

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: 10/03/2014

Well information: Name Change to Chaco 2308 11A #408H

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf_Owner
30-045-35563-00-00	SARAH B	002H	WPX ENERGY PRODUCTION, LLC	O	N	San Juan	F

Application Type:

P&A     Name Change, Drilling/Casing Change      
Location Change

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

Other:

Conditions of Approval:

**Notify NMOCD 24hrs prior to beginning operations, casing & cement**

**Hold C-104 for NSL NSP DHC & directional survey & "As Drilled" Plat**

**Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84**

**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. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.**

**Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore communication to be reported in accordance with 19.15.29.8.**

**CONTINUED ON PAGE 2**

November 6, 2014

Page 2

Sundry states to correct spacing from 160 to 320, C-102 Plat shows total acres 640 all of section 12. WPX will need to file an amended C102 if the spacing is 320.

*Charlie T. Lerrin*

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

10/24/14

Date

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

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

**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.*

OCT 03 2014

5. Lease Serial No.  
NMNM 109397

6. If Indian, Allottee or Tribe Name  
PCO 10/14/14

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

8. Well Name and No.  
Chaco 2308-11A #408H

9. API Well No. DIST. 3  
30-045-35563

10. Field and Pool or Exploratory Area  
Basin Mancos

11. Country or Parish, State  
San Juan, NM

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)  
505-333-1822

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)  
Sur: 386' FNL & 1062' FEL, sec 11, T23N, R8W - BHL: 2465' FNL & 230' FEL, sec 12, T23N, R8W

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

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other Name Change <u>Lateral change</u>
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> 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 recomplete 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 recompletion 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 Energy request to change the name of this well from the Sarah B #<sup>2</sup>11H to the Chaco 2308-11A #<sup>8</sup>407H. We also request to change the lateral alignment of this well per attached C-102, operation plan and directional plan. Finally, we would like to correct the spacing from 160 acres to 320 acres as shown on attached C-102.

14. I hereby certify that the foregoing is true and correct.	
Name (Printed/Typed) Heather Riley	Title    Regulatory Manager
Signature <i>Heather Riley</i>	Date    10/03/14

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by <i>Cynthia Marquez</i>	Title    LLE	Date    10-9-14
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    FFO	

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 <b>30-045-35563</b>		*Pool Code 97232	*Pool Name BASIN MANCOS
*Property Code <b>313863</b>	*Property Name CHACO 2308-11A		*Well Number 408H
*OGRID No. 120782	*Operator Name WPX ENERGY PRODUCTION, LLC		*Elevation 7011'

<sup>10</sup> Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	11	23N	8W		386	NORTH	1062	EAST	SAN JUAN

<sup>11</sup> 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
H	12	23N	8W		2465	NORTH	230	EAST	SAN JUAN

<sup>12</sup> Dedicated Acres 640	ALL	- Section 12	<sup>13</sup> Joint or Infill	<sup>14</sup> Consolidation Code	<sup>15</sup> 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

**SURFACE LOCATION**  
386' FNL 1062' FEL  
SECTION 11, T23N, R8W  
LAT: 36.247807°N  
LONG: 107.645140°W  
DATUM: NAD1927

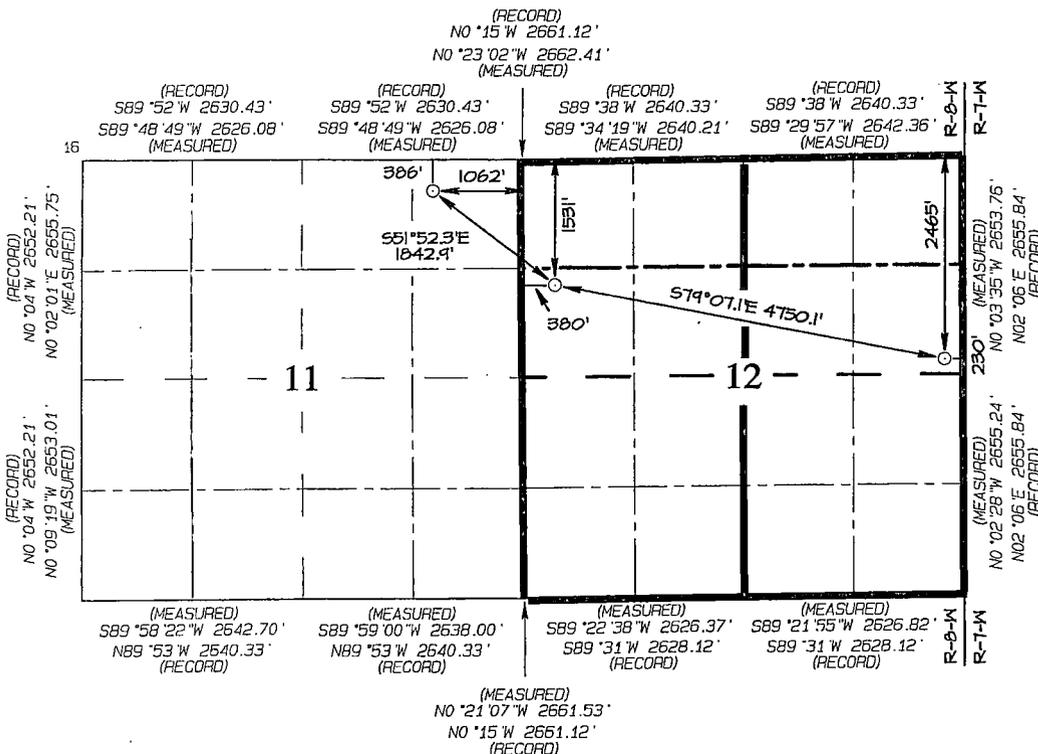
**POINT-OF-ENTRY**  
1531' FNL 380' FWL  
SECTION 12, T23N, R8W  
LAT: 36.244673°N  
LONG: 107.640231°W  
DATUM: NAD1927

**END-OF-LATERAL**  
2465' FNL 230' FEL  
SECTION 12, T23N, R8W  
LAT: 36.242184°N  
LONG: 107.624419°W  
DATUM: NAD1927

LAT: 36.247820°N  
LONG: 107.645750°W  
DATUM: NAD1983

LAT: 36.244686°N  
LONG: 107.640841°W  
DATUM: NAD1983

LAT: 36.242197°N  
LONG: 107.625028°W  
DATUM: NAD1983



<sup>17</sup> 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 into by the division.

Signature: *Heather Riley* Date: 10/31/14

Printed Name: heather.riley@wpxenergy.com

E-mail Address:

<sup>18</sup> 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: SEPTEMBER 8, 2014  
Survey Date: SEPTEMBER 4, 2014

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:** 8/28/2014 **FIELD:** Basin Mancos  
**WELL NAME:** Chaco 2308-11A #408H **SURFACE:** BLM  
**SH Location:** NENE Sec 11 -23N -08W **ELEVATION:** 7011' GR  
**BH Location:** SENE Sec 12 -23N -08W San Juan Co, NM **MINERALS:** Federal  
**MEASURED DEPTH:** 10,849' **LEASE #:** NMNM 109397

**I. GEOLOGY:** Surface formation – Nacimiento

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

Name	MD	TVD	Name	MD	TVD
Ojo Alamo	1160	1155	Point Lookout	4401	4189
Kirtland	1473	1457	Mancos	4590	4375
Picture Cliffs	1878	1835	<b>Kickoff Point</b>	<b>5032</b>	4815
Lewis	1999	1947	Top Target	5798	5415
Chacra	2323	2248	<b>Landing Point</b>	<b>6100</b>	5482
Cliff House	3493	3334	Base Target	6098	5482
Menefee	3531	3370			
			TD	10849	5424

- 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 +/- 5,032' (MD) / 4,815' (TVD). Curve portion of wellbore will be drilled and landed at +/- 90 deg. at +/- 6,100' (MD) / 5,482' (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 +/- 10,849' (MD) / 5,424' (TVD). Will run 4-1/2 in. Production Liner from +/- 5,950 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"	6,100'	7"	23#	K-55
Prod. Liner	6.125"	5,950' - 10,849'	4-1/2"	11.6#	N-80
Tie-Back String	N/A	Surf. - 5950'	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., 2,000ft., 1,500 ft., and 1,000 ft.
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 +/- 5,650 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.

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#### 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 6,100 ft. MD) with a Liner Hanger and pack-off assembly then cemented to +/- 300 ft above the liner hanger. TOL will be +/- 5,950 ft. (MD) +/- 78 degree angle. TOC: +/- 5,650 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.

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1909497.55	555491.90	36.247807	-107.645140	

WELL @ 7025.0usft (Original Well Elev)

**T M**

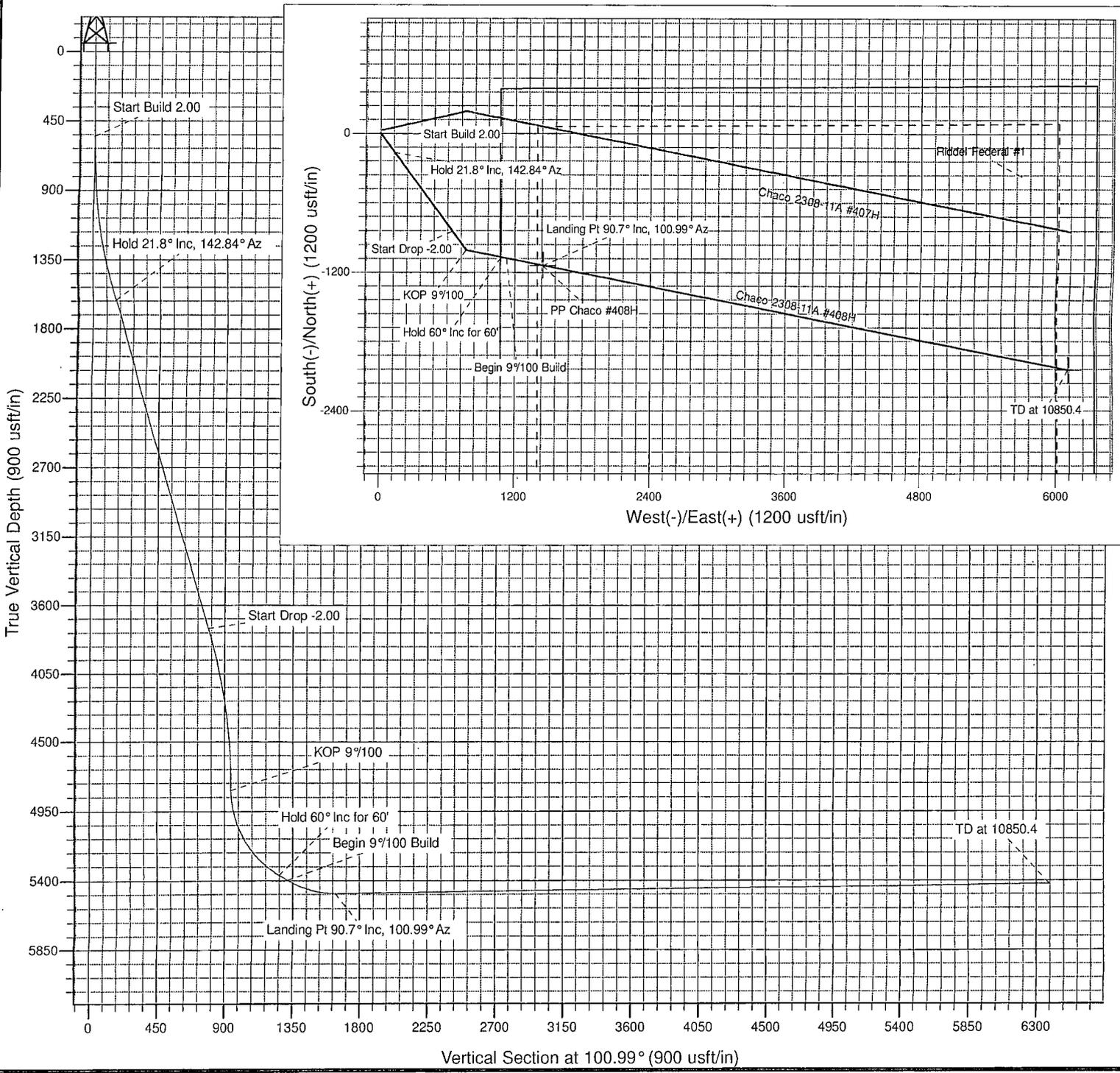
Azimuths to True North  
Magnetic North: 9.40°

Magnetic Field  
Strength: 50147.7snT  
Dip Angle: 62.99°  
Date: 8/26/2014  
Model: IGRF2010

Project: SJ 12-23N-08W  
Site: Chaco 2308-11A  
Well: Chaco 2308-11A #408H  
Design #1 26Aug14 kjs

ANNOTATIONS									
TVD	MD	Inc	Azi	+N/-S	+E/-W	V Sect	Departure	Annotation	
550.0	550.0	0.00	0.00	0.0	0.0	0.0	0.0	Start Build 2.00	
1613.8	1639.9	21.80	142.84	-163.3	123.7	152.6	204.8	Hold 21.8° Inc, 142.84° Az	
3751.6	3942.3	21.80	142.84	-844.6	640.2	789.4	1059.8	Start Drop -2.00	
4815.4	5032.2	0.00	0.00	-1007.9	763.9	942.0	1264.7	KOP 9°/100	
5366.7	5698.9	60.00	100.99	-1068.6	1076.4	1260.3	1583.0	Hold 60° Inc for 60'	
5396.7	5758.9	60.00	100.99	-1078.5	1127.4	1312.3	1634.9	Begin 9°/100 Build	
5482.0	6100.0	90.70	100.99	-1140.7	1447.5	1638.4	1961.0	Landing Pt 90.7° Inc, 100.99° Az	
5424.0	10849.4	90.70	100.99	-2046.2	6109.4	6387.4	6710.1	TD at 10850.4	

DESIGN TARGET DETAILS									
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape	
TD / PBHL Chaco #408H	5424.0	-2046.4	6110.4	1907463.05	561606.26	36.242184	-107.624419	Point	
- plan hits target center									
PP Chaco #408H	5482.0	-1140.7	1447.5	1908359.66	556941.59	36.244673	-107.640231	Point	
- plan misses target center by 0.1usft at 6100.0usft MD (5482.0 TVD, -1140.7 N, 1447.5 E)									



Vertical Section at 100.99° (900 usft/in)



## **SAN JUAN BASIN**

**SJ 12-23N-08W**

**Chaco 2308-11A**

**Chaco 2308-11A #408H**

**Wellbore #1**

**Plan: Design #1 26Aug14 kjs**

## **Standard Planning Report - Geographic**

**28 August, 2014**

Database:	COMPASS-SANJUAN	Local Co-ordinate Reference:	Well Chaco 2308-11A #408H
Company:	SAN JUAN BASIN	TVD Reference:	WELL @ 7025.0usft (Original Well Elev)
Project:	SJ 12-23N-08W	MD Reference:	WELL @ 7025.0usft (Original Well Elev)
Site:	Chaco 2308-11A	North Reference:	True
Well:	Chaco 2308-11A #408H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 26Aug14 kjs		

Project	SJ 12-23N-08W, San Juan 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 West 3003		

Site	Chaco 2308-11A				
Site Position:	Northing:	1,909,526.70 usft	Latitude:	36.247887	
From: Map	Easting:	555,506.59 usft	Longitude:	-107.645090	
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	0.11 °

Well	Chaco 2308-11A #408H					
Well Position	+N/-S	0.0 usft	Northing:	1,909,497.55 usft	Latitude:	36.247807
	+E/-W	0.0 usft	Easting:	555,491.90 usft	Longitude:	-107.645140
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,011.0 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/26/2014	9.40	62.99	50,148

Design	Design #1 26Aug14 kjs			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	100.99

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	
1,639.9	21.80	142.84	1,613.8	-163.3	123.7	2.00	2.00	0.00	142.84	
3,942.3	21.80	142.84	3,751.6	-844.6	640.2	0.00	0.00	0.00	0.00	
5,032.2	0.00	0.00	4,815.4	-1,007.9	763.9	2.00	-2.00	0.00	180.00	
5,698.9	60.00	100.99	5,366.7	-1,068.6	1,076.4	9.00	9.00	0.00	100.99	
5,758.9	60.00	100.99	5,396.7	-1,078.5	1,127.4	0.00	0.00	0.00	0.00	
6,100.0	90.70	100.99	5,482.0	-1,140.7	1,447.5	9.00	9.00	0.00	0.00	
10,850.4	90.70	100.99	5,424.0	-2,046.4	6,110.4	0.00	0.00	0.00	0.00	TD / PBHL Chaco #408H

Database: COMPASS-SANJUAN  
 Company: SAN JUAN BASIN  
 Project: SJ 12-23N-08W  
 Site: Chaco 2308-11A  
 Well: Chaco 2308-11A #408H  
 Wellbore: Wellbore #1  
 Design: Design #1 26Aug14 kjs

Local Co-ordinate Reference: Well Chaco 2308-11A #408H  
 TVD Reference: WELL @ 7025.0usft (Original Well Elev)  
 MD Reference: WELL @ 7025.0usft (Original Well Elev)  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature

**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	1,909,497.55	555,491.90	36.247807	-107.645140
200.0	0.00	0.00	200.0	0.0	0.0	1,909,497.55	555,491.90	36.247807	-107.645140
400.0	0.00	0.00	400.0	0.0	0.0	1,909,497.55	555,491.90	36.247807	-107.645140
550.0	0.00	0.00	550.0	0.0	0.0	1,909,497.55	555,491.90	36.247807	-107.645140
<b>Start Build 2.00</b>									
600.0	1.00	142.84	600.0	-0.3	0.3	1,909,497.21	555,492.17	36.247806	-107.645139
800.0	5.00	142.84	799.7	-8.7	6.6	1,909,488.88	555,498.51	36.247783	-107.645118
1,000.0	9.00	142.84	998.2	-28.1	21.3	1,909,469.49	555,513.26	36.247730	-107.645068
1,200.0	13.00	142.84	1,194.4	-58.5	44.4	1,909,439.12	555,536.37	36.247646	-107.644990
1,400.0	17.00	142.84	1,387.6	-99.8	75.6	1,909,397.94	555,567.71	36.247533	-107.644884
1,600.0	21.00	142.84	1,576.6	-151.6	114.9	1,909,346.13	555,607.13	36.247391	-107.644750
1,639.9	21.80	142.84	1,613.8	-163.3	123.7	1,909,334.54	555,615.96	36.247359	-107.644721
<b>Hold 21.8° Inc, 142.84° Az</b>									
1,800.0	21.80	142.84	1,762.4	-210.6	159.6	1,909,287.24	555,651.95	36.247229	-107.644599
2,000.0	21.80	142.84	1,948.1	-269.8	204.5	1,909,228.13	555,696.93	36.247066	-107.644447
2,200.0	21.80	142.84	2,133.8	-329.0	249.4	1,909,169.03	555,741.90	36.246903	-107.644295
2,400.0	21.80	142.84	2,319.5	-388.2	294.2	1,909,109.93	555,786.88	36.246741	-107.644142
2,600.0	21.80	142.84	2,505.2	-447.4	339.1	1,909,050.82	555,831.85	36.246578	-107.643990
2,800.0	21.80	142.84	2,690.9	-506.6	383.9	1,908,991.72	555,876.83	36.246416	-107.643838
3,000.0	21.80	142.84	2,876.6	-565.8	428.8	1,908,932.62	555,921.80	36.246253	-107.643686
3,200.0	21.80	142.84	3,062.3	-625.0	473.7	1,908,873.52	555,966.78	36.246090	-107.643534
3,400.0	21.80	142.84	3,248.0	-684.1	518.5	1,908,814.41	556,011.76	36.245928	-107.643382
3,600.0	21.80	142.84	3,433.7	-743.3	563.4	1,908,755.31	556,056.73	36.245765	-107.643230
3,800.0	21.80	142.84	3,619.4	-802.5	608.2	1,908,696.21	556,101.71	36.245603	-107.643078
3,942.3	21.80	142.84	3,751.6	-844.6	640.2	1,908,654.16	556,133.71	36.245487	-107.642969
<b>Start Drop -2.00</b>									
4,000.0	20.64	142.84	3,805.3	-861.3	652.8	1,908,637.54	556,146.36	36.245441	-107.642927
4,200.0	16.64	142.84	3,994.8	-912.2	691.4	1,908,586.66	556,185.07	36.245301	-107.642796
4,400.0	12.64	142.84	4,188.3	-952.5	721.9	1,908,546.43	556,215.68	36.245190	-107.642692
4,600.0	8.64	142.84	4,384.8	-982.0	744.2	1,908,517.04	556,238.05	36.245110	-107.642616
4,800.0	4.64	142.84	4,583.4	-1,000.4	758.2	1,908,498.63	556,252.06	36.245059	-107.642569
5,000.0	0.64	142.84	4,783.2	-1,007.8	763.8	1,908,491.28	556,257.65	36.245039	-107.642550
5,032.2	0.00	0.00	4,815.4	-1,007.9	763.9	1,908,491.14	556,257.76	36.245038	-107.642550
<b>KOP 9°/100</b>									
5,200.0	15.10	100.99	4,981.2	-1,012.1	785.5	1,908,486.99	556,279.34	36.245027	-107.642477
5,400.0	33.10	100.99	5,163.0	-1,027.6	865.3	1,908,471.64	556,359.20	36.244984	-107.642206
5,600.0	51.10	100.99	5,310.8	-1,053.0	996.4	1,908,446.44	556,490.33	36.244914	-107.641761
5,698.9	60.00	100.99	5,366.7	-1,068.6	1,076.4	1,908,431.06	556,570.35	36.244872	-107.641490
<b>Hold 60° Inc for 60'</b>									
5,758.9	60.00	100.99	5,396.7	-1,078.5	1,127.4	1,908,421.26	556,621.38	36.244844	-107.641317
<b>Begin 9°/100 Build</b>									
5,800.0	63.70	100.99	5,416.1	-1,085.4	1,162.9	1,908,414.42	556,656.95	36.244825	-107.641196
6,000.0	81.70	100.99	5,475.3	-1,121.6	1,349.6	1,908,378.53	556,843.70	36.244726	-107.640563
6,100.0	90.70	100.99	5,482.0	-1,140.7	1,447.5	1,908,359.71	556,941.60	36.244674	-107.640232
<b>Landing Pt 90.7° Inc, 100.99° Az - PP Chaco #408H</b>									
6,200.0	90.70	100.99	5,480.8	-1,159.7	1,545.6	1,908,340.84	557,039.78	36.244621	-107.639899
6,400.0	90.70	100.99	5,478.3	-1,197.9	1,741.9	1,908,303.09	557,236.17	36.244516	-107.639233
6,600.0	90.70	100.99	5,475.9	-1,236.0	1,938.3	1,908,265.34	557,432.56	36.244412	-107.638567
6,800.0	90.70	100.99	5,473.4	-1,274.1	2,134.6	1,908,227.58	557,628.95	36.244307	-107.637901
7,000.0	90.70	100.99	5,471.0	-1,312.2	2,330.9	1,908,189.83	557,825.34	36.244202	-107.637236
7,200.0	90.70	100.99	5,468.5	-1,350.4	2,527.2	1,908,152.08	558,021.73	36.244097	-107.636570
7,400.0	90.70	100.99	5,466.1	-1,388.5	2,723.5	1,908,114.33	558,218.12	36.243992	-107.635904
7,600.0	90.70	100.99	5,463.7	-1,426.6	2,919.8	1,908,076.58	558,414.51	36.243888	-107.635239
7,800.0	90.70	100.99	5,461.2	-1,464.8	3,116.2	1,908,038.83	558,610.90	36.243783	-107.634573

**Planning Report - Geographic**

Database: COMPASS-SANJUAN  
 Company: SAN JUAN BASIN  
 Project: SJ 12-23N-08W  
 Site: Chaco 2308-11A  
 Well: Chaco 2308-11A #408H  
 Wellbore: Wellbore #1  
 Design: Design #1 26Aug14 kjs

Local Co-ordinate Reference: Well Chaco 2308-11A #408H  
 TVD Reference: WELL @ 7025.0usft (Original Well Elev)  
 MD Reference: WELL @ 7025.0usft (Original Well Elev)  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature

**Planned Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,000.0	90.70	100.99	5,458.8	-1,502.9	3,312.5	1,908,001.08	558,807.29	36.243678	-107.633907
8,200.0	90.70	100.99	5,456.3	-1,541.0	3,508.8	1,907,963.33	559,003.68	36.243573	-107.633241
8,400.0	90.70	100.99	5,453.9	-1,579.2	3,705.1	1,907,925.58	559,200.07	36.243468	-107.632576
8,600.0	90.70	100.99	5,451.5	-1,617.3	3,901.4	1,907,887.83	559,396.46	36.243364	-107.631910
8,800.0	90.70	100.99	5,449.0	-1,655.4	4,097.7	1,907,850.08	559,592.85	36.243259	-107.631244
9,000.0	90.70	100.99	5,446.6	-1,693.6	4,294.0	1,907,812.33	559,789.24	36.243154	-107.630578
9,200.0	90.70	100.99	5,444.1	-1,731.7	4,490.4	1,907,774.58	559,985.63	36.243049	-107.629913
9,400.0	90.70	100.99	5,441.7	-1,769.8	4,686.7	1,907,736.83	560,182.01	36.242944	-107.629247
9,600.0	90.70	100.99	5,439.3	-1,808.0	4,883.0	1,907,699.08	560,378.40	36.242839	-107.628581
9,800.0	90.70	100.99	5,436.8	-1,846.1	5,079.3	1,907,661.33	560,574.79	36.242734	-107.627916
10,000.0	90.70	100.99	5,434.4	-1,884.2	5,275.6	1,907,623.57	560,771.18	36.242630	-107.627250
10,200.0	90.70	100.99	5,431.9	-1,922.4	5,471.9	1,907,585.82	560,967.57	36.242525	-107.626584
10,400.0	90.70	100.99	5,429.5	-1,960.5	5,668.3	1,907,548.07	561,163.96	36.242420	-107.625918
10,600.0	90.70	100.99	5,427.1	-1,998.6	5,864.6	1,907,510.32	561,360.35	36.242315	-107.625253
10,800.0	90.70	100.99	5,424.6	-2,036.8	6,060.9	1,907,472.57	561,556.74	36.242210	-107.624587
10,849.4	90.70	100.99	5,424.0	-2,046.2	6,109.4	1,907,463.25	561,605.25	36.242184	-107.624423
<b>TD at 10850.4</b>									
10,850.4	90.70	100.99	5,424.0	-2,046.4	6,110.4	1,907,463.05	561,606.26	36.242184	-107.624419
<b>TD / PBHL Chaco #408H</b>									

**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 #408H - hit/miss target - Shape - Point	0.00	0.00	5,424.0	-2,046.4	6,110.4	1,907,463.05	561,606.26	36.242184	-107.624419
PP Chaco #408H - plan misses target center by 0.1usft at 6100.0usft MD (5482.0 TVD, -1140.7 N, 1447.5 E) - Point	0.00	0.00	5,482.0	-1,140.7	1,447.5	1,908,359.66	556,941.59	36.244673	-107.640232

**Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
550.0	550.0	0.0	0.0	Start Build 2.00
1,639.9	1,613.8	-163.3	123.7	Hold 21.8° Inc, 142.84° Az
3,942.3	3,751.6	-844.6	640.2	Start Drop -2.00
5,032.2	4,815.4	-1,007.9	763.9	KOP 9°/100
5,698.9	5,366.7	-1,068.6	1,076.4	Hold 60° Inc for 60'
5,758.9	5,396.7	-1,078.5	1,127.4	Begin 9°/100 Build
6,100.0	5,482.0	-1,140.7	1,447.5	Landing Pt 90.7° Inc, 100.99° Az
10,849.4	5,424.0	-2,046.2	6,109.4	TD at 10850.4