

State of New Mexico  
Energy, Minerals and Natural Resources Department

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**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 3160-4 or 3160-5 form.

Operator Signature Date: August 15, 2013

Well information:  
EnerVest Operating  
Jicarilla Apache 102 #14M  
30-039-31193  
Section 9, T26N, R4W

Conditions of Approval:

Notify NMOCD 24hrs prior to beginning operations.  
Hold C104 for NSL for Dakota & Directional survey & "As drilled" plat

\_\_\_\_\_  
NMOCD Approved by Signature

AUG 29 2013

\_\_\_\_\_  
Date

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

RECEIVED

FORM APPROVED  
OMB No. 1004-0137  
Expires: October 31, 2014

AUG 16 2013

## 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.

5. Lease Serial No.  
Jicarilla Contract 102

6. If Indian, Allottee or Tribe Name  
Jicarilla Apache Tribe

SUBMIT IN TRIPLICATE - Other instructions on page 2.

## 1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other

2. Name of Operator  
EnerVest Operating, L.L.C.

3a. Address  
1001 Fannin St., Suite 800  
Houston, TX 77002

3b. Phone No. (include area code)  
713-659-3500

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)  
1310' FSL & 1482' FWL (UL N)  
Sec. 9 T26N R04W  
BHL: 660' FSL & 1980' FWL

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

8. Well Name and No.  
Jicarilla Apache 102 #14M9. API Well No.  
30-039-3119310. Field and Pool or Exploratory Area  
Blanco Mesaverde/Basin Dakota11. County or Parish, State  
Rio Arriba, NM

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

## TYPE OF SUBMISSION

## TYPE OF ACTION

☒ Notice of Intent☐ Subsequent Report☐ Final Abandonment Notice☐ Acidize☐ Alter Casing☐ Casing Repair☐ Change Plans☐ Convert to Injection☐ Deepen☐ Fracture Treat☐ New Construction☐ Plug and Abandon☐ Plug Back☐ Production (Start/Resume)☐ Reclamation☐ Recomplete☐ Temporarily Abandon☐ Water Disposal☐ Water Shut-Off☐ Well Integrity☒ Other Correction

13. 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 must 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 must be filed once testing has been completed. Final Abandonment Notices must 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 purpose of this sundry is to correct inconsistencies between form 3160-3 (dated 7/02/2013), the proposed drilling program, and the directional plan originally submitted.

Attached are the proposed drilling program and a revised directional plan, as well as a proposed wellbore diagram. The GL elevation, estimated formation tops, TD, and casing points are all consistent between the drilling program and directional plan.

RCVD AUG 22 '13  
OIL CONS. DIV.  
DIST. 3

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

Bart Trevino

Title Regulatory Analyst

Signature

Date 08/15/2013

## THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

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.

Title

Office

Petroleum Engineer

Date

8/20/2013

FFD

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.

(Instructions on page 2)

NMOC

## **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'

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### **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**

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Rio Arriba County, NM  
GL Elev: 7112'

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#### **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 3<sup>rd</sup> 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.

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Rio Arriba County, NM

GL Elev: 7112'

#### **4.4 PROPOSED CASING PROGRAM :**

The casings program is designed as follows:

<b>Casing Design</b>								
<b>Hole/Casing Description</b>	<b>Hole Size</b>	<b>Casing OD</b>	<b>Weight lb/ft</b>	<b>Grade</b>	<b>Age</b>	<b>Connection</b>	<b>Top</b>	<b>Bottom</b>
<b>Surface</b>	12 1/4"	9 5/8"	36	J-55	New	ST&C	0	500'
<b>Prod Csg MD</b>	7 7/8"	4 1/2"	11.6	N-80	New	LT&C	500'	8383'
<b>TVD</b>							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 3<sup>rd</sup> 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 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**

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Rio Arriba County, NM  
GL Elev: 7112'

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**Production casing** will be cemented in 3 stages covering all zones of production potential and the 3<sup>rd</sup> 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 CaCl<sub>2</sub>, 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 CaCl<sub>2</sub>, 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 CaCl<sub>2</sub>, 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.

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Rio Arriba County, NM  
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Cement specifications may vary slightly due to cement type and cement contractor availability.

#### **4.6 MUD PROGRAM**

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

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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**

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Rio Arriba County, NM  
GL Elev: 7112'

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#### **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 (H2S): 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

## Well Details: Jicarilla Apache 102 #14M

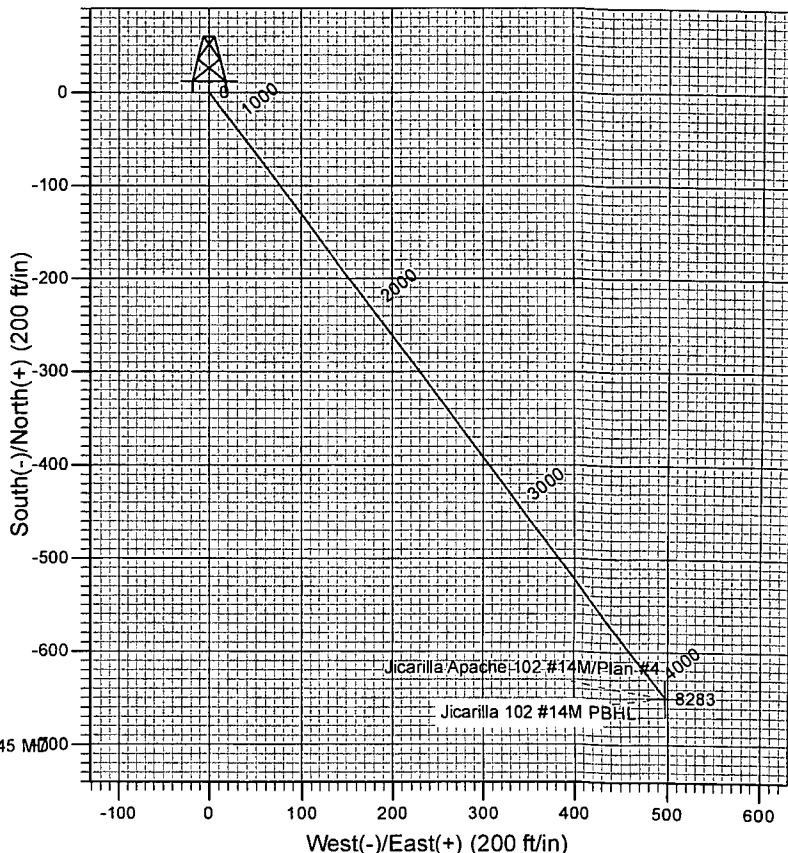
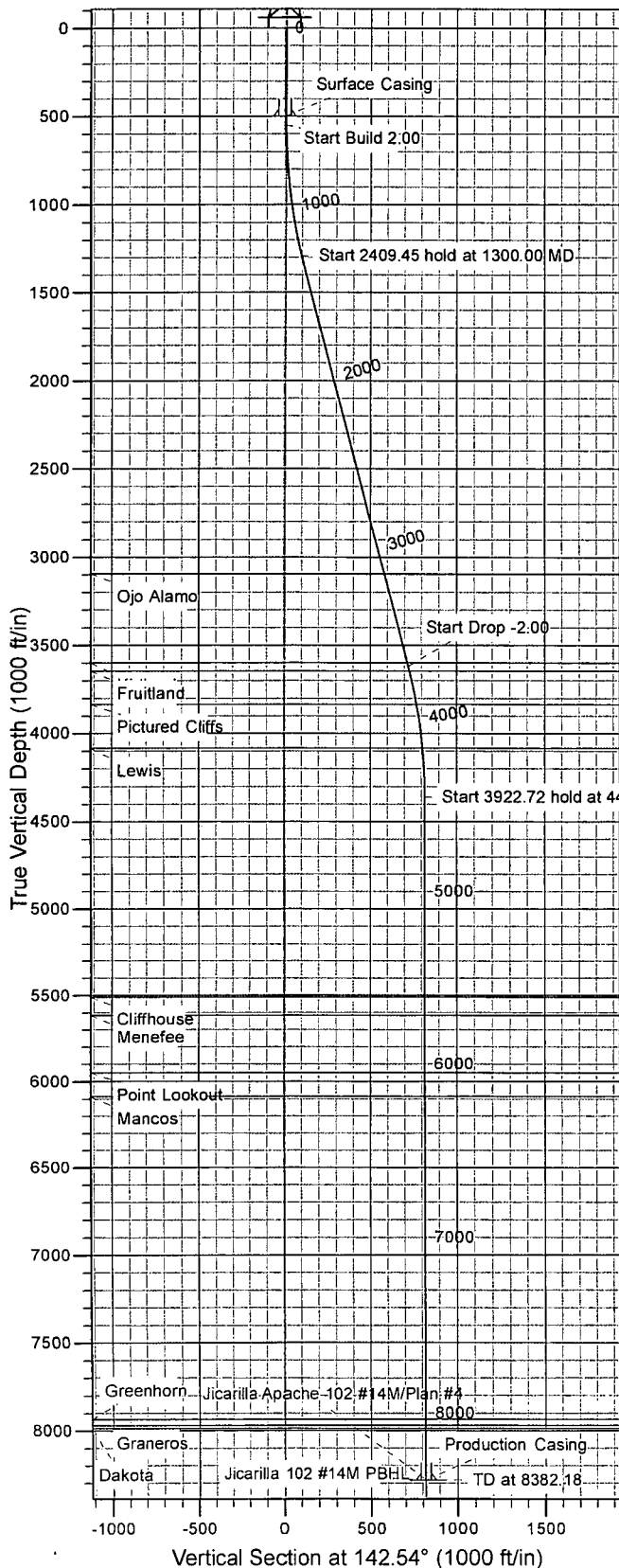
TVD Reference: WELL @ 7112.00ft (Original Well Elev)

+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	



Azimuths to True North  
Magnetic North: 9.44°

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



### FORMATION TOP DETAILS

TVDPth	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	6185.18	Mancos
7935.00	8034.18	Greenhorn
7970.00	8069.18	Graneros
7988.00	8087.18	Dakota

### Plan: Plan #4

10:18, August 15 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	-500.00	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

# **EnerVest Operating LLC**

**Rio Arriba County, NM (NAD83)**

**Jicarilla**

**Jicarilla Apache 102 #14M**

**OH**

**Plan: Plan #4**

## **Standard Planning Report**

**15 August, 2013**



**[www.scientificdrilling.com](http://www.scientificdrilling.com)**

<b>Database:</b>	Grand Junction District	<b>Local Co-ordinate Reference:</b>	Well Jicarilla Apache 102 #14M
<b>Company:</b>	EnerVest Operating LLC	<b>TVD Reference:</b>	WELL @ 7112.00ft (Original Well Elev)
<b>Project:</b>	Rio Arriba County, NM (NAD83)	<b>MD Reference:</b>	WELL @ 7112.00ft (Original Well Elev)
<b>Site:</b>	Jicarilla	<b>North Reference:</b>	True
<b>Well:</b>	Jicarilla Apache 102 #14M	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #4		

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

Site		Jicarilla			
Site Position:		Northing:	-274,017,644.35 usft	Latitude:	7° 5' 24.101 S
From:	Lat/Long	Easting:	372,015,898.75 usft	Longitude:	42° 3' 21.841 E
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.00 °

<b>Well</b>	Jicarilla Apache 102 #14M					
<b>Well Position</b>	<b>+N/-S</b>	460,410,665.20 ft	<b>Northing:</b>	2,001,848.14 usft	<b>Latitude:</b>	36° 29' 50.280 N
	<b>+E/-W</b>	40,096,780.92 ft	<b>Easting:</b>	1,343,377.65 usft	<b>Longitude:</b>	107° 15' 38.218 W
<b>Position Uncertainty</b>	0.00 ft		<b>Wellhead Elevation:</b>	<b>Ground Level:</b> 7,112.00 ft		

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

Design	Plan #4			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.00	0.00	0.00	142.54

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(ft)	(ft)	Rate	Rate	Rate	(°)	
(ft)			(ft)			(°/100ft)	(°/100ft)	(°/100ft)		
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	<u>-650.00</u>	<u>498.00</u>	0.00	0.00	0.00	0.00	Jicarilla 102 #14M PB

PBHL }  $Y \rightarrow (1310 - 650)_{ft} = 660 ft/s$   
 $X \rightarrow (1482 + 498)_{ft} = 1980 ft/w$

William Tambekou  
8/20/2013

**Database:** Grand Junction District  
**Company:** EnerVest Operating LLC  
**Project:** Rio Arriba County, NM (NAD83)  
**Site:** Jicarilla  
**Well:** Jicarilla Apache 102 #14M  
**Wellbore:** OH  
**Design:** Plan #4

**Local Co-ordinate Reference:** Well Jicarilla Apache 102 #14M  
**TVD Reference:** WELL @ 7112.00ft (Original Well Elev)  
**MD Reference:** WELL @ 7112.00ft (Original Well Elev)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

**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)
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
<b>Greenhorn</b>									
8,069.18	0.00	0.00	7,970.00	-650.00	498.00	818.84	0.00	0.00	0.00
<b>Graneros</b>									
8,087.18	0.00	0.00	7,988.00	-650.00	498.00	818.84	0.00	0.00	0.00
<b>Dakota</b>									
8,100.00	0.00	0.00	8,000.82	-650.00	498.00	818.84	0.00	0.00	0.00
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
<b>TD at 8382.18 - Jicarilla 102 #14M PBHL</b>									

**Design Targets**

Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
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
8,382.18	8,283.00	Production Casing	4.500	7.875

**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	

# Planning Report



**Database:** Grand Junction District  
**Company:** EnerVest Operating LLC  
**Project:** Rio Arriba County, NM (NAD83)  
**Site:** Jicarilla  
**Well:** Jicarilla Apache 102 #14M  
**Wellbore:** OH  
**Design:** Plan #4

**Local Co-ordinate Reference:** Well Jicarilla Apache 102 #14M  
**TVD Reference:** WELL @ 7112.00ft (Original Well Elev)  
**MD Reference:** WELL @ 7112.00ft (Original Well Elev)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

## Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
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

## Jicarilla Apache 102 # 14M (2 Casing Strings)

TYPE	Dakota/MV	RIG	TBD	DATE	15-Jul-2013
FIELD	Tapacito	COUNTY	Rio Arriba	ELEVATION	7112'
GAS/OIL	Gas/Oil	MUD	LSND	BHT/BHP	175 deg / 1822 psi
LOCATION	SHL = 1310' FSL & 1482' FWL BHL = 660' FSL & 1980' FWL Unit N, Sec 9, T26N, R4W			SHL = Lat: 36.49730, Long: 107.26061	
COMMENTS:	OBJECTIVE FORMATION: Dakota and Mesa Verde			BHL = Lat: 36.49550, Long: 107.25901	
NOTES:	This well will be drilled as an "S" shaped well				

		DEPTH TVD	
<b>Surface Section</b>	<b>Cemented to Surface</b>		
Inclination @ 500'	12 1/4" Hole > 9-5/8", 36#, J-55, LT&C	500'	Cement to surface Water based bentonite mud Drilled Tri-Cone Bit
<b>Production Section</b>	<b>Cemented to Surface with 3 Stages</b>		
	7 7/8" Hole from 500' to TD >		< < < Start to drill directionally @ 600' 142.54 deg azimuth
			Drilled w/PDC, motor, 4-1/2" DP
			8.7-9.0 PPG LSND Bentonite Mud
		3600' MD	< < < Stage Collar Cementing Tool
	Fruitland Coal >	3645'	
	Picture Cliffs >	3835'	
	Lewis >	4082'	
			< < < Resume vertical hole @ +/- 4500' MD Vertical Section = +/- 818' SE
		5000' MD	< < < Stage Collar Cementing Tool
	Cliffhouse >	5510'	
	Menefee >	5616'	
	Point Lookout >	5950'	
	Mancos >	6087'	
	Mancos (Regulatory) >	6450'	
	Greenhorn >	7935'	
	Graneros Shale >	7970'	
	Dakota >	7988'	
	4-1/2", 11.6#, N-80 LT&C - To Surface	8283' TVD 8383' MD	Logs: Cased Hole Pulsed Neutron (RMT) & CBL to surface casing
AFE #	REGULATORY	B Trevino	713-495-5355
EV #	ENGINEER	R Trueheart / L Diede	713-495-1561 / 505-334-8867
API #	GEOLOGIST	G Kowalczyk	713-495-6590