

WATER PERMIT NO. 1806-1

Name of Applicant: Luff Exploration Company

Address: 1580 Lincoln St, Suite 850, Denver CO 80203

Phone: 303 861-2468

Amount of Water Claimed: 87.5 gpm (0.194 cfs)

Total Acres: NA

Source of Water Supply: groundwater

Water to be used for: industrial use

County: Harding

Type of Waste Disposal System:

Location:

PRIORITY

Date Received: 8-26-03

Application/License Fee: \$200

Corrected Application Received:

Period of Annual Use: January 1 – December 31

Remarks:

Diversion Point: NE ¼ NW ¼ Sec 25-T23N-R5E

Land to be Irrigated: NA

Depth of Well: 9,255 feet deep

Well Driller:

Remarks:

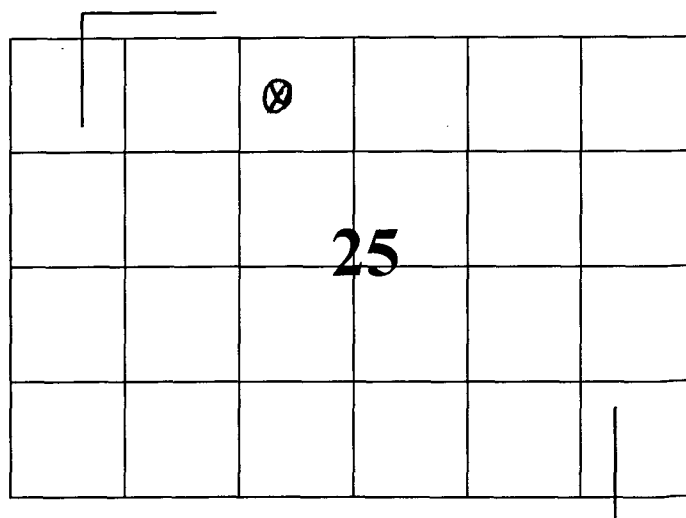
Type of Map: plat

Prepared by:

Reviewed and the Number Assigned on: 8-26-03

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____



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

Mail to:
Water Rights Program
Joe Foss Building
523 E. Capitol
Pierre, SD 57501-3181
(605) 773-3352

No. 1806-1 (office use only)
Hydrologic Unit 10130301
Basin Grand River
Newspaper Nation's Center News, Buffalo

RECEIVED
AUG 26 2003
WATER RIGHTS
PROGRAM

Application For Permit To Appropriate Water Within The State Of South Dakota

Check use(s) of water:

☐ Municipal ☐ Suburban Housing ☐ Recreational ☐ Institutional
☐ Rural Water System ☐ Commercial ☐ Fish & Wildlife ☐ Geothermal Heat
☐ Domestic (over 18 gpm) ☒ Industrial ☐ Other _____

Type of Application: ☒ New ☐ Vested Right (Use predates Mar 2, 1955) ☐ Future Use Reservation
(check one) ☐ Place to Beneficial Use Water Reserved by Future Use Permit No. _____
☐ Amendment/Correction to Permit No. _____

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.) _____

- Name of Applicant Luff Exploration Company Phone (303) 861-2468
(check one) ☒ Owner ☐ Tenant/lessee
Mailing Address 1580 Lincoln Street, Suite 850, Denver State Colorado 80203
(Street, RR, or Box and City) (Zip Code)
- Amount of water claimed 0.194 *CFS or 87.5 **GPM ***AF
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable
- Source of water supply Well - Dakota Formation (though water will be Red River water previously injected into Dakota, when this well was a SWD well).
- Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)
1 well in NE/4 NW/4 Section 25-T23N-R5E
County Harding
- County or counties where water will be used Harding
- Annual period during which water is to be used January 1 - December 31
- Give a description of the 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)

Water will be injected into the Red River formation of secondary recovery units, including (but not limited to) the East Harding Springs Red River Unit secondary oil recovery project as approved by the SD-DENR, Oil & Gas Program, Case 2-2003 and the US Dept. of Interior, Bureau of Land Management, effective June 1, 2003. Maximum requested rate of 3,000 BBL/Day equates to 87.5 gal/minute.

STATE OF SOUTH DAKOTA)
County of Harding SS

Attachments: Attach Form 2A if diversion is from a well or dugout, or if storage of water is proposed. Attach map and any other technical information. (see instructions)

I, Richard D. Goches, the applicant, certify that I have read this application, have examined the attached map and that the matters stated are true and that I intend, and am able to complete the necessary construction.

Applicant's signature Richard D. Goches

Subscribed and sworn to before me this 25th day of August 2003

Notary Public Signature
Exp. 5/24/04

**SOUTH DAKOTA
WATER PERMIT NO. 1806-1**

Date of first receipt of application August 26, 2003.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 1806-1 to Luff Exploration Company, 1580 Lincoln St, Suite 850, Denver CO 80203 authorizing the construction of the water use system and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 1806-1 appropriates 0.194 cubic feet of water per second (87.5 gallons per minute) from one well (Minnelusa Formation) 9, 255 feet deep located in the NE ¼ NW ¼ Section 25-T23N-R5E.
2. The water appropriated shall be used for the purpose of industrial use and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date of approval of Permit No. 1806-1 is November 3, 2003.
5. The date from which applicant may claim right is August 26, 2003.
6. One-fifth of the construction is to be completed on or before May 3, 2006.
7. All construction is to be completed on or before November 3, 2008.
8. Water is to be put to beneficial use on or before November 3, 2012.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

WATER MANAGEMENT BOARD

By: Garland Erbele

Garland Erbele, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

FEB 20 2004

date



(type or print in ink)

1. Well Information - Proposed Construction

- a) Drill Hole Diameter 7 7/8" Depth 9,255 ft
- b) Casing Type Steel Diameter 5 1/2" OD Thickness .275" & .304"
- c) Screen Type None Diameter _____ Thickness _____
- d) Gravel Pack None Length of Gravel Pack _____
- e) Depth to Top of Water Bearing Material 6,202 ft (K.B.) (Top Dakota formation perforation)
- f) Depth to Water (ground surface to water level) 6,202 ft (K.B.) (Top Dakota formation perforation)
- g) Distance to nearest existing domestic well:
- On applicants property Not applicable On property owned by others Not applicable

2. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field) Not applicable
- b) System Capacity (gallons) _____ Year Constructed _____
- c) Connected to the City of _____ Sanitary System _____

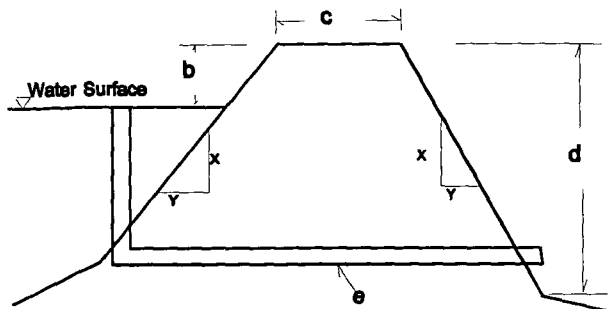
3. Dugout Information

- a) Surface Dimensions 400 Bbl Fiberglass Tanks Depth Above ground
- b) Depth to water (ground surface to water level) _____

4. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to 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) Primary Outlet Capacity _____
If pipe, diameter _____
- f) Secondary Spillway Capacity _____
Spillway Width _____
- g) X & Y Slope _____
Upstream _____
Downstream _____
- h) Surface Area of Impoundment _____
- i) Storage _____ Acre Feet
- j) Drainage Area Above Dam _____ Acres

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date AUGUST 26, 20 03

RECEIVED OF LUFF EXPLORATION COMPANY, 1580 Lincoln St Suite 850, Denver CO 80203

The following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. <u>1806-1</u> to Appropriate Water, to construct and to put water to beneficial use	150	00
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. <u>1806-1</u>	50	00
Fee for Filing Transfer Form _____		
Fee for _____		
Fee for Issuing New Well Driller's License No. _____ for C.Y. _____		
Fee for Renewal of Well Driller's License No. _____ for C.Y. _____		
Fee for Issuing Well Pump Installer's License No. _____ for C.Y. _____		
Fee for Renewal of Well Pump Installer's License No. _____ for C.Y. _____		
(Any Other Work Provided by Law)	TOTAL	200.00

No.

000868

By

Darland Erbe
Chief Engineer *gm*

Luff Exploration Company

1580 Lincoln Street, #850, Denver, CO 80203 Phone: (303) 861-2468 Fax: (303) 861-2481
Well Report of Operations

1-25 ERICKSON, EAST HARDING SPRINGS, NE NW, SECTION 25, T23N, R5E
HARDING COUNTY, SOUTH DAKOTA

1

06/26/03 MIRU. POOH w/tubing & packer. SDFN.
Cost: \$1439

06/27/03 Hydro test tubing to 4000 psi while going in hole. Found holes and blew out 20 jts.
SDFN.
Cost: \$4261

Cum: \$5700

06/28/03 POOH with tubing. Close in well. SDFN.
Cost: \$924

Cum: \$6624

06/29/03 SD

06/30/03 PU Centralift pump. RIH 4000'. LD 20 jts. RIH to 5020'. Hit tight spot with pump.
Went down to 5080'. Checked cable - shorted out. Pull 60,000# over to pull back up through tight
spot. POOH. Pump stuck 60' from surface. SDFN.
Cost: \$3487

Cum: \$10,111

07/01/03 Repair rig until 1:30 PM. Jar down on pump 1/2 hour - would not move down. Pulled up
to 100,000#. Came up 2" and stuck. SDFN.
Cost: \$587

Cum: \$10,698

07/02/03 PU bumper sub, 6" drill collar and surface jars. Knocked pump down hole 30'. Worked
up and down and tried to rotate. Pull up to where it was stuck before - pump stuck again. Knocked
pump free. Went down hole 30'. SDFN.
Cost: \$2495

Cum: \$13,193

07/03/03 Rig up power swivel. Rotated pipe from 110' up to 72' from surface. Could not come
up any further. Rig down swivel. Take bolts out of casinghead. SDFN.
Cost: \$2464

Cum: \$20,657

07/04-07/06/03 SD

07/07/03 Weld on casing stub. Pull casing out of slips. Rig up casing crew. High Plains backed
off 5-1/2" casing 4 jts below surface. POOH. Lay down landing joint and 2 more jts casing.
Picked up 2 jts casing. Screwed back into casing. Set slips with 80,000# tension. Recovered 24' of
pump. Missing 46' of pump and motor. SDFN.
Cost: \$7896

Cum: \$28,553

07/08/03 Cut off 5-1/2" casing. Put on tubing head. PU 4-1/2" bit and 5-1/2" scraper. RIH. Felt
dog leg 4990-5120'. RIH to 5790'. Tagged top of fish (ESP motor). Would not go any further.
POOH. SDFN.

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Well Report of Operations

Cost: \$2632

Cum: \$31,185

2

07/09/03 Present operation: TIH with multi-prong rope spear without stop sub to fish cable. PU multi-prong rope spear, 4' perf sub, xo sub, xo sub, 4-1/2" OD stop sub. RIH with tubing. Tag up at 5790'. Rotate tubing. Set down 18,000#. Took 5000# over to pull free. Pull 8 jts. Hit tight spot. Took 40,000# over to pull free. Kept hanging up all the way out of hole. Nothing recovered on spear. Stop sub had groove cuts and egg shaped (4-5/8 x 4-3/8). Take off stop sub. RIH with multi-prong rope spear, xo sub, and 4' perf sub. RIH with 67 jts. Close in well. SDFN.
Cost: \$3188

Cum: \$34,373

07/10/03 Finish RIH. Circulated hole clean. Rotated wireline spear. Did not pick up any weight. Tried 4 times. POOH. Recovered 6" of cable. Wait on High Plains Wire Line. Run casing inspection log from 5748' to surface. SDFN.
Cost: \$8971

Cum: \$43,344

07/11/03 Wait on tools until 3:00 PM. PU 3-7/8" mill, drill collar and bumper sub. Bumper sub would not scope open or close. SDFN.
Cost: \$2542

Cum: \$45,886

07/12/03 SD

07/13/03 SD

07/14/03 PU 4-3/8" shoe with wire catcher, 1 jt 4-3/8" washover pipe, top sub, 2-7/8" sub, xo sub, bumper sub, jars, xo sub, 6 drill collars, xo sub, accelerator and xo sub. RIH with tubing. Tag up at 5752' KB. Worked way down to 5819'. Would not go any deeper. POOH. Left 4-3/8" shoe with wire catcher in hole. Close in well. SDFN.
Cost: \$2531

Cum: \$48,417

07/15/03 RIH with prong rope socket. Set down and rotate tubing. POOH. Recovered 1' of pump cable. RIH with 4-1/2" OD change over sub, bumper sub, jars and drill collars. Worked overshaft. Drove fish down to 6450' KB. Lay down 1 jt. Close in well. SDFN.
Cost: \$3600

Cum: \$51,417

07/16/03 POOH with tubing and tools. RIH with 40 jts - lay down 40 jts. RIH with 158 jts. Remove BOP. Flange up wellhead. Recovered 24' shaft out of Centrilift pump.
Cost: \$16,731

Cum: \$68,148

07/17/03 Rig down and move.
Cost: \$495

Cum: \$68,643

07/18/03 WO rig.

07/19/03 WO rig.

07/20/03 WO rig.

07/21/03 WO rig.

Luff Exploration Company

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Well Report of Operations

3

07/22/03 MIRU. Put on BOP. PU 52 jts tubing to tag. Heat 260 bbls water to 200°. RU Schlumberger. Pump acid and xylene mix. Had acid returns after 10 bbls pumped. Shut down. Pump water to clean acid out of tubing. POOH. Found holes in 2nd and 13th jts. RIH. Leave 2 jts out. Set at 6230'. Pump acid around tubing at ½ BPM. Reverse circulation and pump water till it came clean (140 bbls). SDFN.

Cost: \$8300

Cum: \$76,448

07/23/03 POOH. LD 50 jts – stand back rest. Felt tight spot at 5757" and 5696'. RU Centralift pump and RIH. Land pump at 4922'

Cost: \$7820

Cum: \$84,763

KB	12'
154 jts 4743'	4755'
Drain 1'	4756'
2 jts 62'	4818'
Check valve	4819'
2 jts 62'	4881'
Pump 41'	4922'

07/24/03 Hook up wellhead. RD.

Cost: \$5001

Cum: \$21,121

<u>07/25/03</u>	1055 bbls; 431' FL; 1854 BHP	
<u>07/26/03</u>	891 bbls; 400' FL; 1854 BHP	
<u>07/27/03</u>	830 bbls; 400' FL; 1854 BHP	
<u>07/28/03</u>	930 bbls; 400' FL; 1854 BHP	
<u>07/29/03</u>	974 bbls; 400' FL; 1854 BHP	FL measured with acoustic well sounder
<u>07/30/03</u>	963 bbls; 400' FL; 1854 BHP	
<u>07/31/03</u>	918 bbls; 673' FL; 1830 BHP.	55 Hertz.
<u>08/01/03</u>	1145 bbls; 673' FL; 1830 BHP	
<u>08/02/03</u>	1220 bbls; 673' FL; 1830 BHP	
<u>08/03/03</u>	1250 bbls; 673' FL; 1830 BHP	
<u>08/04/03</u>	1238 bbls; 673' FL; 1830 BHP	SALTS 72,061 PPM
<u>08/05/03</u>	1448 bbls; 523' FL; 1830 BHP	FL measured with acoustic well sounder
<u>08/06/03</u>	1263 bbls; 523' FL; 1830 BHP	65 Hertz speed up
<u>08/07/03</u>	1370 bbls; 500' FL; 1833 BHP	140° TEMP
<u>08/08/03</u>	1600 bbls; 500' FL; 1833 BHP	SALT 66,201 PPM
<u>08/09/03</u>	1630 bbls; 500' FL; 1833 BHP	
<u>08/10/03</u>	1650 bbls; 500' FL; 1833 BHP	
<u>08/11/03</u>	1665 bbls; 500' FL; 1833 BHP	143° - SALT 66,201 PPM
<u>08/12/03</u>	1710 bbls; 462' FL; 1833 BHP	SI - <u>FINAL REPORT</u>

08/21/03 MIRU. SDFN.

Luff Exploration Company

1580 Lincoln Street, #850, Denver, CO 80203 Phone: (303) 861-2468 Fax: (303) 861-2481

Well Report of Operations

4

1-25 ERICKSON, EAST HARDING SPRINGS, NE NW, SECTION 25, T23N, R5E
HARDING COUNTY, SOUTH DAKOTA

08/21/03 MIRU. SDFN.

Cost: \$600

08/22/03 POOH with down hole pump. Change pump. RIH with new pump. Run pump ½ hour.
SDFN.

Cost: \$6656

Cum: \$7256

KB	12'
153 jts 2-7/8" J-55 Coated	4712'
1' Drain	4725'
2 jts 62'	4787'
Check Valve 1'	4788'
2 jts 62'	4850'
1 - 6' sub	4856'
Pump 52'	4908'

↑
Charged
down hole
electrical
submersible
pump

08/23/03 Too windy to rig down.

Cost: \$917

Cost: \$8173

08/24/03 SD

#1-25 ERICKSON CONT., EAGLES NEST BUTTE, NE NEW, SECTION 25, T23N.
R5E, HARDING COUNTY, SOUTH DAKOTA

10/16/77 Casing Detail:

<i>original casing detail</i>	KB	12.00'	
	Landing Jt	15.82'	
	29 jt 17# K-55 LT&C	1234.71'	
	- 109 jt 15.50# K-55 LT&C	4272.76'	
	5 jts 17# K-55 LT&C	197.07'	
	1 jt 20# N-80	47.53'	
	5 jts 23# N-80	95.27'	
	1 jt 20# N-80	39.75'	
	13 jt 17# K-55 LT&C	515.08'	
	DV Collar	2.70'	6430.83
	40 jts 17# K-55 LT&C	1705.72'	
	27 jt 17# N-80	1007.23'	
	Diff Fill Float Collar	1.70'	
	1 jt 17# N-80	13.94'	
	Diff Guide Shoe	2.00'	
	TOTAL	9254.07'	

DROP FROM REPORT UNTIL COMPLETION WORK BEGINS.

10/22/77 Dropped from report 10/16/77 until completion work started. MI & RU completion unit. RIH w/4 1/2" bit, casing scraper and 4000' of 2 7/8", 6.5 lb./ft., 8 rd., FUE J-55 tbg. SDFN.

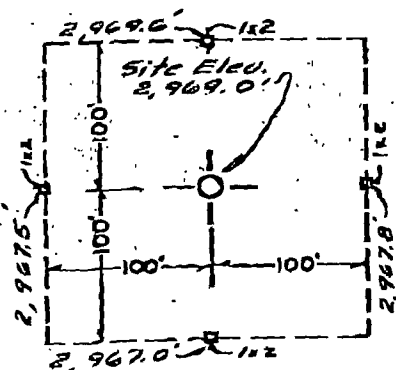
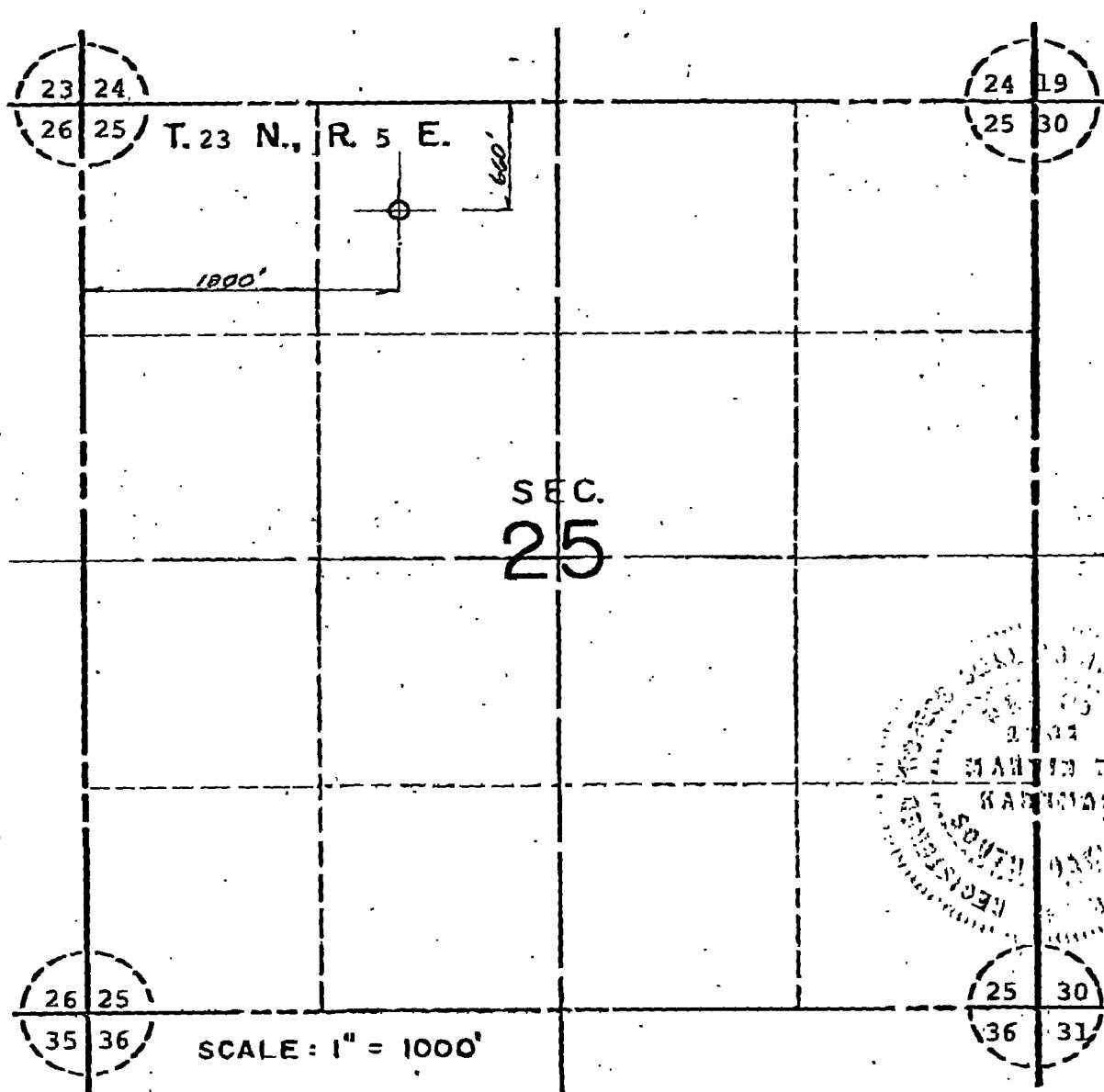
10/23/77 SDFS.

10/24/77 PU 70 more jts 2 7/8" tbg. Tagged cmt at 6,390'. Drilled out cement to DV tool at 6,431'. Drilled out and reamed DV collar. PU 84 more jts 2 7/8" tbg. Cleaned out to PBTD of 9,230'. Circulated hole clean. Pressure tested casing at 2,000 psi for 15 minutes. Held okay. SDFN.

10/25/77 TOH w/284 jts tbg, bit & scraper. Installed BOP. RU Schlumberger. Ran PDC Log from TD to 8800' and from 6500-6000'. Perf 9164-73'; 9156-60'; 9038-47' w/2 shots per foot. PU Baker Model B Bridge Plug, Retrieving Head, 3 jts of tail pipe, Model R Double Grip Pkr, 3000' of tbg. SION.

10/26/77 TIH w/3400' tbg. Bridge Plug would not go down through DV collar. POOH. PU 4 1/2" taper mill. RIH w/taper mill and reamed out DV collar. POOH w/3000' tbg. SDFN.

WELL LOCATION PLAT

APPLICANT: K. D. LuffADDRESS: 1730 Colorado State Bank Bldg., Denver, CO 80200NAME OF WELL: K.D. Luff 1-25 EricksonLocation 660' from North Line1800' from West LineNE $\frac{1}{4}$, NW $\frac{1}{4}$ Sec. 25, T.23 N., R. 5 E.HARDING COUNTY, STATE OF S. D.

SURVEYED UNDER THE DIRECTION OF

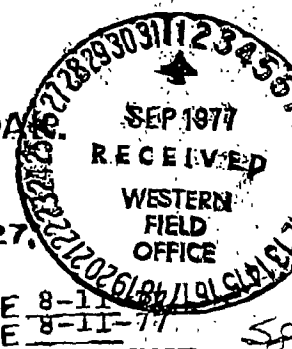
L.W. VEIGEL & CO. P.C. DICKINSON, N.D.

REGISTERED PROFESSIONAL ENGINEER, N.D. 27

MONT. 628ES, S.D. 762

SURVEY BY: Duane WamreDATE 8-11-77LEVELS BY: Duane WamreDATE 8-11-77Our No 457

Comm No

45675

M 240 P 23
M 251 P 8

SATHE ANALYTICAL LABORATORY, INC.

301 W. 2ND STREET

P.O. BOX 1527
WILLISTON, ND. 58801

701-572-3632

WATER ANALYSIS REPORT

OPERATOR: LUFF EXPLORATION COMPANY

DATE: 7/31/03

WELL NO. 1-25 ERICKSON

LAB NO.: W-03-0962

FIELD: not listed

FORMATION: production

COUNTY: Harding

INTERVAL: production

STATE: SD

DST #:

LOC: not listed

SAMPLE WELL HEAD (7/29/03)

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	28800.0	1252.7	CHLORIDE	45571.4	1285.5
CALCIUM	2518.6	125.7	CARBONATE	0.0	0.0
MAGNESIUM	225.3	18.5	BICARBONATE	494.3	8.1
IRON	0.4	0.0	SULFATE	2827.0	58.9
POTASSIUM	988.0	25.3	NITRATE	0.0	0.0
BARIUM	2.8	0.0			
CHROMIUM	0.1	0.0			

SPECIFIC GRAVITY @ 77°F

1.050 PH

6.42

RESISTIVITY @ 77°F, ohm-meters

0.105 NACL (Calc.)

75146.3

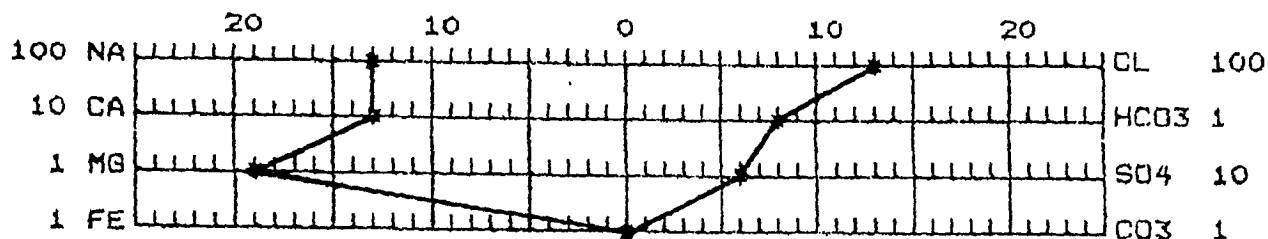
TOTAL DISSOLVED SOLIDS (Calc.) MG/L

81427.9

HYDROGEN SULFIDE

NEG

WATER ANALYSIS PATTERN - MEQ/L



REMARKS - Received 7/31/03.

DISTRIBUTION OF RESULTS

Ken Barnhart -- Bowman ND - 1 copy.

Bob Arceneaux -- Denver CO - 1 copy.



August 22, 2003

Via Federal Express

Mr. Eric Gronlund
Water Rights Program
Department of Environment and Natural Resources
523 East Capitol Avenue
Pierre, South Dakota 57501

RE: Temporary Permit to Use Public Waters
For Testing Purposes
Erickson 1-25 Well
NE NW, Section 25
Township 23 North, Range 5 East
East Harding Springs Field
Harding County, South Dakota

Dear Mr. Gronlund:

Luff Exploration Company respectfully requests a 90-day extension to the temporary permit to use public waters for testing purposes at the above captioned well. The same maximum test rate of 2,000 barrels per day (84,000 gals per day) will be sufficient.

An electrical submersible pump was run in the well. The attached daily reports provide a detailed summary of the well work and subsequent production testing through August 12, 2003. Luff has installed a different electrical submersible pump down in the well, and desires to test this pump, starting within 30 days from now, for a period of another 60-days, or until a permanent water use permit is approved.

Please call me if you have any questions regarding this request. I thank you for your time and attention.

Very truly yours,

LUFF EXPLORATION COMPANY

A handwritten signature in dark ink, appearing to read "Richard D. George", is written over a horizontal line.

Richard D. George, P.E.
Manager of Engineering

Cc Fred V. Steece, Oil and Gas Program
South Dakota Department of Environment and Natural Resources



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

AMENDED
TEMPORARY PERMIT TO USE PUBLIC WATERS
FOR TESTING PURPOSES

This amended temporary permit to use public waters for testing purposes is issued to Luff Exploration Company 1580 Lincoln St., Suite 850, Denver CO 80203 authorizing withdrawal of 2,500,000 gallons of water at a maximum rate of 84,000 gallons per day from ground water (Erickson #1-25 disposal well) located in the NE ¼ NW ¼ Section 25, T23N, R5E, Harding County.

The project involves a productivity test for source water for use in secondary recovery project. The water will be collected and contained in steel surface tanks and re-injected into the well or other wells owned by Luff Exploration at the end of the test period. If the well produces sufficient volume, an appropriate water permit will be obtained to use the well for source water for oilfield secondary recovery.

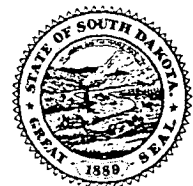
The well authorized under this temporary water use permit may be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner, under this temporary water permit, shall control his withdrawals so there is not a reduction of needed water supplies in other wells.

The original temporary permit for this project authorized use of water from June 15th to July 15th. The permit is being amended to allow the project to continue through August 15, 2003. The remaining portions of the original temporary permit have not been altered. Issuance of this amended temporary permit supercedes the permit issued May 14, 2003.

This permit does not provide necessary right-of-way. Such arrangements should be made with the proper land owner.

Issued: July 8, 2003

Ron Duvall, Environmental Engineer
for Garland Erbele, Chief Engineer
Water Rights Program
605 773-3352



c: faxed to Luff Exploration at (303) 861-2481

NOTE: A temporary permit application form is now available on the internet. You may complete an application form on-line and submit the application directly to the Water Rights Program. The address of the form is www.state.sd.us/denr/des/waterrights/temp_form.htm



MAY 16 2003

DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

**TEMPORARY PERMIT TO USE PUBLIC WATERS
FOR TESTING PURPOSES**

This temporary permit to use public waters for testing purposes is issued to Luff Exploration Company 1580 Lincoln St., Suite 850, Denver CO 80203 authorizing withdrawal of 2,500,000 gallons of water at a maximum rate of 84,000 gallons per day from ground water (Erickson #1-25 disposal well) located in the NE ¼ NW ¼ Section 25, T23N, R5E, Harding County.

The project involves a productivity test for source water for use in secondary recovery project. The water will be collected and contained in steel surface tanks and re-injected into the well or other wells owned by Luff Exploration at the end of the test period. If the well produces sufficient volume, an appropriate water permit will be obtained to use the well for source water for oilfield secondary recovery.

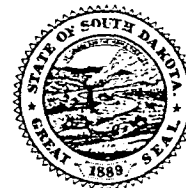
The well authorized under this temporary water use permit may be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner, under this temporary water permit, shall control his withdrawals so there is not a reduction of needed water supplies in other wells.

This temporary permit becomes effective June 15, 2003 and expires on July 15, 2003.

This permit does not provide necessary right-of-way. Such arrangements should be made with the proper land owner.

Issued: May 14, 2003


Garland Erbele, Chief Engineer
Water Rights Program
605 773-3352



c: faxed to Luff Exploration at (303) 861-2481

NOTE: A temporary permit application form is now available on the internet. You may complete an application form on-line and submit the application directly to the Water Rights Program. The address of the form is www.state.sd.us/denr/des/waterrights/temp_form.htm



SUNDRY NOTICE AND REPORT ON WELLS

Operator Name LUFF EXPLORATION COMPANY		Telephone 303-861-2468	
Address 1580 LINCOLN ST., SUITE 850 DENVER, CO 80203			
Permit #	API No.	Well Name and Number	Location (Qtr-Qtr, Sec, Twp, Rge, County)
813	40-063-20147-00	Erickson 1-25	NENW Sec. 25-23N-5E Harding

Notice of Intention To:

Subsequent Report of:

Request for change of:

☐ Temporarily Abandon	☐ Drilling Progress	☐ Location
☐ Plug and Abandon	☐ BOP Pressure Test/Program	☐ Elevation
☐ Pull, Alter, or Test Casing	☐ Gas/Oil Ratio	☐ Producing Method
☐ Perforate	☐ Work-Over (Perf, Frac, Acidize)	☐ Producing Formation
☐ Acidize	☐ Shut-In Pressure	☐ Injection Pressure
☐ Fracture Treatment	☐ Spill	☐ Injection Volume
☐ Squeeze Cement	☐ Mechanical Integrity Test	☐ Injection Fluid
☒ Other <u>PRODUCTION TEST</u>	☐ Other _____	☐ Other _____

Describe Proposed or Completed Operations (clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). Use additional page(s) if appropriate.

The subject well is completed in the Dakota fm. for water disposal and is currently shut-in. Luff Exploration requests approval to conduct a productivity test for a 30 day period. It is proposed to install an electric submersible pump to determine the water producing capability of the well for use as source water for secondary recovery projects. Produced fluids will be contained in surface tanks and trucked or pipelined to Luff's Travers 2-6 injection well located in Sec. 6-22N-5E, Harding Co. At the conclusion of the test period, produced volumes will be reported to the South Dakota Dept. of Environment and Natural Resources. At that time, a decision will be made regarding future use of this well for source water or injection purposes.

I hereby certify that the foregoing as to any work or operation performed is a true and correct report of such work or operation.

<u>Robert C. Arceneaux</u>	<u>ROBERT C. ARCENEUX</u>	<u>OPERATIONS MGR.</u>	<u>4-29-03</u>
Signature	Name (Print)	Title	Date

FOR OFFICE USE ONLY

Approved by: _____ Title: _____ Date: _____

LUFF

EXPLORATION Co.

August 25, 2003

RECEIVED

AUG 26 2003

WATER RIGHTS
PROGRAM

Via Federal Express

Mr. Eric Gronlund
Water Rights Program
Department of Environment and Natural Resources
523 East Capitol Avenue
Pierre, South Dakota 57501

RE: Request for Long-Term Use of Public Waters
Erickson 1-25 Well
NE NW, Section 25, Township 23 North, Range 5 East
East Harding Springs Field
Harding County, South Dakota

Dear Mr. Gronlund:

Although additional temporary production testing is contemplated (to assess a second down-hole electrical submersible pump) Luff Exploration Company has concluded that the above captioned well will likely be suitable for long-term water supply.

Please note that while the well is completed in the Dakota formation, produced water for the foreseeable future will be Red River formation produced water, since this well was a water disposal well for Red River water for many years. A water analysis taken during the first period of temporary testing supports this assessment.

Any efforts that can be made to expedite this application will be greatly appreciated. The water will be used for secondary oil recovery projects, including the recently approved East Harding Springs Red River Unit.

A check related to this application is enclosed.

Please call me if you have any questions regarding this request. I thank you for your time and attention.

Very truly yours,

LUFF EXPLORATION COMPANY



Richard D. George, P.E.
Manager of Engineering

Cc Fred V. Steece, Oil and Gas Program
South Dakota Department of Environment and Natural Resources

1580 LINCOLN STREET • SUITE 850 • DENVER, COLORADO • 80203 • 303.861.2468 • FAX 303.861.2481



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The project involves a productivity test for source water for use in secondary recovery project. The water will be collected and contained in steel surface tanks and re-injected into the well or other wells owned by Luff Exploration at the end of the test period. If the well produces sufficient volume, an appropriate water permit will be obtained to use the well for source water for oilfield secondary recovery.

The well authorized under this temporary water use permit may be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner, under this temporary water permit, shall control his withdrawals so there is not a reduction of needed water supplies in other wells.

The temporary permit becomes effective September 1, 2003 and expires on December 31, 2003 or upon approval of an appropriate water permit if approval is prior to December 31st.

This permit does not provide necessary right-of-way. Such arrangements should be made with the proper land owner.

Issued: August 26, 2003

Garland Erbele, Chief Engineer
Water Rights Program
605 773-3352



c: faxed to Richard D George, PE, with Luff Exploration Company at (303) 861-2481

NOTE: A temporary permit application form is now available on the internet. You may complete an application form on-line and submit the application directly to the Water Rights Program. The address of the form is www.state.sd.us/denr/des/waterrights/temp_form.htm

WATER PERMIT APPLICATIONS NO. 1806-1
LUFF EXPLORATION COMPANY
OCTOBER 2, 2003

Water Permit Application No. 1806-1 proposes to appropriate 0.194 cubic feet of water per second (cfs) [87.5 gallons per minute (gpm)] from one well, 9255 feet deep, located in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ of Sec. 25, T23N-R5E, Harding County. The water is for industrial use in a secondary oil recovery project.

AQUIFER: Minnelusa Formation (MNLS)

GENERAL:

The water source proposed by this application is a "Well-Dakota Formation (though water will be Red River water previously injected into Dakota, when this well was a SWD well)". The well construction information provided with this application along with Underground Injection Control permit information indicates this former salt water disposal well is probably completed into the Minnelusa Formation. The best information available regarding this well's construction indicates the well is perforated at about 6,202 feet below grade. Based on the structure contour map for the Minnelusa (Allen and others, 1985), the top of the Minnelusa formation would be expected to be about 6,219 feet below grade. The geologic information for this well indicates the the Minnelusa Formation extends from 6188'-6866' (McGillivray, personnel communication). The Minnelusa Formation underlies most of western South Dakota and all of Harding County (1.7 million acres) and contains an estimated 4.2912 million acre-feet of recoverable water in storage in the county (Allen and others, 1984).

EXISTING WATER RIGHTS:

There are no existing Water Rights/Permits appropriating water from the Minnelusa Formation in Harding County. In fact the nearest appropriation from the Minnelusa is approximately 90 miles from this well.

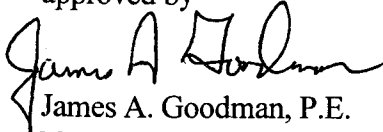
CONCLUSIONS:

1. The data suggest water is available from the Minnelusa Formation.
2. Interference will not be a problem. The nearest appropriation from the Minnelusa is nearly 90 miles from this well.
3. The well completion records for this well indicate that this well was completed in typical oil well fashion, (i.e. the surface casing was grouted in and the lower portion of the production casing was grouted) (McGillivray, personnel communication). There is approximately 760 feet of casing that was not grouted in this well. This construction does not meet the SD Well Construction Standards.



Ken Buhler
Natural Resources Engineering Specialist

approved by



James A. Goodman, P.E.
Natural Resources Engineering Director

REFERENCES:

- Allen, J.C., Iles, D.L., and Petres, A.K., 1984, Analysis of Groundwater and Streamflow Data Western Dakotas Region of South Dakota, Task 3 and 4: Groundwater Resource Inventory: South Dakota Department of Water and Natural Resources,
- Allen, J.C., Iles, D.L., and Petres, A.K., 1985, Analysis of Groundwater and Streamflow Data Western Dakotas Region of South Dakota, Task 3A.B.C. and 4A.B.: Groundwater Resource Inventory: South Dakota Department of Water and Natural Resources,



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**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 1806-1, Luff Exploration Company**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 1806-1, Luff Exploration Company, c/o Richard D. George, 1580 Lincoln Street, Suite 850, Denver CO 80203

The Chief Engineer is recommending APPROVAL of Application No. 1806-1 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) it is in the public interest.

See report on application for additional information.

Garland Erbele, Chief Engineer
October 9, 2003



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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PIERRE, SOUTH DAKOTA 57501-3182

www.state.sd.us/denr

**NOTE: TO BE SURE OF PUBLICATION ON
THE CORRECT DATES, CONTACT
THE NEWSPAPER RIGHT AWAY.**

October 9, 2003

Luff Exploration
%Richard D George
1580 Lincoln Street Suite 850
Denver CO 80203

Dear Mr. George:

Water Permit Application No. 1806-1 for industrial use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice of hearing has been sent to the Publisher of the Nation's Center News printed at Buffalo, SD (Ph # 605-375-3228). You will need to contact the newspaper and authorize publication of this notice. For your information, a copy of the notice, the recommendation of the Chief Engineer and a report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

Be sure to contact the above newspaper to authorize publication of your Notice of Hearing and to arrange for payment. Early contact with the paper can eliminate delays. Upon receiving authorization, the publisher has been instructed to publish your notice once each week for two consecutive weeks with the last publication to occur twenty days before the board meeting. The newspaper has also been instructed to send us the Proof of Publication. We must receive Proof of Publication before action can be taken on the application.

Sincerely,

Eric Gronlund
Natural Resources Engineer
(605) 773-3352

enclosures

NOTE: If you plan to contest any part of the Chief Engineer's recommendation, you must file a petition pursuant to the procedures outlined in the attached notice of hearing. The Water Management Board will then consider your concerns during a hearing on the application.



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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JOE FOSS BUILDING
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PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

October 9, 2003

Nation's Center News
PO Box 107
Buffalo SD 57720-0107

ATTENTION: Legal Public Notice

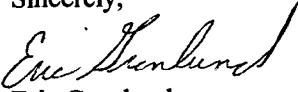
Enclosed is a Notice of Hearing on Application No. 1806-1 to Appropriate Water to be published twice. Please publish the first notice on October 16, 2003 with the second publication 7 days later.

The applicant must verify to you that the notice is to be published, before you make the first publication. **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is Luff Exploration, % Richard D George, 1580 Lincoln Street Suite 850, Denver CO (Ph # 303-861-2468).

Please send the Water Rights Program the first publication immediately. The publication is checked for accuracy so any corrections can be made in the second publication. You may use the form below or fax a copy of the first publication. Any fax should be sent to the attention of Karen Schlaak at (605) 773-4068. Publication errors can invalidate the public notice.

After the second publication, **please send us an affidavit or use the enclosed Proof of Publication form.** The applicant pays the cost of publication, but the Water Rights Program records require an affidavit or Proof of Publication. Delays in receiving the affidavit can be costly to the applicant.

Sincerely,


Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

-----CUT HERE-----

No. 1806-1

TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

Date _____

We are in receipt of your letter of October 9, 2003 enclosing Notice of Hearing to Appropriate Water by Application No. 1806-1 which was first published in our issue of _____. **ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.**

Name

Newspaper

Instruction to Newspaper - Publish first Notice on October 16, 2003 with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO. 1806-1 to Appropriate Water

Notice is given that Luff Exploration Company, 1580 Lincoln St, Suite 850, Denver CO 80203 has filed an application for a water permit to appropriate 0.194 cubic feet of water per second (87.5 gallons per minute) from one well (Minnelusa Formation) 9, 255 feet deep located in the NE ¼ NW ¼ Section 25-T23N-R5E. The water is for industrial use

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 1806-1 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by November 3, 2003.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

Affidavit of Publication

STATE OF SOUTH DAKOTA)
COUNTY OF HARDING

Stewart Huntington of said County and State being first duly sworn, on his oath says: That the NATION'S CENTER NEWS is a legal daily newspaper of general circulation, printed and published in the City of Buffalo, in said County and State by Stewart Huntington, and has been such a newspaper during the times hereinafter mentioned; and that said newspaper has a bonafide circulation of at least 200 copies weekly, and has been published within said County in the English language for at least one year prior to the first publication of the notice herein mentioned, and is printed in whole or in part in an office maintained at the place of publication; and That I, Stewart Huntington, the undersigned, am the Publisher of said newspaper and have personal knowledge of all the facts stated in this affidavit; and that the advertisement headed:

Notice of Application No. 1806-1

a printed copy of which is hereto attached, was printed and published in said newspaper for 2 successive and consecutive weeks, the first publication being made on the 16th day of Oct., 2003, and the last publication on the 23rd day of Oct., 2003, that the full amount of fees charged for publishing same, to-wit: The sum of \$34.57, insures solely to the benefit of the publisher of the NATION'S CENTER NEWS, that no agreement or understanding for a division thereof has been made with any person and that no part thereof has been agreed to be paid to any other person whomsoever.

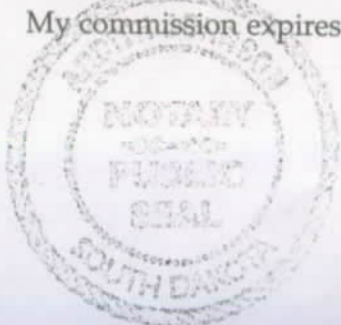
Stewart Huntington

Subscribed and sworn to before me this 23rd day of Oct., 2003

Adith Johnson

Notary Public, Lawrence County, South Dakota

My commission expires: 10-24-2004



NOTICE OF APPLICATION NO. 1806-1

to Appropriate Water

Notice is given that Luff Exploration Company, 1580 Lincoln St., Suite 850, Denver CO 80203 has filed an application for a water permit to appropriate 0.194 cubic feet of water per second (87.5 gallons per minute) from one well (Minnelusa Formation) 9,255 feet deep located in the NE 1/4 NW 1/4 Section 25-T23N-R5E. The water is for industrial use.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 1806-1 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

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#742

Oct. 16, 23

RECEIVED

OCT 30 2003

WATER RIGHTS
PROGRAM



FEB 20 2004

**DEPARTMENT of ENVIRONMENT
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PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

Dale Swanson
25925 350 Ave
Pukwana SD 57370

Dear Mr. Swanson:

Enclosed is Water Permit No. 6447-3 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

Form 10, *Notice of Completion of Works and Application of Water to Beneficial Use*, is enclosed. Please return this completed form after you have finished the system and have put the water to beneficial use. An investigation can then be scheduled so the water license may be issued, thus completing the acquisition of a water right.

An informational sheet *Common Water Right Questions* is also enclosed. This sheet is intended to answer some of the questions associated with obtaining and keeping a water right.

Sincerely,

Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures