POWERTECH (USA) INC.

Hydro ID 705

SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 07-82

Location NE ¼ NE ¼ Sec 21 Twp 6S Rg 1E

County Custer

Please mark well location with an "X"

North / W / E

1 Mile

Well Completion Date 12-5-09

Well Owner: Powertech

Business Name: Powertech USA Inc

Address: P.O. Box 723

Hot Springs S.D 57747

WELL LOG:

FORMATION	DEPTH FROM	DEPTH TO
Skull Creek	0	150
Fall River	150	328
Lakota (Fuson tch.)	328	480
Morrison	480	550
Dakpapa	550	600

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
SS 2200

CASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe ____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
SDR 17 LB/FT	6 IN	0 FT	428 FT	8¾ 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	80	15.1 lb./gal	0 ft.	428 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 428 Feet to 458 Feet

Other information 10' Blank 418-428

WAS A PACKER OR SEAL USED? ☑ YES ☐ NO

If so, what material? K-Packer

Describe packer(s) and location? SET AT 418

DISINFECTION: Was well disinfected upon completion? ☑ YES, How: Bleach

Laboratory sent to for water quality analysis ☐ NO, Why Not? 1 gallon

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:

☐ Pumped Describe: Airlift at 440'
☐ Bailed 5 GPMs
☐ 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 *
DEWEY Burdock 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: Stan Davis

Signature of Well Owner or Equitable Property Holder: ____

Date: 12/15/09

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WATER RIGHTS PROGRAM

POWERTECH (USA) INC.

Hydro ID 706

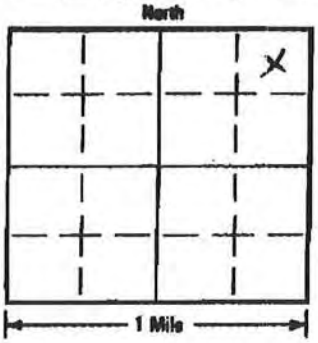
SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 07-92

Location NE ¼ NE ¼ Sec 21 Twp 6S Rg 1E

County CUSTER

Please mark well location with an "X"



Well Completion Date 12 5. 09

Well Owner: PowerTech

Business Name: Power Tech USA Inc

Address: P.O. Box 723

Hot Springs S.D 57747

WELL LOG:

FORMATION	DEPTH FROM	DEPTH TO
Skull Creek	0	150
Fall River	150	316
Lakota (Fuson Member)	316	328

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
SS 2200

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

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
SDR17 LB/FT	6 IN	0 FT	284 FT	8¾ 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	56	15.1 lb./gal	0 ft.	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
☐ NO, Why Not? 1 gallon

Laboratory sent to for water quality analysis

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? ____

WELL TEST DATA:
☐ Pumped Describe: Artesian @ 274'
☐ Bailed 5-10 GPMs
☐ 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 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: Stan Davis
Signature of Well Owner or Authorized Property Holder:
Date: 12/15/09

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POWERTECH (USA) INC.

Hydro ID 707 NE

SD EForm - 1621LD V1

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location ¼ -NW-¼ Sec 34 Twp 6S Rg 1E

County Custer County

Please mark well location with an "X"

North / W / E

1 Mile

Well Completion Date: May 5, 2011

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

Well Owner: ...

Business Name: Powertech, Inc.

Address: 145 N Chicago Street

City, State, Zip: Hot Springs SD 57747

WELL LOG:

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

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

METHOD OF DRILLING: 3.25" HSA to 40.0'

4.25"HSA? 4.25"?

CASING DATA: ☐ Steel ☑ Plastic ☐ Other

If other describe

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	26.0 Ft
Bentonite	1	Lb/gal	26.0 Ft	28.0 Ft

Describe grouting procedure

SCREEN: ☐ Perforated pipe ☑ Manufactured

Diameter 2.00 inches Length 10.0 Feet

Material Sch 40 PVC

Slot Size 0.010" Set From 30.0 Feet to 40.0 Feet

Other 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?

☑ No, Why Not? Monitoring well only.

Lab to which water quality sample sent for analysis

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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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:

SOIL BORING AND MONITORING WELL LOG

Hydro ID 707 — 2 of 3

JB NO. 17-12-11 VERTICAL SCALE 1" = 5' BORING NO. 11-24-4 WELL NO. MW-11-24-4

PROJECT Power Tech

Boring No.	Date	Time
Boring Started	5-5-11	10:55
Boring Completed	11	15:00
Finished Pulling Casing	"	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 40

___ In. Casing To ___

___ In. Casing To ___

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

Jet With Water From ___ To ___

Set with Drilling Mud From ___ To ___

Remarks

State Plane NAD27

441813 1032064

Head (ppm)

STANDPIPE ELEVATION

Well Construction

Flush Mount/Standup

6 cuft Concrete from 26' to 0'.

8 bags of Bentonite used previously

2" PVC Riser Pipe, from 30' to +1.5'.

Bentonite from 28' to 26'.

___ buckets used

1 bags used

12-20 Silica Sand Pack

Sand from 40' to 28'.

7 bags of sand

Flush Threaded 2" PVC Screen .010" Screen Size Opening from 40' to 30'.

Bottom of Well 40.0

Natural Material

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	WATER LEVEL	WATER ELEVATION

START 10:55 COMPLETE 15:00

METHOD 4 1/4 HSA to 40'

CREW CHIEF/LOGGER: RR

POWERTECH (USA) INC.

Hydro ID 707

GEOTECHNICAL FIELD DATA SHEET

Project Number: 17-1211 **Date:** 5-5-11 **Boring Number:** 11-34-4

Project Location: DEWEY **Crew Chief:** BJL

Boring Start Time: 10:55 **Boring Completion Time:** 15:00

Data Reviewed by:

Depth of [illegible]	Sample No./Depth	Set	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] CLASSIFICATION
-.5'	/						Topsoil - silty sand brn moist
	/						organics (SM)
-5' -	/						silty sand - [illegible] Brn
	/						DRY (SM)
12.0' -	/						silty/sandy clay [illegible] moist c.
21.0 -	/						silty sand [illegible] Lt brn
	/						moist to wet @ 35.0' (SM)
	/						EOB 40.0'
	/						
	/						set well
	/						1-10' SC
	/						3-10' R
	/						1-5' R
	/						7 Bags sand 12-20
	/						1 Bag Bent chips
	/						
	/						
	/						
	/						

Method of Advancing Boring

Continuous Sampling From: ______ To: ______

______ In. Flite Auger To: ______

4 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 Grnd	W.L.	Cav
At Completion	5-5-11	0:55	-	32	3[illegible]
1st Recheck					
2nd Recheck					

Additional space

RC GEOT 0001 1/04

POWERTECH (USA) INC.

3 7S

Hydro ID 708

SD EForm - 1631LD V1

SW

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location ¼ ~~NW~~ ¼ Sec ~~34~~ Twp ~~6S~~ Rg 1E

Fall River

County ~~Custer County~~

North

Please mark well location with an "X"

W E

1 Mile

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 ☐ Municipal ☐ Business ☐ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☑ Monitoring well

METHOD OF DRILLING:
4.25" HSA to ~~22.0'~~ ← 30'

CASING DATA: ☐ Steel ☑ Plastic ☐ Other
If other describe

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

20

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Cement	1	Lb/gal	~~0.0 Ft~~	~~8.0 Ft~~
Bentonite	1	Lb/gal	~~8.0 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~~ ← 20 to 30 Feet

Other information 12-20 Silica Sand from ~~10' to 22'~~ ← 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?

Lab to which water quality sample sent for analysis ☑ No, Why Not? Monitoring well only.

Well Owner: ...

Business Name: Powertech, Inc.

Address: 145 N Chicago Street

City, State, Zip: Hot Springs SD 57747

WELL LOG:

FORMATION	DEPTH FROM	DEPTH 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:
☐ Pumped Describe: NA
☐ Bailed
☐ Other

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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~~ ← 11-3-3

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 708

SOIL BORING AND MONITORING WELL LOG

JOB NO. 17-12-11 VERTICAL SCALE 1" = 5' BORING NO. 11-3-3 WELL NO. MW-11-3-3

PROJECT Power tech

Boring No.	Date	Time
Boring Started	5-4-11	10:55
Boring Completed	11	15:00
Finished Pulling Casing	N A	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 ____

t with Drilling Mud From ____ To ____

Remarks

State Plane NAD 27

N 434098 E 1030383

Item (ppm)

STANDPIPE ELEVATION ____

Well Construction

Flush Mount/Stickup

6 cuft Cuttings from 15 ft to 0 ft

8 bags of Bentonite sand pumped-in

2" dia. PVC Riser Pipe, from 20 ft to +2.5 ft

Bentonite from 20 ft to 15 ft

____ buckets used

1 bags used

#12-20 Silica Sand Pack

Sand from 30 ft to 20 ft

7 bags of sand

Flush Threaded 2" dia. PVC Screen

.010 in Screen Slot Opening

from 30 ft to 20 ft

Bottom of Well 30.0

Natural Material

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	WATER LEVEL	WATER ELEVATION

START 10:55 COMPLETE 15:00

METHOD 4¼ HSA to 30'

CREW CHIEF/LOGGER: MK

Hydro ID 708

PowerTech (USA) Inc.

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

T.D. 30 LOCATION: 434097.55, 1030382.50 State Plane NAD27

BIT SIZE 4" FA

SAMPLE LOG BY LE LEASE: (PROJECT) Dewey Bordock

DATE 5/4/11 COUNTY Fall River STATE SD

DEPTH | LITHOLOGY | CARBON | PYRITE | OTHER | Alteration % | Primary Oxidation | Reduction | Secondary Oxidation

L=Limonite (Lim) SOX Surf. Oxidation Rd. Reduced Rdt. Reduction P=Pyrite (Pyr) P_T=Pyrite Tarnish

POX= Primary Oxid. BSOX = Base of Surf. Oxid. SOX = Secondary Oxid. Tz = Transition Zone Fld = Feldspar

SAMPLE DESCRIPTION (Amounts in Percent, %)

T=Trace 1=Minor 2=Moderate 3=Abundant C=Carbon B=Bleached K=Kaolin Cht=Chert

0-22'

cl silty CLAY, orangish brown, dry, stat roots

22-28'

silty, sandy, clayey, GRAVEL, pinks/whites/grays, mixed sized angular qtzites & cherts, wet

28'-30'

competent GRAVELS - gray

TD @ 28' * drilled out to 8½" w/ 4½" HSA * converted to mw.

POWERTECH (USA) INC.

Hydro ID 709

15 7S

SD EForm - 1621LD V1

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location ¼ NW ¼ Sec ~~34~~ Twp ~~6S~~ Rg 1E

Fall River County ~~Custer County~~

Please mark well location with an "X"

North

W E

1 Mile

Well Completion Date: May 9, 2011

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

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

WELL LOG:

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

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

METHOD OF DRILLING: 4.25" HSA to 38.0'

CASING DATA: ☐ Steel ☑ Plastic ☐ Other
If other describe

28 FT

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	2.00 IN	0.0 FT	~~38.0~~ 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~~	~~26.0 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 ~~26' 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?
Lab to which water quality sample sent for analysis ☑ No, Why Not? Monitoring well only.

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

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WATER RIGHTS PROGRAM

REMARKS
Monitoring well 11-15-4

This well was drilled under license # 678 and this report is true and accurate.
Drilling firm: American Engineering Testing, Inc.
Signature of License Representative: B. Hoo

Signature of Well Owner or Equitable Property Holder:

Date:

POWERTECH (USA) INC.

SOIL BORING AND MONITORING WELL LOG

NO. 17-12-11 VERTICAL SCALE 1" = 5' BORING NO. SB- 11-15-4 WELL NO. 2 MW- 11-15-4

PROJECT Hydro ID 709 powertech

Boring No.	Date	Time
Boring Started	5-9-11	915
Boring Completed	11	
Finished Pulling Casing	11	12:30
Boring Filled		
Depth to Frost		

Method of Advancing Boring

Continuous Sampling From — To —

___ In. Flite-Auger To ___

4 1/4 In. Hollow Stem Auger to 38.0

___ In. Casing To ___

___ In. Casing To ___

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

Jet With Water From ___ To ___

Jet with Drilling Mud From ___ To ___

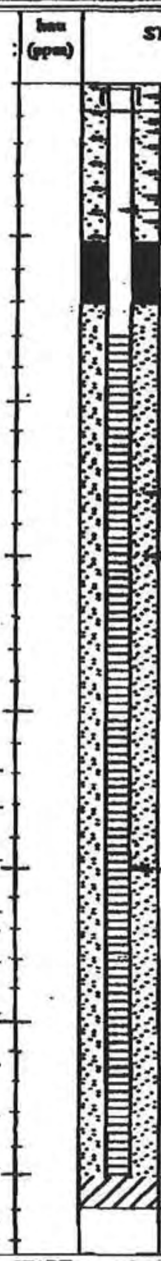
Remarks

State Plane NAD 27

N 426607 E 1029415

hnu (ppm)

STANDPIPE ELEVATION



Well Construction

Flush Mount/Standup

Cement grout

Concrete from 0 ' to 24.0 '.

7 bags of Redi-Mix used

2 " pvc Riser Pipe, from 28 ' to +2 '.

Bentonite from 28 ' to 26 '.

— buckets used

1 bags used

12-20 Silica Sand Pack

Sand from 28 ' to 28 '.

6 bags of sand

Flush Threaded 2" pvc Screen .010 " Screen Size Opening from 38 ' to 28 '.

Bottom of Well 38.0

Natural Material 38.0

START 9:15 COMPLETE 12:30

METHOD 4 1/4 HSA to

CREW CHIEF/LOGGER:

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	WATER LEVEL	WATER ELEVATION

POWERTECH (USA) INC.

Hydro ID 709

PowerTech (USA) Inc.

DRILLED WITH: AIR [ ] WATER [ ] HOLE NO. DB11-15-ALLUV-4

T.D. 40' LOCATION: 426606.639, 1029414.805 State Plane NAD27

BIT SIZE 4" FA

SAMPLE LOG BY LE LEASE: (PROJECT) Dewey Burdock

DATE 5/4/11 COUNTY Fall River STATE SD

DEPTH	LITHOLOGY	CARBON	SYNTHETIC	STAIN	Primary Oxidation	Oxidation	Reduction	Secondary Oxidation	SAMPLE DESCRIPTION
									0-35'
									silty, sandy, CLAY, lt-med brown, dry, some roots, (Alluv)
10									
20									
30									> 32' damp
									35-40'
40									silty, sandy, clayey, GRAVEL, med brown, quartzite & chert pebbles, wet, (Alluv)
									weathered GRANEROS @ 40' = TD
50									* hole drilled out to 8¾" w/ 4¼ HSA & converted to MW.
60									
70									

Alteration %

L = Limonite (Lmn); SOX Surf. Oxidation; Rd. Reduced; Rdt. Reduction; P = Pyrite (Pyr); P_T = Pyrite Tarnish

POX = Primary Oxid.; BSOX = Base of Surf. Oxid.; 2OX = Secondary Oxid.; Tz = Transition Zone; Fld = Feldspar

(Amounts in Percent, %)

T = Trace; 1 = Minor; 2 = Moderate; 3 = Abundant

C = Carbon; K = Kaolin; B = Bleached; Cht = Chert

380-2
No.

Office of State Engineer
DOCUMENT FILE

Darrel Hawthorne
Custer
Ground Water Supply
Well No. 2.
NW. 1/4 NW. 1/4 Sec. 17-6 S-1E
Custer County

Proj. No. 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
Cliff Irrigation Project, Well 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 1951

Recorded in Book 3 Permits Pg. 4

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 1953

Approved Sept. 14 1951

DEAN E. LOUCKS State Engineer.

Map No. 09-2

Form 20—Application for Permit to Appropriate Water—Original Ground Water

NO. 380-2

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

RECEIVED
District 4: PM.
JUN 1957
OFFICE OF STATE ENGINEER
PIERRE, S. DAK.

APPLICATION FOR PERMIT

To Appropriate Water within the State of South Dakota

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

Trans 12-27-76

1. Name of applicant ~~Darrel Hawthorne~~ Henry C. Hollenbeck

Postoffice address ~~Sanator~~ Star Route, Edgemont 57735, County Custer, State S.Dak.

I. If a corporation None

(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, $

2. Name of well Golden Cliff Irrigation Project Well No.2

3. Quantity of water claimed 800 gal. per min.

4. Source of water supply (estimated depth) 376

5. Location of well (subdivision) NW 1/4, NE 1/4, Sec. 17, T. 6 S., R. 1 E.

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, ovverhead 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.) None

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

8. Estimated cost of works:

(a) Head gates, $..... (b) Pumping plant, $ 2000.00

(c) Flaming, $..... (d) Canal-earth, $..... Rock, $.....

(e) Other structures Pipe 5000 ' ..... $ 6000.00 Total, $ 13000.00

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	FEET FROM	LOG OF WELL	
0	40	Shale and Top Soil	
40	90	Dakota Sand	
90	96	Fuson Formation	
96	370	Lakota Sand	
370	37	Morrison 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 dimensions where reductions in size are made.)

(e) Was water tested for irrigation purpose?

Result: Excellent

10. Time required for completion of work 2 years.

11. Time required for complete application of water to the proposed beneficial use 1½ 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 } ss.

I, Darrel 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 Darrel Hawthorne

Subscribed and sworn to before me this 22 day of June, 19 31

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

STATE OF SOUTH DAKOTA
County of Hughes } ss.

Pierre, South Dakota, Sept. 12, 1951, 19

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, 19 51 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.

DEAN E. LOUCKS State Engineer.

Number of permit 360-2

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, , 19 51

Approved Sept. 12, , 19 51, Recorded in Book 1 Water Permits Page 4

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, , 19 52

2nd. The whole of said work is to be completed on or before Sept. 12, , 19 53

3rd. The limit of time for proof of beneficial use of water appropriated in accordance herewith is Sept. 12, , 19 53

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 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., 19 51.

DEAN E. LOUCKS State Engineer.

Certificate of Construction issued SEPTEMBER 9, 19 77

Water License issued SEPTEMBER 9, 19 77

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

Location	Sec.	Twp.	Rge.	Acres
NW ¼ NW ¼	17	6 S.,	1 E.,	34.40
NE ¼ NW ¼	17	6 S.,	1 E.,	5.07
SW ¼ NW ¼	17	6 S.,	1 E.,	35.25
SE ¼ NW ¼	17	6 S.,	1 E.,	38.30
N ½ NE ¼	18	6 S.,	1 E.,	10.46
	Total,			123.48

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

Form 16

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 380-2 .

(1) WHEREAS, On the 29th day of June A. D. 19 51

Darrel Hawthorne

made Water Right Application No. 380-2 for a permit to use 1.78 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 29, 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 E½ NW¼, Section 17, T6S, R3E

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 NW¼, Section 17, T6S, R1E and conduct to and upon 60 acres in the E½ NW¼, 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. 380-2

Water Diversion No. 2 Fall River Water District

CERTIFICATE OF CONSTRUCTION

This is to Certify, That Henry C. Hollenback

the holder of Permit No. 380-2, issued upon Application No. 380-2, 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 NW¼, Section 17, T6S, R1E, for irrigation purposes, 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

9--Notice of Intenti 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 NW¼ of the SW¼ of Section 6, Twp. 65., 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 NW¼ of the NW¼ of Section 17, Twp. 65., Range 1E. Said water to be used for the purpose of providing irrigation on the following described land: NW¼ Sec. 17, NE¼ NE¼ Sec. 18, NW¼ Sec. 6, W½ NE¼ Sec. 6, NW¼ SW¼ Sec 6, E½ SW¼ Sec. 6, W½ SE¼ Sec. 6, NE¼ NW¼ Sec. 7, and NW¼ NE¼ Sec. 7. T. 65., 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.

NCSimt
Enc.
cc: Richardson

DEAN W. LOUCKS
State Engineer

Hydro ID 710
Form 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; fills 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 NW¼, 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:

E½ of NW¼ 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:
E½ NW¼ 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 Commission 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)
) ss.
County of _____)

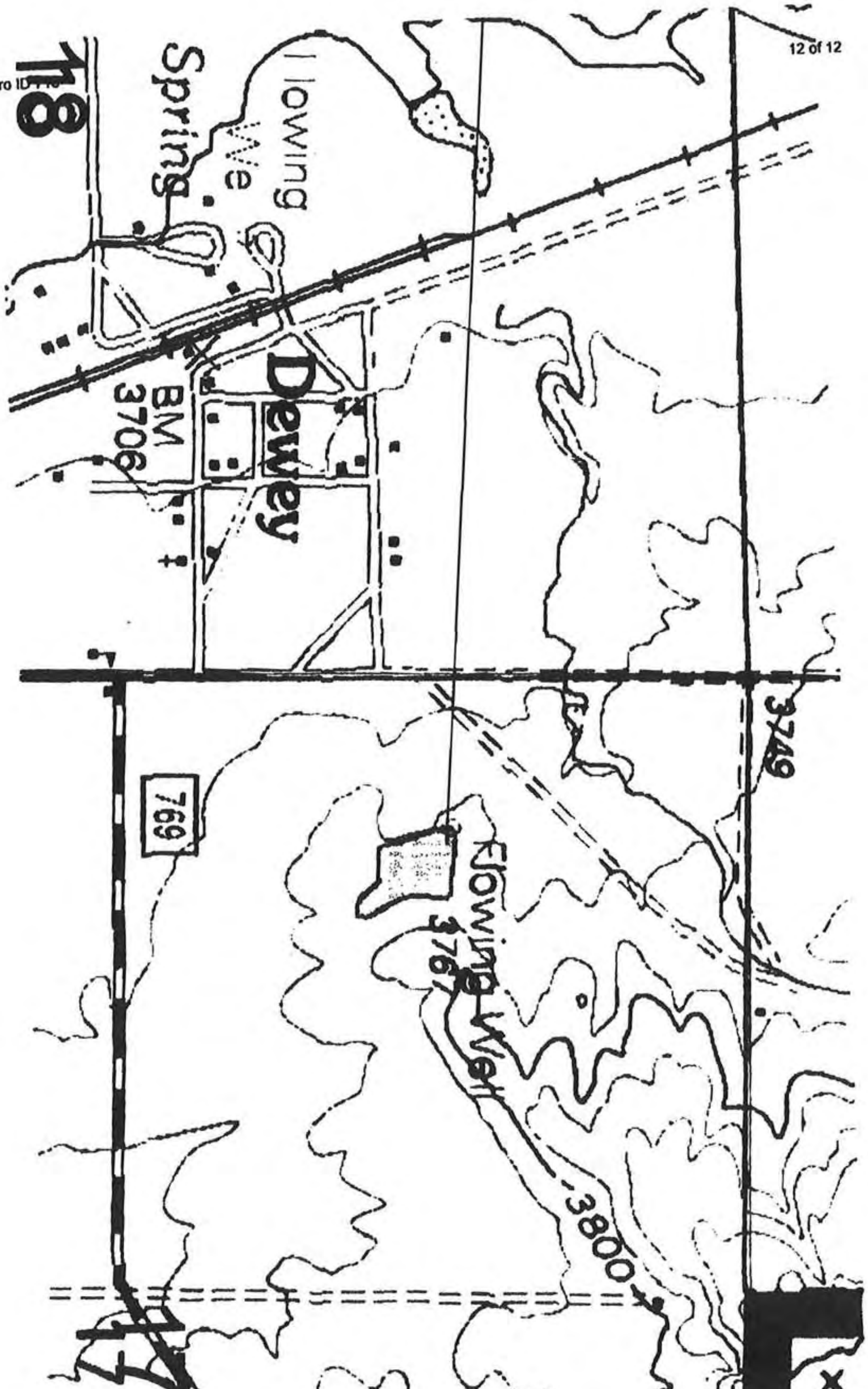
I, Henry C. Hollenbeck being first duly sworn on my oath depose and say: That my relation to the above described undertaking is that of Owner, that I have read the above foregoing statement, and I know of my own personal knowledge that the information herein stated is true.

Henry C. Hollenbeck
(Signed)

Subscribed and sworn to before me this 24th day of Nov, 19 75

Gerald E. Beard
(Notary Public)

POWERTECH (USA) INC.



POWERTECH (USA) INC.

4-24-08

Hydro ID 3026

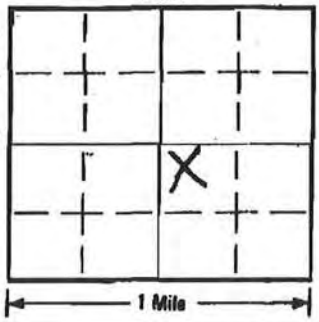
SOUTH DAKOTA WATER WELL COMPLETION REPORT

1 of 1 07-92

Location NW ¼ SE ¼ Sec 1 Twp 7S Rg 1E

County Fall River

Please mark well location with an "X"



Well Completion Date 3-26-08

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	DEPTH TO
Full River	0	55
Fuson	55	80
Lakota	80	166

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
SDR21 LB/FT	6 IN	0 FT	166 FT	8¾ 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	34	15.2 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 .020 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: Respec

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: Airlift at 150'

☐ Bailed

☐ Other

Pumping Level Below Land Surface

____ ft. After ____ Hrs. pumped ____ GPM

____ ft. After ____ Hrs. pumped ____ GPM

If pump installed, pump rate ____ GPM

RECEIVED
APR 28 2008
WATER RIGHTS PROGRAM

REMARKS Dewey Burdock

8-1-6

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 Equitable Property Holder: ____

Date: 4/22/08

POWERTECH (USA) INC.

FORM U.W.-1 Hydro ID 5002
Rev. 7/89
FILING FEE SCHEDULE ON REVERSE SIDE

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E CHEYENNE, WYOMING 82002
(307) 777-6163

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.

9603508I
50.00
6/14/07

FOR OFFICE USE ONLY

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

Temporary Filing No. U.W. 463-211

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?_____.

[X] 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 7/19/07

[ ] 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)

[X] Miscellaneous: Per call 7/19/07 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.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.

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 7/19/07
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	NE¼				NW¼				SW¼				SE¼				TOTAL
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
41	60	28											X						1 Stock Tank

SEE REVERSE SIDE

Permit No. U.W. 183561 Book No. 1329 Page No. 61

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 Putnam & Putnam, 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 Putnam & Putnam, 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 water righted. Well was 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.

[signature] Date ______, 20 __
Signature of Applicant or Authorized Agent

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 A.M.

Permit No. U.W. 183381

[signature]
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, 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 29th day of October, A.D. 20 07.

Cheryl Verplancke
for PATRICK T. TYRRELL, State Engineer

October 16, 2007 - Statement of Completion on 1936 received.
Beneficial Use assumed as of date of completion.

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 4816460 Easting 574367 (meters) per card record 10/23/07
   State Plane Coordinates: Zone ____ Northing ____ Easting ____ (feet)
   Land surface elevation (ft. above mean sea level) ____ Datum ☐ NAVD29 ☐ NAVD88
   Source ☐ GPS ☐ Map ☐ Survey ☐ Unkown ☐ 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~ FLOWS 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 ____ (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 UNKNOWN
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 AF/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

Hydro ID 5002 4464

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 635 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 X 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. Tatman for Tatman & Tatman L.L.P.
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 , 20

Date of Approval 10-29 , 20 07

Date of Priority June 12 , 20 07

Cheryl Verplancke
for State Engineer

POWERTECH (USA) INC.

NO MATCH SWSW 15-6S-1E SPENCER

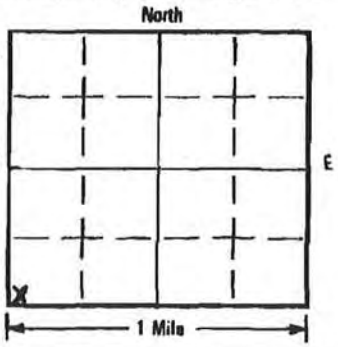
SOUTH DAKOTA WATER WELL COMPLETION REPORT

07-92

Location SW ¼ SW ¼ Sec 15 Twp 6S Rge 1E

County Custer

Please mark well location with an "X"



Well Completion Date: Jan 98

Well Owner: Don Spencer

Business Name:

Address: HCR 59 Box 74 Edgemont SD 57735

WELL LOG:

FORMATION	DEPTH FROM	DEPTH TO
Mowry Shale	0	80
Newcastle Sand	80	140

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: Air Rotary

CASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe:

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
200 LB/FT	5 IN	0 FT	140 FT	7¾ 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	11	Liquid lb./gal	0 ft.	80 ft.
		lb./gal	ft.	ft.

Describe grouting procedure: Pumped

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 5 IN Length 60 FEET

Material PVC

Slot Size .025 Set From 80 Feet to 140 Feet

Other information:

WAS A PACKER OR SEAL USED? ☒ YES ☐ NO

If so, what material? Rubber packer @ 80ft

Describe packer(s) and location?

DISINFECTION: Was well disinfected upon completion? ☒ YES, How: Chlorine Tablets ☐ NO, Why Not?

Laboratory sent to for water quality analysis

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 ☐ Bailed ☒ Other

Describe: Airlift 15-20 gpm

Pumping Level Below Land Surface

____ ft. After ____ Hrs. pumped ____ GPM

____ ft. After ____ Hrs. pumped ____ GPM

If pump installed, pump rate ____ GPM

FEB 1999 WATER RIGHTS PROGRAM Pierre, SD

REMARKS

This well was drilled under license # 1003

And this report is true and accurate.

Drilling firm: Overholser Drilling

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder: Don Spencer

Date: January 20, 1999

POWERTECH (USA) INC.
NO MATCH SWNE 18-6S-1E BNRR

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 ≈ 250ft)

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 _____

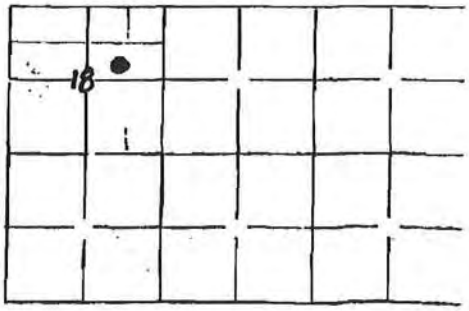
PRIORITY Date Received 1-27-86 Fee $150.00 Remarks _____

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 SW¼ NE¼ section 18 T6S-R1E



Land to be Irrigated N.A.

Well Log: Driller Roby Drlg. Licensed YES X NO ___

Depth of Well ≈ 250 ft. REMARKS _____

Type of Map Plat. PREPARED BY Burlington Northern Reviewed and the Number assigned on Feb. 4, 1986 By K.C. Larson

POWERTECH (USA) INC.

NO MATCH SWNE 18-6S-1E BNRR

FORM 2: Application for uses other than irrigation (type or print)

Mail to: Water Rights Div.
DWNR, Foss Bldg.
Pierre, SD 57501
(605) 773-3352

No. 1954-2 Hydrologic Unit 10120107
Map No. Same Basin Upper Cheyenne
Newspaper Custer Co. Chronicle, Rapid City, Custer (WY)

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 ☐

RECEIVED JAN 1986 DIVISION OF WATER RIGHTS Pierre, SD

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. (308) 762-6000 Ext: 2238
   Post Office Address Box 597, Alliance, (Street, RR or Box) State Ne Zip Code 69301
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 SW¼ NE¼ 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 _____)ss

I, Burlington Northern Railroad Co. the applicant, certify that I have read the foregoing application, have examined the attached map and that the matters therein stated are true and that I intend, and am able to complete the necessary construction.

Signed R. L. Wolfe

Subscribed and sworn to before me this 30th day of December 19 85

ORIGINAL NOTARY - State of Nebraska KATHY J. HURLBERT My Comm. Exp. June 28, 1986

Kathy J. Hurlbert
Notary Public (or other qualified officer)

NO MATCH SWNE 18-6S-1E BNRR

WATER PERMIT

The Water Management Board hereby approves Water Permit Application No. 1954-2

Burlington Northern RR. Co (Applicant) Box 597, Alliance (Post Office Address)

NE (State) 69301 (Zip Code) With the following qualifications.

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 JOHN HATCH

Division of Water Rights
Dept. of Water and Natural Resources

JUN 20 1986, 19

Form 2A NO MATCH SWNE 18-6S-1E BNRR

Supplemental Information

(type or print in ink)

1. Well Information - Proposed construction SEE ATTACHED PLAN SHEET

a) Drill Hole Diameter 8 3/4 Depth 200-250
6" HOLE THROUGH LAKOTA SAND UNIT WITH 4" SCREEN

b) Casing Type PVC Diameter 6 ID Thickness SCH 200

c) Screen Type PVC Diameter 4" ID Thickness SCH 200

d) Gravel Pack Thickness NO Length of Gravel Pack NO

e) Depth to Top of Water Bearing Material TOP of FALL RIVER 60' TOP of LAKOTA 200 250

f) Depth of Water (ground surface to water level) WELL WILL BE ARTESIAN (EXPECTED 40 GPM FLOW)

g) Distance to nearest existing domestic well: 300 FT

On applicants property BN PROPERTY On property owned by others _____

2. Dugout Information Estimates

a) Surface Dimensions _____ Depth _____

b) Depth to water (ground surface to water level) _____

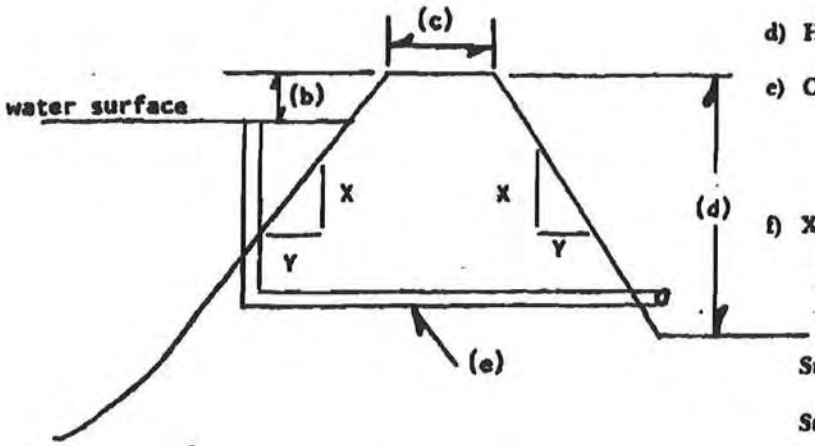
3. Water Storage Dams

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.

a) 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 _____

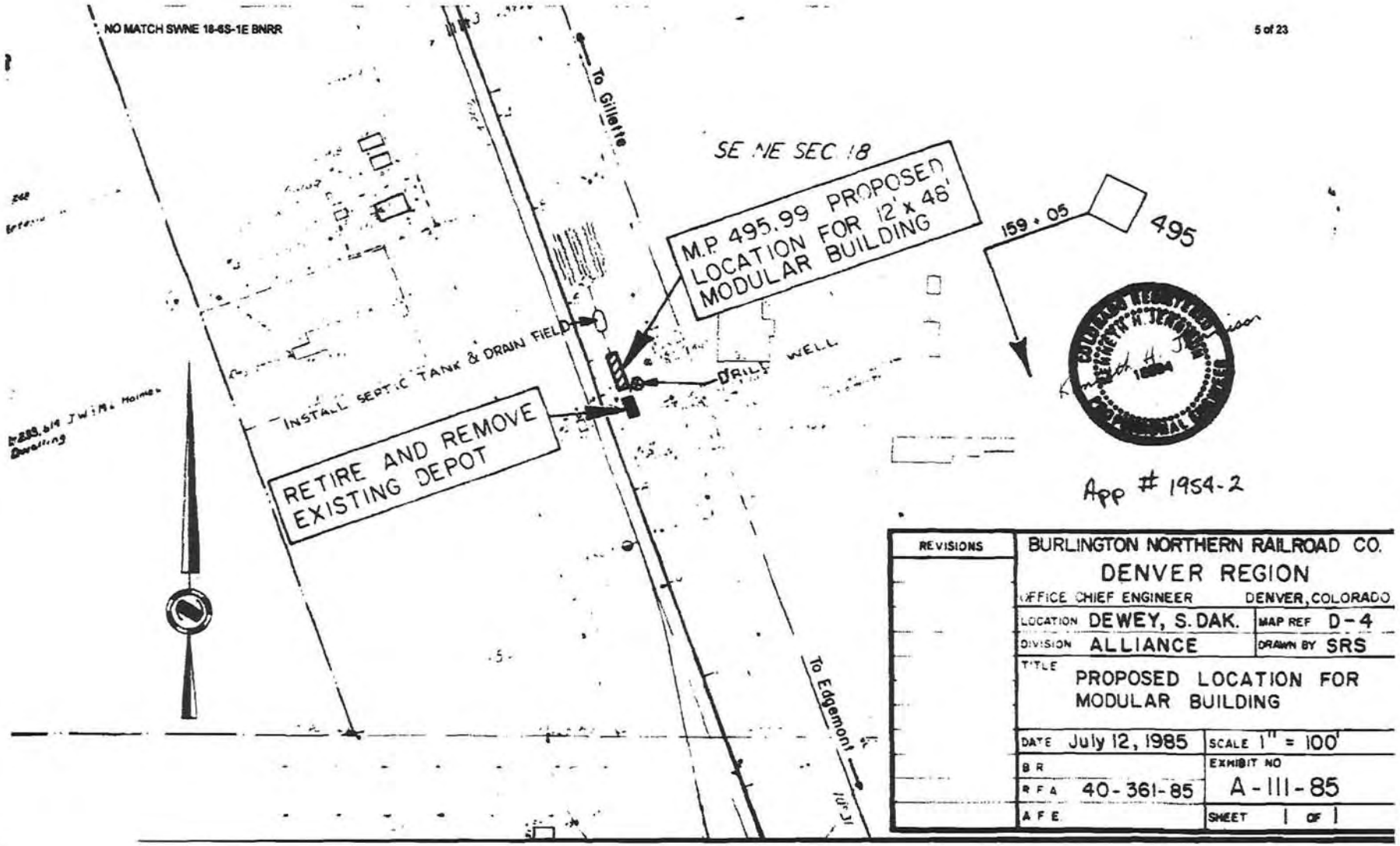
Downstream _____

Surface Area of Impoundment _____

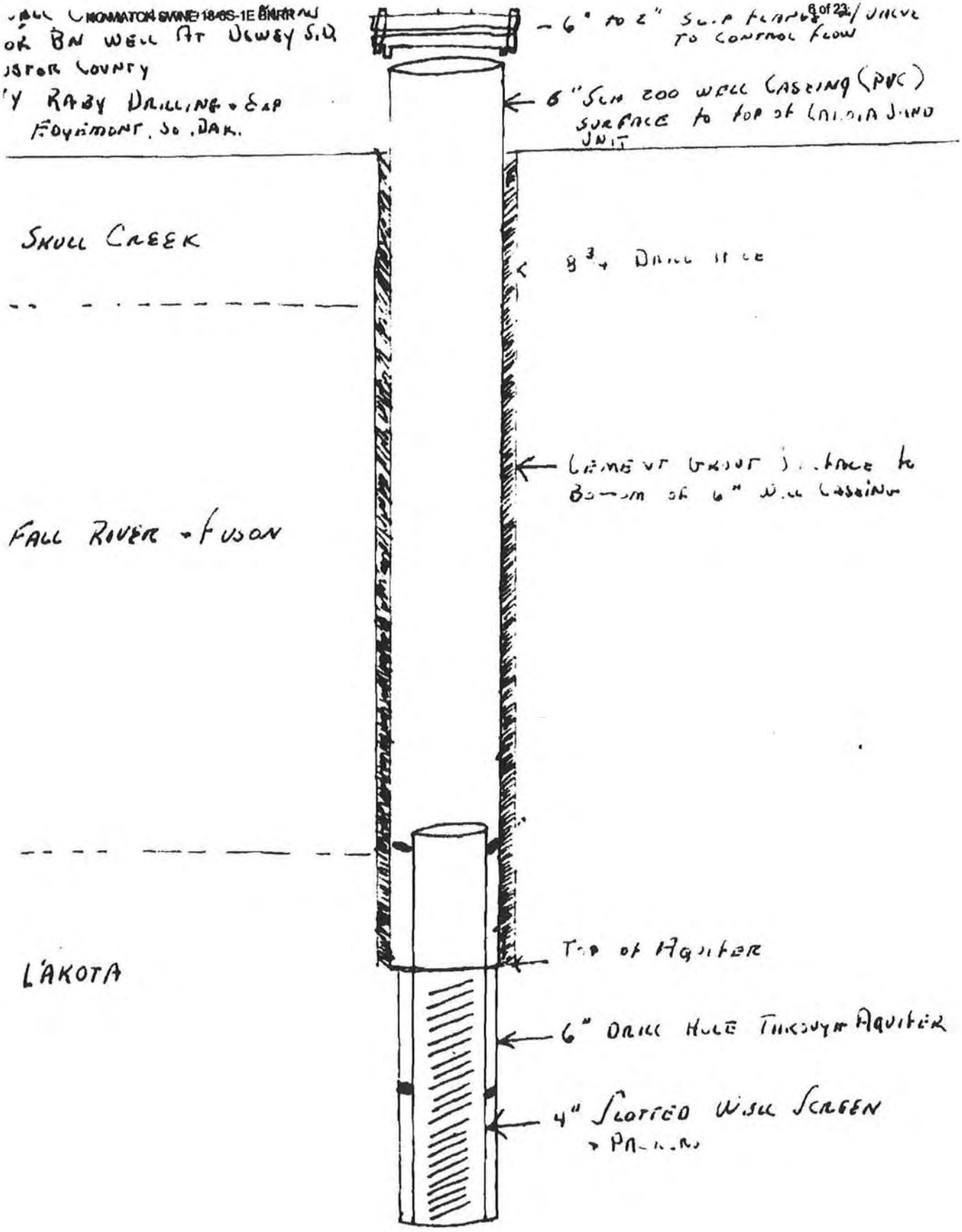
Storage _____ acre feet

Drainage area above dam _____

R. L. Wolsen for B.N.R.R.
Signature of Applicant



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-111-85
	A F E	SHEET 1 OF 1


OR BN WELL AT DEWEY S.D
BY RABY DRILLING & EAP
FOYMONT, SO. DAK.
6" TO 2" SLIP FLANGE / UNION TO CONTROL FLOW
6" SCH 200 WELL CASING (PVC) SURFACE TO TOP OF LAKOTA JOINT UNIT
SKULL CREEK
FALL RIVER - FUSON
LAKOTA
TOP OF AQUIFER
6" DRILL HOLE THROUGH AQUIFER
4" SLOTTED WELL SCREEN

RECEIPT

Division of Water Rights

South Dakota Department of Water and Natural Resources

№ 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

NO MATCH SWNE 18-6S-1E BNRR

SOUTH Dakota Department of
Water & Natural Resources
Joe Foss Building
523 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 69301

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

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 SW¼ NE¼ 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 abundent 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: Meteroic 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 Streamflow 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.

POWERTECH (USA) INC.
NO MATCH SWNE 18-6S-1E BNRR

DWNR 606-11/85

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 SW¼NE¼ 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 19 86 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 SDCL 1-26 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) 46-5-20.1, 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 18-6S-1E BNRR

... Notice ... to Appropriate Water

PROOF OF PUBLICATION

... hereby

... Notice of Intent to Appropriate ...

... and State of South Dakota ... newspaper in the following ...

Signature

Title

Subscribed

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 - Inyan Kara 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 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 2[illegible], Joe Foss Building, 523 E. Capitol, Pierre, South Dakota, May 14, 1986 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 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 SDCL 1-26, must file a written petition with both the applicant and the Chief Engineer [illegible]. 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 under the provisions of SDCL 46-1-[illegible], 46-1-12 thru 46-1-15; 46-2-[illegible], 46-2-11, 46-2-13, 46-2-17; 46-2A-[illegible] 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, 46-6-3, 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14; and Board Rules ARSD 74:02:01:01 thru 74:[illegible]:15;

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 ensure 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 [illegible] days upon written request of [illegible] or any person who has [illegible] to oppose or support the [illegible] request for extension [illegible] Chief Engineer by May [illegible]

0182 03-26-86

04-02-86

SOUTH DAKOTA

Department of
Water & Natural Resources

1954-2

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 5930i

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 acquistion 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 18-6S-1E BNRR

JUL 1986 DIVISION OF WATER RIGHTS Pierre, SD

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. L. Wolfe - 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 18-6S-1E BNRR

19516628

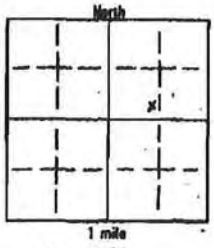
SOUTH DAKOTA WATER WELL COMPLETION REPORT

10-85

Location SW ¼ NE ¼ Sec. 18 Twp. 6S Rg. 1E

County CUSTER

Please mark well location with an "X"



Well Completion Date Sep. 10-86

PROPOSED USE:
☒ Domestic ☐ Municipal ☐ Test Hole
☐ Irrigation ☒ Industrial ☐ Stock

Method of Drilling: ROTARY MUD.

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

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
SCH 200 LB/FT	6" IN	0 FT	240 FT	8¾ IN
SCH 200 LB/FT	4" IN	200 FT	340 FT	6" IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUT:
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 SLRY TO 1 BAG CEMENT W/2% GEL PUMPED CEMENT THROUGH CASSING & UP OUTSIDE
What was grout weight? 94 LBS TO 5 GAL LB/GAL

SCREEN: ☐ Perforated pipe ☒ Manufactured
Diameter 4 IN Length 100 FEET
Material SCH 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 PACKERS ON SCREEN 200' 240' 300'

Was packer or seal used? ☒ YES ☐ NO
If so, what material? NEOPRENE
Describe packer(s) and location? PACKERS ON SCREEN ASSY FOR CENTERLIZERS AND POSSIBLY SAND SCUFF

Was well disinfected upon completion? ☒ YES ☐ NO
Explain 2 GAL CLOROX MIXED WITH LAST WASH OUT.
Bacteriological analysis ☐ YES ☒ NO
Laboratory sent to

Well Owner:
Name BN RAIL ROAD (ATTN) RL. WOLZEN
Address BOX 97 ALLIANCE NEB 69301

Well Log:

Formation	Depth From	Depth To
SKULL CREEK SHALE	0	90
FALL RIVER	90	180
FUZON	180	190
DAKOTA SHALE LIMESTONE - CLAY	190	230
DAKOTA SAND STONE	230	240
" " "	240	330
SHALE & CLAY	330	340

STATIC WATER LEVEL 0 FT 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, SEALED SYSTEM

WELL TEST DATA:
☐ Pumped
☐ Bailed Describe:
☐ Other
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: Bruce P Raby
Signature of Well Owner: REPRESENTIVE
X Richard L Wolzen BNRR.
Date Oct 1-86

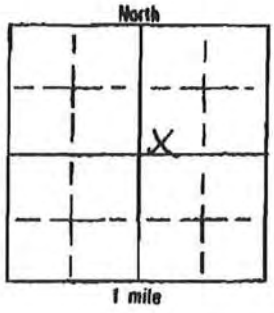
SOUTH DAKOTA WELL AND TEST HOLE PLUGGING REPORT

10-85

Location SW ¼NE ¼ Sec 18 Twp 6S 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
SDDENR

DATE: June 1, 2001
PROJECT NO
FROM: John Trumbo

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
X NO

WE ARE SENDING YOU VIA:

___ EXPRESS COURIER ___ MESSENGER SERV. ___
___ U.S. EXPRESS MAIL ___ HAND DELIVERY
X REGULAR MAIL. ___ OTHER ___

THE FOLLOWING:

ITEM NO.	NO. OF COPIES	DESCRIPTION
1	1	SD well and test hole plugging report

___ FOR YOUR APPROVAL X AS REQUESTED
___ FOR YOUR INFORMATION ___ FOR REVIEW AND COMMENT

OTHER ___

REMARKS ___

JUN 2001 WATER RIGHTS PROGRAM Pierre, SD

transict.wk1

CORDILLERAN ENVIRONMENTAL CONSULTANTS, INC.

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.

DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

October 22, 2001

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.

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

Garland Erbele, Chief Engineer
Water Rights Program

POWERTECH (USA) INC.

NO MATCH 20-6S-1E SKM

PLEASE COMPLETE ENTIRE FORM

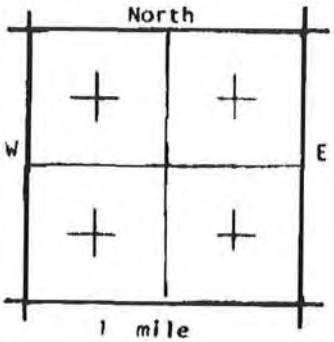
WELL DRILLER'S REPORT
Division of Water Rights
Department of Water & Natural Resources

6/60

Well Owner:
Name Silver King Mines
Address Sturgis, SD

Well Location:

Mark location with an "X"



County Custer
NW ¼ NW ¼ Sec. 31 Twp. 6 S Rg. 1 E

Proposed Use:
/ / Domestic / / Municipal /X/ Test Holes
/ / Irrigation / / Industrial / / Stock

Method of Drilling:
/X/ Forward Rotary / / Bored / / Jetted
/ / Reverse Rotary / / Cable / / Other

Well Construction:
Diameter of Hole 15"
Depth
Casing /X/ Steel / / Concrete
/ / Plastic / / Other
If other, specify

Was casing end left open no
Was a well screen installed yes
Describe Well Screen
Diameter 6 5/8 Material cal.
Slot size
Was well gravel packed yes
Was well grouted yes
Was water sample taken yes

Remarks:

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
/X/ Bailed Describe: bailed 2 hrs.
/X/ Other air lifted ½ hrs.

Pumping Level Below Land Surface
____ ft. After ____ Hrs. pumped ____ GPM
____ " " ____ " " ____ "
____ " " ____ " " ____ "

Well Log:

Formation	Depth From	Depth To
nowery	0	200
skull creek	200	447
fall river	447	539
fusion	539	649
lakota	649	800
morrison	800	850

(Use Back if Necessary)

Date Completed: 10-27-81

Driller:
Forward Drilling 412
Driller's or Firm's Name License NO.
2203 Lincoln, Hot Springs, SD
Address
T H Tefertiller 12-12-81
Signed By Date

DIVISION OF WATER RIGHTS Rec'd

7-19-78 Smith & Assoc. Cornelius #1
10-31-78 (NENE (Sec 27) T6S 1 R.
S. Dak. 0-2 surface (6S 1R)
2-76 Red silty shale streaks of Gyp.
~~72~~ surface pipe set at 72 ft. Down 5 ft. cemented with 18 sack Reg. cement. Out from surface 9-26 15 ft. cement in pipe

76 - 95	Red silty shale streaks of Gyp
95 - 107	White & pink Gyp.
107 - 151	Red silty shale
151 - 194	White & Gray Gyp.
194 - 255	Red silty shale streaks of Gyp
255 - 285	hard Gray limey Gyp streaks of
~~285 - 386~~	Red silty shale
285 - 386	Red silty shale
386 - 422	pink & light lavender limestone.
422 - 429	Red & lavender limey shale
429 - 458	Red silty shale
458 - 482	White Gyp. streaks of Red silty gyp
482 - 508	Red silty shale
508 - 517	white Gyp. streaks of Pink limestone
517 - 520	Red silty shale lost circ.
520 - 539	Red sandy shale
539 - 541	Pink limestone
541 - 570	White & Pink sand
570 - 592	Anhydrite white
592 - 621	Pink & lavender limestone
621 - 638	Pink sandstone
638 - 667	Buff limestone & Pink sand
667 - 723	Gray limestone
723 - 727	Gray shale & anhydrite
727 - 747	Gray Dolomite & black shale
747 - 794	Gray & Pink Dolomite

Cased with 640 ft. 4½ in. black pipe cemented 240 sacks cement, 5 shows

POWERTECH (USA) INC.

NO MATCH NWNE 29-6S-1E SKM

NOTICE OF WELL CONSTRUCTION

Custer

(WELL CONSTRUCTION

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

Well owner Silver King Mines (Name) Box 49 Edgemont, South Dakota (Address) 57735

Date well drilling completed 7-14-80 Purpose of well observation (domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer
0-550	dkgy sh & mdst
550-599	intrbdd fgss & sh
599-619	fgss
619-622	mdst
622-640	fgss
640-700	variegated mdst
700-707	mdst & vfgst
707-716	fgss
716-731	mdst
731-755	fgss w/occ thin mdst layers
755-767	mdst
767-815	fgss
815-820	mdst
820-844	fgss
844-860	mdst

Attach sheet if more space is needed

Depth to top of water producing aquifer 800 ft.

Depth to static water level flowing ft.

Name of producing aquifer (if known) Lakota

Total depth of drill hole 860 ft.

Depth to bottom of casing 800 ft.

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

4½" OD. Sch 40

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

60 ft. open hole

If a flowing well, flow of completed well shut in pressure 3160 Psi G.P.M.

Silver King Mines #406
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 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

NO MATCH 2-7S-4E LINCH

Farm Linch — Index 28CA

County Fall River — Company

Sec. 2 T. 7S R. 1E — Drilled by — Date

Authority Mrs. Linch (Annual 1932) — Type of log

Type of drill — Samples

Elevation — by — method

Remarks [illegible]

1st water — — — — —	177
Striking water — — — — —	369

Well flows size of thumb.

[illegible]

NO MATCH 20-7S-1E TUBBS

[illegible] Tubbs Feb. 4, 193[illegible]
[illegible], S.D.
Fall River County Sec. 2[illegible] Twp. 7S Range 1E

Total Depth 40' Static 26'
Dia. 30"

0-3 top soil
3-24 sand
24-28 gravel
28-40 blue shale

Box

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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Department of Environment & Natural Resources
Tomorrow...Today

Oil and Gas Search for: *api_no_ like '40 047 20045'*

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
Minnekahta	1704
Opeche	1738
Minnelusa	1815
Converse	1838
Red Marker	2237
2nd Leo	2353

Page 1 of 1 (goto top)	Page: 1

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 RL Site approved.

WELL HISTORY

Well Name Petro Lewis # 5-22 Peterson Permit Number 606

Location SW NW 22-7s-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 Rec Dst - 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 Cutting 29 Apr 1971

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
☐ SINGLE ZONE
☐ OIL WELL ☐ GAS WELL ☐ MULTIPLE ZONE

FARM OR LEASE NAME: Peterson
WELL NO: 5-22
OPERATOR: PETRO-LEWIS CORPORATION
FIELD AND POOL, OR WILDCAT: Wildcat
ADDRESS: 1224 Denver Club Building, Denver, Colorado, 80202
NO. ACRES IN LEASE:
LOCATION (Give feet from an established corner of the legal subdivision)*: 1980' FNL, 660'FWL, SW-NW Section 22, T7S, R1E, Fall River County, South Dakota
¼ ¼, SEC. TWP. RGE: SW-NW Sec. 22, T7S, R1E
COUNTY: Fall River
NAME AND ADDRESS OF SURFACE OWNER: Mrs. M. Lenore Peterson
ELEVATION: 3534' Gr.
NO OF WELLS ETC
PROPOSED DEPTH: 2490'
ROTARY OR CABLE TOOLS: Rotary
NAME AND ADDRESS OF CONTRACTOR: Will follow
APPROXIMATE DATE WORK WILL START: 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	SACKS OF CEMENT
12-1/4"	8-5/8"	24#	New	165' Minimum	To Surface

DESCRIBE PROPOSED OPERATIONS. IF PROPOSAL IS TO DEEPEN OF 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 R. J. Doubek — TITLE Manager of Operations — DATE 10/7/70

DO NOT WRITE BELOW THIS LINE

PERMIT NO. 66
CHECKED BY: School and Public Lands — Date
APPROVAL DATE: October 21, 1970
Secretary

CONDITIONS:
A COMPLETE SET OF SAMPLES, AND CORES IF TAKEN, MUST BE SUBMITTED.
CUTTINGS 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 redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate designations.

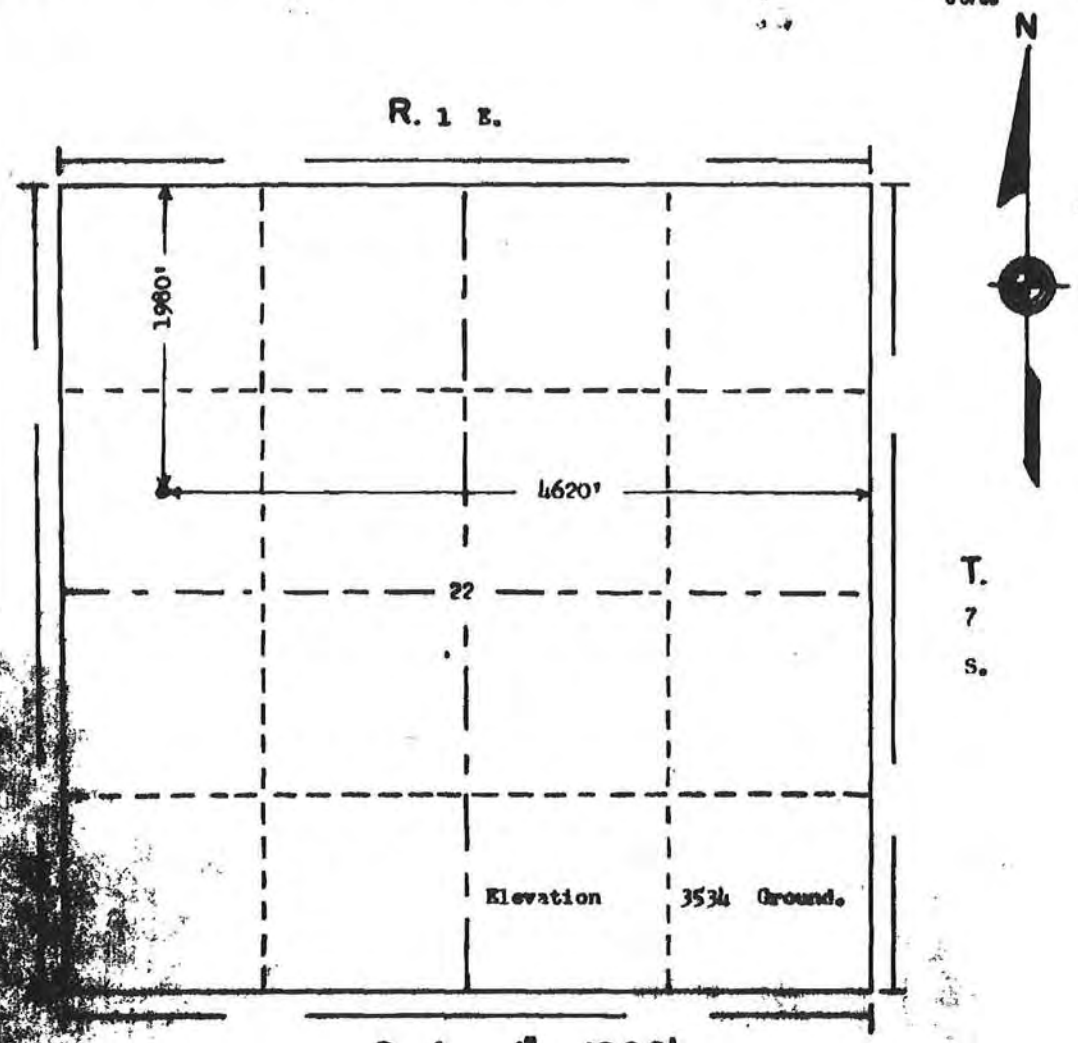
If the well is to be, or has been, directionally drilled, so state and show by attached sheets, if necessary, the coordinate location of the hole in any present or objective productive zones.

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.)

Hydro ID 3

8 of 69



Scale··· 1" = 1000'

Elevation Company, Inc. of Denver, Colorado
in accordance with a request from Owen Stevens
Petro Lewis Corporation
the location of #31 Driftwood Area
1980'FN & 4620'FE Section 22 Township 7 S.
R. 1 E. of the Black Hills Magidian
Fall River County, South Dakota

I hereby certify that this plat is an accurate representation of a correct survey showing the location of #31 Driftwood Area

Date: 7-14-70

Licensed Land Surveyor No. 1212 PE
State of South Dakota

STATE PUB. CO., PIERRE

S. Dak. Oil & Gas Board
FORM 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 reorganization, 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 (if 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, 1970.

SEAL

My commission expires Nov. 3, 1971

Betty D. Brown
Notary Public in and for Denver
County, Colorado

DO NOT WRITE BELOW THIS LINE

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

WELL INSPECTION / SCOUT REPORTS

JUN 25 1971

Number 2

SCOUT REPORT
South Dakota Geological Survey

Date Scouted 6-21-71

Operator Petro-Lewis Permit Number 606

Farm/Lease Name #5-22 Peterson API Number 40 047 20045

SWNW 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 Fred V. Steece Jr.

Ross Lamphere, Ass't. Geologist Fred V. Steece, Principal Geologist

Number 1

SCOUT REPORT
South Dakota Geological Survey

Date Scouted 11-27-70

Operator Petro-Lewis Permit Number 606

Farm/Lease Name # 5-22 Peterson API Number 40 047 20045

SWNW Sec. 22, T. 7S, R. 1E, Fall River County

Elev. 3534 Gr., Est. T.D. 2490, Actual T.D. 2545, Spudded 11-18-70

Contractor A. L. Schlaikjer Geologist Al Nelson

WORK IN PROGRESS:

Logging

DEVELOPMENTS SINCE LAST VISIT:

Drilled to T.D.

DST #1-2381-2395: IHP 1111, FH 1106, IF 20, FF20, IF 30, FF 75, SIP 963, SIP_2 907, Flow, 15 min, SIP. 15 min, $Flow_2$ 45 min, SIP_2 15 min, BHT 96°, mud wt. 9.5, visiosity 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 intermittant blow. Rec: 140 fluid; 60' GCM w/sulfur smell, 80' water w/scum 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.

FORMATION TOPS: (Al Nelson)

Fall River——324	Goosegg——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, 4 1/2 casing ran to 367 and well completed as water well for Peterson farm; flows 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 460 FEL

PERMIT: 606 (10-21-70)
API: 40 047 20045
ELEV: 3534 Gr 3542 KB
CONTR: A.L. Schlaikjer 662-7249 Rainbow Motel
GEOL: Al Nelson Edgemont
ENGR: W.J. McPeters
SPUD: 11-18-70 (1:15 AM)
EST T.D.: 2490
CASING: 8⅝ - 167
CORES: None
DST'S: 2381-2395
LOGS: DIL & Sonic GR
T.D.: 2545 Drlr 2544 Cog
PLUG: 11-27-70

10-29-70
No activity, location staked, but no work done.

11-19-70
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 tonite, ready to plug in A.M.

Plug Program:
40 sax — 2410-2300 Leo
30 sax — 1850-1750 Converse
30 sax — 1130-1030 Band Shale

Plan to run 360 — 4½ casing and convert to water well. Schlaikjer w/ do this before they tear down.

(Leo Sand)
DST #1 - 2391-2395: HP 1111, FH 1106, IF 20 FF 20, IF 30, FF 75, SIP$_1$ 963, SIP$_2$ 907, Flow 1-5 min, SIP 1 - 15 min, Flow 2 - 45 min, SIP$_2$ - 15 min, BHT 96°, mud wt 9.5, viscosity 60; Tool opened with a very weak flow and remained op 5 min, tool open very weak flow ¼" under water remained for 10 min, then intermittant flow. Bypassed tool to see if plugged; Rec 140 fluid; 60' GCM w/sulfur smell, 80' water w/ scum of oil & sulfur smelling gas; Water flowed throughout test.

Resistivity: water .4 @ 62 °F Cl content 18,000 ppm
mud pit spl. 2.6 @ 60 °F
Cl content 2000 ppm

Formation	Depth
Kd	324
Fuson	~~447~~ 452
Lakota	~~508~~ 469
Morr.	700
Sund	848
Lak	966
Basal Sd.	1061
Spear	1174
Goosego	1441
Fosselle Lime	1599
Glendo Sh	1618
Mk	1704
Opeche	1738
Minnelusa	1815
1st Converse	1838
Massive Anhydrite	1911
Base "	1992
2D Converse	1961 – 1991
3D Converse	2076 – 2094
4th Converse	2154 – 2165
Basal Converse	2226
Red Marker	2237 – 2247
2D Leo	2353 –
Des Moines	2416
TD	2548 Drlr
	2544 Log

Site Imp.
Converted to H_2O well
is a good running well.
Area is restored
not real bad area
policed

OPERATOR'S TECHNICAL REPORTS / MAPS

POWERTECH (USA) INC.

Hydro ID 3 — 16 of 69

PHONE 522-1206 AREA 303

VIRG'S TESTERS, INC.

BOX 712 STERLING, COLORADO

Operator Petro-Lewis Corp.
Address See Distribution
Well Name and No. Peterson #5-22
Ticket No. 0786
Date 11-25-70
DST No. 1
No. Final Copies 10

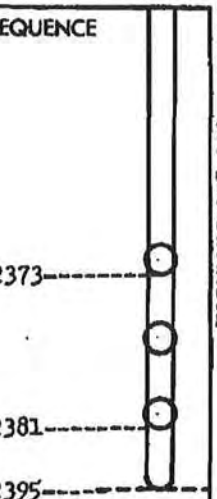
Contractor	A. L. Sohlaikjer, Inc.	Top Choke	1"
Rig No.	4	Bottom Choke	9/16"
Spot	SW-NW	Size Hole	7 7/8"
Sec.	22	Size Rat Hole	None
Twp.	7 S	Size & Wt. D. P.	3½" 13.30
Rng.	1 E	Size Wt. Pipe	None
Field	Wildcat	I. D. of D. C.	2¼"
County	Fall River	Length of D. C.	542'
State	South Dakota	Total Depth	2395'
Elevation	3534' "Ground"	Interval Tested	2381-2395
Formation	"2nd Leo" Sand	Type of Test	Straight

Tool Open @ 10:00 A M.

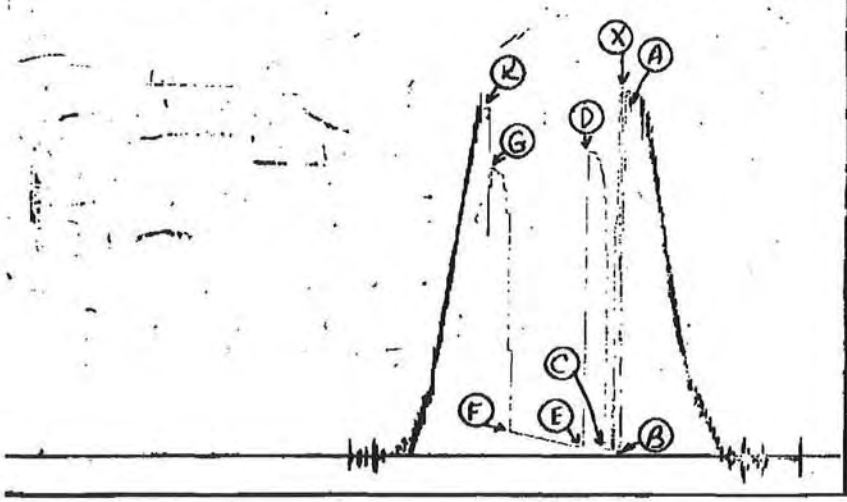
Flow #1 5 Min. SIP #1 15 Min. Flow #2 45 Min SIP #2 15 Min.
Flow #3 ____ Min. SIP #3 ____ Min. Flow #4 ____ Min. SIP #4 ____ Min.

B. H. T. 96° Gravity
Mud Wt. 9.0 Viscosity 60

TOOL SEQUENCE



T-0786 R-4153-N



PRD Make Kuster AK-1
No. 4153 Cap. 2000 @ 2361

Press		Field	Corrected
IH	A	1111	1102 ✓
FH	K	1106	1100 ✓
Flow #1-IF	B	20	4 ✓
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 Bled To			

Our Tester: Lloyd Welty
Witnessed By: S. A. Nelson

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 (¼" 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 anulus 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

Phone 522-1206 **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 °F

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 @ ____ °F

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 [illegible], MAJESTIC BLDG. CODE 303
[illegible] 255-7750 Res. 322-0325
DENVER, COLORADO, 80202

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

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

-3-

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.

FORMATION	DEPTH	DATUM
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)

FORMATION	DEPTH	DATUM
GOOSE EGG FORMATION	1441	+2101
FORELLE LIME MEMBER	1594	
GLENDO 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

LOG FORMATION TOPS (Continued)

FORMATION	DEPTH	DATUM
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.

DEPTH	LITHOLOGY
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, subangular, 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-

	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.

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	GLENDO 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+"/ft. suggests soft, porous sand). (Poor sample, mostly Sundance cave due to water-flow from Dakota-Lakota thinning mud or mudcake). Traces white anhydritic sandstone, very fine, clear grains, soft, no show, to fine, sugary, clean, excellent visible porosity, non-

	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

	porosity, no show, non-calcareous, very fine to fine-plus, clear grains, round, friable.
1988-91	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,

	hard, brittle, part siltier, greenish gray, slightly soft to soft.
2086-89	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 (5½"/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, good yellow fluorescence 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)		

-27-

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.

DEPTH	Rt	POROSITY (from Sonic)	Rw	Sw	FORMATION
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^{o} maximum.

DEPTH	DEVIATION	FORMATION
178	$1/4^{o}$	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".

RUN NO.	MAKE	TYPE	FROM	TO	FEET	HOURS	FORMATION AT BASE OF RUN
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.

DATE	NO. OF DAYS	P.D. DEPTH	FORMATION AT P. D.	STATUS
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

G. Allan Nelson, Consultant
Denver, Colorado
January 26, 1971

Hydro ID 3

South Dak. Petro-Lewis 5-22
Fall River Peterson #5-22
1620' FEL & 1980' FNL, C SW NW
Sec. 22 7S. 1E. 2544 Schlum.
Schlaikjer
Nov. 16, 1970
Nov. 27, 1970
Wildcat - Drift-wood Canyon Prospect
3542 K.B.
D & A.
Ran 4 jts. of ... 8 5/8" sfc csg, totaling ... 8 rd, 20# ...
... Nelson

Petro-Lewis Peterson

1441 +2101 Permian ... Egg Fm.
1520
1600
1534 Forelle Lime Member of Goose Egg
1618 Glendo Shale Member of G.E.
1702
1709 +1838 Minnekahta Lime Member ... of Goose Egg
1739 Opeche Shale Member
1800
1815 +1727 Minnelusa Fm. (Permian) Upper Minnelusa (Permian)
1838 +1704 First Converse Sd.
1900
1911 Massive Anhydrite
1942 Base of Anhydrite
1961 2nd Converse Sd.
1991 Base Second Converse
2100
2094 Base of Third Converse
2154 +1388 Fourth Converse Sd.
2200
2226 Basal Sand
2243
2253 +1290 Red Marker
2300
2353
2396 Base of Second Leo Sd.
2500
2545
T.D. Driller
2544 T.D. Schlumberger

*Spls. examined & described by G. Allan Nelson, Consult. ... Denver


Anhydrite
Pyrite
Fossils
Chert
Muddy Sand (Newcastle)
(behind sfc pipe)
Skull Creek Shale
(behind sfc pipe)
BELOW CORRECTED TO
MATCH LOGS
324
+3218
Dakota Fm. (Fall River Fm)
452
Fuson Shale (Fuson Mem-
469
+3073
ber of Lakota Fm.)
Lakota Sands
(Cave)
700
+2842
Morrison Fm.
832
+2710
Sundance Fm. - Redwater
Shale Member
966
LAK Member of Sundc.
1061
Base of Sand - Top of Permv.
Stockade Beaver Shale
1092
+3366

ADMINISTRATIVE / SUNDRY REPORTS

S. Dak. Oil & Gas Board
FORM 7

PLUGGING RECORD

Operator	Address
Petro-Lewis Corporation	1224 Denver Club Building, Denver, Colorado, 80202

Name of Lease	Well No.	Field & Reservoir
Peterson	5-22	Wildcat

Location of Well	Sec/Twp-Rge or Block & Survey	County
1980' FNL and 660' FWL, SW-NW	Section 22, T7S, R1E	Fall River

Application to drill this well was filed in name of	Has this well ever produced oil or gas	Character of well at completion (Initial production): Oil (bbls/day)	Gas (MCF/day)	Dry?
Petro-Lewis Corporation	No	----	----	Yes

Date plugged:	Total depth	Amount well producing when plugged: Oil (bbls/day)	Gas (MCF/day)	Water (bbls/day)
11/27/70	2544' Logger	----	----	---

Name of each formation containing oil or gas. Indicate which formations 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, ripped etc)	Packers and shoes
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, 19 71

State of Colorado

County of Denver

R. J. Doubek
R. J. Doubek Signature of Affiant

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 therein, and that said report is true and correct.

Subscribed and sworn to before me this 15th day of February, 19 71

Elsie J. Stone
Elsie J. Stone
Notary Public in and for Denver
County, Colorado

SEAL

My commission expires September 24, 1974

DO NOT WRITE BELOW THIS LINE

Approved December 29, 1971
Date

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

Secretary

Dec. 28, 1971

State Geologist

Note: File 2 copies of this form with Secretary, Oil & Gas Board, Pierre.

FEB 1971

S. Dak. Oil & Gas Board
FORM 4

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

FARM OR LEASE NAME: Paterson
WELL NO.: 5-22
FIELD AND POOL, OR WILDCAT: Wildcat
NO. ACRES IN LEASE:

TYPE OF COMPLETION
☐ Oil Well ☐ Gas Well ☐ Dry Hole
☐ New Well ☐ Work-Over ☐ Deepen ☐ Plug Back ☐ Same Zone ☐ Diff Zone

OPERATOR: Petro-Lewis Corporation
ADDRESS: 1224 Denver Club Building, Denver, Colorado, 80202
LOCATION (In feet from nearest lines of section or legal subdivision where possible)*
Surface: 1980' FNL and 660' FWL, SW-NW, Section 22, T7S, R1E
Top prod. interval: Fall River County, South Dakota
At total depth:
¼ ¼ SEC. TWP. RGE.: SW-NW Section 22, T7S, R1E
COUNTY: Fall River

PERMIT NO.	DATE ISSUED	PREVIOUS PERMIT NO.	DATE ISSUED
606	10/21/70	----	------

DATE SPUDDED	DATE T.D. REACHED	DATE COMPL. (Ready to Prod.)	ELEVATIONS (DF, RKB, RT, GR, etc.)*	ELEV. CASINGHEAD FLGE.
11/17/70	11/27/70	P&A 11/27/70	Gr. Elev. 3534'	------

TOTAL DEPTH (MD & TVD)	PLUG, BACK T.D. (MD & TVD)	IF MULTIPLE COMPL., HOW MANY*	INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
2544' Logger	--------	----	⟶	XXXX	------

PRODUCING INTERVAL(S), THIS COMPLETION, TOP, BOTTOM, NAME (MD & TVD)*: Dry Hole
DATE DIRECTIONAL SURVEY SUBMITTED: None

TYPE ELECTRIC AND OTHER LOGS RUN (Circle those filed): Dual Induction Laterolog, Compensated Borehole Sonic - Gamma Ray
WAS WELL CORED: No

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"	167' KB	12-1/4"	20#	Surface casing	100 sx.	None

LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)
None				

TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
None		

PERFORATION RECORD

DEPTH INTERVAL (MD)	HOLES PER FT.	SIZE AND TYPE	PURPOSE
None			

ACID, SHOT, FRAC., CEMENT SQUEEZE, Etc.

AMOUNT AND KIND OF MATERIAL USED	DEPTH INTERVAL (MD)
None	

PRODUCTION

DATE FIRST PRODUCTION	PRODUCING METHOD (Flowing, gas lift, pumping,—size & type of pump)	WELL STATUS (Prod. or shut-in)
Dry Hole	------	P&A 11/27/70

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PRODUCTION FOR TEST ⟶	OIL, Bbls.	GAS, Mcf.	WATER, Bbls. & %	OIL GRAVITY-API (Corr.)

FLOW. TUBING 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

I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED: R. J. Doubek TITLE: Manager of Operations DATE: 2/15/71

R. J. Doubek

DO NOT WRITE BELOW THIS LINE
See Instructions On Reverse Side

Approved _____ Date _____

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

_____, Secretary

STATE PUB. CO., PIERRE

S. Dak. Oil & Gas Board
FORM 6

SUNDRY NOTICES AND REPORT ON WELLS

FARM OR LEASE NAME: Peterson

WELL NO.: 5-22

FIELD AND POOL, OR WILDCAT: Wildcat

NO. ACRES IN LEASE:

¼ ¼ SEC. TWP. RGE.: SW-NW Section 22, T7S, R1E

COUNTY: Fall River

☐ OIL WELL ☐ GAS WELL ☐ ______ ☒ DRY

OPERATOR: Petro-Lewis Corporation

ADDRESS: 1224 Denver Club Building, Denver, Colorado, 80202

LOCATION (In feet from nearest lines of section or legal subdivision, where possible):
1980' FNL and 660' FWL, SW-NW Section 22, T7S, R1E
Fall River County, South Dakota

ELEVATION (DF, RKB, RT, GRD, etc.; how determined): Gr. Elev. 3534'

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	XXX			(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)

T. D. 2544' Logger

Date of Work 11/27/70

We propose to plug and abandon this well as follows:

40 sx. cement from 2300'-2420'
30 sx. cement from 1750'-1850'
30 sx. cement from 1030'-1130'

(Contractor will run pipe to complete as water well for landowner. Pipe will be set at 350'. (Dakota).

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 R. J. Doubek (signature) R. J. Doubek TITLE Manager of Operations DATE 2/15/71

DO NOT WRITE BELOW THIS LINE

Approved ______ Date

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

CONDITIONS, IF ANY: ______ Secretary

See Instructions On Reverse Side

FEB 1971

CORRESPONDENCE

AMERICAN STRATIGRAPHIC COMPANY
17 NORTH 31ST STREET • BILLINGS, MONTANA 59101 • PHONE 252-7647

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:

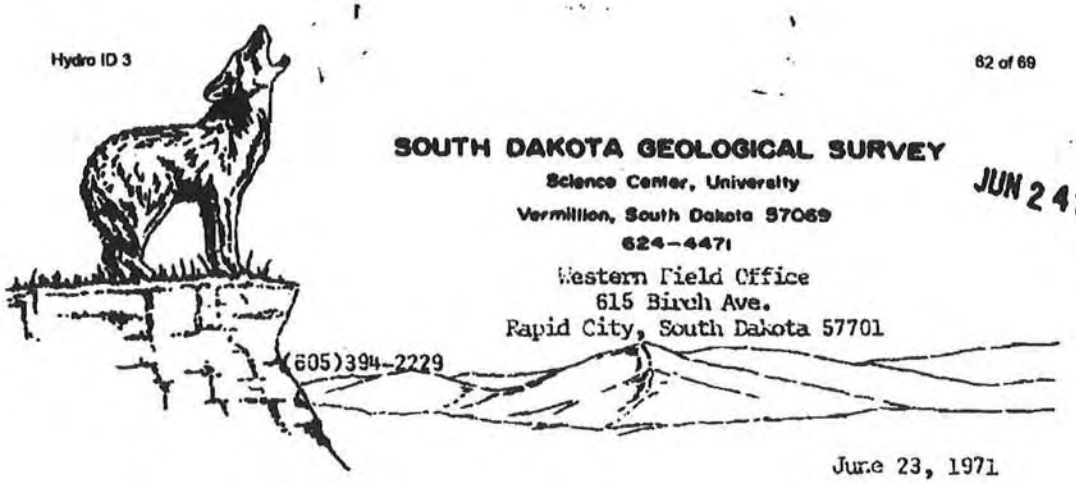
Petro-Lewis Corp. #14-14 Childers
14-8S-2E, Fall River Co., S. D.

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 McCotter
Manager



SOUTH DAKOTA GEOLOGICAL SURVEY
Science Center, University
Vermillion, South Dakota 57069
624-4471

Western Field Office
615 Birch Ave.
Rapid City, South Dakota 57701
(605)394-2229

JUN 24 1971

June 23, 1971

Dr. Duncan J. McGregor
State Geologist
South Dakota Geological Survey
Science Center USD
Vermillion, South Dakota 57069

Dear Dunc,

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, SESE 11-11-4E, Fall River County

As soon as all other requirements have been met I recommend the release of bond.

Sincerely

Fred

Fred V. Steece
Principal Geologist

FVS/dme
cc: Petro-Lewis Corporation

Webb Resources, 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 logs

DEC 16 1970

Western Field Office
615 Birch Avenue
Rapid City, South Dakota 57701
((605)394-2229

December 15, 1970

Mrs. M. Lenore 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 NE 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 57051

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

DEC 1 [illegible] 1970

Western Field Office
615 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 Driscol 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-Lewis #5-22 Petersen located in SW¼ 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 5/8 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 sax—2410-2300 across the Leo sand
30 sax—1850-1750 across the Converse sand
30 sax—1130-1030 across the Basal Sundance sand

If there is further information you need on this well, please let me know.

Sincerely

Fred V. Steece

Fred V. Steece
Principal Geologist

cc: Duncan J. McGregor
State Geologist

Miss Alma Larson
Secretary, Oil and Gas Board

SURETY

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 County of: Denver In the 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 [redacted] ($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 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 NO/100 ($20,000.00) DOLLARS- - - - - - - - - - - - - - -

Witness our hands and seals, this ... day of ...

PETRO-LEWIS CORPORATION
By W. A. Crawley
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 80203
AREA CODE 303 / 792-1230

THE TRAVELERS INDEMNITY COMPANY
By G. A. Talbert
G. A. Talbert, Attorney-in-Fact — Surety

(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 October 21, 1970 (Date)

OIL AND GAS BOARD OF THE STATE OF SOUTH DAKOTA
By ..., Secretary

Countersigned in South Dakota
By Francis T. Schmid
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

Department of Environment & Natural Resources
Tomorrow...Today

Oil and Gas Search for: *api_no_ like '40 047 05093'*

Page 1 of 1	Download Database (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

Formation	Depth (ft.)
Dakota Mud	185
Lakota	371
Morrison	471
Sundance	670
Minnekahta	1518
Opeche	1557
Minnelusa	1645
Red River	2108

Page 1 of 1 (goto top)	Page: 1

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 (44-15) Peterson
660 FSL, 660 FEL
SE SE, -15-7S-1E
Fall River Co.

Surface + mineral owner.
F.A. Peterson
Edgemont, So. Dak.

Contractor: Barnhart Drilling Co.
Casper, Wyo.

Elev: 3576 gr
3585 K.B.

Est T.D. 2500 1st Sed.

Permit: 2-18-65 #382.

Plan to Set 500' 8 5/8, Core + test 1st Sed. + Run Dual Induction-laterlog + GRS

water flowed about 4/50

Crane #7 Rainbow.
971' 8 5/8

March 2, 1965

Coring at 2175'
@ 2179

986.54 of 8 5/8
w/ 450 sx of Cem.
+ 125 sack
Cemented 971

Dave Benson - Geol.

2-19-65
John Ryan of P.I.
Called + Said Barnhart
was Contractor + they were
on location.

2-20-65
Dighe Called at 11:00
A.M. Said Barnhart was
Contractor + had spudded
at 1:30 AM 2-20-65
~~Dick Cooper Geols~~
Don Brause - Eng. pusher.
(Wayne will not be out until
reach Minnelusa

Not Tite
nothing will be tile.

Feb 24, 1965
@ 974
[illegible]

ml
Tops log E.
Dak 185
Lak 371
Morr 471
Sun 670
L 771. top Sun Sand.

Sample. top
mk. - 1527
ml - 1652

Lak + Sun flowed.

1st Sed being Cored.
est. TD. 2500

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 ☐ SINGLE ZONE

☒ OIL WELL ☐ GAS WELL ☐ MULTIPLE ZONE

FARM OR LEASE NAME: Peterson
WELL NO.: #1 (44-15)

OPERATOR: The Superior Oil Company
ADDRESS: P. O. Box 200, Casper, Wyoming

FIELD AND POOL, OR WILDCAT:
NO. ACRES IN LEASE: 2846.03

LOCATION (In feet from an established corner of the legal subdivision)*: 660' FSL & 660' FEL Sec. 15-7S-1E

¼ ¼ SEC. TWP RGE: SE SE 15-7S-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: 2-22-65

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 OF 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. Dukes — TITLE: District Engineer — DATE: 2-11-65

DO NOT WRITE BELOW THIS LINE

PERMIT NO. [illegible]
CHECKED BY: Bernard Linn, School and Public Lands — Date 2/17/65
APPROVAL DATE [illegible] — Secretary
CONDITIONS:
☐ COMPLETE SET OF SAMPLES, AND CORES IF TAKEN, MUST BE SUBMITTED.
☐ SAMPLES, AND CORES IF TAKEN, BELOW [illegible] 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 redrill 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.

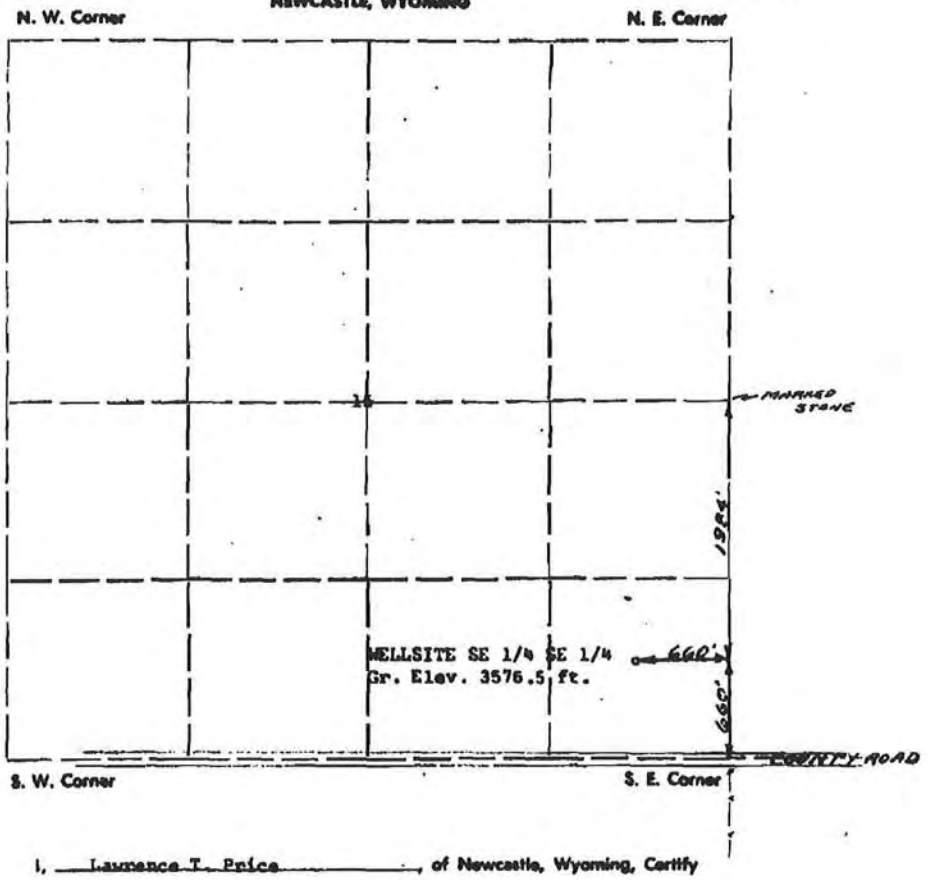
(*Sample location: 660' South and 660' East of the Northwest Corner of Section 16.)

TRI-STATE COMPANY

X 787 746-47

NEWCASTLE, WYOMING

Hydro ID 4 — 6 of 63



I, Lawrence T. Price, of Newcastle, Wyoming, Certify that in accordance with a request from J. P. Dujka of Casper, Wyoming, for The Superior Oil Company P. O. Box 200, Casper, Wyoming I made a survey (date) February 9 19 65 for the location and elevation of the Peterson No. 1 (44-15) oil wellsite

As shown on above map, the well site is in center SE 1/4 SE1/4 Section 15, Township 7 South, Range 1 East, Fall River County, South Dakota. Elevation is 3576.5 feet above mean sea level before dozing.

Lawrence T. Price
Licensed Surveyor No. 1311