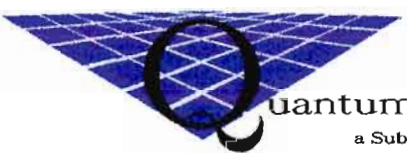


CLIENT:

MANCAL

CONTRACTOR:



Quantum Geophysical, Inc.
a Subsidiary of Geokinetics Inc.

GPS SURVEYING AND G.I.S. DONE BY:



ERICKSON CONTRACT SURVEYING

101 5TH STREET S.W. SPOKANE, MT. 59207 OFFICE: 800-404-6666 FAX: 406-482-8800 E-MAIL: ecs@ecs.com

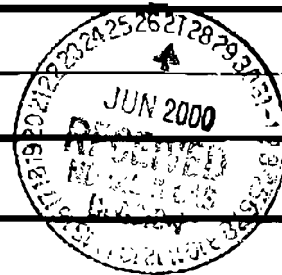
97-0047

ALPINE 3-D POSTPLOT DUNN CO., N.D.		North America Datum 1927 North Dakota South Zone
TOWNSHIP 144N, 145N RANGE 93W, 94W		
SOURCE PT INTERVAL: 165' RECEIVER PT INTERVAL: 165'	TOTAL SOURCE PTS: 1144 TOTAL RECEIVER PTS: 1607 AREA (SQUARE MILES): +/- 10 SQ. MI.	
SOURCE PARAMETERS DYNAMITE		SOURCE LINE INTERVAL: 1650' RECEIVER LINE INTERVAL: 1155'
SHEET 1 OF 1 APRIL 24, 2000	SCALE: 1:24000 1" = 2000'	SOURCE LINE AZIMUTH: 271d 27' 03" RECEIVER LINE AZIMUTH: 181d 27' 05"
DRAWN BY: SHARON ERICKSON / JAMIE SOLT CHECKED BY: SHARON ERICKSON		

LEGEND	
	GATE
	FENCE
	STOCK DAM
	WATERWAY
	HOUSES / OUTBUILDINGS
	OVERHEAD POWER LINES
	UNDERGROUND POWER LINES
	PIPE LINES W/ 100' BUFFER
	RAILROAD TRACKS
	OIL WELLS
	DRY HOLE
	HAZARDS
	COUNTY ROAD NUMBER
	HIGHWAY NUMBER
	IMPROVED GRAVEL ROAD
	UNIMPROVED GRAVEL ROAD
	TRAIL / 2-TRACK
	PAVED ROAD
	RECEIVER POINTS
	POSTPLOT SOURCE POINTS
	PREPLOT SOURCE POINTS
	SPRINGS 330' - 660'
	WATER WELLS - 330'



PERMIT NO.: 97-0047	
SHOT HOLE OPERATIONS: 3 D	*NON-EXPLOSIVE OPERATIONS:



SECTION 1

GEOPHYSICAL CONTRACTOR: Quantum Geophysical, Inc.	
PROJECT NAME AND NUMBER: Alpine 3 D	COUNTY(S): Dunn County
TOWNSHIP(S): 144 / 145 North	RANGE(S): 93 / 94 West
PERMITTED BY: Quantum Geophysical / Permits Plus	
DATE COMMENCED: April 24, 2000	DATE COMPLETED: Drills Complete 5-6-00 Recording Complete 5-18-00

SECTION 2

FIRST S.P. #: 5129	LAST S.P. #: 27142										
LOADED HOLES (UNDETONATED SHOT POINTS)											
S.P. #'s:	19124	21113	27117	27123	15152	19144					
CHARGE SIZE::	5#	5#	5#	5#	5#	5#					
DEPTH:	40'	40'	40'	40'	40'	40'					
REASONS HOLES WERE NOT SHOT: BAD CAPS											

SECTION 3

FLOWING HOLES S.P.#'s	NONE
PROCEDURE FOR PLUGGING FLOWING HOLES:	N/A

Include a 7.5 minute USGS topographic quadrangle map or a computer generated post-plot facsimile of the approximate scale displaying each individual shot hole, SP #, line #, and legal location.

*Non-Explosive Operations - Complete Section 1 and Affidavit.

AFFIDAVIT OF COMPLETION (GEOPHYSICAL CONTRACTOR)

STATE OF ~~NORTH DAKOTA~~ TEXAS)

)

COUNTY OF Harris)

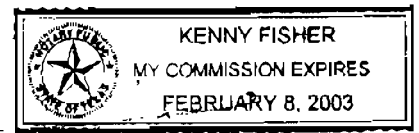
Before me, Kenny Fisher, a Notary Public in and for the said County and State, this day personally appeared Bruce Fulker who being first duly sworn, deposes and says that ~~he~~ is employed by Quantum Geophysical, Inc., that ~~he~~ has read North Dakota Century Code Section 38-08.1, that the foregoing seismic project has been completed in accordance with North Dakota Administrative Code Rule 43-02-12 and that the statements on the reverse side of this document are true.

Bruce Fulker
Geophysical Contractor Representative

Subscribed in my presence and sworn before me this 26TH day of JUNE 2000.

Notary Public

Kenny Fisher



My Commission Expires FEB 8TH 2003.

97-0047

AFFIDAVIT OF PLUGGING (HOLE PLUGGER)



STATE OF NORTH DAKOTA)
)
COUNTY OF _____)

Before me, CARA JOHNSON, a Notary Public in and for the said County and State, this day personally appeared Terry Williams who being first duly sworn, deposes and says that (s)he is employed by Wilderness Exploration, that (s)he has read North Dakota Century Code Section 38-08.1 and that the foregoing seismic project has been plugged in accordance with North Dakota Administrative Code Rule 43-02-12 and that the statements on the attached documents are true.

Wilderness Exploration
Terry Williams
Hole Plugger Representative

Subscribed in my presence and sworn before me this 16th day of May, 2000.

Notary Public Cara L. Johnson

My Commission Expires 9/17/02



MANCAL RESOURCES CORPORATION

March 21, 2000

Honorable Allen Roll
Mayor, City of Dunn Center
P.O. Box 38
Dunn Center, ND 58626

Dear Mayor Roll,

97-0047

**RE: Seismic Exploration Within City Limits
Our File No. A003.001**

As you are aware, Mancal Resources Corporation ("Mancal") recently acquired numerous oil and gas leases in the vicinity of Dunn Center and in the city itself. Mancal desires to conduct seismic operations within city limits, which seismic operations are to be conducted by its contractor, Quantum Geophysical, Inc.

North Dakota Administrative Code 43-02-12-05 provides that seismic shot hole operations may not be conducted less than 1,320 feet from water wells, buildings, underground cisterns, pipelines and flowing springs; it also provides that non-explosive exploration methods may not be conducted less than 300 feet from any such facilities. However, this regulation also provides that variances may be granted by written agreement between the seismic permit holder and the operator of the land.

Pursuant to this regulation, Mancal requests a variance to allow for seismic shot hole operations to be conducted within city owned streets and alleys at a distance not less than 660 feet from such facilities. Should the city council agree to this variance, Mancal will assume all liability for any and all damages, which may occur to any such facilities or any other property caused by seismic operations. By my signature below Mancal has agreed to accept such liability.

If this agreement is acceptable with the city council as passed by resolution, please indicate by your signature and that of city auditor below.

- 2 -

I want to thank you and the council for your cooperation in this matter.

Yours truly,

MANCAL RESOURCES CORPORATION



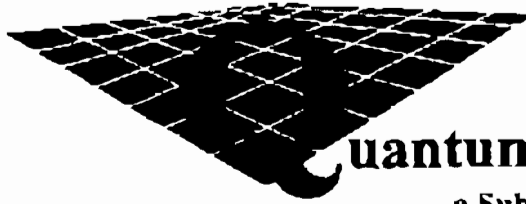
Cam A. Weston
Vice President, Land

AGREED AND ACCEPTED TO THIS 7 DAY OF 11, 2000

CITY OF DUNN CENTER

Per: Allen Roll
Allen Roll, Mayor

Per: Linda Kittison
Linda Kittison, Auditor



Quantum Geophysical, Inc.

a Subsidiary of Geokinetics Inc.

Post-It Fax Note	7671	Date	4-27	# of pages	4
To	Dave Huinden		From	Kim	
Co./Dept.			Co		
Phone #			Phone #		
Fax #			Fax #		

March 23, 2000

Honorable Allen Roll
 Mayor, City of Dunn Center
 P.O. Box 38
 Dunn Center, ND 58626

Re: Geophysical Permit Request

97-0047

Dear Mayor Roll,

Quantum Geophysical, Inc. is requesting permission to conduct 3D geophysical operations within the city limits of Dunn Center on behalf of our client, Mancal Resources Corporation and is further described as Township 145 North, Range 94 West, Section 26, Dunn County, North Dakota. Access to property and/or minerals owned by the City of Dunn Center would be for the sole purpose of conducting 3D shot hole operations, utilizing a 5lb charge loaded in a 40ft hole. No shot hole shall be located less than 660ft from water wells, buildings, underground cisterns, pipelines and flowing springs. In addition, no shot hole shall be located on any City street or alleyway or on private property within the City limits without written permission from said property owner. All shot holes shall be plugged in accordance with Chapter 43-02-12-07 (Drilling and Plugging Requirements) North Dakota Administrative Code. No explosives shall be stored within the City limits of Dunn Center at any time.

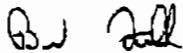
Receiver locations will be located on streets or alleyways wherever possible in such a manner as not to interfere with any auto or pedestrian traffic, fire, ambulance or law enforcement access. In cases where City owned streets or alleyways cannot be used for receiver line placement, Quantum Geophysical, Inc. agrees to obtain written permission from the property owner prior to placing any equipment on said property. Quantum Geophysical, Inc. will conduct its operations in a careful and prudent manner and shall assume all liability for loss, damage or theft of its equipment while on City owned property.

If this agreement is acceptable with the city council as passed by resolution, please indicate by your signature and that of the city auditor below

Thank you for your time and cooperation in this matter.

Yours truly,

Quantum Geophysical, Inc.



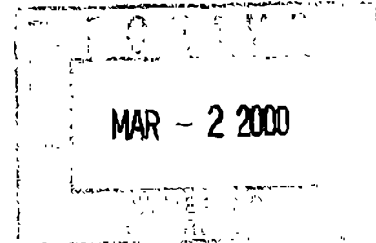
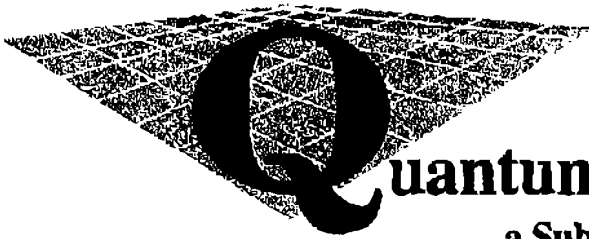
Bruce Fulker
Permit Supervisor

AGREED AND ACCEPTED TO THIS 4 DAY OF 11, 2000.

CITY OF DUNN CENTER

Per: Allen Roll
Allen Roll, Mayor

Per: Linda Kittilson
Linda Kittilson, Auditor



Quantum Geophysical, Inc.

a Subsidiary of Geokinetics Inc.

SEISMOGRAPH PERMIT

North Dakota State Land Dept

Prospect: Beaver Creek
Permit # 1

QUANTUM GEOPHYSICAL, INC. is requesting permission to conduct geophysical operations across property owned and/or leased by you in Golden Valley County North Dakota, and is further described as follows:

Township 143 North Range 103 West Section 16 All 640 Net Acres

SURFACE OWNER	State of ND	SURFACE TENANT/LESSEE
MINERAL OWNER	State of ND	
MINERAL LESSEE	Westport Oil & Gas S2 100% N2 below 12790'	Medora Grazing Association PO Box 108 Medora ND 58645 (701) 623-4336
	Equity Oil Co N2	

CONDITIONS:

Client: Equity Oil Company
\$3.00 per acre to be split with surface lessee (1/2 payment to be paid directly to surface lessee)
Contact Lessee prior to Entry
3 D Shothole 5 # @ 60'

Our operations will be conducted in a prudent and careful manner. We will indemnify you from all claims and damages that might result from our work by virtue of your permission granted herein.

We would appreciate your signature on this agreement, indicating your consent and permission to enter on said acreage/minerals for this seismic survey.

Approval Granted this 8th day of March, 2000

Permit Valid for one (1) year from approval date.

Social Security or Tax ID 45-6002470

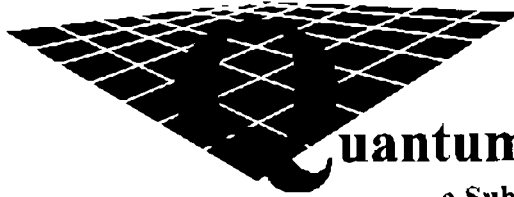
By [Signature] Director, Minerals Management

Address PO Box 5523
Bismarck, ND 58506-5523

Telephone # (701) 328-2804

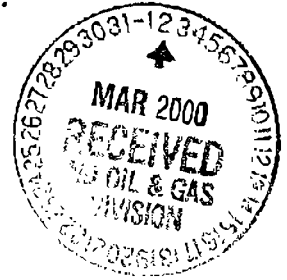
Permit Agent: [Signature] Telephone: 713-850-9794
Bruce Fulker

On any correspondence, please refer to the Prospect and Permit No. Our home office address is 8401 Westheimer, Suite 150, Houston, Texas 77063. The telephone number is (713) 850-9799.



Quantum Geophysical, Inc.

a Subsidiary of Geokinetics Inc.



March 1, 2000

North Dakota Industrial Commission
Oil and Gas Division
600 E Boulevard Ave.
Bismarck, ND 58505

Attn. Dave Hvinden

Re: Alpine 3 D
Dunn County, ND

Dear Mr. Hvinden;

Enclosed is a revised pre-plot map for the above referenced survey. If you have any questions or need additional information I may be reached at (701) 227-1853, Room 113 or (713) 806-2024. I will be in Dickinson until March 8. Thank you.

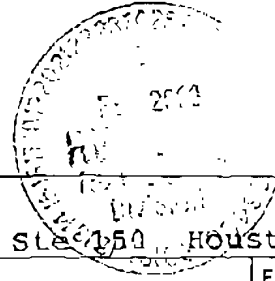
Yours truly,

Bruce Fulker
Permit Supervisor



GEOPHYSICAL EXPLORATION PERMIT
 INDUSTRIAL COMMISSION OF NORTH DAKOTA
 OIL AND GAS DIVISION
 SFN 51459 (11-97)

600 E BOULEVARD AVE
 BISMARCK, ND 58505



1) a. Company Quantum Geophysical, Inc		Address: 8401 Westheimer Street, Houston, TX 77063	
Contact: Bruce Fulker		Telephone: (713) 850-9799	Fax: (713) 850-7783
Surety Company: Bank of North Dakota		Bond Amount: \$50,000.00	Bond Number: GEO300
2) a. Subcontractor(s): Wilderness Exploration		Address: Box 91 Sidney, MT 59270	Telephone: (406) 482-1219
b. Subcontractor(s):		Address:	Telephone:
c. Subcontractor(s):		Address:	Telephone:
3) Party Manager: Billy Flippo		Address:	Telephone: Cell (713) 824-625
4) Project Name or Line Numbers: Alpine 3 D			
5) Exploration Method (Shot Hole, Non-Explosive, 2D, 3D) 3 D Shot Hole Survey			
6) Approximate Drilling Start Date: April 1, 2000		Approximate Completion Date: April 30, 2000	

THE COMMISSION MUST BE NOTIFIED AT LEAST 24 HOURS IN ADVANCE OF COMMENCEMENT OF DRILL/PLUG OPERATIONS

7) Location of Proposed Project - County Dunn County								
Section(s), Township(s) & Range(s)	Sec. 22, 23, 24, 25, 26	T 145 N	R 94 W					
	Sec. 27, 34, 35, 36	T 145 N	R 94 W					
	Sec. 29, 30, 31, 32	T 145 N	R 93 W					
	Sec. 2, 3, 4, 5, 10, 11	T 144 N	R 94 W					
8) Size of Hole	Amt. of Charge	Depth	Shots per Mi. (sq. mi.)	No. of Mi. (sq. mi.)	Identifying Marks Used on Nonmetallic Plug			
3"	5#	40'	(116)	10.62	Geophysical ID	a. Plugger ID	b. Plugger ID	c. Plugger ID
					QG			

9) Anticipated special drilling and plugging procedures? **ND Century Code Chapter 38-08.1**
All holes will be drilled & plugged as per 43-02-12-10 Revised Drilling &

10) Enclose a pre-plot map with proposed location of seismic program lines and powder mag. **Plugging Requirements**

Signed: <i>Bruce Fulker</i>	Title: Permit Supervisor	Date: 02-23-00
--------------------------------	------------------------------------	--------------------------

(This space for State office use)

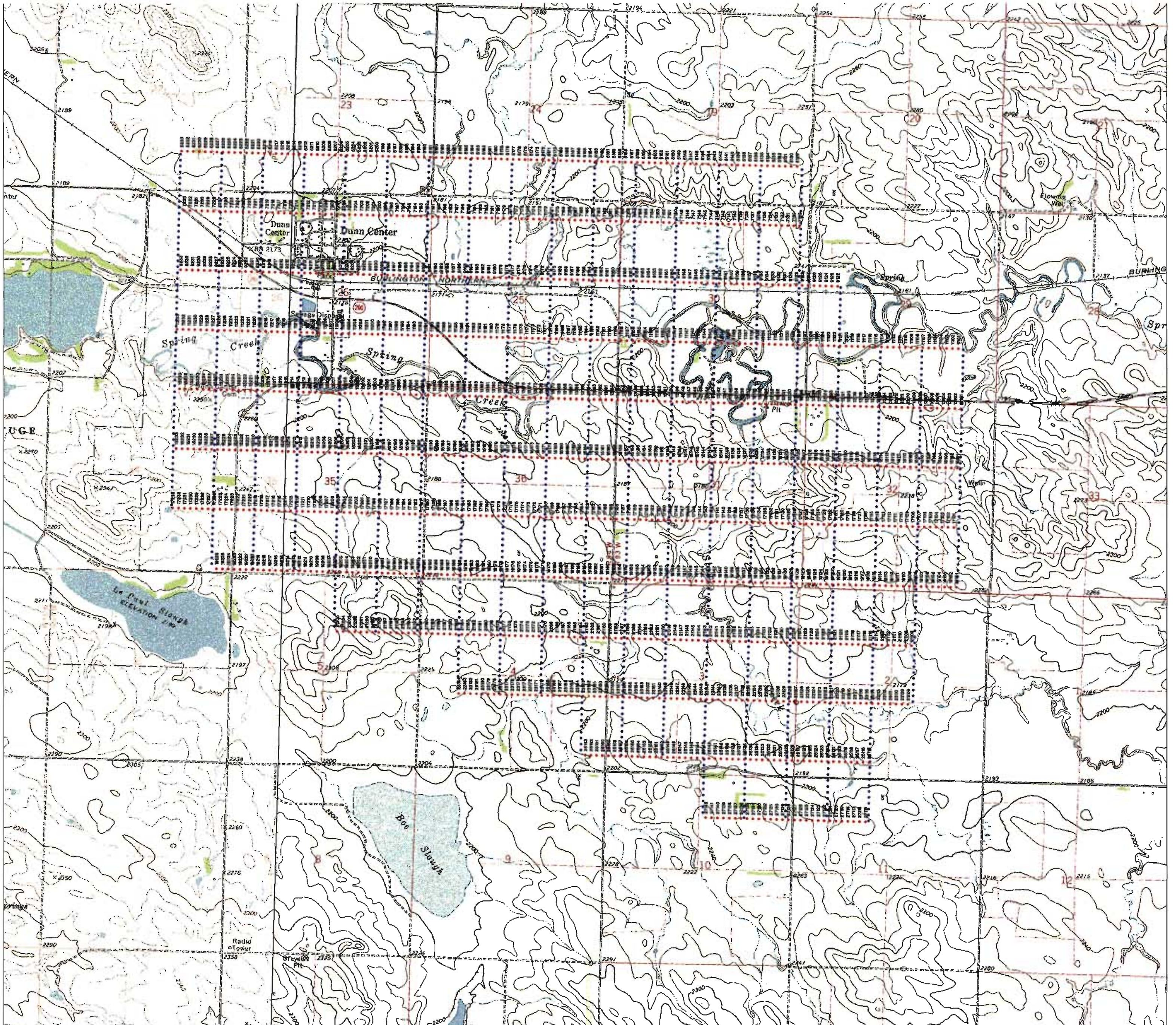
Permit No.: **97-0047** Approval Date: **2/28/00**

Approved By: *Ronald Hutch*

Title: *Geophysical Exploration Supervisor*

County Approval Sent: *Dunn County 2/28/00*

Conditions of Approval if any
Identify surface plugs w/ #47 and contractor stamp, Notify surface owner, county, city and state representative Kim Martin (701-327-7436) prior to drilling. Any variances must be furnished upon



CLIENT:

MANCAL

CONTRACTOR:



Quantum Geophysical, Inc.
a Subsidiary of Geokinetics Inc.

PERMITTING, SURVEYING, AND G.I.S. DONE BY:



ERICKSON CONTRACT SURVEYING

101 6TH STREET S.W. BENEV, MT. 58720 OFFICE: 409-484-8888 FAX: 409-484-8886 EMAIL: ecs@erickson.com

HAZARD REGISTRAR

ROUGH TERRAIN
 DEEP WASHES AND UNDERMINED SINK HOLES
 TICKS, BULL SNAKES, RATTLESNAKES IIII
 LOW OVERHEAD POWER LINES
 WILDLIFE ON HIGHWAYS
 NARROW AND VERY DEEP WASHES IN TALL GRASS
 FIRE HAZARD II VERY DRY III
 NARROW ROADS - STAY RIGHT
 35 MPH SPEED LIMIT ON PROSPECT
 SLOW DOWN NEAR FARM YARDS
 PIPELINES AND PIPERISERS
 HIDDEN INTERSECTIONS AND BLIND CORNERS
 ROCKS IN TALL GRASS, DRIVE SLOW WITH QUADS
 AND TRUCKS
 REMEMBER YOUR ORANGE
 KNOW SAFETY NO PAIN
 NO SAFETY KNOW PAIN

**ALPINE 3-D
 PREPLOT
 DUNN CO., N.D.**

TOWNSHIP 144N, 145N
 RANGE 93W, 94W

SOURCE PT INTERVAL: 220'
 RECEIVER PT INTERVAL: 220'

**SOURCE PARAMETERS
 DYNAMITE**

SHEET 1 OF 1
 FEB. 23, 2000

SCALE: 1:24000
 1" = 2000'

North America Datum 1927
 North Dakota
 South Zone

TOTAL SOURCE PTS: 1233
 TOTAL RECEIVER PTS: 1661
 AREA (SQUARE MILES): +/- 10 SQ. MI.

SOURCE LINE INTERVAL: 1760'
 RECEIVER LINE INTERVAL: 1320'

SOURCE LINE AZIMUTH: 271d 27' 03"
 RECEIVER LINE AZIMUTH: 181d 27' 05"

DRAWN BY: SHANNON BROCKSHU / DANIEL BALT CHECKED BY: SHANNON BROCKSHU
 ECS, INC. IS NOT LIABLE FOR UNDERGROUND UTILITIES OR ALL TOPOG FEATURES ON THIS MAP ARE APPROXIMATE ONLY
 IF A G.I.S. FILE IS READY TO BEAD ALL SOURCE POINTS A MINIMUM OF 100' FROM WATERSHEDS, SPRINGS, WELLS AND ANY STRUCTURES, ETC.
 ANY SOURCE POINTS CLOSER THAN 100' TO WATERSHEDS & SPRINGS HAVE BEEN UNDER THE DIRECTION OF THE CLIENT.
 THEREFORE, ECS, INC. ASSUMES NO LIABILITY OF ANY SOURCE POINT CLOSER THAN 100' TO THE ABOVE MENTIONED ITEMS.

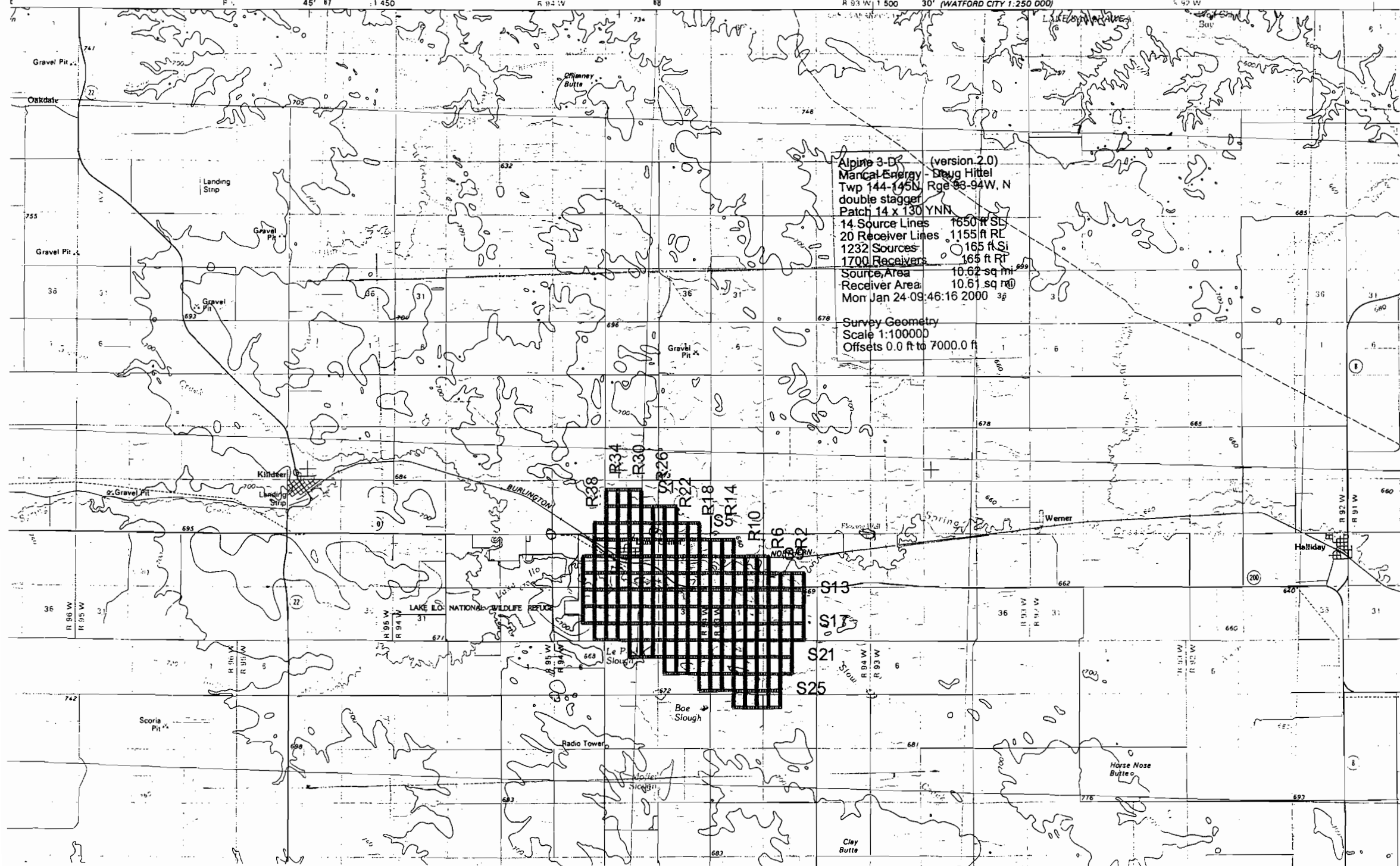
LEGEND

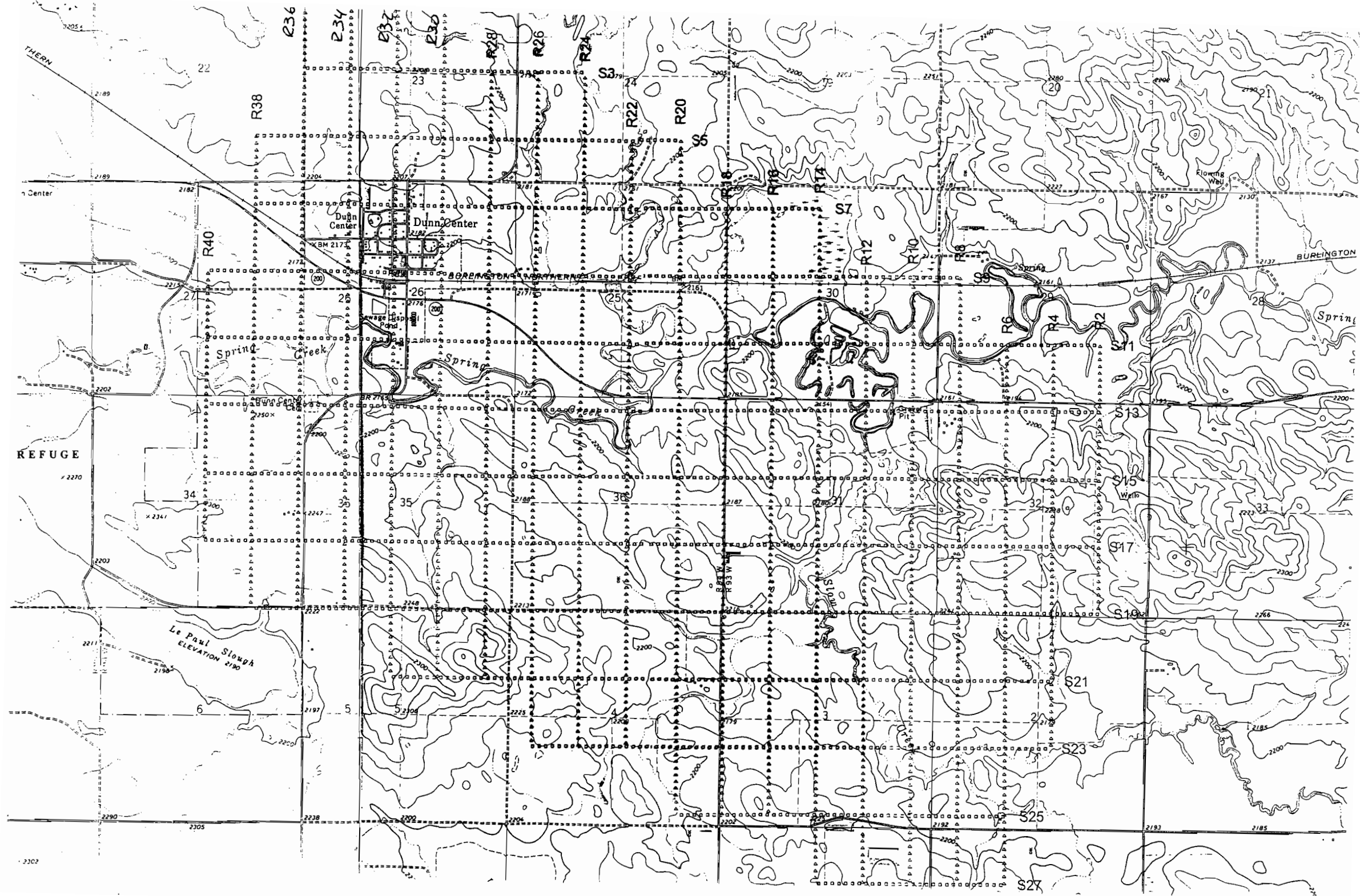
- GATE
- FENCE
- STOCK DAM
- WATERWAY
- HOUSES / OUTBUILDINGS
- OVERHEAD POWER LINES
- UNDERGROUND POWER LINES
- PIPE LINES W/ 100' BUFFER
- RAILROAD TRACKS
- OIL WELLS
- DRY HOLE
- HAZARDS
- COUNTY ROAD NUMBER
- HIGHWAY NUMBER
- IMPROVED GRAVEL ROAD
- UNIMPROVED GRAVEL ROAD
- TRAIL / C-TRACK
- PAVED ROAD
- RECEIVER POINTS
- POSTPLOT SOURCE POINTS
- PREPLOT SOURCE POINTS
- SPRINGS 330' - 600'
- WATER WELLS - 330'

910047

Alpine 3-D (version 2.0)
Mancal Energy - Doug Hittel
Twp 144-145N, Rge 93-94W, N
double stagger
Patch 14 x 130 YNN
14 Source Lines 1650 ft SL
20 Receiver Lines 1155 ft RL
1232 Sources 165 ft Si
1700 Receivers 165 ft Rf
Source Area 10.62 sq mi
Receiver Area 10.61 sq mi
Mon Jan 24-09:46:16 2000 3p

Survey Geometry
Scale 1:100000
Offsets 0.0 ft to 7000.0 ft





NORTH DAKOTA INDUSTRIAL COMMISSION

OIL AND GAS DIVISION

Lynn D. Helms
DIRECTOR

<http://explorer.ndic.state.nd.us>

Bruce E. Hicks
ASSISTANT DIRECTOR

February, 28, 2000

Bruce Fulker
Quantum Geophysical Inc.
8401 Westheimer, Ste. 150
Houston, TX 77063

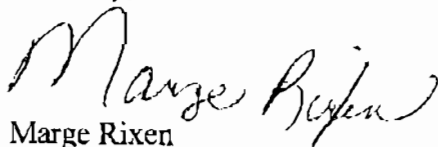
RE: GEOPHYSICAL EXPLORATION PERMIT NO. 97-0047
ALPINE 3 D, Dunn County

Dear Mr. Fulker:

This letter will verify the approval of the above-captioned Geophysical Permits effective February 28, 2000.

Please feel free to contact Mr. David Ivinden, Geophysical Regulation Supervisor if you should have any questions.

Sincerely,



Marge Rixen
Legal Assistant

/mr

NORTH DAKOTA INDUSTRIAL COMMISSION

OIL AND GAS DIVISION

Lynn D. Helms
DIRECTOR

<http://explorer.ndic.state.nd.us>

Bruce E. Hicks
ASSISTANT DIRECTOR

The Honorable Reinhard Hauck
Dunn County Auditor
P.O. Box 105
Manning, ND 58642

February 28, 2000

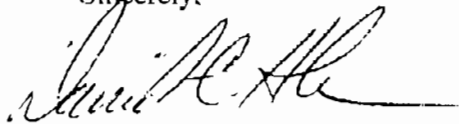
RE: Geophysical Exploration
Permit # 97-0047

Dear Mr. Hauck:

Pursuant to Section 38-08.1-04.2 of the North Dakota Century Code, please be advised that Quantum Geophysical, Inc. was issued the above captioned permit on February 28, 2000 and will remain in effect for a period of one year.

Should you have any questions, please contact our office.

Sincerely,



David C. Hvinden
Geophysical Regulation Supervisor

DCH/dh