Submit 1 Copy To Appropriate District Office
District I – (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II – (575) 748-1283
811 S. First St., Artesia, NM 88210
District III – (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV – (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised July 18, 2013

WELL API NO. **30-045-35559**

5. Indicate Type of Lease STATE ☐ FEE ☒

6. State Oil & Gas Lease No. **E-504-16**

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name **Allison Unit**

1. Type of Well: Oil Well ☐ Gas Well ☒ Other

8. Well Number **152H**

2. Name of Operator HILCORP ENERGY COMPANY

9. OGRID Number 372171

3. Address of Operator PO BOX 4700, FARMINGTON NM 87499

10. Pool name or Wildcat **Basin Fruitland Coal**

4. Well Location
Unit Letter D 891 feet from the North line and 1162 feet from the West line
Section 21 Township 32N Range 6W NMPM San Juan County

11. Elevation *(Show whether DR, RKB, RT, GR, etc.)* 6155' GR

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☒	COMMENCE DRILLING OPNS.	☐	P AND A	☐
PULL OR ALTER CASING	☐	MULTIPLE COMPL	☐	CASING/CEMENT JOB	☐		
DOWNHOLE COMMINGLE	☐						
CLOSED-LOOP SYSTEM	☐						
OTHER:	☒ **Revised C-102 & Drilling Plans**			OTHER:	☐		

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

Hilcorp Energy Company intends to add a pilot hole to the subject well. The pilot hole will be drilled to target depth of 3242' (MD), then fully cased and cemented with 7" casing. A whipstock will be run, and a window will be cut into the 7" casing for a lateral to be drilled into the Blue Mesa. Window depth is 2968' MD / 2663' TVD. The whipstock will then be recovered. The 4-1/2" liner will not be tied back into the pilot to allow production tubing to be run to near the bottom of the pilot hole. This allows produced water to be evacuated from the production casing.

The revised C-102 and drilling plans are attached.

OIL CONS. DIV DIST. 3
FEB 16 2018

Spud Date: Rig Release Date:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Priscilla Shorty TITLE Operations / Regulatory Technician DATE 2/16/2018

Type or print name Priscilla Shorty E-mail address: pshorty@hilcorp.com PHONE: 505-324-5188

For State Use Only

APPROVED BY: TITLE DATE 2-21-18

Conditions of Approval (if any): AV

43

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-045-35559	71629	BASIN FRUITLAND COAL

[4] Property Code	[5] Property Name	[6] Well Number
6784	ALLISON UNIT	152H

[7] OGRID No.	[8] Operator Name	[9] Elevation
372171	HILCORP ENERGY COMPANY	6155'

[10] Surface Location

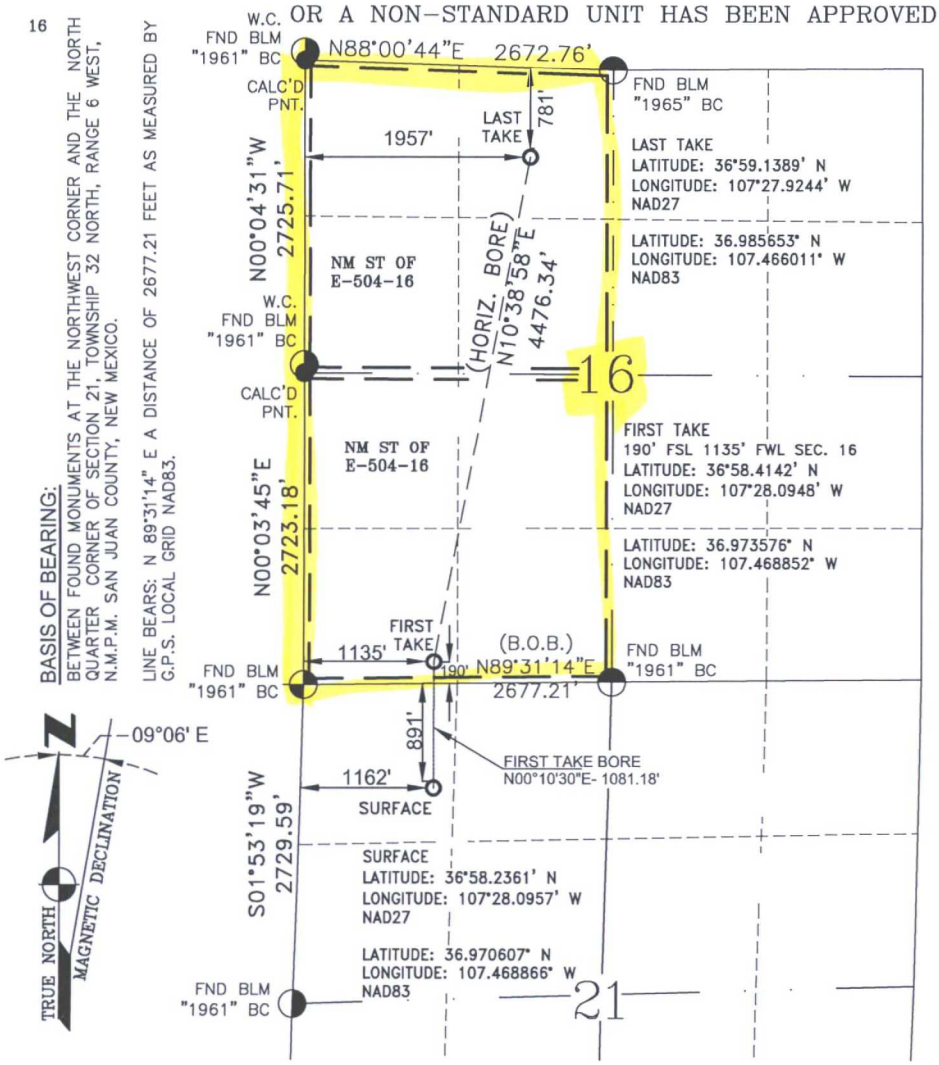
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	21	32-N	6-W		891'	NORTH	1162	WEST	SAN JUAN

[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
C	16	32-N	6-W		781'	NORTH	1957'	WEST	SAN JUAN

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
FC 320.00 ACRES W/2 SEC. 16			

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 a working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Priscilla Shorty 2/12/18
Signature Date

Priscilla Shorty
Printed Name

pshorty@hilcorp.com
E-mail Address

[18] SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

FEBRUARY 9, 2018
Date of Survey

Signature and Seal of Professional Surveyor:

GLEN W. RUSSELL NEW MEXICO 15703 LICENSED PROFESSIONAL SURVEYOR

GLEN W. RUSSELL
Certificate Number 15703

Allison Unit #152H

Hilcorp Energy Company proposes to drill and complete the referenced horizontal well targeting a coal seam with in the Fruitland formation. The original procedure in the APD was modified to include a pilot hole, which will be fully cased and cemented.

1. Location
   Allison Unit #152H
   SHL: 891' FNL, 1,162' FWL – T32N, R06W, Sec 21 (San Juan)
   BHL: 781' FNL, 1957' FWL – T 32N, R06W, Sec 16 (San Juan)
   GL: 6,155'

2. Geological Markers
   Anticipated formation tops with comments of any possible water, gas, or oil shows are indicated below:

Formation	Depth (TVD)	Remarks
Nacimiento	277'	
Ojo Alamo	2,000'	
Kirtland	2,115'	
Fruitland	2,530'	Gas
Big Blue Seam	2,807'	Gas

   *See attached directional Plan for anticipated formation tops in measured depth.

3. Pressure Control Equipment
   See attached BOPE and choke manifold schematic for a diagram of pressure control equipment.
   - BOPE will be nippled up on top of wellhead after surface casing is set and cemented.
   - Pressure control configuration will be designated to meet the minimum 2M standards.
   - All equipment will have 3M pressure ratings.
   - A rotating head will be rigged up on top of annular as seen in attached diagram.

4. Casing & Cement Program
   a. The proposed casing program is outlined below:

Proposed Casing Program				
Casing	**Hole Size**	**Casing Size**	**Weight/Grade**	**Set Depth TVD/MD**
Surface	12-1/4"	9-5/8"	32.3# H-40	500' MD/TVD
Intermediate	8-3/4"	7"	23# J-55/L-80	3,242' MD / 2,780' TVD
Production Liner (Pre-Perforated)	6-1/4"	4-1/2"	11.6# J-55/L-80	7,752' MD / 2,690' TVD

The intermediate hole section will be drilled to target depth, then fully cased and cemented with 7" casing.

A whipstock will be run, and window will be cut in the 7" casing above the Blue Mesa formation to allow for a lateral to be drilled in the Blue Mesa. Window depth is 2968' MD / 2663' TVD.

The whipstock will then be recovered. The 4-1/2" liner will be run outside the window, and not tied back into the pilot hole to allow production tubing to be run to near the bottom of the pilot hole. This allows produced water to be evacuated from the production casing.

If the 6-1/4" hole is not drilled to total MD, the production liner setting depth and length will be adjusted accordingly.

The 7" casing string will be set inside the setback boundary line.

b. The proposed cement program is outlined below:

Cement Program				
Interval	**Depth (MD)**	**Volume**	**Slurry**	**Planned Cement Top**
Surface	500	253 ft^3	Lead Cmt: Type III Cmt 0.25 pps celloflake	Surface
Intermediate	3,242'	689 ft3	Lead Cmt: Premium Lite 3% CaCl, 0.25 pps celloflake, 5 ppm LCM-1 0.4% FL-52, 8% Bentonite, 0.4%SMS 2.13 ft3/sk -- 11.29 gal/sk 12.1 ppg Tail Cmt: Type III 1% CaCl, 0.25 pps celloflake, 0.2% FL-52 1.38 ft3/sk -- 6.64 gal/sk 14.6 ppg	Surface
Production	7,752'	N/A	N/A - Open hole with pre-perforated liner.	N/A

Slurry additives may be adjusted as needed to accommodate required pump and compressive test times.

For the intermediate hole section a 2-stage cement job may be performed if hole conditions indicate during operations. Stage tool will be placed appropriately as conditions indicate.

c. The proposed centralizer program is shown below:

Centralizer Program	
Interval	**Centralizers**
Surface	1 per joint on bottom 3 joints
Intermediate	10' above shoe joint with collar clamp On top of 2nd, 4th, 6th, 8th, 10th joints 1 every 4th joint to Ojo Alamo 1 every joint through Ojo Alamo 1 Turbolizer will be placed mid-way into Ojo Alamo 1 every 4th joint from top of Ojo Alamo to surface shoe 1 inside surface casing
Production	N/A

To allow adequate time for cement to achieve a minimum of 500 psi compressive strength, a minimum of 8 hours wait on cement time for each hole section will be observed. The wellhead will not be installed, casing will not be tested, and the prior casing shoe will not be drilled out until adequate wait on cement time is achieved.

5. Drilling Fluids
   a. The proposed drilling fluid program is outlined below:

Mud Program			
Interval	**Mud Type**	**Weight (ppg)**	**Fluid Loss (cc)**
Surface	Air / Water Gel System	Air 8.3 - 9.2	NC
Intermediate	LSND / Gel System	8.4 - 9.5	6 - 16
Production	LSND Brine (if needed)*	8.5 - 10	4 - 14

*In the production hole, Brine will be utilized only if a weighting agent is needed to raise MW (for either well control or wellbore stability purposes).

LCM may be added to the mud system if hole conditions indicate.

b. If brine is utilized, any cuttings drilled with brine will be hauled off to an approved disposal site.

6. Abnormal Pressures and Hazards
    - No over-pressured intervals expected.
    - Estimated Reservoir Pressure = 1,500 psi
    - Maximum Anticipated Surface Pressure = 1,300 psi
    - No hydrogen sulfide gas is expected based off nearby well production.
7. Testing, Logging, Coring

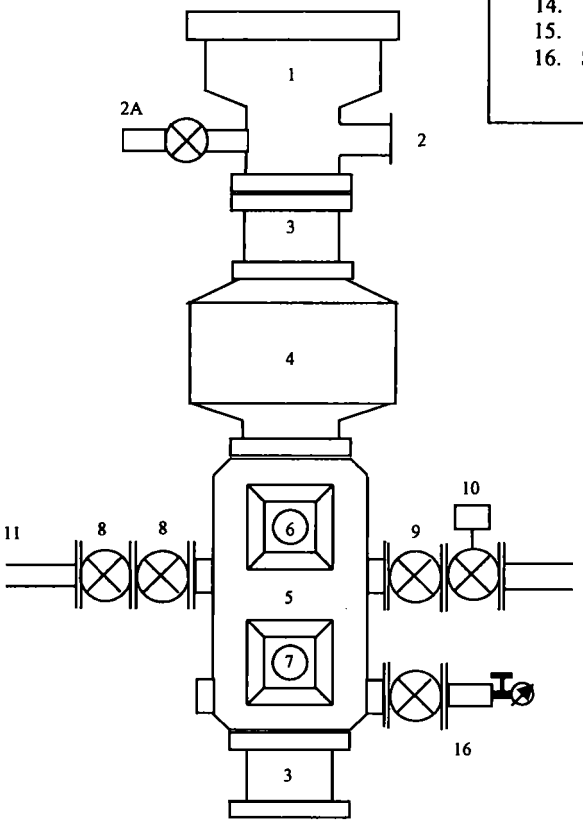
Testing, Logging, Coring Procedure		
Evaluation Method	**Start Depth**	**End depth**
Mud Logs	KOP	TD
MWD Directional Surveys	KOP	TD
LWD GR	7" window	TD
OH Logs	None planned	
Temp Survey	If needed on intermediate casing	

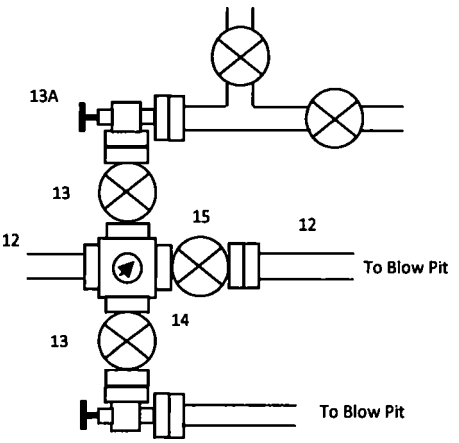
8. Directional Plan
   The planned wellbore directional plan and plot are attached

   The planned directional plan is built of geological targets from offset wells. The production hole will be landed and drilled within target formation horizontally utilizing LWD equipment to help steer the wellbore. On site adjustments will be made to the directional plan as formation and hole indicates.

BOPE & Choke Manifold Schematic

1. Rotating Head
2. Flow line
2A. Fill up line and valve
3. Spacer Spools (as needed)
4. 11" 3M Annular Preventer
5. 11" 3M Double Ram Preventer
6. Blind Rams
7. Pipe Rams
8. 3M Gate Valves (2")
9. 3M Gate Valve (3")
10. 3M HCR Valve (3")
11. Kill Line Connection
12. Choke Line (3" Hardline or Co-Flex)
13. 3M Valve (2")
13A. 3M Adjustable Choke (2")
13B. 3M Adjustable or Fixed Choke (2")
14. 3M Studded Cross & Manifold gauge
15. 3M Panic Line Valve (3")
16. Secondary outlet with valve, bull plug, needle valve, and pressure gauge

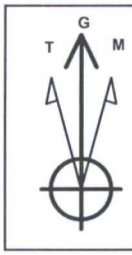




HILCORP ENERGY COMPANY
ALLISON UNIT #152H (PILOT)
SAN JUAN BASIN NM
6155' GL + 15' KB

Downhole DDS Drilling Services

Hilcorp Energy Company



Azimuths to Grid North
True North: -0.22°
Magnetic North: 8.88°

Magnetic Field
Strength: 50136.6snT
Dip Angle: 63.58°
Date: 2/2/2018
Model: IGRF2015

WELL DETAILS: Allison Unit #152H

Ground Level: 6155.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	2172771.270	606647.720	36° 58' 14.166 N	107° 28' 5.742 W

SECTION DETAILS

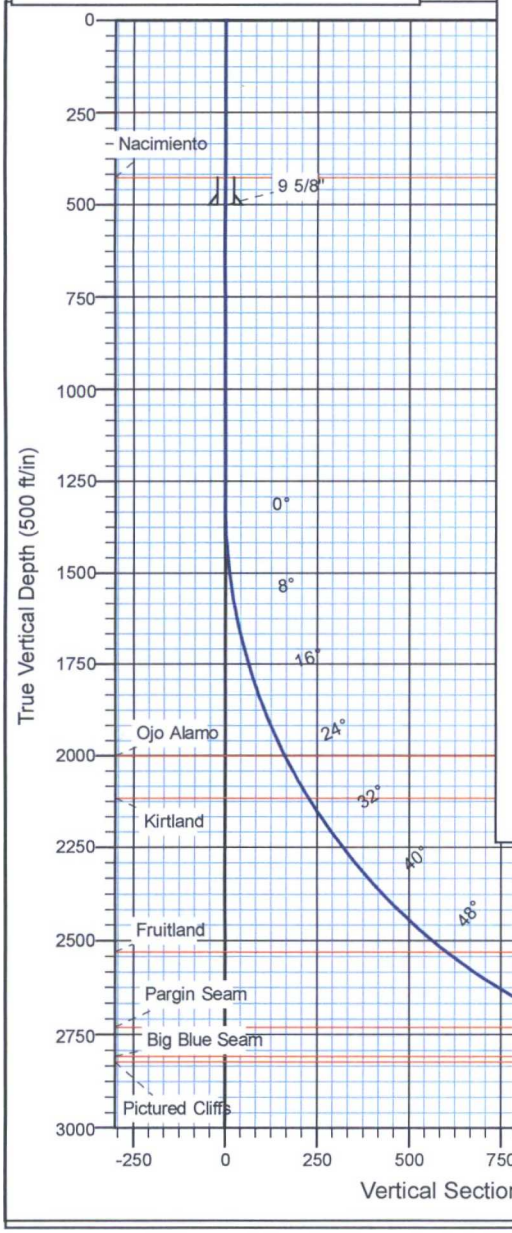
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1313.20	0.00	0.00	1313.20	0.00	0.00	0.00	0.00	0.00	
3	3046.53	65.00	0.00	2697.94	882.17	0.00	3.75	0.00	882.17	
4	3122.40	65.00	0.00	2730.00	950.93	0.00	0.00	0.00	950.93	Entry PT(152H Pilot)
5	3242.40	65.00	0.00	2780.71	1059.69	0.00	0.00	0.00	1059.69	

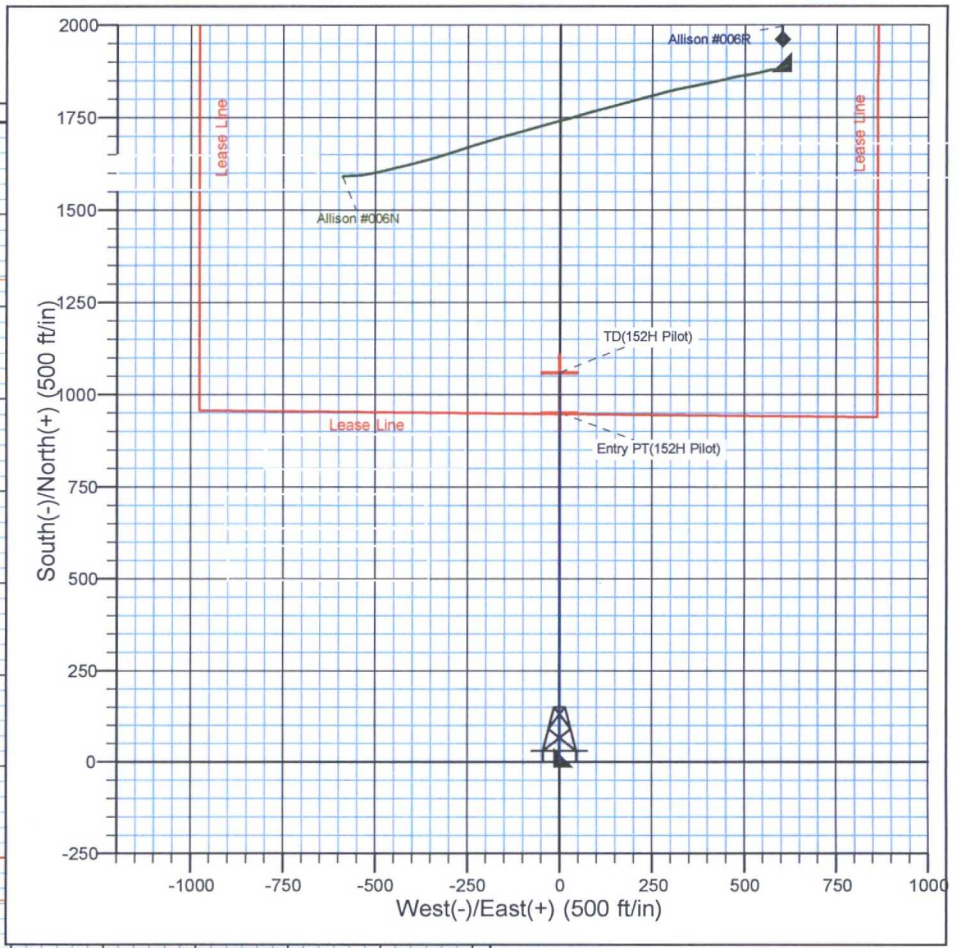
WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Entry PT(152H Pilot)	2730.00	950.93	0.00	2173722.200	606647.720	36° 58' 23.569 N	107° 28' 5.697 W	Point
TD(152H Pilot)	2780.71	1059.69	0.00	2173830.958	606647.720	36° 58' 24.645 N	107° 28' 5.692 W	Point

CASING DETAILS

TVD	MD	Name
500	500	9 5/8"
2781	3242	7"





PROJECT DETAILS: San Juan County, NM

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico West 3003

System Datum: Mean Sea Level

Allison Unit152H Pilot p1

Created By: Frank Scardino Date: 2/5/2018
Checked: _____ Date: _____

Hilcorp Energy Company

San Juan County, NM
Allison Unit #152H
Allison Unit #152H

Pilot Hole

Plan: Design #1

Standard Planning Report

02 February, 2018

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Company:	Hilcorp Energy Company	**TVD Reference:**	rig @ 6170.00ft
Project:	San Juan County, NM	**MD Reference:**	rig @ 6170.00ft
Site:	Allison Unit #152H	**North Reference:**	Grid
Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Pilot Hole		
Design:	Design #1		

Project	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	Allison Unit #152H				
Site Position:		**Northing:**	2,172,771.270 usft	**Latitude:**	36° 58' 14.166 N
From:	Map	**Easting:**	606,647.720 usft	**Longitude:**	107° 28' 5.742 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.22 °

Well	Allison Unit #152H					
Well Position	**+N/-S**	0.00 ft	**Northing:**	2,172,771.270 usft	**Latitude:**	36° 58' 14.166 N
	+E/-W	0.00 ft	**Easting:**	606,647.720 usft	**Longitude:**	107° 28' 5.742 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	0.00 ft	**Ground Level:**	6,155.00 ft

Wellbore	Pilot Hole			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	2/2/2018	9.10	63.58	50,137

Design	Design #1				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**	
	0.00	0.00	0.00	0.00	

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,313.20	0.00	0.00	1,313.20	0.00	0.00	0.00	0.00	0.00	0.00	
3,046.53	65.00	0.00	2,697.94	882.17	0.00	3.75	3.75	0.00	0.00	
3,122.40	65.00	0.00	2,730.00	950.93	0.00	0.00	0.00	0.00	0.00	Entry PT(152H Pilot)
3,242.40	65.00	0.00	2,780.71	1,059.69	0.00	0.00	0.00	0.00	0.00	

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Company:	Hilcorp Energy Company	**TVD Reference:**	rig @ 6170.00ft
Project:	San Juan County, NM	**MD Reference:**	rig @ 6170.00ft
Site:	Allison Unit #152H	**North Reference:**	Grid
Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Pilot Hole		
Design:	Design #1		

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)
1,313.20	0.00	0.00	1,313.20	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	3.25	0.00	1,399.95	2.46	0.00	2.46	3.75	3.75	0.00
1,500.00	7.00	0.00	1,499.54	11.40	0.00	11.40	3.75	3.75	0.00
1,600.00	10.75	0.00	1,598.32	26.84	0.00	26.84	3.75	3.75	0.00
1,700.00	14.50	0.00	1,695.88	48.70	0.00	48.70	3.75	3.75	0.00
1,800.00	18.25	0.00	1,791.81	76.90	0.00	76.90	3.75	3.75	0.00
1,900.00	22.00	0.00	1,885.68	111.30	0.00	111.30	3.75	3.75	0.00
2,000.00	25.75	0.00	1,977.10	151.78	0.00	151.78	3.75	3.75	0.00
2,025.53	26.71	0.00	2,000.00	163.06	0.00	163.06	3.75	3.75	0.00
Ojo Alamo									
2,100.00	29.50	0.00	2,065.68	198.15	0.00	198.15	3.75	3.75	0.00
2,157.29	31.65	0.00	2,115.00	227.29	0.00	227.29	3.75	3.75	0.00
Kirtland									
2,200.00	33.25	0.00	2,151.04	250.21	0.00	250.21	3.75	3.75	0.00
2,300.00	37.00	0.00	2,232.81	307.74	0.00	307.74	3.75	3.75	0.00
2,400.00	40.75	0.00	2,310.64	370.50	0.00	370.50	3.75	3.75	0.00
2,500.00	44.50	0.00	2,384.21	438.21	0.00	438.21	3.75	3.75	0.00
2,600.00	48.25	0.00	2,453.18	510.59	0.00	510.59	3.75	3.75	0.00
2,700.00	52.00	0.00	2,517.27	587.33	0.00	587.33	3.75	3.75	0.00
2,720.85	52.79	0.00	2,530.00	603.85	0.00	603.85	3.75	3.75	0.00
Fruitland									
2,800.00	55.75	0.00	2,576.21	668.09	0.00	668.09	3.75	3.75	0.00
2,900.00	59.50	0.00	2,629.74	752.54	0.00	752.54	3.75	3.75	0.00
3,000.00	63.25	0.00	2,677.63	840.31	0.00	840.31	3.75	3.75	0.00
3,046.53	65.00	0.00	2,697.94	882.17	0.00	882.17	3.75	3.75	0.00
3,100.00	65.00	0.00	2,720.53	930.63	0.00	930.63	0.00	0.00	0.00
3,122.40	65.00	0.00	2,730.00	950.93	0.00	950.93	0.00	0.00	0.00
Pargin Seam - Entry PT(152H Pilot)									
3,200.00	65.00	0.00	2,762.80	1,021.26	0.00	1,021.26	0.00	0.00	0.00
3,242.40	65.00	0.00	2,780.71	1,059.69	0.00	1,059.69	0.00	0.00	0.00
7" - TD(152H Pilot)									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Entry PT(152H Pilot) - plan hits target center - Point	0.00	0.00	2,730.00	950.93	0.00	2,173,722.200	606,647.720	36° 58' 23.569 N	107° 28' 5.697 W
TD(152H Pilot) - plan hits target center - Point	0.00	0.00	2,780.71	1,059.69	0.00	2,173,830.958	606,647.720	36° 58' 24.645 N	107° 28' 5.692 W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
500.00	500.00	9 5/8"	9.625	12.250
3,242.40	2,780.71	7"	7.000	7.500

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Company:	Hilcorp Energy Company	**TVD Reference:**	rig @ 6170.00ft
Project:	San Juan County, NM	**MD Reference:**	rig @ 6170.00ft
Site:	Allison Unit #152H	**North Reference:**	Grid
Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Pilot Hole		
Design:	Design #1		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
425.00	425.00	Nacimiento		0.00	
2,025.53	2,000.00	Ojo Alamo		0.00	
2,157.29	2,115.00	Kirtland		0.00	
2,720.85	2,530.00	Fruitland		0.00	
3,122.40	2,730.00	Pargin Seam		0.00	

Hilcorp Energy Company

San Juan County, NM
Allison Unit #152H
Allison Unit #152H

Pilot Hole

Plan: Design #1

Standard Planning Report - Geographic

02 February, 2018

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Company:	Hilcorp Energy Company	**TVD Reference:**	rig @ 6170.00ft
Project:	San Juan County, NM	**MD Reference:**	rig @ 6170.00ft
Site:	Allison Unit #152H	**North Reference:**	Grid
Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Pilot Hole		
Design:	Design #1		

Project	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	Allison Unit #152H				
Site Position:		**Northing:**	2,172,771.270 usft	**Latitude:**	36° 58' 14.166 N
From:	Map	**Easting:**	606,647.720 usft	**Longitude:**	107° 28' 5.742 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.22 °

Well	Allison Unit #152H					
Well Position	**+N/-S**	0.00 ft	**Northing:**	2,172,771.270 usft	**Latitude:**	36° 58' 14.166 N
	+E/-W	0.00 ft	**Easting:**	606,647.720 usft	**Longitude:**	107° 28' 5.742 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	0.00 ft	**Ground Level:**	6,155.00 ft

Wellbore Pilot Hole

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	2/2/2018	9.10	63.58	50,137

Design	Design #1				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	0.00

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,313.20	0.00	0.00	1,313.20	0.00	0.00	0.00	0.00	0.00	0.00	
3,046.53	65.00	0.00	2,697.94	882.17	0.00	3.75	3.75	0.00	0.00	
3,122.40	65.00	0.00	2,730.00	950.93	0.00	0.00	0.00	0.00	0.00	Entry PT(152H Pilot)
3,242.40	65.00	0.00	2,780.71	1,059.69	0.00	0.00	0.00	0.00	0.00	

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Company:	Hilcorp Energy Company	**TVD Reference:**	rig @ 6170.00ft
Project:	San Juan County, NM	**MD Reference:**	rig @ 6170.00ft
Site:	Allison Unit #152H	**North Reference:**	Grid
Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Pilot Hole		
Design:	Design #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,313.20	0.00	0.00	1,313.20	0.00	0.00	2,172,771.270	606,647.720	36° 58' 14.166 N	107° 28' 5.742 W
1,400.00	3.25	0.00	1,399.95	2.46	0.00	2,172,773.735	606,647.720	36° 58' 14.190 N	107° 28' 5.742 W
1,500.00	7.00	0.00	1,499.54	11.40	0.00	2,172,782.674	606,647.720	36° 58' 14.279 N	107° 28' 5.741 W
1,600.00	10.75	0.00	1,598.32	26.84	0.00	2,172,798.108	606,647.720	36° 58' 14.431 N	107° 28' 5.741 W
1,700.00	14.50	0.00	1,695.88	48.70	0.00	2,172,819.970	606,647.720	36° 58' 14.648 N	107° 28' 5.740 W
1,800.00	18.25	0.00	1,791.81	76.90	0.00	2,172,848.165	606,647.720	36° 58' 14.926 N	107° 28' 5.738 W
1,900.00	22.00	0.00	1,885.68	111.30	0.00	2,172,882.574	606,647.720	36° 58' 15.267 N	107° 28' 5.737 W
2,000.00	25.75	0.00	1,977.10	151.78	0.00	2,172,923.049	606,647.720	36° 58' 15.667 N	107° 28' 5.735 W
2,025.53	26.71	0.00	2,000.00	163.06	0.00	2,172,934.332	606,647.720	36° 58' 15.778 N	107° 28' 5.734 W
Ojo Alamo									
2,100.00	29.50	0.00	2,065.68	198.15	0.00	2,172,969.416	606,647.720	36° 58' 16.125 N	107° 28' 5.733 W
2,157.29	31.65	0.00	2,115.00	227.29	0.00	2,172,998.557	606,647.720	36° 58' 16.414 N	107° 28' 5.731 W
Kirtland									
2,200.00	33.25	0.00	2,151.04	250.21	0.00	2,173,021.478	606,647.720	36° 58' 16.640 N	107° 28' 5.730 W
2,300.00	37.00	0.00	2,232.81	307.74	0.00	2,173,079.011	606,647.720	36° 58' 17.209 N	107° 28' 5.727 W
2,400.00	40.75	0.00	2,310.64	370.50	0.00	2,173,141.769	606,647.720	36° 58' 17.830 N	107° 28' 5.724 W
2,500.00	44.50	0.00	2,384.21	438.21	0.00	2,173,209.482	606,647.720	36° 58' 18.499 N	107° 28' 5.721 W
2,600.00	48.25	0.00	2,453.18	510.59	0.00	2,173,281.862	606,647.720	36° 58' 19.215 N	107° 28' 5.718 W
2,700.00	52.00	0.00	2,517.27	587.33	0.00	2,173,358.598	606,647.720	36° 58' 19.974 N	107° 28' 5.714 W
2,720.85	52.79	0.00	2,530.00	603.85	0.00	2,173,375.121	606,647.720	36° 58' 20.137 N	107° 28' 5.713 W
Fruitland									
2,800.00	55.75	0.00	2,576.21	668.09	0.00	2,173,439.362	606,647.720	36° 58' 20.772 N	107° 28' 5.710 W
2,900.00	59.50	0.00	2,629.74	752.54	0.00	2,173,523.808	606,647.720	36° 58' 21.607 N	107° 28' 5.706 W
3,000.00	63.25	0.00	2,677.63	840.31	0.00	2,173,611.573	606,647.720	36° 58' 22.475 N	107° 28' 5.702 W
3,046.53	65.00	0.00	2,697.94	882.17	0.00	2,173,653.442	606,647.720	36° 58' 22.889 N	107° 28' 5.700 W
3,100.00	65.00	0.00	2,720.53	930.63	0.00	2,173,701.898	606,647.720	36° 58' 23.368 N	107° 28' 5.698 W
3,122.40	65.00	0.00	2,730.00	950.93	0.00	2,173,722.200	606,647.720	36° 58' 23.569 N	107° 28' 5.697 W
Pargin Seam - Entry PT(152H Pilot)									
3,200.00	65.00	0.00	2,762.80	1,021.26	0.00	2,173,792.529	606,647.720	36° 58' 24.265 N	107° 28' 5.694 W
3,242.40	65.00	0.00	2,780.71	1,059.69	0.00	2,173,830.956	606,647.720	36° 58' 24.645 N	107° 28' 5.692 W
7" - TD(152H Pilot)									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Entry PT(152H Pilot) - plan hits target center - Point	0.00	0.00	2,730.00	950.93	0.00	2,173,722.200	606,647.720	36° 58' 23.569 N	107° 28' 5.697 W
TD(152H Pilot) - plan hits target center - Point	0.00	0.00	2,780.71	1,059.69	0.00	2,173,830.958	606,647.720	36° 58' 24.645 N	107° 28' 5.692 W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
500.00	500.00	9 5/8"	9.625	12.250
3,242.40	2,780.71	7"	7.000	7.500

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Company:	Hilcorp Energy Company	**TVD Reference:**	rig @ 6170.00ft
Project:	San Juan County, NM	**MD Reference:**	rig @ 6170.00ft
Site:	Allison Unit #152H	**North Reference:**	Grid
Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Pilot Hole		
Design:	Design #1		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
425.00	425.00	Nacimiento		0.00	
2,025.53	2,000.00	Ojo Alamo		0.00	
2,157.29	2,115.00	Kirtland		0.00	
2,720.85	2,530.00	Fruitland		0.00	
3,122.40	2,730.00	Pargin Seam		0.00	

Downhole
DDS
Drilling Services

Hilcorp Energy Company

San Juan County, NM
Allison Unit #152H
Allison Unit #152H

Pilot Hole
Design #1

Anticollision Report

05 February, 2018

Hilcorp
Energy Company

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Project:	San Juan County, NM	**TVD Reference:**	rig @ 6170.00ft
Reference Site:	Allison Unit #152H	**MD Reference:**	rig @ 6170.00ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Pilot Hole	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #1	**Offset TVD Reference:**	Offset Datum

Reference Design #1

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00ft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 524.24 ft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 2/5/2018

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	3,242.40	Design #1 (Pilot Hole)	MWD	MWD - Standard

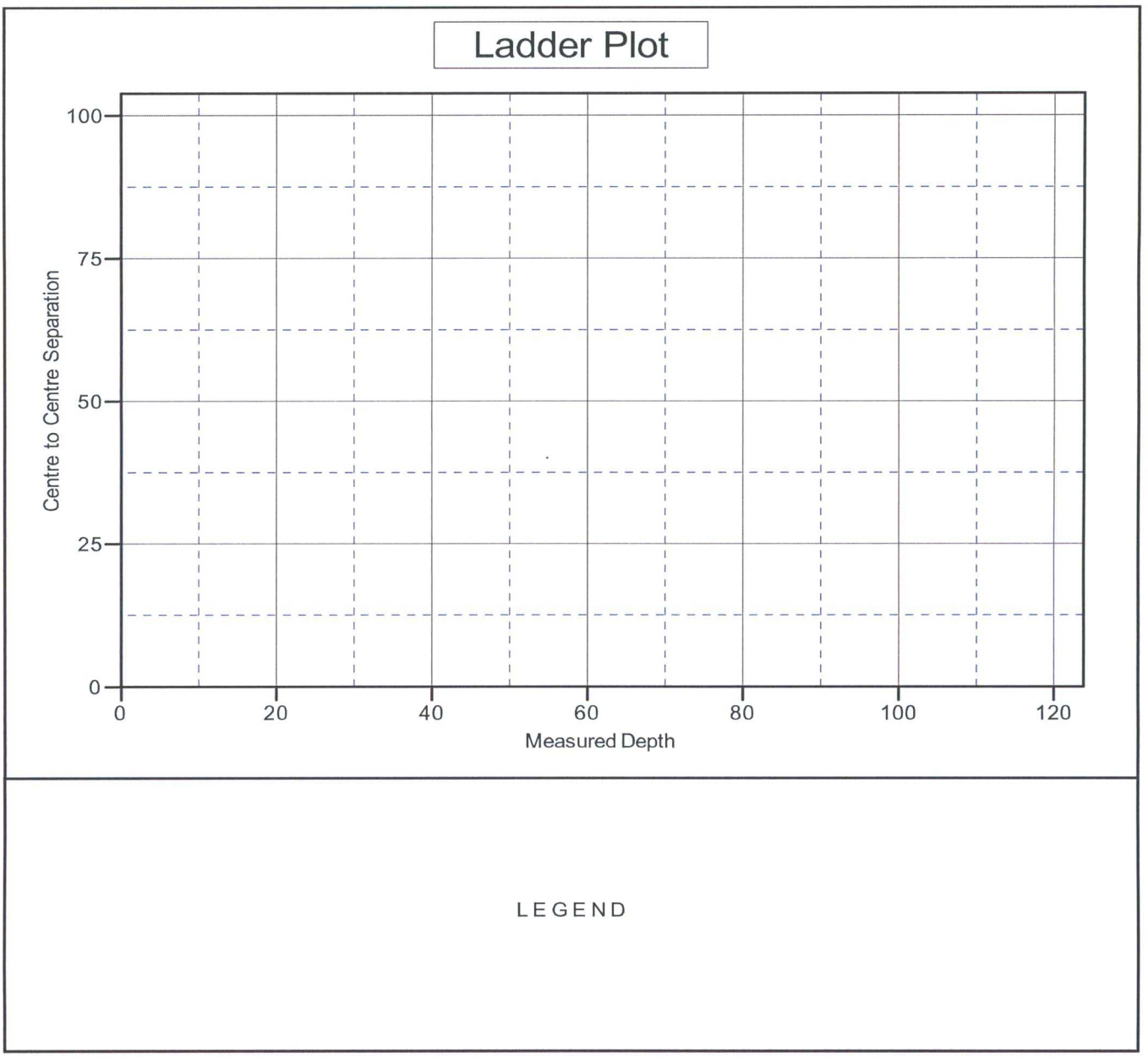
Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Allison Unit #152H Offsets						
Allison Unit #006 - Allison #006 - Allison #006						Out of range
Allison Unit #006m - Allison #006m - Allison #006m						Out of range
Allison Unit #006N - Allison #006N - Allison #006N						Out of range
Allison Unit #006R - Allison #006R - Allison #006R						Out of range
Allison Unit #051A - Allison #051A - Allison #051A						Out of range
Allison Unit #100 - Allison Unit #100 - Allison Unit #100						Out of range
Allison Unit #100s - Allison #100s - Allison #100s						Out of range
EPNG A #001A - EPNG A #001A - EPNG A #001A						Out of range
San Juan 32-5 Unit #018 - San Juan 32-5 #018 - San Ju						Out of range
Yager #002 - Yager #002 - Yager #002						Out of range
Yager B6 #020 - Yager B6 #020 - Yager B6 #020						Out of range

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Project:	San Juan County, NM	**TVD Reference:**	rig @ 6170.00ft
Reference Site:	Allison Unit #152H	**MD Reference:**	rig @ 6170.00ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Pilot Hole	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to rig @ 6170.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

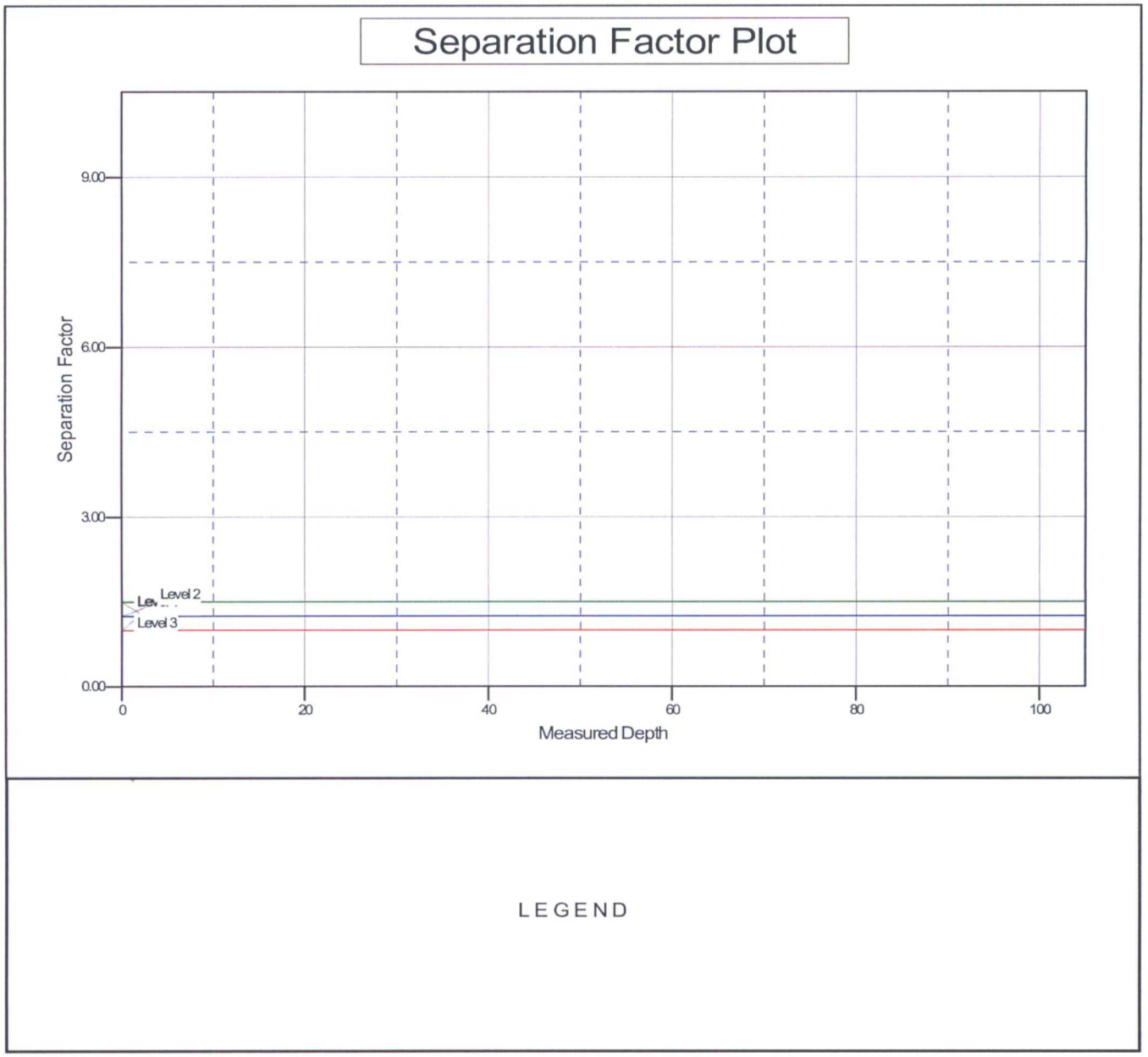
Coordinates are relative to: Allison Unit #152H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.22°



Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Project:	San Juan County, NM	**TVD Reference:**	rig @ 6170.00ft
Reference Site:	Allison Unit #152H	**MD Reference:**	rig @ 6170.00ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Pilot Hole	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to rig @ 6170.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #152H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.22°



HILCORP ENERGY COMPANY
ALLISON UNIT #152H (Horz)
SAN JUAN BASIN NM
6155' GL + 15' KB

Downhole DDS Drilling Services

Hilcorp Energy Company

Azimuths to Grid North
True North: -0.22°
Magnetic North: 8.88°

Magnetic Field
Strength: 50136.6snT
Dip Angle: 63.58°
Date: 2/2/2018
Model: IGRF2015

WELL DETAILS: Allison Unit #152H

Ground Level: 6155.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	2172771.270	606647.720	36° 58' 14.166 N	107° 28' 5.742 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	2968.80	62.08	0.00	2663.31	812.59	0.00	0.00	0.00	803.80	
2	3248.05	90.00	0.00	2730.00	1080.92	0.00	10.00	0.00	1069.23	
3	4030.13	91.56	0.00	2719.35	1862.90	0.00	0.20	0.00	1842.75	
4	4189.65	91.56	0.00	2715.00	2022.36	0.00	0.00	0.00	2000.48	TGT1(152H Horz)
5	5163.77	89.34	14.61	2707.27	2985.87	123.55	1.52	98.53	2971.69	
6	5227.35	89.34	14.61	2708.00	3047.39	139.59	0.00	0.00	3034.89	TGT2(152H Horz)
7	7417.26	91.22	16.12	2697.16	5158.84	719.79	0.11	38.67	5208.62	
8	7752.65	91.22	16.12	2690.00	5480.98	812.88	0.00	0.00	5540.93	TD(152H Horz)

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
TD(152H Horz)	2690.00	5480.98	812.88	2178252.239	607460.598	36° 59' 8.333 N	107° 27' 55.464 W	Point
TGT2(152H Horz)	2708.00	3047.39	139.59	2175818.650	606787.310	36° 58' 44.294 N	107° 28' 3.878 W	Point
TGT1(152H Horz)	2715.00	2022.36	0.00	2174793.630	606647.720	36° 58' 34.164 N	107° 28' 5.646 W	Point
Entry PT(152H Pilot)	2730.00	950.93	0.00	2173722.200	606647.720	36° 58' 23.569 N	107° 28' 5.697 W	Point
Take PT(152H Horz)	2730.00	1080.92	0.00	2173852.188	606647.720	36° 58' 24.854 N	107° 28' 5.691 W	Point

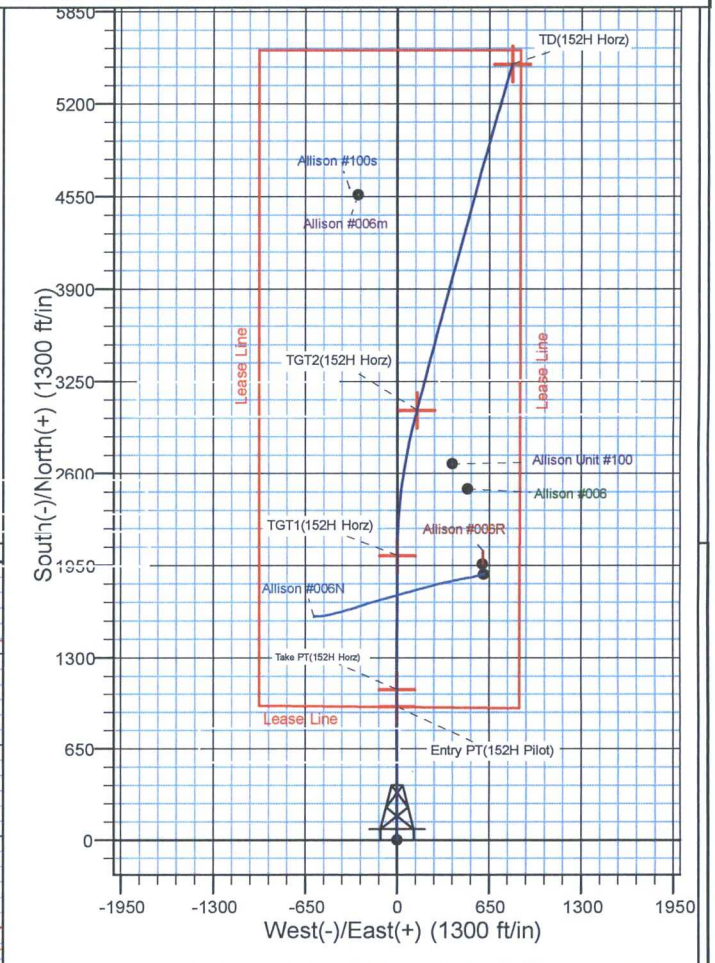
PROJECT DETAILS: San Juan County, NM

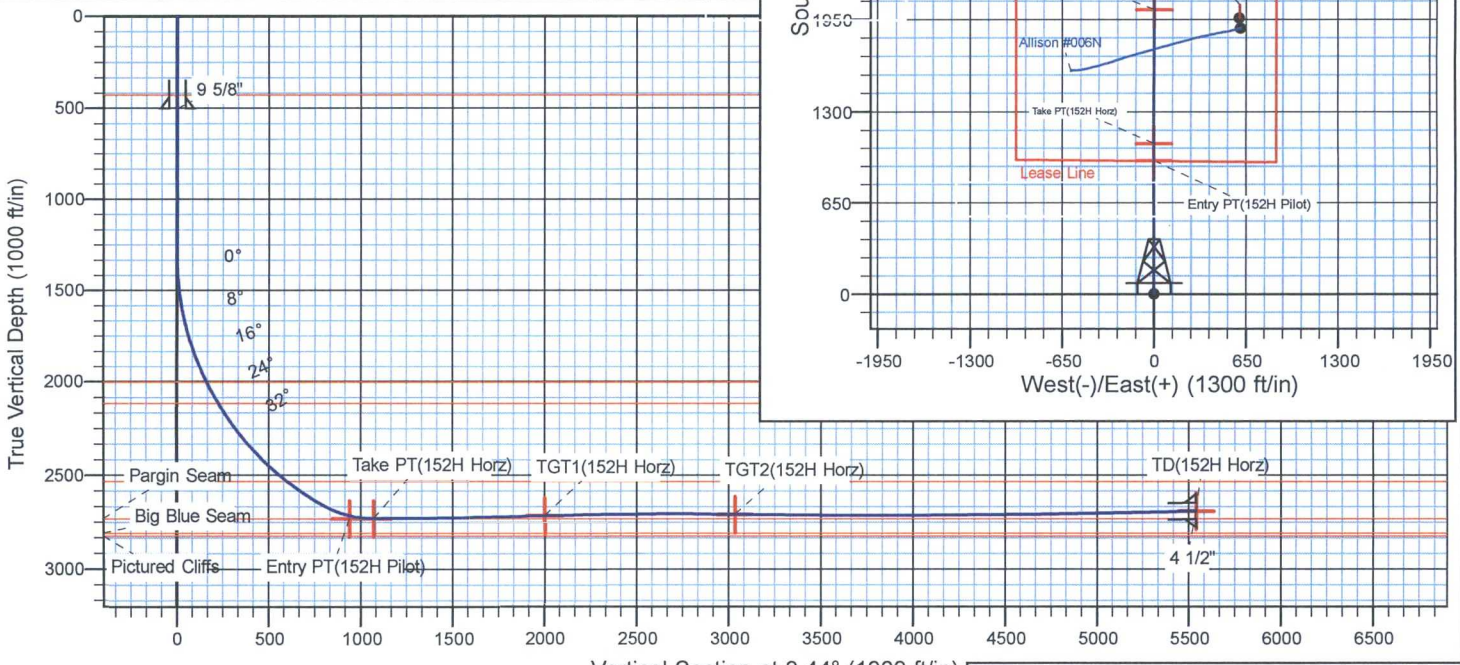
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico West 3003

System Datum: Mean Sea Level

CASING DETAILS

TVD	MD	Name
2690	7752.65	4 1/2"





Allison Unit152H Horz p2

Created By: Frank Scardino Date: 2/6/2018
Checked: _____ Date: _____

Downhole DDS Drilling Services

Hilcorp Energy Company

San Juan County, NM
Allison Unit #152H
Allison Unit #152H

Horz

Plan: Design #2

Standard Planning Report

06 February, 2018

Hilcorp Energy Company

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Company:	Hilcorp Energy Company	**TVD Reference:**	rig @ 6170.00ft
Project:	San Juan County, NM	**MD Reference:**	rig @ 6170.00ft
Site:	Allison Unit #152H	**North Reference:**	Grid
Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Horz		
Design:	Design #2		

Project	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	Allison Unit #152H				
Site Position:		**Northing:**	2,172,771.270 usft	**Latitude:**	36° 58' 14.166 N
From:	Map	**Easting:**	606,647.720 usft	**Longitude:**	107° 28' 5.742 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.22 °

Well	Allison Unit #152H					
Well Position	**+N/-S**	0.00 ft	**Northing:**	2,172,771.270 usft	**Latitude:**	36° 58' 14.166 N
	+E/-W	0.00 ft	**Easting:**	606,647.720 usft	**Longitude:**	107° 28' 5.742 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	0.00 ft	**Ground Level:**	6,155.00 ft

Wellbore	Horz			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	2/2/2018	9.10	63.58	50,137

Design	Design #2			
Audit Notes:				
Version:	**Phase:**	PLAN	**Tie On Depth:**	2,968.80

Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**
	0.00	0.00	0.00	8.44

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
2,968.80	62.08	0.00	2,663.31	812.59	0.00	0.00	0.00	0.00	0.00	
3,248.05	90.00	0.00	2,730.00	1,080.92	0.00	10.00	10.00	0.00	0.00	
4,030.13	91.56	0.00	2,719.35	1,862.90	0.00	0.20	0.20	0.00	0.00	
4,189.65	91.56	0.00	2,715.00	2,022.36	0.00	0.00	0.00	0.00	0.00	TGT1(152H Horz)
5,163.77	89.34	14.61	2,707.27	2,985.87	123.55	1.52	-0.23	1.50	98.53	
5,227.35	89.34	14.61	2,708.00	3,047.39	139.59	0.00	0.00	0.00	0.00	TGT2(152H Horz)
7,417.26	91.22	16.12	2,697.16	5,158.84	719.79	0.11	0.09	0.07	38.67	
7,752.65	91.22	16.12	2,690.00	5,480.98	812.88	0.00	0.00	0.00	0.00	TD(152H Horz)

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Company:	Hilcorp Energy Company	**TVD Reference:**	rig @ 6170.00ft
Project:	San Juan County, NM	**MD Reference:**	rig @ 6170.00ft
Site:	Allison Unit #152H	**North Reference:**	Grid
Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Horz		
Design:	Design #2		

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)
2,968.80	62.08	0.00	2,663.31	812.59	0.00	803.80	3.75	3.75	0.00
3,000.00	65.20	0.00	2,677.16	840.54	0.00	831.45	10.00	10.00	0.00
3,050.00	70.20	0.00	2,696.12	886.79	0.00	877.19	10.00	10.00	0.00
3,100.00	75.20	0.00	2,710.98	934.51	0.00	924.40	10.00	10.00	0.00
3,120.10	77.21	0.00	2,715.78	954.03	0.00	943.71	10.00	10.00	0.00
Entry PT(152H Pilot)									
3,150.00	80.20	0.00	2,721.63	983.35	0.00	972.71	10.00	10.00	0.00
3,200.00	85.20	0.00	2,727.99	1,032.93	0.00	1,021.75	10.00	10.00	0.00
3,248.05	90.00	0.00	2,730.00	1,080.92	0.00	1,069.22	10.00	10.00	0.00
Take PT(152H Horz)									
3,300.00	90.10	0.00	2,729.95	1,132.87	0.00	1,120.61	0.20	0.20	0.00
3,400.00	90.30	0.00	2,729.60	1,232.87	0.00	1,219.53	0.20	0.20	0.00
3,500.00	90.50	0.00	2,728.89	1,332.87	0.00	1,318.45	0.20	0.20	0.00
3,600.00	90.70	0.00	2,727.84	1,432.86	0.00	1,417.36	0.20	0.20	0.00
3,700.00	90.90	0.00	2,726.44	1,532.85	0.00	1,516.27	0.20	0.20	0.00
3,800.00	91.10	0.00	2,724.69	1,632.84	0.00	1,615.17	0.20	0.20	0.00
3,900.00	91.30	0.00	2,722.60	1,732.82	0.00	1,714.07	0.20	0.20	0.00
4,000.00	91.50	0.00	2,720.15	1,832.79	0.00	1,812.96	0.20	0.20	0.00
4,030.13	91.56	0.00	2,719.35	1,862.90	0.00	1,842.75	0.20	0.20	0.00
4,100.00	91.56	0.00	2,717.44	1,932.75	0.00	1,911.84	0.00	0.00	0.00
4,189.65	91.56	0.00	2,715.00	2,022.36	0.00	2,000.48	0.00	0.00	0.00
TGT1(152H Horz)									
4,200.00	91.54	0.16	2,714.72	2,032.71	0.01	2,010.72	1.52	-0.22	1.50
4,300.00	91.31	1.66	2,712.23	2,132.67	1.59	2,109.82	1.52	-0.23	1.50
4,400.00	91.09	3.16	2,710.14	2,232.55	5.79	2,209.25	1.52	-0.23	1.50
4,500.00	90.86	4.66	2,708.44	2,332.30	12.60	2,308.92	1.52	-0.23	1.50
4,600.00	90.63	6.16	2,707.14	2,431.85	22.02	2,408.77	1.52	-0.23	1.50
4,700.00	90.40	7.66	2,706.24	2,531.11	34.05	2,508.72	1.52	-0.23	1.50
4,800.00	90.17	9.16	2,705.74	2,630.04	48.67	2,608.72	1.52	-0.23	1.50
4,900.00	89.95	10.66	2,705.63	2,728.54	65.87	2,708.68	1.52	-0.23	1.50
5,000.00	89.72	12.16	2,705.93	2,826.56	85.65	2,808.55	1.52	-0.23	1.50
5,100.00	89.49	13.66	2,706.62	2,924.03	107.98	2,908.24	1.52	-0.23	1.50
5,163.77	89.34	14.61	2,707.27	2,985.87	123.55	2,971.69	1.52	-0.23	1.50
5,200.00	89.34	14.61	2,707.69	3,020.92	132.69	3,007.70	0.00	0.00	0.00
5,227.35	89.34	14.61	2,708.00	3,047.39	139.59	3,034.89	0.00	0.00	0.00
TGT2(152H Horz)									
5,300.00	89.41	14.66	2,708.79	3,117.67	157.95	3,107.11	0.11	0.09	0.07
5,400.00	89.49	14.73	2,709.76	3,214.40	183.32	3,206.51	0.11	0.09	0.07
5,500.00	89.58	14.80	2,710.57	3,311.09	208.80	3,305.90	0.11	0.09	0.07
5,600.00	89.66	14.87	2,711.23	3,407.76	234.40	3,405.28	0.11	0.09	0.07
5,700.00	89.75	14.94	2,711.74	3,504.39	260.12	3,504.64	0.11	0.09	0.07
5,800.00	89.83	15.01	2,712.11	3,601.00	285.96	3,603.99	0.11	0.09	0.07
5,900.00	89.92	15.07	2,712.32	3,697.57	311.91	3,703.32	0.11	0.09	0.07
6,000.00	90.01	15.14	2,712.38	3,794.11	337.97	3,802.65	0.11	0.09	0.07
6,100.00	90.09	15.21	2,712.30	3,890.63	364.15	3,901.95	0.11	0.09	0.07
6,200.00	90.18	15.28	2,712.06	3,987.11	390.45	4,001.25	0.11	0.09	0.07
6,300.00	90.26	15.35	2,711.67	4,083.55	416.86	4,100.53	0.11	0.09	0.07
6,400.00	90.35	15.42	2,711.14	4,179.97	443.39	4,199.79	0.11	0.09	0.07
6,500.00	90.44	15.49	2,710.45	4,276.35	470.03	4,299.04	0.11	0.09	0.07
6,600.00	90.52	15.56	2,709.61	4,372.70	496.79	4,398.27	0.11	0.09	0.07
6,700.00	90.61	15.62	2,708.63	4,469.02	523.67	4,497.49	0.11	0.09	0.07
6,800.00	90.69	15.69	2,707.49	4,565.30	550.66	4,596.69	0.11	0.09	0.07
6,900.00	90.78	15.76	2,706.21	4,661.55	577.76	4,695.87	0.11	0.09	0.07

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Company:	Hilcorp Energy Company	**TVD Reference:**	rig @ 6170.00ft
Project:	San Juan County, NM	**MD Reference:**	rig @ 6170.00ft
Site:	Allison Unit #152H	**North Reference:**	Grid
Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Horz		
Design:	Design #2		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,000.00	90.87	15.83	2,704.77	4,757.76	604.98	4,795.04	0.11	0.09	0.07
7,100.00	90.95	15.90	2,703.19	4,853.94	632.31	4,894.19	0.11	0.09	0.07
7,200.00	91.04	15.97	2,701.45	4,950.08	659.76	4,993.32	0.11	0.09	0.07
7,300.00	91.12	16.04	2,699.57	5,046.19	687.33	5,092.43	0.11	0.09	0.07
7,400.00	91.21	16.11	2,697.53	5,142.26	715.00	5,191.52	0.11	0.09	0.07
7,417.26	91.22	16.12	2,697.16	5,158.84	719.79	5,208.62	0.11	0.09	0.07
7,500.00	91.22	16.12	2,695.40	5,238.31	742.76	5,290.60	0.00	0.00	0.00
7,600.00	91.22	16.12	2,693.26	5,334.36	770.51	5,389.68	0.00	0.00	0.00
7,700.00	91.22	16.12	2,691.12	5,430.41	798.27	5,488.76	0.00	0.00	0.00
7,752.65	91.22	16.12	2,690.00	5,480.98	812.88	5,540.93	0.00	0.00	0.00
4 1/2" - TD(152H Horz)									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
TD(152H Horz) - plan hits target center - Point	0.00	0.00	2,690.00	5,480.98	812.88	2,178,252.239	607,460.599	36° 59' 8.333 N	107° 27' 55.464 W
TGT2(152H Horz) - plan hits target center - Point	0.00	0.00	2,708.00	3,047.39	139.59	2,175,818.650	606,787.310	36° 58' 44.294 N	107° 28' 3.878 W
TGT1(152H Horz) - plan hits target center - Point	0.00	0.00	2,715.00	2,022.36	0.00	2,174,793.630	606,647.720	36° 58' 34.164 N	107° 28' 5.646 W
Take PT(152H Horz) - plan hits target center - Point	0.00	0.00	2,730.00	1,080.92	0.00	2,173,852.188	606,647.720	36° 58' 24.854 N	107° 28' 5.691 W
Entry PT(152H Pilot) - plan misses target center by 14.56ft at 3120.10ft MD (2715.78 TVD, 954.03 N, 0.00 E) - Point	0.00	0.00	2,730.00	950.93	0.00	2,173,722.200	606,647.720	36° 58' 23.569 N	107° 28' 5.697 W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
500.00	500.00	9 5/8"	9.625	12.250
7,752.65	2,690.00	4 1/2"	4.500	4.500

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Company:	Hilcorp Energy Company	**TVD Reference:**	rig @ 6170.00ft
Project:	San Juan County, NM	**MD Reference:**	rig @ 6170.00ft
Site:	Allison Unit #152H	**North Reference:**	Grid
Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Horz		
Design:	Design #2		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
425.00	425.00	Nacimiento			
2,025.53	2,000.00	Ojo Alamo			
2,157.29	2,115.00	Kirtland			
2,720.85	2,530.00	Fruitland			
3,248.05	2,730.00	Pargin Seam			

Downhole DDS Drilling Services

Hilcorp Energy Company

San Juan County, NM
Allison Unit #152H
Allison Unit #152H

Horz

Plan: Design #2

Standard Planning Report - Geographic

06 February, 2018

Hilcorp Energy Company

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Company:	Hilcorp Energy Company	**TVD Reference:**	rig @ 6170.00ft
Project:	San Juan County, NM	**MD Reference:**	rig @ 6170.00ft
Site:	Allison Unit #152H	**North Reference:**	Grid
Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Horz		
Design:	Design #2		

Project	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	Allison Unit #152H				
Site Position:		**Northing:**	2,172,771.270 usft	**Latitude:**	36° 58' 14.166 N
From:	Map	**Easting:**	606,647.720 usft	**Longitude:**	107° 28' 5.742 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.22 °

Well	Allison Unit #152H					
Well Position	**+N/-S**	0.00 ft	**Northing:**	2,172,771.270 usft	**Latitude:**	36° 58' 14.166 N
	+E/-W	0.00 ft	**Easting:**	606,647.720 usft	**Longitude:**	107° 28' 5.742 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	0.00 ft	**Ground Level:**	6,155.00 ft

Wellbore	Horz			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	2/2/2018	9.10	63.58	50,137

Design	Design #2				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	2,968.80
Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**	
	0.00	0.00	0.00	8.44	

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
2,968.80	62.08	0.00	2,663.31	812.59	0.00	0.00	0.00	0.00	0.00	
3,248.05	90.00	0.00	2,730.00	1,080.92	0.00	10.00	10.00	0.00	0.00	
4,030.13	91.56	0.00	2,719.35	1,862.90	0.00	0.20	0.20	0.00	0.00	
4,189.65	91.56	0.00	2,715.00	2,022.36	0.00	0.00	0.00	0.00	0.00	TGT1(152H Horz)
5,163.77	89.34	14.61	2,707.27	2,985.87	123.55	1.52	-0.23	1.50	98.53	
5,227.35	89.34	14.61	2,708.00	3,047.39	139.59	0.00	0.00	0.00	0.00	TGT2(152H Horz)
7,417.26	91.22	16.12	2,697.16	5,158.84	719.79	0.11	0.09	0.07	38.67	
7,752.65	91.22	16.12	2,690.00	5,480.98	812.88	0.00	0.00	0.00	0.00	TD(152H Horz)

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Company:	Hilcorp Energy Company	**TVD Reference:**	rig @ 6170.00ft
Project:	San Juan County, NM	**MD Reference:**	rig @ 6170.00ft
Site:	Allison Unit #152H	**North Reference:**	Grid
Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Horz		
Design:	Design #2		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
2,968.80	62.08	0.00	2,663.31	812.59	0.00	2,173,583.857	606,647.720	36° 58' 22.201 N	107° 28' 5.704 W
3,000.00	65.20	0.00	2,677.16	840.54	0.00	2,173,611.810	606,647.720	36° 58' 22.478 N	107° 28' 5.702 W
3,050.00	70.20	0.00	2,696.12	886.79	0.00	2,173,658.057	606,647.720	36° 58' 22.935 N	107° 28' 5.700 W
3,100.00	75.20	0.00	2,710.98	934.51	0.00	2,173,705.780	606,647.720	36° 58' 23.407 N	107° 28' 5.698 W
3,120.10	77.21	0.00	2,715.78	954.03	0.00	2,173,725.299	606,647.720	36° 58' 23.600 N	107° 28' 5.697 W
Entry PT(152H Pilot)									
3,150.00	80.20	0.00	2,721.63	983.35	0.00	2,173,754.616	606,647.720	36° 58' 23.890 N	107° 28' 5.696 W
3,200.00	85.20	0.00	2,727.99	1,032.93	0.00	2,173,804.195	606,647.720	36° 58' 24.380 N	107° 28' 5.693 W
3,248.05	90.00	0.00	2,730.00	1,080.92	0.00	2,173,852.188	606,647.720	36° 58' 24.854 N	107° 28' 5.691 W
Take PT(152H Horz)									
3,300.00	90.10	0.00	2,729.95	1,132.87	0.00	2,173,904.139	606,647.720	36° 58' 25.368 N	107° 28' 5.688 W
3,400.00	90.30	0.00	2,729.60	1,232.87	0.00	2,174,004.138	606,647.720	36° 58' 26.357 N	107° 28' 5.684 W
3,500.00	90.50	0.00	2,728.89	1,332.87	0.00	2,174,104.135	606,647.720	36° 58' 27.346 N	107° 28' 5.679 W
3,600.00	90.70	0.00	2,727.84	1,432.86	0.00	2,174,204.129	606,647.720	36° 58' 28.335 N	107° 28' 5.674 W
3,700.00	90.90	0.00	2,726.44	1,532.85	0.00	2,174,304.119	606,647.720	36° 58' 29.323 N	107° 28' 5.670 W
3,800.00	91.10	0.00	2,724.69	1,632.84	0.00	2,174,404.104	606,647.720	36° 58' 30.312 N	107° 28' 5.665 W
3,900.00	91.30	0.00	2,722.60	1,732.82	0.00	2,174,504.081	606,647.720	36° 58' 31.301 N	107° 28' 5.660 W
4,000.00	91.50	0.00	2,720.15	1,832.79	0.00	2,174,604.051	606,647.720	36° 58' 32.289 N	107° 28' 5.655 W
4,030.13	91.56	0.00	2,719.35	1,862.90	0.00	2,174,634.170	606,647.720	36° 58' 32.587 N	107° 28' 5.654 W
4,100.00	91.56	0.00	2,717.44	1,932.75	0.00	2,174,704.014	606,647.720	36° 58' 33.278 N	107° 28' 5.651 W
4,189.65	91.56	0.00	2,715.00	2,022.36	0.00	2,174,793.630	606,647.720	36° 58' 34.164 N	107° 28' 5.646 W
TGT1(152H Horz)									
4,200.00	91.54	0.16	2,714.72	2,032.71	0.01	2,174,803.977	606,647.734	36° 58' 34.266 N	107° 28' 5.646 W
4,300.00	91.31	1.66	2,712.23	2,132.67	1.59	2,174,903.930	606,649.314	36° 58' 35.254 N	107° 28' 5.622 W
4,400.00	91.09	3.16	2,710.14	2,232.55	5.79	2,175,003.817	606,653.512	36° 58' 36.242 N	107° 28' 5.565 W
4,500.00	90.86	4.66	2,708.44	2,332.30	12.60	2,175,103.567	606,660.324	36° 58' 37.228 N	107° 28' 5.476 W
4,600.00	90.63	6.16	2,707.14	2,431.85	22.02	2,175,203.111	606,669.745	36° 58' 38.212 N	107° 28' 5.356 W
4,700.00	90.40	7.66	2,706.24	2,531.11	34.05	2,175,302.378	606,681.769	36° 58' 39.193 N	107° 28' 5.203 W
4,800.00	90.17	9.16	2,705.74	2,630.04	48.67	2,175,401.299	606,696.388	36° 58' 40.171 N	107° 28' 5.018 W
4,900.00	89.95	10.66	2,705.63	2,728.54	65.87	2,175,499.805	606,713.591	36° 58' 41.144 N	107° 28' 4.801 W
5,000.00	89.72	12.16	2,705.93	2,826.56	85.65	2,175,597.827	606,733.367	36° 58' 42.113 N	107° 28' 4.553 W
5,100.00	89.49	13.66	2,706.62	2,924.03	107.98	2,175,695.295	606,755.701	36° 58' 43.076 N	107° 28' 4.273 W
5,163.77	89.34	14.61	2,707.27	2,985.87	123.55	2,175,757.135	606,771.273	36° 58' 43.686 N	107° 28' 4.078 W
5,200.00	89.34	14.61	2,707.69	3,020.92	132.69	2,175,792.187	606,780.411	36° 58' 44.033 N	107° 28' 3.964 W
5,227.35	89.34	14.61	2,708.00	3,047.39	139.59	2,175,818.650	606,787.310	36° 58' 44.294 N	107° 28' 3.878 W
TGT2(152H Horz)									
5,300.00	89.41	14.66	2,708.79	3,117.67	157.95	2,175,888.938	606,805.668	36° 58' 44.989 N	107° 28' 3.648 W
5,400.00	89.49	14.73	2,709.76	3,214.40	183.32	2,175,985.661	606,831.037	36° 58' 45.944 N	107° 28' 3.331 W
5,500.00	89.58	14.80	2,710.57	3,311.09	208.80	2,176,082.356	606,856.522	36° 58' 46.899 N	107° 28' 3.012 W
5,600.00	89.66	14.87	2,711.23	3,407.76	234.40	2,176,179.021	606,882.123	36° 58' 47.854 N	107° 28' 2.692 W
5,700.00	89.75	14.94	2,711.74	3,504.39	260.12	2,176,275.655	606,907.841	36° 58' 48.809 N	107° 28' 2.371 W
5,800.00	89.83	15.01	2,712.11	3,601.00	285.96	2,176,372.260	606,933.675	36° 58' 49.763 N	107° 28' 2.048 W
5,900.00	89.92	15.07	2,712.32	3,697.57	311.91	2,176,468.834	606,959.625	36° 58' 50.717 N	107° 28' 1.723 W
6,000.00	90.01	15.14	2,712.38	3,794.11	337.97	2,176,565.377	606,985.690	36° 58' 51.670 N	107° 28' 1.397 W
6,100.00	90.09	15.21	2,712.30	3,890.63	364.15	2,176,661.888	607,011.872	36° 58' 52.624 N	107° 28' 1.070 W
6,200.00	90.18	15.28	2,712.06	3,987.11	390.45	2,176,758.368	607,038.169	36° 58' 53.577 N	107° 28' 0.741 W
6,300.00	90.26	15.35	2,711.67	4,083.55	416.86	2,176,854.816	607,064.581	36° 58' 54.530 N	107° 28' 0.411 W
6,400.00	90.35	15.42	2,711.14	4,179.97	443.39	2,176,951.231	607,091.110	36° 58' 55.482 N	107° 28' 0.080 W
6,500.00	90.44	15.49	2,710.45	4,276.35	470.03	2,177,047.614	607,117.753	36° 58' 56.434 N	107° 27' 59.747 W
6,600.00	90.52	15.56	2,709.61	4,372.70	496.79	2,177,143.963	607,144.512	36° 58' 57.386 N	107° 27' 59.412 W
6,700.00	90.61	15.62	2,708.63	4,469.02	523.67	2,177,240.279	607,171.386	36° 58' 58.337 N	107° 27' 59.077 W
6,800.00	90.69	15.69	2,707.49	4,565.30	550.66	2,177,336.562	607,198.375	36° 58' 59.288 N	107° 27' 58.739 W
6,900.00	90.78	15.76	2,706.21	4,661.55	577.76	2,177,432.809	607,225.480	36° 59' 0.239 N	107° 27' 58.401 W
7,000.00	90.87	15.83	2,704.77	4,757.76	604.98	2,177,529.023	607,252.699	36° 59' 1.189 N	107° 27' 58.061 W

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Company:	Hilcorp Energy Company	**TVD Reference:**	rig @ 6170.00ft
Project:	San Juan County, NM	**MD Reference:**	rig @ 6170.00ft
Site:	Allison Unit #152H	**North Reference:**	Grid
Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Horz		
Design:	Design #2		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,100.00	90.95	15.90	2,703.19	4,853.94	632.31	2,177,625.201	607,280.033	36° 59' 2.139 N	107° 27' 57.719 W
7,200.00	91.04	15.97	2,701.45	4,950.08	659.76	2,177,721.345	607,307.481	36° 59' 3.089 N	107° 27' 57.376 W
7,300.00	91.12	16.04	2,699.57	5,046.19	687.33	2,177,817.452	607,335.045	36° 59' 4.038 N	107° 27' 57.032 W
7,400.00	91.21	16.11	2,697.53	5,142.26	715.00	2,177,913.524	607,362.722	36° 59' 4.987 N	107° 27' 56.686 W
7,417.26	91.22	16.12	2,697.16	5,158.84	719.79	2,177,930.099	607,367.510	36° 59' 5.151 N	107° 27' 56.627 W
7,500.00	91.22	16.12	2,695.40	5,238.31	742.76	2,178,009.572	607,390.475	36° 59' 5.936 N	107° 27' 56.340 W
7,600.00	91.22	16.12	2,693.26	5,334.36	770.51	2,178,105.619	607,418.230	36° 59' 6.884 N	107° 27' 55.993 W
7,700.00	91.22	16.12	2,691.12	5,430.41	798.27	2,178,201.666	607,445.985	36° 59' 7.833 N	107° 27' 55.646 W
7,752.65	91.22	16.12	2,690.00	5,480.98	812.88	2,178,252.235	607,460.597	36° 59' 8.333 N	107° 27' 55.464 W
4 1/2" - TD(152H Horz)									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
TD(152H Horz) - plan hits target center - Point	0.00	0.00	2,690.00	5,480.98	812.88	2,178,252.239	607,460.599	36° 59' 8.333 N	107° 27' 55.464 W
TGT2(152H Horz) - plan hits target center - Point	0.00	0.00	2,708.00	3,047.39	139.59	2,175,818.650	606,787.310	36° 58' 44.294 N	107° 28' 3.878 W
TGT1(152H Horz) - plan hits target center - Point	0.00	0.00	2,715.00	2,022.36	0.00	2,174,793.630	606,647.720	36° 58' 34.164 N	107° 28' 5.646 W
Take PT(152H Horz) - plan hits target center - Point	0.00	0.00	2,730.00	1,080.92	0.00	2,173,852.188	606,647.720	36° 58' 24.854 N	107° 28' 5.691 W
Entry PT(152H Pilot) - plan misses target center by 14.56ft at 3120.10ft MD (2715.78 TVD, 954.03 N, 0.00 E) - Point	0.00	0.00	2,730.00	950.93	0.00	2,173,722.200	606,647.720	36° 58' 23.569 N	107° 28' 5.697 W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
500.00	500.00	9 5/8"	9.625	12.250
7,752.65	2,690.00	4 1/2"	4.500	4.500

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
425.00	425.00	Nacimiento			
2,025.53	2,000.00	Ojo Alamo			
2,157.29	2,115.00	Kirtland			
2,720.85	2,530.00	Fruitland			
3,248.05	2,730.00	Pargin Seam			

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Company:	Hilcorp Energy Company	**TVD Reference:**	rig @ 6170.00ft
Project:	San Juan County, NM	**MD Reference:**	rig @ 6170.00ft
Site:	Allison Unit #152H	**North Reference:**	Grid
Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Horz		
Design:	Design #2		

Downhole DDS Drilling Services

Hilcorp Energy Company

San Juan County, NM
Allison Unit #152H
Allison Unit #152H

Horz
Design #2

Anticollision Report

06 February, 2018

Hilcorp Energy Company

Anticollision Report

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Project:	San Juan County, NM	**TVD Reference:**	rig @ 6170.00ft
Reference Site:	Allison Unit #152H	**MD Reference:**	rig @ 6170.00ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Horz	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Reference Design #2

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00ft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,266.90 ft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 2/6/2018

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	2,968.80	Design #1 (Pilot Hole)	MWD	MWD - Standard
2,968.80	7,752.65	Design #2 (Horz)	MWD	MWD - Standard

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Allison Unit #152H						
Allison Unit #152H - Pilot Hole - Design #1	3,300.00	3,242.40	89.06	86.71	37.895	CC, ES, SF
Allison Unit #152H Offsets						
Allison Unit #006 - Allison #006 - Allison #006	4,725.43	2,706.08	463.31	397.55	7.045	CC, ES, SF
Allison Unit #006m - Allison #006m - Allison #006m	6,573.28	2,709.85	795.66	687.23	7.338	CC
Allison Unit #006m - Allison #006m - Allison #006m	6,600.00	2,709.61	796.11	686.55	7.267	ES
Allison Unit #006m - Allison #006m - Allison #006m	6,700.00	2,708.63	805.78	693.05	7.148	SF
Allison Unit #006N - Allison #006N - Allison #006N	3,800.00	2,749.12	267.74	218.43	5.429	SF
Allison Unit #006N - Allison #006N - Allison #006N	3,847.05	2,740.90	263.72	215.65	5.485	CC, ES
Allison Unit #006R - Allison #006R - Allison #006R	4,157.57	2,716.07	603.45	544.94	10.314	CC, ES
Allison Unit #006R - Allison #006R - Allison #006R	4,200.00	2,715.47	605.03	545.65	10.188	SF
Allison Unit #051A - Allison #051A - Allison #051A	1,300.00	1,300.00	945.68	937.69	118.321	CC, ES
Allison Unit #051A - Allison #051A - Allison #051A	2,200.00	2,151.04	1,183.45	1,169.73	86.233	SF
Allison Unit #100 - Allison Unit #100 - Allison Unit #100	4,900.00	2,705.63	327.02	257.59	4.710	ES, SF
Allison Unit #100 - Allison Unit #100 - Allison Unit #100	4,901.58	2,705.63	327.02	257.60	4.711	CC
Allison Unit #100s - Allison #100s - Allison #100s	6,605.34	2,709.57	868.54	759.32	7.953	CC, ES
Allison Unit #100s - Allison #100s - Allison #100s	6,800.00	2,707.49	890.30	775.42	7.750	SF
EPNG A #001A - EPNG A #001A - EPNG A #001A						Out of range
San Juan 32-5 Unit #018 - San Juan 32-5 #018 - San Ju						Out of range
Yager #002 - Yager #002 - Yager #002						Out of range
Yager B6 #020 - Yager B6 #020 - Yager B6 #020						Out of range

Offset Design Allison Unit #152H - Allison Unit #152H - Pilot Hole - Design #1 — **Offset Site Error:** 0.00 ft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
2,968.80	2,662.60	2,968.81	2,663.31	0.00	0.00	-180.00	812.59	0.00	0.80	0.80	0.00	N/A	
3,000.00	2,677.16	3,000.00	2,677.63	0.60	0.63	-180.00	840.30	0.00	0.53	0.07	0.46	1.155	Level 2
3,100.00	2,710.98	3,099.48	2,720.31	2.16	2.74	180.00	930.16	0.00	10.29	9.16	1.14	9.036	
3,200.00	2,727.99	3,195.86	2,761.05	3.92	4.81	180.00	1,017.51	0.00	36.48	34.60	1.87	19.465	
3,300.00	2,729.95	3,242.40	2,780.71	5.83	5.81	180.00	1,059.69	0.00	89.06	86.71	2.35	37.895	CC, ES, SF
3,400.00	2,729.60	3,242.40	2,780.71	7.83	5.81	180.00	1,059.69	0.00	180.57	178.65	1.92	93.946	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Project:	San Juan County, NM	**TVD Reference:**	rig @ 6170.00ft
Reference Site:	Allison Unit #152H	**MD Reference:**	rig @ 6170.00ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Horz	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Allison Unit #152H - Allison Unit #152H - Pilot Hole - Design #1

Offset Site Error: 0.00 ft

Survey Program: 0-MWD **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
3,500.00	2,728.89	3,242.40	2,780.71	9.91	5.81	180.00	1,059.69	0.00	278.05	276.35	1.70	163.604	
3,600.00	2,727.84	3,242.40	2,780.71	12.05	5.81	180.00	1,059.69	0.00	376.90	375.33	1.57	239.456	
3,700.00	2,726.44	3,242.40	2,780.71	14.25	5.81	180.00	1,059.69	0.00	476.27	474.77	1.50	318.551	
3,800.00	2,724.69	3,242.40	2,780.71	16.49	5.81	180.00	1,059.69	0.00	575.88	574.44	1.44	399.112	
3,900.00	2,722.60	3,242.40	2,780.71	18.76	5.81	180.00	1,059.69	0.00	675.63	674.22	1.41	479.812	
4,000.00	2,720.15	3,242.40	2,780.71	21.07	5.81	180.00	1,059.69	0.00	775.46	774.08	1.39	559.555	
4,100.00	2,717.44	3,242.40	2,780.71	23.40	5.81	180.00	1,059.69	0.00	875.35	873.98	1.37	637.693	
4,200.00	2,714.72	3,242.40	2,780.71	25.75	5.81	176.23	1,059.69	0.00	975.26	973.89	1.36	714.500	
4,300.00	2,712.23	3,242.40	2,780.71	28.01	5.81	146.18	1,059.69	0.00	1,075.16	1,073.81	1.35	794.345	
4,400.00	2,710.14	3,242.40	2,780.71	30.28	5.81	129.44	1,059.69	0.00	1,175.00	1,173.71	1.29	912.823	

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Project:	San Juan County, NM	**TVD Reference:**	rig @ 6170.00ft
Reference Site:	Allison Unit #152H	**MD Reference:**	rig @ 6170.00ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Horz	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Allison Unit #152H Offsets - Allison Unit #006 - Allison #006 - Allison #006 — **Offset Site Error:** 0.00 ft

Survey Program: 2780-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
3,500.00	2,728.89	2,728.89	2,728.89	32.75	5.74	91.17	2,491.52	496.28	1,260.46	1,237.13	23.33	54.022	
3,600.00	2,727.84	2,727.84	2,727.84	34.89	5.74	91.50	2,491.52	496.28	1,169.21	1,144.55	24.65	47.429	
3,700.00	2,726.44	2,726.44	2,726.44	37.09	5.74	91.74	2,491.52	496.28	1,079.51	1,053.20	26.31	41.030	
3,800.00	2,724.69	2,724.69	2,724.69	39.33	5.73	91.91	2,491.52	496.28	991.78	963.40	28.38	34.949	
3,900.00	2,722.60	2,722.60	2,722.60	41.60	5.73	91.99	2,491.52	496.28	906.60	875.66	30.94	29.304	
4,000.00	2,720.15	2,720.15	2,720.15	43.91	5.72	91.99	2,491.52	496.28	824.76	790.67	34.08	24.199	
4,100.00	2,717.44	2,717.44	2,717.44	46.24	5.72	91.76	2,491.52	496.28	747.34	709.44	37.90	19.719	
4,200.00	2,714.72	2,714.72	2,714.72	48.59	5.71	91.43	2,491.52	496.28	675.86	633.41	42.44	15.923	
4,300.00	2,712.23	2,712.23	2,712.23	50.85	5.71	91.01	2,491.52	496.28	611.14	563.61	47.53	12.858	
4,400.00	2,710.14	2,710.14	2,710.14	53.11	5.70	90.65	2,491.52	496.28	554.66	501.66	52.99	10.466	
4,500.00	2,708.44	2,708.44	2,708.44	55.39	5.70	90.36	2,491.52	496.28	509.21	450.83	58.38	8.723	
4,600.00	2,707.14	2,707.14	2,707.14	57.67	5.70	90.15	2,491.52	496.28	478.00	415.12	62.87	7.603	
4,700.00	2,706.24	2,706.24	2,706.24	59.95	5.69	90.02	2,491.52	496.28	463.93	398.43	65.49	7.083	
4,725.43	2,706.08	2,706.08	2,706.08	60.53	5.69	90.00	2,491.52	496.28	463.31	397.55	65.77	7.045	CC, ES, SF
4,800.00	2,705.74	2,705.74	2,705.74	62.23	5.69	89.98	2,491.52	496.28	468.56	402.98	65.58	7.145	
4,900.00	2,705.63	2,705.63	2,705.63	64.51	5.69	90.02	2,491.52	496.28	491.36	428.12	63.24	7.770	
5,000.00	2,705.93	2,705.93	2,705.93	66.78	5.69	90.14	2,491.52	496.28	529.98	470.72	59.26	8.943	
5,100.00	2,706.62	2,706.62	2,706.62	69.05	5.70	90.35	2,491.52	496.28	581.25	526.67	54.57	10.651	
5,200.00	2,707.69	2,707.69	2,707.69	71.32	5.70	90.57	2,491.52	496.28	642.24	592.41	49.83	12.888	
5,300.00	2,708.79	2,708.79	2,708.79	73.61	5.70	90.64	2,491.52	496.28	711.72	666.23	45.49	15.645	
5,400.00	2,709.76	2,709.76	2,709.76	75.93	5.70	90.65	2,491.52	496.28	787.72	746.01	41.71	18.886	
5,500.00	2,710.57	2,710.57	2,710.57	78.26	5.70	90.62	2,491.52	496.28	868.53	830.05	38.48	22.570	
5,600.00	2,711.23	2,711.23	2,711.23	80.60	5.70	90.56	2,491.52	496.28	952.93	917.18	35.76	26.651	
5,700.00	2,711.74	2,711.74	2,711.74	82.96	5.71	90.47	2,491.52	496.28	1,040.04	1,006.58	33.46	31.083	
5,800.00	2,712.11	2,712.11	2,712.11	85.33	5.71	90.34	2,491.52	496.28	1,129.24	1,097.72	31.53	35.819	
5,900.00	2,712.32	2,712.32	2,712.32	87.70	5.71	90.18	2,491.52	496.28	1,220.07	1,190.18	29.89	40.815	

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Project:	San Juan County, NM	**TVD Reference:**	rig @ 6170.00ft
Reference Site:	Allison Unit #152H	**MD Reference:**	rig @ 6170.00ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Horz	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Allison Unit #152H Offsets - Allison Unit #006m - Allison #006m - Allison #006m

Offset Site Error: 0.00 ft

Survey Program: 2780-MWD

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,600.00	2,711.23	2,711.23	2,711.23	80.60	5.70	-89.58	4,560.09	-276.95	1,260.70	1,215.55	45.15	27.922	
5,700.00	2,711.74	2,711.74	2,711.74	82.96	5.71	-89.72	4,560.09	-276.95	1,184.46	1,134.26	50.20	23.593	
5,800.00	2,712.11	2,712.11	2,712.11	85.33	5.71	-89.84	4,560.09	-276.95	1,112.08	1,056.22	55.86	19.907	
5,900.00	2,712.32	2,712.32	2,712.32	87.70	5.71	-89.93	4,560.09	-276.95	1,044.36	982.22	62.14	16.807	
6,000.00	2,712.38	2,712.38	2,712.38	90.09	5.71	-90.00	4,560.09	-276.95	982.27	913.27	69.00	14.237	
6,100.00	2,712.30	2,712.30	2,712.30	92.49	5.71	-90.06	4,560.09	-276.95	926.93	850.60	76.33	12.144	
6,200.00	2,712.06	2,712.06	2,712.06	94.90	5.71	-90.08	4,560.09	-276.95	879.62	795.68	83.94	10.480	
6,300.00	2,711.67	2,711.67	2,711.67	97.31	5.71	-90.09	4,560.09	-276.95	841.70	750.20	91.50	9.199	
6,400.00	2,711.14	2,711.14	2,711.14	99.73	5.70	-90.08	4,560.09	-276.95	814.48	715.88	98.60	8.260	
6,500.00	2,710.45	2,710.45	2,710.45	102.16	5.70	-90.04	4,560.09	-276.95	799.06	694.29	104.76	7.627	
6,573.28	2,709.85	2,709.85	2,709.85	103.94	5.70	-90.00	4,560.09	-276.95	795.66	687.23	108.43	7.338	CC
6,600.00	2,709.61	2,709.61	2,709.61	104.59	5.70	-89.98	4,560.09	-276.95	796.11	686.55	109.56	7.267	ES
6,700.00	2,708.63	2,708.63	2,708.63	107.04	5.70	-89.90	4,560.09	-276.95	805.78	693.05	112.73	7.148	SF
6,800.00	2,707.49	2,707.49	2,707.49	109.48	5.70	-89.80	4,560.09	-276.95	827.62	713.37	114.25	7.244	
6,900.00	2,706.21	2,706.21	2,706.21	111.93	5.69	-89.68	4,560.09	-276.95	860.71	746.43	114.28	7.531	
7,000.00	2,704.77	2,704.77	2,704.77	114.39	5.69	-89.53	4,560.09	-276.95	903.81	790.67	113.14	7.988	
7,100.00	2,703.19	2,703.19	2,703.19	116.85	5.69	-89.36	4,560.09	-276.95	955.57	844.39	111.17	8.595	
7,200.00	2,701.45	2,701.45	2,701.45	119.32	5.68	-89.17	4,560.09	-276.95	1,014.65	905.98	108.68	9.336	
7,300.00	2,699.57	2,699.57	2,699.57	121.79	5.68	-88.96	4,560.09	-276.95	1,079.87	973.96	105.91	10.196	
7,400.00	2,697.53	2,697.53	2,697.53	124.26	5.68	-88.73	4,560.09	-276.95	1,150.17	1,047.13	103.04	11.163	
7,500.00	2,695.40	2,695.40	2,695.40	126.71	5.67	-88.55	4,560.09	-276.95	1,224.66	1,124.48	100.18	12.225	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Project:	San Juan County, NM	**TVD Reference:**	rig @ 6170.00ft
Reference Site:	Allison Unit #152H	**MD Reference:**	rig @ 6170.00ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Horz	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Allison Unit #152H Offsets - Allison Unit #006N - Allison #006N - Allison #006N — **Offset Site Error:** 0.00 ft

Survey Program: 301-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
2,600.00	2,453.18	2,691.83	2,506.29	16.08	25.40	-15.77	1,684.68	-201.11	1,194.82	1,158.98	35.84	33.339	
2,700.00	2,517.27	2,737.35	2,544.87	17.77	26.10	-19.94	1,677.60	-224.21	1,115.14	1,078.02	37.12	30.042	
2,800.00	2,576.21	2,778.14	2,579.46	19.59	26.72	-24.85	1,671.15	-244.84	1,033.41	995.01	38.40	26.911	
2,900.00	2,629.74	2,813.85	2,609.88	21.51	27.26	-30.50	1,665.43	-262.65	950.14	910.42	39.72	23.921	
3,000.00	2,677.16	2,839.66	2,631.99	23.44	27.63	-38.27	1,661.31	-275.31	865.73	823.67	42.06	20.586	
3,100.00	2,710.98	2,853.89	2,644.26	25.00	27.84	-53.22	1,659.09	-282.18	778.04	735.07	42.97	18.106	
3,200.00	2,727.99	2,853.32	2,643.76	26.76	27.83	-71.10	1,659.18	-281.90	688.20	644.33	43.86	15.689	
3,300.00	2,729.95	2,839.03	2,631.45	28.67	27.62	-78.18	1,661.41	-275.01	598.67	553.89	44.77	13.371	
3,400.00	2,729.60	2,822.11	2,616.94	30.67	27.38	-75.22	1,664.10	-266.73	512.23	466.25	45.98	11.140	
3,500.00	2,728.89	2,804.11	2,601.57	32.75	27.12	-71.88	1,667.00	-257.82	430.97	383.44	47.53	9.067	
3,600.00	2,727.84	2,785.78	2,585.96	34.89	26.84	-68.30	1,669.93	-248.68	358.36	309.10	49.26	7.275	
3,700.00	2,726.44	2,767.37	2,570.32	37.09	26.56	-64.56	1,672.86	-239.42	300.68	250.32	50.36	5.970	
3,800.00	2,724.69	2,749.12	2,554.85	39.33	26.28	-60.73	1,675.75	-230.18	267.74	218.43	49.32	5.429	SF
3,847.05	2,723.75	2,740.90	2,547.88	40.40	26.16	-58.98	1,677.04	-226.01	263.72	215.65	48.08	5.485	CC, ES
3,900.00	2,722.60	2,731.63	2,540.02	41.60	26.01	-56.99	1,678.50	-221.31	268.80	222.07	46.74	5.751	
4,000.00	2,720.15	2,714.05	2,525.13	43.91	25.74	-53.19	1,681.24	-212.39	303.49	258.19	45.30	6.699	
4,100.00	2,717.44	2,696.46	2,510.22	46.24	25.47	-49.47	1,683.97	-203.46	362.29	318.29	43.99	8.235	
4,200.00	2,714.72	2,678.88	2,495.32	48.59	25.21	-45.75	1,686.67	-194.53	435.63	393.18	42.45	10.262	
4,300.00	2,712.23	2,660.80	2,480.01	50.85	24.93	-40.68	1,689.44	-185.33	518.02	477.04	40.98	12.642	
4,400.00	2,710.14	2,641.92	2,464.02	53.11	24.65	-34.98	1,692.31	-175.71	606.04	566.29	39.75	15.247	
4,500.00	2,708.44	2,622.20	2,447.32	55.39	24.35	-28.62	1,695.30	-165.64	697.45	658.71	38.74	18.002	
4,600.00	2,707.14	2,601.37	2,429.70	57.67	24.04	-21.61	1,698.43	-154.99	790.96	753.06	37.89	20.874	
4,700.00	2,706.24	2,579.67	2,411.35	59.95	23.71	-14.16	1,701.69	-143.87	885.76	848.60	37.16	23.835	
4,800.00	2,705.74	2,557.43	2,392.55	62.23	23.37	-6.53	1,705.01	-132.46	981.38	944.85	36.53	26.866	
4,900.00	2,705.63	2,535.38	2,373.93	64.51	23.03	0.96	1,708.28	-121.12	1,077.50	1,041.51	35.98	29.945	
5,000.00	2,705.93	2,512.78	2,354.85	66.78	22.68	8.20	1,711.58	-109.47	1,173.90	1,138.41	35.48	33.083	

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Project:	San Juan County, NM	**TVD Reference:**	rig @ 6170.00ft
Reference Site:	Allison Unit #152H	**MD Reference:**	rig @ 6170.00ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Horz	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Allison Unit #152H Offsets - Allison Unit #006R - Allison #006R - Allison #006R — **Offset Site Error:** 0.00 ft

Survey Program: 12-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
3,100.00	2,710.98	2,697.25	2,697.07	25.00	10.83	64.89	1,989.10	603.49	1,215.14	1,187.44	27.70	43.875	
3,200.00	2,727.99	2,715.40	2,715.23	26.76	10.91	81.26	1,989.34	603.49	1,130.97	1,101.96	29.01	38.985	
3,300.00	2,729.95	2,718.68	2,718.50	28.67	10.92	89.06	1,989.39	603.49	1,047.83	1,017.21	30.62	34.223	
3,400.00	2,729.60	2,719.65	2,719.48	30.67	10.93	89.42	1,989.40	603.49	967.80	935.18	32.62	29.665	
3,500.00	2,728.89	2,720.28	2,720.11	32.75	10.93	89.71	1,989.41	603.49	891.81	856.71	35.09	25.412	
3,600.00	2,727.84	2,720.57	2,720.39	34.89	10.93	89.94	1,989.41	603.49	820.98	782.91	38.07	21.567	
3,700.00	2,726.44	2,720.51	2,720.33	37.09	10.93	90.10	1,989.41	603.49	756.76	715.22	41.54	18.219	
3,800.00	2,724.69	2,720.10	2,719.92	39.33	10.93	90.20	1,989.41	603.49	700.97	655.54	45.43	15.429	
3,900.00	2,722.60	2,719.34	2,719.16	41.60	10.93	90.23	1,989.40	603.49	655.78	606.23	49.55	13.234	
4,000.00	2,720.15	2,718.23	2,718.06	43.91	10.92	90.19	1,989.38	603.49	623.48	569.93	53.55	11.643	
4,100.00	2,717.44	2,716.86	2,716.69	46.24	10.92	90.07	1,989.36	603.49	606.14	549.17	56.97	10.639	
4,157.57	2,715.88	2,716.07	2,715.89	47.59	10.91	90.00	1,989.35	603.49	603.45	544.94	58.51	10.314	CC, ES
4,200.00	2,714.72	2,715.47	2,715.30	48.59	10.91	89.95	1,989.34	603.49	605.03	545.65	59.39	10.188	SF
4,300.00	2,712.23	2,714.32	2,714.14	50.85	10.91	89.91	1,989.33	603.49	618.73	558.27	60.46	10.233	
4,400.00	2,710.14	2,713.56	2,713.38	53.11	10.90	89.93	1,989.32	603.49	645.30	584.93	60.38	10.688	
4,500.00	2,708.44	2,713.19	2,713.01	55.39	10.90	90.02	1,989.31	603.49	683.23	623.87	59.37	11.509	
4,600.00	2,707.14	2,713.21	2,713.04	57.67	10.90	90.16	1,989.31	603.49	730.73	673.01	57.73	12.659	
4,700.00	2,706.24	2,713.64	2,713.46	59.95	10.90	90.36	1,989.32	603.49	786.04	730.31	55.73	14.105	
4,800.00	2,705.74	2,714.46	2,714.28	62.23	10.91	90.61	1,989.33	603.49	847.59	794.01	53.57	15.821	
4,900.00	2,705.63	2,715.67	2,715.50	64.51	10.91	90.90	1,989.35	603.49	914.08	862.68	51.40	17.785	
5,000.00	2,705.93	2,717.29	2,717.11	66.78	10.92	91.23	1,989.37	603.49	984.47	935.20	49.27	19.981	
5,100.00	2,706.62	2,719.30	2,719.12	69.05	10.93	91.60	1,989.40	603.49	1,057.94	1,010.69	47.25	22.393	
5,200.00	2,707.69	2,721.68	2,721.50	71.32	10.94	91.91	1,989.43	603.49	1,133.94	1,088.60	45.34	25.010	
5,300.00	2,708.79	2,724.10	2,723.93	73.61	10.95	92.02	1,989.46	603.49	1,213.10	1,169.49	43.61	27.817	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Project:	San Juan County, NM	**TVD Reference:**	rig @ 6170.00ft
Reference Site:	Allison Unit #152H	**MD Reference:**	rig @ 6170.00ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Horz	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Allison Unit #152H Offsets - Allison Unit #051A - Allison #051A - Allison #051A — **Offset Site Error:** 0.00 ft

Survey Program: 2780-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-159.63	-886.55	-329.16	945.68				
100.00	100.00	100.00	100.00	0.18	0.21	-159.63	-886.55	-329.16	945.68	945.29	0.39	2,423.368	
200.00	200.00	200.00	200.00	0.60	0.42	-159.63	-886.55	-329.16	945.68	944.66	1.02	923.737	
300.00	300.00	300.00	300.00	1.03	0.63	-159.63	-886.55	-329.16	945.68	944.03	1.66	570.623	
400.00	400.00	400.00	400.00	1.45	0.84	-159.63	-886.55	-329.16	945.68	943.39	2.29	412.817	
500.00	500.00	500.00	500.00	1.87	1.05	-159.63	-886.55	-329.16	945.68	942.76	2.92	323.385	
600.00	600.00	600.00	600.00	2.30	1.26	-159.63	-886.55	-329.16	945.68	942.13	3.56	265.802	
700.00	700.00	700.00	700.00	2.72	1.47	-159.63	-886.55	-329.16	945.68	941.49	4.19	225.626	
800.00	800.00	800.00	800.00	3.14	1.68	-159.63	-886.55	-329.16	945.68	940.86	4.82	196.001	
900.00	900.00	900.00	900.00	3.56	1.89	-159.63	-886.55	-329.16	945.68	940.22	5.46	173.252	
1,000.00	1,000.00	1,000.00	1,000.00	3.99	2.10	-159.63	-886.55	-329.16	945.68	939.59	6.09	155.235	
1,100.00	1,100.00	1,100.00	1,100.00	4.41	2.31	-159.63	-886.55	-329.16	945.68	938.96	6.73	140.612	
1,200.00	1,200.00	1,200.00	1,200.00	4.83	2.52	-159.63	-886.55	-329.16	945.68	938.32	7.36	128.507	
1,300.00	1,300.00	1,300.00	1,300.00	5.26	2.74	-159.63	-886.55	-329.16	945.68	937.69	7.99	118.321	CC, ES
1,400.00	1,399.95	1,399.95	1,399.95	5.68	2.95	-159.65	-886.55	-329.16	947.99	939.37	8.63	109.892	
1,500.00	1,499.54	1,499.54	1,499.54	6.11	3.16	-159.73	-886.55	-329.16	956.38	947.12	9.26	103.229	
1,600.00	1,598.32	1,598.32	1,598.32	6.54	3.36	-159.86	-886.55	-329.16	970.89	960.98	9.90	98.025	
1,700.00	1,695.88	1,695.88	1,695.88	7.01	3.57	-160.02	-886.55	-329.16	991.48	980.94	10.54	94.027	
1,800.00	1,791.81	1,791.81	1,791.81	7.54	3.77	-160.21	-886.55	-329.16	1,018.12	1,006.94	11.18	91.028	
1,900.00	1,885.68	1,885.68	1,885.68	8.15	3.97	-160.42	-886.55	-329.16	1,050.74	1,038.92	11.82	88.862	
2,000.00	1,977.10	1,977.10	1,977.10	8.87	4.16	-160.61	-886.55	-329.16	1,089.25	1,076.79	12.46	87.404	
2,100.00	2,065.68	2,065.68	2,065.68	9.71	4.35	-160.78	-886.55	-329.16	1,133.54	1,120.44	13.10	86.553	
2,200.00	2,151.04	2,151.04	2,151.04	10.70	4.53	-160.90	-886.55	-329.16	1,183.45	1,169.73	13.72	86.233	SF
2,300.00	2,232.81	2,232.81	2,232.81	11.83	4.70	-160.96	-886.55	-329.16	1,238.82	1,224.48	14.34	86.382	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Project:	San Juan County, NM	**TVD Reference:**	rig @ 6170.00ft
Reference Site:	Allison Unit #152H	**MD Reference:**	rig @ 6170.00ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Horz	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Allison Unit #152H Offsets - Allison Unit #100 - Allison Unit #100 - Allison Unit #100

Offset Site Error: 0.00 ft

Survey Program: 2780-MWD

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
3,700.00	2,726.44	2,726.44	2,726.44	37.09	5.74	92.64	2,669.49	387.52	1,200.88	1,178.01	22.87	52.502	
3,800.00	2,724.69	2,724.69	2,724.69	39.33	5.73	92.94	2,669.49	387.52	1,106.72	1,082.64	24.07	45.972	
3,900.00	2,722.60	2,722.60	2,722.60	41.60	5.73	93.14	2,669.49	387.52	1,013.67	988.06	25.61	39.582	
4,000.00	2,720.15	2,720.15	2,720.15	43.91	5.72	93.24	2,669.49	387.52	922.09	894.52	27.57	33.445	
4,100.00	2,717.44	2,717.44	2,717.44	46.24	5.72	92.97	2,669.49	387.52	832.44	802.37	30.07	27.682	
4,200.00	2,714.72	2,714.72	2,714.72	48.59	5.71	92.54	2,669.49	387.52	745.42	712.16	33.25	22.416	
4,300.00	2,712.23	2,712.23	2,712.23	50.85	5.71	91.94	2,669.49	387.52	661.15	624.01	37.14	17.803	
4,400.00	2,710.14	2,710.14	2,710.14	53.11	5.70	91.39	2,669.49	387.52	580.20	538.33	41.87	13.859	
4,500.00	2,708.44	2,708.44	2,708.44	55.39	5.70	90.91	2,669.49	387.52	504.24	456.66	47.58	10.597	
4,600.00	2,707.14	2,707.14	2,707.14	57.67	5.70	90.51	2,669.49	387.52	435.96	381.68	54.28	8.032	
4,700.00	2,706.24	2,706.24	2,706.24	59.95	5.69	90.22	2,669.49	387.52	379.59	318.16	61.43	6.179	
4,800.00	2,705.74	2,705.74	2,705.74	62.23	5.69	90.05	2,669.49	387.52	341.14	273.75	67.39	5.063	
4,900.00	2,705.63	2,705.63	2,705.63	64.51	5.69	90.00	2,669.49	387.52	327.02	257.59	69.43	4.710	ES, SF
4,901.58	2,705.63	2,705.63	2,705.63	64.54	5.69	90.00	2,669.49	387.52	327.02	257.60	69.42	4.711	CC
5,000.00	2,705.93	2,705.93	2,705.93	66.78	5.69	90.08	2,669.49	387.52	340.29	274.19	66.10	5.148	
5,100.00	2,706.62	2,706.62	2,706.62	69.05	5.70	90.28	2,669.49	387.52	378.06	318.98	59.08	6.399	
5,200.00	2,707.69	2,707.69	2,707.69	71.32	5.70	90.54	2,669.49	387.52	434.10	382.91	51.19	8.480	
5,300.00	2,708.79	2,708.79	2,708.79	73.61	5.70	90.67	2,669.49	387.52	503.56	459.36	44.19	11.394	
5,400.00	2,709.76	2,709.76	2,709.76	75.93	5.70	90.72	2,669.49	387.52	581.91	543.35	38.56	15.089	
5,500.00	2,710.57	2,710.57	2,710.57	78.26	5.70	90.72	2,669.49	387.52	666.03	631.85	34.18	19.484	
5,600.00	2,711.23	2,711.23	2,711.23	80.60	5.70	90.67	2,669.49	387.52	753.98	723.18	30.80	24.478	
5,700.00	2,711.74	2,711.74	2,711.74	82.96	5.71	90.57	2,669.49	387.52	844.57	816.38	28.19	29.960	
5,800.00	2,712.11	2,712.11	2,712.11	85.33	5.71	90.42	2,669.49	387.52	937.03	910.87	26.16	35.816	
5,900.00	2,712.32	2,712.32	2,712.32	87.70	5.71	90.23	2,669.49	387.52	1,030.86	1,006.28	24.58	41.937	
6,000.00	2,712.38	2,712.38	2,712.38	90.09	5.71	89.98	2,669.49	387.52	1,125.72	1,102.37	23.34	48.226	
6,100.00	2,712.30	2,712.30	2,712.30	92.49	5.71	89.68	2,669.49	387.52	1,221.36	1,198.99	22.37	54.600	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Project:	San Juan County, NM	**TVD Reference:**	rig @ 6170.00ft
Reference Site:	Allison Unit #152H	**MD Reference:**	rig @ 6170.00ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Horz	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Offset Design Allison Unit #152H Offsets - Allison Unit #100s - Allison #100s - Allison #100s — **Offset Site Error:** 0.00 ft

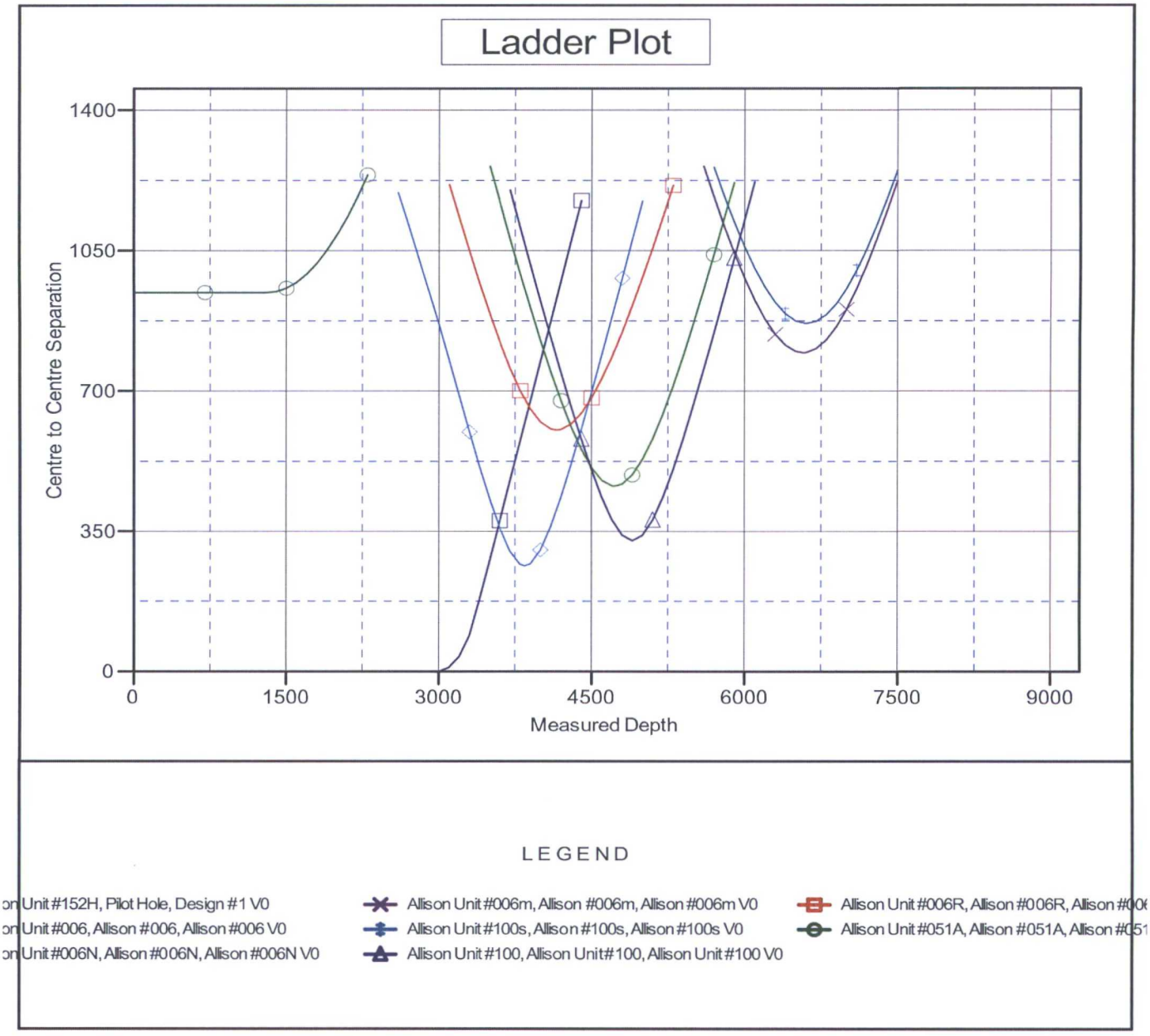
Survey Program: 2780-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,700.00	2,711.74	2,711.74	2,711.74	82.96	5.71	-89.73	4,610.83	-338.48	1,257.98	1,206.09	51.89	24.243	
5,800.00	2,712.11	2,712.11	2,712.11	85.33	5.71	-89.84	4,610.83	-338.48	1,187.30	1,129.90	57.39	20.687	
5,900.00	2,712.32	2,712.32	2,712.32	87.70	5.71	-89.93	4,610.83	-338.48	1,121.18	1,057.75	63.43	17.677	
6,000.00	2,712.38	2,712.38	2,712.38	90.09	5.71	-90.00	4,610.83	-338.48	1,060.47	990.52	69.95	15.161	
6,100.00	2,712.30	2,712.30	2,712.30	92.49	5.71	-90.05	4,610.83	-338.48	1,006.17	929.30	76.87	13.089	
6,200.00	2,712.06	2,712.06	2,712.06	94.90	5.71	-90.08	4,610.83	-338.48	959.36	875.33	84.02	11.418	
6,300.00	2,711.67	2,711.67	2,711.67	97.31	5.71	-90.09	4,610.83	-338.48	921.17	830.02	91.16	10.105	
6,400.00	2,711.14	2,711.14	2,711.14	99.73	5.70	-90.08	4,610.83	-338.48	892.73	794.79	97.94	9.115	
6,500.00	2,710.45	2,710.45	2,710.45	102.16	5.70	-90.05	4,610.83	-338.48	874.97	770.97	104.00	8.413	
6,600.00	2,709.61	2,709.61	2,709.61	104.59	5.70	-90.00	4,610.83	-338.48	868.55	759.57	108.98	7.970	
6,605.34	2,709.57	2,709.57	2,709.57	104.72	5.70	-90.00	4,610.83	-338.48	868.54	759.32	109.21	7.953	CC, ES
6,700.00	2,708.63	2,708.63	2,708.63	107.04	5.70	-89.93	4,610.83	-338.48	873.73	761.09	112.64	7.757	
6,800.00	2,707.49	2,707.49	2,707.49	109.48	5.70	-89.84	4,610.83	-338.48	890.30	775.42	114.88	7.750	SF
6,900.00	2,706.21	2,706.21	2,706.21	111.93	5.69	-89.73	4,610.83	-338.48	917.64	801.88	115.76	7.927	
7,000.00	2,704.77	2,704.77	2,704.77	114.39	5.69	-89.60	4,610.83	-338.48	954.83	839.35	115.48	8.268	
7,100.00	2,703.19	2,703.19	2,703.19	116.85	5.69	-89.45	4,610.83	-338.48	1,000.77	886.49	114.29	8.757	
7,200.00	2,701.45	2,701.45	2,701.45	119.32	5.68	-89.28	4,610.83	-338.48	1,054.32	941.87	112.45	9.376	
7,300.00	2,699.57	2,699.57	2,699.57	121.79	5.68	-89.09	4,610.83	-338.48	1,114.37	1,004.18	110.19	10.113	
7,400.00	2,697.53	2,697.53	2,697.53	124.26	5.68	-88.88	4,610.83	-338.48	1,179.94	1,072.24	107.70	10.956	
7,500.00	2,695.40	2,695.40	2,695.40	126.71	5.67	-88.72	4,610.83	-338.48	1,250.13	1,145.02	105.11	11.894	

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Project:	San Juan County, NM	**TVD Reference:**	rig @ 6170.00ft
Reference Site:	Allison Unit #152H	**MD Reference:**	rig @ 6170.00ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Allison Unit #152H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Horz	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #2	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to rig @ 6170.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #152H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.22°



Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit #152H
Project:	San Juan County, NM	**TVD Reference:**	rig @ 6170.00ft
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Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
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Reference Depths are relative to rig @ 6170.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

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