type="checkbox"/>						

(Note: Report results of multiple completion on Well Completion or Recompletion and Log Form—Form 4)

DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work)

Water was encountered in all porous zones drilled. The Leo sand had excellent porosity but yielded sulphur water when tested. Proposed plugging as approved by telephone is as follows:

35 sx	1900-2000	Minnelusa-Leo
50 sx	750- 900	Sundance
30 sx	105- 190	base of surface casing
10 sx		Surface plug & erect dry hole marker

I hereby certify that the foregoing is to my work or operation performed to a true and correct report of such work or operation.

SIGNED John F. Prother TITLE RESIDENT DATE December 23, 1976

Approved Jan. 5, 1977 DO NOT WRITE BELOW THIS LINE

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

CONDITIONS, IF ANY: See Instructions On Reverse Side Supervisor [Signature]





CORRESPONDENCE



POWERTECH (USA) INC.

API ID 40 047 20071

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NOV 15 1976

November 10, 1976

Aquarius Resources Corporation
307 Conroy Building
Casper, WY 82601

Attention John F. Trotter

Gentlemen:

Enclosed is your copy of Permit #776 (Form 2a) and approved Application to Drill (Form 2) covering the Aquarius #3A-11 Peterson oil test in Fall River County, South Dakota. A copy of the permit should be posted at the well site. Also enclosed is a receipt for your \$100 permit fee.

Please make weekly drilling progress reports to the Western Field Office.

May I wish you success in your drilling venture and if there is anything I can do to be of help, please let me know.

Sincerely,

Fred V. Stecos
Supervisor, Western Field Office

FVS/jm

Enc. 3

cc: Dr. Duncan J. McGregor
Mr. Vern W. Butler
Dr. Allyn Lockner
Mr. George Kane



SURETY



NO SURETY INFORMATION FOR THIS WELL AS OF 5/18/2011



MISCELLANEOUS



**NO MISCELLANEOUS
INFORMATION FOR THIS WELL
AS OF 5/18/2011**



Oil and Gas Search for: api_no_ like '40 047 20074'		
Page 1 of 1	<u>Download Database</u> (Excel spreadsheet format)	Page: Prev 1 <input type="button" value="v"/> Next

Record 1 of 1

Well Information

API No:	40 047 20074	County:	FALL RIVER
Well Name:	WULF 1 PETERSON	Location:	NENE 21-7S-1E
Permit No:	903	Total Depth:	2500
Operator Name:	CRYSTAL OIL COMPANY	Bottom Hole:	Minnelusa
Permit Date:	12-13-1978	KB Elevation:	3539
Spud Date:	03-10-1979	Ground Elevation:	3533
Plug Date:		Latitude:	43.433117
		Longitude:	-103.997735
Well Field	WILDCAT	Status	P&A
Class:	DRY HOLE	Type:	DRY HOLE

Formation Tops

<u>Formation</u>	<u>Depth (ft.)</u>
Dakota Mud	235
Lakota	545
Sundance	840
Minnelusa	1840
Red Marker	2287
1st Leo	2290
2nd Leo	2382

Page 1 of 1 (goto top)	Page: Prev 1 <input type="button" value="v"/> Next
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COUNTY: FALL RIVER
LEGAL LOCATION: NENE 21-7N-1E
API NO: 40 047 20074
PERMIT NO: 903
WELL NAME: WULF #1 PETERSON
OPERATOR: CRYSTAL OIL COMPANY
PERMIT ISSUED: 12/13/1978
PERMIT CLOSED: 05/08/1979
FILE LOCATION: 7N-1E-21 NENE

TARGET CODES:

WELL HISTORY / CHECKLIST

PERMIT TO DRILL / INTENT TO DRILL

WELL INSPECTION / SCOUT REPORTS

OPERATOR'S TECHNICAL REPORTS / MAPS

ADMINISTRATIVE / SUNDRY REPORTS

CORRESPONDENCE

SURETY

MISCELLANEOUS



WELL HISTORY / CHECKLIST

BOND RELEASE CHECKLIST

Well Name & Location		Permit # 903
Wulf #1 Peterson NENE 21-7S-1E, Fall River		API # 40 047 20074
Bond # 708E675-4	Date Issued 10-25-78	Date Released OCT 03 1986

Surface Restoration

- ☒ Pits filled.
- ☒ Site Level
- ☒ Site policed
- ☒ NA Dry-hole marker solid, sealed, correctly inscribed
- ☒ X No dry-hole marker desired, letter in WFO files from surface owner
- ☒ Letter of approval from Surfaceowner.

Paperwork filed

- ☐ Form 4 (Completion or Recompletion Report)
- ☒ Form 6 (Sundry Notices and Report on Wells)
- ☒ Form 7 (Plugging Report)

Geological Information Filed

- ☒ Well Logs: IFS, SNP, DIL, GR, MEIT, CALIP, Cement Bond, Term, Micro, Laterlog, SP Dens. BCSL DI-SR
- ☒ NA DST Charts and Reports
- ☒ Geologist's Report
- ☒ Results of coring and core analyses
- ☒ Set of 10-foot sample cuttings (check with Bob Schoon)
- ☒ Crystal #1 Peterson - Core from 2378'-2424' - at SP174

Date OCT 3 1986

Checked By JK Steece

PERMIT CHECKLIST

Well Name and Location:	Permit # 903
Wulf #1 Peterson	API # 40 047 20074
NENE 21-7S-1E, Fall River	Bond # 708E675-4

Paperwork filed with WFO

- X Organization Report
- X Application
- X Bond
- X Permit Fee

The Following Papers sent to Operator:

- X Permit (Form 2a)
- X Receipt for \$100 permit fee
- X Cover letter explaining material sent

Permit Fee Filed:

- X Permit fee w/Cash Receipts Transmittal Form sent to State Treasurer

Notification of New Permit sent to:

- X Dr. Duncan J. McGregor
- X Mr. Vern W. Butler
- X Dr. Allyn Lockner
- X Mr. George Kane

DATE 12-13-78 CHECKED BY Cheryl Pederson



PERMIT TO DRILL / INTENT TO DRILL

State Pub. Co. Pierre

APPLICATION FOR PERMIT TO:

S. Dak. Oil & Gas Board
FORM 2

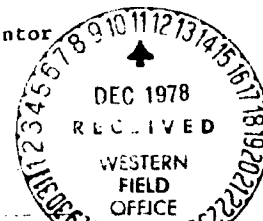
<input checked="" type="checkbox"/> DRILL	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> PLUG BACK	FARM OR LEASE NAME Peterson
<input checked="" type="checkbox"/> OIL WELL	<input type="checkbox"/> GAS WELL	<input checked="" type="checkbox"/> SINGLE ZONE	WELL NO. #1
<input type="checkbox"/> MULTIPLE ZONE			FIELD AND POOL OR WILDCAT Wildcat
OPERATOR Wulf Oil Corporation			NO. ACRES IN LEASE 1200.00
ADDRESS P. O. Box 1320 - Chadron, Nebraska 69337			NE 1/4 Sec. 21, T7S, R1E
LOCATION (in feet from nearest line of section or legal subdivision, where possible)* 660' FNL - 658' FEL Section 21			COUNTY Fall River
NAME AND ADDRESS OF SURFACE OWNER Peterson & Son, Inc. Edgemont, S. D.		ELEVATION 3,533 GP	NO. OF WELLS ETC. 1
NAME AND ADDRESS OF CONTRACTOR Northern Wyoming Drilling Co., Inc. Box 746 Chadron, Nebraska 69337		PROPOSED DEPTH 2,400'	ROTARY OR CABLE TOOLS Rotary
IF LEASE PURCHASED WITH ANY WELLS DRILLED, FROM WHOM PURCHASED (Name and address) N/A		APPROXIMATE DATE WORK WILL START December 28, 1978	

PROPOSED CASING AND CEMENTING PROGRAM					
SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	NEW OR SECOND HAND	DEPTH	SACKS OF CEMENT
12 1/2" 12 1/2"	8 5/8"	24#	New	250'	200 sx.
7 7/8"	5 1/2"	15.50#	New	2,400'	150 sx.

DESCRIBE PROPOSED OPERATIONS. IF PROPOSAL IS TO DEEPEN OR PLUG BACK, GIVE DATA ON PRESENT PRODUCTIVE ZONE AND PROPOSED NEW PRODUCTIVE ZONE. GIVE BLOW OUT PREVENTER PROGRAM IF ANY

We plan to drill a 2,400' well into the Leo Formation. We plan to start the well Dec. 28, 1978 with operations lasting approximately 14 days.

Northern Wyoming Drlg. Rig #2 is equipped with a 10" Ragan Blowout Preventor which will be used while drilling the well.



SIGNED Dennis P. Steele TITLE Vice-President Operator DATE 12-1-78

PERMIT NO. <u>903</u> DATE ISSUED <u>December 13, 1978</u> CONDITIONS: <input type="checkbox"/> COMPLETE SET OF SAMPLES, AND CORES IF TAKEN, MUST BE SUBMITTED. <input type="checkbox"/> SAMPLES, AND CORES IF TAKEN, BELOW <u>SOUTH DAKOTA</u> DEPTH, MUST BE SUBMITTED. STATE GEOLOGICAL SURVEY WESTERN FIELD OFFICE	DO NOT WRITE BELOW THIS LINE CHECKED BY <u>Fred W. Steele</u> Date <u>12-1-78</u> Supervisor, Western Field Office
--	--

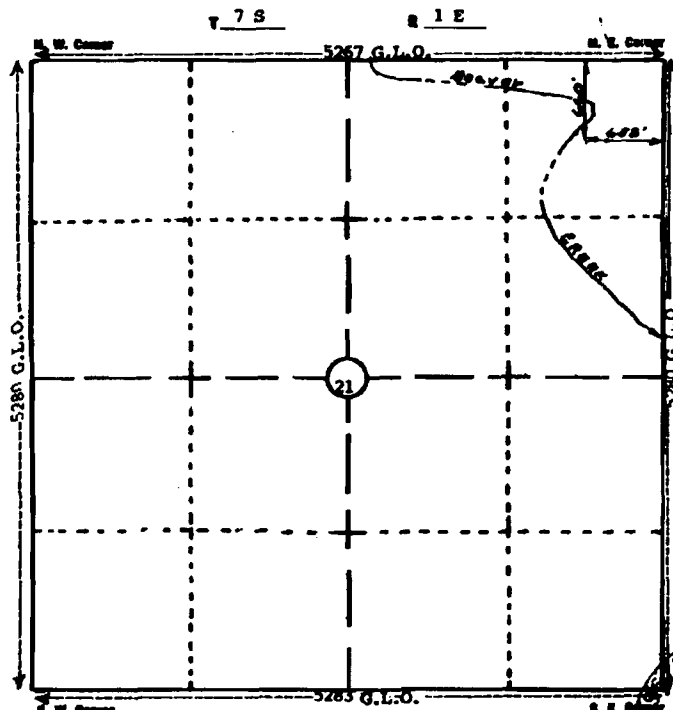
API ID: 20074



PLAINS ENGINEERING
A DIVISION OF HOSKINS-WESTERN-SONDERGEE, INC.
ENGINEERS • ARCHITECTS • PLANNERS • SURVEYORS

P.O. BOX 737 • NEWCASTLE, WY 82701 • 307-746-2784
1013 MAIN ST. • SHELBY CITY, MT 59701 • 406-323-0666
P.O. BOX 433 • SUFFALO, WY 82534 • 307-684-7979
634 PAL BLVD. • HIGH SPRING, SD 57137 • 605-743-0889
P.O. BOX 2839 • GILLETTE, WY 82718 • 307-682-7285

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Elevation at the following reference points:

- 130' North (on bank of Beaver Creek) - 3532'
- 150' West (on bank of Beaver Creek) - 3533'
- 200' South - 3532'
- 200' East (possible alternate site) - 3537.4'



I, Lawrence T. Price, of Newcastle, Wyoming, certify

that in accordance with a request from Sherry Samuels

of Gillette, Wyoming, for Wulf Oil Corp.

P. O. Box 1320, Chadron, Nebraska 69337

That I, Lawrence T. Price, ~~XXXXXX~~

made a survey (date) November 29, 1978

for the location and elevation of the #1 Peterson Well site

As shown on above map, the well site is in NE 1/4 NE 1/4

Section 21, Township 7 South, Range 1 East

Pall River County, South Dakota, Elevation is 3533 feet

above mean sea level before diking.

Lawrence T. Price
Licensed Surveyor No.

789663.54
Notes in Bk 312 Pg 46



WELL INSPECTION / SCOUT REPORTS



POWERTECH (USA) INC.

API ID 40 047 20074

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SOUTH DAKOTA GEOLOGICAL SURVEY
Western Field Office

SCOUT REPORT

Number 4

Date Scouted 8-7-79

Operator Wulf Oil & Crystal

Permit Number 903

Farm/Lease Name #1 Peterson

API Number 40 047 20074

NENE Sec. 21 T. 7S R. 1E

County Fall River

Elev. 3533 Gr. Est. T.D. 2400

Actual T.D. 2500 Spudded 3-10-79

Contractor N. Wyoming Drilling

Geologist Jim Cox

SCOUT'S OBSERVATION:

DST RECORD:

Site clean, level, no dry hole marker (as requested by landowner),
site approved.

FORMATION TOPS:

PLUGGING RECORD:

DATE PLUGGED/COMPLETED 4-7-79

CASING RECORD:

8 5/8 From 0 To 250

From _____ To _____

SITE INSPECTION:

Approved X

Not Approved _____

REMARKS:

SCOUTED BY

Tim Kenyon
Tim Kenyon
Geologic Assistant

Fred V. Steece
Fred V. Steece, Supervisor
Western Field Office

SOUTH DAKOTA GEOLOGICAL SURVEY
Western Field Office

SCOUT REPORT

Number 263

Date Scouted _____

Operator Wulf Oil & Crystal

Permit Number 903

Farm/Lease Name #1 Peterson

API Number 40 047 20074

NENE Sec. 21 T. 7S R. 1E

County Fall River

Elev. 3533 Gr. Est. T.D. 2400 Actual T.D. 2500 Spudded 3-10-79

Contractor Northern Wyoming Drilling Geologist Jim Cox

SCOUT'S OBSERVATION:

DST RECORD:

4-9-79: Pits filled but surface is not leveled. Surface plug not in yet, and no dry hole marker erected. Dozer still at site.

5-15-79: Pits filled and surface leveled to original topography. No seed planted.

FORMATION TOPS:

PLUGGING RECORD:

DATE PLUGGED/~~COMPLETED~~ 4-7-79

CASING RECORD:

8 5/8 From 0 To 250

From _____ To _____

SITE INSPECTION:

Approved _____

Not Approved _____

REMARKS:

Mr. Peterson requested that no dry hole marker be erected. Peterson also wanted us to hold the bond since he and Joe Banks haven't come to an agreement yet.

SCOUTED BY

John Fricke
John Fricke
Geologic Assistant

Fred V. Steece
Fred V. Steece, Supervisor
Western Field Office



SOUTH DAKOTA GEOLOGICAL SURVEY
Western Field Office

SCOUT REPORT

Number 1

Date Scouted _____

Operator Wulf Oil & Crystal

Permit Number 903

Farm/Lease Name #1 Peterson

API Number 40 047 20074

NENE Sec. 21 T. 7S R. 1E

County Fall River

Elev. 3533 Gr Est. T.D. 2400 Actual T.D. _____ Spudded 3-10-79

Contractor Northern Wyoming Drilling Geologist Jim Cox, Gillette WY

Joe Banks, owner, Gillette, WY

SCOUTS OBSERVATION:

DST RECORD:

3-6-79: Still MIRT'S, performing minor repairs.

3-22-79: Drilling at 2434. DST #1, 2nd Leo (misrun). Presently down hole with core barrel (core #4). Plan to drill down to 2500'. Good oil shows reported in cores #1 & #3.

FORMATION TOPS:

PLUGGING RECORD:

DATE PLUGGED/COMPLETED _____

Core #1, 17', 2378-2395
#2, 2', 2395-2397
#3, 25', 2397-2422
#4, 12', 2422-2434

CASING RECORD:

8 5/8 From 0 To 250

From _____ To _____

SITE INSPECTION:

Approved _____

Not Approved X

REMARKS:

Mylo Wisman, toolpusher. Will probably spud tomorrow, and test should last approximately 2 weeks. Location extremely muddy.

SCOUTED BY

John Fricke

John Fricke
Geologic Assistant

Fred V. Steece

Fred V. Steece, Supervisor
Western Field Office



Wulf #1 Peterson

75-10-21 NE 15
CR

5/22/95: MM received a call from Wayne Peterson, the landowner. He discovered water surfacing in his alfalfa field several months ago, near the well location. He dug down almost to the wellhead, and the flow increased substantially. Mr. Peterson dug a trench away from the wellhead to keep his alfalfa from damage.

5/30/95: MM inspected the site, accompanied by Wayne Peterson. The flow was estimated at 10 gpm, and since the Inyan Kara and Sundance both exhibit artesian conditions in that area, it was possible the flow was emanating from either (or both) of those formations, travelling up the 5 1/2, 8 5/8 csg annulus.

6/1/95: FVS contacted Sam Clinton w/ Crystal Oil Co. Mr. Clinton assured FVS Crystal was a responsible co. and would fix the problem.

6/1/95: Pat Eddings (Crystal) called FVS and requested info from well files, which were faxed that day.

6/6/95: Received fax from Pat Eddings, Updike Brothers Well Service (Newcastle, WY), had been contracted to plug well.

8/22/95: Received fax from Ed Gibbs (Updike Bro.s) with Sundry of proposed P&A procedure.

8/24/95: MM called Ed Gibbs, approved P&A procedure. Ed said planning to move rig on-site the following week.

8/31/95: MM witnessed P&A (see procedure above).

9/11/95: Received Sundry from Ed Gibbs (Updike Bro.s) w/ P&A procedure. Approved by FVS.



OPERATOR'S TECHNICAL REPORTS / MAPS



POWERTECH (USA) INC.

API ID 40 047 20074

CORE ANALYSIS RESULTS FOR
CRYSTAL OIL COMPANY
#1 PETERSON
WILDCAT
FALL RIVER COUNTY, SOUTH DAKOTA



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July 2012

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Appendix B

July 2012

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Appendix B

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

PAGE NO. 1

CRYSTAL OIL COMPANY

#1 PETERSON
WILDCAT
FALL RIVER COUNTY

FORMATION : MINNELUSA
DRLG. FLUID: WATER BASE MUD
LOCATION : NE NE SEC 21 T7S-R1E
STATE : SOUTH DAKOTA

DATE : 3-19-79
FILE NO. : RP-4-5055-H
ANALYSTS : BOWEN
ELEVATION: 3533 GR

CONVENTIONAL CORE ANALYSIS

SAMP. NO.	DEPTH	PERM. TO AIR (MD) HORZ. VERTICAL	POR. FLD.	FLUID OIL	SATS. WATER	GR. DNS.	DESCRIPTION
	2378-2385						ANHYDRITE--NO ANALYSIS
1	2385-86	0.02	3.0	14.5	80.0		DOL, LTBRN VFXLN
2	2386-87	0.03	2.9	15.4	77.2		DOL, LTBRN VFXLN
3	2387-88	0.05	2.1	19.6	68.5		DOL, LTBRN VFXLN
4	2388-89	0.08	1.6	24.8	49.6		SS, GY VFG
5	2389-90	0.08	1.7	11.8	47.2		SS, GY VFG
6	2390-91	0.08	2.0	41.8	31.3		SS, GY VFG
7	2391-92	0.08	2.2	27.9	46.5		SS, GY VFG CALC
8	2392-93	0.07	2.7	7.6	60.6		SS, GY VFG
9	2393-94	0.14	2.0	10.4	62.4		SS, GY VFG
10	2394-95	0.05	2.3	9.0	63.0		SS, GY VFG
11	2395-96	0.05	7.2	0.0	91.2		SS, LTGY FG
12	2396-97	0.06	8.2	2.5	87.9		SS, LTGY FG
13	2397-98	0.06	8.7	0.0	86.7		SS, LTGY FG
14	2398-99	6.1	11.3	15.3	65.5		SS, LTGY FG
15	2399-00	0.18	11.0	5.5	76.4		SS, LTGY FG
16	2400-01	13	30.5	16.8	48.3		SS, LTGY FG P/CMT
17	2401-02	977	24.9	21.1	40.0		SS, LTGY FG P/CMT
18	2402-03	4.7	15.2	7.6	80.9		SS, LTGY FG
19	2403-04	4.5	12.6	3.2	75.8		SS, LTGY FG
	2404-2406						SHALE--NO ANALYSIS
20	2406-07	10	13.1	1.4	88.9		SS, LTGY VFG SL/CALC
21	2407-08	98	21.6	0.9	94.2		SS, LTGY VFG
22	2408-09	137	14.2	0.0	90.7		SS, LTGY VFG
23	2409-10	4.0	18.5	21.4	49.0		SS, LTGY FG

VF = VERTICAL FRACTURE

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representation, as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or used in connection with which such report is used or relied upon.

POWERTECH (USA) INC.



API ID 40 047 20074

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July 2012

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Appendix B

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
 DALLAS, TEXAS

PAGE NO. 2

CRYSTAL OIL COMPANY

#1 PETERSON
 WILDCAT
 FALL RIVER COUNTY

FORMATION : MINNELUSA
 DRLG. FLUID: WATER BASE MUD
 LOCATION : NE NE SEC 21 T78-R1E
 STATE : SOUTH DAKOTA

DATE : 3-19-79
 FILE NO. : RP-4-5055-H
 ANALYSTS : BOWEN
 ELEVATION: 3533 GR

APR 10 40 047 20074

POWERTECH (USA) INC.



CONVENTIONAL CORE ANALYSIS

SAMP. NO.	DEPTH	PERM. TO AIR (MD) HORZ. VERTICAL	POR. FLD.	FLUID OIL	SATS. WATER	GR. DNS.	DESCRIPTION
	2410-2417						LOST RECOVERY
24	2417-18	0.58	15.9	0.0	80.6		SS, LTGY FG
25	2418-19	18	17.8	0.0	71.3		SS, LTGY FG
26	2419-20	53	16.9	0.0	91.4		SS, LTGY FG
27	2420-21	69	15.9	0.0	89.7		SS, LTGY FG
28	2421-22	48	16.9	0.0	92.3		SS, LTGY FG
29	2422-23	0.08	2.7	0.0	81.4		SS, GY VFG ABNT/ANHY
30	2423-24	0.09	3.2	0.0	95.3		SS, GY VFG ABNT/ANHY
31	2424-25	0.08	2.5	0.0	88.0		SS, GY VFG
32	2425-26	0.17	3.1	0.0	78.7		SS, GY VFG
33	2426-27	0.08	2.8	0.0	86.1		SS, GY VFG
34	2427-28	0.13	2.4	0.0	91.7		SS, GY VFG
35	2428-29	0.08	3.8	0.0	97.4		SS, GY VFG
36	2429-30	0.05	4.2	0.0	92.7		SS, GY VFG
37	2430-31	0.07	2.7	0.0	92.4		SS, GY VFG
38	2431-32	0.02	2.9	0.0	91.7		SS, GY VFG
	2432-2434						SHALE-NO ANALYSIS

VF = VERTICAL FRACTURE

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API ID 48 047 20074

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CORE LABORATORIES, INC.



Petroleum Reservoir Engineering

COMPANY CRYSTAL OIL FIELD WILDCAT FILE RP-4-5085
WELL #1 PETERSON COUNTY FALL RIVER DATE 3-19-79
LOCATION NE NE SEC 21 T7S-R1E STATE SOUTH DAKOTA ELEV. 3533 GR

CORE-GAMMA CORRELATION

VERTICAL SCALE: 5' = 100'

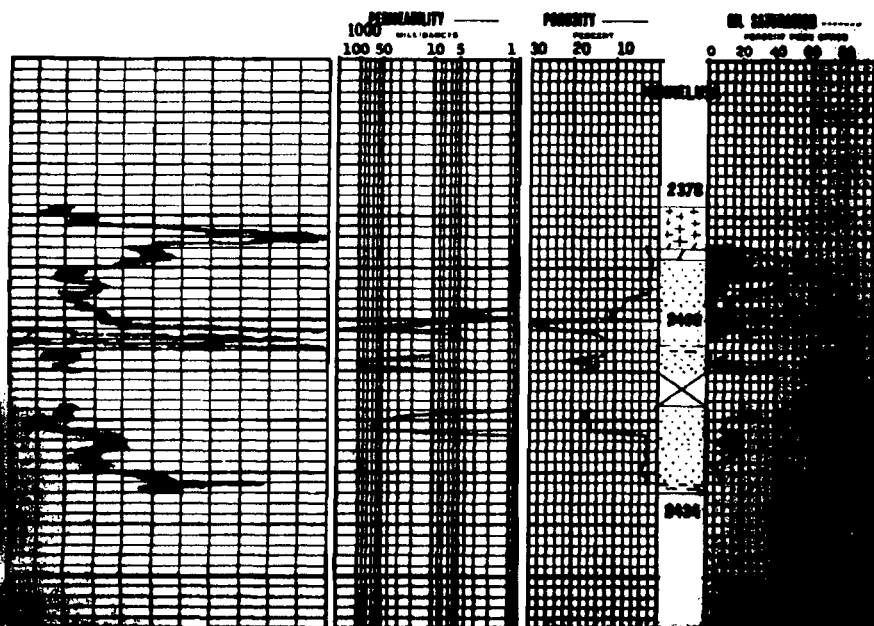
CORE-GAMMA SURFACE LOG

(PATENT APPLIED FOR)

GAMMA RAY
RADIATION INCREASE

COREGRAPH

TOTAL WATER
PERCENT TOTAL WATER
80 60 40 20 0



INTERPRETATION OF DATA

- 2385.0-2395.0 Feet - Non productive due to low permeability and porosity.
- 2395.0-2405.0 Feet - Oil productive characteristics-thin zone. Erratic oil saturations indicate high water cut could be expected.
- 2405.0-2432.0 Feet - Water productive where permeable.

These recovery estimates represent theoretical maximum values for solution gas and water drive. They assume that production is started at original reservoir pressure; i.e., no account is taken of production to date or of prior drainage to other areas. The effects of factors tending to reduce actual ultimate recovery, such as economic limits on oil production rates, gas-oil ratios, or water-oil ratios, have not been taken into account. Neither have factors been considered which may result in actual recovery independent of solution gas and complete water drive recoveries, such as gas cap expansion, gravity drainage, or partial water drive. Predictions of ultimate oil recovery to specific abandonment conditions may be made in an engineering study in which consideration is given to overall reservoir characteristics and economic factors.

These estimates, including interpretations, are based on observations and materials supplied by the client to whom, and for whose exclusive use and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions corrected) but Core Laboratories, Inc. and its officers and employees assume no responsibility and make no warranty or representation as to the probability, proper operation or profitability of any oil, gas or other material well or used in connection with which such report is used or relied upon.



Wulf Oil Corporation

902

DAILY DRILLING REPORT

DATE: March 12, 1979 OPERATOR: Wulf Oil Corporation
 WELL NAME AND LOCATION: #1 Peterson, T7S, R1E, Sec 21: NE1/4, Fall River Co., SD
 DEPTH: 255'
 BIT NUMBER: #1, Y12J, 7 7/8" Reed, drilled 750' with water, 5 hrs drilling cement & p
 DRILLING MUD
 PROPERTIES: WT. _____ VIS. _____ PH _____ H₂O LOSS _____

SAMPLE TOPS:

REMARKS:

3-12

9 hrs - drilling new hole
 8 hrs - nipple up
 1/4 hrs - rig service
 1/4 hrs - jetting pits
 1 hrs - packing swivel

drilling 100 RPM's, 30,000 lbs weight, 54 strokes, 700 lbs pump pressure

35 total rotating hours
 6 3/4 hrs - drilling
 1 3/4 hrs - circulating
 1/4 hrs - rig service
 1/4 hrs - rig up casing tools
 1/4 hrs - running casing
 3/4 hrs - cementing
 13 hrs - waiting on cement and nipple up

survey at 255' with 1° deviation

ran 245' of 8 5/8" 24 lbs ST&C

set at 253' Kb

cemented with 250 sacs cement, 3% Calcium Chloride and 1% chip seal

Good returns

4 hrs - work on derrick
 5 hrs - drilling mouse and rat hole
 15 hrs - drilling 12 1/4 hole

survey at 100' - 1° deviation

drill 100 RPM's, 5 1/2" liners, 14 x 54 strokes, 450 lbs pump pressure



API ID 40 047 20074
MIRT

Estimated spud date, March 1.

2-22-79 Grading location.

Expect to move in rotary tools by February 28.

Rig is currently under day work contract for the Federal Government at Phillip, South Dakota on a geothermal test.

March 2, 1979, 1:35 p.m.

Moved last load onto location this a.m.

Rig is on location and set in.

Shut down and recruiting crews.

When crews are hired, needed welding on derrick will begin.

Anticipate spudding Monday, March 5, 1979.

March 3, 1979 Hiring crews.

Crane or truck unavailable.

Anticipated spud date, Thursday, March 8, 1979

March 4, 1979 Hiring crews.

Crane or truck unavailable.

Anticipated spud date, Thursday, March 8, 1979

Working on derrick. Waiting on crane or truck to move derrick off of the floor.

March 6, 1979 Anticipated spud date March 8, 1979.

Working on derrick.

Anticipated spud date March 8, 1979.

March 7, 1979 Working on derrick.

Anticipated spud date March 8, 1979.

March 8, 1979 Derrick repaired and set up on drilling rig floor.

MIRT

March 9, 1979 Should spud late this afternoon.

Mixed mud and prepared to spud yesterday but derrick would not scope up due to damage incurred in transit to location. Will continue to repair derrick today. If you have further questions, please feel free to contact Joe Banks, Telephone (307) 682-9354.

RECEIVED
MAR 1979
13145

DRILLING REPORT

Crystal Oil Company
AFE #80883
Total Est Cost \$
Crystal's Share \$100,650

Peterson #1
Driftwood Prospect
Fall River County, S. Dakota

LOCATION: NE/4, NE/4, Sec. 21, T7S, R1E

PROPOSED TD: 2400'

CONTRACTOR:

ELEVATION:



- 3-10-79 TD 155', made 155', 1 day - - - This AM drilling - - - 4 hrs work on derrick, 5 hrs drill mouse & rathole, 15 hrs spud 12 1/4" hole. Survey 100', 1°.
- 3-11-79 TD 255', made 100', 2 days - - - This AM WOC & NU BOP's - - - 6 3/4 hrs drilling, 1 3/4 hrs circ, 1/4 hr rig service, 1/4 hr RU csg tools, 1 1/2 hrs run 8 5/8" 24# ST&C surface csg set at 253', cement w/250 sx + 3% CaCl + 1% chip seal, good returns, 3/4 hr cement, 13 hrs WOC & NU BOP's. Survey 255', 1°.
- 3-12-79 TD 750', made 495', 3 days - - - This AM drilling - - - drilling w/water - - - 5 hrs drill cement plug, 9 hrs drilling w/30,000#, 100 RPM, 700 pp, 8 hrs NU, 1 1/2 hrs rig service, 1 1/2 hrs jet pits, 1 hr pack swival - - - Bit #1, Y12J, in 255', made 495'.
- Crystal Oil assume operation 3-13-79.
- 3-13-79 TD 1476', made 734', 4 days - - - This AM drilling - - - drilling w/water - - - 1 1/4 hrs rig service, 1 1/2 hr survey, 1/2 hr rig repair, 4 1/2 hrs trip, 17 1/4 hrs drilling w/25,000#, 100 RPM, 650 pp - - - Bit #1, 7 7/8", Y12J, in 255', out 816', made 581' in 11 hrs. Bit #2, 7 7/8", Y12J, in 816', made 880' in 14 1/2 hrs. Survey 816', 1°.
- 3-14-79 TD 1721', made 245', sh, 5 days - - - This AM mudding up - - - Mud 9.2, Vls 46, WL 6.3 - - - 14 3/4 hrs drilling w/30,000#, 80 RPM, 650 pp, 1 1/4 hrs rig repair, 4 3/4 hrs work stuck pipe, ream 120' to btm, 1/4 hr service rig, 3 hrs mudding up & circ - - - Bit #2, 7 7/8", Y12J, in 816', made 905' in 29 1/4 hrs.
- 3-15-79 TD 1944', made 223', sd & sh, Minnelusa, 6 days - - - This AM work on mud pump - - - Mud 8.8, Vls 38, WL 12.8 - - - 4 1/2 hrs trip (1 hr pull 1st 3 stds, tight spot, 1/2 hr washing down), 1/2 hr survey, 1 1/2 hrs circ & cond, 1/2 hr service rig, 13 3/4 hrs drilling w/30,000#, 50 RPM, 550 pp, 3 1/4 hrs rig repair, work on mud pump - - - Bit #2, 7 7/8", Y12J, in 816', out 1721', made 905' in 29 1/4 hrs. Bit #3, 7 7/8", FP-52, in 1721', made 223' in 13 3/4 hrs. Survey 1721', 1 1/4°.
- 3-16-79 TD 2177', made 233', sd & sh, 7 days - - - This AM drilling - - - Mud 8.7, Vls 53, WL 6.6 - - - 3 1/4 hrs rig repair, 3/4 hrs service rig, 1 1/2 hrs circ & cond mud, 18 1/2 hrs drilling w/30,000#, 50 RPM, 500 pp - - - Bit #3, 7 7/8 FP-52, in 1721', made 458' in 32 1/4 hrs. Cum cost \$90,004.
- 3-17-79 TD 2266', made 109', sd & sh, 8 days - - - This AM drilling - - - Mud 10, Vls 64, WL 4.8 - - - 1 1/4 hrs service rig, 22 3/4 hrs drilling w/35,000#, 50 RPM, 600 pp - - - Bit #3, 7 7/8", FP-52, in 1721', made 565' in 55 hrs. Top of Red Marker 2270', Btm at 2278'. Cum cost \$98,664.

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POWERTECH (USA) INC.
API ID 40 047 20074

DRILLING REPORT
(2)



CEPCO
AFE #80883
Total Est Cost \$
Crystal's Share \$100,650

Peterson #1
Driftwood Prospect
Fall River County, S. Dakota

- 3-18-79 TD 2378', made 92', sd & sh, 9 days - - - This AM trip to run core barrel - - - Mud 10, Vis 45, WL 4 - - - 21 3/4 hrs drilling w/35,000#, 50 RPM, 600 pp, 1/2 hr service rig, 1/4 hr rig repair, 1 1/2 hrs trip - - - Bit #3, 7 7/8", FP-52, in 1721', out 2378', made 657' in 76 3/4 hrs. Cum cost \$107,429.
- 3-19-79 TD 2395', made 17', sh & Leo sd, 10 days - - - This AM WOO, lay down core barrel - - - Mud 9.9, Vis 43, WL 8 - - - 4 hrs reaming, 13 hrs coring 2378-85', 5 hrs trip, cut 17', 1/4 hr survey, 1/4 hr RU to TOOH w/core, 1 1/2 hr break out & lay down core, show of sd on btm 8 1/2', Leo sd 2386.5-85', light to med gray, very, very fine grain, hard anhy, poor porosity & permeability. Survey 2378', 1 1/2⁰.
- 3-20-79 TD 2395', made 0', Leo Sd, 11 days - - - This AM wash core barrel to btm - - - Mud 9.7, Vis 51, WL 7.6 - - - 11 3/4 hrs trip, 3/4 hr ream, 4 1/2 hrs PU DST tool, run DST test #1, 15 mins, surface bubbles only, close tool 30 mins, reopen tool 60 mins, surface bubbles only, blow dtd in 52 mins, CI for 60 mins, POOH, CI pressures were higher than hydrostatic, tool slid 5' to btm, CI press appears to be of no value, mud may have been by passed or pkrs compressed rathole mud during CI, Interval tested 2386-95', surface ck 1/4", btm ck 15/16", rec 50' drilling mud, Cal 300 PPM
- | | |
|-------------|-------------|
| 1st Period: | 2nd Period: |
| IHH 1165# | IF --- |
| IF 17-23# | FF 23-0# |
| IFF --- | FCI --- |
| ICI --- | FHH 1121# |
- Test not valid, 2 hrs circ & cond mud, 1/2 hr service rig, 4 1/2 hrs WOO, PU 60' core barrel, RIH at 7 AM, wash core barrel to btm. Cum cost \$124,415.
- 3-21-79 TD 2422', made 27', 2nd Leo Sd, 12 days - - - This AM lay down core - - - Mud 9.8, Vis 49, WL 5.8 - - - 3 1/2 hrs wash & ream 50' to btm, 1/2 hr circ & clean hole, 1 1/2 hr coring 2395-86', 1 hr go through pump, change fuel filters, 1/2 hr coring 2396-97', TOOH w/core #2 2396-97', 2 1/2 hrs TOOH & check core barrel, 1 1/2 hrs TIH w/core barrel, 1 1/2 hrs wash 4 jts to btm, 1 hr circ & cond mud, 3 hrs coring 2397-2422', 1/4 hr service rig, 2 1/2 hrs cond & circ mud, lay down kelly, 2 1/4 hrs TOOH w/core #3. Cum cost \$133,050.
- 3-22-79 TD 2434', made 12', 2nd Leo Sd & sh, 13 days - - - This AM POOH w/core #4 - - - Mud 10.5, Vis 48, WL 14 - - - 1 hr lay down core #3, cut 25', rec 18', 1 1/4 hrs WOO, 1/2 hr TIH to ream & cond core hole, 1 hr reaming core hole, 1 1/2 hrs circ & cond hole for core #4, 2 1/4 hrs TOOH, 1/2 hr service rig, 1/2 hr PU core barrel, 2 hrs TIH w/core barrel, 2 hrs reaming & circ, 8 1/2 hrs coring, 2422-34', 12', 1/4 hr service rig, 2 3/4 hrs circ & cond mud. Cum cost \$140,880.
- 3-23-79 TD 2500', made 68', sd, sh & dolomite, 14 days - - - This AM circ & cond to log - - - Mud 9.8, Vis 45, WL 8 - - - 2 1/2 hrs TOOH w/core #4, 2422-34', cut 12', 2 hrs lay down core & core barrel, rec 12', 1/2 hr service rig, 2 hrs TIH w/bit, 1/2 hr ream, 3/4 hr service rig, 14 1/2 hrs drilling, 1 1/4 hr circ & cond mud to log - - - Bit #3, 7 7/8", FP-52, RR, made 68' in 14 1/2 hrs. Cum cost \$150,853.



POWERTECH (USA) INC.

API ID 40 047 20074

DRILLING REPORT
(3)



CEPCO
AFE #80883
Total Est Cost \$
Crystal's Share \$100,850

Peterson #1
Driftwood Prospect
Fall River County, S. Dakota

- 3-24-79 TD 2500', made 0', 15 days - - - This AM circ, prep to run csg - - - Mud 9.9, Vis 49 - - - 1/2 hr circ to log, 1/4 hr survey, 1 3/4 hrs TOOH to log, 10 hrs logging, Schlumberger ran DILL-SFL, bore hole compensated, sonic & dip meter, Schlumberger's TD 2499', driller's TD 2500', 1 1/2 hr TIH to circ, 11 hrs circ, WO csg. Survey 2500', 2°. Cum cost \$162,326.
- 3-25-79 TD 2500', made 0', 18 days - - - This AM WOC - - - 1 1/2 hr circ, WO csg, 3 1/2 hrs lay down kelly, DP, collars, RU csg crew, 3 hrs run 71 jts 5 1/2" 14# K-55 R-2 ST&C csg, test to 4300#, total 2503.94', land csg at 2499', PBD 2466', 3/4 hr RU Howco to cement, cement w/10 BW, 500 gals mud flush, 200 sx Class "G" cement, 3% KCL, .75% CFR-2, .4% Halad 22-A, .25 D-Air, displace w/61.13 2% KCL water, bump plug w/2000#, held 5 mins OK, plug down at 3:45 PM, broke out Howco, break down Hydril to set slips, 7 1/4 hrs well had strong water flow out csg, CI csg head, RD Howco, release rig at 11 PM, 3-24-79, 8 hrs WOC. Cum cost \$174,208.
- TD 2500', PBD 2466'.
- 3-26-79 24 hrs, waiting to move rig off location. Cum cost \$174,208.
- 3-27-79 RD & MO rig, WO completion rig. Cum cost \$174,208.
- 3-28-79 WO completion rig. Cum cost \$174,208.
- 3-29-79 11 hrs MI & RU Eatmon Rig #12 from Kimball, NB. Plan to run CBL & perforate today. Cum Cost \$186,208.
- 3-30-79 11 hrs, Schlumberger ran CBL-VDL-GR from 2450-1400', good bond to top of cement at 1530', found PBD at 2460', Howco press tested csg to 2500#, held OK, TIH w/4" csg gun, 4/SPF, FL at surface after perf, RIH w/tbg as follows:

Tbg breakdown:		
6.00'		KB
2342.51'	75 jts	2 7/8", 6.4# J-55 tbg
1.12'		1 - SN
2349.63'	75 jts	

RIH w/swab, FL at surface, swab 3 hrs, rec 53 BLW, pulling from SN, fluid 100% load water, no gas, last run FL 100' above SN, 13 hrs CIPN. This AM CITP 5#, FL 1900', rec 300' dirty, brackish water, prep to acidize. Cum cost \$186,240.

TD 2500', PBD 2460', 5 1/2" csg perfs 2399-2400'.

- 3-31-79 11 hrs, CITP 5#, CIP 5#, FL 1900', Halliburton acidized perfs 2399-2400' as follows: load hole w/36 bbls 2% KCL water, circ 12 bbls 15% HCL + 1%, displace w/3 bbls 2% KCL, CI csg w/1 bbl of acid across perfs, start pump on acid, break down formation at 600# at 1 BPM, 400# pp w/6 bbls of acid pump, SD, let acid soak 10 mins, press dropped to 0#, pump final 6 bbls acid at 2 BPM, 700# pp, overdisplace 1 bbl, ISIP 600#, 15 min 100#, RIH w/swab, FL at surface, swab 8 hrs, rec 157 bbls 100% water, swabbing from SN w/FL maintaining 400', average 19 BW per hr feed in after load rec, 13 hrs CIPN. This AM CITP 50#, CIP 50#, FL 200' from surface, bled off air (no gas) (no hydrocarbons). Cum cost \$201,218.

-22



DRILLING REPORT
(4)

CEPCO
AFE #80883
Total Est Cost \$
Crystal's Share \$100,650

Peterson #1
Driftwood Prospect
Fall River County, S. Dakota

TD 2500', PBD 2460'.

- 4-1-79 10 hrs, CITP 50#, CIGP 50#, bled off air (no gas), FL 200' from surface, fluid sample indicated 100% water, TOOH w/tbg, MU & TIH w/pkr & tbg, set pkr at 2290.53', WO Halliburton 4 hrs, mix & pump 25 ex Class "G" w/Halad 22-A, 75 ex Class "G" regular, 20 bbls slurry, sq perfs 2399-2400' at 2 BPM, 500# pp w/4 bbls in perfs, press increased to 1500#, reduce rate slowly from 2 BPM to 0 w/8 bbls in perfs, cement locked up, held 1500# on well for 30 mins w/min bleed off, rev out cement, press up to 1500#, held 5 min, OK, POOH w/tbg, 14 hrs CIFN. This AM WOC. Cum cost \$208,452.
- 4-2-79 24 hrs WOC. This AM drill out cement sq. Cum cost \$208,452.
- 4-3-79 11 hrs, MU & TIH w/4 3/4" bit & scraper, 2 7/8" tbg, tag cement at 2348', RU power swivel, rev circ equip, drill 50' cement, circ hole clean, test sq to 1500#, held OK, MU & TIH w/pkr, set at 2350', swab dry in 2 runs, no fluid entry, 13 hrs CIFN. This AM TOOH w/pkr, prep to perf 2400-02'. Cum cost \$210,442.
- 4-4-79 10 hrs, TP 0#, CP 0#, FL 2350', no fluid feed in, POOH w/tbg & pkr, RU Goodwill & perf 2400-02', 4/SPF, made 7 holes w/4" sq gun, 1 shot did not fire, found PBD 2424', RD Good will, TIH w/tbg & pkr as follows:

Tbg breakdown:

6.00'		KB
2342.51'	75 jts	2 7/8" 8.4# J-55 tbg
1.12'		1 - SN
3.50'		1 - Baker Model "R" pkr
2353.13'	75 jts	

RU swab, swab well dry in 2 runs, made 1 run every 30 mins to 1 hr, rec 100' fluid per run, 100% water, no gas, cont to swab while WO Goodwill to report, made 2 BW in 3 hrs swabbing, RU Goodwill, TIH w/ 1 11/16" through tbg gun, FL 200' above SN, perf 2400-02' w/9 holes, RD Goodwill, GIH w/swab, found FL 200' above SN, swab dry, made 1 run every 30 mins, rec 50-100' fluid per run, 100% water, 14 hrs CIFN, rec 3 BW in 5 hrs swabbing. This AM opened tbg w/slight blow, no gas, CP 0#, FL 1000' from surface, 100% water, swab down in 1 run, FL maintaining 100' above SN, making 1 run every 30 mins. Cum cost \$213,732.





POWERTECH (USA) INC.

API ID 40 047 20074

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DRILLING REPORT

(5)

CEPCO
AFE #80883
Total Est Cost \$
Crystal's Share \$100,650

Peterson #1
Driftwood Prospect
Fall River County, S. Dakota

TD 2500', PBD 2460', 5 1/2" csg perfs 2400-02'.

4-7-79 12 hrs, work, 3 hrs WO Halliburton, RU, pump plug from 2424-2274' w/16 sx
50-60 Poz mix, lay down tbg, pump plug from 290-210' w/8 sx 50-60 Poz mix,
filled top of 5 1/2" csg w/15' cement, pumped 10 sx cement into surface csg,
RD Halliburton, RD Eaton rig, load out pipe & clean up location.

P & A

FINAL REPORT



20



ADMINISTRATIVE / SUNDRY REPORTS



POWERTECH (USA) INC.

API ID 40 047 20074

SUNDRY NOTICES AND REPORT ON WELLS

27 of 48

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: September 30, 1990

3. Lease Designation and Serial No.

6. If Indian, Allottee or Tribe Name

7. If Unit or CA, Agreement Designation

8. Well Name and No.

Peterson #1

9. API Well No.

40-047-20074

10. Field and Pool, or Exploratory Area

Wildcat

11. County or Parish, State

Fall River, SD

SUBMIT IN TRIPLICATE

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator

Crystal Oil Company

3. Address and Telephone No.

P.O. Box 21101, Shreveport, LA 71120

800-231-4814

4. Location of Well (Postage, Sec., T., R., M., or Survey Description)

NENE Sect. 21, T7S R1E
660' FNL & 758' FEL

12. CHECK APPROPRIATE BOX(es) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

- ☐ Notice of Intent
☐ Subsequent Report
☐ Final Abandonment Notice

TYPE OF ACTION

- ☒ Abandonment
☐ Recompletion
☐ Plugging Back
☐ Casing Repair
☐ Altering Casing
☐ Other
☐ Change of Plans
☐ New Construction
☐ Non-Routine Fracturing
☐ Water Shut-Off
☐ Conversion to Injection

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)

8-31-95

Found fresh water leak to be in 5 1/2" csg.
Tagged T.D. at 1800' with sand line.
Welded a seal between 5 1/2" and 8 5/8" with an outlet in 8 5/8"
Pump 50 sx class G. cement down 8 5/8" and shut in.
Pump 50 sx cement in 5 1/2" from 370' to surface.
Cement settled inside 5 1/2"
Filled 5 1/2" back up with 20 sx
Cement settled
Wait 1 hour and filled 5 1/2" back up with 24 sx.
Cement settled slowly.
Wait 3 hours and filled 5 1/2" back up with 32 sx.
5 1/2" and 8 5/8" stayed full.
Welded a cap over the 8 5/8"
Filled in holes and ditches and leveled location up.

RECEIVED

SEP 11 1995

OIL & GAS PROGRAM

14. I hereby certify that the foregoing is true and correct

Signed Eugene D. Sills

Title Foreman

Date 9-7-95

(This space for Publisher or Standoff Use only)

Approved by John H. Hance

Title Area Supervisor

Date SEP 11 1995

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*See instruction on Reverse Side



POWERTECH (USA) INC.

ARR 12:40 09/22/95 4:48PM UPDI. BROS INC

28 of 48
P. 2/2

SUNDRY NOTICES AND REPORT ON WELLS

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: September 30, 1990

5. Lease Designation and Serial No.

6. If Indian, Allotment or Tribe Name

7. If Unit or CA, Agreement Designation

8. Well Name and No.

Peterson #1

9. API Well No.

40-047-20074

10. Field and Pool, or Exploratory Area

Wildcat

11. County or Parish, State

Fall River, SD

SUBMIT IN TRIPLICATE

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator

Crystal Oil Company

3. Address and Telephone No.

P.O. Box 21101, Shreveport, LA 71120 800-231-4814

4. Location of Well (Fomage, Sec., T., R., M., or Survey Description)

NENE Sect. 21. T7S R1E
660' FNL & 658' FEL

12. CHECK APPROPRIATE BOX(es) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

☒ Notice of Intent

☐ Subsequent Report

☐ Final Abandonment Notice

TYPE OF ACTION

☒ Abandonment

☐ Recompletion

☐ Plugging Back

☐ Casing Repair

☐ Alarming Casing

☐ Other

☐ Change of Plans

☐ New Construction

☐ Non-Routine Fracturing

☐ Water Shut-Off

☐ Conversion to Injection

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)

Repair a fresh water leak at the surface of the well which had been plugged on 4-6-79.

RIH with Tubing and Tag cement plug at 210'-290'

If the plug is still there and is not leaking then perforate at 275' and set a cement retainer at 210' and squeeze the 8 5/8 with 100 sx of class G cement.

Put a 15 sx plug at surface of 5 1/2.

If the cement plug is not found at 210'-290' then replace it with 35 sx cement and 15 sx at surface of 5 1/2 plus pump 50 sx cement down the surface pipe.

14. I hereby certify that the foregoing is true and correct

Signed Edward Gibbs

Title Foreman UBI

Date 8-22-95

(This space for Federal or State office use)

Approved by _____
Conditions of approval, if any:

Title _____

Date _____

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*See instruction on Reverse Side



POWERTECH (USA) INC.

API ID 40 047 20074

S. Dak. Oil & Gas Board
FORM 7

PLUGGING RECORD

Operator CRYSTAL OIL COMPANY		Address P. O. Box 21101, Shreveport, LA 71120	
Name of Lease Peterson		Well No. 1	Field & Reservoir Wildcat - Dry
Location of Well 660' FNL & 658' FEL NE$\frac{1}{4}$, NE$\frac{1}{4}$ of Section 21, T7S, R1E		County Fall River	
Application to drill this well was filed in name of Wulf Oil Corporation		Has this well ever produced oil or gas No	Character of well at completion (initial production): Oil (bbls/day) --- Gas (MCF/day) --- Dry* Yes
Date plugged: April 6, 1979	Total depth 2500'	Amount well producing when plugged: Oil (bbls/day) 0 Gas (MCF/day) 0	Water (bbls./day) 0
Name of each formation containing oil or gas. Indicate which formation open to wellbore at time of plugging Dry		Fluid content of each formation ---	Depth interval of each formation ---
		Size, kind & depth of plugs used. Indicate zones squeeze cemented, giving amount cement. ---	

CASING RECORD

Size pipe	Put in well (ft.)	Pulled out (ft.)	Left in well (ft.)	Give depth and method of parting casing (shot, ripped, etc.)	Packers and shoes
8-5/8"	253'	0	253'	---	None
5-1/2"	2499'	0	2499'	---	None

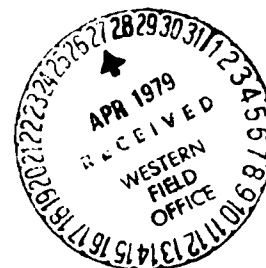
Was well filled with mud-laden fluid, according to regulations? **Yes**

Indicate deepest formation containing fresh water
Second Leo

In addition to other information required on this form, if this well was plugged back for use as a fresh water well, give all pertinent details of plugging operations to base of fresh water sand, perforated interval to fresh water sand, name and address of surface owner, and attach letter from surface owner authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.

4-6-79 - Pump plug from 2424-2274' w/16 sx 50-50 Posmix
 Pump plug from 290-210' w/8 sx 50-50 Posmix
 Pump plug from 15'-0' w/5 sx cement
 Pump 10 sx cement into surface casing annulus.

Plugged and Abandoned 4-6-79



USE REVERSE SIDE FOR ADDITIONAL DETAIL

Executed this the **24** day of **April**, 19**79**
 State of **Louisiana**
 County of **Parish of Caddo**

Before me, the undersigned authority, on this day personally appeared **James O. Glass**, known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states, that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.

Subscribed and sworn to before me this **24** day of **April**, 19**79**

SEAL

My commission expires **with life**

Notary Public in and for
County,

Lillian Connor Nixon, Notary Public
 Caddo Parish, Louisiana
 My Commission is For Life

DO NOT WRITE BELOW THIS LINE

Approved **May 8, 1979**
 Date

Oil and Gas Board of the State of South Dakota
Secretary

Supervisor, Western Field Office



POWERTech (USA) Inc.

API ID 40 047 20074

31 of 48

Well name: WOLF #1 Akrsm

CO: Fall River

Legal Location: NENE 21-75-26

Status: 13:4

open hole size: 12 1/4
Depth: 252

surface csg size: 8 1/2
Depth: 252

Cement Amt: 250
calculations

- 1) RTH 5 1/2 - sand line to 100' no cement until started on obstruction
- 2) pumped 50 sks in 8 1/2 - 272-0
- 3) pumped 105 sks in 5 1/2 - 766-0

Formation Tops

2' Fine WOLF 1A - 200' away

Drifts - 235

Clay - 245

Basal Sandstone - 1195

1' - 1195 - 1195

Red shales 7067

1' L - 2460

2' L - 2460

298 open hole size 7 1/2
2504 Depth

5 1/2 - 14 # production csg size & weight

Cement Amt: type: _____
calculations

2' - 1062 - 1195

CRL 11.0

1020

Pi A on 4/6/79

1' - 1195 - 1195
Red shales 7067

1' - 1195 - 1195

1' - 1195 - 1195

1' - 1195 - 1195

1' - 1195 - 1195

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1' - 1195 - 1195



POWERTECH (USA) INC.

STATE FID. NO. ARND 40 047 20074

S. Dak. Oil & Gas Board
32 of 48 FORM 6

SUNDRY NOTICES AND REPORT ON WELLS		FARM OR LEASE NAME
<input type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> _____ <input checked="" type="checkbox"/> DRY		Peterson
OPERATOR Crystal Oil Company		WELL NO. 1
ADDRESS P.O. Box 21101 -Shreveport, Louisiana 71120		FIELD AND POOL, OR WILDCAT Wildcat
LOCATION (in feet from nearest lines of section or legal subdivision, where possible) 660' FNL and 658' FEL of Sec. 21, T7S, R1E		NO. ACRES IN LEASE 1200
ELEVATIONS (D.F., R.K.B., I.T., GRD., etc.; how determined) 3533' GR.		T. R. SEC. TWP. RGE. NE 1/4, NE 1/4 Sec. 21, T7S, R1E
		COUNTY Fall River

INDICATE BELOW BY CHECK MARK NATURE OF REPORT, NOTICE OR OTHER DATA			
NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	<input type="checkbox"/>	SHOOT OR ACIDIZE	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	REPAIR WELL	<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>	PULL OR ALTER CASING	<input type="checkbox"/>
ABANDON	<input checked="" type="checkbox"/>	WATER SHUT-OFF	<input type="checkbox"/>
		FRACTURE TREATMENT	<input type="checkbox"/>
		SHOOTING OR ACIDIZING	<input type="checkbox"/>
		REPAIRING WELL	<input type="checkbox"/>
		ALTERING CASING	<input type="checkbox"/>

(Note: Report results of multiple completion on Well Completion or Recompletion and Log Form—Form 4)

DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work)

4-6-79 Pump plug from 2424'-2274' w/16 sx 50-50 pozmix
 Pump plug from 290'-210' w/8 sx 50-50 pozmix
 Fill top of 5 1/2" casing w/15' cement, pump 10 sx cement in to surface casing.



I hereby certify that the foregoing as to any work or operation performed is a true and correct report of such work or operation.

SIGNED James O. Blase TITLE Asst. Mgr. of Prod. Admin. DATE 4/9/79

Approved 4-17-79

Date

DO NOT WRITE BELOW THIS LINE

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

Fred W. Steene
Supervisor, Western Field Office

CONDITIONS, IF ANY:

See Instructions On Reverse Side



CORRESPONDENCE



McGillivray, Mack

From: McGillivray, Mack
To: Steeco, Fred; Townsend, Bob
Cc: Gladd, Roxanne; Hamann, Sheldon
Subject: RE: Leaking oil test well, Fall River County
Date: Tuesday, September 05, 1995 4:25PM

I witnessed the plugging of this well last Thurs (8/31). When I arrived on location a backhoe had finished digging down to the casing. Water was shooting out of the weld around the cap on the surface (8 5/8") casing. The welder welded a 2" collar on the side of the surface pipe and cut a hole through the pipe. I estimated the flow at about 20 gpm. When the welder cut off the old casing cap, it was apparent the flow was coming up the inside of the production (5 1/2") casing, not the production/surface casing annulus as we had expected. This led us to speculate that the 5 1/2 had holes in it somewhere. Since the rig only had 400' of tubing, I had the rig run their sand line with a large sinker bar into the hole to determine where the top cement plug was. They didn't hit anything until 1800'; there was supposed to be cement plugs at the surface and at 210-290'.

A ring was welded in the annulus to isolate the two strings of casing, and a vacuum truck pumped up the water flowing out of the casing. A line from the cement pump was hooked up to the 8 5/8 casing, and we pumped 50 sacks of cement down the casing at 2 bpm - 400 psi, leaving a plug from 288-0'. There was still 300 psi when we stopped pumping, so we shut the valve, and left the pressure on the pipe. The flow from the 5 1/2 never changed.

The rig ran 12 jts of 2 3/8" tubing into the 5 1/2 casing to 308', and we pumped a 50 sk plug from 419-0' (base of surface casg - 385'). When the tubing was pulled out, the cement level dropped about 100' in the pipe, but the water flow had stopped completely. I had them shut down for 1 hour, then we pumped 20 more sks cmt. The cement level dropped again, to the 100' level. I told them I wanted to see the cement level stay at surface, so we released the rig and waited 3 hours for the cement to set up. After 3 hours, we pumped another 35 sks cmt to fill the pipe. This time, the cement level stayed static. A total of 105 sks cmt were pumped down the 5 1/2 casg, which calculates to a plug from 788' to surface.

A steel cap was welded on top of the pipe, and the backhoe filled the hole and levelled the location. Wayne Peterson (the landowner), stopped by and said he was pleased with the response, cooperation, and results from Crystal Oil Co. and DENR.

As a side note, I witnessed another plugging of a former producing well the day before south of Provo. The company rep spent most of the time informing me SD plugging regs were too strict and expensive, and we were killing future exploration in the state. He asked why we required so much cement in shallow wells. I invited him to ride with me the next day to this well, and I would show him why.

From: Steeco, Fred
To: Townsend, Bob
Cc: McGillivray, Mack
Subject: Leaking oil test well, Fall River County
Date: Wednesday, June 07, 1995 10:49AM

Bob, I received a fax from Crystal Oil Co. this morning that they are talking with Updike Brothers, Inc., a drilling contractor in Newcastle, WY, and have asked for Updike to submit a bid on repairing the well.



Staece, Fred

From: Townsend, Bob
To: Martley, Bill; Goodman, Jim; Tollefson, Tim
Cc: Pinner, Steve; Staece, Fred
Subject: FW: Mail failure
Date: Friday, June 02, 1995 9:54AM

I discussed this with Fred this morning. The leakage rate was estimated by Meck at about 10 gpm. The leakage is probably related to a problem with cementing in the annulus between the surface casing and long string. Fred has been in contact with the company that did the test several times and has faxed well information to them in that they no longer have records on this well. Fred indicates that they plan to fix the well although they don't have a time line for the fix yet because they are still evaluating the information Fred sent. If the company does not respond with a plan in the next week or two, Fred will write them a letter requesting a plan for fixing the well.

Microsoft Mail v3.0 IPM.Microsoft Mail.Note

From: Staece, Fred
To: Townsend, Bob
Cc: Gledd, Roxanne
McGillivray, Meck
Subject: 1979 oil test leaking water, Fall River County
Date: 1995-06-01 10:48
Priority:
Message ID: 534D4BE1
Conversation ID: 534D4BE1

Bob, this note is for your information.

Mr. Wayne Peterson, a rancher in Fall River County informed us that an oil test drilled on his land in 1979 has started to leak water for the past several months. Meck and Mr. Peterson inspected the site on Tuesday and found the well to be flowing maybe 10 gpm. The water is being diverted from his hay field onto the Cheyenne River flood plain where it is being dissipated into the alluvium. I talked to Roxanne who told me that even though the operator's drilling bond has long since been released, they would still have some responsibility to fix the problem. I phoned the operator, located in Louisiana, and was told they would repair the well at an early date.



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES
OIL AND GAS PROGRAM
2050 West Main, Suite #1
Rapid City, SD 57702
605-394-2229 FAX 605-394-5317

TO: WFO Files
FROM: Fred V. Steece
DATE: June 2, 1995
SUBJECT: Leaking oil test, Fall River County

This office was contacted by Mr. Mark Tubbs for Mr. Wayne Peterson on ^{May 22} or about May 29, 1995 informing Mack that an old oil test drilled on Peterson's land had begun to flow water several months ago. The Wulf #1 Peterson located in NENE 21-7S-1E, Fall River County, was started by Wulf, taken over and plugged by Crystal Oil Company in 1979.

The following day Mack McGillivray met Mr. Peterson and inspected the well location and took photos and kept notes on his findings. He found that the water was flowing at an estimated rate of 10 gpm and had been channelled away from a hayfield toward the Cheyenne River. The water was not entering the river but was disappearing into the alluvium some distance from the river.

I spoke to Roxanne Gledd, Assistant Attorney General, to find out what responsibility the company would have after all this time, particularly since their drilling and plugging bond had long since been released. Roxanne told me as long as the well was not completed as a water well and turned over to the landowner for his use that, the company would still be responsible for plugging the hole.

I next visited with Jim Goodman at Water Rights to inform him of the flowing well and to inquire whether his division had a fund for plugging uncontrolled wells. He informed me they did not.

On June 1, 1995, I telephoned the company in Shreveport, LA and spoke with Mr. Sam Clinton who assured me that Crystal is a responsible company and would fix the problem. He arranged for Mr. Pat Eddings to contact me and we spoke about details of information in our well files. I faxed the information that he requested, including a list of drilling contractors who have drilled in South Dakota in recent times. Mr. Eddings said he would study the information and get back to me when they had made a decision on the well.

I conveyed some of this information to Bob Townsend via E-Mail dated June 2, 1995.

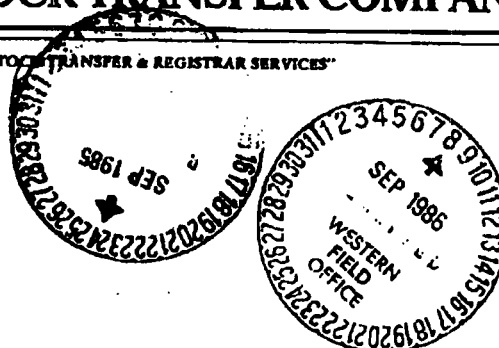


MCM STOCK TRANSFER COMPANY, INC.

"STOCK TRANSFER & REGISTRAR SERVICES"

MICHAEL C. MILLER
PRESIDENT

(303) 866-7842



September 2, 1986

Mr. Fred Steece, Supervisor
Department of Water & Natural Resources
Western Field Office
36 E. Chicago
Rapid City, South Dakota 57701

Re: Letter of 06/09/86
Wulf Oil Corporation

Dear Mr. Steece:

As per requested in your letter of June 9, 1986, in regard to the Wulf #1 Peterson well and the Wulf #4 Federal well in Fall River County, South Dakota, I have sent you the material I found in the company files. The Wulf #1 Peterson was operated by Crystal Oil, who took over in the middle of the drilling of it. Any further information you need on this, I would suggest you contact them.

The information I am sending includes this:

- (1) Geological Report Wulf Oil #4 Federal
- (2) Plugging Record Wulf Peterson #1
- (3) Drilling Report Wulf #1 Peterson

I received copies of the above from Banks Enterprises, Inc., one of the partners on the projects. ~~Most of our records were lost in a fire at our office in Denver, Colorado, on June 10, 1986.~~

Yours very truly,

Larry C. Wulf, President
WULF OIL CORPORATION

LCW/lw
Enc: 1

MAILING ADDRESS: P.O. BOX 300017, DENVER, CO 80230
OFFICE ADDRESS: 901 EAST 17th AVENUE, SUITE 200, DENVER, CO 80202



Mr. Fred V. Steece, Supervisor
Western Field Office
36 East Chicago
Rapid City, SD 57701

Dear Mr. Steece:

This letter informs you that the surface restoration
at the site of the following oil or gas test well
has been completed to my satisfaction.

<u>Permit</u>	<u>Well Name and Location</u>
903	Wulf #1 Peterson, NENE 21-7S-1E, Fall River

I am the surface owner of record.

SIGNED Wayne J. Peterson DATE 9/19/95



POWERTECH (USA) INC.

API ID 40 047 20074

39 of 46

CRYSTAL OIL COMPANY

SUITE 879, TOWER III, PARK CENTRAL BUILDING
1515 ARAPAHOE ST., DENVER, COLORADO 80202
TELEPHONE 303-623-2226

April 10, 1979

Department of Natural Resources
South Dakota Geological Survey
Western Field Office
308 West Boulevard
Rapid City, South Dakota 57701

Attention: Fred V. Steece

Re: Crystal No. 1 Peterson
NE/4NE/4 Section 21
Township 1 East, Range 7 South
Fall River County, South Dakota



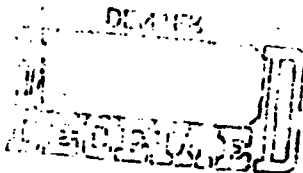
Gentlemen:

This is to advise I do not want a dry hole marker locating the Crystal No. 1 Peterson erected in my cultivated field because of a hindrance to my future farming of same. Thank you.

Very truly yours,

PETERSON AND SONS, INC.

By: Wayne J. Peterson
Pres.



CRYSTAL OIL COMPANY

P.O. BOX 21101, SHREVEPORT, LOUISIANA 71120
TELEPHONE 316-222-7781 TWX 510 973 4087

March 13, 1979

South Dakota
State Geological Survey
308 West Boulevard
Rapid City, South Dakota 57701

Re: Transfer of Drilling Permit
Wulf Oil Corp.-Peterson #1
Permit no. 903

Gentlemen:

We acquired the above well March 13, 1979 and assume the full responsibility for its operation and abandonment in conformity with the law, rules, regulations, and orders issued by the board.

A Blanket Bond in our name is attached.

If there is any other information we should furnish you, please let us know.

Yours very truly,

CRYSTAL OIL COMPANY


Asst. Manager of Production Admin.

JOG/mr

Attachments





SURETY



POWERTECH (USA) INC.

API ID 40 047 20074

42 of 48

State Pub. Co., Pierre

NOV 30 1978

S. Dak. Oil & Gas Board
FORM 2

Bond No. 708E675-4

BOND

KNOW ALL MEN BY THESE PRESENTS,

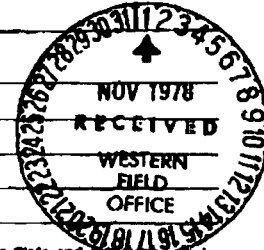
That
we Hulf Oil Corporation
of the _____ in the _____
County of Dawes State of Nebraska
as Principal,
Travelers Indemnity Company
and
of Hartford, Connecticut

as surety, authorized to do business in the State of South Dakota as surety, are held and firmly bound unto the State of South Dakota in the sum of (\$5,000.00; \$20,000.00), lawful money of the United States, for which payment, well and truly to be made, we bind ourselves, and each of us, and each of our heirs, executors, administrators or successors, and assigns jointly and severally, firmly by these presents.

The condition of this obligation is that whereas the above bounden principal proposes to drill a well or wells for oil, gas, or stratigraphic purposes in and upon the following described land situated within the State, to wit:

Blanket

(May be used as blanket bond or for single well)



NOW, THEREFORE, if the above bounden principal shall comply with all of the provisions of the laws of this State and the rules, regulations and orders of the Oil and Gas Board of the State, especially with reference to the proper plugging of said well or wells, and filing with the Oil and Gas Board of this State all notices and records required by said Board, and the restoration of the surface, in the event said well or wells do not produce oil or gas in commercial quantities, or cease to produce oil or gas in commercial quantities, then this obligation shall be terminated by the Board, the same shall be and remain in full force and effect.

Penal sum of

Twenty Thousand Dollars and no/100-----(\$20,000.00)

Witness our hands and seals, this 25th day of October 1978

Hulf Oil Corporation

Dennis R. Steel
Vice President

Principal

Witness our hands and seals, this 25th day of October 1978

Countersignature:

Cheryl J. Leape

Travelers Indemnity Company

Norman Sterling, Jr.

Norman Sterling, Jr., Attorney-in-fact

(If the principal is a corporation, the bond should be executed by its duly authorized officers, with the seal of the corporation affixed. When principal or surety executes this bond by agent, power of attorney or other evidence of authority must accompany the bond.)

DO NOT WRITE BELOW THIS LINE

Approved 11-1-78
Date

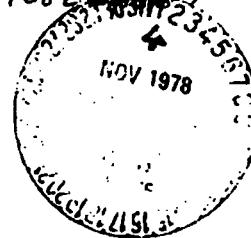
OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA
Fred V. Steele
Supervisor, Western Field Office



POWERTECH (USA) INC.

API ID 40 047 20074

Bond No. 70851-15-4



STATE OF SOUTH DAKOTA

Department of Natural Resource Development Division of Geological Survey
Form 8

BONDING COMPANY INFORMATION SHEET

Information about your bonding company:

Name of bonding company: Travelers Indemnity Company
Street Address: 101 University Blvd.
City, State: Denver, CO 80206
Phone: (303) 321-2333 Remarks: _____

Information about your South Dakota bonding company agent:

Name of South Dakota Agent: Kluthe & Land Agency
Street Address: 619 Mount Rushmore Rd., P.O. Box 3031
City, State: Rapid City, South Dakota 57701
Phone: _____ Remarks: _____

Information about releasing your bond:

When the Principal for whom you are providing Surety has fulfilled all obligations, whom should we contact with our Bond Release?

Name of Contact: Bayly, Martin & Pay, Inc.
Street Address: 817 17th Street, Suite 500
City, State: Denver, Colorado 80202
Phone: (303) 292-500 Remarks: _____

Please file this form together with Oil & Gas Form No. 3 with: Mr. Fred V. Steece, Supervisor, South Dakota Geological Survey, Western Field Office, 308 West Boulevard, Rapid City, South Dakota 57701 PH: (605) 394-2229



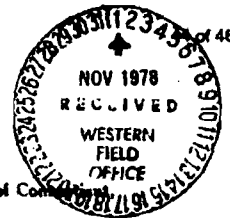
POWERTECH (USA) INC.

API ID#0 047 20074

The Travelers Indemnity Company

Hartford, Connecticut

POWER OF ATTORNEY



KNOW ALL MEN BY THESE PRESENTS:

That THE TRAVELERS INDEMNITY COMPANY, a corporation of the State of Connecticut, does hereby make, constitute and appoint

Norman Sterling, Jr., Paul M. Barbour, Norman C. Headrick, David H. Snead, Thomas J. Sisk, Jr., all of Denver, Colorado, EACH

its true and lawful Attorney(s)-in-Fact, with full power and authority, for and on behalf of the Company as surety, to execute and deliver and affix the seal of the Company thereto, if a seal is required, bonds, undertakings, recognizances, consents of surety or other written obligations in the nature thereof, as follows:

Any and all bonds, undertakings, recognizances, consents of surety or other written obligations in the nature thereof not exceeding in amount Two Hundred Thousand Dollars (\$200,000) in any single instance

and to bind THE TRAVELERS INDEMNITY COMPANY thereby, and all of the acts of said Attorney(s)-in-Fact, pursuant to these presents, are hereby ratified and confirmed.

This appointment is made under and by authority of the following by-laws of the Company which by-laws are now in full force and effect:

ARTICLE IV, SECTION 14. The Chairman of the Board, the President, the Chairman of the Finance Committee, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Corporate Secretary or any Department Secretary may appoint attorneys-in-fact or agents with power and authority, as defined or limited in their respective powers of attorney, for and on behalf of the Company to execute and deliver, and affix the seal of the Company thereto, bonds, undertakings, recognizances, consents of surety or other written obligations in the nature thereof and any of said officers may remove any such attorney-in-fact or agent and revoke the power and authority given to him.

ARTICLE IV, SECTION 16. Any bond, undertaking, recognizance, consent of surety or written obligation in the nature thereof shall be valid and binding upon the Company when signed by the Chairman of the Board, the President, the Chairman of the Finance Committee, any Executive Vice President, any Senior Vice President, any Vice President or any Second Vice President and duly attested and sealed, if a seal is required, by the Corporate Secretary or any Department Secretary or any Assistant Corporate Secretary or any Assistant Department Secretary, or shall be valid and binding upon the Company when duly executed and sealed, if a seal is required, by a duly authorized attorney-in-fact or agent, pursuant to and within the limits of the authority granted by his or her power of attorney.

This power of attorney is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Directors of THE TRAVELERS INDEMNITY COMPANY at a meeting duly called and held on the 30th day of November, 1939:

Voted: That the signature of any officer authorized by the By-Laws and the Company seal may be affixed by facsimile to any power of attorney or special power of attorney or certification of either given for the execution of any bond, undertaking, recognizance or other written obligation in the nature thereof; such signature and seal, when so used being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

This power of attorney revokes that dated October 20, 1976 on behalf of Norman Sterling, Jr., Schuyler F. Cross, Paul M. Barbour

IN WITNESS WHEREOF, THE TRAVELERS INDEMNITY COMPANY has caused these presents to be signed by its proper officer and its corporate seal to be hereunto affixed this 30th day of May 1978.



THE TRAVELERS INDEMNITY COMPANY

By

Secretary, Surety

State of Connecticut, County of Hartford—ss:

On this 30th day of May in the year 1978 before me personally came D. J. Nash to me known, who, being by me duly sworn, did depose and say: that he resides in the State of Connecticut; that he is Secretary (Surety) of THE TRAVELERS INDEMNITY COMPANY, the corporation described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by authority of his office under the by-laws of said corporation, and that he signed his name thereto by like authority.



Notary Public

My commission expires April 1, 1983

A-1000 Rev. 4-78 Printed in U.S.A.

(Over)



MISCELLANEOUS



**NO MISCELLANEOUS
INFORMATION FOR THIS WELL
AS OF 5/18/2011**

Oil and Gas Search for: *api_no_ like '40 047 20077'*

Page 1 of 1

Download Database
(Excel spreadsheet format)

Page: Prev 1 Next

Record 1 of 1

Well Information

API No:	40 047 20077	County:	FALL RIVER
Well Name:	WULF 2 PETERSON	Location:	SWSW 15-7S-1E
Permit No:	919	Total Depth:	2462
Operator Name:	WULF OIL CORPORATION	Bottom Hole:	Minnelusa
Permit Date:	06-08-1979	KB Elevation:	3572
Spud Date:	08-03-1979	Ground Elevation:	3564
Plug Date:	08-13-1979	Latitude:	43.435870
		Longitude:	-103.991583
Well Field:	WILDCAT	Status:	P&A
Class:	DRY HOLE	Type:	DRY HOLE

Formation Tops

<u>Formation</u>	<u>Depth (ft.)</u>
Sundance	822
Spearfish	1164
Goose Egg	1515
Minnekahta	1689
Opeche	1728
Minnelusa	1817
Red Marker	2232
1st Leo	2242
2nd Leo	2340

Page 1 of 1 (goto top)

Page: Prev 1 Next

COUNTY: FALL RIVER
LEGAL LOCATION: SWSW 15-7N-1E
API NO: 40 047 20077
PERMIT NO: 919
WELL NAME: WULF #1 PETERSON
OPERATOR: WULF OIL CORPORATION
PERMIT ISSUED: 06/08/1979
PERMIT CLOSED: 09/21/1979
FILE LOCATION: 7N-1E-15 SWSW

TARGET CODES:

WELL HISTORY / CHECKLIST

PERMIT TO DRILL / INTENT TO DRILL

WELL INSPECTION / SCOUT REPORTS

OPERATOR'S TECHNICAL REPORTS / MAPS

ADMINISTRATIVE / SUNDRY REPORTS

CORRESPONDENCE

SURETY

MISCELLANEOUS



WELL HISTORY / CHECKLIST



BOND RELEASE CHECKLIST

Well Name and Location		Permit # 919
Wulf #2 Peterson SWSW 15-7S-1E, Fall River		API # 40 063 20077
Bond # 708E675-4	Date Issued	Date Released NOV 06 1985

Surface Restoration

- ☒ Pits filled
- ☒ Site Level
- ☒ Site policed
- ☒ Dry-hole marker solid, sealed, correctly inscribed
- ☒ ~~NA~~ No dry-hole marker desired, letter in WFO files from surface owner
- ☒ Letter from surface owner

Paperwork filed

- ☒ Form 4 (Completion or Recompletion Report)
- ☒ Form 6 (Sundry Notice and Report on Wells)
- ☒ Form 7 (Plugging Report)

Geological Information Filed

- ☒ Well Logs: IES, SNP, DIL, CR, NEUT, CALIP, Cement Bond, Temp, Micro, Laterlog, SM Dens. Acoustilog
- ☒ DST Charts and Reports
- ☒ Geologist's Report
- ☐ Results of coring and core analyses (None cut)
- ☒ Set of 10-foot sample cuttings (Check with Bob Schoon)

Date NOV 1 1985 Checked By J. Stacey



PERMIT CHECKLIST

Well Name and Location:	Permit # 919
Wulf #2 Peterson	API # 40 047 20077
SWSW 15-7S-1E, Fall River	BOND # 708E675-4

Paperwork filed with WFO

- ☒ Organization Report
- ☒ Application
- ☒ Bond
- ☒ Permit Fee

The Following Papers sent to Operator:

- ☒ Permit (Form 2a)
- ☒ Receipt for \$100 permit fee
- ☒ Cover letter explaining material sent

Permit Fee Filed:

- ☒ Permit fee w/Cash Receipts Transmittal Form sent to State Treasurer

Notification of New Permit sent to:

- ☒ Dr. Duncan J. McGregor
- ☒ ~~Mr. Warren R. Neufeld~~ Mr. Warren R. Neufeld
- ☒ ~~Mr. Jack Gerken~~
- ☒ ~~Mr. Jack Gerken~~ Mr. Jack Gerken

Date June 22, 1979 Check By cp



PERMIT TO DRILL / INTENT TO DRILL



State Pub. Co., Pierre

APPLICATION FOR PERMIT TO:

S. Dak. Oil & Gas Board
FORM 2

<input checked="" type="checkbox"/> DRILL	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> PLUG BACK	FARM OR LEASE NAME Peterson
<input checked="" type="checkbox"/> OIL WELL	<input type="checkbox"/> GAS WELL	<input checked="" type="checkbox"/> SINGLE ZONE	WELL NO. #2
<input type="checkbox"/> MULTIPLE ZONE			FIELD AND POOL OR WILDCAT Wildcat
OPERATOR Wulf Oil Corporation			NO. ACRES IN LEASE 1200.00
ADDRESS P.O. Box 1320, Chadron, NE 69337			1/4 SEC. TWP. RGE Sec 15: T7S, R1E Center SE 1/4 SW 1/4
LOCATION (In feet from nearest lines of section or legal subdivision, where possible)* 1/330' FSL - 987' FWL Section 15			COUNTY Fall River, South Dakota
NAME AND ADDRESS OF SURFACE OWNER Peterson & Son, Inc. Edgemont, South Dakota HCR - 59, Box 16		ELEVATION 3564.9' gr PROPOSED DEPTH 2400'	NO. OF WELLS ETC 1 ROTARY OR CABLE TOOLS Rotary
NAME AND ADDRESS OF CONTRACTOR Northern Wyoming Drilling Co., Inc. P.O. Box 487 Gillette, Wyoming 82716		APPROXIMATE DATE WORK WILL START July 1, 1979	

IF LEASE PURCHASED WITH ANY WELLS DRILLED, FROM WHOM PURCHASED (Name and address)

NA

PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	NEW OR SECOND HAND	DEPTH	SACKS OF CEMENT
12 1/4"	8 5/8"	24#	New	250'	200 SX.
7 7/8"	5 1/2"	15.50#	New	2,400'	150 SX.

DESCRIBE PROPOSED OPERATIONS. IF PROPOSAL IS TO DEEPEN OR PLUG BACK, GIVE DATA ON PRESENT PRODUCTIVE ZONE AND PROPOSED NEW PRODUCTIVE ZONE. GIVE BLOW OUT PREVENTER PROGRAM IF ANY

We plan to drill a 2,400' well into the Leo Formation. We plan to start the well July 1, 1979 with operations lasting approximately 14 days.

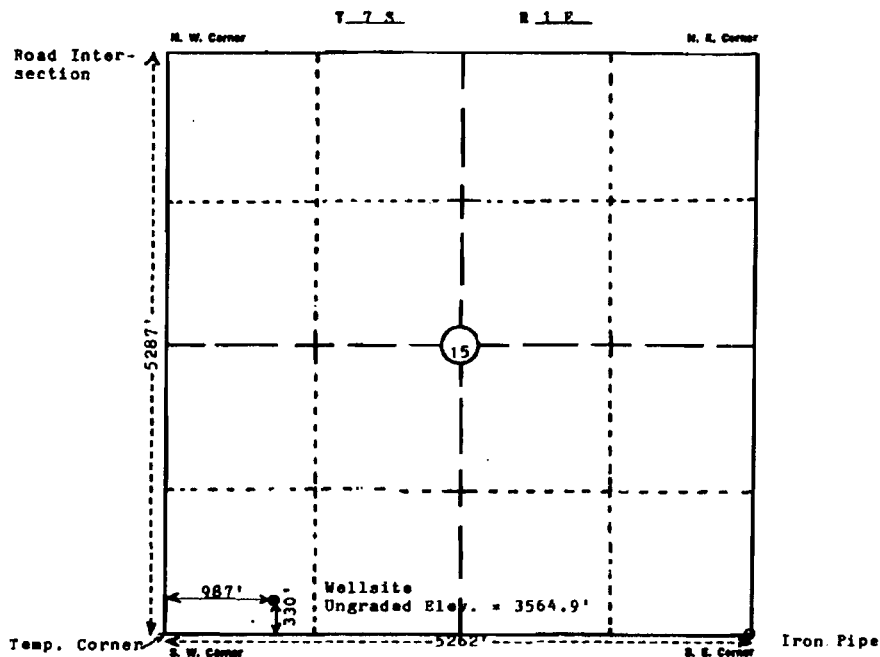
Northern Wyoming Drilling Rig #2 is equipped with a 10" Ragan Blowout Preventor which will be used while drilling the well.

SIGNED <i>Dennis R. Stahl</i> Dennis R. Stahl	Operator President	DATE 3/15/79
NOT WRITE BELOW THIS LINE		
PERMIT NO. 919 PERMIT NO. 6-8-79	CHECKED BY <i>Fred A. Steele</i>	(School and Public Lands) Secretary
ADDITIONAL DATE CONDITIONS	MAY 1979 WESTERN FIELD OFFICE	
<p>COMPLETE SET OF SAMPLES, AND CORES IF TAKEN, MUST BE SUBMITTED.</p> <p>SAMPLES, AND CORES IF TAKEN, BELOW DEPTH, MUST BE SUBMITTED.</p> <p>SOUTH DAKOTA STATE GEOLOGICAL SURVEY WESTERN FIELD OFFICE</p> <p>Exception to statewide spacing for geologic reasons. FVS</p>		

API NO 40 047 20077 JUN 27 1979
PLAINS ENGINEERING
 Consulting Engineers & Land Surveyors

NEWCASTLE
 P. O. BOX 737
 NEWCASTLE, WYOMING 82701
 PHONE 307-744-3744
 HOT SPRINGS
 CITY HALL
 HOT SPRINGS, SOUTH DAKOTA 57747
 PHONE 605-743-3600

GILLETTE
 BOX 117
 GILLETTE, WYOMING 82716
 PHONE 307-543-7955
 SUFFALO
 P. O. BOX 435
 SUFFALO, WYOMING 82534
 PHONE 307-364-7975



Dry Hole Site - NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 21 - Elev.=3536.5'
 Water Well - SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 22 - Elev.=3532.5'

I, Darrel L. Schlup, of Newcastle, Wyoming, certify

that in accordance with a request from Jim Cox

of Chadron, Nebraska, for Wulf Oil Corp.

P. O. Box 1320, Chadron, Nebraska 69337

That I XXXXXXXXXX

made a survey (date) May 8 1979

for the location and elevation Wellsite

As shown on above map, the wellsite is in Center SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$

Section 15 Township 7 South North Range 1 East W&E

Fall River County, So. Dak. Elevation is 3564.9 feet

above mean sea level before dozing.

Darrel L. Schlup
 Licensed Surveyor No. 545

Notes Attached
 NW 799003.29



WELL INSPECTION / SCOUT REPORTS

SOUTH DAKOTA GEOLOGICAL SURVEY
Western Field Office

SCOUT REPORT

Number 4-2-3

Date Scouted 7-1-79

Operator WLF

Permit Number 1

Farm/Lease Name #2 Peterson

API Number 47 0077

SENECA Sec. 15 T. 7N R. 1E County Hall River

Elev. 2462 Est. T.D. 2400 Actual T.D. 2462 Spudded

Contractor Northern Wyo. Drilling Geologist Dr. Gries

SCOUT'S OBSERVATION:

DSI RECORD:

Drilling at 1537, expect TD in 3 days - move out on Tuesday, 7-1.
8-12-79: Logger was broken down but is now fixed. Couldn't get all the way down the hole. Contractor plans to trip in and condition and then try logging again, will plug sometime tomorrow. Had fresh water flow from Lakota.

FORMATION TOPS:

8-12-13/79: Plugged, no problems.

8-21-79: Dry hole marker solid, sealed, properly labeled. Two baskets of pipe are still at the site. The pits are open and not fenced and there is assorted junk lying around. Mouse, rat holes still open. Site not approved.

10-6-79: Pits are filled, site is clean, level. Not seeded. Site approved.

PLUGGING RECORD:

DATE PLUGGED/COMPLETED 8-12-13/79

10 sax - 0' - surface
60 sax - 682' - Top Morrison - BS
25 sax - 1922' - Minnelusa
25 sax - 2232' - Red Marker

CASING RECORD:

SITE INSPECTION:

2 5/8 From 0 To 600

Approved X

From To

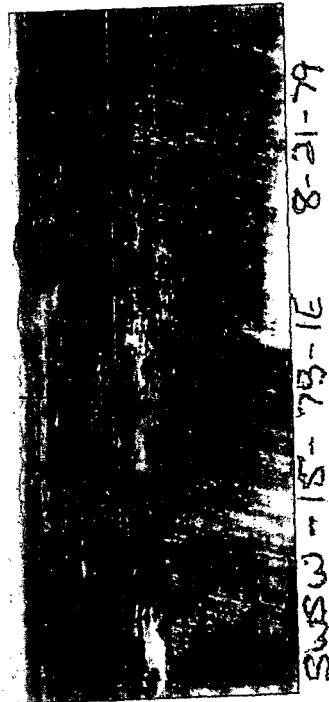
Not Approved

REMARKS:

SCOUTED BY Tim Kenyon
Tim Kenyon
Geologic Assistant

Fred V. Steece
Fred V. Steece, Supervisor
Western Field Office

WULF # 2 PETERSON



OPERATOR'S TECHNICAL REPORTS / MAPS



POWERTECH (USA) INC.

BIT NUMBER: _____

DATE: ~~11-11-2017~~

PROPERTIES: WT. _____ VIS. _____ PH _____ ^{14 of 35} H₂O LOSS _____

SAMPLE TOPS:

REMARKS:

Finished RURT & Spudded at 7:00 P.M.
August 4, 1979

Drilling rat and mouse hole

August 5, 1979

7:00 A.M. — Tripping

drilled 600' of 12½" hole

2 hrs — rat hole
3 hrs — trip
18½ hrs — drill
½ hrs — rig service

Surveys at — 250' with 1° deviation
600' with 3/4° deviation

August 6, 1979

7:00 A.M. nipping up

½ hr — circulating
1 hr — trip out
2 hr — rig up & run casing
2 hr — cementing
12 hr — waiting on cement
6½ hr — nipping up

ran 13 joints of 8 5/8", 24 lbs. ST & C
588' set at 596' KB
plugged down at 11:00 A.M. with good returns

water flow in Lakota at 500', strong 3 inch, improving

225 sacks lite cement with 3% calcium chloride and 1% chip plug followed by
175 sacks regular cement with 3% calcium chloride and 1% chip load.

August 7, 1979

3 days since spud
7 days since move

drilling with water

surface bit — 12½ Y-12-J — drilled 600' in 20 hrs.

bit #1 — 7 7/8" Y-12-J, in at 600', drilled 820' in 17 3/4 hrs.

½ hrs — rig service
17 3/4 hrs — drilling
2 hrs drilling cement
1 hrs redrill mouse hole
3 hrs finish nipping up

13

(P1)



POWERTECH (USA) INC.

API ID 40 047 20077
REMARKS:

15 of 35

8-8

4 days since spud

drilled 495' in 24 hrs

present operation — drilling

drilling in shale

total rotating hrs. - 56 3/4 hrs

drilling with water

Bit #2 — 7 7/8" Y-12, in at 600', out at 1432', drilled 832' in 18 hrs.

Bit #3 — 7 7/8" Y-13, in at 1432', present operation is drilling,
drilled 483' in 19 hrs.

19 hrs. — drilling

3 hrs. — trip

1/2 hrs. — rig repair

1 hrs. — washing

1/2 hrs. — rig service

NOTE: The surface bit is Bit #1.

8-9

five days since spud

present operation is drilling

Bit #3 — 7 7/8" Y-13, in at 1432', out at 1924', drilled 492' in 20 hrs.
teeth are 7, bearings are 8

Bit #4 — FP-53, in at 1924', drilled 281' in 20 hrs., weight 25-30,000 lbs.,
55-60 RPM's, pump 14 x 5 1/2, 54 strokes per minute, 900 lbs. pressure

20 hrs. — drilling

2 hrs. — trip

2 hrs. — wash to bottom

1 1/2" estimated water flow



pg. 2





POWERTECH (USA) INC.

PROPERTIES: WI. 0.0 VIS. 44 IN 1.0 LOSS 1000
APR 10 40 047 20077 1000 35

SAMPLE TOPS:

2nd Leo — 2344'

REMARKS:

8-10

6 days since spud

Formation is Minnelusa

drilled 149' in 24 hrs.

present operation is drilling.

total rotating hrs. — 97 3/4

21 hrs. — drilling

2 1/2 hrs. — circulating

1/2 hrs. — rig service

Sample Description

Drilling break at 2344'

2nd Leo Sandstone 2344'-2360'

sandstone, hard, calcareous and anhydritic, stained, bleeding oil, drilled slow but that may be because of button bit.

will drill to 2365' and test 2nd Leo

8:00 P.M. — DST #1 2348-2378 (corrected 11 feet downhole based on pipe strap)
Bottom hole temperature — 86°F

Open 5 minutes, SI 30 minutes, Open 30 minutes, SI 60 minutes
opened with very strong blow off bottom of bucket in 2 minutes; decreased to top of water at end of second flow period.

Recovered 2250 feet of fluid—600 feet gas cut muddy water, 1650 feet of gas cut sulphur water

Top sample Rw 1.08 @ 64° (3800 ppm)
Middle " 0.9 @ 70° (6800 ppm)
Bottom " 0.89 @ 70° (6950 ppm)

HP 1163-1134
FP₁ 379-437
FP₂ 452-988
SIP 1003-1006



Geologic Notes: Fair to good staining in samples but very poor porosity; sand very dolomitic and anhydritic. No significant drilling break. Considerable chattering of bit indicating fractures throughout 2nd Leo section; fractures in cuttings also. Generally poor samples.

(P. 3)

10



POWERTECH (USA) INC.

8-11

7 days since spx
API ID 40 047 20077

17 of 35

drilled 51' in 24 hrs.

104 3/4 total rotating hrs.

7 hrs — drilling
10 3/4 hrs — trip
1 hrs — wait on tester
2 1/2 hrs — testing
2 1/2 hrs — pick up & make & break down & load out test tool.

8:00 P.M. Drilled to 2462', ran Laterolog-SP from 2458'-2150'. Tool malfunctioned.
Tentative log tops (KB=3572)
Red Marker 2230 (+1342)
1st Leo (Meng) 2250
2nd Leo "Zone" 2351 (+1221)

pg. 4



POWERTECH (USA) INC.

API ID 4004720077
REMARKS:

18 of 35

8-12

8 days since spud

drilled 57' in 24 hrs.

116 3/4 total rotating hrs.

1/2 hrs — rig service
12 hrs — drilling
4 3/4 hrs — trip
1 hrs — circulate
6 hrs — logging

Attempted to run logs, but hole bad; will recondition hole and finish logging on August 13.

8-13

9 days since spud

8:30 a.m. on bottom logging, one log down

7 1/2 hrs — trip
3 hrs — circulate to log
3 1/2 hrs — logging
10 hrs — wash to bottom

8-14-79

4:00 P.M.

Log Tops and Calculations:

Red Marker	2229	(+1343)
1st Leo	2248	
2248-53	100% water, 25% por	
2255-58	100% water, 22% por	

2nd Leo 2350

2350-2406 100% water, 5% por

Ran GR Sonic Log from 596-2458

Ran Dual Induction Focused Log from 605-2460

P9.5

6



POWERTECH (USA) INC.
API ID 40 047 20077

19 of 35

Wulf Oil Corporation

DAILY DRILLING REPORT

DATE: August 14, 1979 OPERATOR: Wulf Oil Corporation
WELL NAME AND LOCATION: #2 Peterson, T7S, R1E, Sec. 15: SE 1/4 SW 1/4, Fall River Co., SD
DEPTH: _____
BIT NUMBER: _____
DRILLING MUD
PROPERTIES: WT. _____ VIS. _____ PH _____ H₂O LOSS _____

REMARKS:

4 1/2 hrs — waiting on orders
5 1/2 hrs — logging
8 hrs — lay down collars, picking up pipe, going in hole, plugging,
and lay down pipe
6 hrs — rigging down BOP

2132-2232	25	secs
1822-1922	25	secs
582-682	60	secs
5-25	10	secs

Plugged at 1:30 A.M.



(P3.6)



JOHN PAUL GRIES

Consulting Geologist

226 ST. CHARLES STREET
RAPID CITY, SOUTH DAKOTA

Wulf No. 2 Wayne Paterson

SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 15, T. 7 S., R. 1 E.

Elevation: 3572 KB

Custer County, South Dakota

3564 Gnd

Contractor: Northern Wyoming Drilling Co., Joe Banks Enterprises. 682-9354

Tool pusher: Milo Wiseman, Gillette, Wyoming 307-682-9861

Spud: August 4, 1979 Plugged August 13, 1979

Well site geologist: J. P. Gries, Rapid City, S. D. 605-342-5841

Testing: B & S Testers, P. O. Box 1436, Gillette, Wyoming

Dean Boese, tester, 307-682-9626

Logging: Dresser-Atlas, Gillette, Wyoming 307-682-5123; Paul Gardner, Eng'r.

Ran BHC Acoustic w/ caliper and GR

Dual Induction focused log w/ GR

Casing: 596' of 8 5/8-inch 24 pound in 12 $\frac{1}{4}$ -inch hole with 300 sacks cement

Bit record:	12 1/4-in. Reed Y-12	145628	out of hole at 600 feet
	7 7/8-in. Reed Y-12	40794	out of hole at 1432. 18 hr.
	7 7/8-in. Reed Y-13	212925	out of hole at 1924. 20 hr.
	7 7/8-in. Reed FP-53	141792	out of hole at 2462.

Cores: none

DST No. 1. Drillers depth 2336-2366. After strapping out, corr. to 2348-2378.

Test started 4:00 PM, Aug. 10th. Open 5 minutes, shut in 5 minutes, open 30 minutes, shut in 60 minutes. Recovered 600 feet gas cut muddy water and 1650 feet of gas cut sulfur water.

<u>Pressures</u>	inside	outside
IH	1163	1201
FH	1134	1172
IF-1	379	447
FF-1	437	566
IF-2	452	507
FF-2	988	954
SIP-1	1003	987
SIP-2	1006	987

E-log tops:	Sundance	822
	Spearfish	1164
	Goose Egg	1515
	Minnekahta	1689
	Opeche	1728
	Minnelusa	1817
	Red marker	2232 - 2240



JOHN PAUL GRIES

Consulting Geologist
228 ST. CHARLES STREET
RAPID CITY, SOUTH DAKOTA

Wulf No. 2 Wayne Peterson

Sample description by J. P. Gries

Note: There are intervals where samples were not taken or where depth labeling is obviously in error. Due to constant inflow of water from basal Lakota sand, drilling mud was not maintained until a critical depth was reached with the result that the button bit ground the cuttings very fine. Errors of depth were found when strapping out of hole. Cuttings above these points were not corrected to the new depth, and none of the samples was lagged to correct for return time.

Lakota formation

617 - 648 sandstone, f to m, poorly sorted, gray to white, with calcareous and pyritic cement

Morrison formation

648 - 679 shale or clay, gray to greenish gray; some new light green, very waxy
711 clay, conchoidal fracture, gray to greenish gray
741 clay, same; and very light gray lithographic limestone
805 clay, same; sample almost all limestone
836 shale and clay, brownish gray to greenish gray

Sundance formation

836 - 868 clay, same, and sandstone and siltstone, greenish gray, glauc.
896 shale, greenish gray; very poor sample
930 shale, greenish gray; trace glauconitic siltstone
1020 no samples
1170 samples mislabeled
1200 shale, silty, greenish gray

Spearfish formation (E-log top at 1164)

1200 - 1230 redbeds and anhydrite, cx, white
1260 anhydrite and redbeds
1290 redbeds
1310 redbeds; trace of anhydrite
1340 redbeds
1466 no samples
1498 redbeds; mostly cavings of Jurassic shale
1529 redbeds, poor sample
1560 redbeds, good

Goose Egg formation (E-log top at 1515)

1560 - 1592 redbeds and fresh white anhydrite
1686 no samples



Wulf No. 2 Wayne Peterson (cont'd)

Minnekahta formation (E-log top at 1689)

1686 - 1717 redbeds and anhydrite; trace limestone very fx, pink, brown
- 1817 no samples

Opeche formation (E-log top at 1728)

no samples

Minnelusa formation (E-log top at 1817)

1817 - 1993 no samples
2013 traces of Minnelusa sand in very poor samples
2010 dolomite, orange and white sand, traces of anhydrite. Sample caught by geologist using 80-mesh sieve
2022 same fine ly ground mixture of dolomite and sand
2027 dolomite, light brown, dense, 2/3; anhydrite, white, 1/3; trace sandstone
2029 sandstone, fine, white, 1/2; dolomite, as above, 1/4; anh., 1/4
2033 poor sample, mostly redbeds
2043 log as anhydrite, 2/3; dolomite, 1/3
2053 dolomite, fx, light gray-brown, 1/2; anhydrite, fx to mx, white, 1/2
2063 anhydrite, same; 3/4; dolomite, same, 1/4
2073 dolomite, vy fx, dns, gray, 2/3; anhydrite, white, 1/3
2083 dolomite as above, 1/2; anhydrite, 1/2
2093 poor sample, log as anhydrite
2103 anhydrite, mx, white, 2/3; dolomite, very fx, dense, light gray-brown, 1/3
2123 anhydrite, same but some very sandy, 2/3; dolomite, same, 1/3.
2133 dolomite, finely crystalline, dense, gray-brown
2143 dolomite, same, 1/2; anhydrite, same, 1/2
2153 poor sample, about same; some anhydrite is very sandy
2163 anhydrite, same, 3/4; dolomite, same, 1/4
2173 dolomite, 2/3; anhydrite, 1/3
2183 dolomite, same, 1/2; anhydrite, same, 1/2
2193 poor sample; log as anhydrite
2200 no sample
2210 poor sample, trace splintery red shale
2220 no sample
2230 sample all gray shale, cvd
2240 same
2250 no sample
2260 circulated sample, all shale from above
2270 no sample
2283 poor sample; redbeds with some Minnelusa dolomite & anhydrite
2303 poor samples, probably fine white anhydritic sandstone and anh.
2310 starting to build up drilling mud; dolomite and anhydrite
2320 dolomite, fx, dense, light brown; trace sandstone, fn, white, por.
2333 probably dolomite, vy fx, light gray; trace sandy
2339 dolomite, fx, light gray, anhydritic, to medium gray, dense, 3/4; anhydrite, 1/4. First good sample after mudding up
2343 dolomite, medium gray dense, fractured w/ anhydrite in the fractures; dolomite, light gray, anhydritic

20

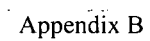


- 3 -

Wulf No. 2 Peterson (cont'd)

- 2343 - 2345 sandstone, f to m, rounded to angular, cemented w/ dolomite and anhydrite, light gray; some porous pieces have fair oil staining
- 2346 sandstone, same but better staining-some bleeding oil when first examined
- 2348 poor sample; some stained sandstone as above; some new tight white siltstone or fine sandstone
- 2352 sandstone, f to m, dolomitic, gray; little staining
- 2358 sandstone, poorly sorted, larger grains well rounded, tight, gray, little staining
- 2360 sandstone, f, round to angular, tight, with dolomite and anhydrite cement
- 2365 probably dolomite, argillaceous, dark gray
- 2366 dolomite, fx, medium gray, some sandy, grading to sandstone, fine, tight, gray; much black fissile shale. Circulated sample
- SIM 2367 = 2383
- 2383 - 2388 Trip, poor sample. dolomite and some sand as above
- 2393 poor sample. Dolomite, vy fx, dense, gray to brown
- 2398 dolomite, vy fx, dense but slightly vuggy, medium gray; good sample
- 2403 dolomite, same, fractured with anhydrite healing the fractures; 2/3; sandstone, f, dolomitic, tight, gray, 1/3
- 2408 dolomite and sand, same; also more black fissile shale
- 2413 dolomite, vy fx, dense, medium gray
- 2420 dolomite, same, 2/3; sandstone, f, dolomitic, light gray
- 2425 dolomite, same, with some thin streaks black fissile shale
- 2430 dolomite, same, 1/3; shale, black, fissile, 2/3
- 2435 dolomite, same; still some black shale coming in
- 2440 dolomite, same, some sandy; traces mx white anhydrite
- 2445 dolomite, same, 2/3; sandstone, f, dolomitic, tight, gray, 2/3
- 2450 dolomite, same, 3/4; shale, black, fissile, 1/4
- 2455 dolomite, same, 1/2; sandstone, same, 1/4; shale, black, fissile, almost coaly, 1/4
- 2460 dolomite, vy fx, dense, very light gray
- 2462 dolomite, same, with some fractures healed with anhydrite
- 2462 circ. dolomite, same, 1/2; sandstone, vy f, dense, tight, no staining, 1/2. TOTAL DEPTH

21





ADMINISTRATIVE / SUNDRY REPORTS



POWERTECH (USA) INC.
API ID 40 047 20077
STATE OF NEBRASKA

S. Dak. Oil & Gas Board
FORM 7

PLUGGING RECORD

Operator WULF OIL CORPORATION		Address P. O. BOX 1320 - CHADRON, NEBRASKA 69337	
Name of Lease Peterson	Well No. #2	Field & Reservoir Wildcat - Leo	
Location of Well 330 FSL, 987 FWL (SE$\frac{1}{4}$SW$\frac{1}{4}$)		Sec Two-Rge or Block & Survey Sec. 15, T7S, R1E	County Fall River
Application to drill this well was filed in name of Wulf Oil Corporation	Has this well ever produced oil or gas No	Character of well at completion (Initial production): Oil (bbls/day) N/A Gas (MCF/day) N/A Dry? YES	
Date plugged: August 13, 1979	Total depth: 2462'	Amount well producing when plugged: Oil (bbls/day) N/A Gas (MCF/day) N/A Water (bbls/day) ??	
Name of each formation containing oil or gas. Indicate which formation open to well bore at time of plugging	Fluid content of each formation	Depth interval of each formation	Size, kind & depth of plugs used. Indicate zones squeezed, cemented, grouting amount, cement.
Leo	See Geologists Report, Attached	See Attached	2132-2232 25 sx.
			1822-1922 25 sx.
			582 - 682 40 sx.
			5 - 25 10 sx.
			Surf. w/ marker - 10 sx.

CASING RECORD

Size pipe	Run in well (ft)	Pulled out (ft)	Left in well (ft)	Give depth and method of parting casing (shot, ripped, etc)	Packers and shoes
8 5/8"	596'	-0-	596'	N/A	None

Was well filled with mud-laden fluid, according to regulations? **Yes**

Indicate deepest formation containing fresh water
Lakota (not sure of type of water)

In addition to other information required on this form, if this well was plugged back for use as a fresh water well, give all pertinent details of plugging operations to base of fresh water sand, perforated interval to fresh water sand, name and address of surface owner, and attach letter from surface owner authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.

on August 15, 1979 we went back in and squeezed the well with 50 sx. of cement to kill the water flow. (Cement had 3% CaCl)

USE REVERSE SIDE FOR ADDITIONAL DETAIL

Executed this the **10th** day of **September**, 19**79**

State of **Nebraska**

County of **Dawes**

Before me, the undersigned authority, on this day personally appeared **Dennis R. Staal** known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states, that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.

Subscribed and sworn to before me this **10th** day of **September**, 19**79**

SEAL
My commission expires **October 4, 1982**

ANNE M. RUBECK
GENERAL NOTARY
State of Nebraska

Notary Public in and for **Dawes**
County, **Nebraska**

Approved **SEP 21 1979**

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA





POWERTECH (USA) INC.
API ID 40 047 20077

STATE PUB. CO. - PIERRE

S. Dak. Oil & Gas Board
FORM 4

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

FARM OR LEASE NAME

Peterson

WELL NO.

#2

FIELD AND POOL, OR WILDCAT

Wildcat

NO. ACRES IN LEASE

1200.00

SEC. TWP. RGE.

SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 15, T7S, R1E

COUNTY

Fall River

TYPE OF COMPLETION

☒ Oil Well ☐ Gas Well ☒ Dry Hole
☒ New Well ☐ Work-Over ☐ Deepen ☐ Plug Back ☐ Same Zone ☐ Diff Zone

OPERATOR

WULF OIL CORPORATION

ADDRESS

P.O. BOX 1320 - CHADRON, NEBRASKA 69337

LOCATION (In feet from nearest lines of section or legal subdivision where possible)*

Surface 330 FSL, 987 FWL (SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$)

Top prod. interval

Same

At total depth

Same

PERMIT NO.

919

DATE ISSUED

6-8-79

PREVIOUS PERMIT NO.

None

DATE ISSUED

None

DATE SPUDDED

8-3-79

DATE T.D. REACHED

8-12-79

DATE COMPL.

Dry Hole

ELEVATIONS (OF, RKB, RT, GIL, etc.)*

3564 GR

3572 KB

ELEV. CASINGHEAD

Ground

TOTAL DEPTH (MD & TVD)

2462'

PLUG BACK T.D. (MD & TVD)

N/A

IF MULTIPLE COMPL. HOW MANY*

N/A

INTERVALS DRILLED BY

ROTARY TOOLS

CABLE TOOLS

X

PRODUCING INTERVAL(S), THIS COMPLETION, TOP, BOTTOM, NAME (MD & TVD)*

None - Dry Hole

DATE DIRECTIONAL SURVEY SUBMITTED

None

TYPE ELECTRIC AND OTHER LOGS RUN (Circle those filed)

BHC Acoustic, w/caliper & GR - Dual Induction Focused Log w/GR

WAS WELL CORED

No

CASING RECORD (Report all strings set in well)

CASING SIZE

8 5/8"

DEPTH SET (MD)

596' KB

HOLE SIZE

12 1/2"

WEIGHT LBS. FT.

24#

PURPOSE

Surface

SACKS CEMENT

300 sx.

AMOUNT PULLED

None

LINER RECORD

SIZE

None

TOP (MD)

None

BOTTOM (MD)

None

SACKS CEMENT*

None

SCREEN (MD)

None

TUBING RECORD

SIZE

None

DEPTH SET (MD)

None

PACKER SET (MD)

None

PERFORATION RECORD

DEPTH INTERVAL (MD)

None

HOLES PER FT.

None

SIZE AND TYPE

None

PURPOSE

None

ACID, SHOT, FRAC, CEMENT SQUEEZE, Etc.

AMOUNT AND KIND OF MATERIAL USED

None

DEPTH INTERVAL (MD)

None

PRODUCTION

DATE FIRST PRODUCTION

None - Below not applicable - Dry Hole

PRODUCING METHOD (Flowing, gas lift, pumping, size & type of pump)

WELL STATUS (Prod. or Shut)

DATE OF TEST (HOURS TESTED)

CHOKE SIZE

PRODUCTION FOR TEST

OIL, BBS.

GAS, Mcf.

WATER, 100% & G.

OIL, GR, TVD, G, G.

FLOW, TUBING PRESSURE

CASING PRESSURE

CALCULATED 24-HOUR RATE

OIL, BBS.

GAS, Mcf.

WATER, BBS.

GAS, Mcf.

DISPOSITION OF GAS (Sold, used for fuel, vented, etc.)

TEST WITNESSES

BY

LIST OF ATTACHMENTS

None

I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED

Donna L. Scott

TITLE

President

DATE

9-10-79

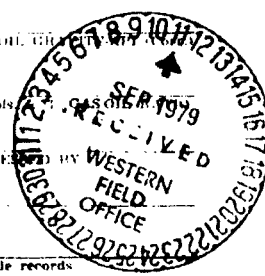
DO NOT WRITE BELOW THIS LINE

Approved

SEP 21 1979

Date

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA





POWERTECH (USA) INC.
API ID 40 047 20077

28 of 35

S. Dak. Oil & Gas Board
FORM 6

STATE OF S. DAKOTA

SUNDRY NOTICES AND REPORT ON WELLS		FARM OR LEASE NAME
<input checked="" type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> DRY		Peterson
OPERATOR WULF OIL CORPORATION		WELL NO. #2
ADDRESS P. O. BOX 1320 - Chadron, Nebraska 69337		FIELD AND POOL OR WILDCAT Wildcat
LOCATION (in feet from nearest lines of section or legal subdivision, where possible) 330 FSL, 987 FWL (SE$\frac{1}{4}$SW$\frac{1}{4}$SW$\frac{1}{4}$)		NO. ACRES IN LEASE 1,200.00
ELEVATIONS (D.F., R.K.B., R.T., G.H.D., etc.; how determined) 3564' CR (Survey) 3572 KB		SEC. TWP. R1E SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 15, T7S, R1E
		COUNTY Fall River

INDICATE BELOW BY CHECK MARK NATURE OF REPORT, NOTICE OR OTHER DATA
NOTICE OF INTENTION TO: SUBSEQUENT REPORT OF:

TEST WATER SHUT-OFF	SHOOT OR ACIDIZE	WATER SHUT-OFF	SHOOTING OR ACIDIZING
FRACTURE TREAT	REPAIR WELL	FRACTURE TREATMENT	REPAIRING WELL
MULTIPLE COMPLETE	PULL OR ALTER CASING	Abandonment	ALTERING CASING
ABANDON			

(Note: Report results of multiple completion on Well Completion or Recompletion and Log Form, Form 4)

DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work)

Well was plugged on August 13, 1979 with plugs as follows:

2132 - 2232	25 sx
1822 - 1922	25 sx
582 - 682	40 sx
5 - 25	10 sx.
Surface w/ marker	10 sx

On August 15, 1979 it was necessary to go back in and squeeze the well with 50 sx. cement w/3% CaCl to kill the water flow.

Dry hole marker has been set, and location will be cleaned up and re-seeded as soon as possible. We would like to know if your office has any requirements as to the seed mixture it would like used when we do re-seed the location, etc.

I hereby certify that the foregoing as to any work or operation performed is a true and correct report of such work or operation.

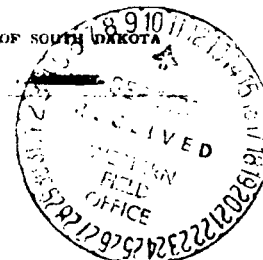
SIGNED Mark Stal TITLE Peterson DATE 9-2-79

Approved SEP 21 1979 DO NOT WRITE BELOW THIS LINE

CONDITIONS, IF ANY

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

Fred R. Stuebe





POWERTECH (USA) INC.

DAIRY/D 44 087.20077

29 of 35

A. Pub. Oil & Gas Board
FORM 0

SUNDRY NOTICES AND REPORT ON WELLS		FARM OR LEASE NAME Peterson
		WELL NO. #2
<input checked="" type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> _____ <input checked="" type="checkbox"/> DRY		FIELD AND POOL OR WILDCAT Wildcat
OPERATOR WOLF OIL CORPORATION		NO. ACRES IN LEASE 1,200.00
P. O. BOX 1320 - CHADRON, NEBRASKA 69337		1/4 SEC. TWP. R1E SW1SW1 Sec. 15, T7S, R1E
LOCATION (in sec. from nearest line of section or legal subdivision, where possible) 330 FWL, 987 FWL (SE1SW1SW1)		COUNTY Fall River
REMARKS (BY, H.K.B. R.T. ORB, etc.; how determined) 3564 GR (Survey) 3572 KB		

INDICATE BELOW BY CHECK MARK NATURE OF REPORT, NOTICE OR OTHER DATA			
NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	<input type="checkbox"/>	SHOOT OR ACIDIZE	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	REPAIR WELL	<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>	PULL OR ALTER CASING	<input type="checkbox"/>
ABANDON	<input checked="" type="checkbox"/>		

(Note: Report results of multiple completion on Well Completion or Restoration and Log Form - Form 1)

REMARKS PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work)

Verbal permission to plug was obtained August 13, 1979.

Well to be plugged as follows:

2132 - 2232	25 SX.
1822 - 1922	25 SX.
582 - 682	40 SX.
5 - 25	10 SX.
Surface w/ marker	10 SX.



I hereby certify that the foregoing as to any work or operation performed is a true and correct report of such work or operation.

SIGNED Dennis Sted TITLE President DATE 9-10-79

DO NOT WRITE BELOW THIS LINE

Approved SEP 11 1979 Date SEP 11 1979

SEAL AND HAS BOARD OF THE STATE OF SOUTH DAKOTA

Fred V. Steece SECRETARY



CORRESPONDENCE

Mr. Fred V. Steece, Supervisor
Western Field Office
36 East Chicago
Rapid City, SD 57701

Dear Mr. Steece:

This letter informs you that the surface restoration
at the site of the following oil or gas test well
has been completed to my satisfaction.

<u>Permit</u>	<u>Well Name and Location</u>
919	Wulf #2 Peterson, SWSW 15-7S-1E, Fall River

I am the surface owner of record.

SIGNED Wayne J. Peterson DATE 9/19/83



SURETY



NO SURETY INFORMATION FOR THIS WELL AS OF 5/18/2011



MISCELLANEOUS



**NO MISCELLANEOUS
INFORMATION FOR THIS WELL
AS OF 5/18/2011**



Oil and Gas Search for: api_no_ like '40 047 20085'		
Page 1 of 1	<u>Download Database</u> (Excel spreadsheet format)	Page: 1

Record 1 of 1

Well Information

API No:	40 047 20085	County:	FALL RIVER
Well Name:	WULF 1A PETERSON	Location:	NENE 21-7S-1E
Permit No:	957	Total Depth:	2460
Operator Name:	WULF OIL CORPORATION	Bottom Hole:	Minnelusa
Permit Date:	12-18-1979	KB Elevation:	3545
Spud Date:	01-13-1980	Ground Elevation:	3537
Plug Date:	01-24-1980	Latitude:	43.433064
		Longitude:	-103.996978
Well Field	WILDCAT	Status	P&A
Class:	DRY HOLE	Type:	DRY HOLE

Formation Tops

<u>Formation</u>	<u>Depth (ft.)</u>
Dakota Mud	335
Lakota	545
Sundance	840
Minnekahta	1705
Minnelusa	1840
Converse	1910
Red Marker	2267
1st Leo	2290
2nd Leo	2382



COUNTY: FALL RIVER
LEGAL LOCATION: NENE 21-7N-1E
API NO: 40 047 20085
PERMIT NO: 957
WELL NAME: WULF #1-A PETERSON
OPERATOR: WULF OIL CORPORATION
PERMIT ISSUED: 12/13/1979
PERMIT CLOSED: 04/21/1982
FILE LOCATION: 7N-1E-21 NENE

TARGET CODES:

WELL HISTORY / CHECKLIST
PERMIT TO DRILL / INTENT TO DRILL
WELL INSPECTION / SCOUT REPORTS
OPERATOR'S TECHNICAL REPORTS / MAPS
ADMINISTRATIVE / SUNDRY REPORTS
CORRESPONDENCE
SURETY
MISCELLANEOUS

WELL HISTORY / CHECKLIST



BOND RELEASE CHECKLIST

Well Name & Location		Permit # <u>957</u>
Wulf #1-A Peterson NENE 21-7S-1E, Fall River		API # <u>40 047 20085</u>
Bond # <u>70AR675-4</u>	Date Issued _____	Date Released <u>NOV 06 1985</u>

Surface Restoration

- ☒ Pits filled
- ☒ Site Level
- ☒ Site policed
- NA Dry-hole marker solid, sealed, correctly inscribed
- ☒ No dry-hole marker desired, letter in WFO files from surface owner
- ☒ *Letter of Approval from surface owner*
- Paperwork filed

- ☐ Form 4 (Completion or Recore Completion Report)
- ☒ Form 6 (Casing Notices and Report on Wells)
- ☒ Form 7 (Plugging Report)

Geological Information Filed

- ☒ Well logs: LFS, SMP, DIL, GR, HELT, CALIP, Cement Bond, Temp, Micro, Laterlog, SWIMMS
- ☒ DST Charts and Reports
- ☒ Geologist's Report
- Results of coring and core analyses (None cut)
- ☒ Set of 10-foot sample cuttings (check with Bob Schoon)
- (Transy to Vermillion 7-17-81)*

Date NOV 1 1985 Checked By J. Justice



PERMIT CHECKLIST

Well Name and Location:	Permit # <u>957</u>
Wulf #1-A Peterson	API # <u>40 047 20085</u>
NENE 21-7S-1E, Fall River	BOND # <u>708E675-4</u>

Paperwork filed with WFO

- X Organization Report
- X Application
- X Bond
- X Permit Fee

The Following Papers sent to Operator:

- X Permit (Form 2a)
- X Receipt for \$100 permit fee
- X Cover letter explaining material sent

Permit Fee Filed:

- X Permit fee w/Cash Receipts Transmittal Form sent to State Treasurer

Notification of New Permit sent to:

- X Dr. Duncan J. McGregor
- X ~~XXXXXXXXXXXX~~ Mr. Warren R. Neufeld
- X ~~XXXXXXXXXXXX~~ Mr. Jack Gerken
- X ~~XXXXXXXXXXXX~~ Fall River County Auditor

Date 12-18-79 Check By Cheryl Pederson



PERMIT TO DRILL / INTENT TO DRILL



POWERTECH (USA) INC.

API ID 40 047 20085

7 of 38

State Pub. Co., Pierre

APPLICATION FOR PERMIT TO:

S. DAK. OIL & GAS BOARD
FORM 2

<input checked="" type="checkbox"/> DRILL	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> PLUG BACK	FARM OR LEASE NAME
<input checked="" type="checkbox"/> OIL WELL	<input type="checkbox"/> GAS WELL	<input type="checkbox"/> SINGLE ZONE	Peterson
		<input type="checkbox"/> MULTIPLE ZONE	WELL NO.
OPERATOR			#1-A
Wulf Oil Corporation			FIELD AND POOL, OR WILDCAT
ADDRESS			Wildcat
P. O. Box 1320 - Chadron, Nebraska 69337			NO. ACRES IN LEASE
LOCATION (In feet from an established corner of the legal subdivision)			1,200.00
660' FNL - 458' FEL Section 21			4 1/4 SEC. TWP. RGE
			NE 1/4 Sec. 21, T7S, R1E
			COUNTY
			Fall River
NAME AND ADDRESS OF SURFACE OWNER		ELEVATION	NO. OF WELLS ETC
Peterson & Son, Inc.		3,537 GR	1
Edgemont, S.D.		PROPOSED DEPTH	ROTARY OR CABLE TOOLS
HCR-59, Box 16		2,400'	Rotary
NAME AND ADDRESS OF CONTRACTOR		APPROXIMATE DATE WORK WILL START	
Northern Wyoming Drilling Company		December 28, 1979	
P. O. Box 487			
Gillette, Wyoming 82716			
IF LEASE PURCHASED WITH ANY WELLS DRILLED, FROM WHOM PURCHASED (Name and address)			
N/A			

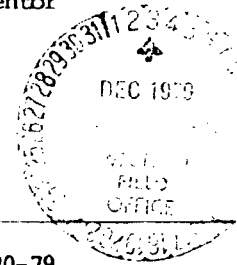
PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	NEW OR SECOND HAND	DEPTH	SACKS OF CEMENT
12 1/4"	8 5/8"	24#	New	250'	200 SX.
7 7/8"	5 1/2"	15.50#	New	2,400'	150 SX.

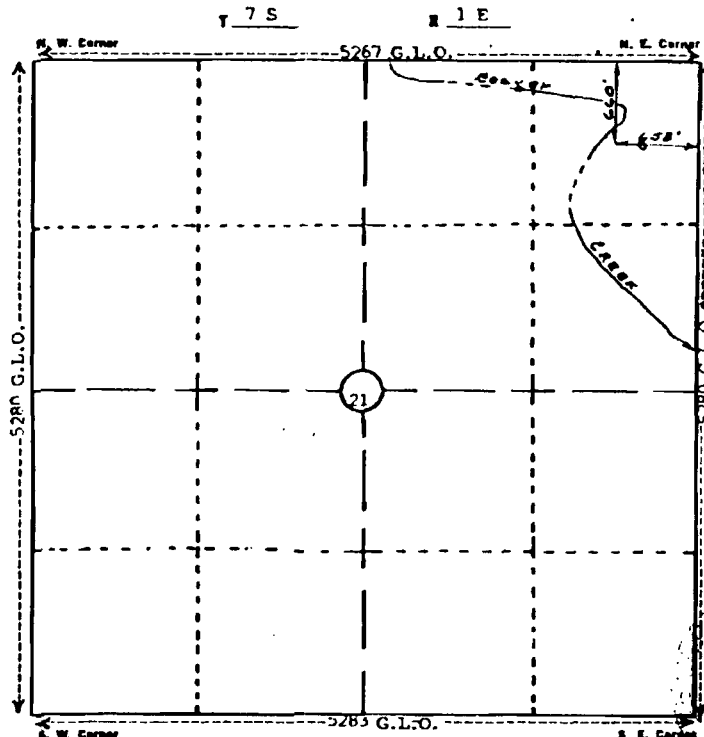
DESCRIBE PROPOSED OPERATIONS. IF PROPOSAL IS TO DEEPEN OR PLUG BACK, GIVE DATA ON PRESENT PRODUCTIVE ZONE AND PROPOSED NEW PRODUCTIVE ZONE. GIVE BLOW OUT PREVENTER PROGRAM IF ANY

We plan to drill a 2,400' well into the Leo Formation. We plan to start the well December 28, 1979 with operations lasting approximately 14 days.

Northern Wyoming Drlg. Rig #2 is equipped with a 10" Ragan Blowout Preventor which will be used while drilling the well.



PERMIT NO. _____	PRESIDENT
SIGNED DATE ISSUED <u>R. St.</u>	TITLE Operator
	DATE 11-30-79
DO NOT WRITE BELOW THIS LINE	
PERMIT NO. <u>357</u>	CHECKED BY <u>J. St.</u>
SOUTH DAKOTA	School and Public Lands
STATE GEOLOGICAL SURVEY	Date
APPROVAL DATE <u>DEC 28</u> 1979	Supervisor, Western Field Office
CONDITIONS:	
* COMPLETE SET OF SAMPLES, AND CORES IF TAKEN, MUST BE SUBMITTED.	
* SAMPLES AND CORES IF TAKEN, BELOW DEPTH MUST BE SUBMITTED	



WULF OIL CC
MAR 26 1980

Elevation at the following reference points:

- 130' North (on bank of Beaver Creek) - 3532'
- 150' West (on bank of Beaver Creek) - 3533'
- 200' South - 3532'
- 200' East (possible alternate site) - 3537.4'

I, Lawrence T. Price, of Newcastle, Wyoming, certify
that in accordance with a request from Sherry Samuels
of Gillette, Wyoming for Wulf Oil Corp.
P. O. Box 1320, Chadron, Nebraska 69337

That I XXXXXXXXXXXXXXXXXXXX
made a survey (date) November 29, 1978
for the location and elevation of the #1 Peterson Wellsite

As shown on above map, the wellsite is in NE 1/4 NE 1/4
Section 21 Township 7 South Range 1 East
Fall River County, South Dakota Elevation is 3533 feet
above mean sea level before dozing.

Lawrence T. Price
Licensed Surveyor No.

789663.54
Notes in Bk. 312 Pg. 46



POWERTECH (USA) INC.

API ID 40 047 20085

George F. Wulf, President
Dennis B. Steel, Vice-President
Lynne M. Garlick, Secretary-Treasurer

Wulf Oil Corporation

9 of 38

P. O. Box 1320
Suite 25, Choney Center Building
CHADRON, NEBRASKA 69337
Phone 308-432-4492

WELL DRILLING PROCEDURE RECOMMENDATION

LOCATION AND WELL NAME: Wulf Oil #1-A Peterson
NE 1/4, Section 21, T7S, R1E, Fall River County,
South Dakota

METHOD OF DRILLING: Rotary

HOLE SIZE: 12 1/4" surface - 7 7/8" drilling hole

CASING: set 150' to 300' of 8 5/8" surface pipe.

MUD PROGRAM: Gel chemical mud—weight 88293#s per gallon—
viscosity of 35-45 seconds per quart—viscosity
of 75-100 for testing or logging—water loss
of 8 cc's and Ph of 8295

SURVEYS: Dual Induction Laterolog and Sonic-Gamma Ray
log from base of surface casing to TD

DRILL STEM TESTS: 1-2nd Leo Sandstone

CORES: None

SAMPLES: Every 10' from base of surface casing to TD

POOL NAME: None

ELEVATION: 3537'

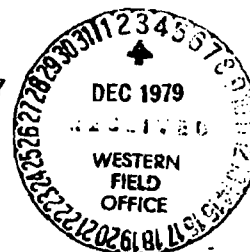
DEPTH AND OBJECTIVE: 2400' or 250' below Red Marker, whichever is the
lesser.

FORMATION DATA:

Dakota	- 295'	(+3238)
Red Marker	- 2208'	(+1325)
2nd Leo	- 2328'	(+1205)

CONTRACTOR: Northern Wyoming Drilling Company

GEOLOGIST: Forest Twiford



WELL INSPECTION / SCOUT REPORTS



POWERTECH (USA) INC.

API ID 40 047 20085

P&A
11 of 38

SOUTH DAKOTA GEOLOGICAL SURVEY
Western Field Office

SCOUT REPORT

Permit Number 957

API Number 40 047 20085

Well Name Wulf #1-A Peterson

NENE Sec. 21 T. 7S R. 1E County Fall River

Elev. 3537 Gr Est. T.D. 2400 Actual T.D. 2460 Spudded 1/13/80

Contractor N. Wyoming #2 Geologist Dennis Stahl, Engr.

FORMATION TOPS:

PLUGGING RECORD:

DATE PLUGGED/COMPLETED 1/24/80

CASING RECORD 8 5/8 FROM <u>0</u> TO <u>800</u> FROM <u> </u> TO <u> </u>		DRY HOLE MARKER	ADJUSTEDLY MARKED	MARKER STURDY	MARKER CAPPED	MUD PIT'S FILLED	SITE LEVELLED	SITE SMOOTHEED	SITE SEIZED	ROADS RECLAIMED	APPROVED	NOT APPROVED	LETTER TO SUR- FACE OWNER	LTR TO OPERATOR	SCOUTED BY
5/27/81		O	O	O	NA	X	X	X	O	O	X		X		KEF, WES
6/9/82		O	O	O	NA	X	X	X	O	X	X		X		JRC, JDO
7-13-82														X	<i>Jim</i>
7/11/83												X			MNS, DWE

X - Satisfactory O - Not satisfactory NA - Not applicable

REMARKS: 5/27/81: Includes #1 & 1A Peterson; landowner unhappy w/results. ~~no~~ letter regarding dry hole marker. 6/8/82: Mr. Peterson not satisfied with restoration. Says he seeded site himself, but only weeds grew. Company didn't seed site. Lots of garbage in creek; looks like owner dumped it.



POWERTech (USA) Inc.

* No ~~dry hole~~ marker de ~~red ltr~~ from land owner in file dated 4/10/79.
APPENDIX B 2083

7/11/83: Mr. Peterson contacted company in 1982. They said they would look at the site, but never have. Mr. Peterson says site is still very rough and he's not satisfied. Didn't visit site. Owner said site has not changed. MNS.



POWERTECH (USA) INC.

API ID 40 047 20085

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SOUTH DAKOTA GEOLOGICAL SURVEY
Western Field Office
SCOUT REPORT

Number 1
Date Scouted 1-9-80
Operator Wulf Oil Company Permit Number 957
Farm/Lease Name #1-A Peterson API Number 40 047 20085
NENE Sec. 21 T. 7S R. 1E County Fall River
Elev. 3537 Gr. Est. T.D. 2400 Actual T.D. 2460 Spudded 1-13-80
Contractor N. Wyoming Drilling #2 Geologist Dennis Staal, Engr.

SCOUT'S OBSERVATION:

RURT, will spud 1-13-80
Plugged: 1-24-80 *[Signature]*

DST RECORD:

#1: 23900-2410; rec 200 SG&MCW
1200 GC sulfur/lo gas

FORMATION TOPS:

Dakota-----0335
Lakota-----0545
Sundance-----0840
Basal-----1130-1195
Minnekahta-----1705

Minnelusa-----1840
Blue Anhyd-----1910
Red Marker-----2267
1st Leo-----2290
2nd Leo-----2382

PLUGGING RECORD:

2300-2200----40 sax
1922-1800----25 sax
1149-1050----30 sax
0868-0750----50 sax
Surface ----10 sax

DATE PLUGGED/~~COMP EXPL~~ 1-24-80

9-09-80: Site is clean, level, seeded. Pits are filled, there is no marker and no letter from landowner in files. *[Signature]*

CASING RECORD:

8 5/8 From 0 To 800
From To

SITE INSPECTION:

Approved _____
Not Approved X

REMARKS:

SCOUTED BY

[Signature: Tim Kenyon]
Tim Kenyon
Geologic Assistant

[Signature: Fred V. Steece]
Fred V. Steece, Supervisor
Western Field Office



OPERATOR'S TECHNICAL REPORTS / MAPS



POWERTECH (USA) INC.

API ID 40 047 20085

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Mulf Oil Corporation

DAILY DRILLING REPORT

DATE: January 25, 1980 OPERATOR: Mulf Oil Corporation
 WELL NAME AND LOCATION: #1-A. Paterson, NE 1/4, Sec 21, T7S, R1E, Fall River Co., S.D.
 DEPTH: T.D.
 BIT NUMBER: _____
 DRILLING MUD
 PROPERTIES: WT. _____ VIS. _____ PH _____ H2O LOSS _____

DRILLERS REPORT:

1-25 Present operation - rigging down
 8 hours plugging & laying down pipe
 8 hours waiting on orders
 8 hours rigging down

Cost to date - \$182,158.15

1-24 PROPERTIES: WT. 10.8 VIS. 60 PH 10 H2O LOSS 6
 Cake - 1/32nds

DRILLERS REPORT:

Drilled 0' in last 24 hours. 135 total rotating hours
 Present operation - tripping w/DST #2; testing Leo Sand
 Recovered 1366' of gas cut water

5 1/2 hours testing
 5 hours tripping
 12 hours waiting on orders
 1 3/4 hours pick up test tool

GEOLOGISTS REPORT:

DST #2-Interval tested was 2395-2404'. TD Driller-2463'; TD Logger-2459'

Opened tool with weak blow 1/2" in water bucket; decreased to surface bubbles after 5 min.
 Remained for rest of 15 min. flow.
 Closed tool for 60 min; opened tool with 1/2" blow on surface and remained steady for 20 min;
 decreased to surface bubbles for remainder of test.
 Closed tool for 120 min--no gas to surface.
 Recovered 1366' of slightly gas cut sulphur water.

Rv top sample 1.10 @ 46° F
 Rv mid sample 1.10 @ 46° F
 Rv bottom sample 1.20 @ 40° F
 Rv sample - 1.10 @ 44° F
 Rv of make-up water - 4.1 @ 50° F
 Rv of mud pit sample - 1.38 @ 50° F
 Total volume-sample - 2400 cc's
 Total volume-sample - 2250 cc's

Oil - none
 Water - 2250 cc's
 Mud - none
 Gas - 1.18 cubic feet
 Other - none



8



#1-A Peterson
January 24, 1980
Page 2

Pressures

IH	1388	1392
FH	1374	1392
IF ₁	30	-
FF ₁	89	-
IF ₂	179	-
FF ₂	596	-
SIP ₁	1013	1197
SIP ₂	1013	-

BOP Temperature - 86° F

Wulf Oil Corporation recommends plugging; please indicate your confirmation as soon as possible today.

1-23 GEOLOGISTS REPORT:

Ran Dual Laterolog and GR-Neutron Density Logs. TD Driller-2460'; TD Logger-2459'. KB-3545'.

Log Tops

Dakota	336
Lakota	545
Morrison	686
Sundance	840
Minnekahta	1707
Red Marker	2267 (+1271)
2nd Leo Zone	2385 (+1160)
2nd Leo SS	2399 (+1146)



Notes:

- 1) 2nd Leo SS is 6' high to #1 Peterson.
- 2) Based on core analysis in #1 Peterson, the zone 2399-2405 should be productive in the #1-A.
- 3) Preparing to run DST #2 2397-2404. Test should be out tomorrow a.m.

DRILLERS REPORT:

Drilled 0' in last 24 hours
Present operation - waiting on orders

6 hours waiting on loggers
9 hours waiting on orders
9 hours logging

Cost to date - \$155,362.15

GEOLOGISTS REPORT:

Calculating & analyzing logs.



POWERTECH (USA) INC.

DRILLING MUD

PROPERTIES: WT. 10.0 VIS. 80 PH 10 H₂O LOSS 6
API ID 40 047 20065

DRILLERS REPORT:

10 days from spud. Drilled 50' in last 24 hours.
Present operation - out of hole to log.
Bit #3 7 7/8" F3--in at 2410', out @ 2460'; drilled 50' in 6 3/4 hours
30,000# wt., 55 rpm, 5 1/2 x 14 pump, 52 SPM, 950# pump pressure
6 3/4 hours drilling
9 1/2 hours tripping
3 hours rig repair
1 1/2 hours testing
3/4 hour rig service
2 1/2 hours circulating

Cost to date - \$147,794.15

GEOLOGISTS REPORT:

Drilled last 50' at 5-10 mpf with a few 2-3 mpf.
Present operation is waiting on loggers
Samples are poor and soupy--Shale shaker is freezing up because mud is sticking.
~~Will have sample descriptions later~~

DRILLING MUD

PROPERTIES: WT. 10.6 VIS. 63 PH 10 H₂O LOSS 6

DRILLERS REPORT:

Drilled 0' in last 24 hours. 129 total rotating hours.
Present formation - Leo Sand
Present operation - testing Leo
Bit #2 7 7/8" FP53--in at 1810', out at 2400'; drilled 600' in 54 hours.
30,000# wt., 55 rpm, 54 SPM, 900# pump pressure
5 1/2 hours tripping
3 hours waiting on test tool
11 1/2 hours waiting on orders
1/2 hour rig service
3 3/4 hours testing

Pipe strap was 2432' and tally board was 2422'

Cost to date - \$129,411.08

GEOLOGISTS REPORT:

DST #1 from 2390-2410' (depth correction of 10'). Corrected Drilling top of Red Marker -2270'
Corrected top of 2nd Leo - 2400'

IF period of 15 minutes

Tool opened with weak blow 1/2 min. in bucket. 5 min. blow increased to 1 min. 15 minute blow increased to 2 min.

ISI period--60 minutes

FP period of 90 minutes, opened tool with weak blow 1/2 min in bucket, 5 min blow increased to 1 min, 15 min blow increased to 2 min, 15 - 90 minutes blow remained steady in bucket. Closed tool, blow died in 1 minute.

Recovered 1400' of fluid. 200' of slightly gas cut/mud cut water
1200' of gas cut sulphur smelling water. Gas would burn at tool joints.

Rw top sample - .129 @ 50° F

Rw mid sample - 0.8 @ 50° F

Rw bottom sample - 0.89 @ 50° F

Rw of make-up water - 4.1 @ 50° F

Mud pit sample Rw - 1.38 @ 50° F

Rw-sampler - 0.80 @ 50° F

Pressure in sampler - 30 psi

Total volume - 2700 cc's Total volume of sample - 2600 cc's

Oil - none

Water - 2600 cc's

Mud - none

gas - .16 cubic feet



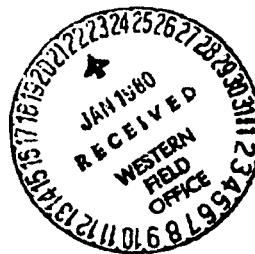
#1-A Peterson
Page 2
January 21, 1980

Pressures

IH	1334	1388
FH	1334	1388
IF ₁	3	36
FF ₁	146	149
IF ₂	207	265
FF ₂	583	596
SIP ₁	985	1013
SIP ₂	991	1016

BOP temperature--86° F

Will drill to 2460' and run Dual Laterolog and GR-Density-Neutron to determine if additional DST's are needed.



17



POWERTECH (USA) INC.

API ID 40 047 20085

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Wulf Oil Corporation

DAILY DRILLING REPORT

DATE: January 20, 1980 OPERATOR: Wulf Oil Corporation
WELL NAME AND LOCATION: #1-A Peterson, NE 1/4, Sec 32, T7S, R1E, Fall River Co., SD
DEPTH: 2400'
BIT NUMBER: 2
DRILLING MUD
PROPERTIES: WT. 10 VIS. 45 PH 10 H₂O LOSS 6

DRILLERS REPORT:

7 days from spud. Drilled 110' in last 24 hours.
Present formation - sand
Present operation - circulating samples
Bit #2 7 7/8" FP53--in at 1810; drilled 590' in 54 hours.
30,000# wt., 55 rpm, 52 SPM, 950# pump pressure
Survey at 2290' - 3/4° dev.
21 hours drilling
1 1/2 hours circulating
1/2 hour survey
1 hour repairs

GEOLOGISTS REPORT:

Drilling in Upper Pennsylvanian.

2:00 p.m. report --top of 2nd Leo Zone at 2390'. Good drilling break from 20 mpf to 2 mpf. Circulated samples were SS, excellent P & P, good visible stain, excellent fluor and excellent streaming cut. TD 2400'. Will test from 2385-2400'. Test should be out by noon 1-21-80.





Wulf Oil Corporation

DAILY DRILLING REPORT

DATE: January 19, 1980 OPERATOR: Wulf Oil Corporation
WELL NAME AND LOCATION: #1-A Peterson, NE 1/4, Sec 32, T7S, R1E, Fall River Co., SD
DEPTH: 2290'
BIT NUMBER: 2
DRILLING MUD
PROPERTIES: WT. 9.0 VIS. 40 PH 9 H₂O LOSS 10

DRILLERS REPORT:

6 days from spud. Drilled 360' in last 24 hours.
Present formation-sand; Present operation-drilling
Bit #2 7 7/8" FP53--in at 1810'; drilled 480' in 33 hours.
30,000# wt., 55 rpms, 52 SPM, 900# pump pressure

24 hours drilling

GEOLOGISTS REPORT:

Drilling in lower Permian.





API ID 40 047 20085

Gulf Oil Corporation

21 of 38

DAILY DRILLING REPORT

DATE: January 16, 1980

OPERATOR: Gulf Oil Corporation

WELL NAME AND LOCATION: #1-A Peterson, NE ²¹~~24~~ Sec 32, T7S, R1E, Fall River Co., SD

DEPTH: 1035'

BIT NUMBER: 1

DRILLING MUD
PROPERTIES: WT. drilling with VIS. _____ PH _____ H₂O LOSS _____
water

DRILLERS REPORT:

3 days from spud.
 Drilled 233' in last 24 hours. 43 total rotating hours.
 Present formation - Shale
 Present operation - working on motor
 Bit #1 Y-12 — in at 802'; drilled 233' in 7 hours.
 25,000# wt., 100 rpm,
 7 hours drilling
 15½ hours waiting on cement
 ¾ hour cement
 1 hour circulating casing

Set 18 joints of 8 5/8" JB24# - set 792' at 802'

Cement - 380 sxs regular, 3% CaCl, 1% chip plug.

\$85,061.49 — Cumulative Costs.





POWERTECH (USA) INC.

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API NO 40 047 20085

BIT NUMBER: 2

DRILLING MUD

PROPERTIES: WT. drill w/water VIS. _____ PH _____ H₂O LOSS _____

DRILLERS REPORT:

5 days from spud. Drilled 180' in last 24 hours.

Present operation - drilling

Bit #1 7 7/8" Y12--in at 802', out at 1810'; drilled 1008' in 31 hours,

Bit #2 7 7/8" FP-53--in at 1810'; drilled 120' so far.

25,000# wt., 55 rpm, 54 SPM, 800# pump pressure

9 hours drilling

12 1/2 hours tripping (had to borrow drill collars from another rig)

1 1/2 hours reaming

1 hour cleaning mud tank

Cost to date - \$97,224.84

GEOLOGISTS REPORT:

DRILLERS REPORT:

4 days from spud. Drilled 115' in last 24 hours. 75 total rotating hours.

Present operation - Drilling

Bit #1 7 7/8" Y12--in at 802'; drilled 948' in 29 hours.

pump 5 1/2 x 14, 54 SPM, 950# pump pressure

22 hours drilling

2 hours mixing mud

Cost to date - \$93,593.54

GEOLOGISTS REPORT:





POWERTECH (USA) INC.

API ID 40 047 20085

Gulf Oil Corporation

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DAILY DRILLING REPORT

DATE: January 15, 1980 OPERATOR: Gulf Oil Corporation
 WELL NAME AND LOCATION: #1-A Peterson, NE 1/4, Sec 22, T7S, R1E, Fall River Co., SD
 DEPTH: 802'
 BIT NUMBER: _____
 DRILLING MUD
 PROPERTIES: WT. water flow VIS. _____ PH _____ H2O LOSS _____

DRILLERS REPORT:

37 1/2 total rotating hours
 Present formation - shale
 Present operation - circulating casing

Bit #1-A 12 1/4" -- in at 0', out at 802'; drilled 802' in 37 1/2 hours.
 Survey at 802' - 2° deviation

19 1/2 hours drilling
 2 hours tripping
 2 1/2 hours run casing
 1/2 hour survey

Cumulative Costs - \$74,381.91

GEOLOGISTS REPORT:

DAILY DRILLING REPORT

DATE: January 14, 1980 OPERATOR: Gulf Oil Corporation
 WELL NAME AND LOCATION: #1-A Peterson, NE 1/4, Sec 22, T7S, R1E, Fall River Co., SD
 DEPTH: 300'
 BIT NUMBER: 1-A
 DRILLING MUD
 PROPERTIES: WT. 8.6 VIS. 35 PH _____ H2O LOSS _____

DRILLERS REPORT:

1 day from spud
 Drilled 300' in last 24 hours
 18 total rotating hours
 Present formation - shale
 Present operation - drilling
 Bit #1-A 12 3/4" Y-12--in at 0'; out at 300', drilled 300' in 18 hours
 110 rpm, 54 SPM, 600# pump pressure
 Survey at 300' - 1° deviation
 18 hours drilling
 6 hours waiting on water

Cumulative Costs - \$66,894.07
 GEOLOGISTS REPORT:





B&S Testers

Box 1436
Gillette, WY 82710

Field Ticket 1182 S&S Testers District Gillette, Wyo. Date January 21, 1960
 Operator Wulf Oil Corporation
 Address P.O. Box 1320
Chadron, Nebraska 69337
 Well Name & Number Peterson #1-A DST No. 1 Mat Pl. Pay 10
 Contractor N.W.D.C. Top Choke 3/8" Flow Me. 1 15 Min.
 Rig No. 2 Bottom Choke 3/4" Shut-in Me. 1 60 Min.
 Spcl. NE NE Size Hole 7 7/8 Flow Me. 2 90 Min.
 Bit. 20 21 Size Flat Hole 1 7/8 7/8 1 1/2 Shut-in Me. 2 120 Min.
 Trip 75 Size & WT. D. P. 3 1/2 IF 13.30 Flow Me. 3 - Min.
 Png. 1E Size WT. Pipe None Shut-in Me. 3 - Min.
 Field Wildcat I. O. of D. C. 2.25 4 1/2 XH Bottom Hole Temp. 86
 County Fall River Length of D. C. above Test 415 Mud Weight 10.6
 State South Dakota Total Depth 2410 Gravity 1.11
 K. S. Division 3545 GL. 3537 Interval Tested 2390-2410 Viscosity 63
 Permeation 2 nd Leg Type of Test Conventional Test Opened @ 03:37 AM 1/21/60

blow. 00:15-Start tools in hole.
03:37-Open tool w/weak blow 1/2" deep in the water. 5 min., blow increased to 1" deep in the water. 15 min., blow increased to 2" deep in the water.
03:52-Close tool-blow died in 1 min.
04:52-Open tool w/weak blow-1/2" deep in the water. 5 min., blow increased to 1" deep in the water. 15 min., blow increased to 2" deep in the water. 30 min., blow steady @ 2" deep in the water. 60 min., blow steady @ 2" deep in the water. 90 min., blow steady @ 2" deep in the water.
06:22-Close tool-blow died in 1 min.
08:22-Equalize tools & work loose.

REMARKS: NO GAS TO SURFACE.

Top Ply at	2384	Middle Ply at	-
Bottom Ply at	2390	4th Ply at	-
Length of Test Interval	20		
Test Interval:	Anchor 20	Collars 0	DP 0
Bulge Straddle:	Anchor -	Collars -	DP -
Was seal plugged?	No	Was anchor plugged?	No
Did bottom anchor hold?	Yes	Press. bulge bottom ply	-

[illegible]

Primer's in Sampler: 30 P100
Total Volume of Sampler: 2700 cc
Total Volume of Sample: 2600 cc
DN: None cc
Water: 2600 cc
Mud: None cc
Gas: .16 cu. ft.
Other: -
Sample R. W.: 0.80 @ 50°
Gravel: - Gas/DN Ratio: -
Mud Lip Water R. W.: 4.7 @ 50°
Mud PR Sample R. W.: 1.38 @ 50°
Mud was Sample drained Rotary table

RESEARCH RESULTS

Type	AK-1	No.	3051	Class	Type	AK-1	No.	2015	Class	Type	No.	Class
Cap.	5700	Lin.	2364	No.	21070	Cap.	5750	Lin.	2406	No.	13496	
Inside	X	Outside		Mrs.	24	Inside	X	Outside		Mrs.	24	
Press.	Field	Corrected		Press.	Field	Corrected		Press.	Field	Corrected		
B-1	A	1334	1357	B-1	1388	1388		I-1				
PH	K	1334	1349	PH	1388	1354		PH				
IP-1	B	3	17	IP-1	36	39		IP-1				
PP-1	C	146	160	PP-1	149	152		PP-1				
IP-2	E	207	242	IP-2	265	268		IP-2				
PP-2	F	583	612	PP-2	596	611		PP-2				
IP-3	I			IP-3				IP-3				
PP-3	H			PP-3				PP-3				
BP-1	D	985	1006	BP-1	1013	1022		BP-1				
BP-2	G	991	1006	BP-2	1016	1022		BP-2				
BP-3	J			BP-3				BP-3				

RAJ TECHNICIAN

WELL OWNERS REPRESENTATIVE (Please Print Legibly)

Dean Boese

No. Final Copies 15

Badgley-Milo Wiseman



TIME: First Flow <u>39</u> <u>152</u> T C I F <u>1022</u> Second Flow <u>268</u> <u>611</u> T C I F <u>1022</u>						Factor: _____ Initial Hydrostatic <u>1388</u> Final Hydrostatic <u>1354</u>						AP ID 40 067 2005	
Gauge No. <u>2015</u>		Depth <u>2406</u>		Clock No. <u>13496</u>		hour <u>24</u>		Ticket Number <u>1182</u>					
1st FLOW PRESSURE			INITIAL CIP			2nd FLOW PRESSURE			FINAL CIP				
Time Defl. 0.00"	Psi Defl. 0.00"	Psi Temp. Corr.	Time Defl. 0.00"	Psi Defl. 0.00"	Psi Temp. Corr.	Time Defl. 0.00"	Psi Defl. 0.00"	Psi Temp. Corr.	Time Defl. 0.00"	Psi Defl. 0.00"	Psi Temp. Corr.		
			.000	.102	152				.000	.410	611		
			.014	.628	936				.030	.638	91		
			.027	.642	957				.061	.652	972		
			.041	.650	969				.091	.660	983		
			.054	.658	981				.121	.666	993		
			.068	.664	990				.151	.670	999		
			.082	.668	996				.182	.672	1001		
			.095	.670	999				.212	.674	1004		
			.109	.674	1004				.242	.676	1007		
			.122	.676	1007				.272	.678	1010		
			.136	.680	1013				.303	.680	1013		
			.150	.680	1013				.333	.682	1016		
			.163	.682	1016				.363	.683	1017		
			.177	.683	1017				.393	.685	1020		
			.190	.685	1020				.424	.686	1022		
			.204	.686	1022				.454	.686	1022		
Remarks:													

OK 26



POWERTECH (USA) INC.

COMPANY WULF OIL COMPANY
WELL API NO. 400472005
SCOT-PEPPERON #1-4
FIELD WILDCAT
COUNTY FALL RIVER
STATE SOUTH DAKOTA

Quantitative Log Interpretation

This interpretation represents our best judgement. However, because all log analysis is based on best assumptions and empirical relationships, we cannot guarantee the accuracy of these figures. For this reason, we must disclaim any responsibility for any loss or expense which results from the use of this interpretation.

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DEPTH	ΔT	ϕ_{AL}	D_B	ϕ_D		R_w	R_T	R_{wt}	S_w	Remarks
2399										
2403		20		12		.45	50	.4	80	IF use $R_w = .65$ at 100 Then $S_w = 95$
2404-06		22				.45			100	
2406-08		25		12		.45	30		86	
2409-11		21		17		.45	30		72	
2412-14		21		17		.45	22		84	
2414-16		20.5		17.5		.45	26		78	
2416-19		23		19		.45	26		69	
2420-21		22		16		.45	70		50	
2422-23		20		10		.45	40		100	
2422-25		19		8		.45	110		80	
2425-27		18		7		.45	65		100	$S_w \sqrt{\frac{R_w}{\phi^2 R_T}}$
2298										
2304		18		8		.65	15		100	
2291-95		18		7		.65	22		100	R_w TOP 1.29 * 50
										R_w MIDDLE .9 * 50
										$R_w = .89 * 50$
2171-74		14		2		.65	1000		100	$R_w = .65 * 100$
2176-80		20		6		.65	30		100	$R_w = .45 * 100$
2182-88		20		6		.65	65		100	
1967-72		23		17		.65	75		55	
1973-78		23		17		.65	100		45	

References

ΔT_{mo}

D_{mo}

ΔT_f

D_f

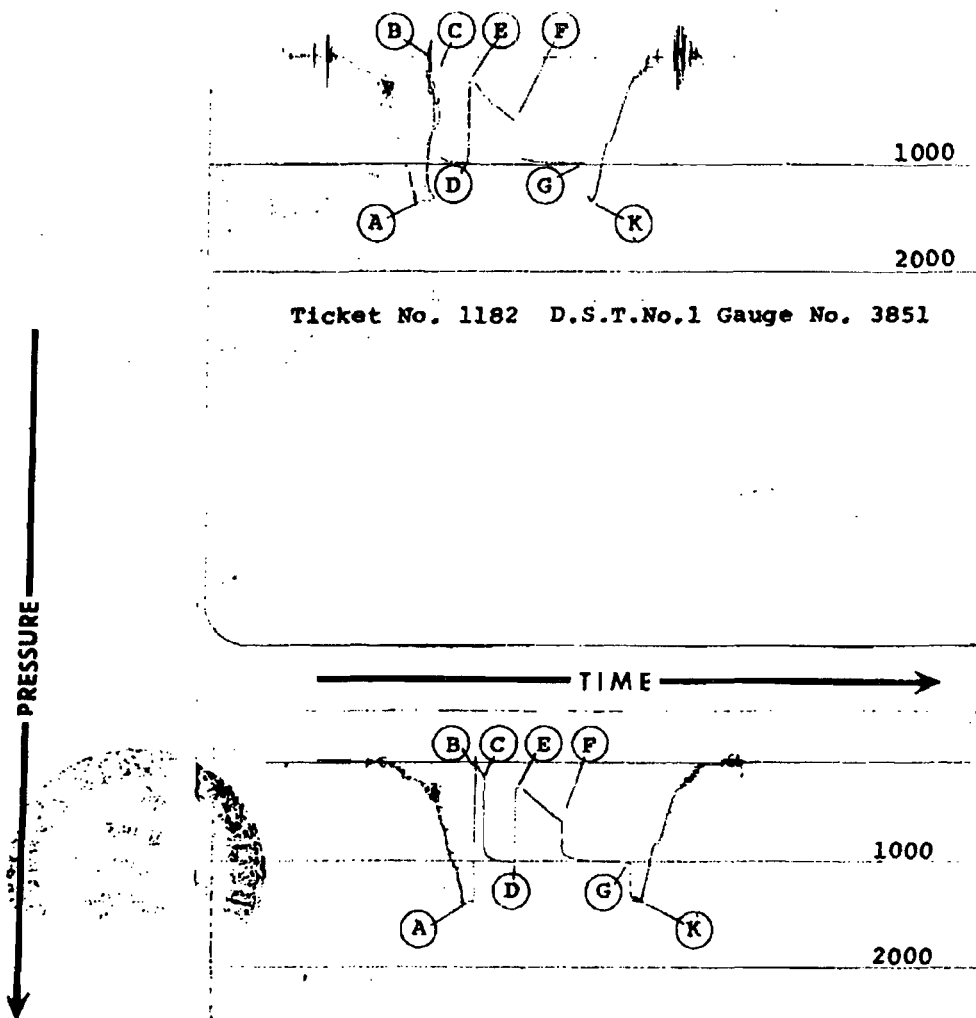
ΔT_{sh}

G. VAUGHN

DRESSER ATLAS ENGINEER

1/23/80

DATE



Each Horizontal Line Equal to 10. p.s.i.

14



ADMINISTRATIVE / SUNDRY REPORTS

PLUGGING RECORD

Operator Wulf Oil Corporation		Address P.O. Box 1320, Chadron, NE 69337	
Name of Lease Peterson		Well No. 1-A	Field & R. serv. or Wildcat - Dry
Location of Well NE 1/4 Sec. 21, T7S, R1E		Sec-Twp-Rge or Block & Survey	County Fall River
Application to drill this well was filed in name of Wulf Oil Corporation	Has this well ever produced oil or gas No	Character of well at completion (initial production) Oil (bbls/day) --- Gas (MCF/day) --- Dry* Yes	
Date plugged: January 25, 1980	Total depth 2460'	Amount well producing when plugged: Oil (bbls/day) 0 Gas (MCF/day) 0 Water (bbls/day) 0	
Name of each formation containing oil or gas. Indicate which formation open to well-bore at time of plugging	Fluid content of each formation	Depth interval of each formation	Size, kind & depth of plugs used. Indicate zones squeeze cemented, giving amount cement.
Dry	---	---	---

CASING RECORD

Size pipe	Put in well (ft.)	Pulled out (ft.)	Left in well (ft.)	Give depth and method of parting casing (shot, ripped, etc.)	Packers and shoes
8-5/8"	802'	0	802'	---	None

Was well filled with mud-laden fluid, according to regulations? **Yes**
 Indicate deepest formation containing fresh water. **None**

In addition to other information required on this form, if this well was plugged back for use as a fresh water well, give all pertinent details of plugging operations to base of fresh water sand, perforated interval, name and address of surface owner, and attach letter from surface owner authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.

January 25, 1980 Plugs were placed as follows:
 2200 to 2300 40 sx.
 1800 to 1900 25 sx.
 1050 to 1150 30 sx.
 750 to 850 40 sx.
 surface no/marker 10 sx.

Plugged and abandoned 1-25-80

USE REVERSE SIDE FOR ADDITIONAL DETAIL

Executed this the 21 day of Jan, 1980.
 State of NE
 County of Fall River

Before me, the undersigned authority, on this day personally appeared George R. Wulf known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath stated that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.

Subscribed and sworn to before me this 21 day of Jan, 1980.

NOTARY PUBLIC
STATE OF NEBRASKA
 My commission expires **May 21, 1985**

Notary Public in and for _____
 County, _____

DO NOT WRITE BELOW THIS LINE
 APR 21 1982
 Approved _____ Date _____
 OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA



STATE OF S. DAKOTA

**SUNDRY NOTICES AND
REPORT ON WELLS**

FARM OR LEASE NAME

Peterson

WELL NO.

#1A

FIELD AND POOL OR WILDCAT

Wildcat

NO. ACRES IN LEASE

1,200.00

SEC. TWP. RGE.

NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 21, T7S, R1E

☒ OIL WELL

☐ GAS WELL

☐

☒ DRY

OPERATOR

WULF OIL CORPORATION

ADDRESS

P. O. BOX 1320 - CHADRON, NEBRASKA 69337

LOCATION (in feet from nearest lines of section or legal subdivision, where possible)

660 FNL - 458 FEL Section 21 (NE $\frac{1}{4}$ NE $\frac{1}{4}$)

ELEVATIONS (D.F., R.R.B., I.T., GRD., etc.; how determined)

3537' Ungraded Ground (Surveyed Elevation)

COUNTY

Fall River

INDICATE BELOW BY CHECK MARK NATURE OF REPORT, NOTICE OR OTHER DATA
NOTICE OF INTENTION TO: SUBSEQUENT REPORT OF:

TEST WATER SHUT-OFF

SHOOT OR ACIDIZE

WATER SHUT-OFF

SHOOTING OR ACIDIZING

FRACTURE TREAT

REPAIR WELL

FRACTURE TREATMENT

REPAIRING WELL

MULTIPLE COMPLETE

PULL OR ALTER CASING

ALTERING CASING

ABANDON

☒

(Note: Report results of multiple completion on Well Completion or Recompletion and Log Form--Form 4)

DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work)

Verbal permission was obtained to plug the well ~~XXXXXXXXXXXX~~ January 25, 1980.

Plugs to be placed as follows:

2200 to 2300	40 sx.
1800 to 1900	25 sx.
1050 to 1150	30 sx.
750 to 850	40 sx.
Surface w/marker	10 sx.



I hereby certify that the foregoing as to any work or operation performed is a true and correct report of such work or operation.

SIGNED Dennis R. Steel

TITLE President

DATE 1/31/80

Approved Mr. Steel
Date

DO NOT WRITE BELOW THIS LINE

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

CONDITIONS, IF ANY:

Fred R. Steel
Secretary



CORRESPONDENCE



Mr. Fred V. Steece, Supervisor
Western Field Office
36 East Chicago
Rapid City, SD 57701

Dear Mr. Steece:

This letter informs you that the surface restoration
at the site of the following oil or gas test well
has been completed to my satisfaction.

<u>Permit</u>	<u>Well Name and Location</u>
957	Wulf #1-A Peterson, NENE 21-7S-1E, Fall River

I am the surface owner of record.

SIGNED Walter Peterson DATE 9/19/85

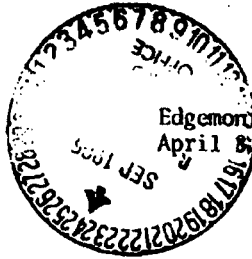


POWERTECH (USA) INC.
API ID 40 047 20085

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WULF OIL CORP.

APR 27 1982



Edgemont, South Dakota 57735
April 8, 1982

Wulf Oil Corporation
P.O. Box 1320
Chadron, NE 69337

Attention: Tim Schuckman

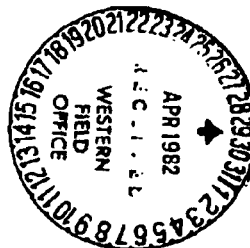
Re: Wulf #1-A Peterson
NE1/4NE1/4, 21-75-1E
Fall River County, South Dakota

Dear Mr. Schuckman:

This is to advise Wulf Oil Corporation that as surface owner
I hereby request that no dry hole marker be erected for the above
referenced well.

Very truly yours,

Wayne Peterson



March 11, 1980

Ms. Deb Richards
Wulf Oil Corporation
P.O. Box 1320
Suite 25, Chaney Center Bldg.
Chadron, NE 69337

Dear Ms. Richards:

Please find enclosed the approved copy of Sundry Notices
and Report on Wells, (Form 6) for the following well:

<u>Permit</u>	<u>Well Name and Location</u>
957	Wulf #1A Peterson, NENE 21-7S-1E, Fall River

This is for your information.

If there is any other way that I can be of help, please
let me know.

Sincerely,



Fred V. Steece, Supervisor
Western Field Office

FVS/cp
Enc.
cc: Dr. Duncan J. McGregor



SURETY



NO SURETY INFORMATION FOR THIS WELL AS OF 5/18/2011



MISCELLANEOUS



**NO MISCELLANEOUS
INFORMATION FOR THIS WELL
AS OF 5/18/2011**

SOURCE E

DEWEY BURDOCK GROUNDWATER WELL REPORT

2010 & 2011 FIELD WORK COMPLETED

(Mike Beshore, Powertech (USA) Inc., October 4, 2011)



POWERTECH (USA) INC.

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Dewey Burdock Groundwater Well Report (2010 & 2011 – Field Work Completed):

During the field seasons of 2010 and 2011, Powertech personnel conducted groundwater well work at the Dewey Burdock project area. This work consisted of locating groundwater wells within the Area of Review (AOR), monitoring water levels of selected wells, measuring flow rates of artesian wells, and determining groundwater well construction information by running the down-hole camera and geophysical logging tools. Groundwater wells within the AOR are shown in **Map 1**. The conducted field work is detailed below.

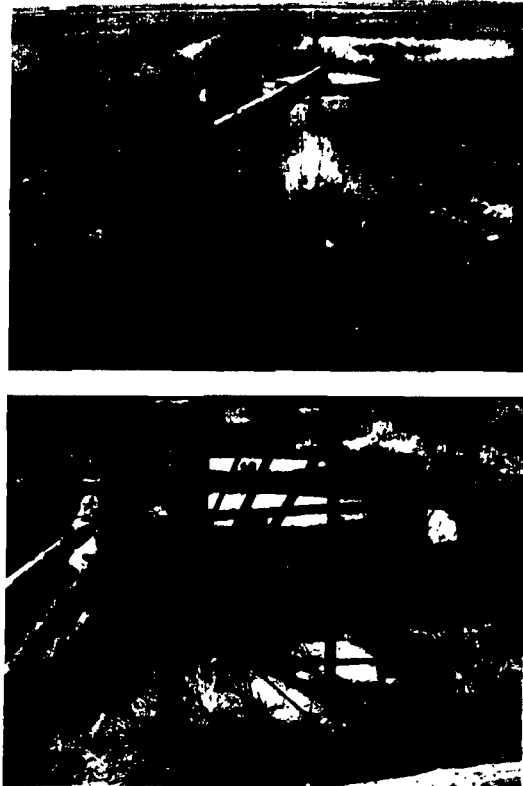
Groundwater Level Measurements:

Groundwater levels were monitored by Powertech personnel on selected groundwater wells, in order to construct groundwater potentiometric surfaces for various aquifers. Standard operating procedures (SOP) for water level measurements under artesian and sub-surface conditions are shown in **Attachment 1**. Groundwater elevation data from the monitoring program are contained within **Table 1**. It should be noted that a significant amount of work had to be completed on many groundwater well surface casings in order to obtain accurate measurements. This was particularly the case for artesian groundwater wells that needed to be fully sealed up and shut in, in order to obtain accurate pressure measurements. Below is a photograph showing an example of well head work completed in order to accurately obtain artesian pressure measurements.



Artesian/Windmill Groundwater Well Flow Rates:

Groundwater wells that free-flow at the ground surface under artesian pressure and by the use of a windmill and their associated flow rates are shown in **Table 2**. This information was provided to Petrotek to incorporate into the project area groundwater flow model. Flow rates of free flowing groundwater wells was obtained by using a 5-gallon bucket, and noting the amount of time it took to fill the bucket, which yielded an estimate of the flow rate. Below are photographs of a typical artesian groundwater well and a flowing windmill within the project area, that are allowed to free-flow to the ground surface.



Groundwater Well Work Completed:

Below is a well by well summary of work completed on groundwater wells during the field season of 2011. Several tasks were completed in order to determine the construction details of many groundwater wells. A tabulated summary of groundwater well status as of September 30, 2011 is included in Table 3.

Hydro ID 5 is former oil test well API 40 047 20065

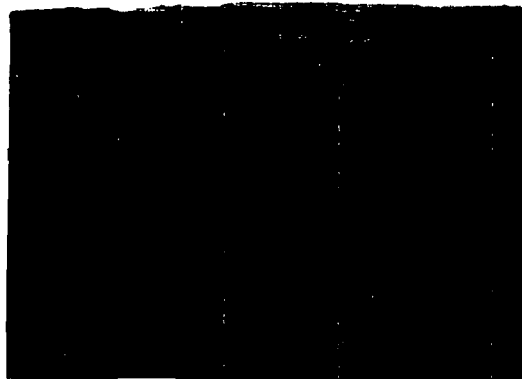
Groundwater Well Hydro ID 5:

Groundwater well number 5 is located about 0.5 miles south of the Powertech Burdock pump test location. The well is artesian and consists of a 4-inch casing. Originally the well was expected to produce water from the Chilson aquifer, however further investigations utilizing the down-hole camera and geophysical tool actually revealed that the well is screened within the lower Fall River aquifer. The geophysical log and the screened interval were sent to Powertech geologists for sub-surface geologic interpretations. The well consists of 4-inch casing to a depth of 155 feet below the ground surface, and is open hole from 155 to 175 feet.

Groundwater Well Hydro ID 6:



Groundwater well number 6 is located within the project AOR and about 1-mile south of the Powertech Burdock pump test location. This well is non-flowing and consists of a 12-inch steel casing. The static water level in the well is at about 20 feet below ground surface.



The 2-inch down-hole camera was run down the well casing in order to determine the well construction details. As with many groundwater wells in the area, it was very difficult to see the screened interval of the well due to mineralization on the inner casing walls. It appeared from the video that the steel well casing ended at a depth of 135 feet below the ground surface, below which was open bore hole to a total depth of 200 feet below ground surface. These depths correspond to other Fall River wells in the area. The geophysical logging tool was also run down the well casing to its total depth. The logs suggest that sandy facies with good porosity exists from the ground surface to 200 feet below the ground surface.

Groundwater Well Hydro ID 9:

Groundwater well number 9 is located within the AOR and south of the Powertech Burdock pump test area. The status of this well was unknown, and was identified at the ground surface by the presence of upwelling water flow from what was hypothesized to be a broken-off casing (see photo below). Historical documents from TVA identify this well as being screened within the Fall River Aquifer. Conversations with the landowner also help validate that well number 9 is screened within the Fall River Aquifer.



PowerTech personnel excavated a small portion of the area near the upwelling water in an attempt to locate the groundwater well. After much effort, the broken off 2-inch groundwater well casing was located about 6 feet below the ground surface. A pipe was then attached to the casing to ensure that artesian pressure would lift the groundwater to the ground surface before repairing the well-head, but water did not flow to the ground surface.

PowerTech personnel then constructed a 6-foot long 1-inch drill bit. This tool was used to ream out sulfide mineralization that had accumulated on the inner walls of the well casing. This process increased artesian flow from the well to about 1.0 gallon/minute at the ground surface.

After verifying flow from the well at the ground surface, a 2-inch pipe was placed inside the existing well casing and penetrated into the well about 2-feet. A protective riser was then placed around the 2-inch pipe, and cement was added to the space between the 2-inch well head and the protective riser. Artesian flow of 1 gallon/minute was observed at the ground surface. Below is a photograph of the final well-head configuration.



The excavated area around the well was then replaced and smoothed out to match the existing topography. The landowner can now utilize the groundwater well for stock watering purposes.



Powertech personnel were unable to run a down-hole camera on the well due to mineralization on the inner casing walls. A one inch camera, once obtained, may penetrate into the water well and allow construction details to be ascertained. This effort resulted in verifying the presence of a groundwater well and is now set up so water level measurements can be obtained.

Groundwater Well Hydro ID 37:

Groundwater well number 37 is located outside of the project boundary but within the AOR, about 0.75 miles south-east of the south-east corner of the project boundary. This groundwater well is not artesian and produces stock water by a windmill. The windmill was disassembled by Powertech personnel so access to the well could be obtained.



This groundwater well originally produce water from an unknown aquifer, but further investigations reveal that it produces from the upper Fall River aquifer according to Powertech geologists who interpreted the geophysical log and screened interval obtained from the down-hole camera. The down-hole camera revealed that the well is cased at the surface, but is open-hole from a depth of 93-145 feet below the ground surface.

Groundwater Well Hydro ID 49:

Groundwater well number 49 is located within the Powertech Dewey aquifer pump test area. This well has a construction report associated with it, is screened from a depth of 475-540 feet, and is known to be screened within the upper Fall River aquifer. The total depth of the well was verified to be 540 feet by Powertech personnel.

This groundwater well is artesian, and when first visited had a leaky surface casing. In order to be able to measure artesian pressure and groundwater levels with a high degree of accuracy, the leak in the surface casing had to be fixed, and fitted with valves to isolate the pressure gauge. Below is a photograph of surface casing work completed. There are no leaks at the ground surface, and measured water levels now correlate very well with other surrounding upper Fall River wells.



Groundwater Well Hydro ID 106:

Groundwater well number 106 is located within the AOR just north of the town of Dewey, and north of the Dewey Fault zone. The status of this 7-inch was unknown, and expected to produce from Inyan Kara aquifers. The well is artesian and flows about 0.1 gallons/minute.

The 2-inch down-hole camera was run down the well casing to determine well construction details. The casing walls were very difficult to see due to mineralization and algae growth. It appeared from the video that the steel casing ended at 160 feet below the ground surface, below which was open bore hole to a depth of 196 feet below ground surface. The geophysical logging tool was then run down the well casing to its total depth. The logs show a zone of good porosity below about 175 feet to 196 feet below the ground surface.

Groundwater Well Hydro ID 220:

Groundwater well number 220 is an existing stock well located about 1.5 miles north north-west of the Powertech Dewey pump test location, consisting of a 6-inch surface casing. Flow from the groundwater well is artesian and produces about 0.2 gallons of water per minute to a nearby stock tank. Below is a photograph of well number 220.



The down-hole camera and geophysical logging tool was used by Powertech personnel to investigate the groundwater well. The well was initially screened within an unknown aquifer. Through the use of the down-hole camera, it was determined that the well is screened from at least 463-523 feet below the ground surface. This corresponds to the upper Fall River aquifer according to Powertech geologists. However as can be seen from the down-hole video, the screened interval extends below 523 feet to an unknown depth. At 523 feet the camera could not go any deeper as the casing was broken and caved in.

Groundwater Well Hydro ID 270:

Groundwater well number 270 has been found and is located about 1.5 miles north and west of the Powertech Dewey pump test location. This groundwater well is artesian and produces about 12 gallons/minute from a 2-inch steel casing. Currently the construction details of the groundwater well are unknown, but is expected to produce from the Inyan Kara aquifers.

Powertech personnel excavated the area around the groundwater well to fix the leaky well-head and prepare it for down-hole tools. A new well-head riser pipe was installed and fitted with a valve for artesian water level measurements. The well-head is no longer leaky.

An attempt was made to run a down-hole camera in the well in order to obtain construction details. Due to mineralization on the inner casing walls, the down-hole camera would not enter the well casing. A 1-inch camera must be obtained to penetrate the well casing and obtain construction details.

Groundwater Well Hydro ID 605:

The original groundwater well database provided to Powertech from their consultants identified a ground water well hydro ID 605, which was suppose to be located about 1500 feet east of the TVA Burdock aquifer pump test well 668. There is in fact no groundwater well at this location. There is a vertical 1-inch pipe that comes up from the ground and provides water to a livestock tank. However this pipe comes from groundwater well Hydro ID 668, which provide water to this location via artesian flow from 668. There is no evidence that groundwater well 605 exists.

Groundwater Wells Hydro ID's 622 and 623:



The status of groundwater wells 622 and 623 are known as TVA construction reports exist, and were utilized in the TVA Dewey pump test as observation wells. Powertech personnel verified in the field each of these wells using a tag line to determine well depth, and most maps that show the screened interval are incorrect. Groundwater well 622 is the southern well and is the lower Chilson, as defined by the well depth being 780 feet below the ground surface. Groundwater well 623 is the northern well and is the lower Fall River, as defined by the tag line going to a depth of 580 feet below the ground surface. Furthermore, groundwater levels obtained from surrounding wells correlate perfectly with the above conclusions. Most maps that have been generated to date are labeled incorrectly, and the well symbols need to be revised to show the verified aquifer. Groundwater well 622 is Chilson and well 623 is Fall River.

Groundwater Well Hydro ID 635:

It was originally thought that Hydro ID 635 was an Sundance groundwater well located near the stock reservoir about 750 feet east of groundwater well Hydro ID 5. However, it has been confirmed that this is actually a discharge point from groundwater well Hydro ID 5. Any groundwater quality samples obtained that are labeled as Hydro ID 635 are actually from Hydro ID 5.

According to well construction reports, there was once a Sundance groundwater well in this area. The construction report shows that an oil test well was plugged back and perforated in the Sundance aquifer. Powertech personnel found a solid steel pipe sticking out of the ground about 2000 feet north of the reservoir where the Hydro ID 5 discharge point is located. It is thought that this is the location of the oil test well. The steel pipe needs to be excavated to check if the well has been plugged back to the ground surface.

This is a different oil test, API 40 047 20071, which was plugged and the dry hole marker placed. Excavation is not required. L.S. 3/12/2012

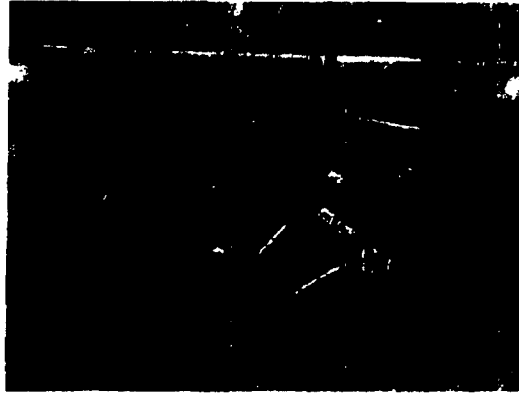
Groundwater Well Hydro ID 642:

Groundwater well number 642 is located in the extreme south-east corner of the project boundary, and was originally hooked up to a windmill for livestock watering purposes. The well is currently not being used for any purpose except for groundwater monitoring. The photograph below shows the windmill structure below which groundwater well 642 is located.





Well number 642 consists of a 5-inch steel surface casing that is in good condition. Groundwater level measurements completed by Powertech personnel yield a water level of about 5-feet below the ground surface. Below is a close up photograph of groundwater well 642.



The construction details of groundwater well 642 were initially unknown. Powertech personnel ran down-hole tools on the well to determine construction information. The down-hole camera shown that the 5-inch surface casing extends to a depth of 12 feet below the ground surface, below which is an open hole to a total well depth of 33 feet. Location and geophysical log information was provided to Powertech geologists, and they interpreted the well to be producing water from surface alluvial sediments. However while running the camera down the hole, it was noted that the walls of the borehole consisted of solid-rock. The geophysical log from the hole should be re-examined to make sure the well is not completed in a sandstone formation such as the Fall River or Chilson.

Groundwater Well Hydro ID 651:

The original groundwater well database provided to Powertech from its consultants identified a groundwater well Hydro ID 651. Powertech personnel inspected this area, and confirmed that there is no groundwater well at this location. There is a stock tank at the location, but it originally received water from groundwater well Hydro ID 6 via a trenched pipeline. Inspection of an aerial photograph of this location clearly shows that a pipeline exists from well number 6 to the location of the stock tank, which was originally thought to be a stand-alone well. From conversations with the current landowner, the groundwater well 6 at one time would provide water to the stock tank, but following TVA pumping of aquifers, the well failed to deliver water to the stock tank location.

Groundwater Well Hydro ID 668:

Groundwater well number 668 is located within the project area and within the proposed groundwater aquifer exemption boundary at the location of the TVA Burdock groundwater pumping test.



As can be seen from the above photograph, this groundwater well is in excellent condition and consists of a 10-inch casing. The groundwater well is artesian and provides livestock water for the landowner. This groundwater well was used as the pumping well during the TVA Burdock aquifer test, and so there is a lot of construction information available. The TVA well construction report shows that the well produces groundwater from both the Fall River and Chilson aquifers, but Powertech personnel thought it was important to verify that information by running the down-hole camera and geophysical logging tool.

Powertech personnel ran the down-hole camera on the water well and confirmed that the well is screened at multiple intervals. The upper screen of the well extends from 300 feet to 350 feet below the ground surface. A solid, unscreened interval exists from 350 feet to 495 feet below the ground surface. From 495 feet to 550 feet below the ground surface is the lower screened interval of the well. The total depth of the well is 550 feet.

The geophysical logs ran by Powertech personnel were provided to Powertech geologists for geologic interpretation. It was confirmed that the upper screened interval of the well (300-350 feet) is in fact within the lower Fall River Formation aquifer. The lower screen of the well from 495 to 550 feet intersects the Lower Chilson Member of the Lakota aquifer. The solid casing that runs between the two screened intervals intersects the Fuson Member confining layer.

During the summer of 2011 Powertech personnel installed an inflatable packer within the groundwater well 668, in an attempt to isolate the two screened intervals of the groundwater well and conduct monitoring of the artesian pressures of each screened aquifer. That task and monitoring details are contained within a stand-alone report provided to Powertech engineering.

Dewey Burdick Groundwater Potentiometric Surface Measurements - Collected by Beshore and Van Eaton

Hydro ID or Hydro Code	SD State Plane 1983 East (Feet)	SD State Plane 1983 North (Feet)	Screened Formation	Total Depth (Feet)	TOC Elevation (Feet)	Measuring Point Elevation (Feet)	Water Level Elevation (Feet) - Week of 8/30/2010	Water Level Elevation (Feet) - Week of 12/13/2010	Water Level Elevation (Feet) - Week of 1/17/2011	Water Level Elevation (Feet) - Week of 2/21/2011	Water Level Elevation (Feet) - Week of 3/21/2011	Water Level Elevation (Feet) - Week of 4/25/2011
12	985376.8	434378.5	Lakota	805	3641.14	3641.51	3653.19	3653.46	3654.06	3654.26	3654.09	3654.55
14	1002103.3	434723.34	Fall River	300	3669.88	3669.88	Not Measured	3662.91	3663.07	3663.02	3663.05	3663.15
38	982726.9	442289.6	Fall River	494	3638.75	3639.63	3644.96	3644.23	3644.76	3644.61	3644.75	3647.01
48	987330.6	444022.8	Fall River	600	3620.86	3621.27	3648.59	3642.36	3642.34	Not Measured	3644.64	3643.47
436	989848.68	454700.89	Fall River	580	3739.85	3739.85	Not Measured	3707.48	3707.56	3707.31	3707.36	3707.31
609	990133.3	447808.3	Lakota	1000	3700.67	3700.67	3688.5	3688.85	3686.81	3687.76	3687.75	3688.05
610	989998	447969.6	Fall River	680	3704.85	3704.85	3691.75	3691.74	3691.51	3691.45	3691.33	3691.52
611	990233.96	453955.33	Lakota	804	3737.36	3737.36	Not Measured	3691.99	3690.77	3691.03	3691.32	3691.26
612	990153.49	454128.57	Lakota	800	3732.34	3732.34	Not Measured	3694.04	3692.69	3692.9	3693.17	3693.15
613	990523.4	453775.8	Fall River	580	3736.93	3736.93	3700.03	3700.2	3700.25	3700.02	3700	3700.03
615	990571	453708.9	Lakota	800	3741	3741	3689.31	3689.79	3688.49	3688.72	3688.99	3688.99
616	990530.63	453135.16	Lakota	835	3751.04	3751.04	Not Measured	3693.43	3692.16	3692.4	3692.63	3692.6
617	989425.25	453583.39	Lakota	810	3725.55	3725.55	Not Measured	3692.35	3691.11	3691.33	3691.58	3691.53
622	991174.5	454033.8	Lakota	780	3754.91	3754.91	3692.85	3693.33	3692.03	3692.24	3692.5	3692.47
623	991084.6	454311.84	Fall River	580	3753.28	3753.28	3708.51	3708.64	3708.65	3708.5	3708.53	3708.55
628	990894.7	449719.2	Fall River	520	3731.99	3731.99	3694.78	3694.93	3694.77	3694.69	3694.42	3694.68
631	1002575.7	449309.8	Fall River	80	3745.37	3745.37	3716.86	3716.95	3716.92	3717.11	3717.37	3717.41
657	989582.27	454729.93	Lakota	800	3747.58	3747.58	Not Measured	3693.34	3692.06	3692.28	3692.48	3692.53
680	1003476.6	429969.1	Lakota	436	3701.94	3701.94	3661.02	3660.69	3661.06	3661.09	3661.07	3661.45
681	988728.3	443725.3	Fall River	600	3626.99	3630.31	3649.22	3643.89	3644.21	Not Measured	3646.05	3646.63
682	1003538.2	431257.9	Lakota	460	3718.24	3718.24	3665.4	3665.14	3665.49	3665.54	3665.45	3665.75
683	988610.5	446104.7	Fall River	650	3663.66	3666.64	3662.67	3659.52	3658.88	Not Measured	3660.21	3660.57
684	1003590.38	429744.24	Lakota	423	3689.04	3689.04	Not Measured	3661.57	3661.96	3661.96	3661.95	3662.34
685	989088.4	443409.7	Fall River	595	3627.85	3630.35	3666.83	3642.12	3642.58	Not Measured	3645.51	3646.14
686	1003368.77	429749.56	Lakota	428	3692.06	3692.06	Not Measured	3661.23	3661.52	3661.56	3661.48	3661.96
687	988480.18	443724.72	Fall River	608	3623.84	3624.79	Not Measured	3641.48	3641.58	Not Measured	3643.99	3644.39
688	1003425.8	429974.4	Fall River	255	3701.26	3701.26	3663.36	3662.81	3663.09	3663.08	3663.06	3663.37
689	988715	443799.2	Lakota	730	3627.27	3629.69	3684.72	3684.1	3678.86	Not Measured	3684.23	3683.99
691	988762.9	443698.4	Fall River	505	3628.88	3630.29	3646.65	3643.51	3643.58	Not Measured	Not Measured	3646.12
692	1003474.48	430014.33	Lakota	335	3704.98	3704.98	Not Measured	3663.21	3663.54	3663.57	3663.54	3663.83
694	997116.1	426936.1	Fall River	392	3598.29	3600.69	3680.25	3640.12	3641.29	3641.2	3641.28	3641.64
695	990783.4	439912.5	Fall River	508	3597.8	3599.12	3638.98	3634.18	3633.64	3634.95	3634.42	3634.95
696	996936.6	427141.5	Lakota	587	3597.96	3599.91	3641.09	3649.16	3649.78	3649.6	3649.58	3650.74
697	990748.4	439347.4	Lakota	682	3597.69	3600.3	3679.68	3675.76	3670.51	3678.16	3672.58	3672.69
698	1004307.8	435651.1	Fall River	205	3714.25	3714.25	3679.28	3679.45	3679.38	3679.22	3679.21	3679.35
705	997022.63	453314.89	Lakota	460	3826.42	3826.42	Not Measured	3709.77	3709.62	3709.41	3709.53	3709.64
706	996987.91	453276.44	Fall River	316	3824.32	3824.32	Not Measured	3725.19	3725.32	3725.1	3725.29	3725.15
3026	1012037.4	432833.2	Lakota	196	3820.48	3820.48	3680.3	3680.89	3680.78	3680.38	3680.46	3680.58

BOLD = OUTLIERS



Hydro ID	Township	Range	Section	1/4 - 1/4 Location	Coordinates East	Coordinates North	Screened Location	Well Use
1	7	1	9	SESE	1027696	429227	Chilson	Stock
2	7	1	16	SESE	1026724	423922	Chilson	Domestic
3	7	1	22	SWNW	1028593	421104	Chilson	Stock
4	7	1	15	SESE	1032516	423080	Unknown	Stock
5	7	1	14	NENW	1035181	427284	Chilson	Stock
6	7	1	14	NESE	1037218	425012	Unknown	Stock
7	7	1	23	NWNW	1033304	422417	Fall River	Domestic
8	7	1	23	SWSE	1036052	418515	Fall River	Domestic
9	7	1	23	NENE	1038003	421806	Fall River	Stock
12	7	1	4	SESE	1026978	434378	Chilson	Stock
13	7	1	3	NWNW	1028360	438470	Chilson	Domestic
14	7	1	2	NWSW	1033704	434723	Fall River	Stock
15	7	1	2	NENW	1035304	438317	Chilson	Stock
16	7	1	1	NESW	1041428	434446	Chilson	Domestic
17	7	1	12	SESW	1040223	431329	Fall River	Stock
18	7	1	9	SWSW	1022812	428960	Fall River	Domestic
37	7	2	18	NWSW	1044183	423947	Unknown	Stock
38	6	1	33	SWNW	1024328	442289	Fall River	Stock
40	6	1	30	SWNW	1013415	447182	Inyan Kara	Domestic
41	6	1	31	SWNE	1015385	442081	Unknown	Stock
42	7	1	5	SWNE	1021144	436481	Chilson	Domestic
43	6	1	34	SWSE	1031123	439436	Chilson	Domestic
49	6	1	32	NWNW	1018932	444022	Fall River	Stock
51	7	1	9	SENE	1027411	431487	Chilson	Stock
61	7	1	11	NWSE	1036832	429987	Chilson	Stock
96	41	60	22	SWSW	1011630	451853	Chilson	Domestic
102	6	1	18	SWNE	1016825	458312	Chilson	Domestic
106	6	1	18	NENE	1018099	459625	Unknown	Stock
107	6	1	18	SWNE	1017018	458158	Fall River	Domestic
108	6	1	18	SWNE	1016478	458698	Fall River	Domestic
109	6	1	17	NENW	1020801	459625	Chilson	Domestic
110	6	1	17	NENE	1023777	459643	Chilson	Stock
111	6	1	17	NWNE	1022074	459586	Fall River	Stock
112	6	1	16	SESE	1027864	455881	Fall River	Stock
113	7	2	6	NESW	1046437	434417	Unknown	Stock
114	7	2	7	SESW	1045410	428654	Unkpapa	Stock
115	6	1	18	SENE	1017697	457640	Fall River	Domestic
116	6	1	18	SENE	1017992	458111	Fall River	Stock

Status	Flow Rate (GPM)	Notes
Flowing	1.5	
	4.11	
Flowing	3	
Flowing	5	
Flowing	1.5	
	0.056	2 X 40 GPD (Est)
	0.14	5 X 40 GPD (Est)
Flowing	3	
Flowing	3.3	
	0.085	1 X 123 GPD (Est)
		Not In Use
		Windmill - Not In Use
	6	
	2.5	
Flowing	1.5	
		Not In Use
		Not In Use
	16.2	
		Not In Use
Flowing	1.2	
Flowing	12.9	
	0.11	4 X 40 GPD
	1.5	2 Residents & 2 Gardens
		Not In Use
		Not In Use
	0.085	1 X 123 GPD (Est)
		Windmill - Not In Use
		Not In Use
	0.56	40 cows X 20 GPD
	0.17	2 X 123 GPD
Flowing	1.5	Dewey Post Office

POWERTECH (USA) INC.



Hydro ID	Township	Range	Section	1/4 - 1/4 Location	Coordinates East	Coordinates North	Screened Location	Well Use
117	6	1	8	SWSE	1022177	460796	Unknown	Stock
138	6	1	18	NENE	1017537	459030	Fall River	Domestic
147	6	1	17	NESW	1020879	456566	Chilson	Monitor
220	6	1	19	SENE	1017872	452334	Unknown	Stock
270	6	1	19	NWSW	1014108	451942	Unknown	Stock
436	6	1	20	NWNE	1021450	454700	Fall River	Monitor
506	7	2	8	SWNW	1050129	430704	Unkpapa	Stock
510	7	1	12	SESE	1042933	428178	Chilson	Stock
609	6	1	29	SWNE	1021735	447808	Chilson	Monitor
610	6	1	29	SWNE	1021599	447969	Fall River	Monitor
611	6	1	20	NWNE	1021835	453954	Chilson	Monitor
612	6	1	20	NWNE	1021755	454128	Chilson	Monitor
613	6	1	20	NWNE	1022125	453775	Fall River	Monitor
614	6	1	20	NWNE	1022185	453769	Fuson	Monitor
615	6	1	20	NWNE	1022172	453708	Chilson	Monitor
616	6	1	20	SWNE	1022132	453134	Chilson	Monitor
617	6	1	20	NENW	1021026	453582	Chilson	Monitor
618	7	1	2	SENE	1038074	435906	Unknown	Stock
619	7	1	2	SENW	1034866	436729	Chilson	Stock
620	6	1	35	NWNW	1033951	443209	Chilson	Stock
622	6	1	20	NENE	1022776	454033	Chilson	Monitor
623	6	1	20	NENE	1022686	454311	Fall River	Monitor
628	6	1	20	SESE	1022496	449718	Fall River	Stock
631	6	1	23	SWSW	1034177	449309	Fall River	Stock
635	7	1	14	NENW	1004085	427131	Sundance	Monitor
637	7	1	11	NESE	1038075	430320	Unknown	Monitor
638	7	1	2	NENE	1038269	437976	Fall River	Monitor
639	7	2	7	SENW	1045704	430722	Unknown	Stock
640	7	1	12	SESE	1043010	427965	Unknown	Stock
642	7	1	12	SESE	1042926	428042	Unknown	Stock
645	7	1	16	NENE	1027681	427998	Unknown	Stock
650	7	1	1	SESE	1043781	433331	Chilson	Stock
656	6	1	31	SENW	1014230	442000	Unknown	Stock
657	6	1	20	NWNE	1021483	454729	Chilson	Monitor
662	7	1	11	SESW	1035381	428928	Unknown	Monitor
668	7	1	15	NWNE	1031029	427450	Imyan Kara	Stock
676	6	1	34	SESW	1030846	439891	Alluvial	Monitor
677	7	1	4	SWSW	1023527	434077	Alluvial	Monitor

Status	Flow Rate (GPM)	Notes
	0.75	Not In Use 2 Residents & 10 Horses
Flowing	0.2	
Flowing	0.8	
	6.25	
Flowing	6.25	Measured @ ST

Powertech (USA) Inc.

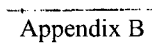


Hydro ID	Township	Range	Section	1/4 - 1/4 Location	Coordinates East	Coordinates North	Screened Location	Well Use
678	7	1	9	SWNE	1026522	431925	Alluvial	Monitor
679	6	1	27	NWSE	1032294	446245	Alluvial	Monitor
680	7	1	11	NESW	1035078	429969	Chilson	Monitor
681	6	1	32	NENW	1020330	443725	Fall River	Monitor
682	7	1	11	SENW	1035139	431257	Chilson	Monitor
683	6	1	29	NESW	1020212	446104	Fall River	Monitor
684	7	1	11	NESW	1035191	429744	Chilson	Monitor
685	6	1	32	NWNE	1020690	443409	Fall River	Monitor
686	7	1	11	NESW	1034970	429749	Chilson	Monitor
687	6	1	32	NENW	1020081	443724	Fall River	Monitor
688	7	1	11	NESW	1035027	429974	Fall River	Monitor
689	6	1	32	NENW	1020316	443789	Chilson	Monitor
690	7	1	11	NESW	1035114	429970	Unkpapa	Monitor
691	6	1	32	NENW	1020364	443698	Fall River	Monitor
692	7	1	11	NESW	1035075	430014	Chilson	Monitor
693	6	1	32	NENW	1020327	443661	Unkpapa	Monitor
694	7	1	15	NWNW	1028717	426836	Fall River	Monitor
695	6	1	32	SESE	1022385	439312	Fall River	Monitor
696	7	1	15	NWNW	1028538	427141	Chilson	Monitor
697	6	1	32	SESE	1022350	439347	Chilson	Monitor
698	7	1	2	NESW	1035909	435651	Fall River	Monitor
703	7	1	1	SWSE	1041621	434334	Unkpapa	Domestic
704	7	1	5	SWNE	1020966	436647	Chilson	Domestic
705	6	1	21	NENE	1028624	453314	Chilson	Monitor
706	6	1	21	NENE	1028589	453276	Fall River	Monitor
707	6	1	34	SWNE	1031935	441809	Alluvial	Monitor
708	7	1	3	SESW	1030254	434094	Alluvial	Monitor
709	7	1	15	SENW	1029286	426603	Alluvial	Monitor
3026	7	1	12	NENE	1043638	432833	Chilson	Monitor
4002	6	1	30	NWSW	1013414	446931	Inyan Kara	Domestic
7002	7	1	23	NWNW	1033333	421931	Chilson	Stock

Status	Flow Rate (GPM)	Notes
Flowing		Shut-In
Flowing		Shut-In
Flowing		Shut-In
Flowing		Shut-In
Flowing		Shut-In
Flowing		Shut-In
Flowing		Shut-In
Flowing		Shut-In
Flowing		Shut-In
	1.5	Not In Use
		1 Resident & Stock (est)
	2.72	
	3.45	



Appendix B



Hydro ID	Township	Range	Section	1/4 - 1/4 Location	Coordinates East	Coordinates North	Screened Location	Well Use	Total Depth	Screened Interval	Screened Aquifer	Work to Complete
1	7	1	9	SESE	1027696	429227	Chilson	Stock				1 Inch Camera
2	7	1	16	SESE	1026724	423922	Chilson	Domestic	650	566-650		Need Access, Artesian
3	7	1	22	SWNW	1028593	421104	Chilson	Stock				1 Inch Camera
4	7	1	15	SESE	1032516	423080	Unknown	Stock				1 Inch Camera & Access
5	7	1	14	NENW	1035181	427284	Fall River	Stock	175	155-175	Lower Fall River	Complete
6	7	1	14	NESE	1037218	425012	Unknown	Stock	200	135-200		Complete
7	7	1	23	NWNW	1033304	422417	Fall River	Domestic	200			Need Access, Artesian
8	7	1	23	SWSE	1036052	418515	Fall River	Domestic	240			Need Access, Artesian
9	7	1	23	NENE	1038003	421806	Fall River	Stock				1 Inch Camera
12	7	1	4	SESE	1026678	434378	Chilson	Stock	805			1 Inch Camera
13	7	1	3	NWNW	1028360	438470	Chilson	Domestic	625	580-625		Complete
14	7	1	2	NWSW	1033704	434723	Fall River	Stock	300		Lower Fall River	1 Inch Camera
15	7	1	2	NENW	1035304	438317	Chilson	Stock				Ready, Dry Hole
16	7	1	1	NESW	1041428	434446	Chilson	Domestic	330			Remove Shed
17	7	1	12	SESW	1040223	431329	Fall River	Stock				Need Access, Pull Windmill
18	7	1	9	SWSW	1022812	428960	Fall River	Domestic	527			Need Access
37	7	2	18	NWSW	1044183	423947	Fall River	Stock	145	93-145	Upper Fall River	Complete
38	6	1	33	SWNW	1024328	442289	Fall River	Stock	494			Pull Pump
40	6	1	30	SWNW	1013415	447182	Inyan Kara	Domestic				1 Inch Camera & Access
41	6	1	31	SWNE	1015385	442081	Unknown	Stock				Need Access
42	7	1	5	SWNE	1021144	436481	Chilson	Domestic	600			Need Access, Artesian
43	6	1	34	SWSE	1031123	439436	Chilson	Domestic				Need Access
49	6	1	32	NWNW	1018932	444022	Fall River	Stock	600	475-540	Upper Fall River	Complete
51	7	1	9	SENE	1027411	431487	Chilson	Stock				Need Access
61	7	1	11	NWSE	1036832	429987	Chilson	Stock				Ready
96	41	60	22	SWSW	1011630	451853	Chilson	Domestic				Need Access
102	6	1	18	SWNE	1016825	458312	Chilson	Domestic				Need Access
106	6	1	18	NENE	1018099	459625	Unknown	Stock	196	160-196		Complete
107	6	1	18	SWNE	1017018	458158	Fall River	Domestic				Need Access
108	6	1	18	SWNE	1016478	458698	Fall River	Domestic				Need Access
109	6	1	17	NENW	1020801	459625	Chilson	Domestic				Need Access
110	6	1	17	NENE	1023777	459643	Chilson	Stock				Need Access
111	6	1	17	NWNE	1022074	459586	Fall River	Stock				Need Access
112	6	1	16	SESE	1027864	455881	Fall River	Stock				Need Access, Pull Windmill
113	7	2	6	NESW	1046437	434417	Unknown	Stock				Need Access, Pull Windmill
114	7	2	7	SESW	1045410	428654	Unkpapa	Stock				Need Access, Pull Windmill
115	6	1	18	SENE	1017697	457640	Fall River	Domestic				Need Access
116	6	1	18	SENE	1017992	458111	Fall River	Stock				Need Access
117	6	1	8	SWSE	1022177	460796	Unknown	Stock				Pull Pump
138	6	1	18	NENE	1017537	459030	Fall River	Domestic				Need Access
147	6	1	17	NESW	1020879	456566	Chilson	Monitor	750	650-750		Complete
220	6	1	19	SENE	1017872	452334	Unknown	Stock		463-523+	Upper Fall River	Complete
270	6	1	19	NWSW	1014108	451942	Unknown	Stock				1 Inch Camera



Hydro ID	Township	Range	Section	1/4 - 1/4 Location	Coordinates East	Coordinates North	Screened Location	Well Use	Total Depth	Screened Interval	Screened Aquifer	Work to Complete
436	6	1	20	NWNE	1021450	454700	Fall River	Monitor	590	505-590	Lower Fall River	Complete
506	7	2	8	SWNW	1050129	430704	Unkpapa	Stock				Ready
510	7	1	12	SESE	1042933	428178	Chilson	Stock				Need Access, Pull Pump
609	6	1	29	SWNE	1021735	447808	Chilson	Monitor	1000	903-966	Lower Chilson	Complete
610	6	1	29	SWNE	1021599	447969	Fall River	Monitor	680	630-672	Lower Fall River	Complete
611	6	1	20	NWNE	1021835	453954	Chilson	Monitor	804	695-730, 755-800	Middle Chilson, Lower Chilson	Complete
612	6	1	20	NWNE	1021755	454128	Chilson	Monitor	800	692-800	Lower Chilson	Complete
613	6	1	20	NWNE	1022125	453775	Fall River	Monitor	580	504-580	Lower Fall River	Complete
614	6	1	20	NWNE	1022185	453769	Fuson	Monitor	620	609-620	Fuson	Complete
615	6	1	20	NWNE	1022172	453708	Chilson	Monitor	800	712-800	Lower Chilson	Complete
616	6	1	20	SWNE	1022132	453134	Chilson	Monitor	835	735-835	Lower Chilson	Complete
617	6	1	20	NENW	1021026	453582	Chilson	Monitor	810	715-810	Lower Chilson	Complete
618	7	1	2	SENE	1038074	435906	Unknown	Stock				Complete
619	7	1	2	SENE	1034866	436729	Chilson	Stock	288	230-288	Upper Chilson	Pull Pump
620	6	1	35	NWNW	1033951	443209	Chilson	Stock				Need Access, Pull Pump
622	6	1	20	NENE	1022776	454033	Chilson	Monitor	780	714-780	Lower Chilson	Complete
623	6	1	20	NENE	1022686	454311	Fall River	Monitor	580	503-580	Lower Fall River	Complete
628	6	1	20	SESE	1022496	449718	Fall River	Stock	520		Upper Fall River	Need Access, Pull Pump
631	6	1	23	SWSW	1034177	449309	Fall River	Stock	80	30-80	Lower Fall River	Need Access, Pull Pump
635	7	1	14	NENW	1004085	427131	Sundance	Monitor				Not A Well
637	7	1	11	NESE	1038075	430320	Unknown	Monitor				1 Inch Camera
638	7	1	2	NENE	1038269	437976	Fall River	Monitor				Plugged?, Need to Verify
639	7	2	7	SENE	1045704	430722	Unknown	Stock				Ready, Hand Dug Well
640	7	1	12	SESE	1043010	427965	Unknown	Stock				Pull Pump
642	7	1	12	SESE	1042926	428042	Alluvial	Stock	33	12-33	Alluvial	Complete
645	7	1	16	NENE	1027681	427998	Unknown	Stock				Need Access, Pull Pump
650	7	1	1	SESE	1043781	433331	Chilson	Stock				Pull Pump
656	6	1	31	SENE	1014230	442000	Unknown	Stock				Remove Shed to Access
657	6	1	20	NWNE	1021483	454729	Chilson	Monitor	800	715-800	Lower Chilson	Complete
662	7	1	11	SESW	1035381	428928	Unknown	Monitor				1 Inch Camera
668	7	1	15	NWNE	1031029	427450	Inyan Kara	Stock	550	300-350, 495-550	Lower Fall River, Lower Chilson	Complete
676	6	1	34	SESW	1030846	439891	Alluvial	Monitor	22.5	12-22	Alluvial	Complete
677	7	1	4	SWSW	1023527	434077	Alluvial	Monitor	14.5	4-14	Alluvial	Complete
678	7	1	9	SWNE	1026522	431925	Alluvial	Monitor	14.5	4-14	Alluvial	Complete
679	6	1	27	NWSE	1032294	446245	Alluvial	Monitor	39	29-39	Alluvial	Complete
680	7	1	11	NESW	1035078	429969	Chilson	Monitor	436	426-436	Lower Chilson	Complete
681	6	1	32	NENW	1020330	443725	Fall River	Monitor	600	585-600	Lower Fall River	Complete
682	7	1	11	SENE	1035139	431257	Chilson	Monitor	460	450-460	Lower Chilson	Complete
683	6	1	29	NESW	1020212	446104	Fall River	Monitor	650	635-650	Lower Fall River	Complete
684	7	1	11	NESW	1035191	429744	Chilson	Monitor	423	413-423	Lower Chilson	Complete
685	6	1	32	NWNE	1020690	443409	Fall River	Monitor	595	580-595	Lower Fall River	Complete



Hydro ID	Township	Range	Section	1/4 - 1/4 Location	Coordinates East	Coordinates North	Screened Location	Well Use	Total Depth	Screened Interval	Screened Aquifer	Work to Complete
686	7	1	11	NESW	1034970	429749	Chilson	Monitor	428	418-428	Lower Chilson	Complete
687	6	1	32	NENW	1020081	443724	Fall River	Monitor	608	593-608	Lower Fall River	Complete
688	7	1	11	NESW	1035027	429974	Fall River	Monitor	255	245-255	Lower Fall River	Complete
689	6	1	32	NENW	1020316	443789	Chilson	Monitor	730	715-730	Middle Chilson	Complete
690	7	1	11	NESW	1035114	429970	Unkpapa	Monitor	631	621-631	Unkpapa	Complete
691	6	1	32	NENW	1020364	443698	Fall River	Monitor	505	490-505	Upper Fall River	Complete
692	7	1	11	NESW	1035075	430014	Chilson	Monitor	335	325-335	Upper Chilson	Complete
693	6	1	32	NENW	1020327	443661	Unkpapa	Monitor	930	910-930	Unkpapa	Complete
694	7	1	15	NWNW	1028717	426836	Fall River	Monitor	392	377-392	Lower Fall River	Complete
695	6	1	32	SESE	1022385	439312	Fall River	Monitor	508	493-508	Lower Fall River	Complete
696	7	1	15	NWNW	1028538	427141	Chilson	Monitor	587	572-587	Middle Chilson	Complete
697	6	1	32	SESE	1022350	439347	Chilson	Monitor	682	667-682	Middle Chilson	Complete
698	7	1	2	NESW	1035909	435651	Fall River	Monitor	205	180-205	Lower Fall River	Complete
703	7	1	1	SWSE	1041621	434334	Unkpapa	Domestic	525	475-525	Unkpapa	Complete
704	7	1	5	SWNE	1020966	436647	Chilson	Domestic				Complete
705	6	1	21	NENE	1028624	453314	Chilson	Monitor	460	428-458	Middle Chilson	Complete
706	6	1	21	NENE	1028589	453276	Fall River	Monitor	316	284-314	Lower Fall River	Complete
707	6	1	34	SWNE	1031935	441809	Alluvial	Monitor	44	30-40	Alluvial	Complete
708	7	1	3	SESW	1030254	434094	Alluvial	Monitor	28	17-27	Alluvial	Complete
709	7	1	15	SENW	1029286	426603	Alluvial	Monitor	40	28-38	Alluvial	Complete
3026	7	1	12	NENE	1043638	432833	Chilson	Monitor	196	166-196	Middle Chilson	Complete
4002	6	1	30	NWSW	1013414	446931	Inyan Kara	Domestic				Need Access, 1 Inch Camera
7002	7	1	23	NWNW	1033333	421931	Chilson	Stock	500			Need Access, Artesian



Powertech (USA) Inc.
Standard Operating Procedure (SOP)
Groundwater Well Water Level Monitoring

This SOP outlines procedures for measuring and documenting artesian and sub-surface water levels within groundwater monitoring wells.

Materials:

- Powertech Groundwater Well Monitoring Data Sheet.
- Electric Logging Water Level Measuring Tape.
- High-Resolution Digital Pressure Gauge.
- Tape Measure with 1/100th foot accuracy.

Personal Protective Equipment (PPE):

- Several potential hazards exist during groundwater well water level monitoring. These include but are limited to pinch-points, pressure, slip/trip/fall, and environmental hazards. Appropriate PPE must always be utilized when conducting groundwater well water level monitoring.

Documentation:

- The person conducting the groundwater well monitoring must completely and accurately fill out the Groundwater Well Monitoring Data Sheet.
- The person conducting the groundwater well monitoring must read and sign the SOP for Groundwater Well Water Level Monitoring. A copy of the signed SOP should be filed at the nearest Powertech Field Office. A copy of the SOP must accompany the person conducting the monitoring in the field.

Procedures:

1. Completely fill in the Powertech Groundwater Well Monitoring Data Sheet.
2. Procedure for pressurized artesian groundwater wells.
 - a. Fully shut-in the artesian groundwater well so that there are no leaks that result in the loss of artesian pressure. This may require some tightening or replacement of plumbing fixtures. A closable valve should be fitted to the well head that allows the attachment of the high-resolution digital pressure gauge. This valve and other plumbing fittings should not be removed, so that future measurements can be conducted at the same elevation.
 - b. Make sure that all air has been evacuated from the artesian groundwater well. The high-resolution digital pressure gauge can now be installed and turned on. Make sure that the gauge has been reset, or zeroed out.



- c. Take an initial pressure measurement in pounds/square-inch (PSI) and document the measurement and time on the Powertech Groundwater Well Monitoring Data Sheet. Pressure measurements should be taken with an accuracy of 0.01 PSI.
- d. Continue to take and document pressure measurements until the artesian water well pressure has stabilized. A stabilized artesian pressure measurement is defined as one of the following:
 - a. A pressure measurement that reaches a maximum value, and then slightly decreases, but does not exceed the maximum documented value within a period of 15 minutes.
 - b. If the pressure measurements DO NOT fluctuate more than 0.04 PSI (or 0.1 feet of water head) over 3 measurements within a 15 minute time period.
- e. Make sure to measure the vertical distance between the surveyed control point (Top of Casing or Survey Pin) and the pressure sensor diaphragm on the pressure gauge. This measurement must be taken with an accuracy of 1/100th of a foot.
3. Procedure for sub-surface water level groundwater wells.
 - a. Lower the probe of an Electric Logging Water Level Measuring Tape into the groundwater well, and lower at a slow rate. Be careful not to let the probe and tape unwind too quickly as they may come free of the spool and be lost into the well.
 - b. Also make sure that the probe sensitivity is adequately adjusted. The deeper the water is in the well, the less sensitivity the probe will require. This is important as condensation in the well could give false readings of the water level in the well.
 - c. Measure and document the depth to the water in the well from the top of the well casing. This measurement must be logged with an accuracy of 1/100th of a foot. Make sure to take several measurements to ensure an accurate final water level.

I certify that I have read and understand the content of this Standard Operating Procedure.

Employee Signature: _____ Date: _____

SOURCE F

RESPEC RESPONSES TO NUCLEAR REGULATORY COMMISSION COMMENTS (REVISION 1)

(Letter from Crystal Hocking, RESPEC, to Mark Hollenbeck, Powertech (USA) Inc., July 22, 2010)

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External Memorandum

To: Mr. Mark Hollenbeck
Powertech (USA) Inc.
310 2nd Avenue
P.O. Box 812
Edgemont, SD 57735

cc: Mr. John Mays, Powertech
Mr. Cory Foreman, RESPEC
Project Central File 1853 — Category A

From: Ms. Crystal Hocking
Staff Geologist
RESPEC
P.O. Box 725
Rapid City, SD 57709

Date: July 22, 2010

Subject: Responses to Nuclear Regulatory Commission Comments (Revision 1)

The purpose of this memorandum is to respond to the five tasks designated by Powertech to help respond to Nuclear Regulatory Commission (NRC) comments regarding the technical report. These tasks were outlined by Mr. John Mays and you at a meeting with RESPEC on June 24, 2010.

Task 1. Check Well 650 and Compare Water Level to Depth to Lakota to Determine Saturated/Unsaturated Conditions at That Location

In an effort to help identify areas where the Lakota Formation is fully saturated, water level measurements of Lakota wells were compared to the elevation of the top of the aquifer. Tables 1 and 2 include well completion and water level measurements for Wells 650, 3026, and 619. Well locations are shown on Figure 1.

The elevation of the top of the Lakota at Well 650, 3,775 feet, was approximated by interpolating the known depth to Lakota at Well 3026 with the location of the outcrop (where the depth equals 0). The average water level measurement is at 3,682 feet elevation, or 92 feet below the approximate top of the Lakota. At the location of Well 3026 (DB08-01-06), the water level is approximately 60 feet below the top of the Lakota Formation. At both of these wells, the Lakota is only partially saturated. At Well 619, the water level in the Lakota is approximately 300 feet above the top of the Lakota Aquifer based on estimates of the Lakota elevation from the sitewide structural contour maps; here the Lakota is fully saturated.



Table 1. Well Completion for Wells 650, 3026, and 619

Hydro I.D. or Hydro Code	650	3026	619
Powertech Borehole I.D.		DB08-01-06	
Formation	Lakota	Lakota	Lakota
Subsurface (SS) or Free-Flowing (FF)	SS	SS	SS
Depth (ft)	Unknown	196	280
Screened Interval (ft)	Unknown	166-196	Unknown
Measuring Point	Top of 8-inch steel casing	Top of 6-inch casing pipe	Top of 5-inch steel coupling on casing
Surveyed Well Casing Elevation (ft)		3,820.48	3,700.12
Stick Up (Well Casing Mark) (ft)		-0.20	0.00
Surveyed Control Point Elevation (ft)	3,821.06		3,698.82
Stick Up (Control Point) (ft)	-0.56		
Calculated Measuring Point Elevation (ft)	3,821.62	3,820.68	3,700.12

In an effort to better delineate where the Lakota Aquifer becomes fully saturated, RESPEC recommends Powertech acquire water levels from two or three additional Lakota wells in close proximity to the outcrop. Recommended wells include Wells 16, 61, and/or 620 (Figure 1). None of these wells have well completion reports, although they are listed in Tennessee Valley Authority (TVA) reports as being completed within the Lakota. Well 16 is listed in the TVA draft Environmental Impact Statement (EIS) as having a water elevation of 3,747 feet, and based on approximations from structure contour maps, the elevation of the Lakota is 3,730 feet or just below the water level of the Lakota. Based on this information alone, it appears that Well 16 is at or very near the area where the Lakota Aquifer becomes fully saturated. From this, it is reasonable to assume that the transition from saturated to unsaturated conditions in the Lakota is located geographically in the central to western portion of the Fall River Formation outcrop. However, because of fluctuations in the water table with time and precipitation patterns, it is highly recommended to take a new water level measurement at Well 16, the only Lakota well located on the Fall River outcrop.

Task 2. Check Field Notes to Verify Data on Existing Potentiometric Surfaces Is Correct

Water level data for wells with questionable data were spot checked to compare field notes with the tabular data. An explanation of the results is provided in the following sections.

— DRAFT —

Table 2. Water Level Measurements for Wells 650, 3026, and 619

Hydro I.D. or Hydro Code	650	3026	619
Powertech Borehole I.D.		DB08-01-06	
Date	ft above mean sea level		
2007-09-27			3,679.13
2007-10-02	3,682.35		
2007-11-09	3,682.35		3,679.19
2008-02-20	3,682.13		
2008-03-24	3,681.92		
2008-03-30		3,681.89	
2008-04-22		3,681.77	
2008-05-21		3,682.13	
2008-05-28		3,681.73	
2008-05-30	3,682.00		
2008-06-24		3,681.85	
2008-07-13		3,681.78	
2008-08-19		3,681.63	
2008-09-22		3,681.78	
2008-10-20		3,681.83	
2008-11-18		3,681.85	
2008-12-17		3,682.50	
2009-01-20		3,682.53	
2009-02-24		3,682.50	
Number	5	13	2
Mean Water Level Elevation	3,682	3,682	3,679
Elevation of Top Lakota	3,775^(a)	3,741	3,375
Difference ^(b)	-92	-59	304

(a) Based on interpolation.

(b) Negative value indicates Lakota Aquifer is unsaturated at well location.
Positive value indicates Lakota Aquifer is saturated at well location.

— DRAFT —

RSI-1853-10-033

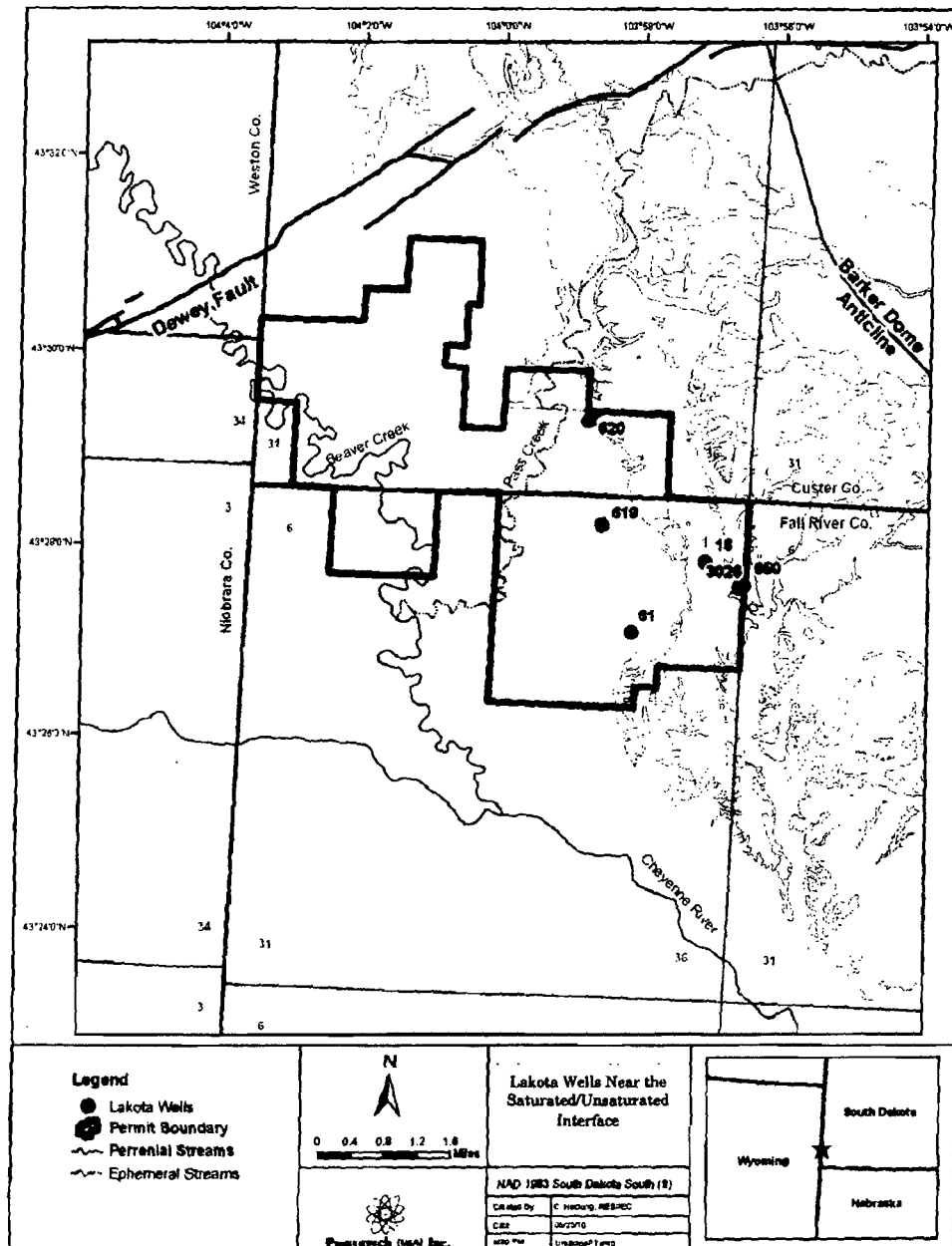


Figure 1. Lakota Wells Near the Saturated/Unsaturated Interface.

— DRAFT —



Fall River Aquifer

Well 613 and Well 622. These two wells are both completed to similar depth in the Fall River Formation (well completion reports available) and are located about 700 feet apart. Both wells have a total depth of 580 feet and similar surface elevation with well 613 screened between 504 and 580 feet and well 622 screened between 503 and 580 feet. The average water levels reported on Figure 2.7-14 of the NRC technical report (TR) are correct as compared to original field notes. These two wells have a difference in head of about 8 feet based on recent averages (3,701 and 3,709 feet elevation, respectively); at the time these wells were drilled, they also exhibited a difference of 8 feet (3,711 and 3,719 feet elevation). The difference in head between these two closely spaced wells is likely the result of minor differences in lithology and permeability of the aquifer.

Well 695. The mean water elevation for this well is 3,632 feet and is correct as presented on Figure 2.7-14 of the NRC TR. The pressure has a mean average of 12 pounds per square inch (psi) with individual measurements that range from 12.7 to 13.8 psi. As in all free-flowing wells, psi is converted to feet by the formula:

$$\text{Feet H}_2\text{O above measuring point} = \text{psi} \times (144 \text{ in}^2 / \text{ft}^2) \times (\text{ft}^3 / 62.43 \text{ lb}). \quad (1)$$

Lakota Aquifer

Well 8002. This Lakota stock well has an average elevation of 3,578 feet as presented on Figure 2.7-15 of the TR. This value was not used while generating the water level contours for several reasons. First, this well is a free-flowing artesian that was shut in during measurements; although no leaks were visible, it is possible that this well could not completely be shut in, as it is an older well with multiple fittings at the surface. Over the measurement time interval (September 2007 through February 2009), only 3 pressure measurements were made: 13, 15, and 14.65. Based on field notes, the value of 14.65 psi should be discarded as one of the lines froze during the stabilization period and the sampler was required by the landowner to open the valve to prevent well damage. It is also believed that the other two readings were potentially taken before the well had completely stabilized.

In generating the water level contours, Well 608 to the west was considered to have more reliable readings as this well is nonartesian and was measured with a water level tape. Water levels at Well 608 indeed exceeded estimates at Well 8002; that is unexpected and unlikely given the water gradient decreases toward the southwest. Water level data for Well 696, although not used in the generation of the original potentiometric surface, have an average value of 3,639 feet elevation; this value is extremely close to the potentiometric surface generated by ignoring the data from Well 8002. Therefore, it is our position that this decision to not use data from Well 8002 was sound. It is advisable to verify completion of this well and obtain additional water level measurements.

Well 615. Based on six measurements, the mean potentiometric surface at Well 615 is correctly reported at 3,690 feet elevation. A well completion report for this well is available to verify this well is completed into the Lakota.

— DRAFT —



Well 609. There are a total of 11 measurements for this well, all within ± 2 feet of each other. The value of 3,690 feet elevation on the existing potentiometric surface map is correct. A well completion report for this well is available to verify this well is completed into the Lakota. In addition, Well 610 (completed in the Fall River) is immediately adjacent to this well and has a comparable water level of 3,693 feet.

Well 689. This well was recently installed by Powertech as a monitoring well for the Dewey pump test. It is screened for 15 feet in the upper Lakota Formation. A total of 11 pressure measurements were collected from this well, ranging from 23 to 25 psi. The mean water level of 3,684 feet presented on the potentiometric surface is correct according to our database and field records.

Well 38. Based on the TVA EIS, this stock well is located in Sec. 33, T6S, R1E with a depth of 550 feet and completed in the Lakota. However, data from a well completion report (Figure 2) indicate this well has a depth of 494 feet. The surface elevation at this well is roughly 3,630 feet, making the depth of this well have an elevation of 3,136 feet (assuming the well completion report is correct). Based on structure contour maps, the bottom of the Fall River (top of Fuson) is around 3,130 feet. Based on the depth reported on the well completion form and the structural contour information based on exploration boreholes, this well is now believed to be completed in the Fall River Formation and not the Lakota Formation. The mean water elevation of 3,644 feet measured at this well could be used in the future to slightly modify the potentiometric surface for the Fall River Formation; the measured value is not unreasonable for the Fall River. Since this is a free-flowing well, it is also possible the water level could be higher than measured if shut in for a longer period of time. If potentiometric surfaces are redrawn in the near future, it is recommended to not include Well 38 on the Lakota surface. It is also recommended to log this well to verify completion.

Task 3. Generate Map of Potentiometric Surfaces That has Wells Labeled by Well I.D.

Existing potentiometric surfaces for the Fall River, Lakota, and Unkpapa Aquifers are presented in Figures 3 through 6. Contours have not been modified from previous versions. Figure 5 is a revised potentiometric map of the Lakota that has wells not used in generating contours removed to reduce confusion.

Task 4. Compile Water Level Data and Completion Information Into a Table

Tables 3 through 8 contain the field water level measurements and calculated water table elevations. Tables 3 and 4 contain data for the Inyan Kara Aquifers, Tables 5 and 6 contain alluvial aquifer information, and Tables 7 and 8 contain water level information on the Unkpapa Aquifer.

— DRAFT —

RSI-1853-10-034

Page 11 of 11

WAGNER'S FINAL REPORT

OFFICE OF STATE ENGINEER
Pierre, South Dakota.

Well No. _____
(do not fill in)

CUSTER COUNTY

Location: SW NE Section 33 Twp. 6S Range 1E

Owner George Putnam Address Burdock, S. Dak.

Depth 494 Drawdown _____ Type Rig Used cable tool

Flow (gpm) _____ Pressure _____ Date Measured _____

Grd. Elev. _____ Water Level Below Ground Surface _____

Temperature _____ Character Water (soft, medium, hard)

Date Commenced _____ Date Completed 11/12/49

x	

Section

CASING DETAIL

Type	Size	Length	Depth
	4" 11	497	494

PERFORATIONS

<u>Type</u>	<u>Size</u>	<u>Length</u>	<u>Depth</u>
-------------	-------------	---------------	--------------

3. CONCLUSIONS

<u>Type</u>	<u>Size</u>	<u>Length</u>	<u>Depth</u>
-------------	-------------	---------------	--------------

Is there a seal between different
size pipes? What kind? _____

WATER BEARING SANDS

From _____ To _____

SOURCE OF INFORMATION

BMA office, Fall River Co.

DRILLER'S LOG

<u>From</u>	<u>To</u>
-------------	-----------

Wanted Driller Roy Benson
 Address Hot Springs, S. Dak.

Figure 2. Well Completion Report for Well 38.

— DRAFT —

RSI-1853-10-035

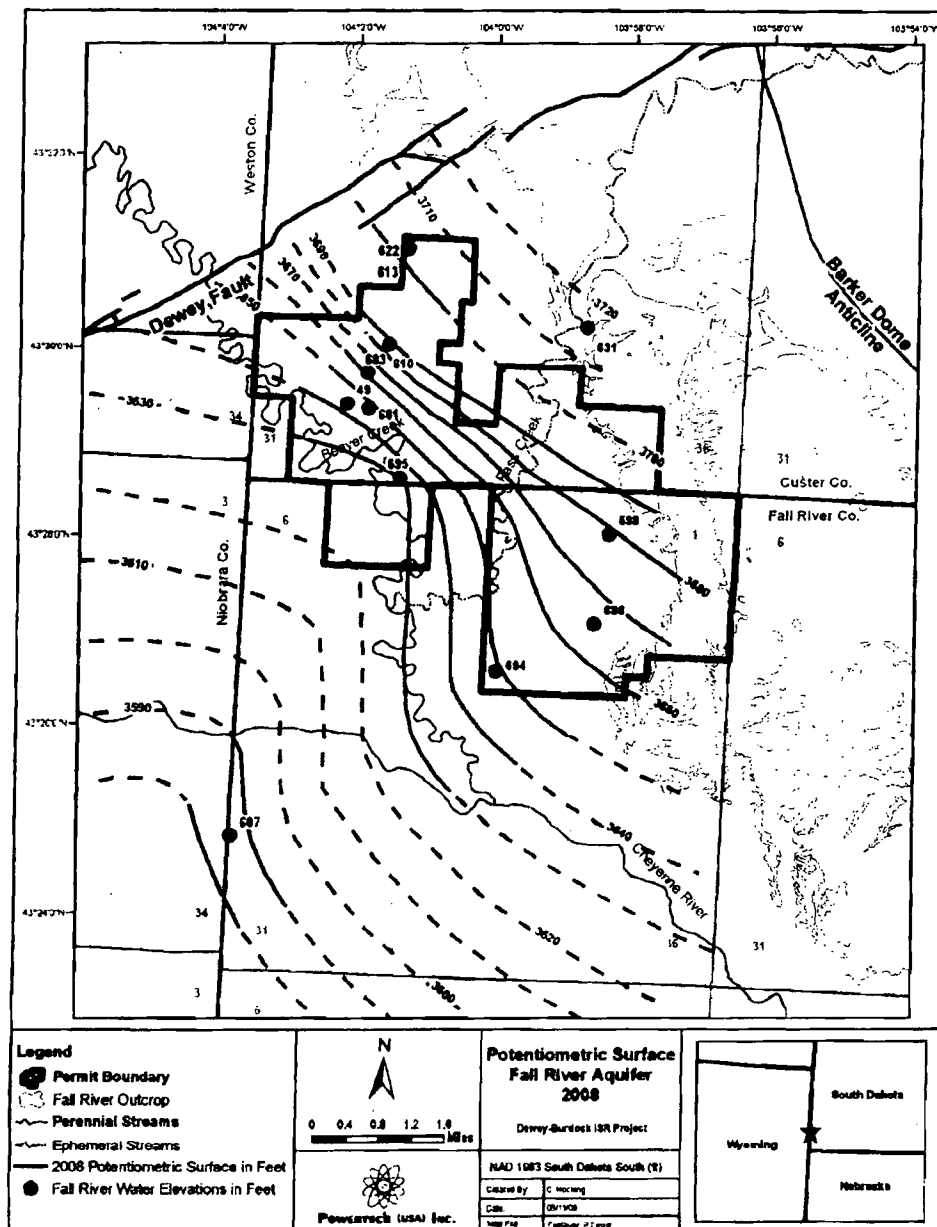


Figure 3. Fall River Aquifer Potentiometric Map With Wells Labeled by Hydro I.D.

— DRAFT —

RSI-1853-10-036

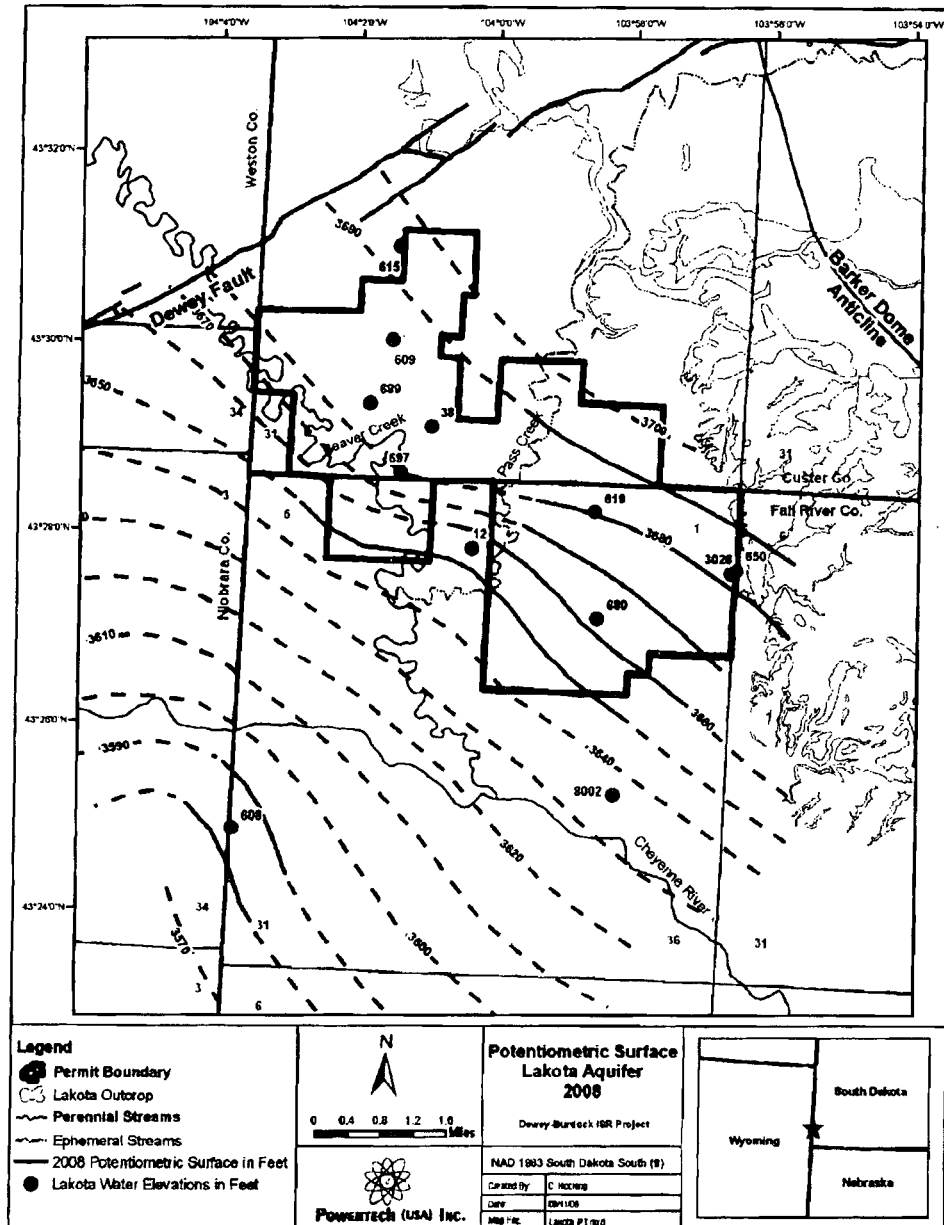


Figure 4. Lakota Aquifer Potentiometric Map With Wells Labeled by Hydro I.D.

— DRAFT —

RSI-1853-10-041

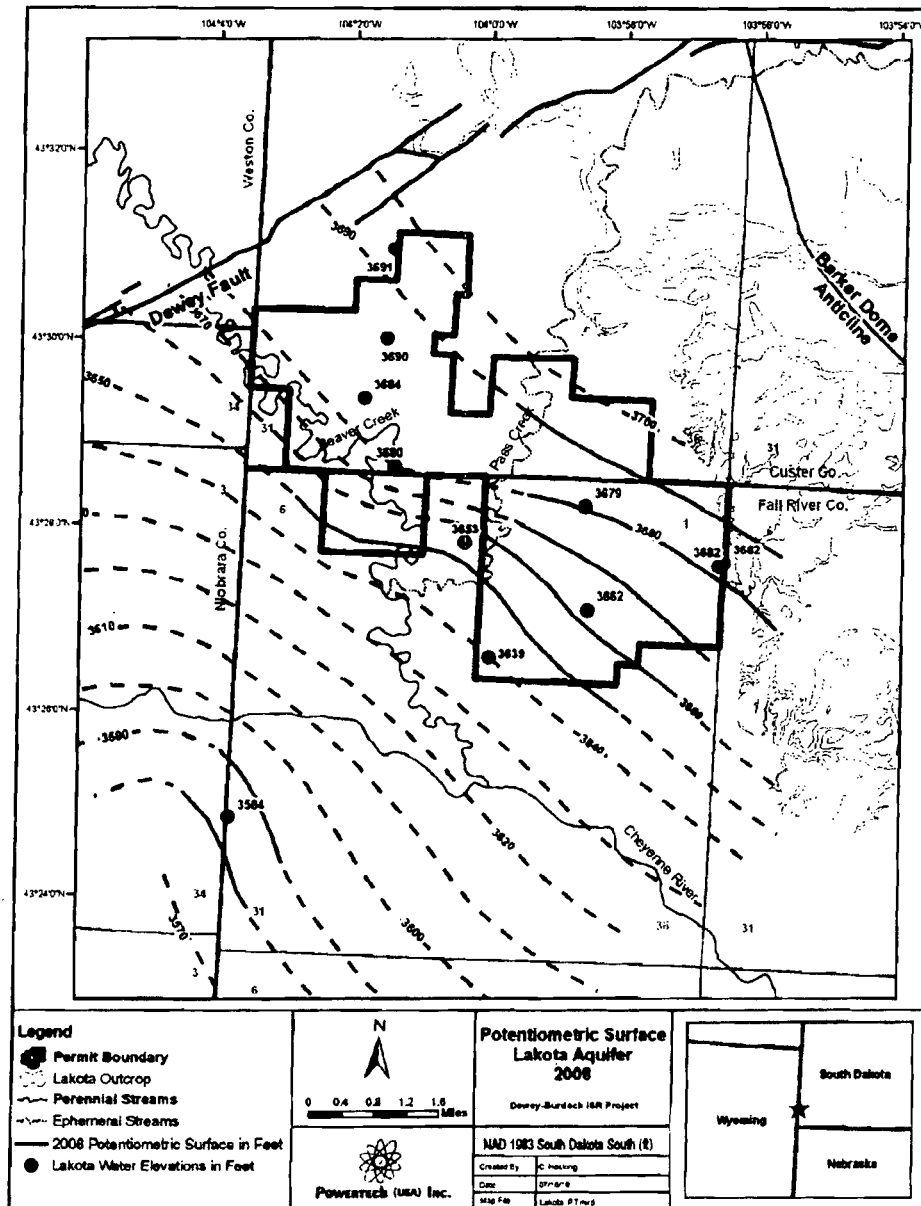


Figure 5. Revised Lakota Aquifer Potentiometric Surface. This map has removed Wells 38 and 8002 and added Well 696 to reflect data that were actually used to generate the contour map.

— DRAFT —

RSI-1853-10-037

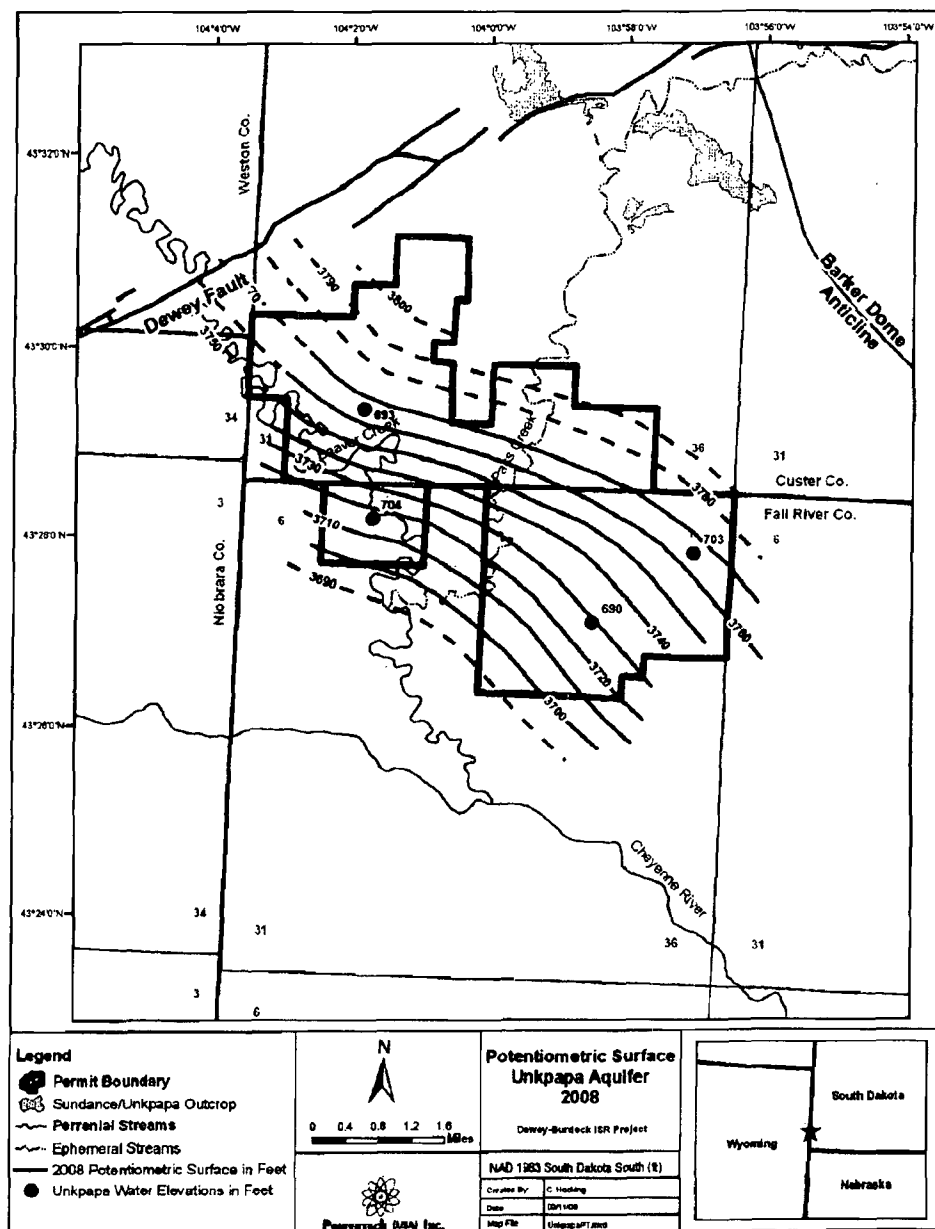


Figure 6. Unkpapa Aquifer Potentiometric Map With Wells Labeled by Hydro I.D.

— DRAFT —

6837

[illegible]



July 22, 2010

3.2067P
3.2841m
Throught
(We)

[illegible]

need
to
add
44.?

DRAFT

Table 5. Alluvial Water Level Measurements in Feet Below Measuring Point

Hydro I.D. or Hydro Code	675	676	677	678	679
Targeted Measurement Frequency	Monthly	Monthly	Monthly	Monthly	Monthly
Measuring Point	top of well casing	top of well casing	top of well casing	top of well casing	top of well casing
Distance from Measuring Point to Ground (ft)	2.3	2.4	2.3	2.3	2.3
Approximate Land Elevation From Topographic Map (ft)	3,491	3,662	3,570	3,591	3,717
Calculated Measuring Point Elevation (ft)	3,493.3	3,664.4	3,572.3	3,593.3	3,719.3
Date	ft below measuring point				
9/28/2007	-11.18	-20.14	-11.51	-12.1	-33.6
10/26/2007	-11.04	-20.3	-11.35	-11.73	-33.83
11/9/2007	-10.99	-20.3	-11.25	-11.45	-33.85
11/14/2007					-33.85
11/27/2007	-10.99	-20.37	-11.12	-11.22	
12/11/2007	-10.82	-20.4		-11.15	-33.88
1/11/2008	-10.6	-20.44			-33.87
1/30/2008			-10.17	-10.82	
2/3/2008					-33.88
2/5/2008	-10.37	-20.5	-10.1	-10.81	
3/6/2008	-10.045	-20.53	-9.9	-10.75	-33.93
4/29/2008	-10.42	-20.6	-9.63	-10.38	
5/18/2008					-34.02
6/30/2008		-20.65	-9.45	-10.95	-34.03

— DRAFT —

Table 6. Alluvial Water Level Measurements in Elevation Above Mean Sea Level

Hydro ID or Hydro Code	675	676	677	678	679
Formation	Alluvial	Alluvial	Alluvial	Alluvial	Alluvial
Subsurface (SS) or Free-Flowing (FF)	SS	SS	SS	SS	SS
Depth (ft)	14-4	22.5	14.5	14.5	39
Screened Interval (ft)	4-14	12-22	4-14	4-14	29-39
Targeted Measurement Frequency	Monthly	Monthly	Monthly	Monthly	Monthly
Measuring Point	top of well casing	top of well casing	top of well casing	top of well casing	top of well casing
Distance from Measuring Point to Ground (ft)	2.3	2.4	2.3	2.3	2.3
Approximate Land Elevation From Topographic Map (ft)	3,491	3,662	3,570	3,591	3,717
Calculated Measuring Point Elevation (ft)	3,493.3	3,664.4	3,572.3	3,593.3	3,719.3
Date	ft above mean sea level				
9/28/2007	3,482.1	3,644.3	3,560.8	3,581.2	3,685.7
10/26/2007	3,482.3	3,644.1	3,561.0	3,581.6	3,685.5
11/9/2007	3,482.3	3,644.1	3,561.1	3,581.9	3,685.5
11/14/2007					3,685.5
11/27/2007	3,482.3	3,644.0	3,561.2	3,582.1	
12/11/2007	3,482.5	3,644.0		3,582.2	3,685.4
1/11/2008	3,482.7	3,644.0			3,685.4
1/30/2008			3,562.1	3,582.5	
2/3/2008					3,685.4
2/5/2008	3,482.9	3,643.9	3,562.2	3,582.5	
3/6/2008	3,483.3	3,643.9	3,562.4	3,582.6	3,685.4
4/29/2008	3,482.9	3,643.8	3,562.7	3,582.9	
5/18/2008					3,685.3
6/30/2008		3,643.8	3,562.9	3,582.4	3,685.3
Mean	3,483	3,644	3,562	3,582	3,685

— DRAFT —

**Table 7. Unkpapa Water Level Measurements in Feet**

Hydro LD. or Hydro Code	690	693	703	704
Targeted Measurement Frequency	Once	Once	Once	Once
Measuring Point	top of casing	top of casing	top of casing	top of casing
Distance from Measuring Point to Ground				2
Surveyed Well Casing Elevation (ft)	3,700.04	3,627.27		
Stick Up (Well Casing Mark) (ft)				
Surveyed Control Point Elevation (ft)	3,699.59	3,626.31		
Stick Up (Control Point) (ft)	0.41			
Calculated Measuring Point Elevation (ft)	3,699.18	3,627.27	3,877*	3,599*
Date	ft above (+) or below (-) measuring point			
5/14/08	29.15	135.77		
5/21/08			-109.96	
5/28/08	30.65			
5/30/08				116.5
6/24/08			-109.4	

(a) Wells were not surveyed. Elevation estimated from topographic map.

Task 5. Generate an Explanation of Water Level Measurement Feasibility for the Wells Listed in the NRC Comments

The wells listed in the NRC review of the TR and an explanation of the feasibility of obtaining a water level measurement from those specific wells is included in Table 9. Figures 7 and 8 display these wells for possible inclusion alongside those wells that are in the current water level monitoring plan. For many of these wells, water level measurements were not easily obtained, but could be obtained with additional work such as pulling a pump and shutting in a well for a period of time. At this time, it is assumed that Powertech will be conducting further field investigations into this matter based on RESPEC's cursory review.

— DRAFT —



Table 8. Unkpapa Water Level Measurements in Elevation Above Sea Level

Hydro LD. or Hydro Code	690	693	703	704
Formation	Unkpapa	Unkpapa	Unkpapa	Unkpapa
Subsurface (SS) or Free-Flowing (FF)	FF	FF	SS	FF
Depth (ft)	623	930	525	955
Screened Interval (ft)	621-631	910-930	475-525	915-955
Targeted Measurement Frequency	Once	Once	Once	Once
Measuring Point	top of well casing	top of well casing	top of well casing	top of well casing
Distance from Measuring Point to Ground				2
Approximate Land Elevation from topographic map (ft)			3,877	3,599
Calculated Measuring Point Elevation (ft)	3,699.2	3,627.3	3,877	3,599
Date	ft above mean sea level			
5/14/08	3,728.3	3,763.0		
5/21/08			3,767.0	
5/28/08	3,729.8			
5/30/08				3,715.5
6/24/08			3,767.6	
Mean	3,729	3,763	3,767	3,716

Task 6. Review the Water Rights, Well Completion, and Water Quality for the Well North of Kennobble's Ranch to Determine Aquifer

Well 4, a stock well located in SESE Sec. 15, T7S, R1E, was brought into question as to which aquifer the well is completed in. A well log indicates this well was originally drilled as an oil exploration well (API# 5093) into the Minnelusa Formation to a depth of 2,264 feet. This log (Figure 9) also indicates the well was plugged and abandoned. RESPEC was not able to find any water rights or well completion information describing how this well was completed as a water well. However, information in Table 2.5.2-1 of the TVA EIS report describes this well (D-19) as being 2,264 feet deep, coinciding with the original drilling depth into the Minnelusa, and with a water level of 3,580 feet elevation.

— DRAFT —

**Table 9. Wells for Possible Inclusion in Water Level Measurement Plan (Page 1 of 3)**

Aquifer	Well	Free Flowing or Subsurface	Reason for not Measuring Originally	Could be Measured With Minimal Additional Effort	Other Comments
Fall River	7	Unknown	Domestic can not measure without pulling pump	Yes	There is a .las file for this well, so it must be possible to measure
Fall River	8	FF	Domestic can not measure without pulling pump and shutting in for period of time	Maybe	Requires further investigation to determine feasibility
Fall River	17	SS	Stock well would need pump pulled and to stop being use to stabilized	Maybe	Requires further investigation to determine feasibility
Fall River	18	FF	Domestic can not measure without pulling pump and shutting in for period of time	Maybe	Requires further investigation to determine feasibility
Fall River	20	Unknown	Domestic can not measure without pulling pump and shutting in for period of time	Maybe	Requires further investigation to determine feasibility
Lakota	1	FF	Could not be sealed for psi measurement because of leaks caused by corrosion and age	No	Could only be measured if well casing is repaired
Lakota	2	FF	Could not be sealed for psi measurement because of leaks caused by corrosion and age	No	Could only be measured if well casing is repaired
Lakota	13	Unknown	Domestic can not measure without pulling pump; well is no longer used as resident moved	Maybe	Requires further investigation to determine feasibility

— DRAFT —

**Table 9. Wells for Possible Inclusion in Water Level Measurement Plan (Page 2 of 3)**

Aquifer	Well	Free Flowing or Subsurface	Reason for not Measuring Originally	Could be Measured With Minimal Additional Effort	Other Comments
Lakota	14	SS	Difficult surface access	Maybe	Requires further investigation to determine feasibility
Lakota	16	SS	difficult surface access because of fittings, domestic well would have to be shut in for period	Maybe	Requires further investigation to determine feasibility
Lakota	42	Unknown	Domestic could not measure without pulling pump. Well has been revamped and completed in the Fall River Formation (?)	Yes	We are not sure when or to what formation this well is now completed in.
Lakota	51	FF	Surface casing in poor condition, leaking	No	This well is not measurable under the present condition
Lakota	96	FF	Domestic can not measure without pulling pump and shutting in for period of time	Maybe	Requires further investigation to determine feasibility
Lakota	115	FF	Domestic can not measure without pulling pump and shutting in for period of time; also not measured because of location north of Dewey Fault	Maybe	Requires further investigation to determine feasibility
Lakota	147	SS	Not measured because of location north of Dewey Fault	Yes	This is a 1-inch piezometer that could easily be measured
Lakota	510	FF	Difficult access, would require shut	Maybe	Requires further investigation to determine feasibility

— DRAFT —

**Table 9. Wells for Possible Inclusion in Water Level Measurement Plan (Page 3 of 3)**

Aquifer	Well	Free Flowing or Subsurface	Reason for not Measuring Originally	Could be Measured With Minimal Additional Effort	Other Comments
Lakota	620	SS	Stock well would need pump pulled and to stop being use to stabilized	Maybe	This well has a good potential for measurement
Lakota	696	FF	Could not be measured at time of potentiometric map generation because of poor or cracked valve fittings. Valves were replaced and RESPEC has record of six measurements from 9/22/08 to 2/22/09	Yes, and it has been	
Lakota	697	FF	This well was inadvertently left off potentiometric maps. It has been measured 12 times between 3/30/08 and 2/24/09.	Yes, and it has been	
Lakota	7002	FF	Because of the age of this well, it is believed that pressurizing may cause a line to rupture	No	Could only be measured if well casing is repaired

This well was sampled three times in 1979 by TVA and once by RESPEC in 2008. Data results are presented in Table 10. In comparison to nearby Well 7 and Well 7002, this well has nearly twice the value of chemical conductivity and sulfates. Conductivity and sulfate values observed at this well are dissimilar from other Inyan Kara wells in the area as well, but values are more compatible with expected water quality for the Minnelusa Aquifer. A detailed statistical comparison of water quality was not conducted at this time.

Based on the available information, it is now reasonable to believe Well 4 may be completed in the Minnelusa Aquifer. It is recommended to try to log this well with a borehole televiewer to confirm the completion of this well.

If you have any further questions or need further explanation of these items, please do not hesitate to contact me.

CMH:llf

— DRAFT —

RSI-1853-10-042

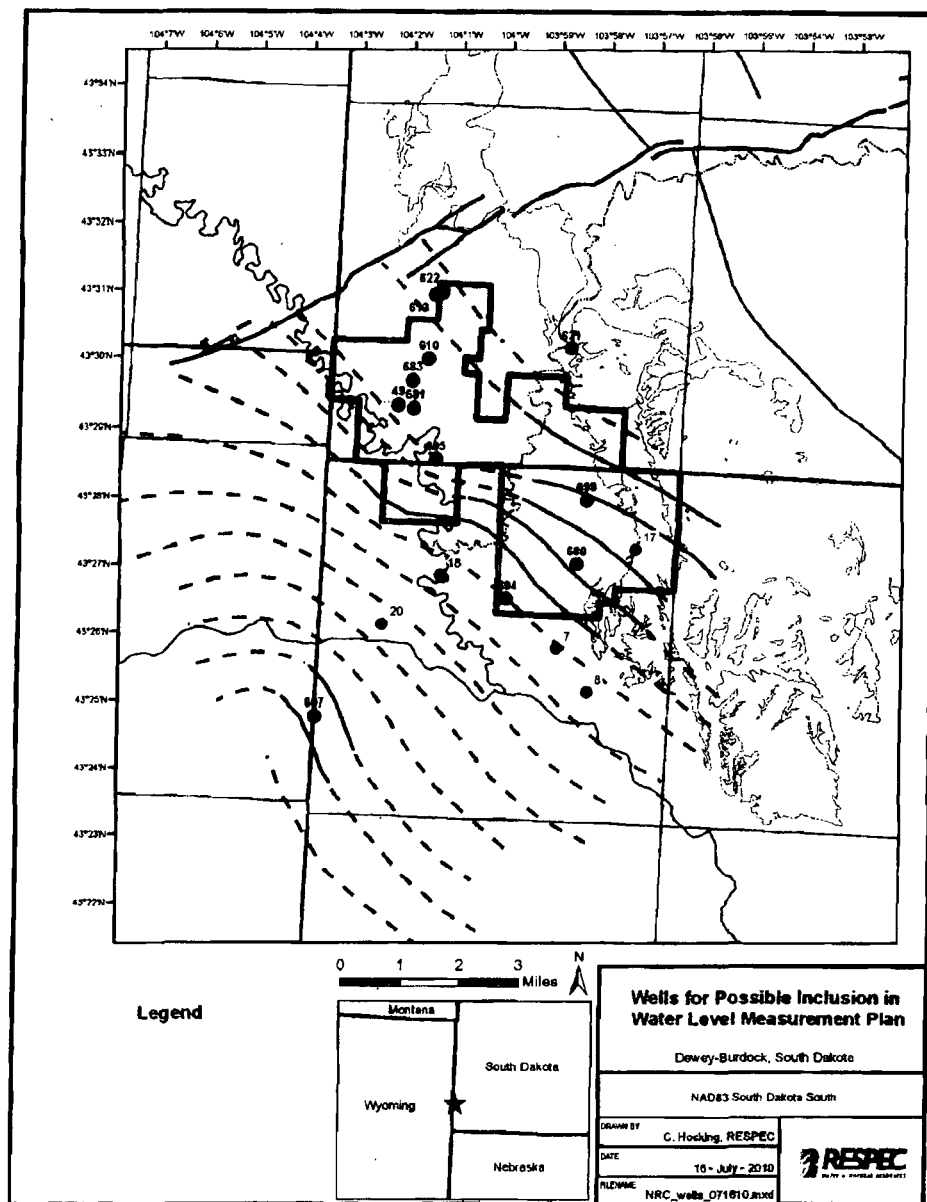


Figure 7. Fall River Aquifer Wells for Possible Inclusion in the Water Level Measurement Plan. Black dots are wells in the current monitoring plan while blue dots are wells not currently included.

— DRAFT —

RSI-1853-10-043

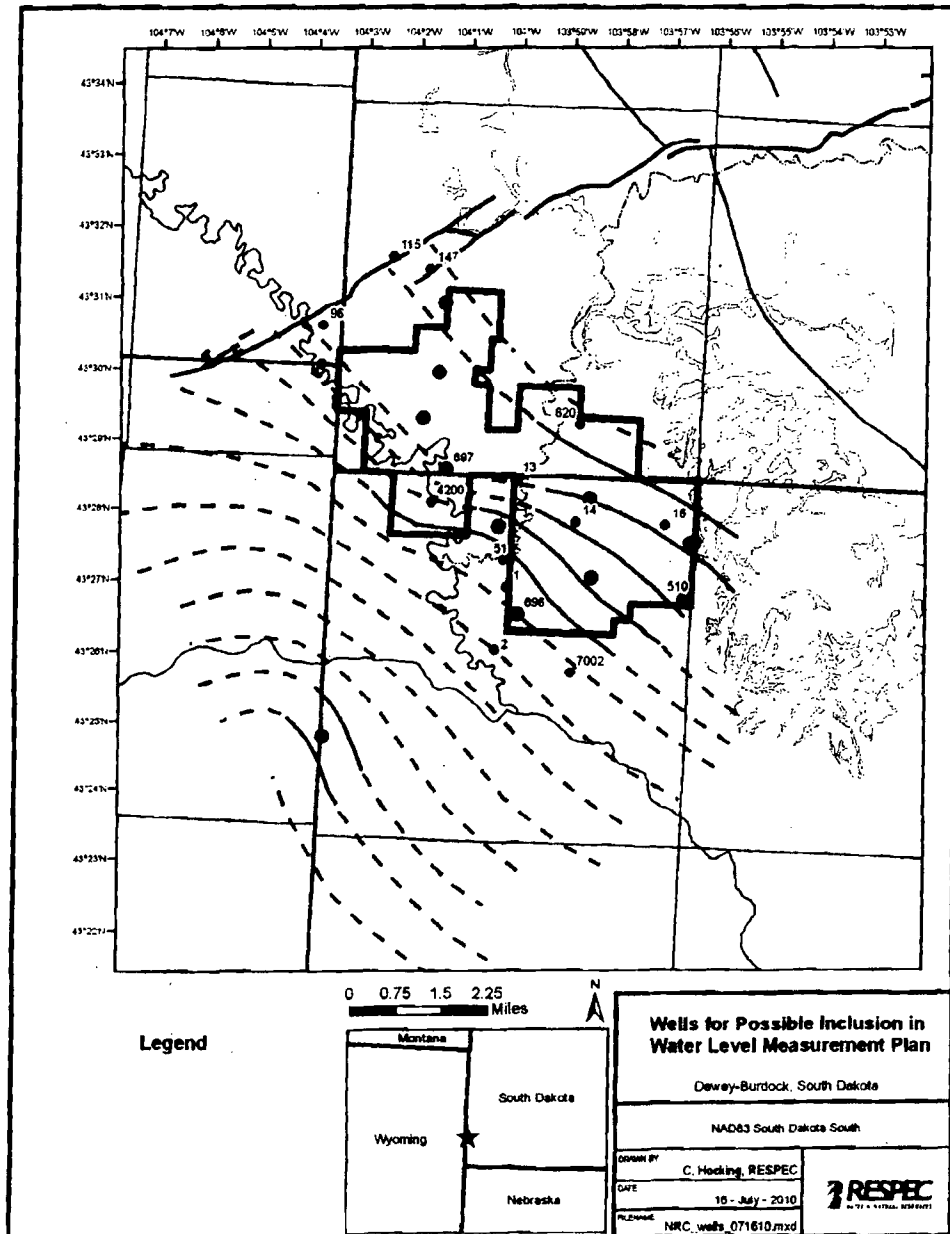


Figure 8. Lakota Aquifer Wells for Possible Inclusion in the Water Level Measurement Plan. Black dots are wells in the current monitoring plan while blue dots are wells not currently included.

— DRAFT —



POWERTECH (USA) INC.

Mr. Mark Hollenbeck

Page 23

July 22, 2010

RSI-1853-10-038

RECEIVED
FEB 19 1965

STATE WATER RESOURCES COMM.
PERMITS SOUTH DAKOTA
A. DICKSON & CO. ENGINEERS
FLOOR 2

Date Filed: Feb. 18, 1965 APPLICATION FOR PERMIT TO:

<input checked="" type="checkbox"/> DRILL	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> PLUG BACK	FARM OR LEASE NAME Potterton WELL NO. \$1 (44-15) FUEL AND FUEL, OR WILDCAT
<input type="checkbox"/> OIL WELL	<input type="checkbox"/> GAS WELL	<input type="checkbox"/> SINGLE BORE	
<input type="checkbox"/> MULTIPLE BORE			

OPERATOR
The Superior Oil Company
Address
P. O. Box 200, Casper, Wyoming
LOCATION (On the line or at the corner of the land subdivision)
640' TBL & 640' TBL Sec. 15-78-1E

NAME AND ADDRESS OF SURFACE OWNER
F. A. Potterton
Edgemont, South Dakota
NAME AND ADDRESS OF SUBMITTER
(Unknown)

NO. OF WELLS ON
2846.00
1/4 SEC 15-78-1E
COUNTY
Fall River

ELEVATION
2774 6.1
PERMIT DEPTH
2500'

NOTARY ON CABLE TOOLS
Notary
DATE OF CABLE
2-22-65

IF LEASE FURNISHED WITH ANY WELLS DEEPER FROM WHICH FURNISHED CABLE AND RECORD

DATE OF CABLE	DATE OF CABLE	WEIGHT PER FOOT	NO. OF WELLS MADE	DEPTH	GAUGE OF CABLE
11-1-65	2-2-65	250	100	250	250

WORKING PROPOSED OPERATIONS IF PROPOSAL IS TO DEEPEN OF PLUG BACK, GIVE DATA OF PREVIOUS PRODUCTIVE BORE AND PROPOSED NEW PRODUCTIVE BORE GIVE BLOW OUT PREVENTIVE PROGRAM IF ANY

- (1) The Superior Oil Company proposes to drill a 2500' 1st Lee Sand test at the above location.
- (2) Will use 8-1/2" csg. at 500' & cut. to surface.
- (3) Will drill 7-7/8" hole to total depth.
- (4) Will catch 10' samples from base of surface to TD.
- (5) Report to case & test the 1st Lee Sand plus any other zones that have significant shows.
- (6) Will run Dual Induction-Logging & GNS logs from TD to base of surf. csg.
- (7) Should commercial production be encountered, 8-1/2" casing will be cemented through the productive zone.

SIGNED: *[Signature]* TITLE: District Engineer DATE: 2-11-65

DO NOT WRITE BELOW THIS LINE

PERMIT NO. 382 CHECKED BY: *[Signature]* 2/17/65

APPROVAL DATE: February 11, 1965 *[Signature]*

COMMENTS:

(1) COMPLAINTS OUT OF SAMPLES, AND CORRE IF THERE. MUST BE SUBMITTED.

(2) SAMPLES, AND CORRE IF THERE. MUST BE SUBMITTED.

INSTRUCTIONS

General: This form is designed for submitting proposals to perform certain well operations as indicated, on all types of lands and leases for operations under a Federal or a State lease, or both, pursuant to applicable Federal and/or State laws and regulations. Approval is not granted to the proposed work until the proposed work is approved by the State Engineer, or his representative, and the State Engineer, or his representative, has approved the proposed work.

If the well is to be, or has been, directionally drilled, so state and show by attached sheets, if necessary, the coordinate location of the hole in any project or adjacent productive zone.

File 1 copies of this form with Bureau of Oil & Gas Survey, Pierre.

(*Sample location: 100' South and 100' West of the Northwest corner of Section 16.)

Figure 9. Well Completion Report for Well I.D. #4 (Page 1 of 3).

— DRAFT —

RSI-1853-10-039

8-043
(December 1949)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

SCHEDULED

WELL LOG

No. D 7-1-13 dd (center)

OTHER Nos. Superior #1 Petroleum
(center)

State S. Dak. County East River Subarea _____
Owner Superior Oil Company Lease #1 Petroleum (40-15)
Location SEE SPECIAL LOG FILE FOR (7D 2260 ft)
MORE INFORMATION 660 ft north and 660 ft west of the southeast corner
Drilled by Borghart Address _____
Date 2-19 to 3-5-65 Casing diam. plugged & abandoned Land-surf. alt. 9555 dolly bush 3576
Source of data P.L. sonic telegraph, gamma-ray, dual induction, and resistivity induction log
(Enter type of well, perforations, yield, and drawdown at end of log)

CORRELATION alt	CORRELATION Geo	MATERIAL	THICKNESS (feet)	DEPTH (feet) P.L.
		Dakota		195
	7	Shall Creek		
	157	Inger Kora		
		Lakota		371
	517	Morrison		
	87	Sundance		771
	1040(?)	Spargish		
	1522	Minnehaha		1518
	1555	Cyncha		1557
	1583	Minnehaha		1605
		Redarker		2108
	2264	T.D.		
		Lease 0-75 to 2221 ft		

RECORD BY _____ DATE _____ SHEET _____ OF _____
51153
GPO 196-953

Figure 9. Well Completion Report for Well I.D. #4 (Page 2 of 3).

— DRAFT —

RSI-1853-10-040

BI-STATE COMPANY
NEWCASTLE, WYOMING

N. W. Corner		N. E. Corner	
S. W. Corner		S. E. Corner	

WELL SITE SE 1/4 & 1/4
Gr. Elev. 3376.5 ft.

I, Lawrence T. Enice, of Newcastle, Wyoming, Certify that in accordance with a request from J. P. Dicks of Casper, Wyoming, for The Superior Oil Company, P. O. Box 200, Casper, Wyoming, I made a survey (date) February 3, 1988, for the location and elevation of the Petroleum No. 1 (22-14) oil well site.

As shown on above map, the well site is in Section 15, Township 7 South, Range 1 East, North County, South Dakota. Elevation is 3376.5 feet above mean sea level before dewatering.

Lawrence T. Enice
Licensed Surveyor No. 1313

Figure 9. Well Completion Report for Well I.D. #4 (Page 3 of 3).

— DRAFT —

Table 10. Water Quality Data for Well 4 (Page 1 of 4)

	1979-06-15	1979-08-15	1979-09-12	2008-02-12
ALKALIN	80		181	88
ANIONS				53.3
As	0.01		0.01	
B	1		1	
BALANCE	-57.3		-54.9	-2.6
BICARB	73		220	107
B-TDS				1.02
Ca	349		477	
CARB	12		0	5
CATIONS				50.6
Cl	28		26	26
Cond, Field	4,550		4,500	
CONDUCT Lab				4,400
C-SOLIDS				3,600
D-Ag				0.005
D-Al				0.1
D-As				0.001
D-B				0.7
D-Ba				0.1
D-Ca				241
D-Cd				0.005
D-Cr				0.05
D-Cu				0.01
D-Fe				0.03
D-GALPHA				3.5
D-GBETA				14.4
D-GGAMMA				20

— DRAFT —

Table 10. Water Quality Data for Well 4 (Page 2 of 4)

	1979-06-15	1979-08-15	1979-09-12	2008-02-12
D-Hg				0.001
D-K				7.8
D-Mg				87
D-Mn				0.07
D-Mo				0.1
D-Na				716
D-Ni				0.05
DO				
D-Pb				0.001
D-Pb210				1
D-Po210				2.7
D-Ra226				1.1
D-Se				0.001
D-SeIV				0.001
D-SeVI				0.001
D-Si				10.2
D-SOLIDS	4,733		4,117	3,700
D-Th				0.005
D-Th230				0.2
D-U				0.0004
D-V				0.1
D-Zn				0.01
F				0.4
Fe	1.68		1.59	
F-pH				7.83
hardness	1,459		1,392	
K	15		14	

— DRAFT —

Table 10. Water Quality Data for Well 4 (Page 3 of 4)

	1979-06-15	1979-08-15	1979-09-12	2008-02-12
L-pH	8		7.7	7.94
Mg	143		49	
Mn	0.12		0.08	
N	0.64		0.22	
Na	920		743	
NH3				0.8
NO2				0.1
NO3				0.1
ORP				120
Pb	0.05		0.05	
PO4	0.01		0.01	
SAR				10
Se	0.01		0.01	
SiO2	9.4		8.6	
SO4	3,230		2,700	2,440
S-Pb210				1
S-Po210				1
S-Ra226				0.7
S-Th230				0.2
S-U				0.0003
T-Ag				0.005
T-As				0.001
T-B				0.6
T-Ba				0.1
T-Be				0.001
T-Cd				0.005
T-Cr				0.05

— DRAFT —

Table 10. Water Quality Data for Well 4 (Page 4 of 4)

	1979-06-15	1979-08-15	1979-09-12	2008-02-12
T-Cu				0.01
TEMP				11.92
T-Fe				1.32
T-Hg				0.001
T-Mn				0.06
T-Mo				0.02
T-Ni				0.05
T-Pb				0.001
T-Pb210				
T-Po210				
T-Ra222				908
T-Ra226		0.11		
T-Sb				0.003
T-Se				0.002
T-Sr				5.7
TSS	6		5.2	
T-Th230				
T-Tl				0.001
T-U		28		0.0005
TURB				0
T-Zn				0.01
V	0.05		0.05	
Zn	0.01		0.01	

— DRAFT —

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SOURCE G

DOMESTIC AND LIVESTOCK WELLS MONITORED DURING FEBRUARY 1982 DEWEY PUMP TEST

(Letter from Gary Cummings, Silver King Mines, Inc., to Peter Martin, Tennessee Valley Authority, April 12, 1982)

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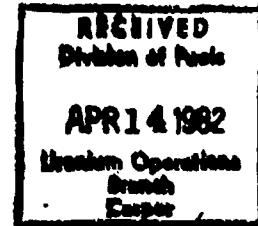

POWERTECH (USA) INC.

D19 820414 007



Silver King Mines, Inc.

P.O. Box 49
Edgemont, South Dakota 57735



PWT
QAD

April 12, 1982

Peter W. Martin
Technical Engineer
Edgemont Project
Tennessee Valley Authority
P. O. Box 2957
Casper, Wyoming 82602

RE: GWC; 223,82

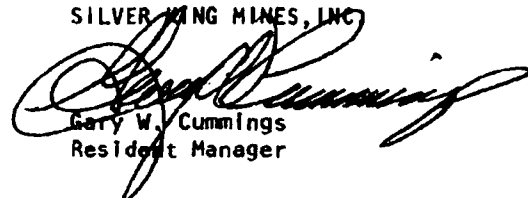
Dear Pete:

Enclosed you will find the information relating to domestic and livestock wells that were monitored during the Dewey Pump Test.

If you have any questions, please call.

Very truly yours,

SILVER KING MINES, INC.


Gary W. Cummings
Resident Manager

GWC:dlg
Enclosure
cc: R. M. Caywood
D. H. Marks
R. H. Davidson
Mark Boggs

July 2012

B-788

Appendix B

	610				609		40		4002		40U Recompletion?				
WELL NUMBERS	119	103	104	39	BPZ 20 FR	BPZ 20 LAX	D-7		40U	40L	102	13	41	48	BY-1 FR
DATE	FT	GPH	FT	FT	FT	FT	FT		GPM	PSI	GPM	FT	GPM	PSI	PSI
2-16-82	PUMP TEST STARTED														
2-17-82	-	-	-	26.89	Froze	4.88	4.54		-	-	-	-	-	-	-
2-18-82	10.73	.72	9.40	26.93	Froze	14.35	Froze at 4.54		-	-	-	-	-	-	-
2-19-82	-	-	-	26.83	3.91	20.18	4.61		-	-	-	-	-	-	-
2-19-82	-	-	-	-	4:00 PM 3.88	4:00 PM 22.44	-		-	-	-	-	-	-	-
2-20-81	10.69	.75	9.63	26.93	8:20 AM 3.96	8:20 AM 27.59	4.61		-	-	-	-	-	-	-
2-21-82	-	-	-	26.94	1:10 PM 3.95	1:10 PM 35.90	4.83		-	-	-	-	-	-	-
2-22-82	-	-	-	26.84	1:00 PM 3.89	1:00 PM 42.30	4.62		-	-	-	-	-	-	-
2-23-82	-	-	-	-	3.91	10:30 AM 47.90	-		8:15 AM 1.48 GPM	-	10.80	-	-	-	-
2-23-82	-	-	-	-	-	-	-		2:30 PM .70 GPM	-	-	-	-	-	-
2-24-82	10.77	.70	9.62	Windmill Running	4.70	12:00 noon 54.32	4.78		Dribbles	-	10.90	-	-	-	-
2-25-82	-	-	-	28.43	5.00	10:40 AM 59.64	4.74		Drips	-	10.80	7.10	11.40	-	-
2-26-82	10.70	.72	9.53	-	4.73	12:18 PM 65.20	4.78		No Water	-	10.80	7.35	11.50	-	-
2-27-82	-	-	-	-	-	9:35 AM 69.35	-		-	-	-	-	-	-	-
2-27-82	-	-	-	-	-	3:30 PM 70.81	-		-	-	-	-	-	-	-
2-28-82	-	-	-	-	4.85	10:30 AM 71.00	4.67		-	-	-	-	-	-	-
3-1-82	10.62	.75	9.46	-	4.79	12:35 PM 67.91	4.56		-	-	10.90	5.74	11.40	-	-
3-1-82	-	-	-	-	4.88	1:08 PM 64.82	4.56		-	-	10.90	-	-	-	-
3-2-82	-	-	-	-	5.07	11:50 AM 62.10	4.59		.80	-	10.80	-	-	-	-
3-4-82	10.47	.72	9.52	-	5.29	12:10 PM 59.46	4.70		.80	-	10.80	6.37	11.20	-	-
3-5-82	-	-	-	-	5.49	2:25 PM 56.76	4.75		.92	-	-	-	-	13.54'	-
3-6-82	-	-	-	-	-	11:34 AM 54.89	-		-	-	-	-	-	11.05'	-
3-7-82	-	-	-	-	-	52.60	-		-	-	-	-	-	8.25'	-
3-8-82	10.70	.75	9.48	-	6.00	50.28	4.58		.80	-	10.80	6.63	-	5.54	-
3-10-82	10.42	-	-	-	6.98	46.37	4.58		.50	-	-	-	-	0.80	-
3-11-82	-	-	-	-	-	-	-		Dry	16 GPM 12 PSI	-	-	-	Flow 5 GPM	1.6 GPM 25 PSI
3-12-82	10.18	.77	9.41	-	6.49	42.98	4.61		-	-	9.80	6.86	10.80	Flow 8 GPM	-
3-15-82	-	-	-	-	6.73	38.42	4.85		-	14 PSI PSI	-	-	-	Flow 15 GPM	25.8 PSI
3-17-82	-	-	-	-	7.15	36.05	4.99		-	14.45 PSI	-	-	-	5.45 PSI	25.5 PSI
3-19-82	10.50	.72	9.40	-	7.21	2:00 PM 33.48	4.91		-	15.20 PSI	10.6	6.66	-	6.75	25.0
3-22-82	-	-	-	-	7.65	30.58	5.49		-	14.75 PSI	-	-	-	8.00	25.0
3-24-82	-	-	-	-	7.81	1:00 PM 28.60	4.54		-	15.75 PSI	-	-	-	-	25.25
3-26-82	10.72	.70	9.42	-	7.95	11:45 26.79	4.47		-	17.25 PSI	8.8'	9.50	10.5	9.80	25.0
3-29-82	-	-	-	-	7.92	23.38	-		-	18.40 PSI	-	-	-	-	25.0 PSI

POWERTECH (USA) INC.



July 2012

B-789

Appendix B

626
625

WELL NUMBER	BP2 LA 22 FT	BP2 FR 22 FT	93 GPM	96 GPM	106 GPM	107 FT	115 GPM	147 FT	148 FT	38 GPM	42 GPM	109 FT	110 FT	111 FT	117 FT
2-16-82	PUMP TEST STARTED														
2-17-82	70.62	74.92	-	4.00	1.80	1.23	1.15	13.06	-	1.80	2.50	60.35	83.95	8.08	29.78
2-18-82	70.69	74.89	Well in use 1.50	4.00	1.75	1.25	1.15	13.06	-	1.75	Leak 2.43	60.02	83.68	8.21	29.87
2-19-82	70.63	74.88	-	4.00	1.80	1.27	1.15	13.06	-	1.80	2.38	59.89	83.63	8.13	29.83
2-19-82															
2-20-82	70.74	74.96	1.55	4.00	1.75	1.26	1.15	13.05	-	1.80	2.42	Well in use 60.22	83.65	8.21	29.90
2-21-82	70.75	74.95	-	4.00	1.80	1.55	1.17	13.08	-	1.80	2.35	Well in use 60.60	83.86	8.26	29.94
2-22-82	70.71	74.91	-	9:00 AM 3.90	1.80	1.30	1.17	13.10	-	1.80	2.40	60.32	83.78	8.17	29.89
2-23-82	-	-	-	3.90	-	-	-	-	-	-	2.40	-	-	-	-
2-24-82	70.92	75.10	1.55	3.90	1.80	1.45	1.10	13.35	Water at Surface	1.80	2.40	60.35	83.96	8.33	29.95
2-25-82	70.92	75.09	-	3.90	1.80	1.42	1.10	13.68	Water at Surface	1.80	2.35	60.20	83.94	8.32	30.02
2-26-82	70.87	74.95	1.60	3.90	1.80	1.48	1.15	14.12	Water at Surface	1.80	2.35	Well in use 60.32	83.91	8.25	29.95
2-28-82	70.98	75.00	-	3.70	1.80	1.35	1.20	15.44	0.10'	-	2.35	60.57	84.21	8.29	30.00
3-01-82	70.75	74.87	1.60	3.95	1.80	1.24	1.20	16.32	.60	1.80	2.35	60.15	83.95	8.23	Pump on
3-02-82	70.82	74.85	-	3.95	1.80	1.23	-	17.09	.90	-	2.30	59.83	84.19	8.15	29.77
3-03-82	70.80	74.81	-	3.95	1.80	1.25	1.17	17.93	1.22	-	2.32	59.89	84.27	8.17	29.80
3-04-82	70.84	74.95	1.57	3.95	1.80	1.36	1.20	18.72	1.47	1.80	2.35	59.99	84.31	8.25	29.82
3-05-82	70.97	75.05	-	3.95	1.80	1.42	1.15	19.48	1.74	-	2.32	60.05	84.40	8.30	29.95
3-6-82	-	-	-	-	-	-	-	20.21	-	-	-	-	-	-	-
3-07-82	-	-	-	-	-	-	-	20.85	-	-	-	-	-	-	-
3-08-82	70.99	75.06	1.60	3.95	1.80	1.27	1.20	21.38	1.89	1.80	Leak 2.35	60.00	84.49	8.31	30.35
3-10-82	70.91	74.98	-	3.75	1.80	1.23	No flow	22.35	1.73	-	-	60.00	84.51	8.16	29.90
3-11-82															
3-12-82	70.78	74.88	1.60	3.95	1.80	1.28	1.10	22.98	1.52	1.80	2.20	60.21	84.60	8.30	29.73
3-15-82	70.51	74.51	-	3.90	1.80	1.52	1.00	23.61	1.43	-	2.25	59.79	84.36	8.11	-
3-17-82	-	-	-	-	-	1.67	.85	23.86	1.41	-	Leak 2.18	-	-	-	-
3-19-82	70.63	74.67	1.57	3.85	1.80	1.57	Well in use	24.02	1.22	1.80	2.20	59.75	84.40	8.15	
3-22-82	-	-	-	-	-	1.80	1.10	24.05	1.15	-	2.18	-	-	-	-
3-24-82	-	-	-	-	-	1.23	1.12	24.04	.80	-	-	-	-	-	-
3-26-82	70.96	75.00	1.55	3.90	1.80	1.14	1.25	24.06	.76	1.70	2.25	60.02	84.77	8.40	29.92
3-30-82	-	-	-	-	-	-	-	24.02	.13	-	-	-	-	-	-

PowerTech (USA) Inc.



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SOURCE H

WYOMING WATER RIGHT 183561

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FORM U.W. 5002
Rev. 7/83
FILING FEE SCHEDULE
ON REVERSE SIDE

STATE OF WYOMING
OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E CHEYENNE, WYOMING 82002
(307) 777-6163

1 of 4

36035081
50.00
6/11/07

APPLICATION FOR PERMIT TO APPROPRIATE GROUND WATER

APPLICATION FOR WELLS AND SPRINGS

Note: Only springs flowing 25 gallons per minute or less, where the proposed use is domestic and/or stock watering, will be considered as ground water appropriations.

FOR OFFICE USE ONLY

Temporary Filing No. U.W. 463-211

PERMIT NO. U.W. 183561
WATER DIVISION NO. 2 DISTRICT 1
U.W. DISTRICT Newcastle

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.
ALL ITEMS MUST BE COMPLETED BEFORE APPLICATION IS ACCEPTABLE

NAME AND NUMBER OF WELL OR SPRING

Putnam 21

- Name of applicant(s) Putnam & Putnam, LLP Phone: (605) 662-7448
- Address of applicant(s) 778 Cedar St. Dewey SD 57735
(MAILING ADDRESS) (CITY) (STATE) (ZIP)
- Name & address of agent to receive correspondence and notices John A. Putnam
778 Cedar St. Dewey SD 57735 Phone: (605) 662-7448
(MAILING ADDRESS) (CITY) (STATE) (ZIP)

4. Use to which the water will be applied:

- ☐ Domestic: Use of water in 3 single family dwellings or less, noncommercial watering of lawns and gardens totaling one acre or less. Number of houses served? _____
- ☒ Stock Watering: Normal livestock use at four tanks or less within one mile of well or spring. Stockwatering pipelines and commercial feedlots are a miscellaneous use. Number of stock tanks? 1 Per call 7/11/07
- ☐ Irrigation: Watering of commercially grown crops (large-scale lawn watering of golf courses, cemeteries, recreation areas, etc., is miscellaneous use).
- ☐ Municipal: Use of water in incorporated Towns and Cities. Note 1: use of water in unincorporated towns, subdivisions, improvement districts, mobile home parks, etc. is classified as miscellaneous use. Note 2: a permit may be required by the Wyoming Department of Environmental Quality (WDEQ) if the well will be classified as a public water supply under the WDEQ's rules and regulations.
- ☒ Industrial: Long term use of water for the manufacture of a product or production of oil/gas or other minerals (oil field water flood operations, power plant water supply, etc.). (Describe in REMARKS)
- ☒ Miscellaneous: Any use of water not defined under previous definitions such as stock water pipelines, subdivisions, mine dewatering, mineral/oil exploration drilling, potable supplies in office, etc. Describe in Remarks. Note: a permit may be required by the WDEQ if the well will be classified as a public water supply under the WDEQ's rules and regulations.
- ☐ Coalbed Methane: Water produced in the production of coal bed methane gas. Note: wells used in the production coal bed methane will require a permit from the Wyoming Oil and Gas Conservation Commission.
- ☐ Monitor, Observation: Note: a WDEQ permit may be required Test Well: (Describe in REMARKS)

5. Location of the well or spring: (NOTE: Quarter-quarter (40 acre subdivision) MUST be shown. EXAMPLE: SE 1/4 NW 1/4 of Sec. 12, Township 14 North, Range 68 West.)

12, Township 14 North, Range 68 West.
Nebraska County, SW 1/4 SW 1/4 of Sec. 28, T. 41 N., R. 60 W. of the 6th P.M. (W.R.M.), Wyoming. If located in a platted subdivision, also provide Lot/Tract Block of the Subdivision (or Add'n) of Resurvey Location: Tract (or Lot)

6. Estimated depth of the well or spring is 600 feet. Estimated production interval is Unknown ft. to ft.

- (a) MAXIMUM instantaneous flow of water to be developed and beneficially used: 10 gallons per minute. NOTE: if for domestic and/or stock use, this application will be processed for a maximum of 25 gallons per minute. For a spring, after approval of this application, some type of artificial diversion or improvement must be constructed to qualify for a water right.
- (b) MAXIMUM volumetric quantity of water-to-be-developed and beneficially used per calendar year: 5 Per call 7/11/07
Circle appropriate units: (Gallons) (Acre Feet) A four person family utilizes approximately one (1) acre-foot of water per year or 325,000 gallons.

8. Mark the point(s) or area(s) of use in the tabulation box below.

TABULATION BOX

TWP	RNG	SEC	NE 1/4	NW 1/4	SW 1/4	SE 1/4	TOTAL
41	60	28			X		1 Stock Tank

Permit No. U.W. 183561 SEE REVERSE SIDE Book No. 1329 Page No. 61



POWERTECH (USA) INC.

2 of 4

9. ~~Describe~~ **Describe** MAXIMUM acreage to be irrigated in each 40 acre subdivision in the tabulation box above.
- a. Land will be irrigated from this well only
- c. Land is irrigated from existing water right(s) with water from this well to be additional supply. Describe existing water right(s) under REMARKS.

10. If for irrigation use, describe method of irrigation, i.e. center pivot sprinkler, flood, etc. _____

11. The well or spring is to be constructed on lands owned by Laramie Cattle Company, LLC
(The granting of a permit does not constitute the granting of right-of-way. If any easement or right-of-way is necessary in connection with this application, it should be understood that the responsibility is the applicant's. A copy of the agreement should accompany this application, if the land is privately owned and the owner is not the co-applicant.)

12. The water is to be used on lands owned by Laramie Cattle Company, LLC
(If the landowner is not the applicant, a copy of the agreement relating to the usage of appropriated water on the land should be submitted to this office. If the landowner is included as co-applicant on the application, this procedure need not be followed.) NOTE: Water rights attach to the area(s) and/or point(s) of use.

REMARKS: Existing well is not currently being used. Well was dug in 1936

Under penalties of perjury, I declare that I have examined this application and to the best of my knowledge and belief it is true, correct and complete.

Signature of Applicant or Authorized Agent _____ Date 20 07

THE LEGALLY REQUIRED FILING FEE MUST ACCOMPANY THIS APPLICATION

DOMESTIC AND/OR STOCK WATERING USES (Domestic use is defined as use of water in 3 single family dwellings or less, noncommercial watering of lawns and gardens totalling one acre or less.)	\$25.00
IRRIGATION, MUNICIPAL, INDUSTRIAL, MISCELLANEOUS, COAL BED METHANE	\$50.00
MONITOR (For water level measurements or chemical quality sampling) or TEST WELL	No Fee

IF WELL WILL SERVE MULTIPLE USES, SUBMIT ONLY ONE (THE HIGHER) FILING FEE.

THIS SECTION IS NOT TO BE FILLED IN BY APPLICANT

THE STATE OF WYOMING)
) ss

STATE ENGINEER'S OFFICE)

This instrument was received and filed for record on the 12th day of June, A.D. 20 07 at 9:18 o'clock AM.

Permit No. U.W. 130501

Signature of State Engineer

THIS IS TO CERTIFY that I have examined the foregoing application and do hereby grant the same subject to the following limitations and conditions:

This application is approved subject to the condition that the proposed use shall not interfere with any existing rights to ground water from the same source of supply and is subject to regulation and correlation with surface water rights, if the ground and surface waters are interconnected. The use of water hereunder is subject to the further provisions of Chapter 160, Session Laws of Wyoming, 1957, and any subsequent amendments thereto.

Granting of a permit does not guarantee the right to have the water level or artesian pressure in the well maintained at any specific level. The well should be constructed to a depth adequate to allow for the maximum development and beneficial use of ground water in the source of supply.

If the well is a flowing artesian well, it shall be so constructed and equipped that the flow may be shut off when not in use without loss of water into sub-surface formations or at the land surface.

Coal Bed Methane wells have Additional Conditions and Limitations on attachment sheet.

This permit and accompanying notices serve to register an existing well and establish a valid water right for the same. Time limit for Completion of Construction and Completion of Beneficial Use is waived.

Approval of this application may be considered as authorization to proceed with construction of the proposed well or spring. A Statement of Completion will be filed within thirty (30) days of completion of construction, including pump installation.

Completion of construction and completion of the beneficial use of water for the purpose specified in Item 4 of this application will be made by December 31, 20__.

The amount of appropriation shall be limited to the quantity to which permittee is entitled as determined at time of proof of application of water to beneficial use.

Witness my hand this 27th day of October, A.D. 20 07.

Signature of State Engineer
for PATRICK T. TYRRELL, State Engineer

October 16, 2007 - Statement of Completion on 1936 received.
Beneficial Use assumed as of date of completion.



POWERTECH (USA) INC.
Hydro ID 5002

3 of 4

FORM U.W.8
Rev. 1.07

STATE OF WYOMING
OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black pen.

PERMIT NO. U.W. 183561 NAME OF WELL/SPRING Putnam 21

1. NAME OF OWNER PUTNAM & PUTNAM, LLP

2. ADDRESS 778 CEDAR ST
Please check if address has changed from that shown on permit

City DEWEY State SD Zip Code 57735 Phone No 605-662-7448

3. USE OF WATER ☐ Domestic ☒ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☐ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)

1 stock tank

4. LOCATION OF WELL/SPRING SW 1/4 SW 1/4 of Section 28 T. 41 N., R. 60 W., of the 6th P.M. (or W.R.M.)

Subdivision Name _____ Lot _____ Block _____

Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83

Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)

UTM: Zone 13 Northing 7016400 Easting 574367 (meters) per

State Plane Coordinates: Zone _____ Northing _____ Easting _____ (feet) 102367

Land surface elevation (ft. above mean sea level) _____ Datum ☐ NAVD29 ☐ NAVD88

Source ☐ GPS ☐ Map ☐ Survey ☐ Unknown ☐ Other _____ Altitude (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled _____ Dug _____ Driven _____ Other _____

Describe _____

6. CONSTRUCTION Total depth of well/spring 6.39 ft.

Depth of static water level 0 ft. (below land surface) Casing height 2 ft. above ground

a. Diameter of borehole (bit size) 5 inches

b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded

diameter from _____ ft. to _____ ft. Material _____ Gage _____

diameter from _____ ft. to _____ ft. Material _____ Gage _____

c. Cemented/grouted interval, from _____ ft. to _____ ft.

Amount of cement/grout used _____ type _____ (example: 10 sacks)

d. Type of completion ☐ Customized perforations ☐ Open hole ☐ Factory screen

Type of perforator used _____

Size of perforations _____ inches by _____ inches.

Number of perforations and depths where perforated

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

Open hole from _____ ft. to _____ ft.

Well screen details

Diameter _____ slot size _____ set from _____ ft. to _____ ft.

Diameter _____ slot size _____ set from _____ ft. to _____ ft.

e. Well development method _____ How long was well developed? _____

f. Was a filter/gravel pack installed? Yes ☐ No ☐ Size of sand/gravel _____

Filter/gravel pack installed from _____ ft. to _____ ft.

g. Was surface casing used? ☐ Yes ☐ No Was it cemented in place? ☐ Yes ☐ No

Surface casing installed from _____ ft. to _____ ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Un known

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) 1936

9. PUMP INFORMATION Manufacturer None Type _____

Source of power _____ Horsepower _____ Depth of pump setting or intake _____ ft.

Amount of water being pumped _____ gal./min. (For springs or flowing wells, see item 10)

Total volumetric quantity used per calendar year. 5 ac/yr per U.W. 5

*If these amounts exceed permitted amount an enlargement is required.

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well)

If artesian flow or spring, yield is 5 gal./min. Surface pressure is _____ lb./sq.inch, or _____ feet of water.

The flow is controlled by ☐ Valve ☐ Cap ☐ Plug

Does well leak around casing? ☐ Yes ☒ No

Permit No. U.W. 183561 Book No. 1329 Page No. 61

SEE REVERSE SIDE

**POWERTECH (USA) INC.**

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., spring box, cribbing, etc., is necessary to qualify for a water right)

12. PUMP TEST Was a pump test conducted? Yes No

If so, by whom

Yield gal./min. with ft. drawdown after hours
Yield gal./min. with ft. drawdown after hours

13. LOG OF WELL Total depth drilled 6.5 ft.

Depth of completed well ft. Diameter of well inches

Depth to first water bearing formation ft.

Depth to principal water bearing formation Top ft. to Bottom ft.

DRILL CUTTINGS DESCRIPTION

From Feet	To Feet	Rock Type or Description	Formation	Water Bearing? (Yes or no)
Surface				
		Not Available		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? Yes ☒ No

15. QUALITY OF WATER INFORMATION

Does a chemical and/or bacteriological water quality analysis accompany this form? Yes No

It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well (contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984).

If not, do you consider the water as Good Acceptable Poor Unusable

REMARKS

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

John R. Rulman for Rulman & Rulman LLP
Signature of Owner or Authorized Agent

10.15.07 .20
Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 183361

Date of Receipt OCT 15 2007

Date of Priority June 12 2007

Date of Approval 10.29.07

Chris Veylance
for State Engineer

SOURCE I

ADDITIONAL WATER WELLS IN EDMONT PROJECT AREA

(Silver King Mines, Inc., Interoffice Correspondence, Keith Andersen to R.M. Caywood, August 3, 1979)

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POWERTECH (USA) INC.

INTEROFFICE CORRESPONDENCE

Company Silver King Mines, Inc. Date August 3, 1979

To: R. M. Caywood

From: Keith E. Andersen Subject: Quarterly Burdock Area Water Levels

Attached are quarterly measurements of Burdock Area water well flow rates and water levels. Wells numbered 135 - 143 are new wells or wells added to our monitoring program by request. Wells numbered 200 - 216 are probable Sundance wells located east of the Burdock Area.

In an effort to obtain all possible information, several measurements of questionable accuracy were made as noted below.

<u>Well No.</u>	<u>Problem</u>
2	Leaking around casing
4	Leaking around casing
75	Measuring point changes
13	Pipeline use affects flow
33	Measuring point changes
35	Measured inside cylinder drop pipe
36	Leaking around pipeline fittings
37	Measured inside cylinder drop pipe
40	Two wells at different elevations piped together
41	Pump had been operating
42	Leaking around pipeline fittings
52	Measuring point changed
53	Measured through cylinder drop pipe
56	Casing broken out
98	Casing leaking
113	Measured inside cylinder drop pipe
114	Measured inside cylinder drop pipe

Water quality data on these wells is not yet complete.


Keith E. Andersen, Chief Engineer

P 300 2 4M 7-79

Additional Water Wells In Edgemont Project Area

<u>Well No.</u>	<u>Location</u>
135	T 8 S, R 2 E, Sec. 1 bd
136	T 8 S, R 2 E, Sec. 5 bb
137	T 7 S, R 2 E, Sec. 17 bd
138	T 6 S, R 1 E, Sec. 18 a
139	T 41 N, R 60 W, Sec. 18 dd
140	T 9 S, R 3 E, Sec. 19 bc
141	T 10 S, R 3 E, Sec. 20 aa
142	T 7 S, R 2 E, Sec. 35 bd
143	T 8 S, R 1 E, Sec. 30 dc
200	T 7 S, R 2 E, Sec. 13 ca
201	T 7 S, R 2 E, Sec. 13 ca
202	T 7 S, R 2 E, Sec. 13 ca
203	T 7 S, R 2 E, Sec. 12 cd
204	T 7 S, R 2 E, Sec. 12 cb
205	T 7 S, R 2 E, Sec. 12 ac
206	T 7 S, R 2 E, Sec. 12 ac
207	T 7 S, R 2 E, Sec. 12 aa
208	T 7 S, R 2 E, Sec. 2 bc
209	T 7 S, R 2 E, Sec. 3 da
210	T 7 S, R 2 E, Sec. 2 bd
211	T 7 S, R 2 E, Sec. 12 ba
212	T 8 S, R 3 E, Sec. 8 db
213	T 7 S, R 3 E, Sec. 20 dc
214	T 7 S, R 3 E, Sec. 18 cd
215	T 6 S, R 2 E, Sec. 27 dd
216	T 6 S, R 2 E, Sec. 22 aa
144	T 9 S, R 3 E, Sec. 21
145	T 8 S, R 2 E, Sec. 3 dc
146	T 9 S, R 2 E, Sec. 21 bc

Additional Water Wells In Edgemont Project Area

<u>No.</u>	<u>Owner</u>	<u>Use</u>	<u>Depth</u>	<u>Probable Aquifer</u>	<u>Remarks</u>
135	Mike Ringer	D,S	360	Lakota	Drilled 1977 - Submersible Pump
136	Ed Dodson	D,S		Spring	Source Uncertain
137	USFS	S			Windmill
138	John Carlson	D	100	Fall River	Drilled 1977, flows, Jet Pump
139	Gerald Darrow	S	620	Lakota	Drilled 1978, flows 20 gpm
140	Ken Barker	D,S			
141	Howard Henderson	S		Spring	Source Uncertain
142	Jack Standen	D,S	280	Fall River	Submersible Pump
143	Jeff Schultz	D,S	1,640	Fall River	Drilled 1962, Submersible Pump @ 440
200	George Hey	D,S	108	Sundance	Water Level 52.7', Submersible Pump
201	George Hey	S	110	Sundance	Pump Jack
202	George Hey	S	200	Sundance	Water Level 16.7'
203	Donald Spencer	D,S	200	Sundance	Submersible Pump at 160
204	Donald Spencer	U	170	Sundance	
205	Mason Miller	U	108	Sundance	Water Level 24.5
206	Mason Miller	D,S	200	Sundance	Water Level 18.4, Jet Pump
207	Mason Miller	D,S			Submersible Pump, Pipeline
208	Mason Miller	S	179	Sundance	Pump Jack
209	Donald Spencer	U	247	Sundance	Water Level 145.2
210	George Hey	S	125	Sundance	Pump Jack
211	Donald Spencer	S	161	Sundance	Pump Jack - Water Level 8.14
212	Carl Reutter	S	2,204		Flows 1.5 gpm, old oil test
213	George Hey	S	100	Sundance	Submersible Pump, Water Level 34.1
214	George Hey	S	270	Sundance	Water Level 39.1
215	Claude Smith	S	900		Water Level 60.7, Submersible Pump, Pipeline
216	Claude Smith	U			Water Level 217.9
144		S,O			Water Level 368.4'

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SOURCE J

FOREST SERVICE WELLS AND SPRINGS

(Letter from Keith Andersen, Silver King Mines, Inc., to John Hatch, South Dakota Water Rights
Commission, January 12, 1979)

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FOREST SERVICE WELLS AND SPRINGS

This list of wells and springs located on U. S. Forest Service land was obtained from the Forest Service office in Newcastle, Wyo. These wells and springs will be visited and an attempt made to determine the aquifer from which they produce. The water on Forest Service land is used by ranches for stock water during the summer months and to supply water for wild life.

Name	Location
Bennett Canyon Well	T7S, R2E, SW $\frac{1}{4}$, Sec. 7 #114
Driftwood Canyon Well	NW $\frac{1}{4}$, Sec. 16 no match > 2 km
Heck Well	NW $\frac{1}{4}$, Sec. 17 #137 > 2 km
Spencer Well	NE $\frac{1}{4}$, Sec. 7 no match
Bennett # 2 Well	SW $\frac{1}{4}$, Sec. 6 #113
Hey Well	T7S, R3E, SW $\frac{1}{4}$, Sec. 18 > 2 km
Roderick Spring	T7S, R2E, SE $\frac{1}{4}$, Sec. 18
North Roderick Spring	NE $\frac{1}{4}$, Sec. 17
North Long Mountain Spring	T7S, R3E, NW $\frac{1}{4}$, Sec. 32
South Long Mountain Spring	NW $\frac{1}{4}$, Sec. 32
Dewey Well	T6S, R1E, SW $\frac{1}{4}$, Sec. 5 #120 > 2 km
Cook Well	NW $\frac{1}{4}$, Sec. 9 no match > 2 km
Pass Creek Well	NE $\frac{1}{4}$, Sec. 22 #632 > 2 km
Lower Turkey Spring	T5S, R1E, SW $\frac{1}{4}$, Sec. 32
Turkey Spring	NE $\frac{1}{4}$, Sec. 32
Tailend Reservoir Spring	Sec. 15
Bowl Spring	T5S, R1E, NE $\frac{1}{4}$, Sec. 29
Bosley Spring	SE $\frac{1}{4}$, Sec. 17
Barrel Spring	NW $\frac{1}{4}$, Sec. 7
Sheepwagon Spring	T4S, R1E, SW $\frac{1}{4}$, Sec. 32
Lower Dugout Spring	NW $\frac{1}{4}$, Sec. 29
Dugout Spring	NE $\frac{1}{4}$, Sec. 19
North Spring	Sec. 6
South Spring	Sec. 6
Carr Spring	T42N, R60W, SE $\frac{1}{4}$, Sec. 4
Mix Spring	T43N, R60W, NW $\frac{1}{4}$, Sec. 28
Pipeline Spring	Sec. 21
Pollard Spring	NE $\frac{1}{4}$, Sec. 9

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SOURCE K

HYDROGEOLOGIC INVESTIGATIONS AT PROPOSED URANIUM MINE NEAR DEWEY, SOUTH DAKOTA

(Report No. WR28-2-520-128, J. Mark Boggs, Tennessee Valley Authority, October 1983)

SEE APPENDIX I FOR THIS SOURCE REPORT

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SOURCE L

COORDINATES, ELEVATIONS AND WATER LEVELS FOR BURDOCK PIEZOMETERS

(Letter from Keith Andersen, Silver King Mines, Inc., to John Hatch, South Dakota Water Rights
Commission, January 12, 1979)

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Coordinates (SKM Grid) and Elevations for Burdock Area Observation Wells

Well	Aquifer	Coordinates	Measuring Point Elevation	Height of Measuring Point Above Ground Level
Original Nine Wells		Installed Fall 1976 (Abandoned five Fall 1978)		
B-1 FR 672	K _F	90,856 E 188,869 N	3622.07	- 1.0 ft.
B-2 Aban	K ₁	90,808 E 188,859 N	3621.08	0
B-3 FR ?	K _F	93,532 E 190,992 N	3701.16	2.0 ft.
B-3 Aban	K ₁	93,583 E 191,005 N	3701.63	1.6 ft.
B-4 Aban	K ₁	95,531 E 190,551 N	3679.45	2.58 ft.
B-5 637 Aban		97,944 E 191,909 N	3731.04	1.9 ft.
B-6 FR 659	K _F	91,925 E 192,493 N	3642.64	0
B-6 660 Aban		91,874 E 192,472 N	3644.12	0
B-8 661	K ₁	100,952 E 193,839 N	3788.58	2.0 ft.
Burdock Well	K _F , K ₁	668 91,081 E 189,167 N	3624.16	= GL Elevation
Four Additional Wells		Installed August 1977		
B-7 FR 665	K _F	93,303 E 190,402 N	3671.24	1.75 ft.
B-7 666	K ₁	93,279 E 190,373 N	3671.1	2.08 ft.
B-9 FR 646	K _F	91,389 E 187,658 N	3605.42	3.0 ft.
B-9 658	K ₁	91,389 E 187,658 N	3605.42	2.6 ft.
Seven Replacement Wells		Installed Fall 1978		
B-2 LAK 674	K _F	90,776 E 188,900 N	3621.11	1.3 ft.
B-2 FU 673	K ₁ f	90,767 E 188,841 N	3619.96	0
B-10 FR 671	K _F	91,221 E 189,275 N	3631.19	1.4 ft.
B-10 FU 670	K ₁ f	91,265 E 189,344 N	3630.31	1.6 ft.
B-10 LAK 669	K ₁	91,206 E 189,317 N	3631.24	1.6 ft.
B-11 FR 664	K _F	90,805 E 189,721 N	3623.94	0
B-11 LAK 663	K ₁	90,843 E 189,739 N	3624.82	1.0 ft.

Source: Letter from Keith Andersen, Silver King Mines, Inc., to John Hatch, South Dakota Water Rights Commission, January 12, 1979

Revised Coordinates and Elevations for Burdock Piezometers

<u>Well</u>	<u>Coordinates</u>	<u>Measuring Point Elevation</u>	<u>Height of Measuring Point to Ground Level</u>
1-1 FR	90,856.22 E 188,868.81 N	3622.07	-1.0
1-2 LAK	90,775.65 E 188,899.89 N	3621.11	1.3 ft.
1-2 Fuson	90,767.34 E 188,841.37 N	3619.96	0'
1-3 FR	93,531.56 E 190,991.69 N	3701.16	2 ft.
1-4	95,530.98 E 190,550.99 N	3679.45	2.58 ft.
1-6 FR	91,924.72 E 192,492.25 N	3642.64	0'
1-6	91,874.49 E 192,471.83 N	3644.12	0'
1-7	93,279.33 E 190,372.99 N	3671.10	2.08 ft.
1-7 FR	93,303.13 E 190,401.62 N	3671.24	1.75 ft.
1-9	91,388.52 E 187,657.99 N	3605.42	3 ft.
1-10 FR	91,220.54 E 189,274.64	3631.19	1.4 ft.
1-10 LAK	91,205.62 189,317.02	3631.24	1.6 ft.
1-10 Fuson	91,265.09 189,343.85	3630.31	1.6 ft.
1-11 LAK	90,842.73 189,738.78	3624.82	1 ft.
1-11 FR	90,805.19 189,720.73	3623.94	0'
Sundance Well 662	95,840.49 E 189,370.12 N	3647.84	3 ft.
Burdock Well	91,081.12 189,167.42	3624.16 = GL Elevation	

Water Level Measurements for Burdock Piezometers

All pressure measurements on 9-21 are 2-2.75 psi lower than previous measurement - gauge may not have been accurate.

B-1	7-20-78	14.25 psi	
	9-21-78	12.25 psi	
	10-13-78	8.80 psi	Burdock well flowing
B-2	7-20-78	16.0 psi	Abandoned 11-10-78
	9-21-78	13.25 psi	
B-3	7-20-78	35.9'	
	8-4-78	36.3'	
	airlifted on 8-4		Abandoned 11-10-78
	8-21-78	36.5	
	9-21-78	36.8	
B-3 FR	7-20-78	37.5	
	8-4-78	37.7	
	airlifted on 8-4		
	8-21-78	37.3	
	9-21-78	37.6	
	10-13-78	38.7	Burdock well flowing
B-4	11-22-78	38.8	
	7-20-78	11.5'	Water Level in Annulus 11.8'
	9-21-78	12.1'	
	10-13-78	13.6	Burdock well flowing
	11-21-78	13.9	Abandoned 12-5-78

Source: Letter from Keith Andersen, Silver King Mines, Inc., to John Hatch, South Dakota Water Rights Commission, January 12, 1979



(Continued - Page 2)

B-5	7-20-78	48.8	
	9-21-78	49.4	
	10-13-78	49.7	Burdock well flowing
	11-21-78	50.0	Abandoned 12-5-78
B-6	7-20-78	10.3 psi	
	9-21-78	8.25 psi	
	10-13-78	7.75 psi	Burdock well flowing Abandoned 12-5-78
B-6 FR	7-20-78	7.75 psi	
	9-21-78	5.5 psi	
	10-13-78	5.5 psi	Burdock well flowing
B-7	7-20-78	8.9'	
	7-26-78	9.0'	Airlifted
	8-4-78	9.3'	
	8-7-78	9.2'	
	8-21-78	9.2'	Airlifted
	9-21-78	9.3'	Airlifted
	10-13-78	12.6	Burdock well flowing
	11-21-78	11.5	
B-7 FR	7-20-78	17.6'	
	7-26-78	17.4	Airlifted
	8-4-78	12.5'	
	8-8-78	12.4'	
	8-21-78	12.3'	Airlifted
	9-21-78	12.6'	Airlifted
	10-12-78	13.75	Burdock well flowing
	11-21-78	15.5	
B-8	7-20-78	96.25'	
	8-4-78	97.5'	Airlifted
	8-21-78	97.3'	
	9-21-78	97.9'	
B-9	7-20-78	19.2 psi	
	9-21-78	17.0 psi	
	10-13-78	15.0 psi	Burdock well flowing
B-9 FR	7-20-78	17.9 psi	
	9-21-78	16.0 psi	
	10-13-78	15.25 psi	Burdock well

Outlying Piezometer Wells

Locations:

BPZ 14 & 15 FR	T8S, R2E, sec 23	NE/4	NW/4	NW/4
BPZ 16 & 17 FR	T7S, R2E, sec 30	SW/4	SE/4	SE/4
BPZ 18 & 19 FR	T40N, R60W, sec 27	SE/4	SE/4	NW/4
BPZ 20 & 21 FR	T6S, R1E, sec 29	SW/4	NW/4	NE/4
BPZ 22 & 23 FR	T41N, R60W, sec 9	SW/4	SE/4	SE/4

BPZ 14 #602
BPZ 15 FR #601
BPZ 16 #643
BPZ 17FR #644
BPZ 18 #608
BPZ 19 FR #607
BPZ 20 #609
BPZ 21 FR #610
BPZ 22 #626
BPZ 23 FR #625

Source: Letter from Keith Andersen, Silver King Mines, Inc., to John Hatch, South Dakota Water Rights Commission, January 12, 1979



(Continued - Page 3)

Water Levels:

BPZ 14	7-20-78	130.5'	
	8-7-78	130.2'	Airlifted
	8-22-78	136'	Airlifted
	9-21-78	136.5'	
	10-13-78	136.6	
	11-21-78	135.9	
BPZ-15 FR	7-20-78	59.5'	
	8-7-78	51.5'	Airlifted
	8-9-78	47.7'	
	8-22-78	47.5	Airlifted
	9-21-78	47.7'	Airlifted
	10-13-78	47.8	
	11-21-78	47.5	
BPZ-16	7-20-78	7.0 psi	shut in on this date
	8-9-78		Airlifted
	9-21-78	9.0 psi	
	10-13-78	9.0 psi	
BPZ-17	7-20-78	20.6'	
	8-9-78	20.6'	Airlifted
	8-22-78	21.8'	
	9-21-78	21.9'	
	10-13-78	21.9'	
	11-21-78	22.0'	
BPZ-18	8-7-78	17.5'	
	9-21-78	17.7'	
	10-16-78	17.7	Airlifted
	11-20-78	20.3"	
BPZ-19 FR	8-7-78	21.8'	Airlifted
	8-22-78	18.3'	Airlifted
	9-21-78	18.7'	Airlifted
	10-16-78	21.1	
	11-21-78	19.8	
BPZ-20	7-20-78	4.8'	
	7-31-78	4.75'	Airlifted - much mud
	8-3-78	172.7'	
	8-21-78	83'	Airlifted
	9-20-78	73.3'	Airlifted
	10-12-78	108.5	Airlifted
	11-21-78	89.9	

Source: Letter from Keith Andersen, Silver King Mines, Inc., to John Hatch, South Dakota Water Rights Commission, January 12, 1979



POWERTECH (USA) INC.

(Continued-Page 4)

BPZ-21 FR	7-31-78	Slight Flow	Airlifted
	8-3-78	15'	
	8-8-78	11.5'	
	8-21-78	6.3'	Airlifted
	9-20-78	7.5'	Airlifted
	10-12-78	9.3	
	11-21-78	8.7	
BPZ-22	7-20-78	65.9'	
	7-31-78	64.5'	Airlifted - much mud
	8-3-78	153.9'	
	8-21-78	89.3'	Airlifted
	9-20-78	76.1'	Airlifted
	10-12-78	85.1'	Airlifted
	11-21-78	70.5'	
BPZ-23 FR	7-20-78	73.2'	
	7-31-78	70'	Airlifted
	8-3-78	72.7'	
	8-21-78	70.3'	Airlifted
	9-20-78	68.6'	Airlifted
	10-12-78	73.8	
	11-21-78	73.3	

Depth of Screen:

BPZ-14	588-630
BPZ-15 FR	336-378
BPZ-16	252-294
BPZ-17 FR	84-126
BPZ-18	798-882
BPZ-19 FR	672-714
BPZ-20	903-966
BPZ-21FR	630-672
BPZ-22	588-630
BPZ-23 FR	420-462

attempted to set 42' dec

not pressure grouted

BPZ 14 #602
BPZ 15 FR #601
BPZ 16 #643
BPZ 17FR #644
BPZ 18 #608
BPZ 19 FR #607
BPZ 20 #609
BPZ 21 FR #610
BPZ 22 #626
BPZ 23 FR #625

All wells constructed of 1" blk iron pipe with torch slot screen. Grout pumped down annulus to desired depth with 1" plastic pipe.

Source: Letter from Keith Andersen, Silver King Mines, Inc., to John Hatch, South Dakota Water Rights Commission, January 12, 1979



POWERTECH (USA) INC.

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POWERTECH (USA) INC.

SOURCE M

CONSTRUCTION AND LOCATION DATA FOR DEWEY PUMP TEST WELLS

(in letter from Keith Andersen, Silver King Mines, Inc., to Steve Stampfli, Office of Surface Mining, South Dakota Department of Water and Natural Resources, March 3, 1982)

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July 2012

B-819

WELL #	611 DEWEY TEST WELL	613	614	615	612	436	657	623	622	616	617	624
	D-1 FR	D-1 Fu	D-1 LK	D-2 LK	D-3 FR	D-3 LK	D-4 FR	D-4 LK	D-5 LK	D-6 LK	D-7 FR	
Hole Number	DWT-99	DWM-51	54	46	47	49	48	52	50	55	56	DXM-1
Date Drilled	10-17-81	7-21-81	9-04-81	7-07-81	7-09-81	7-16-81	7-14-81	7-23-81	7-20-81	9-09-81	9-11-81	7-30-81
Date Completed	10-17-81	8-14-81	9-14-81	8-13-81	8-14-81	8-18-81	8-18-81	8-17-81	8-17-81	9-15-81	9-15-81	7-30-81
Depth Cased	694	504	609	712	692	505	715	503	714	735	715	120
Depth Completed	801	580	620	800	800	590	800	580	780	835	810	120
X-Coord.	80798	80923	80982	80972	80710	80385	80416	81564	81618	81126	80004	76979
Y-Coord.	214898	215036	215035	214972	215068	215595	215658	215330	215281	214090	214495	219008
Collar Elev.	3736.2	3737.3	3741.1	3741.4	3728.5	3738.0	3744.3	3753.5	3751.4	3747.7	3723.3	3723.9
"r"		175.1	177.7	176.1	176.1	175.1	176.1	176.1	176.1	176.1	176.1	176.1
SWL (12-3-81)	34.16	26.23	32.16	39.68	26.56	21.03	42.37	34.22	49.68	45.86	21.42	Surface

PowerTech (USA) Inc.



Source: Letter from Keith Andersen, Silver King Mines, Inc., to Steve Stampfli, Office of Surface Mining, South Dakota Department of Water and Natural Resources, March 3, 1982

Appendix B



POWERTECH (USA) INC.

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SOURCE N

BURDOCK MINE AREA HYDROLOGY STATUS REPORT

(Silver King Mines, Inc. Interoffice Correspondence from Keith Andersen to R.M. Caywood, December 18, 1978, provided in a letter from Keith Andersen to John Hatch, South Dakota Water Rights Commission, January 12, 1979)

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POWERTECH (USA) INC.

INTEROFFICE CORRESPONDENCE

Company Silver King Mines, Inc. Date December 18, 1978

To: R. M. Caywood

From: Keith E. Andersen

Subject: Burdock Mine Area Hydrology
Status Report

Uranium ore in economically recoverable quantities has been discovered northwest of Edgemont, South Dakota, near Burdock on lands leased by the Tennessee Valley Authority. The ore is located in the Lakota Formation. Tentative plans call for conventional underground mining techniques which will require dewatering the ore zone during the mining operation. The Lakota Formation and the overlying Fall River Formation are the two principal aquifers supplying domestic water for area ranches. In view of this information, it was apparent that extensive hydrologic investigations would be required in planning the proposed mine.

An attempt has been made to identify all wells and springs having their source in the Fall River or Lakota Formation within approximately a 25 mile radius of the proposed mine. Appended are lists of these wells. The list entitled "Water Wells in the Edgemont Project Area" includes those wells felt most likely to be affected by proposed mine dewatering because of their proximity to the mine and their topographic location along the Cheyenne River Basin. Information on these wells was obtained from personal visits to the wells and with the well owners, Silver King Mines, Inc. files, South Dakota Geological Survey Report #109 "Ground Water Resources of the Western Half of Fall River County, SD" by Jack Keene, and from USGS Hydrologic Atlas "Water Resources of the Powder River Basin and Adjacent Areas, Northeastern Wyoming" by Hadson, Pearl, and Druse. Since completion of this listing in May, 1977, selected wells from this list have been monitored on a quarterly basis. Information on other wells within 25 miles of the proposed mine is as shown on the listings.

In addition to monitoring selected existing wells several observation wells have been installed to monitor water levels in the Fall River and Lakota aquifers. Initially nine observation wells were constructed in the Burdock area during the fall of 1976 to monitor water level drawdown during the February, 1977, pump test. Four more wells were installed during August, 1977, to provide additional information for the November, 1977, pump test. To provide additional information on area water levels ten wells were installed during the summer of 1978 at selected locations throughout the project area. Finally, when it appeared that some of the original nine wells were not providing reliable data, five of these wells were cemented off and abandoned and seven replacement wells drilled during the fall of 1978. Information on all of the observation wells is appended.

P 300 2 4M 7.78



R. M. Caywood
Keith E. Andersen

Page 2

A test well was constructed during January, 1977, for the purpose of conducting pump tests and potentially for dewatering use. This well was pumped during the February, 1977, and November, 1977, pump tests.

The well was allowed to free flow after completion until February 11, 1977, the starting date for the first pump test. This flow resulted in pre-pump test drawdown as shown in the attached data. The well was pumped from both aquifers for 337 hours at an average discharge of 261 gpm. The water level in the well stabilized at 433 feet of drawdown after 280 hours. Data from observation well B-2 indicated the static head on the well before it was allowed to flow was about +30 feet. Using a total drawdown of 463 feet the specific capacity of the well was estimated at 0.56 gpm/ft..

Coefficients of transmissibility and storage were estimated from the observation well drawdown data using the time-drawdown graphical solution to the Theis non-equilibrium well formula. It was necessary to estimate the pumping rate from the Fall River and Lakota for this analysis. The Fall River pumping rate was estimated at 100 gpm and the Lakota at 161 gpm. Using these figures, the transmissivity and storage coefficient of the Lakota were estimated at 1600 gpd/ft. and 5.5×10^{-5} , respectively, and at 860 gpd/ft. and 4×10^{-5} for the Fall River.

Since approximately one-half of the domestic wells in the area produce from the Fall River aquifer and since it would be possible to sink a shaft through the Fall River with minimal disturbance to water levels, another pump test was planned to determine if the Fall River and Lakota were hydraulically connected. Four additional observation wells were installed in preparation for this test.

Following the February, 1977, pump test the well was shut in and not allowed to flow at the surface. Water was able to communicate between the aquifers since the well screen was open to both aquifers. During the week of October 25, 1977, the Fall River aquifer was isolated and shut in with a pneumatic packer. The Lakota was allowed to free flow until the pump test, November 14, again resulted in pre-pump test drawdown.

The pump test began at 10:00 a.m. on November 14, and continued until November 17. By the morning of November 17, it appeared that sufficient data had been obtained to determine whether or not leaky aquifer conditions existed in the Burdock area and the initial phase of the test was terminated at 11:30 a.m.. The average pumping rate for this period was 193 gpm. Assuming that the water levels in piezometers B-1 FR and B-2 were the same as the Fall River and Lakota water levels in the well before the pump was installed, the total Lakota drawdown at the end of the initial phase was 267 feet and the total Fall River drawdown was 49 feet. At 11:30 a.m. the pumping rate was increased to 225 gpm in an attempt to provide additional data on the apparent specific capacity of the well and on the rate of drawdown in the Fall River with respect to the head differential between the Fall River and Lakota water levels.



R. M. Caywood
Keith E. Anderson

Page 3

After two hours additional pumping at 225 gpm the Lakota drawdown was 298 feet and the Fall River drawdown was 50 feet. At 1:30 p.m. the pumping rate was increased to 250 gpm. For the next hour the pumping rate fluctuated considerably because the pipeline from the well head to the holding reservoir was not capable of handling the increased flow. The pipeline broke and was repaired several times causing a varying pumping head and varying pumping rate. The pumping rate was cut back to 230 gpm at 3:00 p.m.. The pneumatic packer, which had been set at 200 psi, was pressured to 250 psi at 3:15 p.m. to see what effect this might have on the rate of drawdown in the Fall River. The pump was shutoff at 4:15 p.m. and water level recovery rates monitored.

~~Time-drawdown data from this pump test indicated a complex hydrologic system~~ in this area, with the effects of both leakage and boundary conditions influencing ground water flow. Early time data indicated a transmissivity of about 1600 gpd/ft. and storage coefficient of about 7.5×10^{-5} for the Lakota, which agreed reasonably well with the values calculated for the first test. Attempts at more detailed analysis of the data were not successful.

Because of the difficulty in analyzing the drawdown data it began to appear that some of the data might be unreliable. To investigate this possibility, cement logs were run on wells B-2, B-3, B-4, and B-5. These logs showed the cement grout was not properly placed to isolate the Fall River and Lakota in these wells. These four wells and well B-6 have been abandoned and replaced with seven new wells. Sonic bond logs were run on the new wells, which showed the wells to be properly grouted.

At this time two additional pump tests are planned in the Burdock Area to obtain more reliable hydrologic data on the Lakota and Fall River aquifers. A three-five day test pumping from the Lakota is tentatively scheduled for early January, 1979, followed by a three-five day test pumping from the Fall River.

Keith E. Andersen

Keith E. Andersen, Chief Engineer

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SOURCE O

ANALYSIS OF AQUIFER TESTS CONDUCTED AT THE PROPOSED BURDOCK URANIUM MINE SITE, BURDOCK,

SOUTH DAKOTA

(Report No. WR28-1-520-109, J. M. Boggs and A.M. Jenkins, Tennessee Valley Authority, May 1980)

SEE APPENDIX I FOR THIS SOURCE REPORT

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SOURCE P

HYDRO ID 704 RECOMPLETION

(Email from Len Eakin, Powertech (USA) Inc., to Mike Beshore, Powertech (USA) Inc., May 9, 2011)

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POWERTECH (USA) INC.
Elizabeth Scheinost

From: Leonard Eakin [leakin@powertechuranium.com]
Sent: Monday, May 09, 2011 4:44 PM
To: Michael Beshore; Frank Lichnovsky; leakin@powertechuranium.com
Cc: escheinost@powertechuranium.com
Subject: re: Putnam Water Well 704
Attachments: _Certification_.htm

For DB08-5-1 the Unkpapa completion date was 4/29/2008. The Unkpapa was cemented off on 1/28/2009 and the Lakota was perf'd by Goodwell on 2/4/2009.

From: "Michael Beshore" <mbeshore@powertechuranium.com>
Sent: Monday, May 09, 2011 4:35 PM
To: "Frank Lichnovsky" <fllichnovsky@powertechuranium.com>, leakin@powertechuranium.com
Subject: Putnam Water Well 704

Gents, Could Lisa and myself be provided the following information on well 704. This was the Putnam well that was originally drilled to the Unkpapa, and then cemented up to the Lakota.

Please Provide:

Date Drilled to Unkpapa and the Date Cemented up to the Lakota.

This may have occurred on the same day, but need to make certain so we know what water quality samples are from what.

Thanks, Mike



POWERTECH (USA) INC.

Michael D. Beshore, P.G.
Senior Environmental Coordinator

Powertech (USA) Inc.
P.O. Box 1066
8305 6th Street
Wellington, CO 80549
(970) 282-7777 office
(970) 556-5988 cell
Email: mbeshore@powertechuranium.com
Website: www.powertechuranium.com

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SOURCE Q
SOUTH DAKOTA WATER RIGHT 380-2

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**380-2**

No.

**Office of State Engineer
DOCUMENT FILE***Darrel Hawthorne**Custer**Ground Water Supply**Well No. 2**70 1/4 NW 1/4 Sec. 17-6 S-1E**Custer County***409-2**No. **380-2**Division No. **2****Fall River** District**PERMIT**

to appropriate water from

Ground Water Supply

Custer County, South Dakota.

Name of applicant

*Darrel Hawthorne*Name of diversion works *Golden**Gift Irrigation Project, add No. 2*

Date of first receipt at office of State

Engineer *June 29* 1951

Returned to applicant for correction

..... 19.....

Corrected application received

..... 19.....

Date of water right

June 29 1951Recorded in Book *3* *Section 1*

One-fifth of work to be completed

Sept. 12 1952

Whole work to be completed

Sept. 12 1953

Final proof of use of water

Sept. 12 1953Approved *Sept. 12* 1951

DEAR ... LOUCKS State Engineer.



POWERTECH (USA) INC.

Hydro ID 710

Map No. 109-2

2 of 11

Form 211-Application for Permit to Appropriate Water-Original

Ground Water

H. P. No. 4154

NO. 380-2

Water Division No. 2 East River

(Marks to be filled by the State Engineer.)

RECEIVED
District 4: PM
JUN 27 1974

APPLICATION FOR PERMIT

To Appropriate Water within the State of South Dakota
OFFICE OF STATE ENGINEER
Dakota, S. DAK.

(NOTE-Draw a line through items not applicable.)

1. Name of applicant John L. Thompson Henry C. Keller, Inc.
Postoffice address State Route 11, General 57735 County Butte State S. Dak.

- I. If a corporation
 - (a) Name of same
 - (b) Date and place of incorporation
 - (c) Amount of capital stock
 - (d) Amount paid in
 - (e) Names and address of directors

(NOTE-A certified copy of articles of incorporation must accompany the application.)

II. Method of accomplishing the work and financial resources of the applicant:

- (a) Method of accomplishing work (Whether by contract, employment of others, or by direct labor)
 - (b) Cash on hand, \$ 3000.00
 - (c) Treasury stock, \$ 0.00
 - (d) Bonds to be issued, \$ 0.00
 - (e) Other resources, \$ 0.00

2. Name of well Golden Cliff Irrigation Project Well No. 2
3. Quantity of water claimed 300 gal. per min.
4. Source of water supply (estimated depth) 376
5. Location of well (subdivision) 1/4, 23 1/4, 39, 17, T. 6 N., R. 1 W.
6. Annual periods during which water is to be used April 1 to Oct. 1
7. To be used for:

I. Irrigation or domestic use: Gravity, overhead sprinkling or combination system?

- (a) Number of acres to be irrigated 126.49 acres.

(b) Legal subdivisions to be irrigated See List Attached

(NOTE-A list of lands to be irrigated, giving each subdivision and fraction with acreage thereof, should be written here, or may be appended as a part of this application. Same must also be shown on accompanying map.)

- (c) Statement as to domestic use (giving location, etc.)

II. Stockwatering, mining, milling, power, fish culture, fire protection and public recreation:

- (a) Nature of use
- (b) Amount of power to be generated horse power.
- (c) Location of plant
- (d) Method of developing power
- (e) Point where return water will be diverted to stream



POWERTECH (USA) INC.

Hydro ID 710

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8. Estimated cost of works:

(a) Head gate, \$..... (b) Pumping plant, \$..... 2000.00
(c) Flaming, \$..... (d) Canal-earth, \$..... Rock, \$.....
(e) Other structures Pipe, \$..... \$..... Total, \$..... 3000.00

9. Description of works:

(a) Head gate: Width feet; height feet;
Material

(b) Log of well:

(To be completed when well is drilled)

FEET FROM	LOG OF WELL
0 - 40	Gravel and Top Soil
40 - 50	Nakota Sand
50 - 55	Fusion Formation
55 - 370	Lakota Sand
370 - 37	Imprison Formation

(c) Measuring device Pressure Gauge and Nozzle Size

(d) Canal: Total length None miles.

LOCATION BELOW HEADGATE	DEPTH	BOTTOM WIDTH	WIDTH AT WATER LINE	GRADE PER MILE
At Mile	..... feet	..... feet	..... feet	..... feet
At Mile	..... feet	..... feet	..... feet	..... feet
At Mile	..... feet	..... feet	..... feet	..... feet
At Mile	..... feet	..... feet	..... feet	..... feet
At Mile	..... feet	..... feet	..... feet	..... feet
At Mile	..... feet	..... feet	..... feet	..... feet

(Give dimension where reductions in size are made.)

(a) Was water tested for irrigation purpose?

Result: Excellent

10. Time required for completion of work years.

11. Time required for complete application of water to the proposed beneficial use 1 years.

12. Choice of newspaper for publication of notice of intention to appropriate Custer

Chronicle, Custer, S. Dak.

STATE OF SOUTH DAKOTA

County of Custer

I, Dennis Hawthorne, being first duly sworn on my oath depose and say: That my relation to the above described, undertaking is that of owner, that I have read the above and foregoing statement, and examined the map accompanying the same, and that I know of my own personal knowledge that the matters herein stated and shown are true.

Signed Daniel Hawthorne

Subscribed and sworn to before me this 22 day of June, 1931

Edna F. Richardson
Notary Public (or other qualified officer.)



POWERTECH (USA) INC.

Form 10-77 by State Engineer:

4 of 11

STATE OF SOUTH DAKOTA

County of Hughes

Pierre, South Dakota, Sept. 12, 1951, 1951

This is to certify that the foregoing application was received at this office at 4:00 o'clock P.m. upon the 29th day of June, 1951 and that after examination it was found to comply with the South Dakota water laws, was published in accordance with the provisions thereof and consideration given to any and all information presented found to comply with the South Dakota water laws, was published in accordance with the provisions thereof and consideration given to any and all information presented.

NO PROTESTS WERE RECEIVED.

Donald Quicks
DEAN A. QUICKS State Engineer.

Number of permit 380-2

Date of first receipt of application June 29, 1951

Date of return to applicant for correction 19

Date of receipt of corrected application 19

Date from which applicant may claim right June 29, 1951

Approved Sept. 12, 1951. Recorded in Book Page 2

This is to certify that I have examined the foregoing application for a permit to appropriate water of the State of South Dakota, and I hereby grant the same as stated herein, subject, however, to the following limitations and conditions:

1st. The equivalent of at least one-fifth, of the work above specified is to be completed on or before Sept. 12, 1952

2nd. The whole of said work is to be completed on or before Sept. 12, 1953

3rd. The limit of time for proof of beneficial use of water appropriated in accordance herewith is Sept. 12, 1953

4th. The water appropriated shall be used for the purpose of Providing irrigation

5th. The prior right of all persons who, by compliance with the laws of the State of South Dakota, have acquired "right to the use of water must not be injuriously affected by this appropriation.

6th. The amount of the appropriation herein granted shall not exceed 800 gallons per minute; neither shall it exceed the capacity of the above described system of diversion works, nor the least amount of water that experience may hereafter indicate as necessary for the production of crops in the exercise of the best husbandry; and further, said appropriation must be limited to not more than one-seventieth (1/70) of one cubic foot of water per second of time for each acre of land to which water is actually and beneficially applied for irrigation on or before Sept. 12, 1953; said water to be used during the following described annual period:

April 1 to October 1, Inclusive

Witness my hand this 12th day of Sept., 1951

Certificate of Construction issued SEPTEMBER 9, 1951

Water license issued SEPTEMBER 9, 1951

Donald Quicks
DEAN A. QUICKS State Engineer.



Location of lands to be irrigated by the Golden Cliff Irrigation
Well No. 2.

Location	Sec.	Twp.	Rge.	Acres
N 1/4 M 1	17	6 S., 1 E.,	34.40	
N 1/4 M 2	17	6 S., 1 E.,	5.07	
N 1/4 M 3	17.	6 S., 1 E.,	35.25	
N 1/4 M 4	17	6 S., 1 E.,	38.30	
N 1/4 M 5	18	6 S., 1 E.,	10.46	
Total,				126.48

DISCHARGE OF ONE SPRINKLER HEAD - TWO NOZZLES - 7/32 & 1/4 "

Pressure in Pounds

Discharge in GPM.

25	14.8
30	16.2
35	17.6
40	18.9
45	20.1
50	21.3
55	22.4
60	23.4



POWERTECH (USA) INC.

Hydro ID 710
Form 10

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STATE OF SOUTH DAKOTA

WATER LICENSE NO. 330-2

(1) WHEREAS, On the 29th day of June, A. D. 19 51
Daryl Hawthorne
made Water Right Application No. 530-2 for a permit to use 1.70 cubic feet per second of the waters
of artesian ground water
County of Custer, State of South Dakota, for irrigation
purposes; and
(2) WHEREAS, On the 12th day of September, A. D. 19 51
Permit No. 380-2 with a date of priority of June 27, 1951
was issued to said applicant for the diversion of said water, and provided for the completion of construction of the water
supply system therein described on or before the 12th day of September, A. D. 19 52 and for the
application to beneficial use of said water on or before the 12th day of September, A. D. 19 53
and, whereas, on the 25th day of November, 1975, the Permit was
transferred to Henry C. Hollenbeck

and:

(3) WHEREAS, It is hereby certified that the applicant has complied with the provisions of the laws of the State of South Dakota
relating to completion of the construction of the water supply system and is entitled to divert .85 cubic feet
per second of water for beneficial use and;

(4) WHEREAS, It is hereby certified that the applicant has complied with the provisions of the laws of the State of South Dakota
relating to the application of water to beneficial use of the following extent:

for irrigating 60 acres in the E4 NW1/4, Section 17, T6S, R1E



POWERTECH (USA) INC.

Hydro ID 710

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(5) NOW, THEREFORE, By the virtue of the authority vested in us by the laws of the State of South Dakota, We hereby grant and confirm to

Henry C. Hollenbeck

of

Edgemont

the holder _____ and owner _____ of said permit No. 380-2 a water right, dating from June 29, 1951 to use of _____ cubic feet per second of the waters of _____

artesian ground water

in the County of Custer and State of South Dakota, or so much thereof as may be necessary for the purposes hereinbelow mentioned, to be diverted at

a point in the center of NW 1/4, Section 17, T6S, R1E

and conduct to and upon 60 acres in the E 1/2 NW 1/4, Section 17, T6S, R1E

for the purpose of Irrigation

Subject to any limitations listed in Water Right Permit No. 380-2 and subject to the laws of the State of South Dakota.

WITNESS, My hand and seal of our office at Pierre, South Dakota

this 9th day of September A. D.

Nineteen Hundred and Seventy-seven

WATER RIGHTS COMMISSION

By:

John Hatch

Chief Engineer, Executive Officer

JOHN HATCH



POWERTECH (USA) INC.

Hydro ID 710

8 of 11

Form 15.

Permit No. 300-2

Water Diversion No. 2 Fall River Water District

CERTIFICATE OF CONSTRUCTION

This is to Certify, That Henry C. Hollenback

the holder of

Permit No. 300-2, issued upon Application No. 300-2, bearing date of priority of June 29,

1931 authorizing the diversion of 1.78 cu. ft. per second of the waters of

artesian ground water county of Custer, State of South Dakota at

a point in the center of the NW 1/4, Section 17, T8S, R1E

for irrigation

purposes, he has complied with the provisions of the laws of the State of South Dakota relating to proof of completion of the works of diversion set out and described in said Permit; that said works are found in satisfactory condition for diverting and conveying to the place of intended use 1.78 cu. ft. per second of water.

Date September 9, 1977

By: JOHN HATCH
JOHN HATCH, Chief Engineer



POWERTECH (USA) INC.

Hydro ID 710

9 of 11

9--Notice of Intent to appropriate Water

Mon. 379-2 & 380-2

(First Publication _____, 19__)

APPROPRIATION OF WATER

Office of State Engineer,

Pierre, S. Dak., July 10, 1951

Notice is hereby given that Darrel Hawthorne whose postoffice address is Dewey, South Dakota, has made applications in accordance with the provisions of the water laws of South Dakota for permits to appropriate for beneficial use as follows:

1000 gallons of water per minute of time from ground water supply through the Golden Cliff Irrigation Project, Well No. 1, the point of diversion of which is to be located in the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 6, Twp. 65., Range 18. 800 gallons of water per minute of time from ground water supply through the Golden Cliff Irrigation Project, Well No. 2, the point of diversion of which is to be located in the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 17, Twp. 65., Range 18. Said water to be used for the purpose of providing irrigation on the following described land: NW $\frac{1}{4}$ Sec. 17, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 18, NW $\frac{1}{4}$ Sec. 6, W $\frac{1}{2}$ NE $\frac{1}{4}$ Sec. 6, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 6, E $\frac{1}{2}$ SW $\frac{1}{4}$ Sec. 6, W $\frac{1}{2}$ SE $\frac{1}{4}$ Sec. 6, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 6, and NW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 7. T. 65., R. 18.

This application will be taken up by the State Engineer at his office at Pierre for consideration upon the 21st day of August 1951, at 10:00 A.M. All persons who believe that their prior rights would be injuriously affected, or that the allowance of the permit would be detrimental to the public welfare shall file such protest with the State Engineer in writing prior to the above date and may appear on the day above mentioned in person for the purpose of discussing further, the information presented.

Appropriate action will be taken by the State Engineer after suitable time has elapsed for the consideration of any or all information presented.

HCS:mt
Enc.
cc: Richardson

DEAN W. LOUCKS
State Engineer



POWERTECH (USA) INC.

Hydro ID 710
Form 12

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Permit No. 380-2

Water Division 2 Fall River Water District

REPORT OF EXAMINATION OF WORKS
AND/OR APPLICATION OF WATER TO BENEFICIAL USE

TO: Water Resource Commission, State Office Building No. 2, Pierre, South Dakota 57501

I have this day made a thorough examination of the water use system constructed by Darrel
Hawthorne of Custer, SD holder
of Permit No. 380-2, bearing date of priority of June 29, 1951
authorizing the diversion of 1.78 cu. ft. per second of the waters of ground water
for irrigation purposes, in Custer County.

I have to report on the condition of the same as follows:

The Water Use System consists of,

A. Works used to divert the water:

376 foot flowing artesian well, steel cased; fill's storage dam,
15 foot high, 30 foot wide at the base and 50 foot in length
on the west side and 60 foot in length on the south side.

B. Works used to transport water to place of use,

Approx. 800 feet of natural ditch

C. Works used to apply water to beneficial use.

Flood irrigates by spreading

The system is in the following condition: Fair

The point of diversion is located Center of NW 1/4, Sec. 17, T6S., R1E., B.H.M.

The works are capable of diverting and conveying to the place of use 2 1.78

cu. ft. per second of water which is to be used for irrigation

Water has been put to beneficial use to the maximum extent as follows:

E 1/2 of NW 1/4 of Sec. 17, T6S., R1E., B.H.M.

comprising a total of 60 acres of land.

Henry C. Hollenbeck
Star Rt.
Edgemont, SD 57735

Date 8-25-75

Thomas A. Gardner
(Signature)

THOMAS A GARDNER
Water Resources Engineer



Form 20.

No. 380-2

NOTICE OF TRANSFER OF WATER PERMIT

TO: ~~WATER RIGHTS COMMISSION~~State Office Building No. 2
Pierre, South Dakota 57501

Date _____

This is to notify you that title to the lands described as follows:
E 1/4 NW 1/4 of Sec. 17, T6S., R1E., D.H.M.formerly owned by Darrel Hawthornehas been transferred to Henry C. Hollenbecktogether with any rights to the beneficial use of water thereon as evidenced by Water Right Permit No.
380-2 as provided for in Section 61.0127 of the 1960 Supplement to the South Dakota Code of 1939.You are therefore hereby requested to file this "Notice of Transfer of Water Permit" in its appropriate file at
the Office of Water Resources Commission. Evidence of the change of ownership.A fee of one dollar is hereto attached to cover filing fees as required under Section 61.0159 of the 1960
Supplement to the South Dakota Code of 1939.

STATE OF SOUTH DAKOTA

County of _____

I, Henry C. Hollenbeck, being first duly sworn on my oath depose and
say: That my relation to the above described undertaking is that of Owner, that I have read the above foregoing
statement, and I know of my own personal knowledge that the information herein stated is true.Henry C. Hollenbeck
(Signed)Subscribed and sworn to before me this 24th day of Nov, 19 75Ronald B. Beard
(Notary Public)

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SOURCE R

AN EARLIER NAME FOR HYDRO ID 710

(Letter from R.M. Caywood, Silver King Mines, Inc., to Clinton C. Smythe, Tennessee Valley Authority,
May 12, 1980)

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POWERTECH (USA) INC.

KEA



Silver King Mines, Inc.

P.O. Box 49
Edgemont, South Dakota 57735

May 12, 1980

Clinton C. Smythe
Project Manager
Edgemont Project
Tennessee Valley Authority
P. O. Box 2957
Casper, Wyoming 82602

RE: CAY; 143,80

Dear Clint:

Attached are water levels and flow rates for Burdock Area water wells measured during the April, 1980 quarterly well check. Please note the addition of Wells #149 and 150.

<u>Well No.</u>	<u>Location</u>	<u>Well Owner</u>
149	T 6 S, R 1 E, Sec. 17 bb	H. C. Hollenbeck
150	T 6 S, R 1 E, Sec. 6 aa	H. C. Hollenbeck

Very truly yours,

SILVER KING MINES, INC.


R. M. Caywood
Resident Manager

KEA:dlg
Enclosure
cc: David C. Arnold
C. Richard Dodson(encl)
R. J. Mullin "
J. M. Boggs "
R. L. Doty "
J. T. Watson "

QUARTERLY WELL CHECK

April, 1980

Well No.	Date Read	Water Level/gpm	Change Since Last Report	Remarks
136	4-17-80	3.60'	down .10'	
139	4-25-80	23.00 gpm	None	
141	5-1-80	.60 gpm	None	
147	5-1-80	10.90'	Down .75'	
148	5-1-80	flows	Well still flows, but dropped about 8".	MP elevation has been
149	4-29-80	19.20'	first measurement	
150	4-29-80	70.70'	first measurement	
200	4-30-80	52.02'	up 1.00'	
202	4-30-80	16.34'	up .12'	
204	4-28-80	37.12'	down .29'	
205	4-30-80	24.48'	down .37'	
206	4-30-80	18.49'	down .33'	
209	4-30-80	145.75	down 1.11'	
212	4-28-80	2.75 gpm	None	
213	4-28-80	32.97'	down .42'	
214	4-28-80	80.40'	down .40'	
216	4-30-80	220.37	down 1.37'	