

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: 9/2/14

Well information:

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf. Owner	UL	Sec	Twp	N/S	Rng	W/E	Feet	NS	Ft	EW
30-045-35554-00-00	CHACO 2308 06H	396H	WPX ENERGY PRODUCTION, LLC	O	N	San Juan	F	H	6	23	N	8	W	1737	N	276	E

Application Type:

- ☐ P&A ☒ Drilling/Casing Change ☒ Location Change
☐ Recomplete/DHC (For hydraulic fracturing operations review EPA Underground injection control Guidance #84)
☒ Other: well name change

Conditions of Approval:

Notify NMOCD 24hrs prior to beginning operations
Hold C-104 for as drilled plat, directional survey & NSL

(For hydraulic fracturing operations review EPA Underground injection control Guidance #84)

NMOCD Approved by Signature

9-5-14

Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

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

SEP 02 2014

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.

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)

SHL: 1737' FNL & 276' FEL SEC 6 23N 8W

BHL: 1530' FNL & 230' FWL SEC 6 23N 8W

5. Lease Serial No.

NMNM 109399

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.

Chaco 2308-06H #396H

9. API Well No.

30-045-35554

10. Field and Pool or Exploratory Area

Nageezi Gallup

11. Country or Parish, State

San Juan County, 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	☐ 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 Name Change/Realign Interval
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

RCVD SEP 3 '14

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. WPX would also like to change the well name from the Katie #2H to the Chaco 2308-06H #396H.

CONDITIONS OF APPROVAL

Adhere to previously issued stipulations

OIL CONS. DIV.
BIA'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

DIST. 3

Title Regulatory Specialist

Signature

Date 9/2/14

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

William Tambekou

Petroleum

Title Engineer

Date 9/2/2014

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 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)

NMOCDA

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

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-045-35554	*Pool Code 47540	*Pool Name NAGEEZI GALLUP
*Property Code 313663	*Property Name CHACO 2308-06H	*Well Number 396H
*OGRI No. 120782	*Operator Name WPX ENERGY PRODUCTION, LLC	*Elevation 6927'

¹⁰ Surface Location

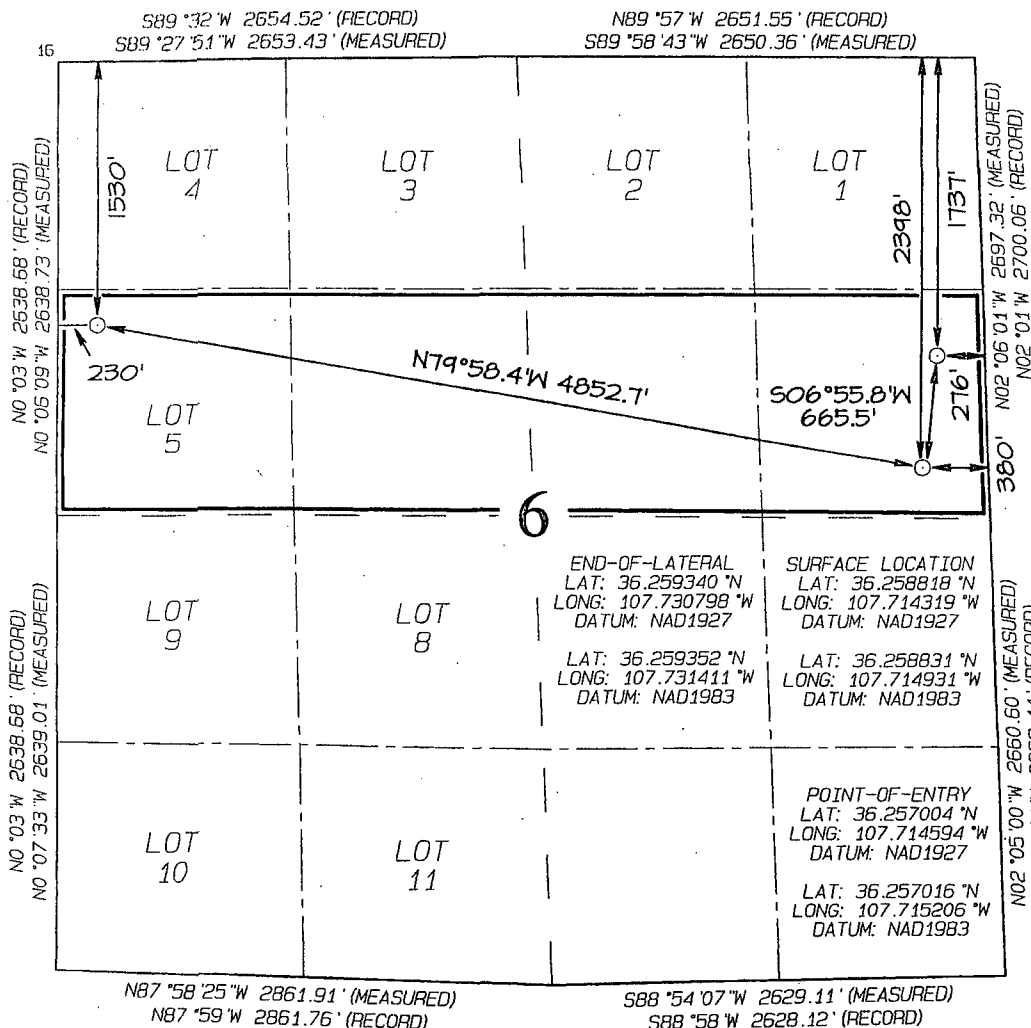
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	6	23N	8W		1737	NORTH	276	EAST	SAN JUAN

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
D	6	23N	8W		1530	NORTH	230	WEST	SAN JUAN

¹² Dedicated Acres 160.87 Acres - S/2 N/2	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



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: 9/2/14

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: AUGUST 28, 2014
Date of Survey: AUGUST 25, 2014

Signature and Seal of Professional Surveyor

JASON C. EDWARDS
NEW MEXICO
REGISTERED PROFESSIONAL SURVEYOR
15269

JASON C. EDWARDS
Certificate Number 15269

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

DATE: 8/20/14 **FIELD:** Nageezi Gallup

WELL NAME: Chaco 2308-06H #396H **SURFACE:** BLM

SH Location: SENE Sec 6 -23N -08W **ELEVATION:** 6927' GR

BH Location: NWNW Sec 6 -23N -08W
San Juan Co., NM **MINERALS:** BLM

MEASURED DEPTH: 10,735' **LEASE #:** NMNM 109399

I. GEOLOGY: Surface formation – Nacimiento**A. FORMATION TOPS: (KB)**

Name	MD	TVD	Name	MD	TVD
Ojo Alamo	1014	1012	Point Lookout	4150	4021
Kirtland	1250	1243	Mancos	4355	4222
Picture Cliffs	1619	1597	Kickoff Point	4808	4674
Lewis	1768	1740	Top Target	5553	5263
Chacra	2047	2007	Landing Point	5882	5340
Cliff House	3154	3066	Base Target	5882	5340
Menefee	3212	3122			
			TD	10735	5240

- 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 +/- 4,808' (MD) / 4,674' (TVD). Curve portion of wellbore will be drilled and landed at +/- 90 deg. at +/- 5,882' (MD) / 5,340' (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 +/- 10,735' (MD) / 5,240' (TVD). Will run 4-1/2 in. Production Liner from +/- 5,732 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:**

CASING TYPE	OH SIZE (IN)	DEPTH (MD) (FT)	CASING SIZE (IN)	WEIGHT(LB)	GRADE
Surface	12.25"	400'±	9.625"	36#	J-55
Intermediate	8.75"	5882'	7"	23#	K-55
Prod. Liner	6.125"	5,732' - 10,735'	4-1/2"	11.6#	N-80
Tie-Back String	N/A	Surf. - 5,732'	4-1/2"	11.6#	N-80

B. FLOAT EQUIPMENT:

- SURFACE CASING:** 9-5/8" notched regular pattern guide shoe. *MTF sel sub* on each of the bottom (4) joints of Surface Casing.
- INTERMEDIATE CASING:** 7" cement nose guide shoe with a collar one joint above the shoe. Install (1) centralizer on each of the standard centralizer every (3) joints to 2,500 ft. Run (1) centralizer every 2,300ft., 2,000ft., 1,500 ft., and 1,000 ft.
- PRODUCTION LINER:** Run 4-1/2" Liner with cement nose guide float collar + 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.
- TIE-BACK CASING:** None

C. CEMENTING:

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

- 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.
- 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.
- 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 +/- 5,432 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 (~5,700' 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 5,882 ft. MD) with a Liner Hanger and pack-off assembly then cemented to +/- 300 ft above the liner hanger. TOL will be +/- 5,732 ft. (MD) +/- 78 degree angle. TOC: +/- 5,432 ft. (MD).

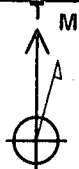
After cementing and TOL clean up operations are complete, the TOL will be tested to 1500 psi (per BLM).

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 2308-06H #396H
 Surface Location: Chaco 2308-06H
 NAD 1927 (NADCON CONUS) , US State Plane 1927 (Exact solution) New Mexico West 3003
 Ground Elevation: 6927.0
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.0 0.0 1913473.49 535088.50 36.258818 -107.714319
 KELLY BUSHING @ 6941.0usft



Azimuths to True North
 Magnetic North: 9.43°
 Magnetic Field
 Strength: 50148.5nT
 Dip Angle: 62.98°
 Date: 8/15/2014
 Model: IGRF2010

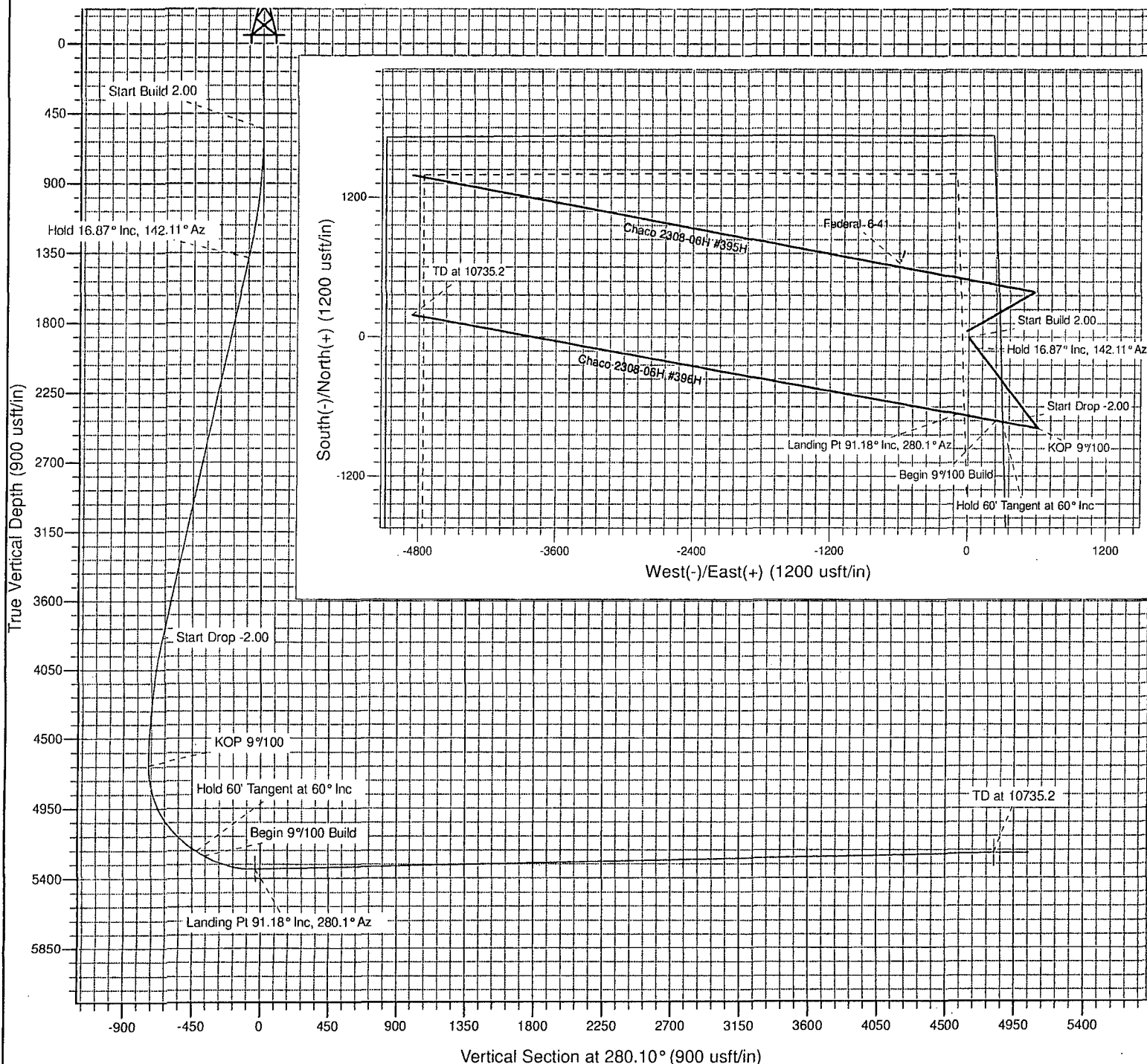
Project: SJ 06-23N-08W
 Site: Chaco 2308-06H
 Well: Chaco 2308-06H #396H
 Design #1 15Aug14 KJS

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation
550.0	550.0	0.00	0.00	0.0	0.0	0.0	0.0	Start Build 2.00
1381.5	1393.6	16.87	142.11	-97.3	75.7	-91.6	123.3	Hold 16.87° Inc, 142.11° Az
3842.1	3964.9	16.87	142.11	-686.3	534.0	-646.1	869.6	Start Drop -2.00
4673.5	4808.4	0.00	142.11	-783.6	609.7	-737.7	992.9	KOP 9°/100
5224.8	5475.0	59.99	280.10	-727.8	296.4	-419.5	1311.1	Hold 60° Tangent at 60° Inc
5254.8	5535.1	60.00	280.10	-718.7	245.2	-367.4	1363.1	Begin 9°/100 Build
5340.0	5881.6	91.18	280.10	-660.5	-81.2	-35.9	1694.6	Landing Pt 91.18° Inc, 280.1° Az
5240.0	10735.2	91.18	280.10	190.2	-4858.6	4816.6	6547.2	TD at 10735.2

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
TD / PBHIL Chaco #396	5240.0	190.2	-4858.6	1913657.69	530229.65	36.259340	-107.730798	Circle (Radius: 230.0)
PP Chaco #396H	5340.0	-660.6	-81.1	1912812.82	535008.26	36.257004	-107.714594	Circle (Radius: 50.0)





SAN JUAN BASIN

SJ 06-23N-08W

Chaco 2308-06H

Chaco 2308-06H #396H

Wellbore #1

Plan: Design #1 15Aug14 kjs

Standard Planning Report - Geographic

28 August, 2014

Database:	COMPASS-SANJUAN	Local Co-ordinate Reference:	Well Chaco 2308-06H #396H
Company:	SAN JUAN BASIN	TVD Reference:	KELLY BUSHING @ 6941.0usft
Project:	SJ 06-23N-08W	MD Reference:	KELLY BUSHING @ 6941.0usft
Site:	Chaco 2308-06H	North Reference:	True
Well:	Chaco 2308-06H #396H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 15Aug14.kjs		

Project	SJ 06-23N-08W		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico West 3003		

Site	Chaco 2308-06H		
Site Position:	Northings:	1,913,523.71 usft	Latitude: 36.258957
From: Map	Easting:	535,071.64 usft	Longitude: -107.714376
Position Uncertainty:	0.0 usft	Slot Radius: 13.200 in	Grid Convergence: 0.07 "

Well	Chaco 2308-06H #396H		
Well Position	+N/-S	0.0 usft	Northings: 1,913,473.49 usft
	+E/-W	0.0 usft	Easting: 535,088.51 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft
			Ground Level: 6,927.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	8/15/2014	9.43
			Dip Angle
			62.98
			Field Strength
			50,149

Design	Design #1 15Aug14.kjs		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			280.10

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
550.0	0.00	0.00	550.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,393.6	16.87	142.11	1,381.4	-97.3	75.7	2.00	2.00	0.00	142.11	
3,964.9	16.87	142.11	3,842.1	-686.3	534.0	0.00	0.00	0.00	0.00	
4,808.4	0.00	0.00	4,673.5	-783.6	609.7	2.00	-2.00	0.00	180.00	
5,475.1	60.00	280.10	5,224.8	-727.8	296.3	9.00	9.00	0.00	280.10	
5,535.1	60.00	280.10	5,254.8	-718.7	245.2	0.00	0.00	0.00	0.00	
5,881.6	91.18	280.10	5,340.0	-660.6	-81.1	9.00	9.00	0.00	-0.01	
10,735.2	91.18	280.10	5,240.0	190.2	-4,858.6	0.00	0.00	0.00	0.00	TD / PBHL Chaco #396H

Database:	COMPASS-SANJUAN	Local Co-ordinate Reference:	Well Chaco 2308-06H #396H
Company:	SAN JUAN BASIN	TVD Reference:	KELLY BUSHING @ 6941.0usft
Project:	SJ 06-23N-08W	MD Reference:	KELLY BUSHING @ 6941.0usft
Site:	Chaco 2308-06H	North Reference:	True
Well:	Chaco 2308-06H #396H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 15Aug14 kjs		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	1,913,473.49	535,088.51	36.258819	-107.714319
200.0	0.00	0.00	200.0	0.0	0.0	1,913,473.49	535,088.51	36.258819	-107.714319
400.0	0.00	0.00	400.0	0.0	0.0	1,913,473.49	535,088.51	36.258819	-107.714319
550.0	0.00	0.00	550.0	0.0	0.0	1,913,473.49	535,088.51	36.258819	-107.714319
Start Build 2.00									
600.0	1.00	142.11	600.0	-0.3	0.3	1,913,473.15	535,088.77	36.258818	-107.714318
800.0	5.00	142.11	799.7	-8.6	6.7	1,913,464.90	535,095.21	36.258795	-107.714296
1,000.0	9.00	142.11	998.2	-27.8	21.7	1,913,445.68	535,110.20	36.258742	-107.714245
1,200.0	13.00	142.11	1,194.4	-57.9	45.1	1,913,415.60	535,133.67	36.258659	-107.714166
1,393.6	16.87	142.11	1,381.5	-97.3	75.7	1,913,376.26	535,164.35	36.258551	-107.714062
Hold 16.87° Inc, 142.11° Az									
1,400.0	16.87	142.11	1,387.6	-98.8	76.9	1,913,374.80	535,165.49	36.258547	-107.714058
1,600.0	16.87	142.11	1,579.0	-144.6	112.5	1,913,329.03	535,201.19	36.258421	-107.713937
1,800.0	16.87	142.11	1,770.4	-190.4	148.2	1,913,283.26	535,236.89	36.258295	-107.713816
2,000.0	16.87	142.11	1,961.8	-236.2	183.8	1,913,237.50	535,272.59	36.258170	-107.713695
2,200.0	16.87	142.11	2,153.2	-282.0	219.4	1,913,191.73	535,308.30	36.258044	-107.713575
2,400.0	16.87	142.11	2,344.5	-327.8	255.1	1,913,145.96	535,344.00	36.257918	-107.713454
2,600.0	16.87	142.11	2,535.9	-373.7	290.7	1,913,100.20	535,379.70	36.257792	-107.713333
2,800.0	16.87	142.11	2,727.3	-419.5	326.4	1,913,054.43	535,415.40	36.257666	-107.713212
3,000.0	16.87	142.11	2,918.7	-465.3	362.0	1,913,008.66	535,451.10	36.257540	-107.713091
3,200.0	16.87	142.11	3,110.1	-511.1	397.7	1,912,962.90	535,486.80	36.257414	-107.712970
3,400.0	16.87	142.11	3,301.5	-556.9	433.3	1,912,917.13	535,522.50	36.257289	-107.712849
3,600.0	16.87	142.11	3,492.9	-602.7	469.0	1,912,871.36	535,558.20	36.257163	-107.712728
3,800.0	16.87	142.11	3,684.3	-648.5	504.6	1,912,825.60	535,593.90	36.257037	-107.712607
3,964.9	16.87	142.11	3,842.1	-686.3	534.0	1,912,787.86	535,623.33	36.256933	-107.712508
Start Drop -2.00									
4,000.0	16.17	142.11	3,875.7	-694.2	540.1	1,912,779.99	535,629.47	36.256912	-107.712487
4,200.0	12.17	142.11	4,069.6	-732.8	570.2	1,912,741.40	535,659.58	36.256805	-107.712385
4,400.0	8.17	142.11	4,266.4	-760.7	591.8	1,912,713.56	535,681.29	36.256729	-107.712312
4,600.0	4.17	142.11	4,465.2	-777.6	605.0	1,912,696.62	535,694.51	36.256682	-107.712267
4,800.0	0.17	142.11	4,665.1	-783.6	609.7	1,912,690.65	535,699.16	36.256666	-107.712251
4,808.4	0.00	142.11	4,673.5	-783.6	609.7	1,912,690.64	535,699.17	36.256666	-107.712251
KOP 9°/100									
5,000.0	17.24	280.10	4,862.2	-778.6	581.5	1,912,695.62	535,671.00	36.256680	-107.712346
5,200.0	35.24	280.10	5,040.8	-763.1	494.8	1,912,710.96	535,584.29	36.256722	-107.712641
5,400.0	53.24	280.10	5,183.5	-738.8	358.0	1,912,735.16	535,447.45	36.256789	-107.713105
5,475.0	59.99	280.10	5,224.8	-727.8	296.4	1,912,746.06	535,385.82	36.256819	-107.713314
Hold 60° Tangent at 60° Inc									
5,475.1	60.00	280.10	5,224.8	-727.8	296.3	1,912,746.08	535,385.72	36.256819	-107.713314
5,535.1	60.00	280.10	5,254.8	-718.7	245.2	1,912,755.13	535,334.57	36.256844	-107.713487
Begin 9°/100 Build									
5,600.0	65.84	280.10	5,284.4	-708.5	188.3	1,912,765.19	535,277.69	36.256872	-107.713680
5,800.0	83.84	280.10	5,336.4	-674.8	-1.0	1,912,798.66	535,088.38	36.256965	-107.714322
5,881.5	91.17	280.10	5,340.0	-660.6	-81.1	1,912,812.83	535,008.27	36.257004	-107.714594
PP Chaco #396H									
5,881.6	91.18	280.10	5,340.0	-660.5	-81.2	1,912,812.85	535,008.16	36.257004	-107.714594
Landing Pt 91.18° Inc, 280.1° Az									
6,000.0	91.18	280.10	5,337.5	-639.8	-197.7	1,912,833.45	534,891.59	36.257061	-107.714989
6,200.0	91.18	280.10	5,333.4	-604.7	-394.6	1,912,868.27	534,694.69	36.257157	-107.715657
6,400.0	91.18	280.10	5,329.3	-569.7	-591.4	1,912,903.08	534,497.78	36.257253	-107.716325
6,600.0	91.18	280.10	5,325.2	-534.6	-788.3	1,912,937.89	534,300.88	36.257350	-107.716993
6,800.0	91.18	280.10	5,321.1	-499.6	-985.1	1,912,972.71	534,103.97	36.257446	-107.717660
7,000.0	91.18	280.10	5,316.9	-464.5	-1,182.0	1,913,007.52	533,907.07	36.257542	-107.718328
7,200.0	91.18	280.10	5,312.8	-429.5	-1,378.9	1,913,042.33	533,710.17	36.257639	-107.718996

Database:	COMPASS-SANJUAN	Local Co-ordinate Reference:	Well Chaco 2308-06H #396H
Company:	SAN JUAN BASIN	TVD Reference:	KELLY BUSHING @ 6941.0usft
Project:	SJ 06-23N-08W	MD Reference:	KELLY BUSHING @ 6941.0usft
Site:	Chaco 2308-06H	North Reference:	True
Well:	Chaco 2308-06H #396H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 15Aug14 kjs		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,400.0	91.18	280.10	5,308.7	-394.4	-1,575.7	1,913,077.14	533,513.26	36.257735	-107.719663
7,600.0	91.18	280.10	5,304.6	-359.4	-1,772.6	1,913,111.96	533,316.36	36.257831	-107.720331
7,800.0	91.18	280.10	5,300.5	-324.3	-1,969.5	1,913,146.77	533,119.46	36.257927	-107.720999
8,000.0	91.18	280.10	5,296.3	-289.2	-2,166.3	1,913,181.58	532,922.55	36.258024	-107.721667
8,200.0	91.18	280.10	5,292.2	-254.2	-2,363.2	1,913,216.40	532,725.65	36.258120	-107.722334
8,400.0	91.18	280.10	5,288.1	-219.1	-2,560.0	1,913,251.21	532,528.74	36.258216	-107.723002
8,600.0	91.18	280.10	5,284.0	-184.1	-2,756.9	1,913,286.02	532,331.84	36.258312	-107.723670
8,800.0	91.18	280.10	5,279.9	-149.0	-2,953.8	1,913,320.84	532,134.94	36.258409	-107.724338
9,000.0	91.18	280.10	5,275.7	-114.0	-3,150.6	1,913,355.65	531,938.03	36.258505	-107.725005
9,200.0	91.18	280.10	5,271.6	-78.9	-3,347.5	1,913,390.46	531,741.13	36.258601	-107.725673
9,400.0	91.18	280.10	5,267.5	-43.9	-3,544.3	1,913,425.27	531,544.23	36.258697	-107.726341
9,600.0	91.18	280.10	5,263.4	-8.8	-3,741.2	1,913,460.09	531,347.32	36.258794	-107.727008
9,800.0	91.18	280.10	5,259.3	26.2	-3,938.1	1,913,494.90	531,150.42	36.258890	-107.727676
10,000.0	91.18	280.10	5,255.1	61.3	-4,134.9	1,913,529.71	530,953.51	36.258986	-107.728344
10,200.0	91.18	280.10	5,251.0	96.4	-4,331.8	1,913,564.53	530,756.61	36.259082	-107.729012
10,400.0	91.18	280.10	5,246.9	131.4	-4,528.6	1,913,599.34	530,559.71	36.259179	-107.729679
10,600.0	91.18	280.10	5,242.8	166.5	-4,725.5	1,913,634.15	530,362.80	36.259275	-107.730347
10,735.2	91.18	280.10	5,240.0	190.2	-4,858.6	1,913,657.69	530,229.70	36.259340	-107.730799
TD at 10735.2 - TD / PBHL Chaco #396									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
TD / PBHL Chaco #396 - plan hits target center - Circle (radius 230.0)	0.00	0.00	5,240.0	190.2	-4,858.6	1,913,657.69	530,229.65	36.259340	-107.730799
PP Chaco #396H - plan hits target center - Circle (radius 50.0)	0.00	0.00	5,340.0	-660.6	-81.1	1,912,812.83	535,008.27	36.257004	-107.714594

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
550.0	550.0	0.0	0.0	Start Build 2.00
1,393.6	1,381.5	-97.3	75.7	Hold 16.87° Inc, 142.11° Az
3,964.9	3,842.1	-686.3	534.0	Start Drop -2.00
4,808.4	4,673.5	-783.6	609.7	KOP 9°/100
5,475.0	5,224.8	-727.8	296.4	Hold 60' Tangent at 60° Inc
5,535.1	5,254.8	-718.7	245.2	Begin 9°/100 Build
5,881.6	5,340.0	-660.5	-81.2	Landing Pt 91.18° Inc, 280.1° Az
10,735.2	5,240.0	190.2	-4,858.6	TD at 10735.2