

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary-Designate

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Jami Bailey, Division Director
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-3 APD form.

Operator Signature Date: 7/2/13

Well information;

Operator EnerVest, Well Name and Number Jicarilla Apache 102 14M

API# 30-039-31193, Section 9, Township 26 NS, Range 4 E/W

Conditions of Approval:

(See the below checked and handwritten conditions)

- ☒ Notify Aztec OCD 24hrs prior to casing & cement.
- ☒ Hold C-104 for directional survey & "As Drilled" Plat
- ☒ Hold C-104 for NSL, NSP, DHC
- ☐ Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- ☒ Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
 - A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
 - A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
 - A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
- ☐ Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
- ☐ Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils

Charles Hernandez
NMOCD Approved by Signature

8-29-2013 ca
Date

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JUL 03 2013

Form 3160-3
(March 2012)FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Farmington Field Office
Bureau of Land Management

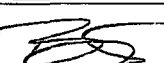
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		6. If Indian, Allottee or Tribe Name Jicarilla Apache Tribe
1b. Type of Well: <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator EnerVest Operating, L.L.C.		8. Lease Name and Well No. Jicarilla Apache 102 #14M
3a. Address 1001 Fannin St., Suite 800 Houston, TX 77034	3b. Phone No. (include area code) 713-659-3500	9. API Well No. 30-039- 31193
4. Location of Well (Report location clearly and in accordance with any State requirements.)* At surface 1310' FSL & 1482' FWL (UL N), Sec. 9 T26N R04W At proposed prod. zone 660' FSL & 1980' FWL (UL N), Sec. 9 T26N R04W		10. Field and Pool, or Exploratory Blanco Mesaverde/Basin Dakota
14. Distance in miles and direction from nearest town or post office* 30 miles from Lindreth, NM		11. Sec., T. R. M. or Blk. and Survey or Area Sec. 9 T26N R04W
15. Distance from proposed* location to nearest property or lease line, ft. 1320' (Also to nearest drig. unit line, if any)	16. No. of acres in lease 2567.94	12. County or Parish Rio Arriba
17. Spacing Unit dedicated to this well MV - S/320 DK - W/320	18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 260'	13. State NM
19. Proposed Depth 8020' (MD) 8119.18' (TVD)	20. BLM/BIA Bond No. on file RLB0007886	RCVD AUG 1 '13 OIL CONS. DIV. DIST. 3
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 7112' GL	22. Approximate date work will start* 03/01/2014	23. Estimated duration 5 weeks

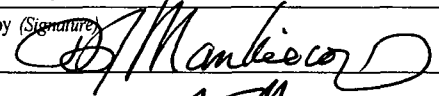
24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, must be attached to this form:

- | | |
|--|---|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the BLM. |

25. Signature 	Name (Printed/Typed) Bart Trevino	Date 07/02/2013
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Title
Regulatory Analyst

Approved by (Signature) 	Name (Printed/Typed) AFM	Date 7/31/13
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Title AFM	Office FFO
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Application approval 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.
Conditions of approval, if any, are attached.

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.

BLM'S APPROVAL OR ACTION OF THIS

(Continued on page 2)

**DRILLING OPERATIONS
AUTHORIZED ARE SUBJECT TO
COMPLIANCE WITH ATTACHED
"GENERAL REQUIREMENTS"**

**ACTION DOES NOT RELIEVE THE LESSEE AND
OPERATOR FROM OBTAINING ANY OTHER
AUTHORIZATION REQUIRED FOR OPERATIONS
ON FEDERAL AND INDIAN LANDS**

*(Instructions on page 2)

**This action is subject to technical
and procedural review pursuant to
43 CFR 3165.3 and appeal
pursuant to 43 CFR 3165.4**

NMOC

RV

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District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
JUL 03 2013 Revised August 1, 2011
Submit one copy to appropriate District Office
Farmington Field Office
Bureau of Land Management.

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-039-31193	² Pool Code 72319/71599	³ Pool Name Blanco Mesaverde/Basin Dakota
⁴ Property Code 306751	⁵ Property Name JICARILLA APACHE 102	⁶ Well Number 14M
⁷ OGRID No. 143199	⁸ Operator Name ENERVEST OPERATING, LLC	⁹ Elevation 7112'

¹⁰ Surface Location

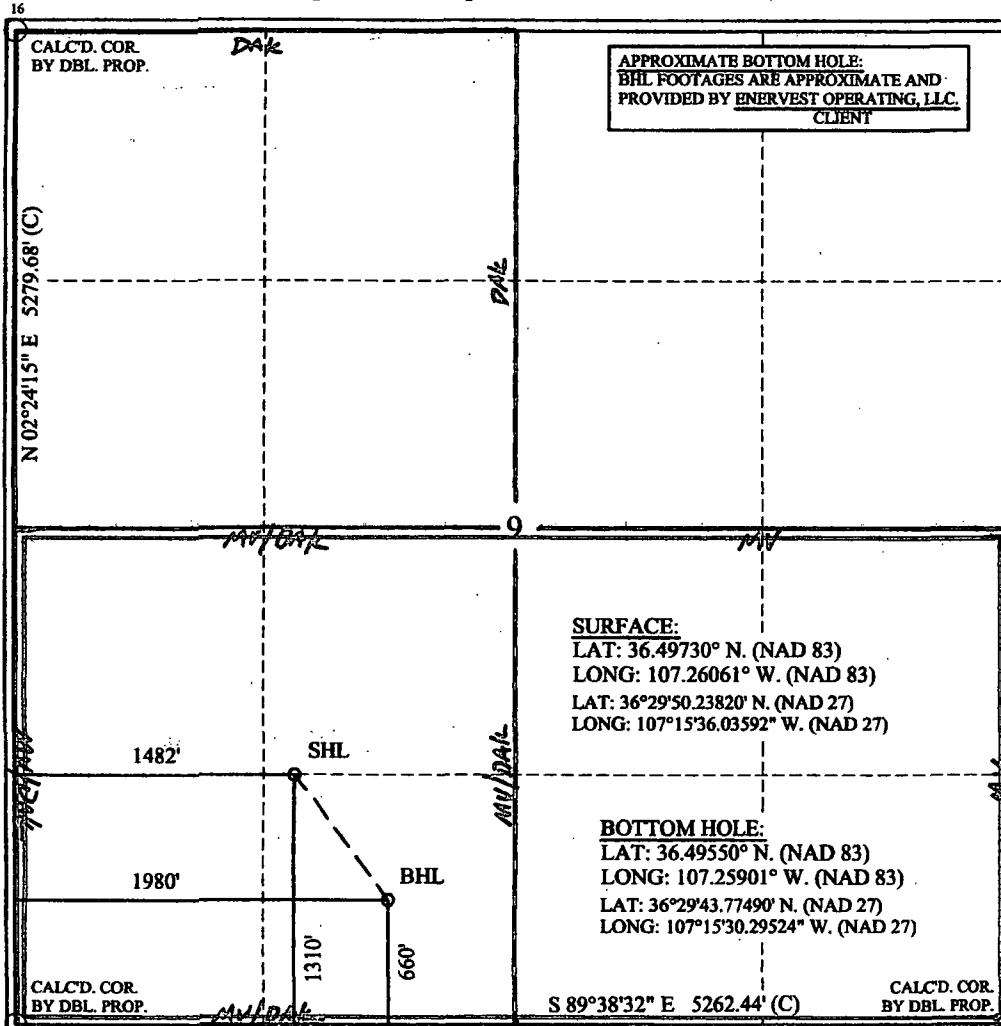
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	9	26-N	4-W		1310	SOUTH	1482	WEST	RIO ARriba

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
N	9	26-N	4-W		660	SOUTH	1980	WEST	

¹² Dedicated Acres MV - S/320 DK - W/320	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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No allowable will be assigned to this completion until all interest have been consolidated or a non-standard unit has been approved by the division.



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.

Bart Trevino 12/19/12
Signature Date

Bart Trevino
Printed Name

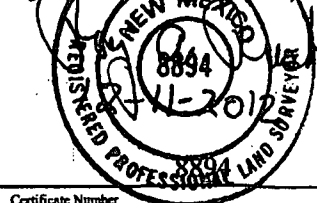
btrevino@enervest.net
E-mail Address

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.

DECEMBER 10, 2012

Date of Survey
Signature and Seal of Professional Surveyor:



Certificate Number

EnerVest Operating, LLC**Jicarilla Apache 102 # 14M**

Surface: 1310' FSL, 1482' FWL Unit N, Sec. 9, T26N R04W
Bottom Hole: 660' FSL, 1980' FWL Unit N, Sec 9, T26N, R04W
Rio Arriba County, NM
GL Elev: 7112'

RECEIVED**JUL 29 2013**

Farmington Field Office
Bureau of Land Management

Revised Drilling Plan (7-15-2013)

All Lease and /or unit operations will be conducted in such a manner that full compliance is made with applicable laws, regulations, BLM Onshore orders and EnerVest's approved Further Development Project Plan. The operator is fully responsible for the actions of its subcontractors. A copy of the APD and Conditions of Approval will be available to the field representatives to ensure compliance.

4.1, 4.2 ESTIMATED (TVD) FORMATION TOPS (KB) and NOTABLE ZONES:

The following are estimates of formation and proposed casing depths.

<u>Formation Name</u>	<u>Depth (TVD)</u>	<u>Rock Type</u>	<u>Comments</u>
San Jose	Surface	Sandstone	
Ojo Alamo	3095'	Sandstone	Possible Gas, Water
Kirtland	3599'	Shale	
Fruitland	3645'	Coal, Shale, Sandstone	Possible Lost Circ, Gas, Water
Pictured Cliffs	3835'	Sandstone	Possible Lost Circ, Gas, water
Lewis	4082'	Shale	Sloughing Shale
Mesa Verde (Cliffhouse)	5510'	Sandstone	Possible Lost Circ, Gas, Water
Mesa Verde (Menefee)	5616'	Coal, Sandstone, Shale	Possible Lost Circ, Gas, Water
Mesa Verde (Point Lookout)	5950'	Sandstone	Possible Lost Circ, Gas, Water
Mancos	6087'	Shale	Sloughing Shale
Greenhorn	7935'	Limestone	Gas, Oil
Graneros	7970'	Shale	Gas, Oil, Water
Dakota	7988'	Sandstone	Gas, Oil, Water
Proposed Total Depth	8283'		

Fresh water zones will be adequately protected by setting and cementing the surface casing. All zones containing commercial quantities of oil or gas will be cased and cemented.

This well is to be drilled as a directionally drilled "S-shaped" well. The well is to be drilled vertically from surface to a kick off point at +/- 600 ft MD. The well will be directionally drilled at a 142.54 degree azimuth to a point 818 ft south east of the surface location and at an estimated MD of +/-4500 ft. The well will be drilled vertically from that point to the estimated TD.

EnerVest Operating, LLC

Jicarilla Apache 102 # 14M

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Rio Arriba County, NM
GL Elev: 7112'

4.3 PRESSURE CONTROL:

Maximum expected pressure is ~1822 (.22 pressure gradient) psi. The drilling contract has not yet been awarded, thus the exact BOP and Choke Manifold model to be used is not yet known. A typical 11" 2000 psi model is pictured in Exhibits A & B.

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

BOP equipment, accumulator, choke manifold and all accessories will meet or exceed BLM requirements as listed in Onshore Order #2 for the 2M systems. The pressure control equipment considerations include but will not be limited to:

1. BOP will be a double gate ram preventer with a set of blind rams and a set of properly-sized pipe rams.
2. Accumulator will have sufficient capacity to close the BOP rams and retain 200 psi above pre charge.
3. Accumulator fluid volume is to be maintained at manufacturer's recommendations.
4. BOP will also have manual closing handles available.
5. 2" minimum kill line and kill line valves (2).
6. Choke manifold (2" lines) with 2 adjustable chokes with valves and gauge.
7. Manually operated Kelly cocks available.
8. Safety valve and sub(s) with adequate opening for all drill strings used.
9. Fill line and flow line above the upper-most BOP rams.

BOPs will be pressure tested; after initial installation, before drilling out from under all set and cemented casing strings and any time a seal is broken. The BOPs will also be pressure tested a minimum of once every 21 days by a 3rd party. Additionally, the BOPs will be operationally checked every 24 hours.

All tests and pressure tests will be recorded on IADC log.

Ram type preventors, choke manifold and related pressure control equipment will be pressure tested to the rated working pressure of 2000 psi (high) and 250 psi (low).

The casing strings will be pressure tested per BLM Onshore Order #2 for 30 min as follows:

- a. Surface casing tested to 600 psi prior to drilling out the shoe.
- b. The 4 ½" 11.6# N-80 production casing will be tested to 6000 psi at the commencement of completion operations.

EnerVest Operating, LLC

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Rio Arriba County, NM
GL Elev: 7112'

4.4 PROPOSED CASING PROGRAM :

The casings program is designed as follows:

Casing Design								
Hole/Casing Description	Hole Size	Casing OD	Weight lb/ft	Grade	Age	Connection	Top	Bottom
Surface	12 1/4"	9 5/8"	36	J-55	New	ST&C	0	500'
Prod Csg MD	7 7/8"	4 1/2"	11.6	N-80	New	LT&C	500'	8383'
TVD							500'	8283'

Surface casing is to be cemented to surface. The production casing is to be cemented in 3 stages covering all zones of production potential and the 3rd stage is intended to circulate cement to surface.

4.5 CASING CEMENT:

A prototypical cementing program is listed as follows, site-specific cement designs will be produced for each well as the hole conditions warrant. The cement program will be designed to meet the BLM Onshore Order #2 and NMOCD requirements.

Surface casing will be cemented to the surface.

Cement and properties; Mix and pump 225 sacks (313 cu ft) Type III cement (or equivalent) cement. Slurry density is to be 14.6 (yield = 1.39 cu ft/sx). Volume will include 100% excess. Cement is to be displaced using a top plug.

Two centralizers will be run on the shoe joint, one centralizer each on the next two joints and then one centralizer on every third joint thereafter.

The surface casing will be pressure tested to 600 psi prior to drilling out the shoe.

EnerVest Operating, LLC

Jicarilla Apache 102 # 14M

Surface: 1310' FSL, 1482' FWL Unit N, Sec. 9, T26N R04W
Bottom Hole: 660' FSL, 1980' FWL Unit N, Sec 9, T26N, R04W
Rio Arriba County, NM
GL Elev: 7112'

Production casing will be cemented in 3 stages covering all zones of production potential and the 3rd stage is intended to circulate cement to surface. Volumes based on 50% OH excess cement for stage 1, 2 and 3.

Stage 1 cement; mix and pump 577 sacks (1159 cu ft) premium lite high strength cement with CaCl₂, cellophane, gilsonite and fluid loss agent. Slurry density is to be 12.5 (yield = 2.01 cu ft/sx).

DV tool at +/- 5000 ft. MD

Stage 2 Lead cement; mix and pump 192 sacks (408 cu ft) premium lite slurry with CaCl₂, cello flake and gilsonite. Estimated slurry density is to be 12.1 (yield = 2.13 cu ft/sx).

Stage 2 Tail cement; mix and pump 50 sacks (70 cu ft) Type III cement (or equivalent) cement. Slurry density is to be 14.6 (yield = 1.39 cu ft/sx). or equivalent cement.

DV tool at +/- 3600 ft. MD

Stage 3 Lead cement; mix and pump 540 sacks (1151 cu ft) premium lite slurry with CaCl₂, cello flake and gilsonite. Estimated slurry density is to be 12.1 (yield = 2.13 cu ft/sx).

Stage 3 Tail cement; mix and pump 50 sacks (70 cu ft) Type III cement (or equivalent) cement. Slurry density is to be 14.6 (yield = 1.39 cu ft/sx). or equivalent cement.

Two centralizers will be run on the shoe joint, one centralizer on every third joint into the surface casing.

The production casing will be pressure tested for 30 minutes at the commencement of completion operations as outlined above

Where cement has not been circulated to surface (or to planned depth) a CBL or temperature survey will be run to determine the TOC for that casing string. A CBL log will be run in the production casing prior to the commencement of completion operations.

EnerVest Operating, LLC

Jicarilla Apache 102 # 14M

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Rio Arriba County, NM
GL Elev: 7112'

Cement specifications may vary slightly due to cement type and cement contractor availability.

4.6 MUD PROGRAM

Depth (MD)	Type	Wt / pp	Visc	Fluid Loss
0-500'	FW gel/Lime Spud Mud	8.4-9.0	30-40	N/C
500'-8383'	LSND/Gel sweeps, LCM as needed	8.7-9.0	20-32	4-6 cc

The well will be drilled utilizing a closed loop mud handling system. The closed loop system will comply with the NMOCD pit rules pertaining to the use of the system and disposal of the drill cuttings and waste. Drilling mud will be moved for re-use to drill subsequent wells whenever possible.

Viscosity, mud weight and other physical and chemical characteristics of the drilling mud will be varied as required to keep the hole clean, circulate drill cuttings, prevent caving, prevent lost circulation and maximize penetration rate.

Sufficient mud and materials will be kept on site to maintain mud properties and meet lost circulation or mud weight requirements at all times.

Mud design may change depending on well conditions, LCM, fluid loss and viscosity will be determined by the EnerVest representative and the mud engineer on site.

4.7 CORING, TESTING, & LOGGING

No cores or drill stem tests are planned. Well logs to be run are:

500' to TD; GR/ Cement Bond Log, at the commencement of completion operations.

1000' to TD; GR/Induction/Density Neutron. (Cased hole GR/Neutron will be run if the hole conditions do not allow the use of the open hole logs)

This well will be directionally drilled and a record of the deviation will be run while drilling. A deviation survey will be submitted at the conclusion of the well completion.

EnerVest Operating, LLC

Jicarilla Apache 102 # 14M

Surface: 1310' FSL, 1482' FWL Unit N, Sec. 9, T26N R04W
Bottom Hole: 660' FSL, 1980' FWL Unit N, Sec 9, T26N, R04W
Rio Arriba County, NM
GL Elev: 7112'

4.8 ANTICIPATED PRESSURES AND TEMPERATURES:

- | | | |
|----|---|------------|
| a. | Expected bottom hole pressure: | < 1822 psi |
| b. | Anticipated abnormal pressure: | None |
| c. | Anticipated abnormal temperatures: | None |
| d. | Anticipated hazardous gas (H ₂ S): | None |

If any of the foregoing conditions are unexpectedly encountered, suitable steps will be taken to mitigate according to accepted industry best practices.

4.9 OTHER INFORMATION:

The anticipated spud date is spring 2014. The spud date will be dependent on the weather conditions, road conditions and the Conditions of Approval.

The dirt work for road and well pad construction will commence upon approval of the APD and will be dependent on weather conditions.

The well will be spud after well pad construction is complete and a suitable rig becomes available. The duration of drilling operations is expected to be from two to three weeks. The drilling rig and associated equipment will be removed and preparations will be made for the completion of the well.

Completion will start about one to four weeks after the finish of the drilling operations. A completion rig will be moved in for the completion phase. The completion phase of the well is expected to +/- two weeks. The completion phase will include; perforating, acidizing, fracture stimulation and well testing.

Some events/situations may arise that could potentially change the starting date or project duration that are out of EnerVest's control. If such events/situations arise, the proper officials will be promptly notified.



Scientific Drilling

Company: EnerVest Operating LLC
Project: Rio Arriba County, NM (NAD83)
Site: Jicarilla

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JUL 29 2013

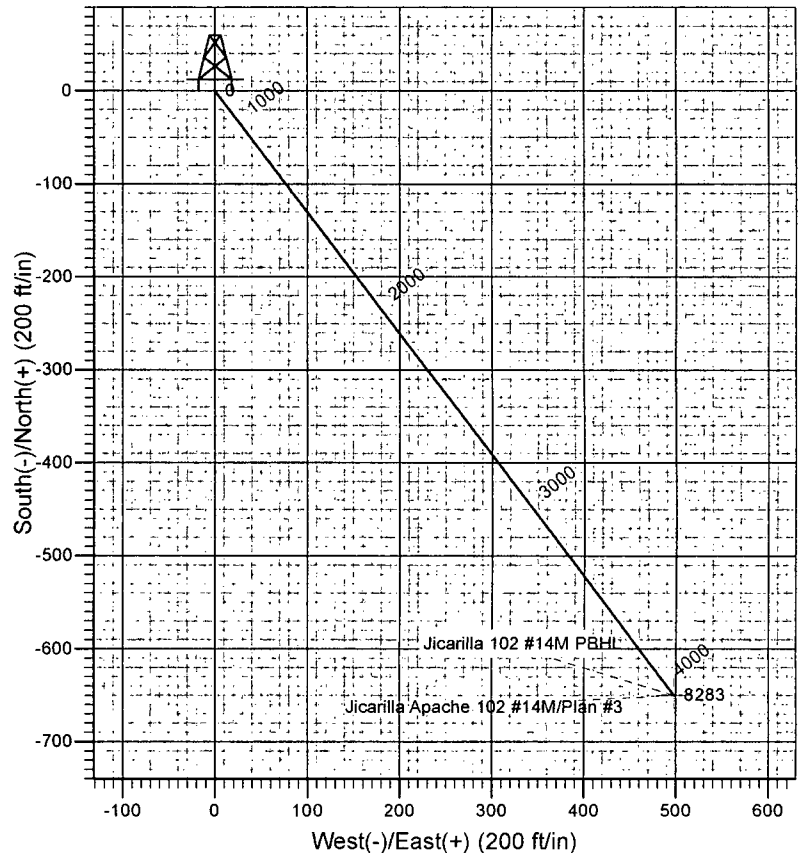
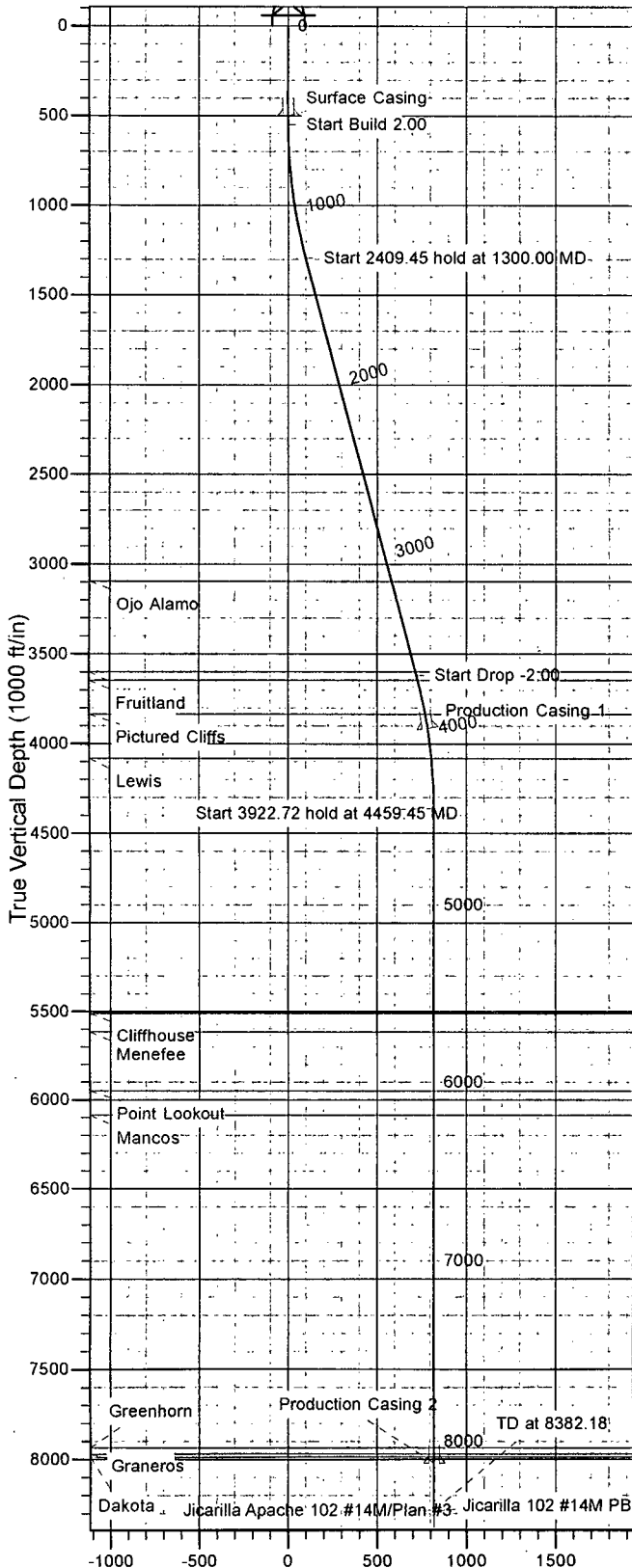
Farmington Field Office

Well Details: Jicarilla Apache 102 #14M

Bureau of Land Management
Azimuths to True North
Magnetic North: 9.44°

TVD Reference: WELL @ 7112.00ft (Original Well Elev)
Ground Level: 7112.00
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.00 0.00 2001848.13 1343377.65 36° 29' 50.280 N 107° 15' 38.218 W

Magnetic Field
Strength: 50393.1snT
Dip Angle: 63.31°
Date: 7/22/2013
Model: BGGM2013



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
3095.00	3167.16	Ojo Alamo
3599.00	3688.94	Kirtland
3645.00	3736.53	Fruitland
3835.00	3931.19	Pictured Cliffs
4082.00	4180.74	Lewis
5510.00	5609.18	Cliffhouse
5616.00	5715.18	Menefee
5950.00	6049.18	Point Lookout
6087.00	6186.18	Mancos
7935.00	8034.18	Greenhorn
7970.00	8069.18	Graneros
7988.00	8087.18	Dakota

Plan: Plan #3

11:25, July 22 2013
Created By: Janie Collins

PROJECT DETAILS: Rio Arriba County, NM (NAD83)

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Central Zone

System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	550.00	0.00	0.00	550.00	0.00	0.00	0.00	0.00	0.00	
3	1300.00	15.00	142.54	1291.46	-77.49	59.37	2.00	142.54	97.62	
4	3709.45	15.00	142.54	3618.82	-572.51	438.63	0.00	0.00	721.23	
5	4459.45	0.00	0.00	4360.28	-650.00	498.00	2.00	180.00	818.84	
6	8382.18	0.00	0.00	8283.00	-650.00	498.00	0.00	0.00	818.84	Jicarilla 102 #14M PBHL

Database:	Grand Junction District	Local Co-ordinate Reference:	Well Jicarilla Apache 102 #14M
Company:	EnerVest Operating LLC	TVD Reference:	WELL @ 7112.00ft (Original Well Elev)
Project:	Rio Arriba County, NM (NAD83)	MD Reference:	WELL @ 7112.00ft (Original Well Elev)
Site:	Jicarilla	North Reference:	True
Well:	Jicarilla Apache 102 #14M	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Project:	Rio Arriba County, NM (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site:	Jicarilla		
Site Position:		Northing:	-274,017,644.35 usft
From:	Lat/Long	Easting:	372,015,898.75 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Grid Convergence:	0.00 °

Well:	Jicarilla Apache 102 #14M		
Well Position	+N/-S	460,410,665.20 ft	Northing:
	+E/-W	40,096,780.92 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	7,112.00 ft

Wellbore:	OH		
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	7/22/2013	9.44	63.31	50,393

Design:	Plan #3		
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Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)
	0.00	0.00	0.00

Plan Sections:										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
550.00	0.00	0.00	550.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,300.00	15.00	142.54	1,291.46	-77.49	59.37	2.00	2.00	0.00	142.54	
3,709.45	15.00	142.54	3,618.82	-572.51	438.63	0.00	0.00	0.00	0.00	
4,459.45	0.00	0.00	4,360.28	-650.00	498.00	2.00	-2.00	0.00	180.00	
8,382.18	0.00	0.00	8,283.00	-650.00	498.00	0.00	0.00	0.00	0.00	Jicarilla 102 #14M PB

Database:	Grand Junction District	Local Co-ordinate Reference:	Well Jicarilla Apache 102 #14M
Company:	EnerVest Operating LLC	TVD Reference:	WELL @ 7112.00ft (Original Well Elev)
Project:	Rio Arriba County, NM (NAD83)	MD Reference:	WELL @ 7112.00ft (Original Well Elev)
Site:	Jicarilla	North Reference:	True
Well:	Jicarilla Apache 102 #14M	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
Surface Casing									
550.00	0.00	0.00	550.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
600.00	1.00	142.54	600.00	-0.35	0.27	0.44	2.00	2.00	0.00
700.00	3.00	142.54	699.93	-3.12	2.39	3.93	2.00	2.00	0.00
800.00	5.00	142.54	799.68	-8.65	6.63	10.90	2.00	2.00	0.00
900.00	7.00	142.54	899.13	-16.95	12.99	21.35	2.00	2.00	0.00
1,000.00	9.00	142.54	998.15	-28.00	21.45	35.27	2.00	2.00	0.00
1,100.00	11.00	142.54	1,096.63	-41.78	32.01	52.63	2.00	2.00	0.00
1,200.00	13.00	142.54	1,194.44	-58.28	44.65	73.42	2.00	2.00	0.00
1,300.00	15.00	142.54	1,291.46	-77.49	59.37	97.62	2.00	2.00	0.00
Start 2409.45 hold at 1300.00 MD									
1,400.00	15.00	142.54	1,388.05	-98.03	75.11	123.50	0.00	0.00	0.00
1,500.00	15.00	142.54	1,484.65	-118.58	90.85	149.38	0.00	0.00	0.00
1,600.00	15.00	142.54	1,581.24	-139.12	106.59	175.26	0.00	0.00	0.00
1,700.00	15.00	142.54	1,677.83	-159.67	122.33	201.14	0.00	0.00	0.00
1,800.00	15.00	142.54	1,774.42	-180.21	138.07	227.02	0.00	0.00	0.00
1,900.00	15.00	142.54	1,871.02	-200.76	153.81	252.91	0.00	0.00	0.00
2,000.00	15.00	142.54	1,967.61	-221.30	169.55	278.79	0.00	0.00	0.00
2,100.00	15.00	142.54	2,064.20	-241.85	185.29	304.67	0.00	0.00	0.00
2,200.00	15.00	142.54	2,160.80	-262.39	201.03	330.55	0.00	0.00	0.00
2,300.00	15.00	142.54	2,257.39	-282.94	216.77	356.43	0.00	0.00	0.00
2,400.00	15.00	142.54	2,353.98	-303.48	232.52	382.32	0.00	0.00	0.00
2,500.00	15.00	142.54	2,450.57	-324.03	248.26	408.20	0.00	0.00	0.00
2,600.00	15.00	142.54	2,547.17	-344.57	264.00	434.08	0.00	0.00	0.00
2,700.00	15.00	142.54	2,643.76	-365.12	279.74	459.96	0.00	0.00	0.00
2,800.00	15.00	142.54	2,740.35	-385.66	295.48	485.84	0.00	0.00	0.00
2,900.00	15.00	142.54	2,836.94	-406.21	311.22	511.73	0.00	0.00	0.00
3,000.00	15.00	142.54	2,933.54	-426.75	326.96	537.61	0.00	0.00	0.00
3,100.00	15.00	142.54	3,030.13	-447.30	342.70	563.49	0.00	0.00	0.00
3,167.16	15.00	142.54	3,095.00	-461.10	353.27	580.87	0.00	0.00	0.00
Ojo Alamo									
3,200.00	15.00	142.54	3,126.72	-467.84	358.44	589.37	0.00	0.00	0.00
3,300.00	15.00	142.54	3,223.31	-488.39	374.18	615.25	0.00	0.00	0.00
3,400.00	15.00	142.54	3,319.91	-508.94	389.92	641.14	0.00	0.00	0.00
3,500.00	15.00	142.54	3,416.50	-529.48	405.66	667.02	0.00	0.00	0.00
3,600.00	15.00	142.54	3,513.09	-550.03	421.40	692.90	0.00	0.00	0.00
3,688.94	15.00	142.54	3,599.00	-568.30	435.40	715.92	0.00	0.00	0.00
Kirtland									
3,700.00	15.00	142.54	3,609.68	-570.57	437.14	718.78	0.00	0.00	0.00
3,709.45	15.00	142.54	3,618.82	-572.51	438.63	721.23	0.00	0.00	0.00
Start Drop -2.00									
3,736.53	14.46	142.54	3,645.00	-577.98	442.82	728.11	2.00	-2.00	0.00
Fruitland									
3,800.00	13.19	142.54	3,706.63	-590.02	452.04	743.28	2.00	-2.00	0.00
3,900.00	11.19	142.54	3,804.37	-606.77	464.88	764.39	2.00	-2.00	0.00
3,931.19	10.57	142.54	3,835.00	-611.45	468.46	770.27	2.00	-2.00	0.00

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Project:	Rio Arriba County, NM (NAD83)	MD Reference:	WELL @ 7112.00ft (Original Well Elev)
Site:	Jicarilla	North Reference:	True
Well:	Jicarilla Apache 102 #14M	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
Pictured Cliffs									
4,000.00	9.19	142.54	3,902.79	-620.82	475.64	782.08	2.00	-2.00	0.00
4,011.35	8.96	142.54	3,914.00	-622.24	476.73	783.87	2.00	-2.00	0.00
Production Casing 1									
4,100.00	7.19	142.54	4,001.77	-632.12	484.30	796.32	2.00	-2.00	0.00
4,180.74	5.57	142.54	4,082.00	-639.25	489.76	805.30	2.00	-2.00	0.00
Lewis									
4,200.00	5.19	142.54	4,101.18	-640.68	490.86	807.10	2.00	-2.00	0.00
4,300.00	3.19	142.54	4,200.91	-646.48	495.30	814.41	2.00	-2.00	0.00
4,400.00	1.19	142.54	4,300.83	-649.51	497.62	818.23	2.00	-2.00	0.00
4,459.45	0.00	0.00	4,360.28	-650.00	498.00	818.84	2.00	-2.00	0.00
Start 3922.72 hold at 4459.45 MD									
4,500.00	0.00	0.00	4,400.82	-650.00	498.00	818.84	0.00	0.00	0.00
4,600.00	0.00	0.00	4,500.82	-650.00	498.00	818.84	0.00	0.00	0.00
4,700.00	0.00	0.00	4,600.82	-650.00	498.00	818.84	0.00	0.00	0.00
4,800.00	0.00	0.00	4,700.82	-650.00	498.00	818.84	0.00	0.00	0.00
4,900.00	0.00	0.00	4,800.82	-650.00	498.00	818.84	0.00	0.00	0.00
5,000.00	0.00	0.00	4,900.82	-650.00	498.00	818.84	0.00	0.00	0.00
5,100.00	0.00	0.00	5,000.82	-650.00	498.00	818.84	0.00	0.00	0.00
5,200.00	0.00	0.00	5,100.82	-650.00	498.00	818.84	0.00	0.00	0.00
5,300.00	0.00	0.00	5,200.82	-650.00	498.00	818.84	0.00	0.00	0.00
5,400.00	0.00	0.00	5,300.82	-650.00	498.00	818.84	0.00	0.00	0.00
5,500.00	0.00	0.00	5,400.82	-650.00	498.00	818.84	0.00	0.00	0.00
5,600.00	0.00	0.00	5,500.82	-650.00	498.00	818.84	0.00	0.00	0.00
5,609.18	0.00	0.00	5,510.00	-650.00	498.00	818.84	0.00	0.00	0.00
Cliffhouse									
5,700.00	0.00	0.00	5,600.82	-650.00	498.00	818.84	0.00	0.00	0.00
5,715.18	0.00	0.00	5,616.00	-650.00	498.00	818.84	0.00	0.00	0.00
Menefee									
5,800.00	0.00	0.00	5,700.82	-650.00	498.00	818.84	0.00	0.00	0.00
5,900.00	0.00	0.00	5,800.82	-650.00	498.00	818.84	0.00	0.00	0.00
6,000.00	0.00	0.00	5,900.82	-650.00	498.00	818.84	0.00	0.00	0.00
6,049.18	0.00	0.00	5,950.00	-650.00	498.00	818.84	0.00	0.00	0.00
Point Lookout									
6,100.00	0.00	0.00	6,000.82	-650.00	498.00	818.84	0.00	0.00	0.00
6,186.18	0.00	0.00	6,087.00	-650.00	498.00	818.84	0.00	0.00	0.00
Mancos									
6,200.00	0.00	0.00	6,100.82	-650.00	498.00	818.84	0.00	0.00	0.00
6,300.00	0.00	0.00	6,200.82	-650.00	498.00	818.84	0.00	0.00	0.00
6,400.00	0.00	0.00	6,300.82	-650.00	498.00	818.84	0.00	0.00	0.00
6,500.00	0.00	0.00	6,400.82	-650.00	498.00	818.84	0.00	0.00	0.00
6,600.00	0.00	0.00	6,500.82	-650.00	498.00	818.84	0.00	0.00	0.00
6,700.00	0.00	0.00	6,600.82	-650.00	498.00	818.84	0.00	0.00	0.00
6,800.00	0.00	0.00	6,700.82	-650.00	498.00	818.84	0.00	0.00	0.00
6,900.00	0.00	0.00	6,800.82	-650.00	498.00	818.84	0.00	0.00	0.00
7,000.00	0.00	0.00	6,900.82	-650.00	498.00	818.84	0.00	0.00	0.00
7,100.00	0.00	0.00	7,000.82	-650.00	498.00	818.84	0.00	0.00	0.00
7,200.00	0.00	0.00	7,100.82	-650.00	498.00	818.84	0.00	0.00	0.00
7,300.00	0.00	0.00	7,200.82	-650.00	498.00	818.84	0.00	0.00	0.00
7,400.00	0.00	0.00	7,300.82	-650.00	498.00	818.84	0.00	0.00	0.00
7,500.00	0.00	0.00	7,400.82	-650.00	498.00	818.84	0.00	0.00	0.00
7,600.00	0.00	0.00	7,500.82	-650.00	498.00	818.84	0.00	0.00	0.00
7,700.00	0.00	0.00	7,600.82	-650.00	498.00	818.84	0.00	0.00	0.00

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Project:	Rio Arriba County, NM (NAD83)	MD Reference:	WELL @ 7112.00ft (Original Well Elev)
Site:	Jicarilla	North Reference:	True
Well:	Jicarilla Apache 102 #14M	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,800.00	0.00	0.00	7,700.82	-650.00	498.00	818.84	0.00	0.00	0.00
7,900.00	0.00	0.00	7,800.82	-650.00	498.00	818.84	0.00	0.00	0.00
8,000.00	0.00	0.00	7,900.82	-650.00	498.00	818.84	0.00	0.00	0.00
8,034.18	0.00	0.00	7,935.00	-650.00	498.00	818.84	0.00	0.00	0.00
Greenhorn									
8,069.18	0.00	0.00	7,970.00	-650.00	498.00	818.84	0.00	0.00	0.00
Graneros									
8,087.18	0.00	0.00	7,988.00	-650.00	498.00	818.84	0.00	0.00	0.00
Dakota									
8,100.00	0.00	0.00	8,000.82	-650.00	498.00	818.84	0.00	0.00	0.00
8,119.18	0.00	0.00	8,020.00	-650.00	498.00	818.84	0.00	0.00	0.00
Production Casing 2									
8,200.00	0.00	0.00	8,100.82	-650.00	498.00	818.84	0.00	0.00	0.00
8,300.00	0.00	0.00	8,200.82	-650.00	498.00	818.84	0.00	0.00	0.00
8,382.18	0.00	0.00	8,283.00	-650.00	498.00	818.84	0.00	0.00	0.00
TD at 8382.18 - Jicarilla 102 #14M PBHL									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Jicarilla 102 #14M PBHL	0.00	0.00	8,283.00	-650.00	498.00	2,001,192.95	1,343,868.80	36° 29' 43.853 N	107° 15' 32.119 W
- plan hits target center									
- Point									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
500.00	500.00	Surface Casing	9.625	12.250
4,011.35	3,914.00	Production Casing 1	5.500	8.750
8,119.18	8,020.00	Production Casing 2	5.500	7.875

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Site:	Jicarilla	North Reference:	True
Well:	Jicarilla Apache 102 #14M	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,167.16	3,095.00	Ojo Alamo		0.00		
3,688.94	3,599.00	Kirtland		0.00		
3,736.53	3,645.00	Fruitland		0.00		
3,931.19	3,835.00	Pictured Cliffs		0.00		
4,180.74	4,082.00	Lewis		0.00		
5,609.18	5,510.00	Cliffhouse		0.00		
5,715.18	5,616.00	Menefee		0.00		
6,049.18	5,950.00	Point Lookout		0.00		
6,186.18	6,087.00	Mancos		0.00		
8,034.18	7,935.00	Greenhorn		0.00		
8,069.18	7,970.00	Graneros		0.00		
8,087.18	7,988.00	Dakota		0.00		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
550.00	550.00	0.00	0.00	Start Build 2.00	
1,300.00	1,291.46	-77.49	59.37	Start 2409.45 hold at 1300.00 MD	
3,709.45	3,618.82	-572.51	438.63	Start Drop -2.00	
4,459.45	4,360.28	-650.00	498.00	Start 3922.72 hold at 4459.45 MD	
8,382.18	8,283.00	-650.00	498.00	TD at 8382.18	

EnerVest Operating, LLC
Jicarilla Apache 102 # 14M

SHL: 1310' FSL, 1482' FWL Unit N, Sec 9, T26N, R04W
BHL: 660' FSL, 1980' FWL Unit N, Sec 9, T26N, R04W
Rio Arriba, NM

Surface Use Plan

1. **DIRECTIONS & EXISTING ROADS** (See attached Vicinity map)

The location is approximately 30 miles NW of the intersection of US Hwy 550 and NM Hwy 537

Latitude: N 36.49733

Latitude: W 107.26061

From Intersection of US Hwy 550 and NM State Hwy 537: Turn north on Hwy 537 for 28 miles, turn left on J-6 for 2.6 mi to J-64, turn right on J-64, go 1.7 mi, turn left, go 0.5 mi to location on the left.

2. **ROAD TO BE BUILT OR UPGRADED**

- A. Drilling of this well will not require the construction of a new access road as this well is to be drilled on a well location of a P&Aed well. After the well is completed as a commercial producer, the need for a pipeline is ascertained, it is proposed to construct a tie-in at the north side of the location to an existing Williams pipeline which was used for the original location for this well site. If any road construction is to be done it will be done as follows.
- B. Width: 20 ft running surface; 40 ft total ROW with is applied for to accommodate access and drainage installation along the road.
- C. Maximum grade: 0-1%.
- D. Turnouts: No turnouts are planned for this access road.
- E. Drainage design: The drainage design for the proposed new access road will be in conformance with Jicarilla Apache Tribal and BIA standards – with the agreement of the of the Jicarilla Apache Tribe. It is proposed to build a drainage holding and diversion pond near location if needed to prevent location erosion and divert drainage around the location. Any area used in this fashion will have been reviewed and given clearance for the possible archaeological and environmental impact.
- F. Location and size of culverts: None are required.
- G. Surface Materials: No gates, cattle guards or fences to be installed along the access road or the location. Road base material may be used as necessary during the drilling and completion phases of this project.

3. **SURFACE OWNERSHIP**

The surface ownership of the well site location and access roads are all on Jicarilla Apache Nation land.

4. **EXISTING WELLS** (See the Vicinity map)

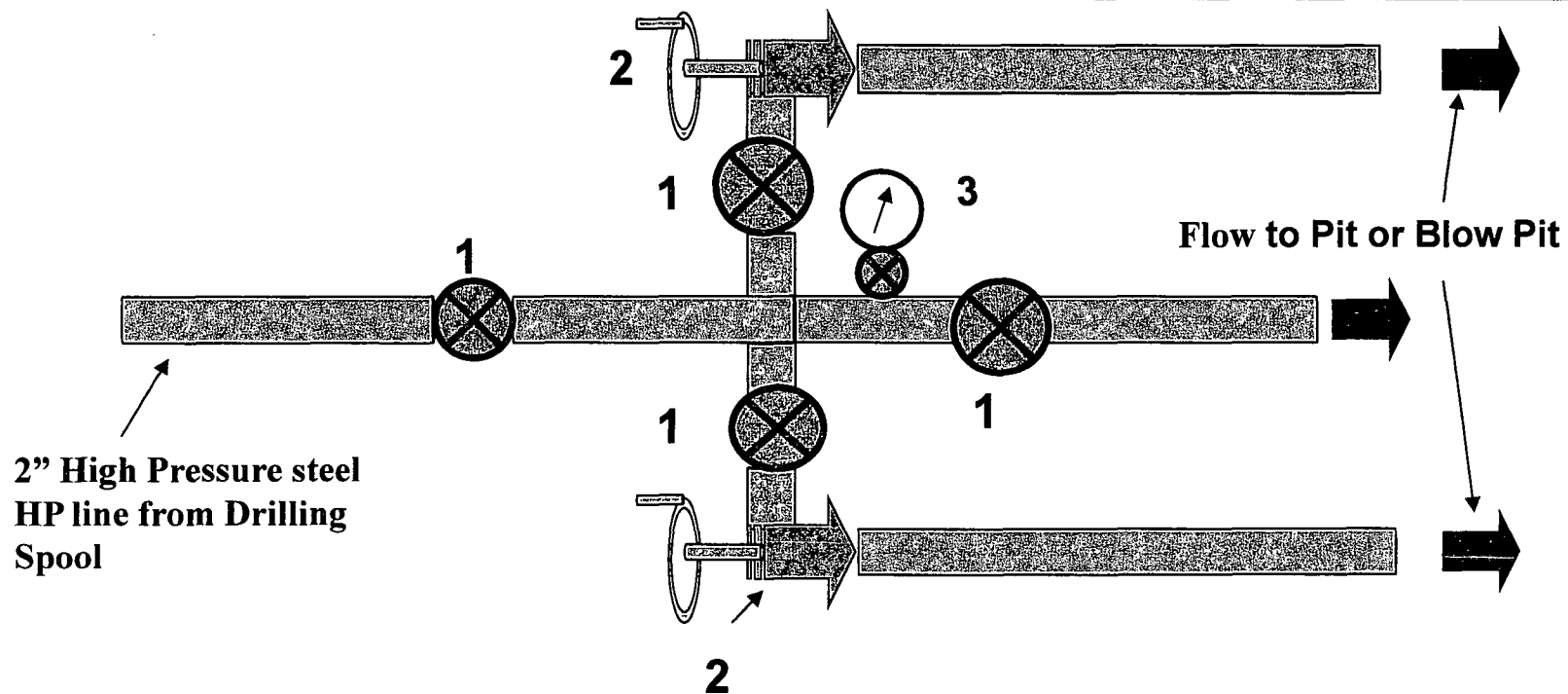
This is a development location. There are thirteen existing wells within a one-mile radius of the proposed location as shown on the Vicinity map.

Exhibit B

**EnerVest
Jicarilla 2013 Drilling
Program
2000 psi Choke Manifold**

Components

1. 2" Valves (2M)
2. Adjustable Chokes
3. Gauge



**EnerVest
Jicarilla 2013
Drilling Program
Blowout Preventer
2000 psi**

Exhibit A

- | Components | |
|------------|------------------|
| 1. | Wellhead 9 5/8" |
| 2. | Drilling Spool |
| 3. | Pipe Rams |
| 4. | Blind Rams |
| 5. | Spool |
| 6. | 2" Check Valve |
| 7. | 2" Manual Valves |

