State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

Heather Riley, 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 3160-3 APD form.

Operator Signature Date: 9/20/2018
Well information;
Operator Hilcorp, Well Name and Number Allison Unit 17H

API# 30-045-35887, Section 21 Township 32 N/S, Range 6 E/W

Conditions of Approval: (See the below checked and handwritten conditions)

- ✓ Notify Aztec OCD 24hrs prior to casing & cement.
- ✓ Hold C-104 for directional survey & "As Drilled" Plat
- o Hold C-104 for NSL, NSP, DHC
- o Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- o Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
  - A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
  - A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
  - A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
- o Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
- o Submit Gas Capture Plan form prior to spudding or initiating recompletion operations
- ✓ 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.

NMOCD Approved by Signature

12.18.18
Date

1220 South St. Francis Drive • Santa Fe, New Mexico 87505
Phone (505) 476-3460 • Fax (505) 476-3462 • www.emnrd.state.nm.us/ocd

Form 3160-3 (June 2015) NMOCD

DEC 04 2018

DISTRICT III

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMSF0081155

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☐ Gas Well ☑ Other CBNG

1c. Type of Completion: ☐ Hydraulic Fracturing ☑ Single Zone ☐ Multiple Zone

7. If Unit or CA Agreement, Name and No.
ALLISON / NMNM078372X

8. Lease Name and Well No.
ALLISON UNIT
117H

2. Name of Operator
HILCORP ENERGY COMPANY

9. API Well No.
30-045-35887

3a. Address
1111 Travis Street Houston TX 77002

3b. Phone No. *(include area code)*
(713)209-2400

10. Field and Pool, or Exploratory
BASIN FRUITLAND COAL

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface D NWNW / 885 FNL / 1233 FWL / LAT 36.970622 / LONG -107.468621

At proposed prod. zone E SWNW / 1718 FNL / 727 FWL / LAT 36.953413 / LONG -107.470846

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 21 / T32N / R6W / NMP

14. Distance in miles and direction from nearest town or post office*
18 miles

12. County or Parish
SAN JUAN

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)
1233 feet

16. No of acres in lease
1872.99

17. Spacing Unit dedicated to this well
480

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
70 feet

19. Proposed Depth
2711 feet / 6300 feet

20. BLM/BIA Bond No. in file
FED: NMB001486

KP

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
6152 feet

22. Approximate date work will start*
04/01/2019

23. Estimated duration
45 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification.
6. Such other site specific information and/or plans as may be requested by the BLM.

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Priscilla Shorty / Ph: (505)324-5188	09/20/2018

Title
Regulatory Technician

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
Title	Office FARMINGTON	

Application approval 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.
Conditions of approval, if any, are attached.

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.

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

This action is subject to technical and procedural review pursuant to 43 CFR 3165.3 and appeal pursuant to 43 CFR 3165.4

DRILLING OPERATIONS AUTHORIZED ARE SUBJECT TO COMPLIANCE WITH ATTACHED "GENERAL REQUIREMENTS"

(Continued on page 2)

*(Instructions on page 2)

NMOCD

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

OIL CONSERVATION DIVISION
1220 South St. Francis Drive
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
30-045-35887	71629	BASIN FRUITLAND COAL

4 Property Code	5 Property Name	6 Well Number
318864	ALLISON UNIT	117H
7 OGRID No.	**8 Operator Name**	**9 Elevation**
372171	HILCORP ENERGY COMPANY	6152'

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	32N	6W		885	NORTH	1233	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
E	28	32N	6W		1718	NORTH	727	WEST	SAN JUAN

12 Dedicated Acres		13 Joint or Infill	14 Consolidation Code	15 Order No.
480.00	W/2 - Section 21 NW/4 - Section 28			

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
885' FNL 1233' FWL
SEC 21, T32N, R6W
LAT: 36.970617 °N
LONG: 107.468016 °W
DATUM: NAD1927

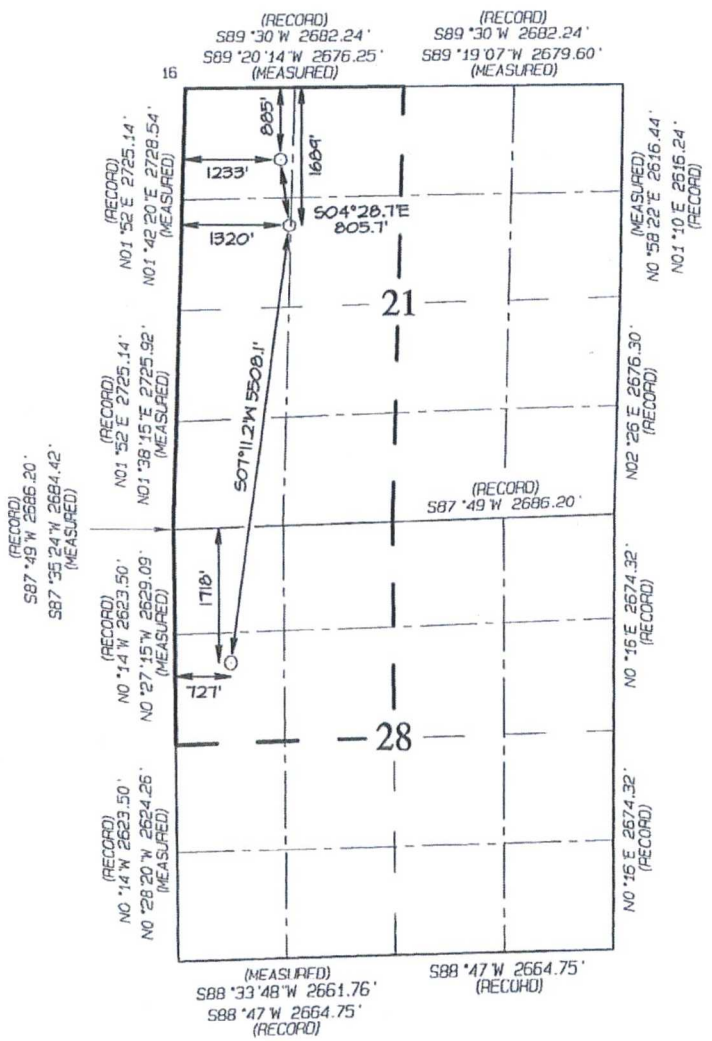
LAT: 36.970622 °N
LONG: 107.468621 °W
DATUM: NAD1983

FIRST TAKE POINT
1689' FNL 1320' FWL
SEC 21, T32N, R6W
LAT: 36.968410 °N
LONG: 107.467811 °W
DATUM: NAD1927

LAT: 36.968416 °N
LONG: 107.468416 °W
DATUM: NAD1983

BOTTOM-HOLE LOCATION
1718' FNL 727' FWL
SEC 28, T32N, R6W
LAT: 36.953407 °N
LONG: 107.470241 °W
DATUM: NAD1927

LAT: 36.953413 °N
LONG: 107.470846 °W
DATUM: NAD1983



17 OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom-hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Priscilla Shorty 9/19/18
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.

Date Revised: SEPTEMBER 17, 2018
Date of Survey: AUGUST 4, 2018

Signature and Seal of Professional Surveyor

JASON C. EDWARDS
NEW MEXICO
15269
REGISTERED PROFESSIONAL SURVEYOR

JASON C. EDWARDS
Certificate Number 15269

Hilcorp Energy Company

Hilcorp Energy Company

Technical Plan

1. Location

Allison 117H
SHL: 885' FNL, 1233' FWL, Sec 21, T32N, R6W
Lat-1 BHL: 1718' FNL, 727' FWL, Sec 28, T32N, R6W
GL: 6152'

2. Geological Markers

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

Formation	Depth (TVD)	Remarks
Ojo Alamo	2015'	Wet
Kirtland	2151'	Wet
Fruitland	2495'	Possible Gas/Water
Pictured Cliffs	2846'	Wet

See attached directional plan for anticipated formation tops in measured depth.

Regional formation tops based on new drill tops (Allison unit 152H) ; NMOCD approved these tops post drill

3. Pressure Control Equipment

See Attached BOPE & 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 designed 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				
Casing	**Hole Size**	**Casing Size**	**Weight/Grade**	**Depth**
Surface	12-1/4"	9-5/8"	32.3# H-40	0' - 500' (MD)
Intermediate	8-3/4"	7"	23# L-80	0' – 3,367.56' (MD)
Prod Liner (predrilled)	6-1/4"	4-1/2"	11.6# J-55/L-80	3,026' – 8,535.28' (MD)

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

A whipstock will be run, and a window will be cut in the 7" casing above the target coal seam to allow for the lateral to be drilled.

First Take Point / Whipstock / casing exit depth is:
Lat1 – 3,016.8' MD / 2,697.76' TVD.

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 shoe and the window / casing exit will be set inside the setback boundary line.

B) The proposed cement program is shown below:

Cement Program						
Interval	**Depth (MD)**	**Sacks**	**Slurry**	**Excess**	**Volume**	**Planned Cement Top**
Surface	500'	265	Lead Cmt: Varicem Cement 2% Calcium Chloride, pellet 0.1250 lbm/sk Poly-E-Flake 1.18 ft3 / sk - 5.24 gal/sk 15.8 ppg	100%	313 ft^3	Surface
Intermediate	3,367.56'	360	Lead Cmt: Varicem Cement 0.3% Super CBL 0.3 % FE-2 5 lbm/sk Kol-Seal 0.125 lbm/sk Poly-E-Flake 2.11 ft3 / sk – 11.25 gal/sk 12.9 ppg	50%	760 ft^3	Surface
Production		N/A	N/A – Open hole with pre-drilled liner	N/A	N/A	N/A

Actual cement volumes will be determined and may be adjusted onsite based on well conditions. For the intermediate hole, 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) Closed loop equipment will be utilized for solids control. Cuttings from surface, intermediate, and production hole will be hauled to an approved disposal site.

6. Abnormal Pressures & Hazards

- No over-pressured intervals expected.
- Estimated Reservoir Pressure = 1500 psi.
- Maximum anticipated surface pressure = 1,300 psi
- There is some offset Fruitland Coal and Mesa Verde production within the area which could result in these respective formations being under pressured.
- No hydrogen sulfide gas is expected based on nearby well production.

7. Intermediate Hole Section / Pilot Hole

- The intermediate or "pilot" hole section will be drilled through the target Fruitland coal seam.
- GR will be run in the BHA and will be used in conjunction with mud logger data to determine the exact TVD depth of the target coal seam.
- 7" casing will be run completely through the interval, and cemented to surface.

8. Testing, Logging, Coring

Testing, Logging, Coring Procedure		
Evaluation Method	**Start Depth**	**End depth**
Mud Logs	Fruitland Coal Top	TD
MWD Directional Surveys	KOP	TD
LWD GR	7" window	TD
Temp Survey	If needed on intermediate casing	

9. Directional Plan

The planned wellbore directional plan and plot is attached.

The planned directional plan is built off 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.

Hilcorp

Hilcorp Energy Company

San Juan Co., NM (NAD27)
Sec.21-T32N-R06W
Allison Unit 117H

Lat 1
Rev2

Anticollision Report

19 September, 2018

KOLTEK
ENERGY SERVICES

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lat 1	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Reference	Rev2		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.00 usft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 09/19/18

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	3,016.80	Rev2 (Pilot Hole)	MWD	MWD - Standard
3,016.80	8,535.17	Rev2 (Lat 1)	MWD	MWD - Standard

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Sec.21-T32N-R06W						
Allison Unit 051 - Original Hole - Original Hole	5,565.44	3,086.45	413.59	323.22	4.577	CC, ES
Allison Unit 051 - Original Hole - Original Hole	5,600.00	3,086.61	415.03	324.04	4.561	SF
Allison Unit 051A - Original Hole - Original Hole	3,111.92	2,969.39	467.25	439.78	17.008	CC, ES
Allison Unit 051A - Original Hole - Original Hole	3,250.00	2,993.68	479.76	450.66	16.488	SF
Allison Unit 117H - Pilot Hole - Rev2	3,016.80	3,016.80	0.00	0.00	10,000.000	CC
Allison Unit 117H - Pilot Hole - Rev2	3,033.26	3,033.25	0.24	-0.04	0.843	Level 1, ES, SF
Allison Unit 117S - Original Hole - Original Hole	3,573.69	2,996.91	254.05	173.53	3.155	CC, ES, SF

Offset Design Sec.21-T32N-R06W - Allison Unit 051 - Original Hole - Original Hole — **Offset Site Error:** 0.00 usft

Survey Program: 216-INC_ONLY<10 — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	315.00	315.00	0.00	1.95	177.13	-3,376.79	169.55	3,381.04				
100.00	100.00	415.00	415.00	0.10	2.89	177.13	-3,376.79	169.55	3,381.04	3,378.05	2.99	1,130.926	
200.00	200.00	520.00	520.00	0.32	3.88	177.13	-3,376.79	169.55	3,381.04	3,376.84	4.20	804.204	
207.10	207.10	520.00	520.00	0.34	3.88	177.13	-3,376.79	169.55	3,381.04	3,376.82	4.22	801.163	
300.00	300.00	609.49	609.49	0.55	4.94	177.13	-3,376.96	169.55	3,381.21	3,375.73	5.48	616.867	
400.00	400.00	711.61	711.61	0.77	6.14	177.13	-3,377.09	169.55	3,381.35	3,374.44	6.91	489.568	
500.00	500.00	813.73	813.73	0.99	7.34	177.13	-3,377.16	169.55	3,381.42	3,373.08	8.33	405.819	
600.00	600.00	915.85	915.85	1.22	8.54	177.13	-3,377.17	169.55	3,381.42	3,371.66	9.76	346.535	
700.00	700.00	1,017.97	1,017.97	1.44	9.74	177.13	-3,377.11	169.55	3,381.37	3,370.18	11.18	302.359	
800.00	800.00	1,120.08	1,120.08	1.67	10.94	177.13	-3,376.99	169.55	3,381.25	3,368.64	12.61	268.166	
900.00	900.00	1,230.00	1,230.00	1.89	12.23	177.13	-3,376.79	169.55	3,381.07	3,366.95	14.13	239.352	
1,000.00	1,000.00	1,320.37	1,320.37	2.12	13.30	177.13	-3,376.62	169.55	3,380.87	3,365.46	15.42	219.270	
1,100.00	1,100.00	1,418.20	1,418.20	2.34	14.46	177.13	-3,376.49	169.55	3,380.75	3,363.95	16.80	201.238	
1,200.00	1,200.00	1,516.04	1,516.04	2.57	15.61	177.13	-3,376.43	169.55	3,380.68	3,362.50	18.18	185.948	
1,247.99	1,247.99	1,562.99	1,562.99	2.68	16.17	177.13	-3,376.42	169.55	3,380.68	3,361.83	18.84	179.407	
1,300.00	1,300.00	1,613.88	1,613.87	2.79	16.77	177.13	-3,376.43	169.55	3,380.69	3,361.12	19.56	172.820	
1,400.00	1,400.00	1,711.72	1,711.71	3.02	17.93	177.13	-3,376.50	169.55	3,380.75	3,359.81	20.94	161.426	
1,436.41	1,436.41	1,747.34	1,747.33	3.10	18.35	177.13	-3,376.53	169.55	3,380.79	3,359.34	21.45	157.643	
1,500.00	1,499.98	1,809.54	1,809.53	3.22	19.08	1.61	-3,376.62	169.55	3,379.43	3,357.12	22.31	151.497	

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lat 1	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 051 - Original Hole - Original Hole — **Offset Site Error:** 0.00 usft

Survey Program: 216-INC_ONLY<10 — **Offset Well Error:** 0.00 usft

Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
1,600.00	1,599.62	1,914.63	1,914.62	3.40	20.28	1.62	-3,376.79	169.55	3,371.43	3,347.85	23.58	142.987	
1,700.00	1,698.42	2,013.44	2,013.42	3.60	21.20	1.65	-3,376.79	169.55	3,356.14	3,331.68	24.46	137.217	
1,800.00	1,795.87	2,110.88	2,110.87	3.83	22.11	1.69	-3,376.79	169.55	3,333.78	3,308.59	25.20	132.315	
1,900.00	1,891.46	2,206.47	2,206.46	4.15	23.00	1.74	-3,376.79	169.55	3,304.49	3,278.71	25.78	128.194	
2,000.00	1,984.69	2,299.70	2,299.69	4.58	23.87	1.81	-3,376.79	169.55	3,268.41	3,242.21	26.19	124.780	
2,100.00	2,075.09	2,400.00	2,399.99	5.13	24.80	1.90	-3,376.79	169.55	3,225.73	3,199.21	26.52	121.628	
2,200.00	2,162.18	2,471.63	2,471.61	5.82	25.65	2.00	-3,376.93	169.55	3,176.79	3,150.18	26.62	119.361	
2,300.00	2,245.53	2,556.64	2,556.63	6.65	26.65	2.14	-3,377.05	169.55	3,121.72	3,095.03	26.69	116.960	
2,400.00	2,324.68	2,637.34	2,637.32	7.62	27.61	2.30	-3,377.14	169.55	3,060.75	3,034.20	26.56	115.247	
2,500.00	2,399.25	2,713.30	2,713.29	8.72	28.51	2.51	-3,377.18	169.55	2,994.23	2,968.01	26.22	114.202	
2,600.00	2,468.83	2,784.14	2,784.12	9.94	29.34	2.77	-3,377.19	169.55	2,922.48	2,896.81	25.68	113.824	
2,700.00	2,533.08	2,849.48	2,849.46	11.28	30.11	3.10	-3,377.17	169.55	2,845.90	2,820.96	24.94	114.125	
2,800.00	2,591.65	2,908.99	2,908.97	12.71	30.82	3.53	-3,377.13	169.55	2,764.88	2,740.87	24.02	115.123	
2,900.00	2,644.25	2,962.36	2,962.35	14.23	31.45	4.09	-3,377.07	169.55	2,679.86	2,656.92	22.94	116.819	
3,000.00	2,690.60	3,009.33	3,009.32	15.83	32.00	4.86	-3,377.01	169.55	2,591.27	2,569.52	21.75	119.130	
3,013.62	2,696.42	3,015.22	3,015.20	16.05	32.07	4.99	-3,377.00	169.55	2,578.96	2,557.38	21.59	119.479	
3,016.80	2,697.76	3,016.58	3,016.57	16.11	32.09	4.99	-3,377.00	169.55	2,576.07	2,554.46	21.61	119.190	
3,050.00	2,711.01	3,029.98	3,029.97	16.55	32.25	1.40	-3,376.98	169.55	2,545.62	2,525.82	19.80	128.568	
3,100.00	2,727.91	3,047.07	3,047.05	17.09	32.45	-5.93	-3,376.95	169.55	2,498.56	2,480.67	17.89	139.662	
3,150.00	2,741.06	3,060.32	3,060.31	17.68	32.60	-17.50	-3,376.93	169.55	2,450.38	2,429.51	20.87	117.420	
3,200.00	2,750.34	3,069.65	3,069.63	18.30	32.71	-37.01	-3,376.92	169.55	2,401.44	2,368.62	32.82	73.176	
3,250.00	2,755.68	3,074.98	3,074.97	18.95	32.78	-66.18	-3,376.91	169.55	2,352.14	2,304.33	47.81	49.195	
3,292.19	2,757.10	3,076.34	3,076.33	19.51	32.79	-90.59	-3,376.90	169.55	2,310.55	2,258.54	52.01	44.425	
3,304.19	2,757.14	3,076.36	3,076.34	19.67	32.79	-88.61	-3,376.90	169.55	2,298.74	2,246.55	52.20	44.040	
3,400.00	2,757.74	3,076.79	3,076.78	20.94	32.80	-88.67	-3,376.90	169.55	2,204.56	2,151.07	53.49	41.216	
3,500.00	2,758.37	3,077.24	3,077.23	22.37	32.80	-88.74	-3,376.90	169.55	2,106.42	2,051.48	54.94	38.338	
3,600.00	2,759.00	3,077.69	3,077.68	23.85	32.81	-88.80	-3,376.90	169.55	2,008.46	1,952.01	56.45	35.577	
3,700.00	2,759.63	3,078.15	3,078.13	25.39	32.81	-88.86	-3,376.90	169.55	1,910.72	1,852.71	58.01	32.937	
3,800.00	2,760.26	3,078.60	3,078.58	26.96	32.82	-88.92	-3,376.90	169.55	1,813.22	1,753.62	59.61	30.421	
3,900.00	2,760.88	3,079.04	3,079.03	28.57	32.83	-88.99	-3,376.90	169.55	1,716.01	1,654.78	61.23	28.025	
4,000.00	2,761.51	3,079.49	3,079.48	30.20	32.83	-89.05	-3,376.90	169.55	1,619.14	1,556.25	62.88	25.748	
4,100.00	2,762.14	3,079.94	3,079.93	31.86	32.84	-89.11	-3,376.90	169.55	1,522.67	1,458.11	64.56	23.586	
4,200.00	2,762.77	3,080.39	3,080.37	33.54	32.84	-89.17	-3,376.90	169.55	1,426.69	1,360.44	66.25	21.534	
4,300.00	2,763.40	3,080.84	3,080.82	35.23	32.85	-89.23	-3,376.90	169.55	1,331.30	1,263.34	67.96	19.589	
4,400.00	2,764.02	3,081.28	3,081.27	36.95	32.85	-89.30	-3,376.89	169.55	1,236.64	1,166.95	69.69	17.746	
4,500.00	2,764.65	3,081.73	3,081.72	38.67	32.86	-89.36	-3,376.89	169.55	1,142.89	1,071.47	71.42	16.002	
4,600.00	2,765.28	3,082.18	3,082.16	40.40	32.86	-89.42	-3,376.89	169.55	1,050.29	977.12	73.17	14.355	
4,700.00	2,765.91	3,082.62	3,082.61	42.15	32.87	-89.48	-3,376.89	169.55	959.18	884.26	74.92	12.802	
4,800.00	2,766.54	3,083.07	3,083.05	43.90	32.87	-89.54	-3,376.89	169.55	870.02	793.34	76.69	11.345	
4,900.00	2,767.16	3,083.51	3,083.50	45.66	32.88	-89.61	-3,376.89	169.55	783.49	705.03	78.46	9.986	
5,000.00	2,767.79	3,083.95	3,083.94	47.43	32.88	-89.67	-3,376.89	169.55	700.55	620.32	80.23	8.731	
5,100.00	2,768.42	3,084.40	3,084.38	49.21	32.89	-89.73	-3,376.89	169.55	622.64	540.63	82.02	7.592	
5,200.00	2,769.05	3,084.84	3,084.83	50.99	32.89	-89.79	-3,376.89	169.55	551.91	468.10	83.80	6.586	
5,300.00	2,769.68	3,085.28	3,085.27	52.77	32.90	-89.85	-3,376.89	169.55	491.44	405.84	85.60	5.741	
5,400.00	2,770.31	3,085.72	3,085.71	54.56	32.90	-89.91	-3,376.89	169.55	445.45	358.06	87.39	5.097	
5,500.00	2,770.93	3,086.17	3,086.15	56.35	32.91	-89.97	-3,376.89	169.55	418.74	329.54	89.19	4.695	
5,565.44	2,771.34	3,086.45	3,086.44	57.53	32.91	-90.01	-3,376.88	169.55	413.59	323.22	90.37	4.577	CC, ES
5,600.00	2,771.56	3,086.61	3,086.59	58.15	32.91	-90.03	-3,376.88	169.55	415.03	324.04	91.00	4.561	SF
5,700.00	2,772.19	3,087.05	3,087.03	59.95	32.92	-90.10	-3,376.88	169.55	434.93	342.13	92.80	4.687	
5,800.00	2,772.82	3,087.49	3,087.47	61.75	32.93	-90.16	-3,376.88	169.55	475.47	380.86	94.61	5.025	
5,900.00	2,773.45	3,087.93	3,087.91	63.56	32.93	-90.22	-3,376.88	169.55	531.96	435.54	96.43	5.517	
6,000.00	2,774.07	3,088.36	3,088.35	65.37	32.94	-90.28	-3,376.88	169.55	599.91	501.67	98.24	6.107	

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 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lat 1	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 051 - Original Hole - Original Hole

Offset Site Error: 0.00 usft

Survey Program: 216-INC_ONLY<10

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
6,100.00	2,774.70	3,088.80	3,088.79	67.18	32.94	-90.34	-3,376.88	169.55	675.88	575.82	100.06	6.755	
6,200.00	2,775.33	3,089.24	3,089.22	68.99	32.95	-90.40	-3,376.88	169.55	757.44	655.57	101.88	7.435	
6,300.00	2,775.96	3,089.68	3,089.66	70.80	32.95	-90.46	-3,376.88	169.55	842.99	739.29	103.70	8.129	
6,400.00	2,776.59	3,090.11	3,090.10	72.62	32.96	-90.52	-3,376.88	169.55	931.42	825.90	105.52	8.827	
6,500.00	2,777.22	3,090.55	3,090.53	74.44	32.96	-90.58	-3,376.88	169.55	1,021.98	914.64	107.34	9.521	
6,600.00	2,777.84	3,090.98	3,090.97	76.26	32.97	-90.64	-3,376.88	169.55	1,114.16	1,004.99	109.17	10.206	
6,700.00	2,778.47	3,091.42	3,091.40	78.08	32.97	-90.70	-3,376.88	169.55	1,207.59	1,096.59	110.99	10.880	
6,800.00	2,779.10	3,091.85	3,091.84	79.90	32.98	-90.76	-3,376.87	169.55	1,301.99	1,189.17	112.82	11.540	
6,900.00	2,779.73	3,092.29	3,092.27	81.72	32.98	-90.82	-3,376.87	169.55	1,397.17	1,282.52	114.65	12.187	
7,000.00	2,780.36	3,092.72	3,092.71	83.55	32.99	-90.88	-3,376.87	169.55	1,492.98	1,376.50	116.48	12.818	
7,100.00	2,780.98	3,093.15	3,093.14	85.37	32.99	-90.94	-3,376.87	169.55	1,589.31	1,471.00	118.31	13.434	
7,200.00	2,781.61	3,093.59	3,093.57	87.20	33.00	-91.00	-3,376.87	169.55	1,686.06	1,565.92	120.14	14.034	
7,300.00	2,782.24	3,094.02	3,094.00	89.03	33.00	-91.06	-3,376.87	169.55	1,783.17	1,661.20	121.97	14.620	
7,400.00	2,782.87	3,094.45	3,094.43	90.86	33.01	-91.12	-3,376.87	169.55	1,880.59	1,756.79	123.80	15.190	
7,500.00	2,783.50	3,094.88	3,094.87	92.69	33.01	-91.18	-3,376.87	169.55	1,978.26	1,852.63	125.63	15.746	
7,600.00	2,784.13	3,095.31	3,095.30	94.52	33.02	-91.24	-3,376.87	169.55	2,076.15	1,948.69	127.47	16.288	
7,700.00	2,784.75	3,095.74	3,095.73	96.35	33.02	-91.30	-3,376.87	169.55	2,174.24	2,044.94	129.30	16.815	
7,800.00	2,785.38	3,096.17	3,096.15	98.18	33.03	-91.36	-3,376.87	169.55	2,272.49	2,141.36	131.14	17.329	
7,900.00	2,786.01	3,096.60	3,096.58	100.01	33.03	-91.42	-3,376.87	169.55	2,370.89	2,237.92	132.97	17.830	
8,000.00	2,786.64	3,097.03	3,097.01	101.84	33.04	-91.48	-3,376.86	169.55	2,469.42	2,334.61	134.80	18.318	
8,100.00	2,787.27	3,097.46	3,097.44	103.68	33.04	-91.54	-3,376.86	169.55	2,568.06	2,431.42	136.64	18.794	
8,200.00	2,787.89	3,097.88	3,097.87	105.51	33.05	-91.60	-3,376.86	169.55	2,666.80	2,528.33	138.48	19.258	
8,300.00	2,788.52	3,098.31	3,098.29	107.35	33.05	-91.65	-3,376.86	169.55	2,765.64	2,625.32	140.31	19.711	
8,400.00	2,789.15	3,098.74	3,098.72	109.18	33.06	-91.71	-3,376.86	169.55	2,864.55	2,722.40	142.15	20.152	
8,500.00	2,789.78	3,099.16	3,099.15	111.02	33.06	-91.77	-3,376.86	169.55	2,963.54	2,819.55	143.99	20.582	
8,535.29	2,790.00	3,099.31	3,099.30	111.67	33.06	-91.79	-3,376.86	169.55	2,998.48	2,853.85	144.63	20.732	

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lat 1	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 051A - Original Hole - Original Hole — **Offset Site Error:** 0.00 usft

Survey Program: 8058-INC_ONLY<10 — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	238.00	238.00	0.00	0.82	-155.81	-892.40	-400.90	978.32				
100.00	100.00	338.00	338.00	0.10	1.17	-155.81	-892.40	-400.90	978.32	977.05	1.27	772.806	
200.00	200.00	438.00	438.00	0.32	1.52	-155.81	-892.40	-400.90	978.32	976.48	1.84	532.589	
300.00	300.00	538.00	538.00	0.55	1.86	-155.81	-892.40	-400.90	978.32	975.91	2.41	406.297	
400.00	400.00	638.00	638.00	0.77	2.21	-155.81	-892.40	-400.90	978.32	975.34	2.98	328.419	
500.00	500.00	738.00	738.00	0.99	2.56	-155.81	-892.40	-400.90	978.32	974.77	3.55	275.594	
600.00	600.00	838.00	838.00	1.22	2.90	-155.81	-892.40	-400.90	978.32	974.20	4.12	237.408	
700.00	700.00	938.00	938.00	1.44	3.25	-155.81	-892.40	-400.90	978.32	973.63	4.69	208.516	
800.00	800.00	1,038.00	1,038.00	1.67	3.59	-155.81	-892.40	-400.90	978.32	973.06	5.26	185.893	
900.00	900.00	1,138.00	1,138.00	1.89	3.94	-155.81	-892.40	-400.90	978.32	972.48	5.83	167.699	
1,000.00	1,000.00	1,238.00	1,238.00	2.12	4.29	-155.81	-892.40	-400.90	978.32	971.91	6.40	152.749	
1,100.00	1,100.00	1,338.00	1,338.00	2.34	4.63	-155.81	-892.40	-400.90	978.32	971.34	6.98	140.246	
1,200.00	1,200.00	1,438.00	1,438.00	2.57	4.98	-155.81	-892.40	-400.90	978.32	970.77	7.55	129.635	
1,300.00	1,300.00	1,538.00	1,538.00	2.79	5.32	-155.81	-892.40	-400.90	978.32	970.20	8.12	120.517	
1,400.00	1,400.00	1,638.00	1,638.00	3.02	5.67	-155.81	-892.40	-400.90	978.32	969.63	8.69	112.597	
1,436.41	1,436.41	1,674.41	1,674.41	3.10	5.80	-155.81	-892.40	-400.90	978.32	969.42	8.90	109.966	
1,500.00	1,499.98	1,737.98	1,737.98	3.22	6.02	28.74	-892.40	-400.90	977.04	967.73	9.31	104.947	
1,600.00	1,599.62	1,837.62	1,837.62	3.40	6.36	29.11	-892.40	-400.90	969.89	959.98	9.92	97.812	
1,700.00	1,698.42	1,936.42	1,936.42	3.60	6.70	29.83	-892.40	-400.90	956.53	946.03	10.50	91.080	
1,800.00	1,795.87	2,033.87	2,033.87	3.83	7.04	30.93	-892.40	-400.90	937.12	926.04	11.07	84.632	
1,900.00	1,891.46	2,129.46	2,129.46	4.15	7.37	32.43	-892.40	-400.90	911.87	900.23	11.64	78.330	
2,000.00	1,984.69	2,222.69	2,222.69	4.58	7.70	34.41	-892.40	-400.90	881.12	868.88	12.23	72.034	
2,100.00	2,075.09	2,313.09	2,313.09	5.13	8.01	36.93	-892.40	-400.90	845.28	832.40	12.88	65.619	
2,200.00	2,162.18	2,400.18	2,400.18	5.82	8.31	40.08	-892.40	-400.90	804.91	791.27	13.64	59.010	
2,300.00	2,245.53	2,483.53	2,483.53	6.65	8.60	43.95	-892.40	-400.90	760.73	746.17	14.57	52.221	
2,400.00	2,324.68	2,562.68	2,562.68	7.62	8.87	48.62	-892.40	-400.90	713.67	697.95	15.72	45.395	
2,500.00	2,399.25	2,637.25	2,637.25	8.72	9.13	54.10	-892.40	-400.90	664.94	647.80	17.14	38.800	
2,600.00	2,468.83	2,706.83	2,706.83	9.94	9.37	60.34	-892.40	-400.90	616.18	597.37	18.81	32.765	
2,700.00	2,533.08	2,771.08	2,771.08	11.28	9.59	67.10	-892.40	-400.90	569.55	548.90	20.65	27.577	
2,800.00	2,591.65	2,829.65	2,829.65	12.71	9.80	74.02	-892.40	-400.90	527.90	505.34	22.55	23.405	
2,900.00	2,644.25	2,882.25	2,882.25	14.23	9.98	80.62	-892.40	-400.90	494.80	470.41	24.39	20.286	
3,000.00	2,690.60	2,928.60	2,928.60	15.83	10.14	86.43	-892.40	-400.90	474.28	448.18	26.10	18.169	
3,013.62	2,696.42	2,934.42	2,934.42	16.05	10.16	87.13	-892.40	-400.90	472.67	446.34	26.33	17.953	
3,016.80	2,697.76	2,935.76	2,935.76	16.11	10.16	87.28	-892.40	-400.90	472.34	445.96	26.38	17.905	
3,050.00	2,711.01	2,949.01	2,949.01	16.55	10.21	88.37	-892.40	-400.90	469.49	442.65	26.83	17.497	
3,100.00	2,727.91	2,965.91	2,965.91	17.09	10.27	89.74	-892.40	-400.90	467.34	439.99	27.34	17.090	
3,111.92	2,731.39	2,969.39	2,969.39	17.23	10.28	90.00	-892.40	-400.90	467.25	439.78	27.47	17.008	CC, ES
3,150.00	2,741.06	2,979.06	2,979.06	17.68	10.31	90.64	-892.40	-400.90	468.17	440.25	27.91	16.773	
3,200.00	2,750.34	2,988.34	2,988.34	18.30	10.35	90.99	-892.40	-400.90	472.27	443.77	28.50	16.570	
3,250.00	2,755.68	2,993.68	2,993.68	18.95	10.36	90.72	-892.40	-400.90	479.76	450.66	29.10	16.488	SF
3,292.19	2,757.10	2,995.10	2,995.10	19.51	10.37	90.00	-892.40	-400.90	488.65	459.06	29.59	16.513	
3,304.19	2,757.14	2,995.14	2,995.14	19.67	10.37	90.10	-892.40	-400.90	491.64	461.89	29.75	16.526	
3,400.00	2,757.74	2,995.74	2,995.74	20.94	10.37	90.17	-892.40	-400.90	524.83	493.79	31.04	16.908	
3,500.00	2,758.37	2,996.37	2,996.37	22.37	10.37	90.25	-892.40	-400.90	574.67	542.18	32.49	17.686	
3,600.00	2,759.00	2,997.00	2,997.00	23.85	10.38	90.32	-892.40	-400.90	636.43	602.43	34.00	18.718	
3,700.00	2,759.63	2,997.63	2,997.63	25.39	10.38	90.40	-892.40	-400.90	706.99	671.43	35.56	19.884	
3,800.00	2,760.26	2,998.26	2,998.26	26.96	10.38	90.47	-892.40	-400.90	783.98	746.83	37.15	21.104	
3,900.00	2,760.88	2,998.88	2,998.88	28.57	10.38	90.55	-892.40	-400.90	865.69	826.92	38.77	22.328	
4,000.00	2,761.51	2,999.51	2,999.51	30.20	10.38	90.62	-892.40	-400.90	950.90	910.48	40.42	23.525	
4,100.00	2,762.14	3,000.14	3,000.14	31.86	10.39	90.70	-892.40	-400.90	1,038.75	996.66	42.09	24.678	
4,200.00	2,762.77	3,000.77	3,000.77	33.54	10.39	90.78	-892.40	-400.90	1,128.62	1,084.84	43.78	25.778	
4,300.00	2,763.40	3,001.40	3,001.40	35.23	10.39	90.85	-892.40	-400.90	1,220.07	1,174.58	45.49	26.821	

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 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lat 1	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 051A - Original Hole - Original Hole — **Offset Site Error:** 0.00 usft

Survey Program: 8058-INC_ONLY<10 — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,400.00	2,764.02	3,002.02	3,002.02	36.95	10.39	90.93	-892.40	-400.90	1,312.77	1,265.56	47.21	27.807	
4,500.00	2,764.65	3,002.65	3,002.65	38.67	10.40	91.00	-892.40	-400.90	1,406.47	1,357.52	48.94	28.737	
4,600.00	2,765.28	3,003.28	3,003.28	40.40	10.40	91.08	-892.40	-400.90	1,500.98	1,450.29	50.69	29.614	
4,700.00	2,765.91	3,003.91	3,003.91	42.15	10.40	91.16	-892.40	-400.90	1,596.16	1,543.72	52.44	30.439	
4,800.00	2,766.54	3,004.54	3,004.54	43.90	10.40	91.23	-892.40	-400.90	1,691.89	1,637.70	54.20	31.217	
4,900.00	2,767.16	3,005.16	3,005.16	45.66	10.40	91.31	-892.40	-400.90	1,788.10	1,732.13	55.96	31.951	
5,000.00	2,767.79	3,005.79	3,005.79	47.43	10.41	91.38	-892.40	-400.90	1,884.69	1,826.96	57.74	32.643	
5,100.00	2,768.42	3,006.42	3,006.42	49.21	10.41	91.46	-892.40	-400.90	1,981.63	1,922.11	59.52	33.296	
5,200.00	2,769.05	3,007.05	3,007.05	50.99	10.41	91.53	-892.40	-400.90	2,078.85	2,017.56	61.30	33.914	
5,300.00	2,769.68	3,007.68	3,007.68	52.77	10.41	91.61	-892.40	-400.90	2,176.33	2,113.24	63.09	34.498	
5,400.00	2,770.31	3,008.31	3,008.31	54.56	10.42	91.69	-892.40	-400.90	2,274.03	2,209.15	64.88	35.051	
5,500.00	2,770.93	3,008.93	3,008.93	56.35	10.42	91.76	-892.40	-400.90	2,371.91	2,305.24	66.67	35.575	
5,600.00	2,771.56	3,009.56	3,009.56	58.15	10.42	91.84	-892.40	-400.90	2,469.97	2,401.50	68.47	36.073	
5,700.00	2,772.19	3,010.19	3,010.19	59.95	10.42	91.91	-892.40	-400.90	2,568.18	2,497.90	70.27	36.546	
5,800.00	2,772.82	3,010.82	3,010.82	61.75	10.42	91.99	-892.40	-400.90	2,666.52	2,594.44	72.08	36.996	
5,900.00	2,773.45	3,011.45	3,011.45	63.56	10.43	92.06	-892.40	-400.90	2,764.97	2,691.09	73.88	37.424	
6,000.00	2,774.07	3,012.07	3,012.07	65.37	10.43	92.14	-892.40	-400.90	2,863.54	2,787.85	75.69	37.832	
6,100.00	2,774.70	3,012.70	3,012.70	67.18	10.43	92.22	-892.40	-400.90	2,962.20	2,884.70	77.50	38.222	
6,200.00	2,775.33	3,013.33	3,013.33	68.99	10.43	92.29	-892.40	-400.90	3,060.95	2,981.64	79.31	38.594	
6,300.00	2,775.96	3,013.96	3,013.96	70.80	10.43	92.37	-892.40	-400.90	3,159.77	3,078.65	81.13	38.949	
6,400.00	2,776.59	3,014.59	3,014.59	72.62	10.44	92.44	-892.40	-400.90	3,258.67	3,175.73	82.94	39.290	
6,500.00	2,777.22	3,015.22	3,015.22	74.44	10.44	92.52	-892.40	-400.90	3,357.64	3,272.88	84.76	39.616	
6,600.00	2,777.84	3,015.84	3,015.84	76.26	10.44	92.59	-892.40	-400.90	3,456.66	3,370.09	86.57	39.928	
6,700.00	2,778.47	3,016.47	3,016.47	78.08	10.44	92.67	-892.40	-400.90	3,555.74	3,467.34	88.39	40.227	
6,800.00	2,779.10	3,017.10	3,017.10	79.90	10.45	92.75	-892.40	-400.90	3,654.86	3,564.65	90.21	40.515	
6,900.00	2,779.73	3,017.73	3,017.73	81.72	10.45	92.82	-892.40	-400.90	3,754.04	3,662.01	92.03	40.792	
7,000.00	2,780.36	3,018.36	3,018.36	83.55	10.45	92.90	-892.40	-400.90	3,853.25	3,759.40	93.85	41.057	
7,100.00	2,780.98	3,018.98	3,018.98	85.37	10.45	92.97	-892.40	-400.90	3,952.51	3,856.84	95.67	41.313	
7,200.00	2,781.61	3,019.61	3,019.61	87.20	10.45	93.05	-892.40	-400.90	4,051.80	3,954.31	97.49	41.560	
7,300.00	2,782.24	3,020.24	3,020.24	89.03	10.46	93.12	-892.40	-400.90	4,151.13	4,051.81	99.32	41.797	
7,400.00	2,782.87	3,020.87	3,020.87	90.86	10.46	93.20	-892.40	-400.90	4,250.48	4,149.35	101.14	42.026	
7,500.00	2,783.50	3,021.50	3,021.50	92.69	10.46	93.28	-892.40	-400.90	4,349.87	4,246.91	102.96	42.247	
7,600.00	2,784.13	3,022.13	3,022.13	94.52	10.46	93.35	-892.40	-400.90	4,449.29	4,344.50	104.79	42.461	
7,700.00	2,784.75	3,022.75	3,022.75	96.35	10.47	93.43	-892.40	-400.90	4,548.73	4,442.12	106.61	42.667	
7,800.00	2,785.38	3,023.38	3,023.38	98.18	10.47	93.50	-892.40	-400.90	4,648.19	4,539.76	108.43	42.866	
7,900.00	2,786.01	3,024.01	3,024.01	100.01	10.47	93.58	-892.40	-400.90	4,747.68	4,637.42	110.26	43.059	
8,000.00	2,786.64	3,024.64	3,024.64	101.84	10.47	93.65	-892.40	-400.90	4,847.18	4,735.10	112.08	43.246	
8,100.00	2,787.27	3,025.27	3,025.27	103.68	10.47	93.73	-892.40	-400.90	4,946.71	4,832.80	113.91	43.427	
8,200.00	2,787.89	3,025.89	3,025.89	105.51	10.48	93.80	-892.40	-400.90	5,046.26	4,930.52	115.73	43.602	
8,300.00	2,788.52	3,026.52	3,026.52	107.35	10.48	93.88	-892.40	-400.90	5,145.82	5,028.26	117.56	43.772	
8,400.00	2,789.15	3,027.15	3,027.15	109.18	10.48	93.95	-892.40	-400.90	5,245.40	5,126.02	119.38	43.937	
8,500.00	2,789.78	3,027.78	3,027.78	111.02	10.48	94.03	-892.40	-400.90	5,344.99	5,223.79	121.21	44.097	
8,535.29	2,790.00	3,028.00	3,028.00	111.67	10.48	94.06	-892.40	-400.90	5,380.14	5,258.29	121.85	44.153	

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lat 1	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 117H - Pilot Hole - Rev2 — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
3,016.80	2,697.76	3,016.80	2,697.76	0.00	0.00	0.00	-803.14	62.93	0.00	0.00	0.00	N/A CC	
3,033.26	2,704.53	3,033.25	2,704.72	0.22	0.27	-153.75	-818.00	64.09	0.24	-0.04	0.28	0.843	Level 1, ES, SF
3,050.00	2,711.01	3,049.98	2,711.79	0.44	0.55	-154.06	-833.12	65.28	0.96	0.40	0.56	1.718	
3,100.00	2,727.91	3,099.71	2,732.80	0.99	1.37	-154.83	-878.05	68.80	6.03	4.81	1.22	4.934	
3,150.00	2,741.06	3,148.80	2,753.55	1.57	2.19	-155.41	-922.41	72.27	15.41	13.52	1.89	8.160	
3,200.00	2,750.34	3,196.89	2,773.88	2.20	2.99	-155.80	-965.86	75.68	29.04	26.52	2.52	11.508	
3,250.00	2,755.68	3,243.61	2,793.62	2.85	3.78	-156.02	-1,008.07	78.98	46.81	43.69	3.11	15.042	
3,292.19	2,757.10	3,281.71	2,809.72	3.42	4.41	-156.07	-1,042.49	81.68	64.92	61.36	3.56	18.243	
3,304.19	2,757.14	3,292.36	2,814.22	3.58	4.59	-156.13	-1,052.12	82.43	70.43	66.71	3.72	18.936	
3,400.00	2,757.74	3,367.56	2,846.00	4.86	5.86	-156.01	-1,120.06	87.76	114.68	109.75	4.93	23.253	
3,500.00	2,758.37	3,367.56	2,846.00	6.29	5.86	-156.01	-1,120.06	87.76	188.10	182.50	5.60	33.587	
3,600.00	2,759.00	3,367.56	2,846.00	7.79	5.86	-156.01	-1,120.06	87.76	278.59	272.26	6.33	44.044	
3,700.00	2,759.63	3,367.56	2,846.00	9.34	5.86	-156.01	-1,120.06	87.76	373.95	366.85	7.11	52.625	
3,800.00	2,760.26	3,367.56	2,846.00	11.34	5.86	-156.01	-1,120.06	87.76	471.24	463.23	8.01	58.823	
3,900.00	2,760.88	3,367.56	2,846.00	13.16	5.86	-156.01	-1,120.06	87.76	569.47	560.60	8.88	64.153	
4,000.00	2,761.51	3,367.56	2,846.00	14.90	5.86	-156.01	-1,120.06	87.76	668.23	658.48	9.75	68.527	
4,100.00	2,762.14	3,367.56	2,846.00	16.63	5.86	-156.01	-1,120.06	87.76	767.30	756.67	10.64	72.121	
4,200.00	2,762.77	3,367.56	2,846.00	18.35	5.86	-156.01	-1,120.06	87.76	866.59	855.05	11.54	75.096	
4,300.00	2,763.40	3,367.56	2,846.00	20.07	5.86	-156.01	-1,120.06	87.76	966.03	953.58	12.45	77.581	
4,400.00	2,764.02	3,367.56	2,846.00	21.79	5.86	-156.01	-1,120.06	87.76	1,065.57	1,052.20	13.37	79.676	
4,500.00	2,764.65	3,367.56	2,846.00	23.53	5.86	-156.01	-1,120.06	87.76	1,165.19	1,150.89	14.30	81.456	
4,600.00	2,765.28	3,367.56	2,846.00	25.27	5.86	-156.01	-1,120.06	87.76	1,264.87	1,249.63	15.24	82.982	
4,700.00	2,765.91	3,367.56	2,846.00	27.02	5.86	-156.01	-1,120.06	87.76	1,364.60	1,348.41	16.19	84.300	
4,800.00	2,766.54	3,367.56	2,846.00	28.77	5.86	-156.01	-1,120.06	87.76	1,464.36	1,447.23	17.14	85.446	
4,900.00	2,767.16	3,367.56	2,846.00	30.53	5.86	-156.01	-1,120.06	87.76	1,564.16	1,546.06	18.09	86.450	
5,000.00	2,767.79	3,367.56	2,846.00	32.30	5.86	-156.01	-1,120.06	87.76	1,663.98	1,644.92	19.05	87.335	
5,100.00	2,768.42	3,367.56	2,846.00	34.07	5.86	-156.01	-1,120.06	87.76	1,763.82	1,743.80	20.02	88.118	
5,200.00	2,769.05	3,367.56	2,846.00	35.85	5.86	-156.01	-1,120.06	87.76	1,863.67	1,842.69	20.98	88.817	
5,300.00	2,769.68	3,367.56	2,846.00	37.63	5.86	-156.01	-1,120.06	87.76	1,963.54	1,941.59	21.95	89.442	
5,400.00	2,770.31	3,367.56	2,846.00	39.42	5.86	-156.01	-1,120.06	87.76	2,063.43	2,040.50	22.93	90.004	
5,500.00	2,770.93	3,367.56	2,846.00	41.21	5.86	-156.01	-1,120.06	87.76	2,163.32	2,139.42	23.90	90.511	
5,600.00	2,771.56	3,367.56	2,846.00	43.00	5.86	-156.01	-1,120.06	87.76	2,263.23	2,238.35	24.88	90.971	
5,700.00	2,772.19	3,367.56	2,846.00	44.80	5.86	-156.01	-1,120.06	87.76	2,363.14	2,337.28	25.86	91.390	
5,800.00	2,772.82	3,367.56	2,846.00	46.60	5.86	-156.01	-1,120.06	87.76	2,463.06	2,436.22	26.84	91.772	
5,900.00	2,773.45	3,367.56	2,846.00	48.40	5.86	-156.01	-1,120.06	87.76	2,562.98	2,535.16	27.82	92.123	
6,000.00	2,774.07	3,367.56	2,846.00	50.20	5.86	-156.01	-1,120.06	87.76	2,662.91	2,634.11	28.81	92.444	
6,100.00	2,774.70	3,367.56	2,846.00	52.01	5.86	-156.01	-1,120.06	87.76	2,762.85	2,733.06	29.79	92.741	
6,200.00	2,775.33	3,367.56	2,846.00	53.82	5.86	-156.01	-1,120.06	87.76	2,862.79	2,832.01	30.78	93.015	
6,300.00	2,775.96	3,367.56	2,846.00	55.63	5.86	-156.01	-1,120.06	87.76	2,962.74	2,930.97	31.77	93.269	
6,400.00	2,776.59	3,367.56	2,846.00	57.45	5.86	-156.01	-1,120.06	87.76	3,062.68	3,029.93	32.75	93.504	
6,500.00	2,777.22	3,367.56	2,846.00	59.26	5.86	-156.01	-1,120.06	87.76	3,162.63	3,128.89	33.74	93.723	
6,600.00	2,777.84	3,367.56	2,846.00	61.08	5.86	-156.01	-1,120.06	87.76	3,262.59	3,227.85	34.74	93.928	
6,700.00	2,778.47	3,367.56	2,846.00	62.90	5.86	-156.01	-1,120.06	87.76	3,362.55	3,326.82	35.73	94.119	
6,800.00	2,779.10	3,367.56	2,846.00	64.72	5.86	-156.01	-1,120.06	87.76	3,462.51	3,425.79	36.72	94.298	
6,900.00	2,779.73	3,367.56	2,846.00	66.54	5.86	-156.01	-1,120.06	87.76	3,562.47	3,524.76	37.71	94.465	
7,000.00	2,780.36	3,367.56	2,846.00	68.36	5.86	-156.01	-1,120.06	87.76	3,662.43	3,623.73	38.71	94.623	
7,100.00	2,780.98	3,367.56	2,846.00	70.18	5.86	-156.01	-1,120.06	87.76	3,762.40	3,722.70	39.70	94.771	
7,200.00	2,781.61	3,367.56	2,846.00	72.01	5.86	-156.01	-1,120.06	87.76	3,862.36	3,821.67	40.69	94.911	
7,300.00	2,782.24	3,367.56	2,846.00	73.83	5.86	-156.01	-1,120.06	87.76	3,962.33	3,920.64	41.69	95.042	
7,400.00	2,782.87	3,367.56	2,846.00	75.66	5.86	-156.01	-1,120.06	87.76	4,062.30	4,019.62	42.69	95.167	
7,500.00	2,783.50	3,367.56	2,846.00	77.49	5.86	-156.01	-1,120.06	87.76	4,162.28	4,118.59	43.68	95.285	
7,600.00	2,784.13	3,367.56	2,846.00	79.32	5.86	-156.01	-1,120.06	87.76	4,262.25	4,217.57	44.68	95.397	

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 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lat 1	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 117H - Pilot Hole - Rev2

Offset Site Error: 0.00 usft

Survey Program: 0-MWD

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,700.00	2,784.75	3,367.56	2,846.00	81.14	5.86	-156.01	-1,120.06	87.76	4,362.23	4,316.55	45.68	95.503	
7,800.00	2,785.38	3,367.56	2,846.00	82.97	5.86	-156.01	-1,120.06	87.76	4,462.20	4,415.53	46.67	95.604	
7,900.00	2,786.01	3,367.56	2,846.00	84.81	5.86	-156.01	-1,120.06	87.76	4,562.18	4,514.51	47.67	95.699	
8,000.00	2,786.64	3,367.56	2,846.00	86.64	5.86	-156.01	-1,120.06	87.76	4,662.16	4,613.49	48.67	95.791	
8,100.00	2,787.27	3,367.56	2,846.00	88.47	5.86	-156.01	-1,120.06	87.76	4,762.13	4,712.47	49.67	95.878	
8,200.00	2,787.89	3,367.56	2,846.00	90.30	5.86	-156.01	-1,120.06	87.76	4,862.11	4,811.45	50.67	95.960	
8,300.00	2,788.52	3,367.56	2,846.00	92.13	5.86	-156.01	-1,120.06	87.76	4,962.09	4,910.43	51.67	96.040	
8,400.00	2,789.15	3,367.56	2,846.00	93.97	5.86	-156.01	-1,120.06	87.76	5,062.08	5,009.41	52.67	96.115	
8,500.00	2,789.78	3,367.56	2,846.00	95.80	5.86	-156.01	-1,120.06	87.76	5,162.06	5,108.39	53.67	96.188	
8,535.29	2,790.00	3,367.56	2,846.00	96.45	5.86	-156.01	-1,120.06	87.76	5,197.34	5,143.32	54.02	96.213	

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lat 1	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 117S - Original Hole - Original Hole — **Offset Site Error:** 0.00 usft

Survey Program: 60-INC_ONLY<10 — **Offset Well Error:** 0.00 usft

Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	240.19	240.19	0.00	3.76	168.94	-1,380.96	269.98	1,407.11				
100.00	100.00	337.11	337.10	0.10	5.73	168.94	-1,380.92	269.98	1,407.06	1,401.24	5.83	241.470	
200.00	200.00	434.04	434.02	0.32	7.71	168.94	-1,381.09	269.98	1,407.24	1,399.21	8.03	175.335	
300.00	300.00	538.02	538.00	0.55	9.59	168.94	-1,381.32	269.98	1,407.46	1,397.33	10.13	138.898	
400.00	400.00	638.02	638.00	0.77	11.04	168.94	-1,381.32	269.98	1,407.46	1,395.65	11.81	119.217	
500.00	500.00	738.02	738.00	0.99	12.48	168.94	-1,381.32	269.98	1,407.46	1,393.98	13.48	104.421	
600.00	600.00	838.02	838.00	1.22	13.93	168.94	-1,381.32	269.98	1,407.46	1,392.31	15.15	92.892	
700.00	700.00	938.02	938.00	1.44	15.38	168.94	-1,381.32	269.98	1,407.46	1,390.63	16.82	83.656	
800.00	800.00	1,038.03	1,038.00	1.67	16.83	168.94	-1,381.32	269.98	1,407.46	1,388.96	18.50	76.082	
900.00	900.00	1,138.03	1,138.00	1.89	18.28	168.94	-1,381.32	269.98	1,407.46	1,387.28	20.18	69.758	
1,000.00	1,000.00	1,238.03	1,238.00	2.12	19.73	168.94	-1,381.32	269.98	1,407.46	1,385.61	21.85	64.405	
1,100.00	1,100.00	1,338.03	1,338.00	2.34	21.19	168.94	-1,381.32	269.98	1,407.46	1,383.93	23.53	59.815	
1,200.00	1,200.00	1,438.03	1,438.00	2.57	22.64	168.94	-1,381.32	269.98	1,407.46	1,382.25	25.21	55.835	
1,300.00	1,300.00	1,538.03	1,538.00	2.79	24.09	168.94	-1,381.32	269.98	1,407.46	1,380.57	26.88	52.352	
1,400.00	1,400.00	1,638.03	1,638.00	3.02	25.55	168.94	-1,381.32	269.98	1,407.46	1,378.90	28.56	49.276	
1,436.41	1,436.41	1,674.44	1,674.41	3.10	26.07	168.94	-1,381.32	269.98	1,407.46	1,378.28	29.17	48.244	
1,500.00	1,499.98	1,738.01	1,737.98	3.22	27.00	-6.59	-1,381.32	269.98	1,406.01	1,375.80	30.21	46.534	
1,600.00	1,599.62	1,837.66	1,837.62	3.40	28.45	-6.67	-1,381.32	269.98	1,397.91	1,366.22	31.69	44.112	
1,700.00	1,698.42	1,936.46	1,936.42	3.60	29.88	-6.82	-1,381.32	269.98	1,382.71	1,349.73	32.99	41.919	
1,800.00	1,795.87	2,028.76	2,028.72	3.83	31.39	-7.04	-1,381.44	269.98	1,360.63	1,326.47	34.16	39.827	
1,900.00	1,891.46	2,126.70	2,126.66	4.15	33.38	-7.35	-1,381.73	269.98	1,331.82	1,296.22	35.60	37.412	
2,000.00	1,984.69	2,222.12	2,222.08	4.58	35.32	-7.77	-1,381.86	269.98	1,296.11	1,259.36	36.75	35.268	
2,100.00	2,075.09	2,314.52	2,314.47	5.13	37.19	-8.31	-1,381.83	269.98	1,253.72	1,216.12	37.60	33.342	
2,200.00	2,162.18	2,403.37	2,403.33	5.82	39.00	-9.01	-1,381.66	269.98	1,204.89	1,166.74	38.15	31.586	
2,300.00	2,245.53	2,500.00	2,499.96	6.65	40.96	-9.98	-1,381.32	269.98	1,149.97	1,111.37	38.59	29.796	
2,400.00	2,324.68	2,559.36	2,559.31	7.62	42.87	-10.98	-1,381.55	269.98	1,089.64	1,050.88	38.75	28.117	
2,500.00	2,399.25	2,635.66	2,635.60	8.72	45.32	-12.44	-1,381.73	269.98	1,023.99	984.83	39.17	26.144	
2,600.00	2,468.83	2,706.67	2,706.61	9.94	47.60	-14.37	-1,381.80	269.98	953.23	913.87	39.36	24.219	
2,700.00	2,533.08	2,772.03	2,771.97	11.28	49.70	-16.93	-1,381.77	269.98	877.80	838.24	39.56	22.188	
2,800.00	2,591.65	2,831.41	2,831.35	12.71	51.61	-20.40	-1,381.68	269.98	798.20	758.00	40.21	19.853	
2,900.00	2,644.25	2,884.53	2,884.46	14.23	53.32	-25.18	-1,381.53	269.98	715.00	672.98	42.03	17.013	
3,000.00	2,690.60	2,939.00	2,938.93	15.83	55.07	-32.52	-1,381.32	269.98	628.90	582.16	46.74	13.455	
3,013.62	2,696.42	2,939.00	2,938.93	16.05	55.07	-33.08	-1,381.32	269.98	616.94	569.90	47.04	13.116	
3,016.80	2,697.76	2,939.00	2,938.93	16.11	55.07	-33.08	-1,381.32	269.98	614.15	567.08	47.07	13.048	
3,050.00	2,711.01	2,949.08	2,949.01	16.55	55.46	-40.31	-1,381.32	269.98	584.95	533.18	51.76	11.300	
3,100.00	2,727.91	2,965.99	2,965.91	17.09	56.11	-52.69	-1,381.32	269.98	540.63	480.20	60.43	8.946	
3,150.00	2,741.06	2,979.13	2,979.06	17.68	56.61	-65.16	-1,381.32	269.98	496.47	428.25	68.22	7.277	
3,200.00	2,750.34	2,988.41	2,988.34	18.30	56.97	-76.19	-1,381.32	269.98	453.23	379.93	73.30	6.183	
3,250.00	2,755.68	2,993.76	2,993.68	18.95	57.17	-84.80	-1,381.32	269.98	411.84	336.12	75.72	5.439	
3,292.19	2,757.10	2,995.18	2,995.10	19.51	57.23	-90.00	-1,381.32	269.98	379.18	302.73	76.45	4.960	
3,304.19	2,757.14	2,995.21	2,995.14	19.67	57.23	-89.62	-1,381.32	269.98	370.37	293.75	76.62	4.834	
3,400.00	2,757.74	2,995.82	2,995.74	20.94	57.25	-89.75	-1,381.32	269.98	307.75	229.82	77.93	3.949	
3,500.00	2,758.37	2,996.44	2,996.37	22.37	57.28	-89.90	-1,381.32	269.98	264.52	185.12	79.40	3.332	
3,573.69	2,758.83	2,996.91	2,996.83	23.46	57.29	-90.00	-1,381.32	269.98	254.05	173.53	80.53	3.155	CC, ES, SF
3,600.00	2,759.00	2,997.07	2,997.00	23.85	57.30	-90.04	-1,381.32	269.98	255.41	174.48	80.93	3.156	
3,700.00	2,759.63	2,997.70	2,997.63	25.39	57.32	-90.18	-1,381.32	269.98	283.72	201.22	82.50	3.439	
3,800.00	2,760.26	2,998.33	2,998.26	26.96	57.35	-90.32	-1,381.32	269.98	340.23	256.12	84.11	4.045	
3,900.00	2,760.88	2,998.96	2,998.88	28.57	57.37	-90.46	-1,381.32	269.98	413.54	327.78	85.76	4.822	
4,000.00	2,761.51	2,999.59	2,999.51	30.20	57.40	-90.60	-1,381.32	269.98	496.26	408.84	87.43	5.676	
4,100.00	2,762.14	3,000.21	3,000.14	31.86	57.42	-90.75	-1,381.32	269.98	584.41	495.29	89.12	6.558	
4,200.00	2,762.77	3,000.84	3,000.77	33.54	57.44	-90.89	-1,381.32	269.98	675.86	585.04	90.83	7.441	
4,300.00	2,763.40	3,001.47	3,001.40	35.23	57.47	-91.03	-1,381.32	269.98	769.45	676.89	92.55	8.314	

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 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lat 1	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 117S - Original Hole - Original Hole

Offset Site Error: 0.00 usft

Survey Program: 60-INC_ONLY<10

Offset Well Error: 0.00 usft

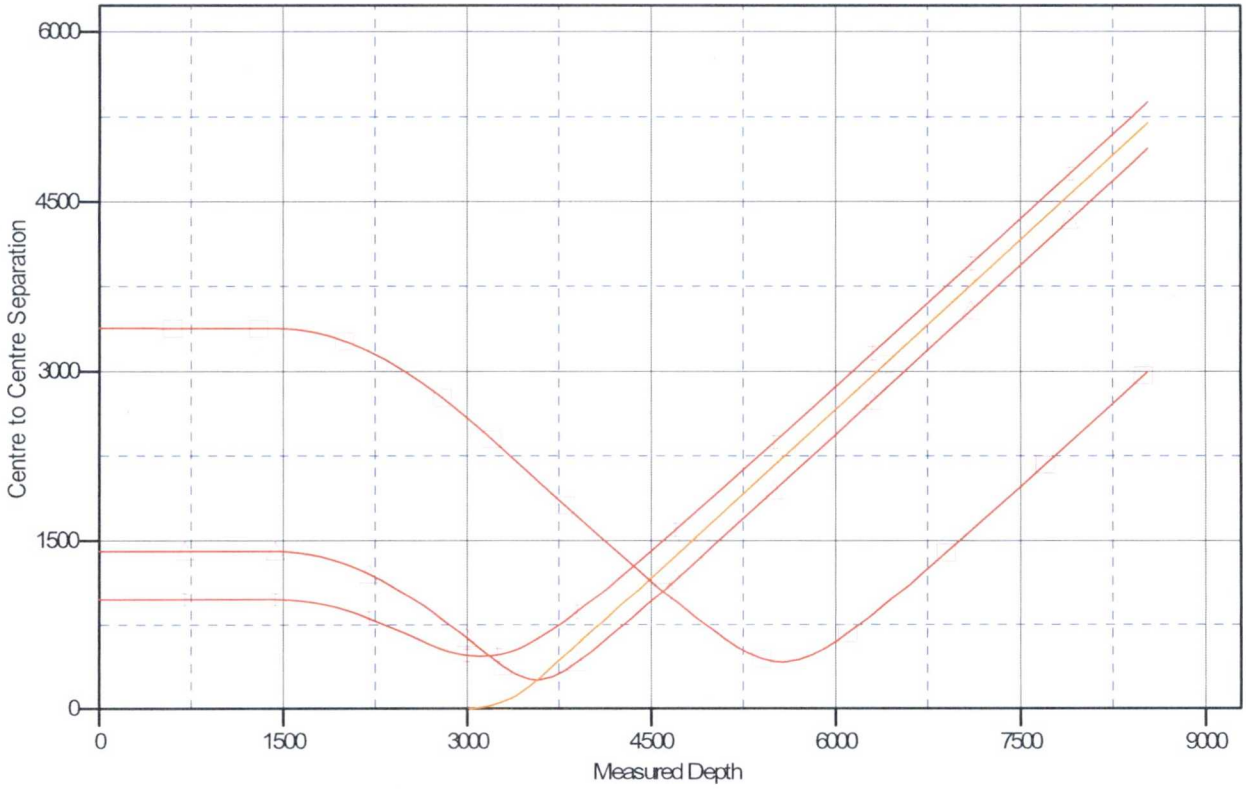
Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,400.00	2,764.02	3,002.10	3,002.02	36.95	57.49	-91.17	-1,381.32	269.98	864.47	770.18	94.29	9.168	
4,500.00	2,764.65	3,002.73	3,002.65	38.67	57.52	-91.31	-1,381.32	269.98	960.50	864.46	96.04	10.001	
4,600.00	2,765.28	3,003.35	3,003.28	40.40	57.54	-91.45	-1,381.32	269.98	1,057.27	959.47	97.80	10.810	
4,700.00	2,765.91	3,003.98	3,003.91	42.15	57.57	-91.60	-1,381.32	269.98	1,154.59	1,055.02	99.57	11.596	
4,800.00	2,766.54	3,004.61	3,004.54	43.90	57.59	-91.74	-1,381.32	269.98	1,252.33	1,150.98	101.35	12.357	
4,900.00	2,767.16	3,005.24	3,005.16	45.66	57.61	-91.88	-1,381.32	269.98	1,350.40	1,247.27	103.13	13.094	
5,000.00	2,767.79	3,005.87	3,005.79	47.43	57.64	-92.02	-1,381.32	269.98	1,448.73	1,343.82	104.91	13.809	
5,100.00	2,768.42	3,006.50	3,006.42	49.21	57.66	-92.16	-1,381.32	269.98	1,547.28	1,440.57	106.71	14.500	
5,200.00	2,769.05	3,007.12	3,007.05	50.99	57.69	-92.30	-1,381.32	269.98	1,646.00	1,537.50	108.50	15.170	
5,300.00	2,769.68	3,007.75	3,007.68	52.77	57.71	-92.44	-1,381.32	269.98	1,744.87	1,634.57	110.30	15.819	
5,400.00	2,770.31	3,008.38	3,008.31	54.56	57.73	-92.59	-1,381.32	269.98	1,843.86	1,731.75	112.11	16.447	
5,500.00	2,770.93	3,009.01	3,008.93	56.35	57.76	-92.73	-1,381.32	269.98	1,942.95	1,829.04	113.91	17.056	
5,600.00	2,771.56	3,009.64	3,009.56	58.15	57.78	-92.87	-1,381.32	269.98	2,042.14	1,926.41	115.72	17.647	
5,700.00	2,772.19	3,010.27	3,010.19	59.95	57.81	-93.01	-1,381.32	269.98	2,141.39	2,023.86	117.53	18.220	
5,800.00	2,772.82	3,010.89	3,010.82	61.75	57.83	-93.15	-1,381.32	269.98	2,240.72	2,121.37	119.34	18.775	
5,900.00	2,773.45	3,011.52	3,011.45	63.56	57.85	-93.29	-1,381.32	269.98	2,340.10	2,218.94	121.16	19.314	
6,000.00	2,774.07	3,012.15	3,012.07	65.37	57.88	-93.43	-1,381.32	269.98	2,439.53	2,316.56	122.97	19.838	
6,100.00	2,774.70	3,012.78	3,012.70	67.18	57.90	-93.57	-1,381.32	269.98	2,539.00	2,414.21	124.79	20.346	
6,200.00	2,775.33	3,013.41	3,013.33	68.99	57.93	-93.72	-1,381.32	269.98	2,638.52	2,511.91	126.61	20.841	
6,300.00	2,775.96	3,014.03	3,013.96	70.80	57.95	-93.86	-1,381.32	269.98	2,738.07	2,609.65	128.42	21.321	
6,400.00	2,776.59	3,014.66	3,014.59	72.62	57.98	-94.00	-1,381.32	269.98	2,837.65	2,707.41	130.24	21.788	
6,500.00	2,777.22	3,015.29	3,015.22	74.44	58.00	-94.14	-1,381.32	269.98	2,937.26	2,805.20	132.06	22.242	
6,600.00	2,777.84	2,939.00	2,938.93	76.26	55.07	-77.16	-1,381.32	269.98	3,037.87	2,909.36	128.51	23.640	
6,700.00	2,778.47	2,939.00	2,938.93	78.08	55.07	-77.16	-1,381.32	269.98	3,137.51	3,007.22	130.29	24.081	
6,800.00	2,779.10	2,939.00	2,938.93	79.90	55.07	-77.16	-1,381.32	269.98	3,237.18	3,105.10	132.08	24.510	
6,900.00	2,779.73	2,939.00	2,938.93	81.72	55.07	-77.16	-1,381.32	269.98	3,336.86	3,203.00	133.86	24.928	
7,000.00	2,780.36	2,939.00	2,938.93	83.55	55.07	-77.16	-1,381.32	269.98	3,436.57	3,300.92	135.65	25.334	
7,100.00	2,780.98	2,939.00	2,938.93	85.37	55.07	-77.16	-1,381.32	269.98	3,536.29	3,398.85	137.44	25.730	
7,200.00	2,781.61	2,939.00	2,938.93	87.20	55.07	-77.16	-1,381.32	269.98	3,636.02	3,496.80	139.23	26.116	
7,300.00	2,782.24	2,939.00	2,938.93	89.03	55.07	-77.16	-1,381.32	269.98	3,735.77	3,594.76	141.02	26.492	
7,400.00	2,782.87	2,939.00	2,938.93	90.86	55.07	-77.16	-1,381.32	269.98	3,835.54	3,692.73	142.81	26.858	
7,500.00	2,783.50	2,939.00	2,938.93	92.69	55.07	-77.16	-1,381.32	269.98	3,935.31	3,790.71	144.60	27.215	
7,600.00	2,784.13	2,939.00	2,938.93	94.52	55.07	-77.16	-1,381.32	269.98	4,035.10	3,888.71	146.39	27.564	
7,700.00	2,784.75	2,939.00	2,938.93	96.35	55.07	-77.16	-1,381.32	269.98	4,134.89	3,986.71	148.18	27.904	
7,800.00	2,785.38	2,939.00	2,938.93	98.18	55.07	-77.16	-1,381.32	269.98	4,234.70	4,084.72	149.98	28.235	
7,900.00	2,786.01	2,939.00	2,938.93	100.01	55.07	-77.16	-1,381.32	269.98	4,334.51	4,182.74	151.77	28.559	
8,000.00	2,786.64	2,939.00	2,938.93	101.84	55.07	-77.16	-1,381.32	269.98	4,434.34	4,280.77	153.57	28.875	
8,100.00	2,787.27	2,939.00	2,938.93	103.68	55.07	-77.16	-1,381.32	269.98	4,534.17	4,378.80	155.36	29.184	
8,200.00	2,787.89	2,939.00	2,938.93	105.51	55.07	-77.16	-1,381.32	269.98	4,634.01	4,476.85	157.16	29.486	
8,300.00	2,788.52	2,939.00	2,938.93	107.35	55.07	-77.16	-1,381.32	269.98	4,733.85	4,574.90	158.96	29.781	
8,400.00	2,789.15	2,939.00	2,938.93	109.18	55.07	-77.16	-1,381.32	269.98	4,833.70	4,672.95	160.75	30.069	
8,500.00	2,789.78	2,939.00	2,938.93	111.02	55.07	-77.16	-1,381.32	269.98	4,933.56	4,771.01	162.55	30.351	
8,535.29	2,790.00	2,939.00	2,938.93	111.67	55.07	-77.16	-1,381.32	269.98	4,968.80	4,805.61	163.19	30.449	

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lat 1	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to KB @ 6167.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.833334°W

Coordinates are relative to: Allison Unit 117H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.22°

Ladder Plot



LEGEND

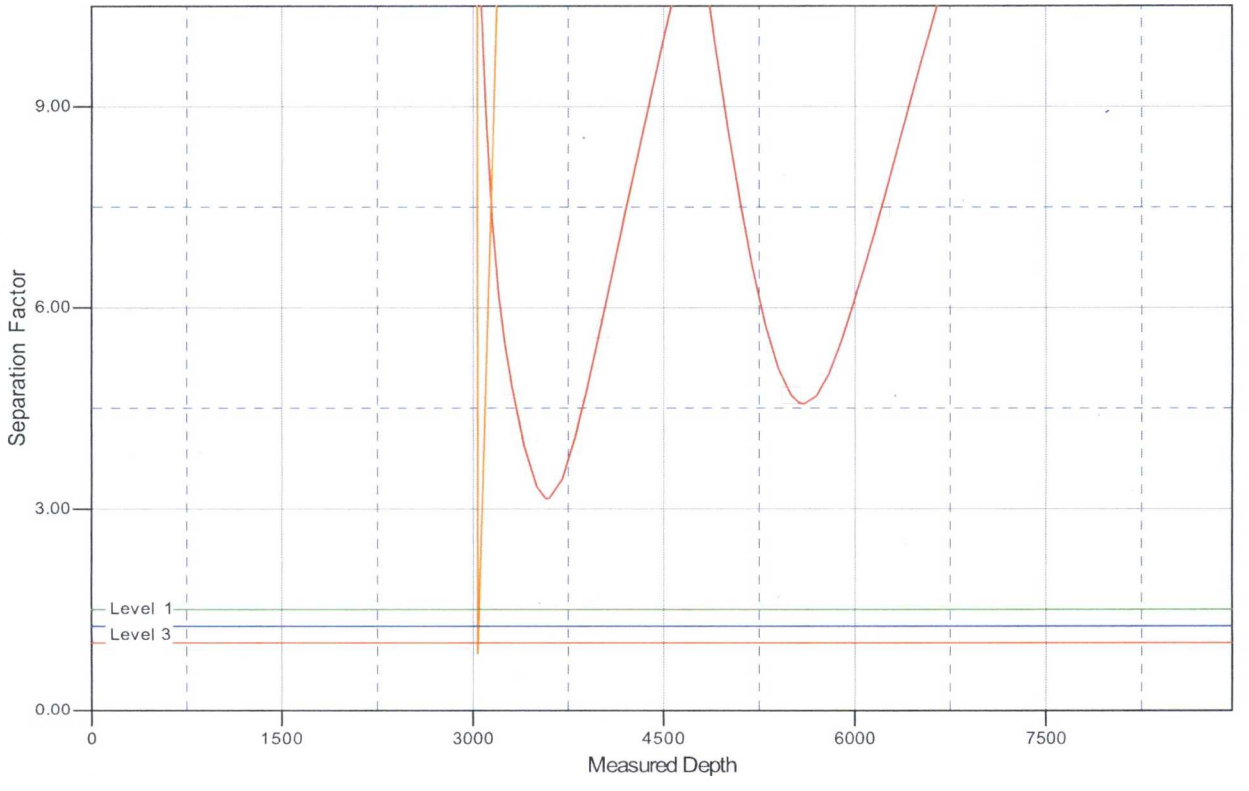
- Allison Unit 117S, Original Hole, Original Hole V0
- Allison Unit 117H, Pilot Hole, Rev2 V0
- Allison Unit 051A, Original Hole, Original Hole V0
- Allison Unit 051, Original Hole, Original Hole V0

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lat 1	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to KB @ 6167.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.833334°W

Coordinates are relative to: Allison Unit 117H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.22°

Separation Factor Plot



LEGEND

- Allison Unit 117S, Original Hole, Original Hole V0
- Allison Unit 117H, Pilot Hole, Rev2 V0
- Allison Unit 051A, Original Hole, Original Hole V0
- Allison Unit 051, Original Hole, Original Hole V0

Company: Hilcorp Energy Company
Field: San Juan Co., NM (NAD27)
Location: Sec.21-T32N-R06W
Well: Allison Unit 117H
Borehole: Lat 1
Plan: Rev2

KOLTEK ENERGY SERVICES

WELL DETAILS: Allison Unit 117H

GL 6152.00 KB @ 6167.00usft

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	2172777.13	606719.46	36.970617°N	107.468016°W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSect
1	3016.80	65.00	175.52	2697.76	-803.14	62.93	0.00	0.00	792.90
2	3292.19	90.00	187.46	2757.10	-1069.22	54.63	10.00	26.58	1058.49
3	3304.19	89.64	187.46	2757.14	-1081.12	53.08	3.00	-180.00	1070.49
4	8535.28	89.64	187.46	2790.00	-6267.83	-626.16	0.00	0.00	6299.03

DESIGN TARGET DETAILS

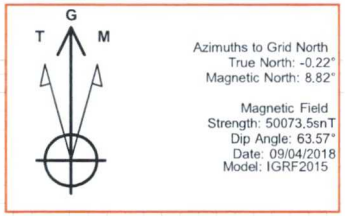
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
Allison Unit 117H FTP	2697.76	-803.14	62.93	36.968410°N	107.467811°W
Allison Unit 117H Toe	2790.00	-6267.83	-626.16	36.953407°N	107.470241°W

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2015.00	2033.16	Ojo Alamo
2151.00	2186.93	Kirtland
2495.00	2639.71	Fruitland
2747.00	3179.47	top of target
2771.00	5510.56	base of target

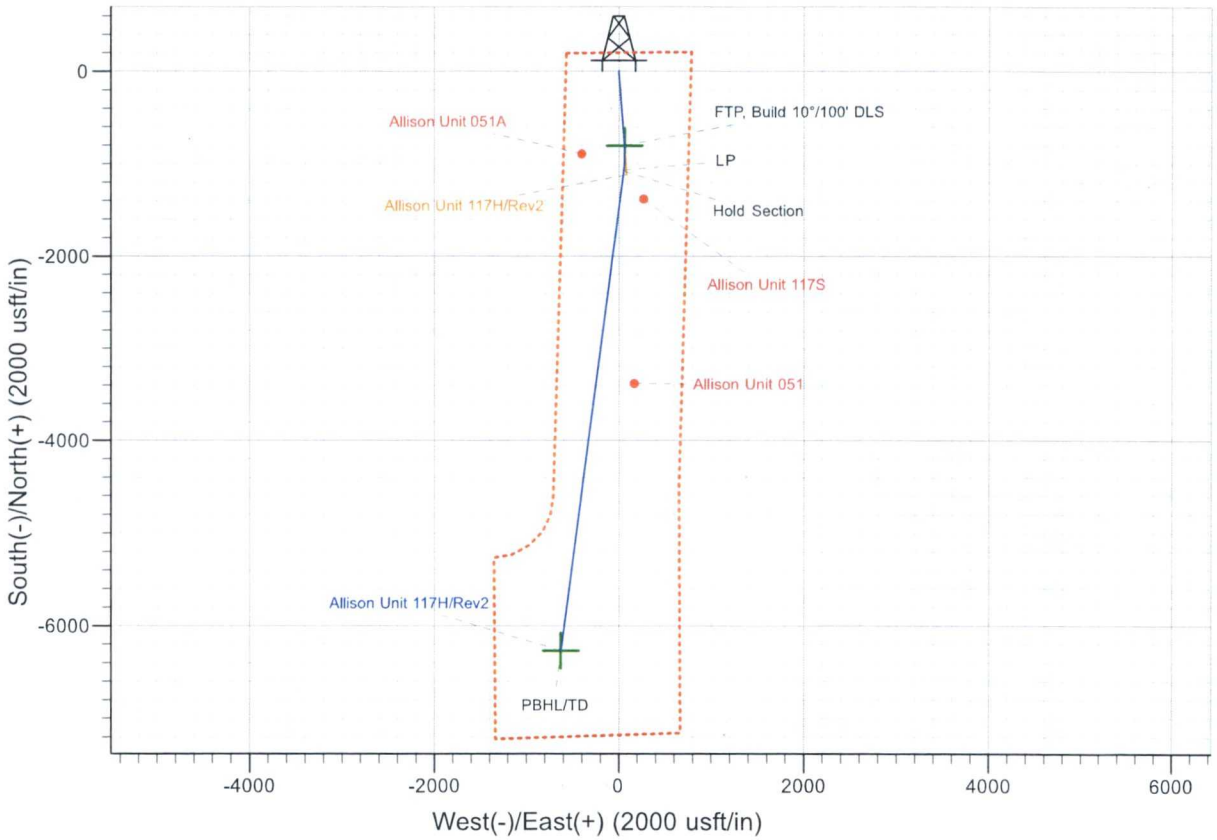
ANNOTATIONS

TVD	MD	Annotation
2697.76	3016.80	FTP, Build 10°/100' DLS
2757.10	3292.19	LP
2757.14	3304.19	Hold Section
2790.00	8535.28	PBHL/TD



Azimuths to Grid North
True North: -0.22°
Magnetic North: 8.82°

Magnetic Field
Strength: 50073.5snT
Dip Angle: 63.57°
Date: 09/04/2018
Model: IGRF2015



Allison Unit 117H	Rev2
Created By: J Rieke	Date: 14:36, September 19 2018

Hilcorp

Hilcorp Energy Company

San Juan Co., NM (NAD27)
Sec.21-T32N-R06W
Allison Unit 117H

Lat 1

Plan: Rev2

Standard Planning Report - Geographic

19 September, 2018

KOLTEK
ENERGY SERVICES

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Company:	Hilcorp Energy Company	**TVD Reference:**	KB @ 6167.00usft
Project:	San Juan Co., NM (NAD27)	**MD Reference:**	KB @ 6167.00usft
Site:	Sec.21-T32N-R06W	**North Reference:**	Grid
Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lat 1		
Design:	Rev2		

Project	San Juan Co., NM (NAD27)		
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	Sec.21-T32N-R06W				
Site Position:		**Northing:**	2,172,794.07 usft	**Latitude:**	36.970665°N
From:	Lat/Long	**Easting:**	606,580.64 usft	**Longitude:**	107.468491°W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.22 °

Well	Allison Unit 117H				
Well Position	**+N/-S** 0.00 usft	**Northing:**	2,172,777.12 usft	**Latitude:**	36.970617°N
	+E/-W 0.00 usft	**Easting:**	606,719.47 usft	**Longitude:**	107.468016°W
Position Uncertainty	0.00 usft	**Wellhead Elevation:**	0.00 usft	**Ground Level:**	6,152.00 usft

Wellbore	Lat 1			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	09/04/18	9.04	63.57	50,073

Design	Rev2			
Audit Notes:				
Version:	**Phase:**	PROTOTYPE	**Tie On Depth:**	3,016.80

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	0.00	0.00	0.00	185.70

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
3,016.80	65.00	175.52	2,697.76	-803.14	62.93	0.00	0.00	0.00	0.00	
3,292.19	90.00	187.46	2,757.10	-1,069.22	54.63	10.00	9.08	4.34	26.58	Allison Unit 117H Toe
3,304.19	89.64	187.46	2,757.14	-1,081.12	53.08	3.00	-3.00	0.00	-180.00	
8,535.29	89.64	187.46	2,790.00	-6,267.83	-626.16	0.00	0.00	0.00	0.00	Allison Unit 117H Toe

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Company:	Hilcorp Energy Company	**TVD Reference:**	KB @ 6167.00usft
Project:	San Juan Co., NM (NAD27)	**MD Reference:**	KB @ 6167.00usft
Site:	Sec.21-T32N-R06W	**North Reference:**	Grid
Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lat 1		
Design:	Rev2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,016.80	65.00	175.52	2,697.76	-803.14	62.93	2,171,973.99	606,782.39	36.968410°N	107.467811°W
FTP, Build 10°/100' DLS									
3,100.00	72.49	179.41	2,727.91	-880.53	66.28	2,171,896.59	606,785.75	36.968198°N	107.467801°W
3,200.00	81.58	183.69	2,750.34	-977.82	63.58	2,171,799.31	606,783.04	36.967931°N	107.467811°W
3,292.19	90.00	187.46	2,757.10	-1,069.22	54.63	2,171,707.90	606,774.10	36.967680°N	107.467843°W
LP									
3,300.00	89.77	187.46	2,757.12	-1,076.97	53.62	2,171,700.16	606,773.09	36.967658°N	107.467847°W
3,304.19	89.64	187.46	2,757.14	-1,081.12	53.08	2,171,696.01	606,772.54	36.967647°N	107.467849°W
Hold Section									
3,400.00	89.64	187.46	2,757.74	-1,176.12	40.64	2,171,601.01	606,760.10	36.967386°N	107.467893°W
3,500.00	89.64	187.46	2,758.37	-1,275.27	27.65	2,171,501.86	606,747.12	36.967114°N	107.467938°W
3,600.00	89.64	187.46	2,759.00	-1,374.42	14.67	2,171,402.70	606,734.13	36.966842°N	107.467984°W
3,700.00	89.64	187.46	2,759.63	-1,473.57	1.68	2,171,303.55	606,721.15	36.966570°N	107.468030°W
3,800.00	89.64	187.46	2,760.26	-1,572.72	-11.30	2,171,204.40	606,708.16	36.966297°N	107.468076°W
3,900.00	89.64	187.46	2,760.88	-1,671.88	-24.29	2,171,105.25	606,695.18	36.966025°N	107.468121°W
4,000.00	89.64	187.46	2,761.51	-1,771.03	-37.27	2,171,006.10	606,682.19	36.965753°N	107.468167°W
4,100.00	89.64	187.46	2,762.14	-1,870.18	-50.26	2,170,906.95	606,669.21	36.965481°N	107.468213°W
4,200.00	89.64	187.46	2,762.77	-1,969.33	-63.24	2,170,807.80	606,656.22	36.965208°N	107.468259°W
4,300.00	89.64	187.46	2,763.40	-2,068.48	-76.23	2,170,708.64	606,643.24	36.964936°N	107.468304°W
4,400.00	89.64	187.46	2,764.02	-2,167.63	-89.21	2,170,609.49	606,630.26	36.964664°N	107.468350°W
4,500.00	89.64	187.46	2,764.65	-2,266.78	-102.20	2,170,510.34	606,617.27	36.964392°N	107.468396°W
4,600.00	89.64	187.46	2,765.28	-2,365.94	-115.18	2,170,411.19	606,604.29	36.964120°N	107.468442°W
4,700.00	89.64	187.46	2,765.91	-2,465.09	-128.16	2,170,312.04	606,591.30	36.963847°N	107.468487°W
4,800.00	89.64	187.46	2,766.54	-2,564.24	-141.15	2,170,212.89	606,578.32	36.963575°N	107.468533°W
4,900.00	89.64	187.46	2,767.16	-2,663.39	-154.13	2,170,113.74	606,565.33	36.963303°N	107.468579°W
5,000.00	89.64	187.46	2,767.79	-2,762.54	-167.12	2,170,014.58	606,552.35	36.963031°N	107.468625°W
5,100.00	89.64	187.46	2,768.42	-2,861.69	-180.10	2,169,915.43	606,539.36	36.962759°N	107.468670°W
5,200.00	89.64	187.46	2,769.05	-2,960.84	-193.09	2,169,816.28	606,526.38	36.962486°N	107.468716°W
5,300.00	89.64	187.46	2,769.68	-3,060.00	-206.07	2,169,717.13	606,513.39	36.962214°N	107.468762°W
5,400.00	89.64	187.46	2,770.31	-3,159.15	-219.06	2,169,617.98	606,500.41	36.961942°N	107.468807°W
5,500.00	89.64	187.46	2,770.93	-3,258.30	-232.04	2,169,518.83	606,487.42	36.961670°N	107.468853°W
5,600.00	89.64	187.46	2,771.56	-3,357.45	-245.03	2,169,419.68	606,474.44	36.961398°N	107.468899°W
5,700.00	89.64	187.46	2,772.19	-3,456.60	-258.01	2,169,320.52	606,461.46	36.961125°N	107.468945°W
5,800.00	89.64	187.46	2,772.82	-3,555.75	-271.00	2,169,221.37	606,448.47	36.960853°N	107.468990°W
5,900.00	89.64	187.46	2,773.45	-3,654.90	-283.98	2,169,122.22	606,435.49	36.960581°N	107.469036°W
6,000.00	89.64	187.46	2,774.07	-3,754.05	-296.97	2,169,023.07	606,422.50	36.960309°N	107.469082°W
6,100.00	89.64	187.46	2,774.70	-3,853.21	-309.95	2,168,923.92	606,409.52	36.960037°N	107.469128°W
6,200.00	89.64	187.46	2,775.33	-3,952.36	-322.93	2,168,824.77	606,396.53	36.959764°N	107.469173°W
6,300.00	89.64	187.46	2,775.96	-4,051.51	-335.92	2,168,725.62	606,383.55	36.959492°N	107.469219°W
6,400.00	89.64	187.46	2,776.59	-4,150.66	-348.90	2,168,626.46	606,370.56	36.959220°N	107.469265°W
6,500.00	89.64	187.46	2,777.22	-4,249.81	-361.89	2,168,527.31	606,357.58	36.958948°N	107.469311°W
6,600.00	89.64	187.46	2,777.84	-4,348.96	-374.87	2,168,428.16	606,344.59	36.958675°N	107.469356°W
6,700.00	89.64	187.46	2,778.47	-4,448.11	-387.86	2,168,329.01	606,331.61	36.958403°N	107.469402°W
6,800.00	89.64	187.46	2,779.10	-4,547.27	-400.84	2,168,229.86	606,318.62	36.958131°N	107.469448°W
6,900.00	89.64	187.46	2,779.73	-4,646.42	-413.83	2,168,130.71	606,305.64	36.957859°N	107.469494°W
7,000.00	89.64	187.46	2,780.36	-4,745.57	-426.81	2,168,031.56	606,292.65	36.957587°N	107.469539°W
7,100.00	89.64	187.46	2,780.98	-4,844.72	-439.80	2,167,932.40	606,279.67	36.957314°N	107.469585°W
7,200.00	89.64	187.46	2,781.61	-4,943.87	-452.78	2,167,833.25	606,266.69	36.957042°N	107.469631°W
7,300.00	89.64	187.46	2,782.24	-5,043.02	-465.77	2,167,734.10	606,253.70	36.956770°N	107.469677°W
7,400.00	89.64	187.46	2,782.87	-5,142.17	-478.75	2,167,634.95	606,240.72	36.956498°N	107.469722°W
7,500.00	89.64	187.46	2,783.50	-5,241.33	-491.73	2,167,535.80	606,227.73	36.956226°N	107.469768°W
7,600.00	89.64	187.46	2,784.13	-5,340.48	-504.72	2,167,436.65	606,214.75	36.955953°N	107.469814°W
7,700.00	89.64	187.46	2,784.75	-5,439.63	-517.70	2,167,337.50	606,201.76	36.955681°N	107.469859°W
7,800.00	89.64	187.46	2,785.38	-5,538.78	-530.69	2,167,238.34	606,188.78	36.955409°N	107.469905°W

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Company:	Hilcorp Energy Company	**TVD Reference:**	KB @ 6167.00usft
Project:	San Juan Co., NM (NAD27)	**MD Reference:**	KB @ 6167.00usft
Site:	Sec.21-T32N-R06W	**North Reference:**	Grid
Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lat 1		
Design:	Rev2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,900.00	89.64	187.46	2,786.01	-5,637.93	-543.67	2,167,139.19	606,175.79	36.955137°N	107.469951°W
8,000.00	89.64	187.46	2,786.64	-5,737.08	-556.66	2,167,040.04	606,162.81	36.954865°N	107.469997°W
8,100.00	89.64	187.46	2,787.27	-5,836.23	-569.64	2,166,940.89	606,149.82	36.954592°N	107.470042°W
8,200.00	89.64	187.46	2,787.89	-5,935.39	-582.63	2,166,841.74	606,136.84	36.954320°N	107.470088°W
8,300.00	89.64	187.46	2,788.52	-6,034.54	-595.61	2,166,742.59	606,123.85	36.954048°N	107.470134°W
8,400.00	89.64	187.46	2,789.15	-6,133.69	-608.60	2,166,643.44	606,110.87	36.953776°N	107.470180°W
8,500.00	89.64	187.46	2,789.78	-6,232.84	-621.58	2,166,544.28	606,097.89	36.953504°N	107.470225°W
8,535.29	89.64	187.46	2,790.00	-6,267.83	-626.16	2,166,509.30	606,093.30	36.953407°N	107.470241°W
PBHL/TD									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Allison Unit 117H FTP - plan hits target center - Point	0.00	0.00	2,697.76	-803.14	62.93	2,171,973.99	606,782.39	36.968410°N	107.467811°W
Allison Unit 117H Toe - plan hits target center - Point	0.00	0.00	2,790.00	-6,267.83	-626.16	2,166,509.30	606,093.30	36.953407°N	107.470241°W

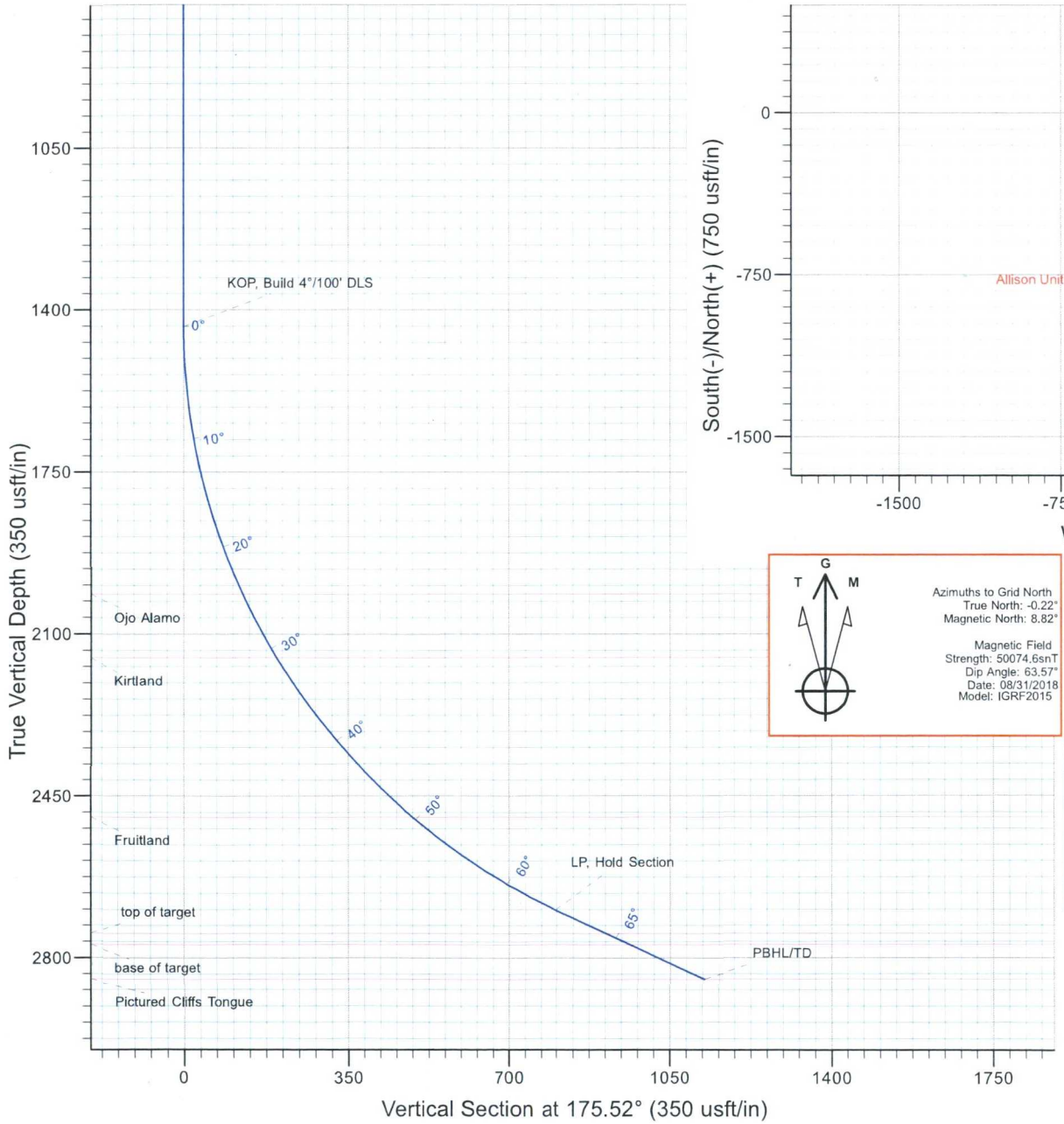
Formations

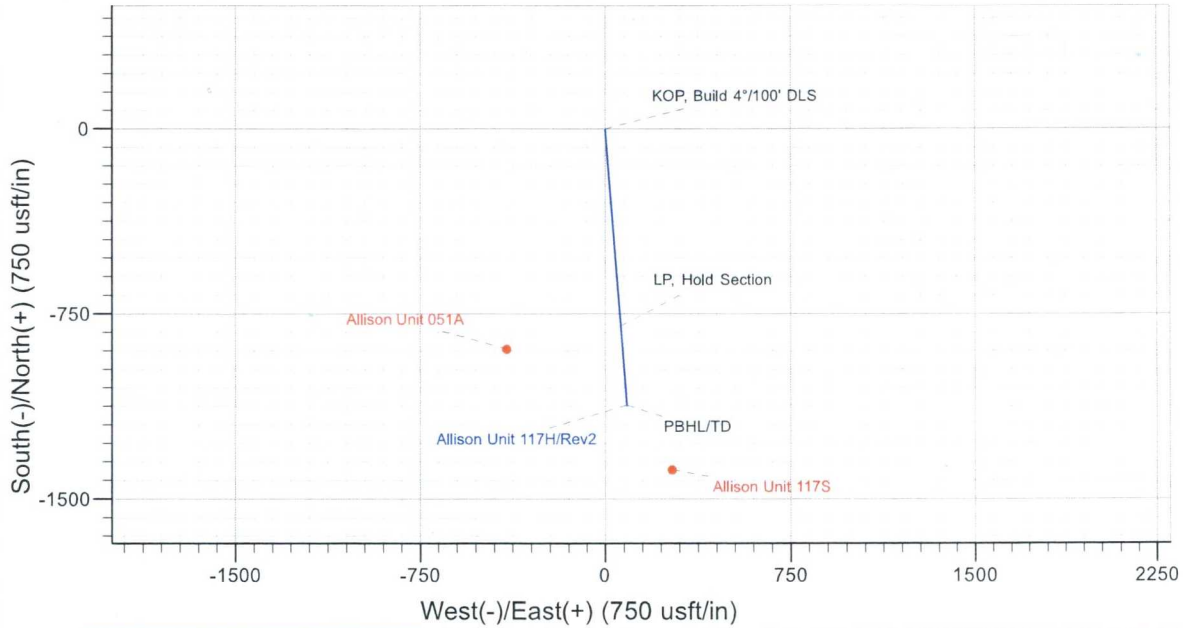
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,033.16	2,015.00	Ojo Alamo		0.00	
2,186.93	2,151.00	Kirtland		0.00	
2,639.71	2,495.00	Fruitland		0.00	
3,179.47	2,747.00	top of target		0.00	
5,510.56	2,771.00	base of target		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
3,016.80	2,697.76	-803.14	62.93	FTP, Build 10°/100' DLS
3,292.19	2,757.10	-1,069.22	54.63	LP
3,304.19	2,757.14	-1,081.12	53.08	Hold Section
8,535.29	2,790.00	-6,267.83	-626.16	PBHL/TD

Company: Hilcorp Energy Company
Field: San Juan Co., NM (NAD27)
Location: Sec.21-T32N-R06W
Well: Allison Unit 117H
Borehole: Pilot Hole
Plan: Rev2





Azimuths to Grid North
True North: -0.22°
Magnetic North: 8.82°

Magnetic Field
Strength: 50074.6snT
Dip Angle: 63.57°
Date: 08/31/2018
Model: IGRF2015

WELL DETAILS: Allison Unit 117H

GL 6152.00 KB @ 6167.00usft

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	2172777.13	606719.46	36.970617°N	107.468016°W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1436.41	0.00	0.00	1436.41	0.00	0.00	0.00	0.00	0.00
3	3013.62	65.00	175.52	2696.42	-800.26	62.70	4.12	175.52	802.71
4	3367.56	65.00	175.52	2846.00	-1120.06	87.76	0.00	0.00	1123.49

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2015.00	2033.16	Ojo Alamo
2151.00	2186.93	Kirtland
2495.00	2639.71	Fruitland
2747.00	3133.30	top of target
2771.00	3190.09	base of target
2846.00	3367.56	Pictured Cliffs Tongue

ANNOTATIONS

TVD	MD	Annotation
1436.41	1436.41	KOP, Build 4°/100' DLS
2696.42	3013.62	LP, Hold Section
2846.00	3367.56	PBHL/TD

Allison Unit 117H Rev2

Created By: J Rieke Date: 14:26, September 19 2018

Hilcorp

Hilcorp Energy Company

San Juan Co., NM (NAD27)
Sec.21-T32N-R06W
Allison Unit 117H

Pilot Hole

Plan: Rev2

Standard Planning Report - Geographic

19 September, 2018

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ENERGY SERVICES

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Pilot Hol

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Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Company:	Hilcorp Energy Company	**TVD Reference:**	KB @ 6167.00usft
Project:	San Juan Co., NM (NAD27)	**MD Reference:**	KB @ 6167.00usft
Site:	Sec.21-T32N-R06W	**North Reference:**	Grid
Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Pilot Hole		
Design:	Rev2		

Project San Juan Co., NM (NAD27)

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 Sec.21-T32N-R06W

Site Position:		**Northing:**	2,172,794.07 usft	**Latitude:**	36.970665°N
From:	Lat/Long	**Easting:**	606,580.64 usft	**Longitude:**	107.468491°W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.22 °

Well Allison Unit 117H

Well Position	**+N/-S**	0.00 usft	**Northing:**	2,172,777.12 usft	**Latitude:**	36.970617°N
	+E/-W	0.00 usft	**Easting:**	606,719.47 usft	**Longitude:**	107.468016°W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	0.00 usft	**Ground Level:**	6,152.00 usft

Wellbore Pilot Hole

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	08/31/18	9.04	63.57	50,075

Design Rev2

Audit Notes:

Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	175.52

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	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	
1,436.41	0.00	0.00	1,436.41	0.00	0.00	0.00	0.00	0.00	0.00	
3,013.62	65.00	175.52	2,696.42	-800.26	62.70	4.12	4.12	0.00	175.52	
3,367.56	65.00	175.52	2,846.00	-1,120.06	87.76	0.00	0.00	0.00	0.00	

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Company:	Hilcorp Energy Company	**TVD Reference:**	KB @ 6167.00usft
Project:	San Juan Co., NM (NAD27)	**MD Reference:**	KB @ 6167.00usft
Site:	Sec.21-T32N-R06W	**North Reference:**	Grid
Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Pilot Hole		
Design:	Rev2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
100.00	0.00	0.00	100.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
200.00	0.00	0.00	200.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
300.00	0.00	0.00	300.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
400.00	0.00	0.00	400.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
500.00	0.00	0.00	500.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
600.00	0.00	0.00	600.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
700.00	0.00	0.00	700.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
800.00	0.00	0.00	800.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
900.00	0.00	0.00	900.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
1,000.00	0.00	0.00	1,000.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
1,100.00	0.00	0.00	1,100.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
1,200.00	0.00	0.00	1,200.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
1,300.00	0.00	0.00	1,300.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
1,400.00	0.00	0.00	1,400.00	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
1,436.41	0.00	0.00	1,436.41	0.00	0.00	2,172,777.12	606,719.47	36.970617°N	107.468016°W
KOP, Build 4°/100' DLS									
1,500.00	2.62	175.52	1,499.98	-1.45	0.11	2,172,775.67	606,719.58	36.970613°N	107.468016°W
1,600.00	6.74	175.52	1,599.62	-9.58	0.75	2,172,767.54	606,720.22	36.970591°N	107.468014°W
1,700.00	10.86	175.52	1,698.42	-24.84	1.95	2,172,752.29	606,721.41	36.970549°N	107.468010°W
1,800.00	14.98	175.52	1,795.87	-47.13	3.69	2,172,730.00	606,723.16	36.970488°N	107.468004°W
1,900.00	19.11	175.52	1,891.46	-76.35	5.98	2,172,700.78	606,725.45	36.970407°N	107.467997°W
2,000.00	23.23	175.52	1,984.69	-112.33	8.80	2,172,664.79	606,728.27	36.970308°N	107.467988°W
2,100.00	27.35	175.52	2,075.09	-154.91	12.14	2,172,622.21	606,731.60	36.970191°N	107.467977°W
2,200.00	31.47	175.52	2,162.18	-203.85	15.97	2,172,573.27	606,735.44	36.970057°N	107.467964°W
2,300.00	35.59	175.52	2,245.53	-258.91	20.29	2,172,518.21	606,739.75	36.969906°N	107.467950°W
2,400.00	39.71	175.52	2,324.68	-319.80	25.06	2,172,457.33	606,744.52	36.969738°N	107.467935°W
2,500.00	43.83	175.52	2,399.25	-386.19	30.26	2,172,390.93	606,749.73	36.969556°N	107.467918°W
2,600.00	47.95	175.52	2,468.83	-457.76	35.87	2,172,319.36	606,755.33	36.969359°N	107.467900°W
2,700.00	52.08	175.52	2,533.08	-534.13	41.85	2,172,242.99	606,761.32	36.969150°N	107.467880°W
2,800.00	56.20	175.52	2,591.65	-614.91	48.18	2,172,162.21	606,767.65	36.968928°N	107.467859°W
2,900.00	60.32	175.52	2,644.25	-699.67	54.82	2,172,077.45	606,774.29	36.968695°N	107.467838°W
3,000.00	64.44	175.52	2,690.60	-787.99	61.74	2,171,989.14	606,781.21	36.968452°N	107.467815°W
3,013.62	65.00	175.52	2,696.42	-800.26	62.70	2,171,976.86	606,782.17	36.968418°N	107.467812°W
LP, Hold Section									
3,100.00	65.00	175.52	2,732.93	-878.31	68.82	2,171,898.81	606,788.28	36.968204°N	107.467792°W
3,200.00	65.00	175.52	2,775.19	-968.67	75.90	2,171,808.46	606,795.36	36.967956°N	107.467769°W
3,300.00	65.00	175.52	2,817.45	-1,059.02	82.97	2,171,718.10	606,802.44	36.967707°N	107.467746°W
3,367.56	65.00	175.52	2,846.00	-1,120.06	87.76	2,171,657.06	606,807.22	36.967540°N	107.467731°W
PBHL/TD									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,033.16	2,015.00	Ojo Alamo		0.00	
2,186.93	2,151.00	Kirtland		0.00	
2,639.71	2,495.00	Fruitland		0.00	
3,133.30	2,747.00	top of target		0.00	
3,190.09	2,771.00	base of target		0.00	
3,367.56	2,846.00	Pictured Cliffs Tongue		0.00	

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Company:	Hilcorp Energy Company	**TVD Reference:**	KB @ 6167.00usft
Project:	San Juan Co., NM (NAD27)	**MD Reference:**	KB @ 6167.00usft
Site:	Sec.21-T32N-R06W	**North Reference:**	Grid
Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Pilot Hole		
Design:	Rev2		

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
1,436.41	1,436.41	0.00	0.00	KOP, Build 4°/100' DLS
3,013.62	2,696.42	-800.26	62.70	LP, Hold Section
3,367.56	2,846.00	-1,120.06	87.76	PBHL/TD

Hilcorp

Hilcorp Energy Company

San Juan Co., NM (NAD27)
Sec.21-T32N-R06W
Allison Unit 117H

Pilot Hole
Rev2

Anticollision Report

19 September, 2018

KOLTEK
ENERGY SERVICES

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Pilot Hole	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Reference	Rev2		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.00 usft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 09/19/18

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	3,367.56	Rev2 (Pilot Hole)	MWD	MWD - Standard

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Sec.21-T32N-R06W						
Allison Unit 051A - Original Hole - Original Hole	3,075.02	2,960.37	469.39	442.07	17.182	CC, ES
Allison Unit 051A - Original Hole - Original Hole	3,200.00	3,013.19	482.86	453.40	16.392	SF
Allison Unit 117S - Original Hole - Original Hole	3,367.56	3,084.08	318.53	247.87	4.508	CC, ES, SF

Offset Design Sec.21-T32N-R06W - Allison Unit 051A - Original Hole - Original Hole — **Offset Site Error:** 0.00 usft

Survey Program: 8058-INC_ONLY<10 — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	238.00	238.00	0.00	0.82	-155.81	-892.40	-400.90	978.32				
100.00	100.00	338.00	338.00	0.10	1.17	-155.81	-892.40	-400.90	978.32	977.05	1.27	772.806	
200.00	200.00	438.00	438.00	0.32	1.52	-155.81	-892.40	-400.90	978.32	976.48	1.84	532.589	
300.00	300.00	538.00	538.00	0.55	1.86	-155.81	-892.40	-400.90	978.32	975.91	2.41	406.297	
400.00	400.00	638.00	638.00	0.77	2.21	-155.81	-892.40	-400.90	978.32	975.34	2.98	328.419	
500.00	500.00	738.00	738.00	0.99	2.56	-155.81	-892.40	-400.90	978.32	974.77	3.55	275.594	
600.00	600.00	838.00	838.00	1.22	2.90	-155.81	-892.40	-400.90	978.32	974.20	4.12	237.408	
700.00	700.00	938.00	938.00	1.44	3.25	-155.81	-892.40	-400.90	978.32	973.63	4.69	208.516	
800.00	800.00	1,038.00	1,038.00	1.67	3.59	-155.81	-892.40	-400.90	978.32	973.06	5.26	185.893	
900.00	900.00	1,138.00	1,138.00	1.89	3.94	-155.81	-892.40	-400.90	978.32	972.48	5.83	167.699	
1,000.00	1,000.00	1,238.00	1,238.00	2.12	4.29	-155.81	-892.40	-400.90	978.32	971.91	6.40	152.749	
1,100.00	1,100.00	1,338.00	1,338.00	2.34	4.63	-155.81	-892.40	-400.90	978.32	971.34	6.98	140.246	
1,200.00	1,200.00	1,438.00	1,438.00	2.57	4.98	-155.81	-892.40	-400.90	978.32	970.77	7.55	129.635	
1,300.00	1,300.00	1,538.00	1,538.00	2.79	5.32	-155.81	-892.40	-400.90	978.32	970.20	8.12	120.517	
1,400.00	1,400.00	1,638.00	1,638.00	3.02	5.67	-155.81	-892.40	-400.90	978.32	969.63	8.69	112.597	
1,436.41	1,436.41	1,674.41	1,674.41	3.10	5.80	-155.81	-892.40	-400.90	978.32	969.42	8.90	109.966	
1,500.00	1,499.98	1,737.98	1,737.98	3.22	6.02	28.74	-892.40	-400.90	977.04	967.73	9.31	104.947	
1,600.00	1,599.62	1,837.62	1,837.62	3.40	6.36	29.11	-892.40	-400.90	969.89	959.98	9.92	97.812	
1,700.00	1,698.42	1,936.42	1,936.42	3.60	6.70	29.83	-892.40	-400.90	956.53	946.03	10.50	91.080	
1,800.00	1,795.87	2,033.87	2,033.87	3.83	7.04	30.93	-892.40	-400.90	937.12	926.04	11.07	84.632	
1,900.00	1,891.46	2,129.46	2,129.46	4.15	7.37	32.43	-892.40	-400.90	911.87	900.23	11.64	78.330	
2,000.00	1,984.69	2,222.69	2,222.69	4.58	7.70	34.41	-892.40	-400.90	881.12	868.88	12.23	72.034	
2,100.00	2,075.09	2,313.09	2,313.09	5.13	8.01	36.93	-892.40	-400.90	845.28	832.40	12.88	65.619	
2,200.00	2,162.18	2,400.18	2,400.18	5.82	8.31	40.08	-892.40	-400.90	804.91	791.27	13.64	59.010	

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Pilot Hole	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 051A - Original Hole - Original Hole

Offset Site Error: 0.00 usft

Survey Program: 8058-INC_ONLY<10

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,300.00	2,245.53	2,483.53	2,483.53	6.65	8.60	43.95	-892.40	-400.90	760.73	746.17	14.57	52.221	
2,400.00	2,324.68	2,562.68	2,562.68	7.62	8.87	48.62	-892.40	-400.90	713.67	697.95	15.72	45.395	
2,500.00	2,399.25	2,637.25	2,637.25	8.72	9.13	54.10	-892.40	-400.90	664.94	647.80	17.14	38.800	
2,600.00	2,468.83	2,706.83	2,706.83	9.94	9.37	60.34	-892.40	-400.90	616.18	597.37	18.81	32.765	
2,700.00	2,533.08	2,771.08	2,771.08	11.28	9.59	67.10	-892.40	-400.90	569.55	548.90	20.65	27.577	
2,800.00	2,591.65	2,829.65	2,829.65	12.71	9.80	74.02	-892.40	-400.90	527.90	505.34	22.55	23.405	
2,900.00	2,644.25	2,882.25	2,882.25	14.23	9.98	80.62	-892.40	-400.90	494.80	470.41	24.39	20.286	
3,000.00	2,690.60	2,928.60	2,928.60	15.83	10.14	86.43	-892.40	-400.90	474.28	448.18	26.10	18.169	
3,013.62	2,696.42	2,934.42	2,934.42	16.05	10.16	87.13	-892.40	-400.90	472.67	446.34	26.33	17.953	
3,075.02	2,722.37	2,960.37	2,960.37	17.07	10.25	90.00	-892.40	-400.90	469.39	442.07	27.32	17.182	CC, ES
3,100.00	2,732.93	2,970.93	2,970.93	17.48	10.29	91.17	-892.40	-400.90	469.93	442.17	27.76	16.926	
3,200.00	2,775.19	3,013.19	3,013.19	19.15	10.43	95.82	-892.40	-400.90	482.86	453.40	29.46	16.392	SF
3,300.00	2,817.45	3,055.45	3,055.45	20.83	10.58	100.40	-892.40	-400.90	511.76	480.78	30.98	16.519	
3,367.56	2,846.00	3,084.00	3,084.00	21.96	10.68	103.43	-892.40	-400.90	539.09	507.18	31.91	16.896	

Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Pilot Hole	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 117S - Original Hole - Original Hole

Offset Site Error: 0.00 usft

Survey Program: 60-INC_ONLY<10

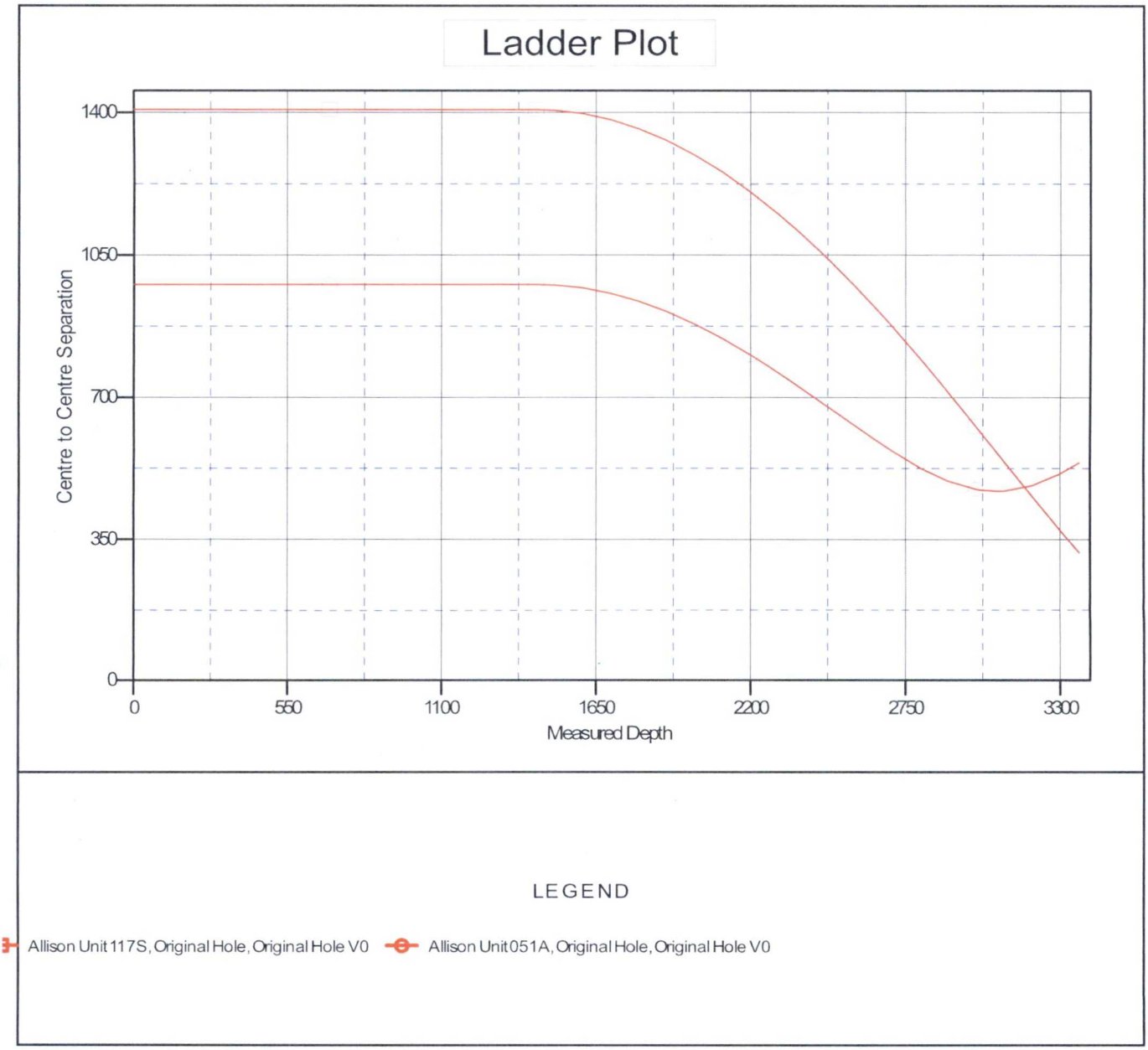
Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	240.19	240.19	0.00	3.76	168.94	-1,380.96	269.98	1,407.11				
100.00	100.00	337.11	337.10	0.10	5.73	168.94	-1,380.92	269.98	1,407.06	1,401.24	5.83	241.470	
200.00	200.00	434.04	434.02	0.32	7.71	168.94	-1,381.09	269.98	1,407.24	1,399.21	8.03	175.335	
300.00	300.00	538.02	538.00	0.55	9.59	168.94	-1,381.32	269.98	1,407.46	1,397.33	10.13	138.898	
400.00	400.00	638.02	638.00	0.77	11.04	168.94	-1,381.32	269.98	1,407.46	1,395.65	11.81	119.217	
500.00	500.00	738.02	738.00	0.99	12.48	168.94	-1,381.32	269.98	1,407.46	1,393.98	13.48	104.421	
600.00	600.00	838.02	838.00	1.22	13.93	168.94	-1,381.32	269.98	1,407.46	1,392.31	15.15	92.892	
700.00	700.00	938.02	938.00	1.44	15.38	168.94	-1,381.32	269.98	1,407.46	1,390.63	16.82	83.656	
800.00	800.00	1,038.03	1,038.00	1.67	16.83	168.94	-1,381.32	269.98	1,407.46	1,388.96	18.50	76.082	
900.00	900.00	1,138.03	1,138.00	1.89	18.28	168.94	-1,381.32	269.98	1,407.46	1,387.28	20.18	69.758	
1,000.00	1,000.00	1,238.03	1,238.00	2.12	19.73	168.94	-1,381.32	269.98	1,407.46	1,385.61	21.85	64.405	
1,100.00	1,100.00	1,338.03	1,338.00	2.34	21.19	168.94	-1,381.32	269.98	1,407.46	1,383.93	23.53	59.815	
1,200.00	1,200.00	1,438.03	1,438.00	2.57	22.64	168.94	-1,381.32	269.98	1,407.46	1,382.25	25.21	55.835	
1,300.00	1,300.00	1,538.03	1,538.00	2.79	24.09	168.94	-1,381.32	269.98	1,407.46	1,380.57	26.88	52.352	
1,400.00	1,400.00	1,638.03	1,638.00	3.02	25.55	168.94	-1,381.32	269.98	1,407.46	1,378.90	28.56	49.276	
1,436.41	1,436.41	1,674.44	1,674.41	3.10	26.07	168.94	-1,381.32	269.98	1,407.46	1,378.28	29.17	48.244	
1,500.00	1,499.98	1,738.01	1,737.98	3.22	27.00	-6.59	-1,381.32	269.98	1,406.01	1,375.80	30.21	46.534	
1,600.00	1,599.62	1,837.66	1,837.62	3.40	28.45	-6.67	-1,381.32	269.98	1,397.91	1,366.22	31.69	44.112	
1,700.00	1,698.42	1,936.46	1,936.42	3.60	29.88	-6.82	-1,381.32	269.98	1,382.71	1,349.73	32.99	41.919	
1,800.00	1,795.87	2,028.76	2,028.72	3.83	31.39	-7.04	-1,381.44	269.98	1,360.63	1,326.47	34.16	39.827	
1,900.00	1,891.46	2,126.70	2,126.66	4.15	33.38	-7.35	-1,381.73	269.98	1,331.82	1,296.22	35.60	37.412	
2,000.00	1,984.69	2,222.12	2,222.08	4.58	35.32	-7.77	-1,381.86	269.98	1,296.11	1,259.36	36.75	35.268	
2,100.00	2,075.09	2,314.52	2,314.47	5.13	37.19	-8.31	-1,381.83	269.98	1,253.72	1,216.12	37.60	33.342	
2,200.00	2,162.18	2,403.37	2,403.33	5.82	39.00	-9.01	-1,381.66	269.98	1,204.89	1,166.74	38.15	31.586	
2,300.00	2,245.53	2,500.00	2,499.96	6.65	40.96	-9.98	-1,381.32	269.98	1,149.97	1,111.37	38.59	29.796	
2,400.00	2,324.68	2,559.36	2,559.31	7.62	42.87	-10.98	-1,381.55	269.98	1,089.64	1,050.88	38.75	28.117	
2,500.00	2,399.25	2,635.66	2,635.60	8.72	45.32	-12.44	-1,381.73	269.98	1,023.99	984.83	39.17	26.144	
2,600.00	2,468.83	2,706.67	2,706.61	9.94	47.60	-14.37	-1,381.80	269.98	953.23	913.87	39.36	24.219	
2,700.00	2,533.08	2,772.03	2,771.97	11.28	49.70	-16.93	-1,381.77	269.98	877.80	838.24	39.56	22.188	
2,800.00	2,591.65	2,831.41	2,831.35	12.71	51.61	-20.40	-1,381.68	269.98	798.20	758.00	40.21	19.853	
2,900.00	2,644.25	2,884.53	2,884.46	14.23	53.32	-25.18	-1,381.53	269.98	715.00	672.98	42.03	17.013	
3,000.00	2,690.60	2,939.00	2,938.93	15.83	55.07	-32.52	-1,381.32	269.98	628.90	582.16	46.74	13.455	
3,013.62	2,696.42	2,939.00	2,938.93	16.05	55.07	-33.08	-1,381.32	269.98	616.94	569.90	47.04	13.116	
3,100.00	2,732.93	2,971.00	2,970.93	17.48	56.30	-36.42	-1,381.32	269.98	541.74	490.53	51.21	10.578	
3,200.00	2,775.19	3,013.26	3,013.19	19.15	57.92	-41.81	-1,381.32	269.98	456.02	398.49	57.53	7.927	
3,300.00	2,817.45	3,055.53	3,055.45	20.83	59.54	-48.64	-1,381.32	269.98	372.63	307.62	65.01	5.732	
3,367.56	2,846.00	3,084.08	3,084.00	21.96	60.64	-54.25	-1,381.32	269.98	318.53	247.87	70.67	4.508	CC, ES, SF

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 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Pilot Hole	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to KB @ 6167.00usft	Coordinates are relative to: Allison Unit 117H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Central Meridian is 107.833334°W	Grid Convergence at Surface is: 0.22°

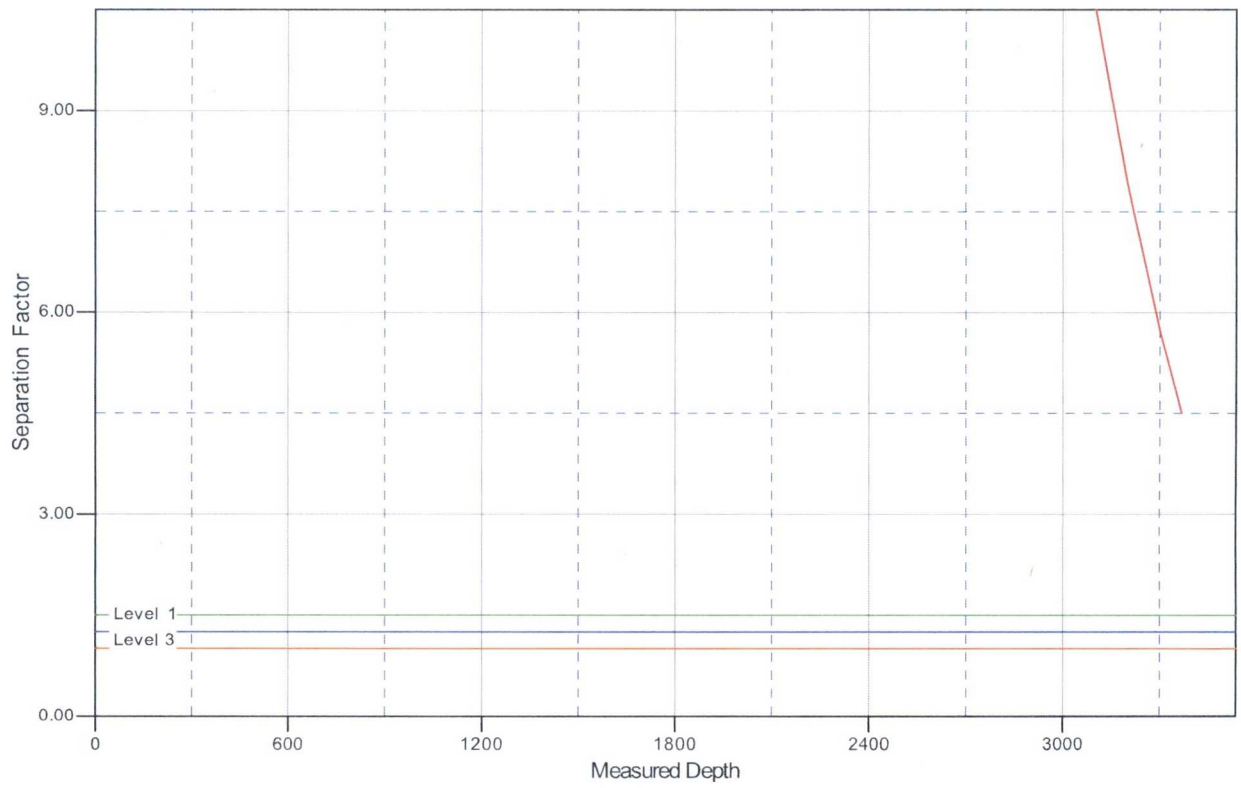


Company:	Hilcorp Energy Company	**Local Co-ordinate Reference:**	Well Allison Unit 117H
Project:	San Juan Co., NM (NAD27)	**TVD Reference:**	KB @ 6167.00usft
Reference Site:	Sec.21-T32N-R06W	**MD Reference:**	KB @ 6167.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Allison Unit 117H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Pilot Hole	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Rev2	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to KB @ 6167.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.833334°W

Coordinates are relative to: Allison Unit 117H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.22°

Separation Factor Plot



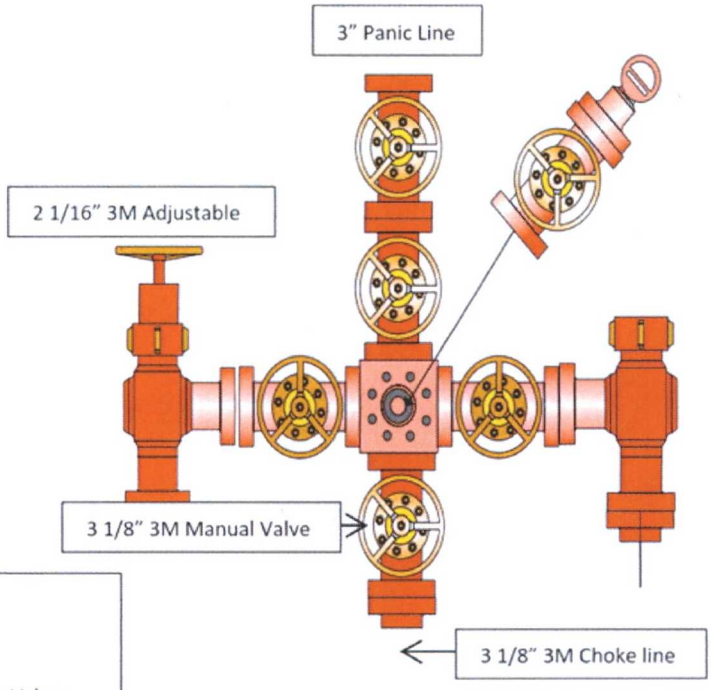
LEGEND

Allison Unit 117S, Original Hole, Original Hole V0

Allison Unit 051A, Original Hole, Original Hole V0

Hilcorp Energy Company

Choke Manifold Schematic – Aztec 777

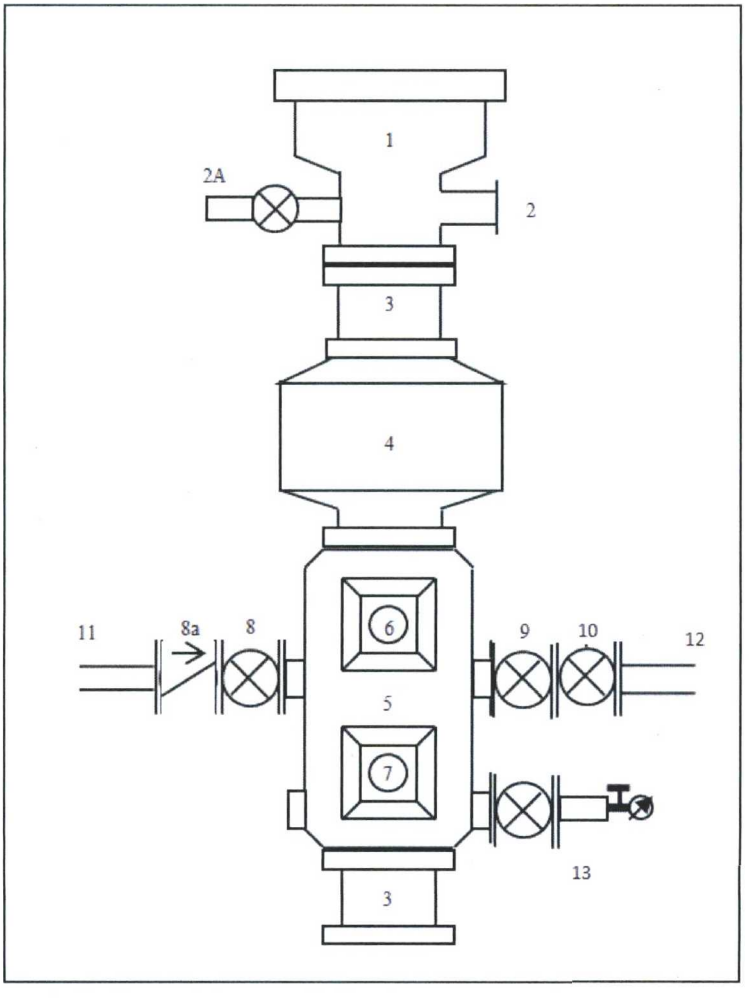


Choke Diagram for a 3,000psi system

- Features all 3 1/8" 3M Manual Valves
- Two 2 1/16" Manual Adjustable Choke Valves
- 3" Panic Line and 2" Vent lines

BOPE Schematic – Aztec 777

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 Valve (2")
8a. Check valve
9. 3M Manual Gate Valve (3")
10. 3M Manual Gate Valve (3")
11. Kill Line Connection, 2" hard line
12. Choke Line (3" Co-Flex)
13. Secondary outlet with valve, bull plug, needle valve, and pressure gauge



Directions from the Intersection of State Hwy 172 & State Hwy 151

in Ignacio, CO to Hilcorp Energy Company Allison Unit #117H

885' FNL & 1233' FWL, Section 21, T32N, R6W, N.M.P.M., San Juan County, NM

Latitude: 36.970622°N Longitude: 107.468621°W Datum: NAD1983

From the intersection of State Hwy 172 & State Hwy 151 in Ignacio, CO, travel Easterly on State Hwy 151 for 11.9 miles to County Road #330;

Go Right (Southerly) on County Road #330 for 2.0 miles, crossing borderline at fork in roadway onto County Road #4025;

Go Left (South-easterly) on County Road #4025 for 0.5 miles to fork in roadway;

Go Left (Easterly) exiting County Road #4025 onto County Road #4029 for 1.1 miles to fork in roadway;

Go Right (Southerly) which is straight onto existing roadway for 0.3 miles to fork in roadway;

Go Left (Easterly) on existing roadway for 0.5 miles to fork in roadway;

Go Right (Southerly) on existing roadway for 0.2 miles to fork in roadway;

Go Right (South-westerly) for 1.4 miles to fork in roadway;

Go Right (Westerly) for 480' to existing Hilcorp Allison Unit #152H location, with the Hilcorp Allison Unit #117H staked offset #152H wellhead;