

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

RCVD OCT24'06
OIL CONS. DIV.
DIST. 3

FORM APPROVED
OMB No. 1004-0135
Expires: January 31, 2004

SUBMIT IN TRIPLICATE - Other Instructions on reverse side

1. Type of Well
☐ Oil Well ☒ Gas Well ☐ Other

2. Name of Operator
Black Hills Gas Resources, Inc. Contact: Lynn H. Benally

3a. Address
3200 N 1st Street PO Box 249 Bloomfield, NM 87413

3b. Phone No. (include area code)
505-634-1111 ext 27

4. Location of Well (Footage, Sec., T. R., M., or Survey Description)
Surface: 2,380' FSL 155' FWL NW/SW Sec.10 T29N R3W Unit L
Bottom Hole: 1,941' FSL 1,157' FEL NE/SE Sec 10 T29N R3W Unit I

5. Lease Serial No.
Contract 451

6. If Indian, Allottee or Tribe Name
Jicarilla Apache

7. If Unit or CA/Agreement, Name and/or No.

8. Well Name and No.
Jicarilla 451-10 #31

9. API Well No.
30-039-29445

10. Field and Pool, or Exploratory Area
E. Blanco / Pictured Cliffs

11. County or Parish, State
Rio Arriba, NM

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input checked="" type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other <u>Convert Vertical</u>
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	<u>well to Horizontal well</u>
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

3. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

The initial APD to drill a Pictured Cliff (PC) well was approved on August 16, 2006. The well was given API number 30-039-29445. After evaluation of data from recently drilled wells in the immediate area, it was determined that the PC formation is best developed in this area, using Horizontal Drilling Technology. Black Hills Gas Resources is submitting an updated drilling plan, a new C-102, and a revised NM State Form C-101, to change the well from a vertical well to a horizontal well. Black Hills Gas Resources also request that if tests of the tertiary and PC formations are favorable that we will also complete these formations and submit comingle applications if needed.

The surface location of the well remains the same but the new bottom hole will be 1,941' FSL 1,157' FEL.

Surface disturbance will not change from the initial APD, therefore the Surface Use Plan will not be updated or modified.

HOLD C104 FOR directional survey + BH survey

14. I hereby certify that the foregoing is true and correct
Name (Printed/Typed)

Lynn H. Benally

Title Regulatory Compliance Coordinator

Signature

Date 10/11/2006

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by (Signature)

Name (Printed/Typed)

Title

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

Date

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on next page)

NMOC D R

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240

DISTRICT II
1301 W. Grand Ave., Artesia, N.M. 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410

DISTRICT IV
1220 South St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102

Revised October 12, 2005

Submit to Appropriate District Office

State Lease - 4 Copies

Fee Lease - 3 Copies

2006 OCT 12 PM 11 03

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-039-29445	² Pool Code 72400	³ Pool Name EAST BLANCO / PICTURED CLIFFS
⁴ Property Code 23930	⁵ Property Name JICARILLA 451-10	⁶ Well Number 31
⁷ OGRID No. 013925	⁸ Operator Name BLACK HILLS GAS RESOURCES	⁹ Elevation 7018'

¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	10	29-N	3-W		2380	SOUTH	155	WEST	RIO ARRIBA

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
I	10	29-N	3-W		1941	SOUTH	1157	EAST	RIO ARRIBA

¹² Dedicated Acres 320-S/2	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

¹⁶ FD. 2 1/2" BC. U.S.G.L.O. 1917				¹⁷ OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. Signature: <u>Daniel Manus</u> Date: <u>10/11/06</u> Printed Name: <u>Daniel Manus</u>
N 00-00-47 E 5280.15' (M)				
155'		10		
2380'		LAT. 36°44'19.8"N (NAD 83) LONG. 107°08'48.3" W (NAD 83)		B.H.L. 1157'
FD. 2 1/2" BC. U.S.G.L.O. 1917	S 89-54-30 W 2644.22' (M)	FD. 2 1/2" BC. U.S.G.L.O. 1917		¹⁸ SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. Date of Survey: <u>SEPTEMBER 23, 2004</u> Signature and Seal of Professional Surveyor: <u>[Signature]</u> 8894 10-11-06 REGISTERED PROFESSIONAL LAND SURVEYOR 8894 Certificate Number

Black Hills Gas Resources (BHGR)
Jicarilla 451-10 #31
Surface Location: 2,380' FSL 155' FWL (NW/SW)
Bottom Hole Location: 1,941' FSL 1,157' FWL (NE/SE)
Sec.10 T29N R3W
Rio Arriba County, New Mexico
Lease: Contract 451

DRILLING PROGRAM
(Per Rule 320)

This Application for Permit to Drill (APD) was initiated under the NOS process as stated in Onshore Order No. 1 and supporting Bureau of Land Management (BLM) documents. This APD process includes an onsite meeting which was held on October 12, 2004 as determined by Bureau of Land Management (BLM), Bureau of Indian Affairs (BIA) and Jicarilla Oil & Gas Administration (JOGA), and at which time the specific concerns of Black Hills Gas Resources (BHGR) were discussed.

This well was originally permitted and approved as a vertical PC well. This new drilling plan addresses changing the un-drilled well to a horizontal PC well.

SURFACE FORMATION – San Jose

GROUND ELEVATION – 7,018'

ESTIMATED FORMATION TOPS - (Water, oil, gas and/or other mineral-bearing formations)

San Jose	Surface	Sandstone, shales & siltstones
Nacimiento	1,977'	Sandstone, shales & siltstones
Ojo Alamo	3,185'	Sandstone, shales & siltstones
Fruitland	3,611'	Sandstone, shales & siltstones
Pictured Cliffs	3,700'	Sandstone, shales & siltstones
Lewis	3,808'	Sandstone, shales & siltstones

TOTAL DEPTH	4,000'	TVD
	4,085'	Vertical Length of Bore

Estimated depths of anticipated fresh water, oil, or gas:

Tertiary

San Jose	surface	Gas
Ojo Alamo	1,977'	Gas
Ojo Alamo	3,185'	Gas
Fruitland	3,611'	Gas
Pictured Cliffs	3,700'	Gas

HORIZONTAL DRILLING PROGRAM

Kick Off Point is estimated to be \pm 3631' TVD

CASING PROGRAM

Depth	Hole Diameter	Casing Diameter	Casing Weight and Grade	Cement
0-250' TVD	12-1/4"	8 5/8"	J-55 24# ST&C New	To surface (\pm 175 sxs Standard cement containing 2% CaCl ₂ and 0.25lb/sx LCM) **
0-4000' TVD	7-7/8"	5 1/2 "	J-55 15.5# LT&C New	TD to surface (Lead: \pm 300 sxs lite standard cement. Tail: 400 sxs 50:50 poz containing 0.25 lb/sx LCM) * **
3631' TVD (KOP) End of Lateral Bore	4-3/4"	2-7/8"	PH-6 Liner	None

* Actual cement volume to be determined by caliper log.

** Cement will be circulated to surface

Yields:

Surface: Standard cement yield = 1.2 ft³/sx (mixed at 15.6 lb/gal)

Production: Lite Standard Cement yield: = 1.59 ft³/sx (mixed at 13.4 lb/gal)
50:50 poz yield = 1.27 ft³/sx (mixed at 14.15 lb/gal)

All fresh water and prospectively valuable minerals encountered during drilling will be recorded by depth and protected.

PRESSURE CONTROL

BOPs and choke manifold will be installed and pressure tested before drilling out under surface casing (subsequent pressure test will be performed whenever pressure seals are broken), and then will be checked daily as to mechanical operating conditions. BOP's will be pressure tested at least once every 30 days. Ram type preventors and related pressure control equipment will be pressure tested to 1,000 psi. Annular type preventor will be pressure tested to 50% of the rated working pressure, not to exceed 1,000 psi. All casing strings will be pressure tested to 0.22 psi/ft. or 1,000 psi, whichever is greater, not to exceed 70% of internal yield.

BOP to be either double gate rams or an annular preventor as per Onshore Order No. 2.

Statement on Accumulator System and Location of Hydraulic Controls

The drilling rig has not yet been selected for this well. Selection will take place after approval of this application. Manual and/or hydraulic controls will be in compliance with Onshore Order No. 2 for 2M systems.

A remote accumulator will be used. Pressures, capacities, location of remote hydraulic and manual controls will be identified at the time of the BLM supervised BOP test.

MUD PROGRAM

0'	-	300'	Fresh water – M.W. 8.5 ppg, Vis 30-33
300'	-	TD'	Clean Faze - Low solids non-dispersed M.W. 8.5 – 9.2 ppg Vis – 28 – 50 sec W.L. 15cc or less

Sufficient mud materials to maintain mud properties, control lost circulation and to contain “kick” will be available at well site.

AUXILIARY EQUIPMENT

- A) A Kelly cock will be kept in the drill string at all times
- B) Inside BOP or stab-in valve (available on rig floor)
- C) Mud monitoring will be visually observed

LOGGING, CORING, TESTING PROGRAM

- A) Logging: DIL- CNL-FDC-GR - TD - BSC (GR to surface)
Sonic (BSC to TD)
- B) Coring: None
- C) Testing: Possible DST – None anticipated. Drill stem tests may be run on shows of interest

ABNORMAL CONDITIONS

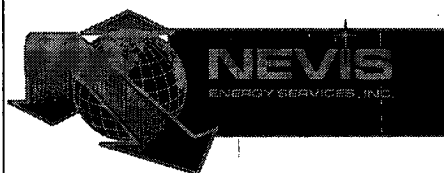
- A) Pressures: No abnormal conditions are anticipated
Bottom hole pressure gradient – 0.31 psi/ft
- B) Temperatures: No abnormal conditions are anticipated
- C) H₂S: See attached H₂S plan in event H₂S is encountered.
- D) Estimated bottomhole pressure: 1,240 psi

ANTICIPATED START DATE

November 1, 2006

COMPLETION

The location pad will be of sufficient size to accommodate all completion activities and equipment. A string of 2-7/8” PH-6 tubing will be run for a flowing string. A Sundry Notice will be submitted with a revised completion program if warranted.



1724-B Townhurst Dr, Houston, Tx 77043
(713) 827-8302
www.nevisenergy.com

Job Number: 61xxx
Company: Black Hills
Lease/Well: Jicarilla 451-10 #31
Location: Rio Arriba Co., NM
Rig Name: ☐
RKB: ☐
G.L. or M.S.L.: ☐

State/Country: NM/USA
Declination: ☐
Grid: ☐
File name: N:\BLACKH~1\2006\JIC451~1\4511031.SVY
Date/Time: 12-Sep-06 / 08:33
Curve Name: Jicarilla 451-10 #31 Plan

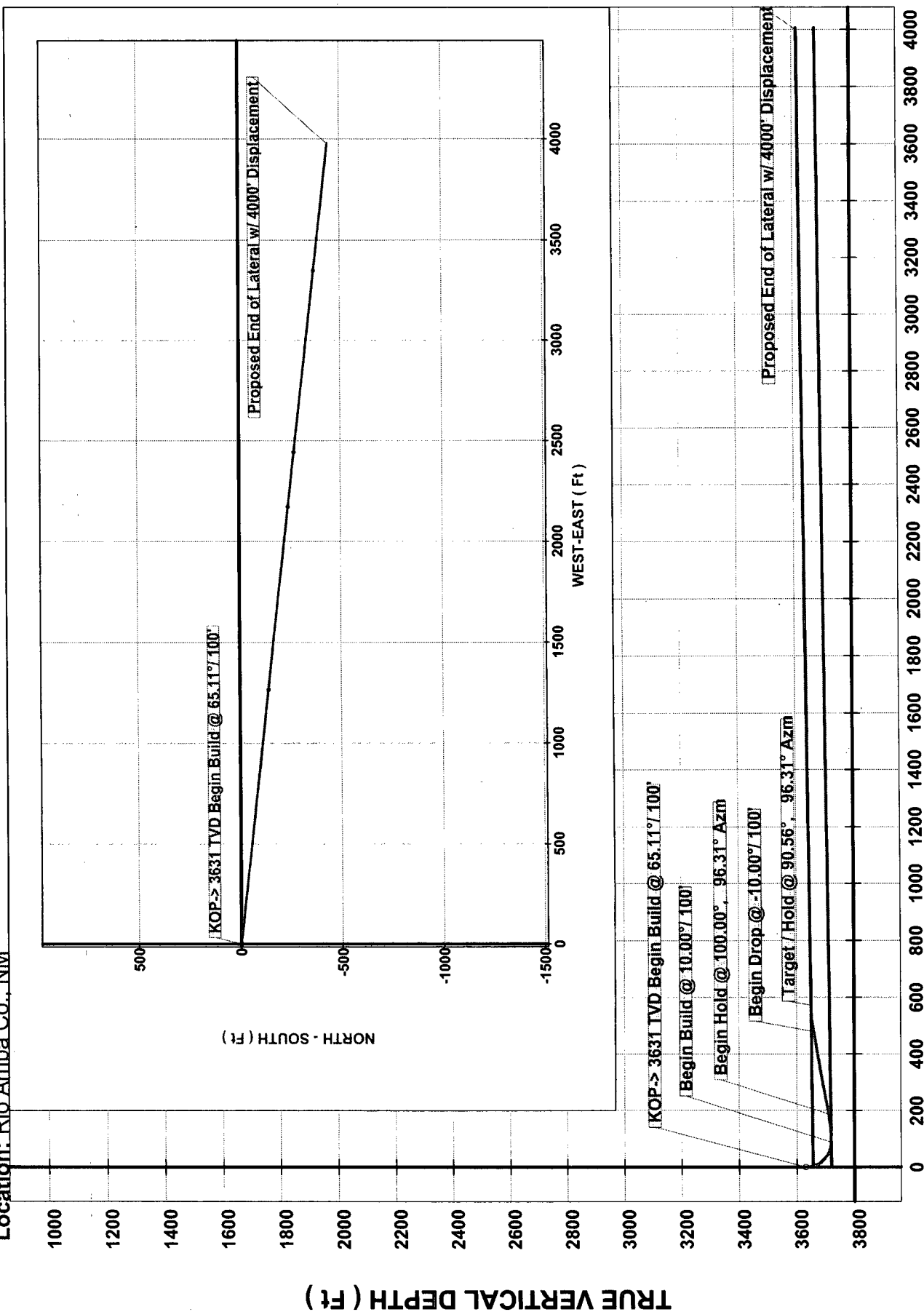
WINSERVE PROPOSAL REPORT
Minimum Curvature Method
Vertical Section Plane 96.31
Vertical Section Referenced to Wellhead
Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	N-S FT	E-W FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
KOP-> 3631 TVD Begin Build @ 65.11°/ 100'									
3631.00	.00	96.31	3631.00	.00	.00	.00	.00	.00	.00
3641.00	6.51	96.31	3640.98	.57	-.06	.56	.57	96.30	65.11
3651.00	13.02	96.31	3650.83	2.26	-.25	2.25	2.26	96.31	65.11
3661.00	19.53	96.31	3660.42	5.06	-.56	5.03	5.06	96.31	65.11
3671.00	26.04	96.31	3669.64	8.94	-.98	8.88	8.94	96.31	65.11
3681.00	32.55	96.31	3678.35	13.83	-1.52	13.74	13.83	96.31	65.11
3691.00	39.07	96.31	3686.46	19.67	-2.16	19.56	19.67	96.31	65.11
3701.00	45.58	96.31	3693.85	26.40	-2.90	26.24	26.40	96.31	65.11
3711.00	52.09	96.31	3700.43	33.93	-3.73	33.72	33.93	96.31	65.11
3721.00	58.60	96.31	3706.11	42.15	-4.63	41.89	42.15	96.31	65.11
3731.00	65.11	96.31	3710.83	50.96	-5.60	50.65	50.96	96.31	65.11
3741.00	71.62	96.31	3714.51	60.25	-6.62	59.89	60.25	96.31	65.11
3751.00	78.13	96.31	3717.12	69.90	-7.68	69.48	69.90	96.31	65.11
3761.00	84.64	96.31	3718.62	79.78	-8.76	79.30	79.78	96.31	65.11
Begin Build @ 10.00°/ 100'									
3769.23	90.00	96.31	3719.00	88.00	-9.66	87.47	88.00	96.31	65.11
3779.23	91.00	96.31	3718.91	98.00	-10.76	97.41	98.00	96.31	10.00
3789.23	92.00	96.31	3718.65	108.00	-11.86	107.34	108.00	96.31	10.00
3799.23	93.00	96.31	3718.21	117.99	-12.96	117.27	117.99	96.31	10.00
3809.23	94.00	96.31	3717.60	127.97	-14.05	127.19	127.97	96.31	10.00
3819.23	95.00	96.31	3716.82	137.94	-15.15	137.10	137.94	96.31	10.00
3829.23	96.00	96.31	3715.86	147.89	-16.24	147.00	147.89	96.31	10.00
3839.23	97.00	96.31	3714.73	157.83	-17.33	156.87	157.83	96.31	10.00
3849.23	98.00	96.31	3713.42	167.74	-18.42	166.72	167.74	96.31	10.00

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	N-S FT	E-W FT	C L O S U R E		Dogleg Severity Deg/100
Distance FT	Direction Deg								
3859.23	99.00	96.31	3711.94	177.63	-19.51	176.56	177.63	96.31	10.00
Begin Hold @ 100.00°, 96.31° Azm									
3869.16	100.00	96.31	3710.30	187.42	-20.58	186.29	187.42	96.31	10.00
3969.18	100.00	96.31	3692.94	285.93	-31.40	284.20	285.93	96.31	.00
4069.18	100.00	96.31	3675.58	384.41	-42.22	382.08	384.41	96.31	.00
Begin Drop @ -10.00°/ 100'									
4164.00	100.00	96.31	3659.11	477.79	-52.47	474.90	477.79	96.31	.00
4174.00	99.00	96.31	3657.46	487.65	-53.56	484.70	487.65	96.31	10.00
4184.00	98.00	96.31	3655.99	497.54	-54.64	494.53	497.54	96.31	10.00
4194.00	97.00	96.31	3654.68	507.45	-55.73	504.38	507.45	96.31	10.00
4204.00	96.00	96.31	3653.55	517.39	-56.82	514.26	517.39	96.31	10.00
4214.00	95.00	96.31	3652.59	527.34	-57.92	524.15	527.34	96.31	10.00
4224.00	94.00	96.31	3651.81	537.31	-59.01	534.06	537.31	96.31	10.00
4234.00	92.99	96.31	3651.20	547.29	-60.11	543.98	547.29	96.31	10.00
4244.00	91.99	96.31	3650.76	557.28	-61.21	553.91	557.28	96.31	10.00
4254.00	90.99	96.31	3650.50	567.28	-62.30	563.85	567.28	96.31	10.00
Target / Hold @ 90.56°, 96.31° Azm									
4258.32	90.56	96.31	3650.45	571.60	-62.78	568.14	571.60	96.31	10.00
4258.34	90.56	96.31	3650.45	571.62	-62.78	568.16	571.62	96.31	1.52
4358.34	90.56	96.31	3649.46	671.61	-73.76	667.55	671.61	96.31	.00
4458.34	90.56	96.31	3648.48	771.61	-84.74	766.94	771.61	96.31	.00
4558.34	90.56	96.31	3647.50	871.60	-95.73	866.33	871.60	96.31	.00
4658.34	90.56	96.31	3646.52	971.60	-106.71	965.72	971.60	96.31	.00
4758.34	90.56	96.31	3645.54	1071.59	-117.69	1065.11	1071.59	96.31	.00
4858.34	90.56	96.31	3644.56	1171.59	-128.67	1164.50	1171.59	96.31	.00
4958.34	90.56	96.31	3643.58	1271.58	-139.66	1263.89	1271.58	96.31	.00
5058.34	90.56	96.31	3642.60	1371.58	-150.64	1363.28	1371.58	96.31	.00
5158.34	90.56	96.31	3641.62	1471.57	-161.62	1462.67	1471.57	96.31	.00
5258.34	90.56	96.31	3640.64	1571.57	-172.60	1562.06	1571.57	96.31	.00
5358.34	90.56	96.31	3639.66	1671.56	-183.59	1661.45	1671.56	96.31	.00
5458.34	90.56	96.31	3638.68	1771.56	-194.57	1760.84	1771.56	96.31	.00
5558.34	90.56	96.31	3637.70	1871.55	-205.55	1860.23	1871.55	96.31	.00
5658.34	90.56	96.31	3636.72	1971.55	-216.53	1959.62	1971.55	96.31	.00
5758.34	90.56	96.31	3635.74	2071.54	-227.52	2059.01	2071.54	96.31	.00
5858.34	90.56	96.31	3634.76	2171.54	-238.50	2158.40	2171.54	96.31	.00
5958.34	90.56	96.31	3633.78	2271.53	-249.48	2257.79	2271.53	96.31	.00
6058.34	90.56	96.31	3632.80	2371.53	-260.46	2357.18	2371.53	96.31	.00
6158.34	90.56	96.31	3631.82	2471.52	-271.45	2456.57	2471.52	96.31	.00
6258.34	90.56	96.31	3630.84	2571.52	-282.43	2555.96	2571.52	96.31	.00
6358.34	90.56	96.31	3629.86	2671.52	-293.41	2655.35	2671.52	96.31	.00
6458.34	90.56	96.31	3628.88	2771.51	-304.39	2754.74	2771.51	96.31	.00
6558.34	90.56	96.31	3627.90	2871.51	-315.38	2854.13	2871.51	96.31	.00
6658.34	90.56	96.31	3626.92	2971.50	-326.36	2953.52	2971.50	96.31	.00

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	N-S FT	E-W FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
6758.34	90.56	96.31	3625.94	3071.50	-337.34	3052.91	3071.50	96.31	.00
6858.34	90.56	96.31	3624.96	3171.49	-348.32	3152.31	3171.49	96.31	.00
6958.34	90.56	96.31	3623.98	3271.49	-359.31	3251.70	3271.49	96.31	.00
7058.34	90.56	96.31	3623.00	3371.48	-370.29	3351.09	3371.48	96.31	.00
7158.34	90.56	96.31	3622.02	3471.48	-381.27	3450.48	3471.48	96.31	.00
7258.34	90.56	96.31	3621.04	3571.47	-392.25	3549.87	3571.47	96.31	.00
7358.34	90.56	96.31	3620.06	3671.47	-403.24	3649.26	3671.47	96.31	.00
7458.34	90.56	96.31	3619.08	3771.46	-414.22	3748.65	3771.46	96.31	.00
7558.34	90.56	96.31	3618.09	3871.46	-425.20	3848.04	3871.46	96.31	.00
7658.34	90.56	96.31	3617.11	3971.45	-436.18	3947.43	3971.45	96.31	.00
Proposed End of Lateral w/ 4000' Displacement									
7686.88	90.56	96.31	3616.83	4000.00	-439.32	3975.80	4000.00	96.31	.00

Job Number: 61xxx
 Company: Black Hills
 Lease/Well: Jicarilla 451-10 #31
 Location: Rio Arriba Co., NM



VERTICAL SECTION (ft) @ 96.31°

Jicarilla 451-10 #31
 2,380' FSL 155' FWL (NW /4 SW /4)
 Sec. 10 T 29 R 3W
 Rio Arriba County, New Mexico
 Contract 451

SURFACE CASING AND CENTRALIZER DESIGN

Proposed Total Depth: 4,000 '
 Proposed Depth of Surface Casing: 250 '
 Estimated Pressure Gradient: 0.31 psi/ft
 Bottom Hole Pressure at 4,000 '
 0.31 psi/ft x 4,000 ' = 1,240 psi
 Hydrostatic Head of gas/oil mud: 0.22 psi/ft
 0.22 psi/ft x 4,000 ' = 880 psi

Maximum Design Surface Pressure

Bottom Hole Pressure	-	Hydrostatic Head	=	
(0.31 psi/ft x 4,000 ')	-	(0.22 psi/ft x 4,000 ')	=	
1,240 psi	-	880 psi	=	360 psi

Casing Strengths

8 5/8 J-55 24# ST&C

Wt.	Tension (lbs)	Burst (psi)	Collapse (psi)
24 #	244,000	2,950	1,370
32 #	372,000	3,930	2,530

Safety Factors

Tension (Dry):	1.8	Burst:	1.0	Collapse:	1.125
Tension (Dry):	24 # / ft x 250 ' = 6,000 #				
	Safety Factor = $\frac{244,000}{6,000}$			= 40.67	ok
Burst:	Safety Factor = $\frac{2,950 \text{ psi}}{360 \text{ psi}}$			= 8.19	ok
Collapse:	Hydrostatic = 0.052 x 9.0 ppg x 250 ' = 117 psi				
	Safety Factor = $\frac{1,370 \text{ psi}}{117 \text{ psi}}$			= 11.71	ok

Use 250 ' 8 5/8 J-55 24# ST&C

Use 2,000 psi minimum casinghead and BOP's but will test to 1,000 psi

Centralizers

5 Total

1 near surface at 40'

2 -1 each at middle of bottom joint, second joint

2 -1 each at every other joint 40' spacing

Total centralized ± 200 ' (50 ' - 250 ')

Note that field experience indicates that additional centralizers greatly increase the chance of "sticking" the surface casing prior to reaching surface casing total depth.