

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary

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: 7/21/14

Well information:

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf. Owner	UL	Sec	Twp	N/S	Rng	W/E
30-039-31225-00-00	CHACO 2306 18D	185H	WPX ENERGY PRODUCTION, LLC	O	N	Rio Arriba	F	D	18	23	N	6	W

Application Type:

☐ P&A ☒ Drilling/Casing Change ☐ Recomplete/DHC
☒ Location Change ☒ Other: Enlarge project area

Conditions of Approval:

Notify NMOCD 24hrs prior to beginning operations

Hold C-104 for as drilled plat, directional survey, NSL, NSP

Project area may change depending on location of perforations

NMOCD Approved by Signature

7/31/14
Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

JUL 21 2014

FORM APPROVED
OMB No. 1004-0137
Expires: March 31, 2007

JUL 30 2014

OIL CONS. DIV DIST. 3

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.

SUBMIT IN TRIPLICATE – Other instructions on page 2.

5. Lease Serial No. NMSF-078359
6. If Indian, Allottee or Tribe Name
7. If Unit of CA/Agreement, Name and/or No. NMNM 132829(CA)
8. Well Name and No. Chaco 2306-18D #185H
9. API Well No. 30-039-31225
10. Field and Pool or Exploratory Area Lybrook Gallup
11. Country or Parish, State Rio Arriba County, NM

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator

WPX Energy Production, LLC

3a. Address

PO Box 640 Aztec, NM 87410

3b. Phone No. (include area code)

505-333-1808

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sur: 924' FNL & 4' FWL, sec 18, T23N, R6W – BHL: 906' FSL & 380' FWL, Sec 12, T23N, R7W

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

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

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.)

WPX plans to plans to realign the lateral on this well as per attached C-102, operations plan and directional plan. Although this horizontal well will be drilled past the applicable setbacks, an unorthodox location application is not required because the completed interval in this well, as defined by 19.15.16.7 B(1) NMAC, will be entirely within the applicable setbacks. This approach complies with all applicable rules, including 19.15.16.14 A(3) NMAC, 19.15.16.14 B(2) NMAC, 19.15.16.15 B(2)NMAC, and 19.15.16.15. B(4) NMAC. This well will be in Northeast Chaco Communitized Area, NMNM 132829CA

CONDITIONS OF APPROVAL

Adhere to previously issued stipulations

BLM'S APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed) Larry Higgins		Title Regulatory Specialist
Signature <i>Larry Higgins</i>		Date 7/21/2014

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by <i>William Tambekou</i>	Title <i>Petroleum Engineer</i>	Date <i>7/25/2014</i>
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 <i>FFO</i>

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)

NMCCD

District I
1625 N. French Drive, Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First Street, 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 Drive, Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

OIL CONSERVATION DIVISION

1220 South St. Francis Drive
Santa Fe, NM 87505

AMENDED REPORT

JUL 21 2014

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-039-31225	*Pool Code 42289	*Pool Name LYBROOK GALLUP
*Property Code 313134	*Property Name CHACO 2306-18D	*Well Number 185H
*GRID No. 120782	*Operator Name WPX ENERGY PRODUCTION, LLC	*Elevation 6991'

10 Surface Location

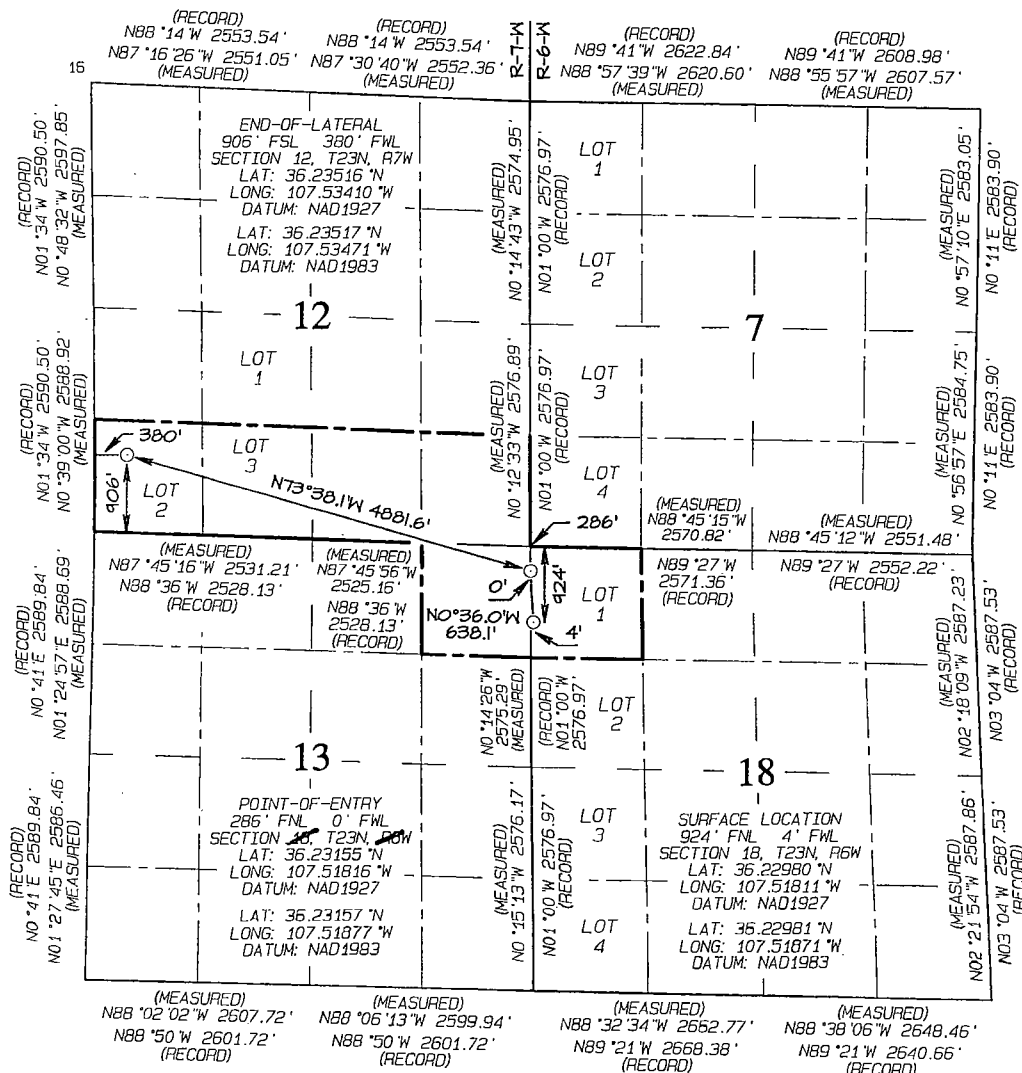
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	18	23N	6W	1	924	NORTH	4	WEST	RIO ARriba

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
M	12	23N	7W	2	906	SOUTH	380	WEST	RIO ARriba

12 Dedicated Acres 235.72	NW/4 NW/4 (18) NE/4 NE/4 (13) S/2 S/2 (12)	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



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: Larry Higgins
Date: 7/21/14
Printed Name: Larry Higgins
E-mail Address: larry.higgins@wpxenergy.com

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 Revised: JULY 21, 2014
Date of Survey: MARCH 4, 2013

Signature and Seal of Professional Surveyor



JASON C. EDWARDS
Certificate Number 15269

WPX ENERGY**Operations Plan***(Note: This procedure will be adjusted on site based upon actual conditions)*

DATE: 7/10/2014 **FIELD:** Lybrook (Gallup)

WELL NAME: Chaco 2307-13A #185H **SURFACE:** BLM

SH Location: NENE Sec 13-23N-07W **ELEVATION:** 6991' GR

BH Location: SWSW Sec 12-23N-07W
Rio Arriba, NM **MINERALS:** BLM

MEASURED DEPTH: 10,953' **LEASE #:** NMSF 078359

I. **GEOLOGY:** Surface formation – San Jose

A. **FORMATION TOPS:** (KB)

Name	MD	TVD	Name	MD	TVD
Ojo Alamo	1418	1438	Point Lookout	4363	4319
Kirtland	1735	1748	Mancos	4575	4528
Picture Cliffs	2056	2062	Kickoff Point	5003	4924
Lewis	2146	2150	Top Target	5814	5571
Chacra	2486	2483	Landing Point	6072	5591
Cliff House	3591	3564	Base Target	6072	5591
Menefee	3637	3609			
			TD	10953	5524

- B. **MUD LOGGING PROGRAM:** Mudlogger on location from surface csg to TD.
- C. **LOGGING PROGRAM:** LWD GR from surface casing to TD.
- D. **NATURAL GAUGES:** Gauge any noticeable increases in gas flow. Record all gauges in Tour book and on morning reports.

II. **DRILLING**

- A. **MUD PROGRAM:** LSND mud (WBM) will be used to drill the 12-1/4" Surface hole, the 8 3/4" Directional Vertical hole, and the curve portion of the wellbore. A LSND (WBM) or (OBM) will be used to drill the lateral portion of well. Treat for lost circulation as necessary. Obtain 100% returns prior to cementing. Notify Engineering of any mud losses.
- B. **BOP TESTING:** While drill pipe is in use, the pipe rams and the blind rams will be function tested once each trip. The anticipated reservoir is expected to be less than 1300 psi, so the BOPE will be tested to **250 psi (Low) for 5 minutes** and **1500 psi (High) for 10 minutes**. Pressure test surface casing to **600 psi for 30 minutes** and intermediate casing to **1500 psi for 30 minutes**. Utilize a BOPE Testing Unit with a recording chart and appropriate test plug for testing. The drum brakes will be inspected and tested each tour. **All tests and inspections will be recorded in the tour book as to time and results.**

NOTE: Vertical portion of the well (8-3/4 in.) will be directionally drilled as per attached Directional Plan to +/- 5,003 (MD) / 4,924' (TVD). Curve portion of wellbore will be drilled and landed at +/- 90 deg. at +/- 6,072 (MD) / 5,591' (TVD). 7 in. csg will be set at this point. A 6-1/8" Lateral will be drilled as per the attached Directional Plan to +/- 10,953' (MD) / 5,524' (TVD). Will run 4-1/2 in. Production Liner from +/- 5,922 ft. to TD and cemented. Liner will be tied back to surface w / 4-1/2" Casing for stimulation / testing, then removed from the well.

III. MATERIALS

A. CASING PROGRAM:

<u>CASING TYPE</u>	<u>OH SIZE (IN)</u>	<u>DEPTH (MD) (FT)</u>	<u>CASING SIZE (IN)</u>	<u>WEIGHT(LB)</u>	<u>GRADE</u>
Surface	12.25"	400'+	9.625"	36#	J-55
Intermediate	8.75"	6,072'	7"	23#	K-55
Prod. Liner	6.125"	5,922' - 10,953'	4-1/2"	11.6#	N-80
Tie-Back String	N/A	Surf. - 5,877'	4-1/2"	11.6#	N-80

B. FLOAT EQUIPMENT:

1. SURFACE CASING: 9-5/8" notched regular pattern guide shoe. Run (1) standard centralizer on each of the bottom (4) joints of Surface Casing.
2. INTERMEDIATE CASING: 7" cement nose guide shoe with a self-fill insert float. Place float collar one joint above the shoe. Install (1) centralizer on each of the bottom (3) joints and one standard centralizer every (3) joints to 2,500 ft. Run (1) centralizer at 2,700 ft., 2,500 ft., 2,300ft., and 2,000ft. Additionally run 1 turbolizing centralizer on every other joint from 100' below the top of the Kirtland to 100' above the top of the Ojo Alamo, as referenced in Formation Tops in Section I-A.
3. PRODUCTION LINER: Run 4-1/2" Liner with cement nose guide Float Shoe + 2jts. of 4-1/2" casing + Landing Collar + 4-1/2" pup joint + (2) RSI (Sliding Sleeves) positioned inside the 330ft Hard line. Centralizer program will be determined by Wellbore condition and when Lateral is evaluated by Geoscientists and Reservoir Engineers. Set seals on Liner Hanger. Test TOL to 1500 psi for 15 minutes.
4. TIE-BACK CASING: None

C. CEMENTING:

(Note: Volumes may be adjusted onsite due to actual conditions)

1. SURFACE: 10 bbl Fr Water Spacer + 190 sx (222.3 cu.ft.) of "Premium Cement" + 2% Calcium Chloride Cement + 0.125# pps of Poly-E-Flake, 15.8 #/gal (1.17 cu ft./sk, Vol 39.58 Bbls.). The 100% excess should circulate cement to the surface. WOC 12 hours. Test csg to 600psi. Total Volume: (222.3 cu-ft/190 sx/39.6 Bbls). TOC at Surface.
2. INTERMEDIATE: 20 bbl (112 cu-ft) Mud Flush III spacer + Lead: 850 sx Foamed 50/50 Poz Cement. 13.0 ppg + 0.1% Halad 766 + 0.2% Versaset + 1.5% Chem-Foamer 760 (Yield :1.43 cu-ft/ sk. / Vol: 1216 cu-ft / 216.5 Bbls.) + TAIL: 100 sx 13.5 #/gal. + 0.2% Versaset + 0.15% HALAD-766 (Yield: 1.28 cu-ft / sk / Vol: 128 cu-ft / 22.8 Bbls.). + Fresh Water Displacement (1,362 cu-ft / +/- 242 Bbls) + 100 sx Top-Out Cement Premium: Yield: (1.17 cu-ft/ sk / (Vol: 117 cu-ft / 20.8 Bbls). Test Casing to 1500 PSI for 30 minutes. Total Cement Volume: (1050 sx / 1461 cu-ft / 260 bbls). Mix with +/- 84,000 SCF Nitrogen. TOC at surface.
3. PRODUCTION LINER: **STAGE 1:** 10 bbl (56 cu-ft) Fr Water Spacer. **STAGE 2:** 40 bbl 9.5 ppg (224.6 cu-ft) Tuned Spacer III + 0.5 gal/bbl Musol + 38.75 ppb Barite + 0.5 gal/bbl SEM-7. **STAGE 3:** 10 bbl Fr Water Spacer. **STAGE 4: Lead Cement:** 50 / 50 Poz Premium + 0.2% Versaset + 0.2% Halad -766, Yield 1.43 cu ft/sk, 13.0 ppg, (10 sx / 14.3 cu ft. / 2.5 bbls). **STAGE 5:** 200 sx. Foamed Lead Cement: 50 / 50 Poz Standard + 0.2% Versaset + 0.2% HALAD-766 + 1.5% Chem-Foamer 760. Yield 1.97 cu-ft/sk. 13.0 ppg (200 sx / 394 cu-ft. / 70.2 bbls.). **STAGE 6:** Tail Cement : 100 sx. 50/50 Poz Standard + 0.2% Versaset + 0.05% HALAD-766 + .05% SA-1015, Weight: 13.5 ppg (100 sx / Yield 1.28 cu ft/sk. / 128 cu ft. / 22.8 bbls) **STAGE 7:** Displace w/ +/- 137 bbl Fr Water. Total Cement (536.3 cu ft / 95.5 bbls). Mix Foamed Cement w/ +/- 75,000 SCF Nitrogen. Est. TOC +/- 5,622 ft.

IV. COMPLETION

A. CBL

1. Run CCL for perforating.

B. PRESSURE TEST

1. Pressure test 4-1/2" casing to 4500 psi max, hold at 1500 psi for 30 minutes. Increase pressure to Open RSI sleeves.

C. STIMULATION

1. Stimulate with approximately 2,805,000# 20/40 mesh sand and 340,000# 16/30 mesh sand in 619,113 gallons water with 42,696 mscf N₂ for 17 stages.
2. Isolate stages with flow through frac plug.
3. Drill out frac plugs and flowback lateral.

D. RUNNING TUBING

1. Production Tubing: Run 2-7/8", 6.5#, J-55, EUE tubing with a SN on top of bottom joint. Land tubing near Top of Liner point of curve (~5,800' MD).

- Although this horizontal well will be drilled past the applicable setbacks, an unorthodox location application is not required because the completed interval in this well, as defined by 19.15.16.7 B(1) NMAC, will be entirely within the applicable setbacks. This approach complies with all applicable rules, including 19.15.16.14 A(3) NMAC, 19.15.16.14 B(2) NMAC, 19.15.16.15 B(2) NMAC, and 19.15.16.15 B(4) NMAC.

NOTE:

Installation of RSI sleeves at Toe of Lateral.

Proposed Operations:

A 4-1/2" 11.6# N-80 Liner will be run to TD and landed +/- 150 ft. into the 7" 23# K-55 Intermediate casing (set at 6,072 ft. MD) with a Liner Hanger and pack-off assembly then cemented to +/- 300 ft above the liner hanger. TOL will be +/- 5,922 ft. (MD) +/- 78 degree angle. TOC: +/- 5,622 ft. (MD).

After cementing and TOL clean up operations are complete, the TOL will be tested to 1500 psi (per BLM).

A 4-1/2" 11.6# N-80 tie-back string with seal assembly will be run and stung into the PBR of the liner hanger, tested to 1500 PSI and hung off at the surface.

The Drilling Rig will be rigged down at this point and Completion operations will begin. After Stimulation and Testing operations are complete the 4-1/2" tie-back string will be removed from the well.

Note: Changes to formation tops, casing landing points, well TD and Directional Plan.

Well Name: Chaco 2307-13A #185H
 Surface Location: Chaco 2307-13A
 NAD 1927 (NADCON CONUS) , US State Plane 1927 (Exact solution) , New Mexico Central 3002
 Ground Elevation: 6991.00
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1905303.57334 125988.30938 36.22980 -107.51811 185H
 WELL @ 7005.00usft (Original Well Elev)



Azimuths to True North
 Magnetic North: 9.36°
 Magnetic Field
 Strength: 50169.0snT
 Dip Angle: 63.00°
 Date: 7/2/2014
 Model: IGRF2010

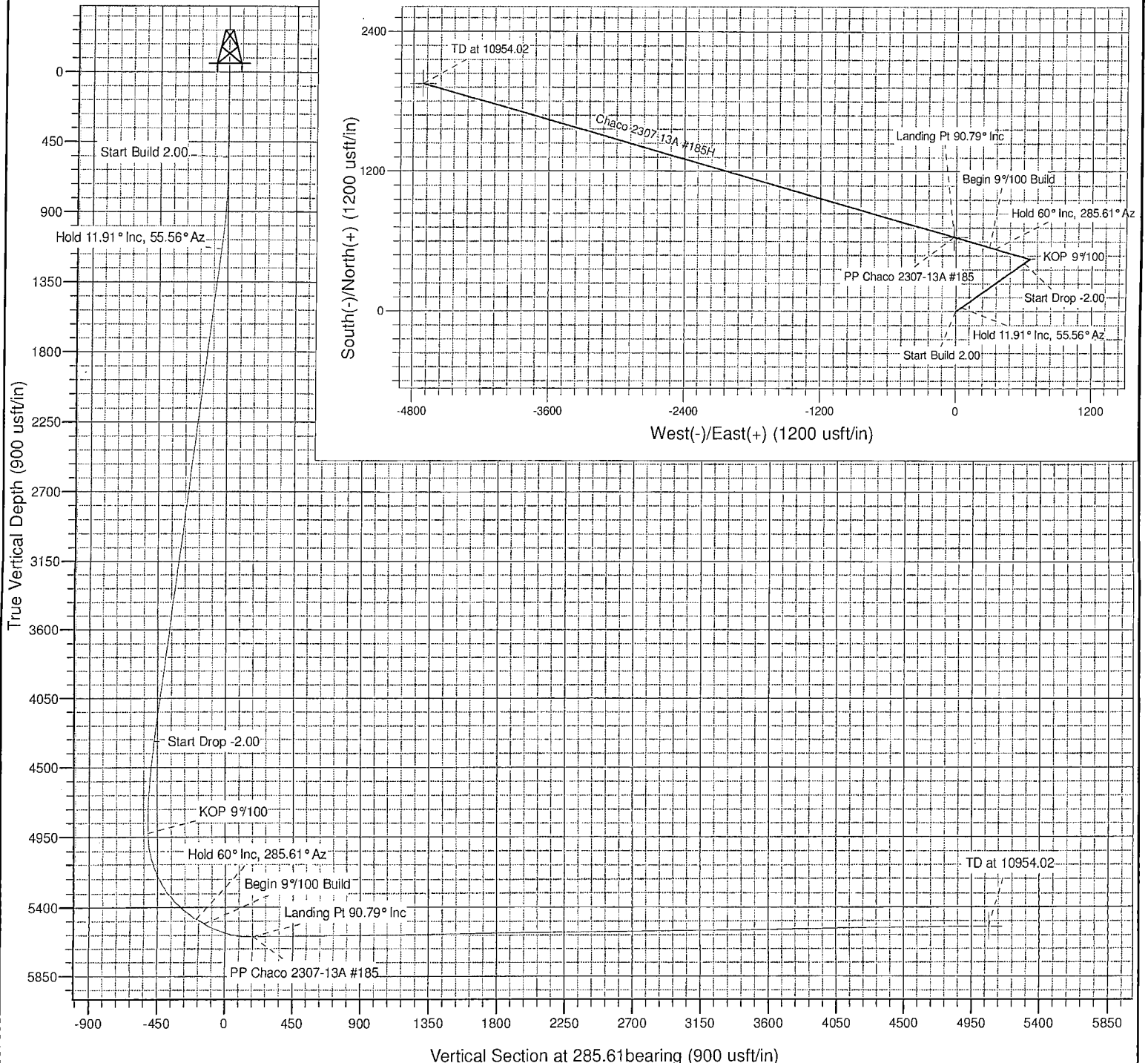
Project: SJ 13-23N-07W
 Site: Chaco 2307-13A
 Well: Chaco 2307-13A #185H
 Design #1 07Jul14 kjs

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsect	Departure	Annotation
550.00	550.00	0.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
1141.24	1145.52	11.91	55.56	34.88	50.86	-39.60	61.67	Hold 11.91° Inc, 55.56° Az
4333.20	4407.71	11.91	55.56	415.69	606.08	-471.87	734.93	Start Drop -2.00
4924.44	5003.23	0.00	0.00	450.57	656.94	-511.47	796.61	KOP 9°/100
5475.77	5669.90	60.00	285.61	536.25	350.38	-193.16	1114.92	Hold 60° Inc, 285.61° Az
5505.77	5729.90	60.00	285.61	550.23	300.33	-141.19	1166.88	Begin 9°/100 Build
5591.00	6071.97	90.79	285.61	638.26	-14.64	185.85	1493.93	Landing Pt 90.79° Inc
5524.01	10953.02	90.79	285.61	1951.95	-4715.11	5066.45	6374.52	TD at 10954.02

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
TD / PBHL Chaco 2307-13A #185	5524.00	1952.22	-4716.06	1907317.32818	121298.17361	36.23516	-107.53410	Point
PP Chaco 2307-13A #185	5591.00	638.26	-14.64	1905941.97497	125982.01831	36.23155	-107.51816	Point
- plan hits target center								



WPXENERGYSM



SAN JUAN BASIN

SJ 13-23N-07W

Chaco 2307-13A

Chaco 2307-13A #185H - Slot 185H

Wellbore #1

Plan: Design #1 07Jul14 kjs

Standard Planning Report - Geographic

08 July, 2014

Database: COMPASS-PICEANCE
 Company: SAN JUAN BASIN
 Project: SJ 13-23N-07W
 Site: Chaco 2307-13A
 Well: Chaco 2307-13A #185H
 Wellbore: Wellbore #1
 Design: Design #1 07Jul14 kjs

Local Co-ordinate Reference: Well Chaco 2307-13A #185H - Slot 185H
 TVD Reference: WELL @ 7005.00usft (Original Well Elev)
 MD Reference: WELL @ 7005.00usft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Project	SJ 13-23N-07W, Rio Arriba County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico Central 3002		

Site	Chaco 2307-13A				
Site Position:		Northing:	1,905,300.20313 usft	Latitude:	36.22979
From:	Lat/Long	Easting:	125,967.61519 usft	Longitude:	-107.51818
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	-0.75 °

Well	Chaco 2307-13A #185H - Slot 185H					
Well Position	+N/-S	0.00 usft	Northing:	1,905,303.57334 usft	Latitude:	36.22980
	+E/-W	0.00 usft	Easting:	125,988.30938 usft	Longitude:	-107.51811
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,991.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/2/2014	9.36	63.00	50,169

Design	Design #1 07Jul14 kjs			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S (usft)	+E/-W (usft)	Direction (bearing)
	0.00	0.00	0.00	285.61

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	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	
1,145.52	11.91	55.56	1,141.24	34.88	50.86	2.00	2.00	0.00	55.56	
4,407.71	11.91	55.56	4,333.20	415.69	606.08	0.00	0.00	0.00	0.00	
5,003.23	0.00	0.00	4,924.44	450.57	656.94	2.00	-2.00	0.00	180.00	
5,669.90	60.00	285.61	5,475.77	536.25	350.38	9.00	9.00	0.00	285.61	
5,729.90	60.00	285.61	5,505.77	550.23	300.33	0.00	0.00	0.00	0.00	
6,071.97	90.79	285.61	5,591.00	638.26	-14.64	9.00	9.00	0.00	0.00	
10,954.02	90.79	285.61	5,524.00	1,952.22	-4,716.08	0.00	0.00	0.00	0.00	TD / PBHL Chaco 23C

Database: COMPASS-PICEANCE
 Company: SAN JUAN BASIN
 Project: SJ 13-23N-07W
 Site: Chaco 2307-13A
 Well: Chaco 2307-13A #185H
 Wellbore: Wellbore #1
 Design: Design #1 07Jul14 kjs

Local Co-ordinate Reference: Well Chaco 2307-13A #185H - Slot 185H
 TVD Reference: WELL @ 7005.00usft (Original Well Elev)
 MD Reference: WELL @ 7005.00usft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	1,905,303.57334	125,988.30938	36.22980	-107.51811
200.00	0.00	0.00	200.00	0.00	0.00	1,905,303.57334	125,988.30938	36.22980	-107.51811
400.00	0.00	0.00	400.00	0.00	0.00	1,905,303.57334	125,988.30938	36.22980	-107.51811
550.00	0.00	0.00	550.00	0.00	0.00	1,905,303.57334	125,988.30938	36.22980	-107.51811
Start Build 2.00									
600.00	1.00	55.56	600.00	0.25	0.36	1,905,303.81540	125,988.67240	36.22980	-107.51811
800.00	5.00	55.56	799.68	6.17	8.99	1,905,309.62114	125,997.37935	36.22982	-107.51808
1,000.00	9.00	55.56	998.15	19.95	29.09	1,905,323.14037	126,017.65433	36.22986	-107.51801
1,145.52	11.91	55.56	1,141.24	34.88	50.86	1,905,337.78892	126,039.62295	36.22990	-107.51794
Hold 11.91° Inc, 55.56° Az									
1,200.00	11.91	55.56	1,194.55	41.24	60.13	1,905,344.02643	126,048.97744	36.22991	-107.51791
1,400.00	11.91	55.56	1,390.24	64.59	94.17	1,905,366.92553	126,083.31951	36.22998	-107.51779
1,600.00	11.91	55.56	1,585.94	87.94	128.21	1,905,389.82463	126,117.66160	36.23004	-107.51768
1,800.00	11.91	55.56	1,781.63	111.28	162.25	1,905,412.72373	126,152.00369	36.23011	-107.51756
2,000.00	11.91	55.56	1,977.32	134.63	196.29	1,905,435.62281	126,186.34578	36.23017	-107.51745
2,200.00	11.91	55.56	2,173.02	157.98	230.33	1,905,458.52191	126,220.68786	36.23023	-107.51733
2,400.00	11.91	55.56	2,368.71	181.32	264.37	1,905,481.42101	126,255.02995	36.23030	-107.51722
2,600.00	11.91	55.56	2,564.41	204.67	298.41	1,905,504.32011	126,289.37204	36.23036	-107.51710
2,800.00	11.91	55.56	2,760.10	228.01	332.45	1,905,527.21920	126,323.71413	36.23043	-107.51699
3,000.00	11.91	55.56	2,955.80	251.36	366.49	1,905,550.11830	126,358.05621	36.23049	-107.51687
3,200.00	11.91	55.56	3,151.49	274.71	400.53	1,905,573.01740	126,392.39830	36.23056	-107.51675
3,400.00	11.91	55.56	3,347.18	298.05	434.57	1,905,595.91650	126,426.74039	36.23062	-107.51664
3,600.00	11.91	55.56	3,542.88	321.40	468.61	1,905,618.81559	126,461.08248	36.23068	-107.51652
3,800.00	11.91	55.56	3,738.57	344.75	502.65	1,905,641.71469	126,495.42455	36.23075	-107.51641
4,000.00	11.91	55.56	3,934.27	368.09	536.69	1,905,664.61379	126,529.76664	36.23081	-107.51629
4,200.00	11.91	55.56	4,129.96	391.44	570.73	1,905,687.51289	126,564.10873	36.23088	-107.51618
4,400.00	11.91	55.56	4,325.66	414.79	604.77	1,905,710.41198	126,598.45082	36.23094	-107.51606
4,407.71	11.91	55.56	4,333.20	415.69	606.08	1,905,711.29452	126,599.77436	36.23094	-107.51606
Start Drop -2.00									
4,600.00	8.06	55.56	4,522.54	434.55	633.58	1,905,729.79268	126,627.51631	36.23099	-107.51596
4,800.00	4.06	55.56	4,721.38	446.49	651.00	1,905,741.51262	126,645.09286	36.23103	-107.51591
5,000.00	0.06	55.56	4,921.21	450.57	656.94	1,905,745.50908	126,651.08641	36.23104	-107.51589
5,003.23	0.00	0.00	4,924.44	450.57	656.94	1,905,745.51009	126,651.08792	36.23104	-107.51589
KOP 9°/100									
5,200.00	17.71	285.61	5,118.09	458.69	627.89	1,905,754.00973	126,622.14189	36.23106	-107.51598
5,400.00	35.71	285.61	5,296.02	482.79	541.67	1,905,779.23232	126,536.24482	36.23113	-107.51628
5,600.00	53.71	285.61	5,437.57	520.50	406.71	1,905,818.71120	126,401.79707	36.23123	-107.51673
5,669.90	60.00	285.61	5,475.77	536.25	350.38	1,905,835.19140	126,345.67273	36.23127	-107.51692
Hold 60° Inc, 285.61° Az									
5,729.90	60.00	285.61	5,505.77	550.23	300.33	1,905,849.83116	126,295.81616	36.23131	-107.51709
Begin 9°/100 Build									
5,800.00	66.31	285.61	5,537.41	567.06	240.12	1,905,867.44479	126,235.83186	36.23136	-107.51730
6,000.00	84.31	285.61	5,587.92	618.92	54.57	1,905,921.72731	126,050.96960	36.23150	-107.51793
6,071.97	90.79	285.61	5,591.00	638.26	-14.64	1,905,941.97409	125,982.01806	36.23155	-107.51816
Landing Pt 90.79° Inc - PP Chaco 2307-13A #185									
6,200.00	90.79	285.61	5,589.24	672.72	-137.94	1,905,978.04308	125,859.18311	36.23165	-107.51858
6,400.00	90.79	285.61	5,586.50	726.55	-330.54	1,906,034.38630	125,667.30319	36.23180	-107.51923
6,600.00	90.79	285.61	5,583.75	780.38	-523.14	1,906,090.72951	125,475.42325	36.23194	-107.51989
6,800.00	90.79	285.61	5,581.01	834.21	-715.74	1,906,147.07273	125,283.54332	36.23209	-107.52054
7,000.00	90.79	285.61	5,578.26	888.03	-908.34	1,906,203.41594	125,091.66338	36.23224	-107.52119
7,200.00	90.79	285.61	5,575.52	941.86	-1,100.94	1,906,259.75915	124,899.78345	36.23239	-107.52185
7,400.00	90.79	285.61	5,572.77	995.69	-1,293.54	1,906,316.10236	124,707.90352	36.23254	-107.52250
7,600.00	90.79	285.61	5,570.03	1,049.52	-1,486.14	1,906,372.44558	124,516.02358	36.23268	-107.52315
7,800.00	90.79	285.61	5,567.28	1,103.35	-1,678.74	1,906,428.78879	124,324.14365	36.23283	-107.52380

Database: COMPASS-PICEANCE
 Company: SAN JUAN BASIN
 Project: SJ 13-23N-07W
 Site: Chaco 2307-13A
 Well: Chaco 2307-13A #185H
 Wellbore: Wellbore #1
 Design: Design #1 07Jul14 kjs

Local Co-ordinate Reference: Well Chaco 2307-13A #185H - Slot 185H
 TVD Reference: WELL @ 7005.00usft (Original Well Elev)
 MD Reference: WELL @ 7005.00usft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,000.00	90.79	285.61	5,564.54	1,157.18	-1,871.35	1,906,485.13201	124,132.26371	36.23298	-107.52446
8,200.00	90.79	285.61	5,561.80	1,211.00	-2,063.95	1,906,541.47522	123,940.38379	36.23313	-107.52511
8,400.00	90.79	285.61	5,559.05	1,264.83	-2,256.55	1,906,597.81844	123,748.50385	36.23327	-107.52576
8,600.00	90.79	285.61	5,556.31	1,318.66	-2,449.15	1,906,654.16164	123,556.62392	36.23342	-107.52642
8,800.00	90.79	285.61	5,553.56	1,372.49	-2,641.75	1,906,710.50486	123,364.74398	36.23357	-107.52707
9,000.00	90.79	285.61	5,550.82	1,426.32	-2,834.35	1,906,766.84808	123,172.86406	36.23372	-107.52772
9,200.00	90.79	285.61	5,548.07	1,480.14	-3,026.95	1,906,823.19129	122,980.98412	36.23387	-107.52837
9,400.00	90.79	285.61	5,545.33	1,533.97	-3,219.55	1,906,879.53451	122,789.10419	36.23401	-107.52903
9,600.00	90.79	285.61	5,542.58	1,587.80	-3,412.15	1,906,935.87772	122,597.22425	36.23416	-107.52968
9,800.00	90.79	285.61	5,539.84	1,641.63	-3,604.75	1,906,992.22094	122,405.34432	36.23431	-107.53033
10,000.00	90.79	285.61	5,537.09	1,695.46	-3,797.35	1,907,048.56414	122,213.46439	36.23446	-107.53099
10,200.00	90.79	285.61	5,534.35	1,749.28	-3,989.95	1,907,104.90736	122,021.58446	36.23461	-107.53164
10,400.00	90.79	285.61	5,531.60	1,803.11	-4,182.55	1,907,161.25057	121,829.70452	36.23475	-107.53229
10,600.00	90.79	285.61	5,528.86	1,856.94	-4,375.15	1,907,217.59379	121,637.82459	36.23490	-107.53295
10,800.00	90.79	285.61	5,526.11	1,910.77	-4,567.75	1,907,273.93700	121,445.94466	36.23505	-107.53360
10,953.02	90.79	285.61	5,524.01	1,951.95	-4,715.11	1,907,317.04520	121,299.13732	36.23516	-107.53410
TD at 10954.02									
10,954.02	90.79	285.61	5,524.00	1,952.22	-4,716.08	1,907,317.32818	121,298.17361	36.23516	-107.53410
TD / PBHL Chaco 2307-13A #185									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (bearing)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
TD / PBHL Chaco 2307- - plan hits target center - Point	0.00	0.00	5,524.00	1,952.22	-4,716.08	1,907,317.32818	121,298.17361	36.23516	-107.53410
PP Chaco 2307-13A #185 - plan hits target center - Point	0.00	0.00	5,591.00	638.26	-14.64	1,905,941.97497	125,982.01831	36.23155	-107.51816

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
550.00	550.00	0.00	0.00	Start Build 2.00
1,145.52	1,141.24	34.88	50.86	Hold 11.91° Inc, 55.56° Az
4,407.71	4,333.20	415.69	606.08	Start Drop -2.00
5,003.23	4,924.44	450.57	656.94	KOP 9°/100
5,669.90	5,475.77	536.25	350.38	Hold 60° Inc, 285.61° Az
5,729.90	5,505.77	550.23	300.33	Begin 9°/100 Build
6,071.97	5,591.00	638.26	-14.64	Landing Pt 90.79° Inc
10,953.02	5,524.01	1,951.95	-4,715.11	TD at 10954.02