

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: 9/13/2018

Well information;

Operator El Dorado, Well Name and Number Allison Unit 110H

API# 30-045-35883, 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, com agreement
 - ☐ Hold C-104 for NSL, NSP, DHC name change to include com in well name
 - ☐ Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
 - ☐ 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
 - ☐ 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
 - ☐ 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.

Charles Sayer
NMOCD Approved by Signature

12/4/18
Date

NMOC

NOV 19 2018

UNITED STATES

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

DISTRICT

APPLICATION FOR PERMIT TO DRILL OR REENTER

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

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM0004207
1b. Type of Well: ☐ Oil Well ☐ Gas Well ☒ Other CBNG		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: ☐ Hydraulic Fracturing ☒ Single Zone ☐ Multiple Zone		7. If Unit or CA Agreement, Name and No. ALLISON / NMNM078372X
2. Name of Operator HILCORP ENERGY COMPANY		8. Lease Name and Well No. ALLISON UNIT 110H
3a. Address 1111 Travis Street Houston TX 77002	3b. Phone No. (include area code) (713)209-2400	9. API Well No. 30-045-35883
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface D NWNW / 867 FNL / 1094 FWL / LAT 36.970671 / LONG -107.469096 At proposed prod. zone C NENW / 111 FNL / 1490 FWL / LAT 36.987423 / LONG -107.485845		10. Field and Pool, or Exploratory BASIN FRUITLAND COAL / BASIN FRUIT
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) 1094 feet	16. No. of acres in lease 919.05	17. Spacing Unit dedicated to this well 800
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft 70 feet	19. Proposed Depth 2711 feet / 7945 feet	20. BLM/BIA Bond No. in file FED: NMB001486
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. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above) |
| 2. A Drilling Plan | 5. Operator certification. |
| 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). | 6. Such other site specific information and/or plans as may be requested by the BLM |

25. Signature (Electronic Submission)	Name (Printed/Typed) Priscilla Shorty / Ph: (505)324-5188	Date 09/13/2018
Title Regulatory Technician		
Approved by (Signature) 	Name (Printed/Typed) Richard A. Fields	Date 11/15/18
Title Field Manager		

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.

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

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

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

NMOC

Submit one copy to
Appropriate District Office

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

OIL CONSERVATION DIVISION

1220 South St. Francis Drive
Santa Fe, NM 87505

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-045-35883	*Pool Code 71629	*Pool Name BASIN FRUITLAND COAL
*Property Code 318864	*Property Name ALLISON UNIT	*Well Number 110H
*OGRIID No. 372171	*Operator Name HILCORP ENERGY COMPANY	*Elevation 6152'

¹⁰ Surface Location

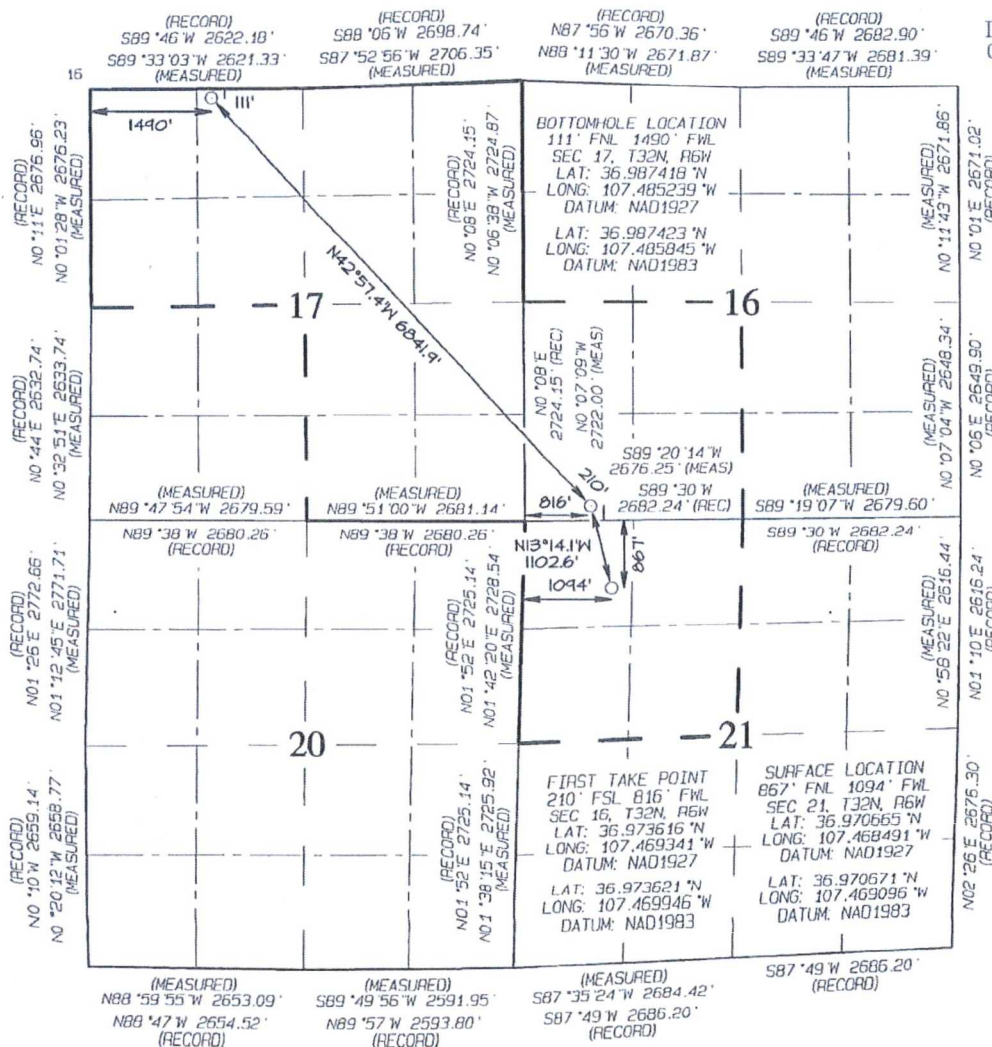
UL or Int no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	21	32N	6W		867	NORTH	1094	WEST	SAN JUAN

¹¹ Bottom Hole Location If Different From Surface

BL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	17	32N	6W		111	NORTH	1490	WEST	SAN JUAN

¹² Dedicated Acres 800.00	SW/4 - Section 16 N/2, SE/4 - Section 17 NW/4 - Section 21	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.

NO ALLOWABLE WILL BE ASSIGNED
TO THIS COMPLETION UNTIL ALL
INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN
APPROVED BY THE DIVISION



¹⁷ OPERATOR CERTIFICATION

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

Signature Priscilla Shorty Date 9/13/18

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 10, 2018
Date of Survey: AUGUST 4, 2018

Signature and Seal of Professional Surveyor



JASON C. EDWARDS
Certificate Number 15269

Allison 110H



Hilcorp Energy Company

Hilcorp Energy Company Technical Plan

1. Location

Allison 110H

SHL: 867' FNL, 1094' FWL, Sec 21, T32N, R6W

Lat-1 BHL: 111' FNL, 1490' FWL, Sec 17, 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 nipped 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.



Hilcorp Energy Company

Allison 110H

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' - 3,539.5' (MD)
Prod Liner (predrilled)	6-1/4"	4-1/2"	11.6# J-55/L-80	3,100' - 10,083.3' (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 - 3,093' MD / 2,657.3' 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.



Hilcorp Energy Company

Allison 110H

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: 2% Calcium Chloride, pellet 0.1250 lbm/sk Poly-E-Flake 1.18 ft ³ / sk - 5.24 gal/sk 15.8 ppg	100%	313 ft ³	Surface
Intermediate	3,539.5'	378	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 ft ³ / sk - 11.25 gal/sk 12.9 ppg	50%	798 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



Hilcorp Energy Company

Allison 110H

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.



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Allison 110H

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.

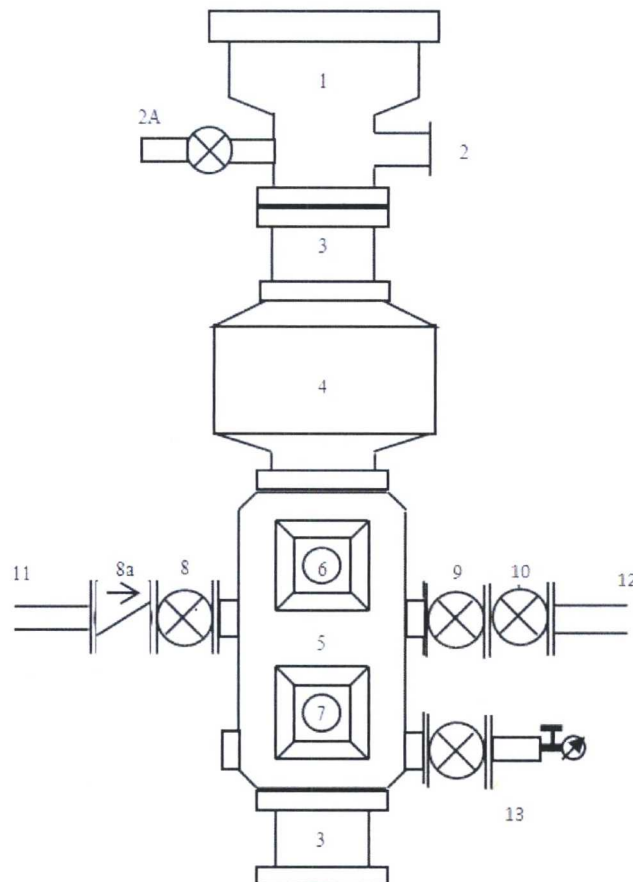
Allison 110H



Hilcorp Energy Company

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





Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.21-T32N-R06W

Allison Unit 110H

Lat 1

Plan: Rev0

Standard Planning Report - Geographic

31 August, 2018





Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.21-T32N-R06W
Well: Allison Unit 110H
Wellbore: Lat 1
Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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:	36.97067°N
From:	Lat/Long	Easting:	606,580.64 usft	Longitude:	107.46849°W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.22 °

Well	Allison Unit 110H					
Well Position	+N/-S	0.00 usft	Northing:	2,172,794.07 usft	Latitude:	36.97067°N
	+E/-W	0.00 usft	Easting:	606,580.64 usft	Longitude:	107.46849°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	08/31/18	9.04	63.57	50,075

Design	Rev0			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	3,093.06
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	321.05

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
3,093.06	65.00	346.76	2,657.32	1,073.40	-252.56	0.00	0.00	0.00	0.00	
3,343.06	90.00	346.76	2,711.00	1,309.11	-308.01	10.00	10.00	0.00	0.00	
3,643.06	90.00	346.76	2,711.00	1,601.13	-376.72	0.00	0.00	0.00	0.00	
4,819.44	90.58	311.47	2,704.89	2,594.82	-971.04	3.00	0.05	-3.00	-89.00	
10,083.34	90.58	311.47	2,652.00	6,080.73	-4,914.93	0.00	0.00	0.00	0.00	Allison Unit 110H Toe



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.21-T32N-R06W
Well: Allison Unit 110H
Wellbore: Lat 1
Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,093.06	65.00	346.76	2,657.32	1,073.40	-252.56	2,173,867.47	606,328.08	36.97362°N	107.46934°W
FTP, Build 10°/100' DLS									
3,100.00	65.69	346.76	2,660.21	1,079.54	-254.00	2,173,873.61	606,326.64	36.97363°N	107.46935°W
3,200.00	75.69	346.76	2,693.23	1,171.29	-275.59	2,173,965.36	606,305.05	36.97389°N	107.46942°W
3,300.00	85.69	346.76	2,709.38	1,267.23	-298.16	2,174,061.30	606,282.48	36.97415°N	107.46950°W
3,343.06	90.00	346.76	2,711.00	1,309.11	-308.01	2,174,103.18	606,272.63	36.97426°N	107.46953°W
LP, Hold Section									
3,400.00	90.00	346.76	2,711.00	1,364.54	-321.05	2,174,158.60	606,259.58	36.97442°N	107.46957°W
3,500.00	90.00	346.76	2,711.00	1,461.88	-343.96	2,174,255.94	606,236.68	36.97468°N	107.46965°W
3,600.00	90.00	346.76	2,711.00	1,559.22	-366.86	2,174,353.29	606,213.78	36.97495°N	107.46973°W
3,643.06	90.00	346.76	2,711.00	1,601.13	-376.72	2,174,395.20	606,203.92	36.97507°N	107.46976°W
Begin Turn									
3,700.00	90.03	345.05	2,710.98	1,656.36	-390.59	2,174,450.43	606,190.05	36.97522°N	107.46981°W
3,800.00	90.08	342.05	2,710.89	1,752.26	-418.90	2,174,546.32	606,161.74	36.97548°N	107.46990°W
3,900.00	90.13	339.05	2,710.70	1,846.54	-452.19	2,174,640.61	606,128.45	36.97574°N	107.47002°W
4,000.00	90.19	336.05	2,710.42	1,938.95	-490.37	2,174,733.02	606,090.27	36.97600°N	107.47015°W
4,100.00	90.24	333.05	2,710.05	2,029.24	-533.33	2,174,823.31	606,047.31	36.97625°N	107.47029°W
4,200.00	90.29	330.05	2,709.60	2,117.16	-580.95	2,174,911.22	605,999.68	36.97649°N	107.47045°W
4,300.00	90.34	327.05	2,709.05	2,202.46	-633.12	2,174,996.53	605,947.52	36.97672°N	107.47063°W
4,400.00	90.38	324.05	2,708.42	2,284.91	-689.67	2,175,078.98	605,890.97	36.97695°N	107.47082°W
4,459.69	90.41	322.26	2,708.01	2,332.68	-725.46	2,175,126.75	605,855.18	36.97708°N	107.47095°W
Hold Section									
4,500.00	90.43	321.06	2,707.71	2,364.30	-750.46	2,175,158.36	605,830.18	36.97717°N	107.47103°W
4,600.00	90.48	318.06	2,706.91	2,440.39	-815.32	2,175,234.46	605,765.31	36.97738°N	107.47125°W
4,700.00	90.52	315.06	2,706.04	2,512.98	-884.08	2,175,307.05	605,696.56	36.97758°N	107.47149°W
4,800.00	90.57	312.06	2,705.09	2,581.88	-956.54	2,175,375.94	605,624.10	36.97777°N	107.47173°W
4,819.44	90.58	311.47	2,704.89	2,594.82	-971.04	2,175,388.89	605,609.60	36.97780°N	107.47178°W
4,900.00	90.58	311.47	2,704.08	2,648.17	-1,031.40	2,175,442.24	605,549.24	36.97795°N	107.47199°W
5,000.00	90.58	311.47	2,703.08	2,714.40	-1,106.32	2,175,508.46	605,474.32	36.97813°N	107.47225°W
5,100.00	90.58	311.47	2,702.07	2,780.62	-1,181.24	2,175,574.69	605,399.40	36.97832°N	107.47250°W
5,200.00	90.58	311.47	2,701.07	2,846.84	-1,256.17	2,175,640.91	605,324.47	36.97850°N	107.47276°W
5,300.00	90.58	311.47	2,700.06	2,913.06	-1,331.09	2,175,707.13	605,249.55	36.97868°N	107.47301°W
5,400.00	90.58	311.47	2,699.06	2,979.29	-1,406.01	2,175,773.35	605,174.62	36.97886°N	107.47327°W
5,500.00	90.58	311.47	2,698.05	3,045.51	-1,480.94	2,175,839.58	605,099.70	36.97905°N	107.47352°W
5,600.00	90.58	311.47	2,697.05	3,111.73	-1,555.86	2,175,905.80	605,024.78	36.97923°N	107.47378°W
5,700.00	90.58	311.47	2,696.05	3,177.96	-1,630.78	2,175,972.02	604,949.85	36.97941°N	107.47404°W
5,800.00	90.58	311.47	2,695.04	3,244.18	-1,705.71	2,176,038.25	604,874.93	36.97959°N	107.47429°W
5,900.00	90.58	311.47	2,694.04	3,310.40	-1,780.63	2,176,104.47	604,800.01	36.97978°N	107.47455°W
6,000.00	90.58	311.47	2,693.03	3,376.62	-1,855.55	2,176,170.69	604,725.08	36.97996°N	107.47480°W
6,100.00	90.58	311.47	2,692.03	3,442.85	-1,930.48	2,176,236.91	604,650.16	36.98014°N	107.47506°W
6,200.00	90.58	311.47	2,691.02	3,509.07	-2,005.40	2,176,303.14	604,575.24	36.98033°N	107.47531°W
6,300.00	90.58	311.47	2,690.02	3,575.29	-2,080.32	2,176,369.36	604,500.31	36.98051°N	107.47557°W
6,400.00	90.58	311.47	2,689.01	3,641.52	-2,155.25	2,176,435.58	604,425.39	36.98069°N	107.47582°W
6,500.00	90.58	311.47	2,688.01	3,707.74	-2,230.17	2,176,501.81	604,350.47	36.98087°N	107.47608°W
6,600.00	90.58	311.47	2,687.00	3,773.96	-2,305.09	2,176,568.03	604,275.54	36.98106°N	107.47634°W
6,700.00	90.58	311.47	2,686.00	3,840.18	-2,380.02	2,176,634.25	604,200.62	36.98124°N	107.47659°W
6,800.00	90.58	311.47	2,684.99	3,906.41	-2,454.94	2,176,700.47	604,125.70	36.98142°N	107.47685°W
6,900.00	90.58	311.47	2,683.99	3,972.63	-2,529.86	2,176,766.70	604,050.77	36.98160°N	107.47710°W
7,000.00	90.58	311.47	2,682.98	4,038.85	-2,604.79	2,176,832.92	603,975.85	36.98179°N	107.47736°W
7,100.00	90.58	311.47	2,681.98	4,105.08	-2,679.71	2,176,899.14	603,900.93	36.98197°N	107.47761°W
7,200.00	90.58	311.47	2,680.97	4,171.30	-2,754.64	2,176,965.37	603,826.00	36.98215°N	107.47787°W
7,300.00	90.58	311.47	2,679.97	4,237.52	-2,829.56	2,177,031.59	603,751.08	36.98233°N	107.47813°W
7,400.00	90.58	311.47	2,678.96	4,303.74	-2,904.48	2,177,097.81	603,676.16	36.98252°N	107.47838°W
7,500.00	90.58	311.47	2,677.96	4,369.97	-2,979.41	2,177,164.04	603,601.23	36.98270°N	107.47864°W



Koltek Energy Services
Planning Report - Geographic



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.21-T32N-R06W
Well: Allison Unit 110H
Wellbore: Lat 1
Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,600.00	90.58	311.47	2,676.95	4,436.19	-3,054.33	2,177,230.26	603,526.31	36.98288°N	107.47889°W
7,700.00	90.58	311.47	2,675.95	4,502.41	-3,129.25	2,177,296.48	603,451.39	36.98307°N	107.47915°W
7,800.00	90.58	311.47	2,674.94	4,568.64	-3,204.18	2,177,362.70	603,376.46	36.98325°N	107.47940°W
7,900.00	90.58	311.47	2,673.94	4,634.86	-3,279.10	2,177,428.93	603,301.54	36.98343°N	107.47966°W
8,000.00	90.58	311.47	2,672.93	4,701.08	-3,354.02	2,177,495.15	603,226.62	36.98361°N	107.47992°W
8,100.00	90.58	311.47	2,671.93	4,767.30	-3,428.95	2,177,561.37	603,151.69	36.98380°N	107.48017°W
8,200.00	90.58	311.47	2,670.92	4,833.53	-3,503.87	2,177,627.60	603,076.77	36.98398°N	107.48043°W
8,300.00	90.58	311.47	2,669.92	4,899.75	-3,578.79	2,177,693.82	603,001.85	36.98416°N	107.48068°W
8,400.00	90.58	311.47	2,668.91	4,965.97	-3,653.72	2,177,760.04	602,926.92	36.98434°N	107.48094°W
8,500.00	90.58	311.47	2,667.91	5,032.20	-3,728.64	2,177,826.26	602,852.00	36.98453°N	107.48119°W
8,600.00	90.58	311.47	2,666.91	5,098.42	-3,803.56	2,177,892.49	602,777.07	36.98471°N	107.48145°W
8,700.00	90.58	311.47	2,665.90	5,164.64	-3,878.49	2,177,958.71	602,702.15	36.98489°N	107.48170°W
8,800.00	90.58	311.47	2,664.90	5,230.86	-3,953.41	2,178,024.93	602,627.23	36.98507°N	107.48196°W
8,900.00	90.58	311.47	2,663.89	5,297.09	-4,028.33	2,178,091.16	602,552.30	36.98526°N	107.48222°W
9,000.00	90.58	311.47	2,662.89	5,363.31	-4,103.26	2,178,157.38	602,477.38	36.98544°N	107.48247°W
9,100.00	90.58	311.47	2,661.88	5,429.53	-4,178.18	2,178,223.60	602,402.46	36.98562°N	107.48273°W
9,200.00	90.58	311.47	2,660.88	5,495.76	-4,253.10	2,178,289.82	602,327.53	36.98581°N	107.48298°W
9,300.00	90.58	311.47	2,659.87	5,561.98	-4,328.03	2,178,356.05	602,252.61	36.98599°N	107.48324°W
9,400.00	90.58	311.47	2,658.87	5,628.20	-4,402.95	2,178,422.27	602,177.69	36.98617°N	107.48349°W
9,500.00	90.58	311.47	2,657.86	5,694.42	-4,477.87	2,178,488.49	602,102.76	36.98635°N	107.48375°W
9,600.00	90.58	311.47	2,656.86	5,760.65	-4,552.80	2,178,554.72	602,027.84	36.98654°N	107.48401°W
9,700.00	90.58	311.47	2,655.85	5,826.87	-4,627.72	2,178,620.94	601,952.92	36.98672°N	107.48426°W
9,800.00	90.58	311.47	2,654.85	5,893.09	-4,702.64	2,178,687.16	601,877.99	36.98690°N	107.48452°W
9,900.00	90.58	311.47	2,653.84	5,959.32	-4,777.57	2,178,753.38	601,803.07	36.98708°N	107.48477°W
10,000.00	90.58	311.47	2,652.84	6,025.54	-4,852.49	2,178,819.61	601,728.15	36.98727°N	107.48503°W
10,030.93	90.58	311.47	2,652.53	6,046.02	-4,875.67	2,178,840.09	601,704.97	36.98732°N	107.48511°W
PBHL/TD									
10,083.34	90.58	311.47	2,652.00	6,080.73	-4,914.93	2,178,874.80	601,665.70	36.98742°N	107.48524°W

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Allison Unit 110H Toe	0.00	0.00	2,652.00	6,080.73	-4,914.93	2,178,874.80	601,665.70	36.98742°N	107.48524°W
- plan hits target center									
- Point									
Allison Unit 110H FTP	0.00	0.00	2,657.32	1,073.40	-252.56	2,173,867.47	606,328.08	36.97362°N	107.46934°W
- plan hits target center									
- Point									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,084.72	2,015.00	Ojo Alamo		0.00	
2,255.78	2,151.00	Kirtland		0.00	
2,766.96	2,495.00	Fruitland		0.00	
3,267.33	2,706.00	top of Zone		0.00	



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.21-T32N-R06W
Well: Allison Unit 110H
Wellbore: Lat 1
Design: Rev0

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well Allison Unit 110H
KB @ 6167.00usft
KB @ 6167.00usft
Grid
Minimum Curvature

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,093.06	2,657.32	1,073.40	-252.56	FTP, Build 10"/100' DLS
3,343.06	2,711.00	1,309.11	-308.01	LP, Hold Section
3,643.06	2,711.00	1,601.13	-376.72	Begin Turn
4,459.69	2,708.01	2,332.68	-725.46	Hold Section
10,030.93	2,652.53	6,046.02	-4,875.67	PBHL/TD



Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.21-T32N-R06W

Allison Unit 110H

Pilot Hole

Rev0

Anticollision Report

31 August, 2018





Koltek Energy Services

Anticollision Report



Company: Hilcorp Energy Company
 Project: San Juan Co., NM (NAD27)
 Reference Site: Sec.21-T32N-R06W
 Site Error: 0.00 usft
 Reference Well: Allison Unit 110H
 Well Error: 0.00 usft
 Reference Wellbore: Pilot Hole
 Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
 TVD Reference: KB @ 6167.00usft
 MD Reference: KB @ 6167.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: EDM 5000.1 Single User Db
 Offset TVD Reference: Offset Datum

Reference	Rev0		
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	08/31/18
From (usft)	To (usft)	Survey (Wellbore)
0.00	3,539.52	Rev0 (Pilot Hole)
		Tool Name
		MWD
		Description
		MWD - Standard

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec.16-T32N-R06W						
Allison Unit 006N - Original Hole - Original Hole	3,539.52	3,062.77	150.21	114.08	4.157	CC, ES, SF
Sec.21-T32N-R06W						
Allison Unit 152H - Original Hole - Original Hole	794.61	782.89	61.55	58.75	22.044	CC
Allison Unit 152H - Original Hole - Original Hole	800.00	788.22	61.55	58.73	21.870	ES
Allison Unit 152H - Original Hole - Original Hole	3,300.00	3,385.00	337.84	289.01	6.918	SF
Allison Unit 152H - ST 1 - ST 1	794.61	782.89	61.55	58.75	22.044	CC
Allison Unit 152H - ST 1 - ST 1	800.00	788.22	61.55	58.73	21.870	ES
Allison Unit 152H - ST 1 - ST 1	3,400.00	3,511.53	359.04	307.67	6.990	SF

Offset Design												
Sec.16-T32N-R06W - Allison Unit 006N - Original Hole - Original Hole												
Survey Program: 301-MWD												
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Warning		Offset Site Error: 0.00 usft		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	20.02	1,864.81	679.62	1,985.47			
100.00	100.00	57.97	57.97	0.10	0.07	20.02	1,864.71	679.45	1,984.67	1,984.51	0.16	N/A
200.00	200.00	178.73	178.72	0.32	0.21	19.99	1,863.91	678.04	1,983.64	1,983.12	0.52	3,782.433
300.00	300.00	299.42	299.36	0.55	0.35	19.93	1,862.29	675.19	1,981.57	1,980.69	0.89	2,234.211
400.00	400.00	441.02	440.63	0.77	0.71	19.72	1,859.62	666.42	1,977.60	1,976.14	1.46	1,357.758
500.00	500.00	539.57	538.68	0.99	0.98	19.46	1,858.31	656.62	1,972.98	1,971.06	1.93	1,024.206
600.00	600.00	703.26	700.95	1.22	1.49	18.90	1,855.88	635.30	1,967.56	1,964.94	2.62	751.202
700.00	700.00	855.90	851.19	1.44	2.06	18.23	1,849.67	609.11	1,957.96	1,954.63	3.33	588.212
800.00	800.00	981.21	973.45	1.67	2.62	17.52	1,844.22	582.22	1,947.04	1,943.02	4.02	484.838
900.00	900.00	1,127.78	1,114.71	1.89	3.40	16.48	1,837.53	543.74	1,934.76	1,929.87	4.89	395.782
926.40	926.40	1,189.36	1,173.41	1.95	3.76	15.99	1,833.70	525.57	1,930.83	1,925.58	5.25	367.766
1,000.00	999.98	1,273.07	1,252.77	2.12	4.28	28.74	1,827.65	499.65	1,917.84	1,911.72	6.12	313.300
1,100.00	1,099.76	1,368.76	1,343.10	2.35	4.90	28.27	1,821.04	468.76	1,896.56	1,889.66	6.90	274.981
1,200.00	1,199.07	1,473.58	1,441.47	2.59	5.63	27.80	1,813.91	433.27	1,870.79	1,863.03	7.76	241.159
1,300.00	1,297.62	1,643.38	1,598.20	2.85	6.94	26.74	1,800.38	369.42	1,839.01	1,829.87	9.14	201.207
1,400.00	1,395.16	1,780.29	1,722.01	3.17	8.11	25.95	1,785.88	312.83	1,799.84	1,789.48	10.35	173.865
1,500.00	1,491.42	1,893.49	1,822.59	3.55	9.16	25.37	1,772.08	262.78	1,754.65	1,743.23	11.42	153.597
1,600.00	1,586.12	1,992.97	1,909.65	4.02	10.15	24.91	1,759.70	216.27	1,705.01	1,692.60	12.41	137.427
1,700.00	1,679.02	2,080.90	1,986.14	4.58	11.04	24.63	1,748.17	174.46	1,650.99	1,637.72	13.27	124.387

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.16-T32N-R06W - Allison Unit 006N - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 301-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance				Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)	
1,800.00	1,769.85	2,172.73	2,065.38	5.24	11.99	24.31	1,735.95	129.69	1,593.04	1,578.88	14.16	112.484		
1,900.00	1,858.38	2,250.77	2,132.29	6.00	12.82	24.19	1,725.14	91.01	1,531.06	1,516.15	14.92	102.652		
2,000.00	1,944.34	2,323.05	2,194.01	6.86	13.60	24.20	1,715.23	54.71	1,465.73	1,450.13	15.60	93.937		
2,100.00	2,027.52	2,396.15	2,256.19	7.82	14.41	24.24	1,705.18	17.62	1,397.06	1,380.78	16.28	85.804		
2,200.00	2,107.68	2,468.96	2,317.84	8.87	15.22	24.32	1,695.06	-19.77	1,325.08	1,308.15	16.93	78.262		
2,300.00	2,184.60	2,540.20	2,378.00	10.02	16.00	24.50	1,684.76	-56.51	1,249.73	1,232.21	17.52	71.313		
2,400.00	2,258.08	2,603.41	2,431.42	11.25	16.65	24.95	1,675.32	-88.95	1,171.26	1,153.25	18.01	65.034		
2,500.00	2,327.90	2,662.61	2,481.54	12.57	17.25	25.64	1,666.36	-119.17	1,090.00	1,071.55	18.45	59.064		
2,600.00	2,393.88	2,719.05	2,529.37	13.97	17.83	26.62	1,657.66	-147.84	1,006.06	987.16	18.90	53.228		
2,700.00	2,455.84	2,771.24	2,573.60	15.44	18.37	28.04	1,649.45	-174.29	919.59	900.22	19.37	47.470		
2,800.00	2,513.61	2,816.00	2,611.72	16.99	18.83	30.15	1,642.28	-196.63	830.85	810.93	19.92	41.714		
2,900.00	2,567.03	2,854.38	2,644.68	18.60	19.19	33.23	1,636.21	-215.33	740.27	719.62	20.65	35.851		
3,000.00	2,615.95	2,887.92	2,673.79	20.28	19.51	37.65	1,631.12	-231.19	648.23	626.46	21.76	29.789		
3,093.06	2,657.32	2,915.90	2,698.26	21.89	19.76	43.41	1,627.08	-244.13	561.48	538.11	23.38	24.017		
3,100.00	2,660.25	2,917.92	2,700.04	22.01	19.78	43.53	1,626.80	-245.06	554.99	531.49	23.50	23.619		
3,200.00	2,702.51	2,947.00	2,725.65	23.77	20.04	45.67	1,622.85	-258.25	461.56	436.24	25.32	18.229		
3,300.00	2,744.77	2,980.25	2,755.10	25.54	20.33	49.20	1,618.58	-273.09	368.61	341.07	27.55	13.382		
3,400.00	2,787.03	3,013.84	2,784.97	27.31	20.62	54.79	1,614.49	-287.89	276.34	245.99	30.35	9.106		
3,500.00	2,829.30	3,048.72	2,816.14	29.09	20.91	64.82	1,610.44	-303.01	185.37	151.15	34.22	5.417		
3,539.52	2,846.00	3,062.77	2,828.74	29.79	21.03	71.04	1,608.86	-309.02	150.21	114.08	36.14	4.157 CC, ES, SF		



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 152H - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 527-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	109.10	-23.41	67.57	72.51					
100.00	100.00	88.00	88.00	0.10	0.10	109.10	-23.41	67.57	71.51	71.32	0.19	367.498		
200.00	200.00	188.00	188.00	0.32	0.21	109.10	-23.41	67.57	71.51	70.98	0.53	134.495		
300.00	300.00	288.00	288.00	0.55	0.32	109.10	-23.41	67.57	71.51	70.64	0.87	82.309		
400.00	400.00	388.00	388.00	0.77	0.44	109.10	-23.41	67.57	71.51	70.31	1.21	59.300		
500.00	500.00	488.00	488.00	0.99	0.55	109.10	-23.41	67.57	71.51	69.97	1.54	46.345		
600.00	600.00	592.26	592.18	1.22	0.75	110.11	-23.67	64.64	68.96	67.00	1.96	35.148		
700.00	700.00	690.84	690.58	1.44	0.96	110.42	-22.04	59.21	63.24	60.83	2.40	26.341		
794.61	794.61	782.89	782.61	1.66	1.14	109.29	-20.34	58.09	61.55	58.75	2.79	22.044 CC		
800.00	800.00	788.22	787.93	1.67	1.15	109.23	-20.27	58.11	61.55	58.73	2.81	21.870 ES		
900.00	900.00	887.79	887.50	1.89	1.35	108.21	-19.40	58.98	62.09	58.85	3.24	19.176		
926.40	926.40	914.15	913.86	1.95	1.40	107.91	-19.16	59.29	62.31	58.96	3.35	18.589		
1,000.00	999.98	987.87	987.56	2.12	1.56	121.35	-18.43	60.13	63.62	59.95	3.67	17.314		
1,100.00	1,099.76	1,087.79	1,087.48	2.35	1.76	124.93	-17.46	60.97	67.62	63.52	4.10	16.494		
1,200.00	1,199.07	1,187.07	1,186.75	2.59	1.96	131.12	-16.51	61.84	75.25	70.72	4.53	16.601		
1,300.00	1,297.62	1,283.16	1,282.81	2.85	2.16	137.74	-15.68	63.90	88.55	83.58	4.97	17.812		
1,400.00	1,395.16	1,378.29	1,377.52	3.17	2.38	141.02	-12.43	71.86	110.00	104.56	5.44	20.210		
1,500.00	1,491.42	1,476.35	1,474.16	3.55	2.62	140.98	-3.13	85.38	136.02	130.06	5.96	22.828		
1,600.00	1,586.12	1,576.19	1,571.36	4.02	2.93	139.57	12.60	101.82	164.17	157.60	6.57	24.987		
1,700.00	1,679.02	1,680.20	1,671.21	4.58	3.32	137.73	35.80	119.32	192.61	185.29	7.32	26.317		
1,800.00	1,769.85	1,789.77	1,775.32	5.24	3.81	136.41	66.04	135.02	219.88	211.67	8.21	26.783		
1,900.00	1,858.38	1,912.35	1,890.08	6.00	4.43	135.86	107.87	144.66	241.94	232.67	9.28	26.081		
2,000.00	1,944.34	2,027.66	1,994.20	6.86	5.14	135.08	157.16	148.39	258.80	248.28	10.52	24.601		
2,100.00	2,027.52	2,150.58	2,099.27	7.82	6.09	133.42	220.79	150.22	272.50	260.38	12.11	22.494		
2,200.00	2,107.68	2,272.42	2,195.74	8.87	7.25	131.09	295.06	147.64	280.91	266.86	14.05	19.992		
2,300.00	2,184.60	2,385.02	2,277.02	10.02	8.51	128.04	372.83	143.92	286.73	270.43	16.30	17.588		
2,400.00	2,258.08	2,494.03	2,348.02	11.25	9.89	124.18	455.46	141.18	292.72	273.78	18.93	15.460		
2,500.00	2,327.90	2,609.72	2,416.12	12.57	11.50	119.81	548.79	136.01	297.68	275.66	22.02	13.519		
2,600.00	2,393.88	2,718.69	2,473.88	13.97	13.13	115.61	640.87	128.41	301.65	276.39	25.26	11.941		
2,700.00	2,455.84	2,824.62	2,525.93	15.44	14.78	111.84	732.65	119.14	306.08	277.47	28.62	10.696		
2,800.00	2,513.61	2,931.19	2,574.86	16.99	16.50	108.49	826.67	108.18	311.07	278.97	32.10	9.690		
2,900.00	2,567.03	3,036.31	2,619.21	18.60	18.24	105.53	921.17	95.79	316.18	280.52	35.66	8.867		
3,000.00	2,615.95	3,142.03	2,662.22	20.28	19.99	103.35	1,016.67	81.47	321.21	282.00	39.21	8.192		
3,093.06	2,657.32	3,240.64	2,700.99	21.89	21.68	102.05	1,106.09	66.45	325.47	282.91	42.56	7.648		
3,100.00	2,660.25	3,247.99	2,703.83	22.01	21.80	101.99	1,112.77	65.26	325.76	282.95	42.81	7.609		
3,200.00	2,702.51	3,356.11	2,744.26	23.77	23.69	100.86	1,211.26	46.45	328.56	282.01	46.55	7.058		
3,300.00	2,744.77	3,385.00	2,754.80	25.54	24.20	100.52	1,237.62	41.12	337.84	289.01	48.83	6.918 SF		
3,400.00	2,787.03	3,385.00	2,754.80	27.31	24.20	100.52	1,237.62	41.12	373.48	322.90	50.58	7.384		
3,500.00	2,829.30	3,385.00	2,754.80	29.09	24.20	100.52	1,237.62	41.12	429.93	377.60	52.33	8.216		
3,539.52	2,846.00	3,385.00	2,754.80	29.79	24.20	100.52	1,237.62	41.12	456.38	403.36	53.02	8.608		

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 152H - ST 1 - ST 1													Offset Site Error: 0.00 usft
Survey Program: 527-MWD, 3176-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)					
0.00	0.00	0.00	0.00	0.00	0.00	109.10	-23.41	67.57	72.51				
100.00	100.00	88.00	88.00	0.10	0.10	109.10	-23.41	67.57	71.51	71.32	0.19	367.498	
200.00	200.00	188.00	188.00	0.32	0.21	109.10	-23.41	67.57	71.51	70.98	0.53	134.495	
300.00	300.00	288.00	288.00	0.55	0.32	109.10	-23.41	67.57	71.51	70.64	0.87	82.309	
400.00	400.00	388.00	388.00	0.77	0.44	109.10	-23.41	67.57	71.51	70.31	1.21	59.300	
500.00	500.00	488.00	488.00	0.99	0.55	109.10	-23.41	67.57	71.51	69.97	1.54	46.345	
600.00	600.00	592.26	592.18	1.22	0.75	110.11	-23.67	64.64	68.96	67.00	1.96	35.148	
700.00	700.00	690.84	690.58	1.44	0.96	110.42	-22.04	59.21	63.24	60.83	2.40	26.341	
794.61	794.61	782.89	782.61	1.66	1.14	109.29	-20.34	58.09	61.55	58.75	2.79	22.044 CC	
800.00	800.00	788.22	787.93	1.67	1.15	109.23	-20.27	58.11	61.55	58.73	2.81	21.870 ES	
900.00	900.00	887.79	887.50	1.89	1.35	108.21	-19.40	58.98	62.09	58.85	3.24	19.176	
926.40	926.40	914.15	913.86	1.95	1.40	107.91	-19.16	59.29	62.31	58.96	3.35	18.589	
1,000.00	999.98	987.87	987.56	2.12	1.56	121.35	-18.43	60.13	63.62	59.95	3.67	17.314	
1,100.00	1,099.76	1,087.79	1,087.48	2.35	1.76	124.93	-17.46	60.97	67.62	63.52	4.10	16.494	
1,200.00	1,199.07	1,187.07	1,186.75	2.59	1.96	131.12	-16.51	61.84	75.25	70.72	4.53	16.601	
1,300.00	1,297.62	1,283.16	1,282.81	2.85	2.16	137.74	-15.68	63.90	88.55	83.58	4.97	17.812	
1,400.00	1,395.16	1,378.29	1,377.52	3.17	2.38	141.02	-12.43	71.86	110.00	104.56	5.44	20.210	
1,500.00	1,491.42	1,476.35	1,474.16	3.55	2.62	140.98	-3.13	85.38	136.02	130.06	5.96	22.828	
1,600.00	1,586.12	1,576.19	1,571.36	4.02	2.93	139.57	12.60	101.82	164.17	157.60	6.57	24.987	
1,700.00	1,679.02	1,680.20	1,671.21	4.58	3.32	137.73	35.80	119.32	192.61	185.29	7.32	26.317	
1,800.00	1,769.85	1,789.77	1,775.32	5.24	3.81	136.41	66.04	135.02	219.88	211.67	8.21	26.783	
1,900.00	1,858.38	1,912.35	1,890.08	6.00	4.43	135.86	107.87	144.66	241.94	232.67	9.28	26.081	
2,000.00	1,944.34	2,027.66	1,994.20	6.86	5.14	135.08	157.16	148.39	258.80	248.28	10.52	24.601	
2,100.00	2,027.52	2,150.58	2,099.27	7.82	6.09	133.42	220.79	150.22	272.50	260.38	12.11	22.494	
2,200.00	2,107.68	2,272.42	2,195.74	8.87	7.25	131.09	295.06	147.64	280.91	266.86	14.05	19.992	
2,300.00	2,184.60	2,385.02	2,277.02	10.02	8.51	128.04	372.83	143.92	286.73	270.43	16.30	17.588	
2,400.00	2,258.08	2,494.03	2,348.02	11.25	9.89	124.18	455.46	141.18	292.72	273.78	18.93	15.460	
2,500.00	2,327.90	2,609.72	2,416.12	12.57	11.50	119.81	548.79	136.01	297.68	275.66	22.02	13.519	
2,600.00	2,393.88	2,718.69	2,473.88	13.97	13.13	115.61	640.87	128.41	301.65	276.39	25.26	11.941	
2,700.00	2,455.84	2,824.62	2,525.93	15.44	14.78	111.84	732.65	119.14	306.08	277.47	28.62	10.696	
2,800.00	2,513.61	2,931.19	2,574.86	16.99	16.50	108.49	826.67	108.18	311.07	278.97	32.10	9.690	
2,900.00	2,567.03	3,036.31	2,619.21	18.60	18.24	105.53	921.17	95.79	316.18	280.52	35.66	8.867	
3,000.00	2,615.95	3,142.03	2,662.22	20.28	19.99	103.35	1,016.67	81.47	321.21	282.00	39.21	8.192	
3,093.06	2,657.32	3,236.47	2,695.41	21.89	21.16	101.32	1,103.95	68.11	325.99	283.88	42.11	7.741	
3,100.00	2,660.25	3,244.23	2,697.37	22.01	21.25	101.06	1,111.38	67.09	326.38	284.03	42.35	7.707	
3,200.00	2,702.51	3,342.59	2,713.64	23.77	22.47	96.32	1,207.39	53.80	331.74	286.06	45.68	7.262	
3,300.00	2,744.77	3,423.95	2,719.23	25.54	23.56	91.26	1,288.05	44.87	342.16	293.51	48.65	7.033	
3,400.00	2,787.03	3,511.53	2,721.91	27.31	24.77	85.66	1,375.27	37.45	359.04	307.67	51.37	6.990 SF	
3,500.00	2,829.30	3,590.78	2,723.98	29.09	25.90	80.89	1,454.31	31.97	381.39	327.73	53.66	7.107	
3,539.52	2,846.00	3,622.31	2,723.19	29.79	26.37	79.02	1,485.79	30.21	391.88	337.41	54.48	7.194	

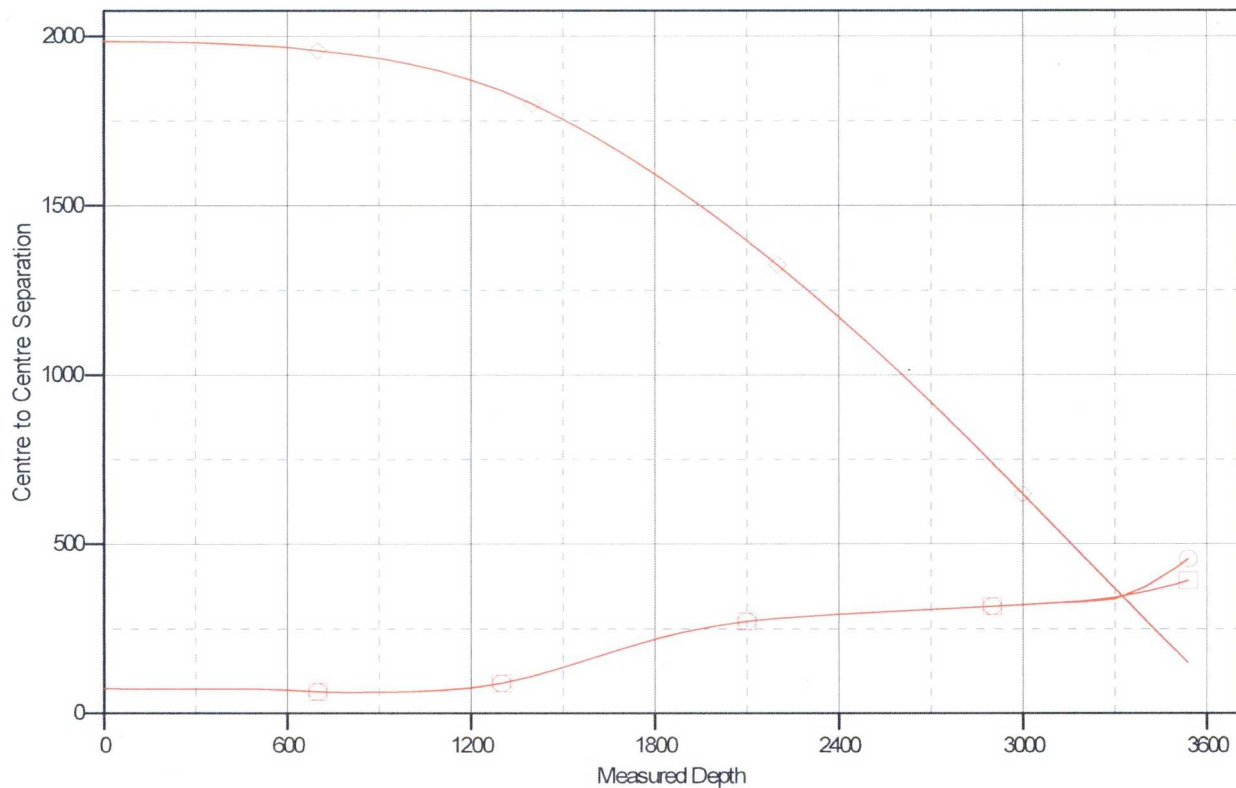
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 6167.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.83334°W

Coordinates are relative to: Allison Unit 110H
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 152H, Original Hole, Original Hole V0
  Allison Unit 152H, ST 1, ST 1 V0
  Allison Unit 006N, Original Hole, Original Hole V0



Koltek Energy Services
Anticollision Report



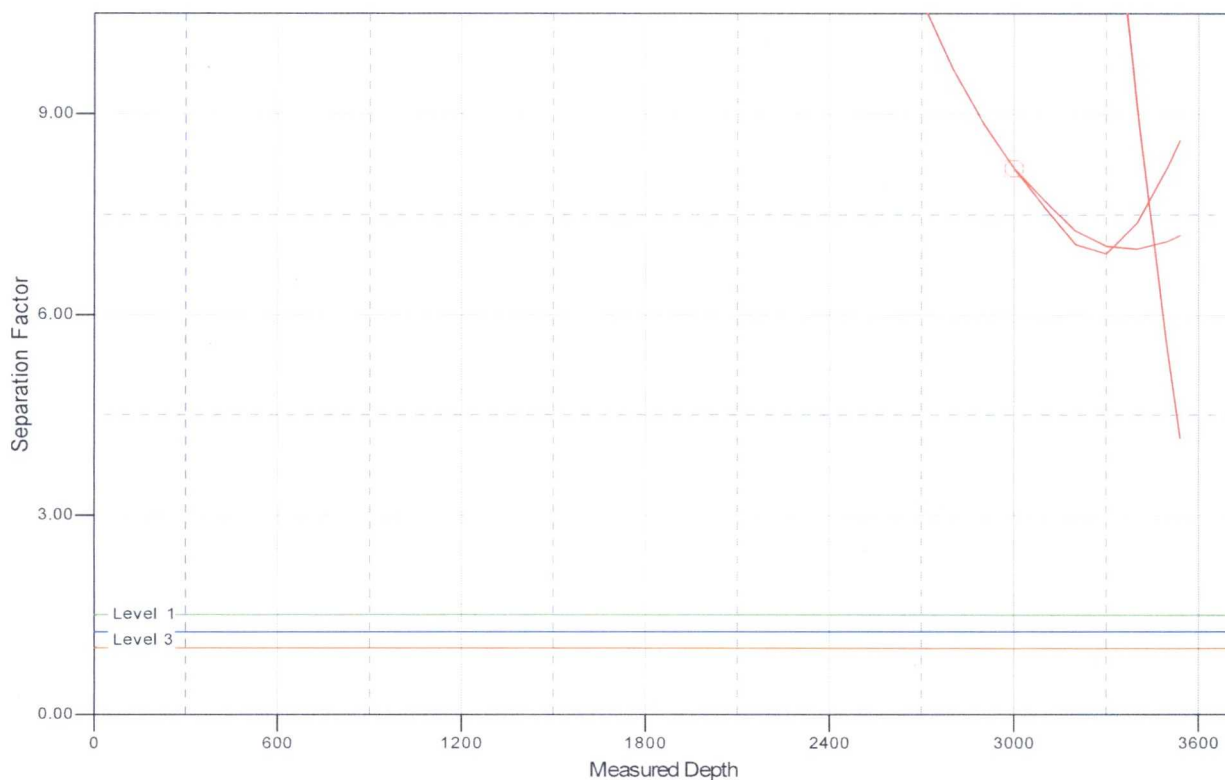
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 6167.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.83334°W

Coordinates are relative to: Allison Unit 110H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.22°

Separation Factor Plot

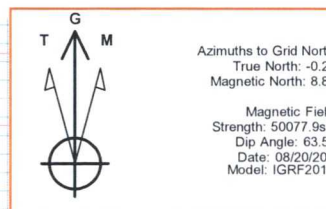
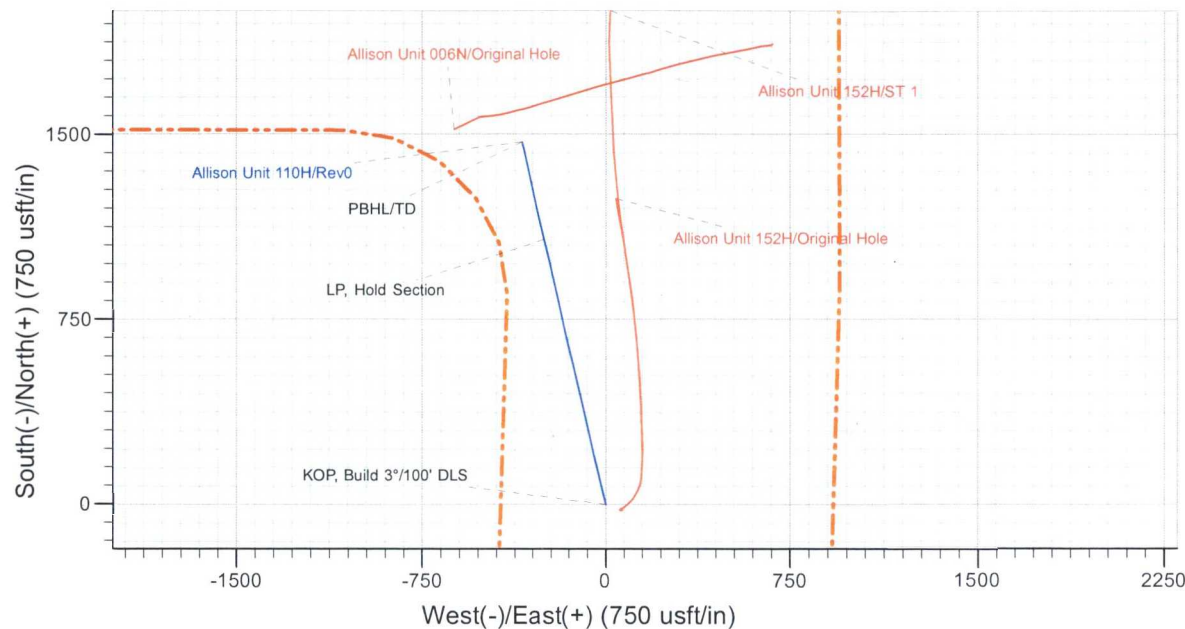
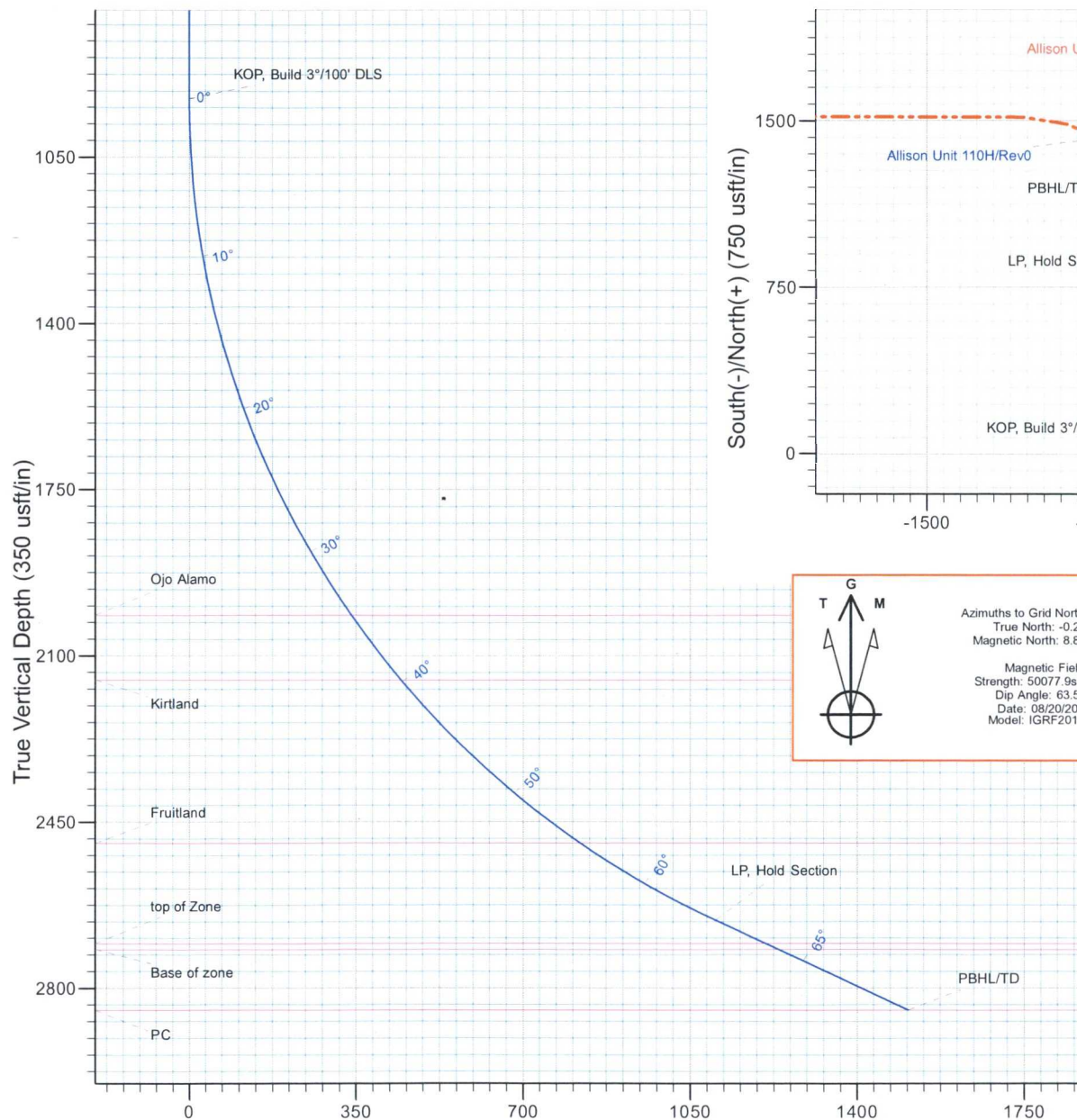


LEGEND

→ Allison Unit 152H, Original Hole, Original Hole V0 → Allison Unit 152H, ST 1, ST 1 V0 → Allison Unit 006N, Original Hole, Original Hole V0



Company: Hilcorp Energy Company
 Field: San Juan Co., NM (NAD27)
 Location: Sec.21-T32N-R06W
 Well: Allison Unit 110H
 Borehole: Pilot Hole
 Plan: Rev0



WELL DETAILS: Allison Unit 110H							
		GL 6152.00	KB @ 6167.00usft				
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude		
0.00	0.00	2172794.07	606580.63	36.97066°N	107.46849°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	926.40	0.00	0.00	926.40	0.00	0.00	0.00	0.00	0.00
3	3093.06	65.00	346.76	2657.32	1073.40	-252.56	3.00	346.76	1102.72
4	3539.52	65.00	346.76	2846.00	1467.28	-345.23	0.00	0.00	1507.35

FORMATION TOP DETAILS			
TVDPath	MDPath	Formation	
2015.00	2084.72	Ojo Alamo	
2151.00	2255.78	Kirtland	
2495.00	2766.96	Fruitland	
2706.00	3208.26	top of Zone	
2719.00	3239.02	Base of zone	
2846.00	3539.52	PC	

ANNOTATIONS			
TVD	MD	Annotation	
926.40	926.40	KOP, Build 3°/100' DLS	
2657.32	3093.06	LP, Hold Section	
2846.00	3539.52	PBHL/TD	

Allison Unit 110H	Rev0
Created By: J Rieke	Date: 15:01, August 31 2018



Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.21-T32N-R06W

Allison Unit 110H

Pilot Hole

Plan: Rev0

Standard Planning Report - Geographic

31 August, 2018





Koltek Energy Services
Planning Report - Geographic



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.21-T32N-R06W
Well: Allison Unit 110H
Wellbore: Pilot Hole
Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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
From:	Lat/Long	Easting:	606,580.64 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in
		Latitude:	36.97067°N
		Longitude:	107.46849°W
		Grid Convergence:	0.22 °

Well	Allison Unit 110H		
Well Position	+N/-S	0.00 usft	Northing: 2,172,794.07 usft
	+E/-W	0.00 usft	Easting: 606,580.64 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	36.97067°N
		Longitude:	107.46849°W
		Ground Level:	6,152.00 usft

Wellbore	Pilot Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	08/20/18	9.05	63.57	50,078

Design	Rev0			
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	346.76

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	
926.40	0.00	0.00	926.40	0.00	0.00	0.00	0.00	0.00	0.00	
3,093.06	65.00	346.76	2,657.32	1,073.40	-252.56	3.00	3.00	0.00	346.76	
3,539.52	65.00	346.76	2,846.00	1,467.28	-345.23	0.00	0.00	0.00	0.00	



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.21-T32N-R06W
Well: Allison Unit 110H
Wellbore: Pilot Hole
Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	2,172,794.07	606,580.64	36.97067°N	107.46849°W
100.00	0.00	0.00	100.00	0.00	0.00	2,172,794.07	606,580.64	36.97067°N	107.46849°W
200.00	0.00	0.00	200.00	0.00	0.00	2,172,794.07	606,580.64	36.97067°N	107.46849°W
300.00	0.00	0.00	300.00	0.00	0.00	2,172,794.07	606,580.64	36.97067°N	107.46849°W
400.00	0.00	0.00	400.00	0.00	0.00	2,172,794.07	606,580.64	36.97067°N	107.46849°W
500.00	0.00	0.00	500.00	0.00	0.00	2,172,794.07	606,580.64	36.97067°N	107.46849°W
600.00	0.00	0.00	600.00	0.00	0.00	2,172,794.07	606,580.64	36.97067°N	107.46849°W
700.00	0.00	0.00	700.00	0.00	0.00	2,172,794.07	606,580.64	36.97067°N	107.46849°W
800.00	0.00	0.00	800.00	0.00	0.00	2,172,794.07	606,580.64	36.97067°N	107.46849°W
900.00	0.00	0.00	900.00	0.00	0.00	2,172,794.07	606,580.64	36.97067°N	107.46849°W
926.40	0.00	0.00	926.40	0.00	0.00	2,172,794.07	606,580.64	36.97067°N	107.46849°W
KOP, Build 3°/100' DLS									
1,000.00	2.21	346.76	999.98	1.38	-0.32	2,172,795.45	606,580.31	36.97067°N	107.46849°W
1,100.00	5.21	346.76	1,099.76	7.67	-1.81	2,172,801.74	606,578.83	36.97069°N	107.46850°W
1,200.00	8.21	346.76	1,199.07	19.04	-4.48	2,172,813.11	606,576.16	36.97072°N	107.46851°W
1,300.00	11.21	346.76	1,297.62	35.46	-8.34	2,172,829.52	606,572.30	36.97076°N	107.46852°W
1,400.00	14.21	346.76	1,395.16	56.87	-13.38	2,172,850.94	606,567.26	36.97082°N	107.46854°W
1,500.00	17.21	346.76	1,491.42	83.22	-19.58	2,172,877.29	606,561.06	36.97089°N	107.46856°W
1,600.00	20.21	346.76	1,586.12	114.44	-26.93	2,172,908.50	606,553.71	36.97098°N	107.46858°W
1,700.00	23.21	346.76	1,679.02	150.44	-35.40	2,172,944.51	606,545.24	36.97108°N	107.46861°W
1,800.00	26.21	346.76	1,769.85	191.12	-44.97	2,172,985.19	606,535.67	36.97119°N	107.46865°W
1,900.00	29.21	346.76	1,858.38	236.38	-55.62	2,173,030.44	606,525.02	36.97132°N	107.46868°W
2,000.00	32.21	346.76	1,944.34	286.08	-67.31	2,173,080.15	606,513.33	36.97145°N	107.46872°W
2,100.00	35.21	346.76	2,027.52	340.10	-80.02	2,173,134.16	606,500.62	36.97160°N	107.46876°W
2,200.00	38.21	346.76	2,107.68	398.27	-93.71	2,173,192.34	606,486.93	36.97176°N	107.46881°W
2,300.00	41.21	346.76	2,184.60	460.46	-108.34	2,173,254.52	606,472.30	36.97193°N	107.46886°W
2,400.00	44.21	346.76	2,258.08	526.47	-123.87	2,173,320.54	606,456.77	36.97211°N	107.46891°W
2,500.00	47.21	346.76	2,327.90	596.14	-140.26	2,173,390.21	606,440.38	36.97230°N	107.46897°W
2,600.00	50.21	346.76	2,393.88	669.27	-157.47	2,173,463.34	606,423.17	36.97251°N	107.46902°W
2,700.00	53.21	346.76	2,455.84	745.66	-175.44	2,173,539.73	606,405.20	36.97272°N	107.46908°W
2,800.00	56.21	346.76	2,513.61	825.11	-194.13	2,173,619.17	606,386.50	36.97293°N	107.46915°W
2,900.00	59.21	346.76	2,567.03	907.38	-213.49	2,173,701.45	606,367.15	36.97316°N	107.46921°W
3,000.00	62.21	346.76	2,615.95	992.27	-233.47	2,173,786.34	606,347.17	36.97339°N	107.46928°W
3,093.06	65.00	346.76	2,657.32	1,073.40	-252.56	2,173,867.47	606,328.08	36.97362°N	107.46934°W
LP, Hold Section									
3,100.00	65.00	346.76	2,660.25	1,079.53	-254.00	2,173,873.59	606,326.64	36.97363°N	107.46935°W
3,200.00	65.00	346.76	2,702.51	1,167.75	-274.75	2,173,961.81	606,305.89	36.97388°N	107.46942°W
3,300.00	65.00	346.76	2,744.77	1,255.97	-295.51	2,174,050.04	606,285.13	36.97412°N	107.46949°W
3,400.00	65.00	346.76	2,787.03	1,344.19	-316.27	2,174,138.26	606,264.37	36.97436°N	107.46956°W
3,500.00	65.00	346.76	2,829.30	1,432.41	-337.02	2,174,226.48	606,243.61	36.97460°N	107.46963°W
3,539.52	65.00	346.76	2,846.00	1,467.28	-345.23	2,174,261.35	606,235.41	36.97470°N	107.46966°W
PBHL/TD									



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.21-T32N-R06W
Well: Allison Unit 110H
Wellbore: Pilot Hole
Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,084.72	2,015.00	Ojo Alamo		0.00	
2,255.78	2,151.00	Kirtland		0.00	
2,766.96	2,495.00	Fruitland		0.00	
3,208.26	2,706.00	top of Zone		0.00	
3,239.02	2,719.00	Base of zone		0.00	
3,539.52	2,846.00	PC		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
926.40	926.40	0.00	0.00	KOP, Build 3"/100' DLS
3,093.06	2,657.32	1,073.40	-252.56	LP, Hold Section
3,539.52	2,846.00	1,467.28	-345.23	PBHL/TD



Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.21-T32N-R06W

Allison Unit 110H

Lat 1

Rev0

Anticollision Report

31 August, 2018





Local Co-ordinate Reference:	Well Allison Unit 110H
TVD Reference:	KB @ 6167.00usft
MD Reference:	KB @ 6167.00usft
North Reference:	Grid
Survey Calculation Method:	Minimum Curvature
Output errors are at	2.00 sigma
Database:	EDM 5000.1 Single User Db
Offset TVD Reference:	Offset Datum

Reference	Rev0		
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	08/31/18		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	3,093.06	Rev0 (Pilot Hole)	MWD	MWD - Standard	
3,093.06	10,083.34	Rev0 (Lat 1)	MWD	MWD - Standard	

Site Name	Reference	Offset	Distance		Separation Factor	Warning
	Measured Depth (usft)	Measured Depth (usft)	Between Centres (usft)	Between Ellipses (usft)		
Offset Well - Wellbore - Design						
Sec.16-T32N-R06W						
Allison Unit 006N - Original Hole - Original Hole	3,637.13	2,944.47	137.50	102.52	3.930	CC, ES
Allison Unit 006N - Original Hole - Original Hole	3,643.06	2,944.32	137.63	102.55	3.923	SF
Sec.17-T32N-R06W						
Allison Unit 002B - Original Hole - Original Hole	9,156.27	3,011.90	562.69	358.33	2.753	CC, ES
Allison Unit 002B - Original Hole - Original Hole	9,200.00	3,011.71	564.38	358.93	2.747	SF
Allison Unit 038B - Original Hole - Original Hole	5,471.41	2,697.38	183.55	83.13	1.828	CC, ES, SF
Allison Unit 038M - Original Hole - Original Hole	7,190.25	3,004.25	1,261.39	1,093.62	7.518	CC
Allison Unit 038M - Original Hole - Original Hole	7,200.00	3,004.15	1,261.43	1,093.41	7.508	ES
Allison Unit 038M - Original Hole - Original Hole	7,400.00	3,002.12	1,278.71	1,105.73	7.392	SF
Allison Unit 038N - Original Hole - Original Hole	8,002.72	2,968.29	276.97	91.66	1.495	Level 3, CC, ES, SF
Allison Unit 110 - Original Hole - Original Hole	7,234.43	3,003.80	1,192.43	1,009.48	6.518	CC, ES
Allison Unit 110 - Original Hole - Original Hole	7,400.00	3,002.13	1,203.86	1,016.80	6.436	SF
Sec.18-T32N-R06W						
Allison Unit 039N - Original Hole - Original Hole	10,083.34	3,001.42	2,018.45	1,786.43	8.699	CC, ES, SF
Sec.21-T32N-R06W						
Allison Unit 110H - Pilot Hole - Rev0	3,093.06	3,093.06	0.00	0.00	0.000	Level 1, CC, SF
Allison Unit 110H - Pilot Hole - Rev0	3,100.00	3,100.00	0.04	-0.10	0.301	Level 1, ES
Allison Unit 152H - Original Hole - Original Hole	794.61	782.89	61.55	58.75	22.044	CC
Allison Unit 152H - Original Hole - Original Hole	800.00	788.22	61.55	58.73	21.870	ES
Allison Unit 152H - Original Hole - Original Hole	3,250.00	3,385.00	334.49	288.01	7.196	SF
Allison Unit 152H - ST 1 - ST 1	794.61	782.89	61.55	58.75	22.044	CC
Allison Unit 152H - ST 1 - ST 1	800.00	788.22	61.55	58.73	21.870	ES
Allison Unit 152H - ST 1 - ST 1	3,643.06	3,758.04	401.30	344.18	7.026	SF

Offset Design													Sec.16-T32N-R06W - Allison Unit 006N - Original Hole - Original Hole		Offset Site Error: 0.00 usft	
Survey Program: 301-MWD													Offset Well Error: 0.00 usft			
Reference		Offset		Semi Major Axis			Distance						Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
0.00	0.00	0.00	0.00	0.00	0.00	20.02	1,864.81	679.62	1,985.47							
100.00	100.00	57.97	57.97	0.10	0.07	20.02	1,864.71	679.45	1,984.67	1,984.51	0.16	N/A				

COMPASS 5000.1 Build 70



Koltek Energy Services

Anticollision Report



Company: Hilcorp Energy Company
 Project: San Juan Co., NM (NAD27)
 Reference Site: Sec.21-T32N-R06W
 Site Error: 0.00 usft
 Reference Well: Allison Unit 110H
 Well Error: 0.00 usft
 Reference Wellbore: Lat 1
 Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
 TVD Reference: KB @ 6167.00usft
 MD Reference: KB @ 6167.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at 2.00 sigma
 Database: EDM 5000.1 Single User Db
 Offset TVD Reference: Offset Datum

Offset Design Sec.16-T32N-R06W - Allison Unit 006N - Original Hole - Original Hole												Offset Site Error: 0.00 usft
Survey Program: 301-MWD												Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)				
200.00	200.00	178.73	178.72	0.32	0.21	19.99	1,863.91	678.04	1,983.64	1,983.12	0.52	3,782.433
300.00	300.00	299.42	299.36	0.55	0.35	19.93	1,862.29	675.19	1,981.57	1,980.69	0.89	2,234.211
400.00	400.00	441.02	440.63	0.77	0.71	19.72	1,859.62	666.42	1,977.60	1,976.14	1.46	1,357.758
500.00	500.00	539.57	538.68	0.99	0.98	19.46	1,858.31	656.62	1,972.98	1,971.06	1.93	1,024.206
600.00	600.00	703.26	700.95	1.22	1.49	18.90	1,855.88	635.30	1,967.56	1,964.94	2.62	751.202
700.00	700.00	855.90	851.19	1.44	2.06	18.23	1,849.67	609.11	1,957.96	1,954.63	3.33	588.212
800.00	800.00	981.21	973.45	1.67	2.62	17.52	1,844.22	582.22	1,947.04	1,943.02	4.02	484.838
900.00	900.00	1,127.78	1,114.71	1.89	3.40	16.48	1,837.53	543.74	1,934.76	1,929.87	4.89	395.782
926.40	926.40	1,189.36	1,173.41	1.95	3.76	15.99	1,833.70	525.57	1,930.83	1,925.58	5.25	367.766
1,000.00	999.98	1,273.07	1,252.77	2.12	4.28	28.74	1,827.65	499.65	1,917.84	1,911.72	6.12	313.300
1,100.00	1,099.76	1,368.76	1,343.10	2.35	4.90	28.27	1,821.04	468.76	1,896.56	1,889.66	6.90	274.981
1,200.00	1,199.07	1,473.58	1,441.47	2.59	5.63	27.80	1,813.91	433.27	1,870.79	1,863.03	7.76	241.159
1,300.00	1,297.62	1,643.38	1,598.20	2.85	6.94	26.74	1,800.38	369.42	1,839.01	1,829.87	9.14	201.207
1,400.00	1,395.16	1,780.29	1,722.01	3.17	8.11	25.95	1,785.88	312.83	1,799.84	1,789.48	10.35	173.865
1,500.00	1,491.42	1,893.49	1,822.59	3.55	9.16	25.37	1,772.08	262.78	1,754.65	1,743.23	11.42	153.597
1,600.00	1,586.12	1,992.97	1,909.65	4.02	10.15	24.91	1,759.70	216.27	1,705.01	1,692.60	12.41	137.427
1,700.00	1,679.02	2,080.90	1,986.14	4.58	11.04	24.63	1,748.17	174.46	1,650.99	1,637.72	13.27	124.387
1,800.00	1,769.85	2,172.73	2,065.38	5.24	11.99	24.31	1,735.95	129.69	1,593.04	1,578.88	14.16	112.484
1,900.00	1,858.38	2,250.77	2,132.29	6.00	12.82	24.19	1,725.14	91.01	1,531.06	1,516.15	14.92	102.652
2,000.00	1,944.34	2,323.05	2,194.01	6.86	13.60	24.20	1,715.23	54.71	1,465.73	1,450.13	15.60	93.937
2,100.00	2,027.52	2,396.15	2,256.19	7.82	14.41	24.24	1,705.18	17.62	1,397.06	1,380.78	16.28	85.804
2,200.00	2,107.68	2,468.96	2,317.84	8.87	15.22	24.32	1,695.06	-19.77	1,325.08	1,308.15	16.93	78.262
2,300.00	2,184.60	2,540.20	2,378.00	10.02	16.00	24.50	1,684.76	-56.51	1,249.73	1,232.21	17.52	71.313
2,400.00	2,258.08	2,603.41	2,431.42	11.25	16.65	24.95	1,675.32	-88.95	1,171.26	1,153.25	18.01	65.033
2,500.00	2,327.90	2,662.61	2,481.54	12.57	17.25	25.64	1,666.36	-119.17	1,090.00	1,071.55	18.45	59.064
2,600.00	2,393.88	2,719.05	2,529.37	13.97	17.83	26.62	1,657.66	-147.84	1,006.06	987.16	18.90	53.228
2,700.00	2,455.84	2,771.24	2,573.60	15.44	18.37	28.04	1,649.45	-174.29	919.59	900.22	19.37	47.470
2,800.00	2,513.61	2,816.00	2,611.72	16.99	18.83	30.15	1,642.28	-196.63	830.85	810.93	19.92	41.714
2,900.00	2,567.03	2,854.38	2,644.68	18.60	19.19	33.23	1,636.21	-215.33	740.27	719.62	20.65	35.851
3,000.00	2,615.95	2,887.92	2,673.79	20.28	19.51	37.65	1,631.12	-231.19	648.23	626.46	21.76	29.789
3,093.06	2,657.32	2,915.90	2,698.26	21.89	19.76	43.41	1,627.08	-244.13	561.49	538.11	23.38	24.017
3,100.00	2,660.21	2,917.89	2,700.01	21.98	19.78	44.85	1,626.80	-245.04	554.98	531.38	23.59	23.522
3,150.00	2,678.78	2,930.67	2,711.24	22.51	19.89	57.91	1,625.04	-250.87	507.59	481.54	26.04	19.490
3,200.00	2,693.23	2,940.55	2,719.95	23.08	19.98	75.72	1,623.71	-255.34	459.66	429.80	29.86	15.394
3,250.00	2,703.46	2,947.00	2,725.65	23.69	20.04	95.08	1,622.85	-258.25	411.68	379.45	32.23	12.774
3,300.00	2,709.38	2,951.04	2,729.22	24.34	20.08	111.37	1,622.32	-260.06	364.28	332.46	31.82	11.448
3,343.06	2,711.00	2,951.38	2,729.53	24.91	20.08	120.81	1,622.28	-260.22	324.55	294.01	30.54	10.627
3,400.00	2,711.00	2,950.08	2,728.37	25.70	20.07	120.27	1,622.45	-259.63	274.05	242.71	31.34	8.744
3,500.00	2,711.00	2,947.00	2,725.65	27.15	20.04	118.99	1,622.85	-258.25	194.17	161.28	32.89	5.903
3,600.00	2,711.00	2,947.00	2,725.65	28.66	20.04	118.99	1,622.85	-258.25	142.44	108.21	34.23	4.161
3,637.13	2,711.00	2,944.47	2,723.41	29.24	20.02	117.93	1,623.18	-257.11	137.50	102.52	34.99	3.930 CC, ES
3,643.06	2,711.00	2,944.32	2,723.29	29.34	20.02	117.87	1,623.20	-257.05	137.63	102.55	35.08	3.923 SF
3,700.00	2,710.98	2,943.29	2,722.37	30.22	20.01	117.65	1,623.34	-256.58	151.88	115.99	35.88	4.233
3,800.00	2,710.89	2,943.24	2,722.33	31.80	20.01	118.85	1,623.35	-256.56	216.79	179.87	36.92	5.871
3,900.00	2,710.70	2,945.54	2,724.37	33.45	20.03	122.56	1,623.04	-257.60	303.53	266.30	37.23	8.153
4,000.00	2,710.42	2,950.33	2,728.59	35.16	20.07	129.95	1,622.41	-259.74	397.88	361.98	35.90	11.082
4,100.00	2,710.05	2,957.62	2,735.05	36.92	20.13	143.16	1,621.46	-263.01	495.26	464.38	30.88	16.039
4,200.00	2,709.60	2,967.45	2,743.75	38.73	20.22	164.15	1,620.20	-267.40	593.89	573.99	19.90	29.848
4,300.00	2,709.05	2,979.81	2,754.71	40.58	20.32	-170.77	1,618.64	-272.90	692.92	676.89	16.03	43.216
4,400.00	2,708.42	2,994.68	2,767.91	42.47	20.45	-150.50	1,616.80	-279.47	791.88	764.75	27.13	29.193
4,500.00	2,707.71	3,011.93	2,783.27	44.40	20.60	-137.53	1,614.72	-287.05	890.44	853.87	36.58	24.345
4,600.00	2,706.91	3,030.39	2,799.75	46.35	20.76	-129.42	1,612.54	-295.10	988.40	945.47	42.93	23.022

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.16-T32N-R06W - Allison Unit 006N - Original Hole - Original Hole														Offset Site Error:	0.00 usft
Survey Program: 301-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)							
4,700.00	2,706.04	3,050.71	2,817.93	48.33	20.93	-124.20	1,610.22	-303.86	1,085.59	1,038.12	47.47	22.870			
4,800.00	2,705.09	3,072.72	2,837.68	50.32	21.11	-120.67	1,607.76	-313.25	1,181.86	1,130.86	51.00	23.173			
4,819.44	2,704.89	3,074.00	2,838.83	50.71	21.13	-119.81	1,607.62	-313.79	1,200.46	1,148.71	51.75	23.198			
4,900.00	2,704.08	3,091.37	2,854.50	52.34	21.26	-121.47	1,605.75	-321.07	1,277.57	1,224.98	52.59	24.293			
5,000.00	2,703.08	3,108.91	2,870.40	54.38	21.40	-123.05	1,603.91	-328.23	1,373.57	1,319.80	53.77	25.544			
5,100.00	2,702.07	3,125.62	2,885.63	56.47	21.53	-124.47	1,602.22	-334.88	1,469.84	1,414.87	54.97	26.739			
5,200.00	2,701.07	3,142.44	2,901.05	58.60	21.66	-125.83	1,600.57	-341.42	1,566.35	1,510.21	56.14	27.902			
5,300.00	2,700.06	3,160.88	2,918.00	60.75	21.80	-127.23	1,598.82	-348.44	1,663.04	1,605.83	57.21	29.071			
5,400.00	2,699.06	3,178.82	2,934.56	62.94	21.93	-128.52	1,597.19	-355.15	1,759.88	1,701.60	58.28	30.199			
5,500.00	2,698.05	3,200.00	2,954.18	65.16	22.08	-129.96	1,595.34	-362.91	1,856.86	1,797.68	59.17	31.379			
5,600.00	2,697.05	3,200.00	2,954.18	67.40	22.08	-129.96	1,595.34	-362.91	1,954.01	1,892.94	61.06	32.000			
5,700.00	2,696.05	3,221.78	2,974.44	69.66	22.22	-131.35	1,593.49	-370.68	2,051.23	1,989.35	61.89	33.145			
5,800.00	2,695.04	3,233.25	2,985.16	71.95	22.30	-132.04	1,592.51	-374.68	2,148.65	2,085.45	63.19	34.001			
5,900.00	2,694.04	3,244.24	2,995.43	74.25	22.38	-132.69	1,591.57	-378.45	2,246.19	2,181.68	64.51	34.820			
6,000.00	2,693.03	3,262.00	3,012.09	76.57	22.49	-133.69	1,590.06	-384.42	2,343.87	2,278.40	65.47	35.798			
6,100.00	2,692.03	3,262.00	3,012.09	78.91	22.49	-133.69	1,590.06	-384.42	2,441.63	2,374.32	67.31	36.275			
6,200.00	2,691.02	3,279.89	3,028.92	81.26	22.61	-134.66	1,588.56	-390.29	2,539.48	2,471.25	68.23	37.220			
6,300.00	2,690.02	3,293.39	3,041.65	83.63	22.69	-135.35	1,587.46	-394.66	2,637.40	2,568.04	69.36	38.027			
6,400.00	2,689.01	3,306.59	3,054.11	86.00	22.77	-136.01	1,586.40	-398.88	2,735.38	2,664.90	70.48	38.808			
6,500.00	2,688.01	3,326.00	3,072.48	88.39	22.89	-136.94	1,584.89	-404.97	2,833.43	2,762.15	71.29	39.748			
6,600.00	2,687.00	3,326.00	3,072.48	90.79	22.89	-136.94	1,584.89	-404.97	2,931.53	2,858.48	73.06	40.128			
6,700.00	2,686.00	3,343.02	3,088.62	93.19	22.99	-137.72	1,583.61	-410.20	3,029.69	2,955.74	73.94	40.974			
6,800.00	2,684.99	3,354.10	3,099.16	95.61	23.05	-138.21	1,582.80	-413.55	3,127.90	3,052.78	75.12	41.640			
6,900.00	2,683.99	3,364.90	3,109.44	98.03	23.11	-138.68	1,582.03	-416.76	3,226.17	3,149.87	76.30	42.285			
7,000.00	2,682.98	3,375.42	3,119.47	100.46	23.17	-139.12	1,581.29	-419.84	3,324.49	3,247.01	77.47	42.911			
7,100.00	2,681.98	3,390.00	3,133.40	102.90	23.26	-139.73	1,580.31	-424.03	3,422.85	3,344.43	78.43	43.644			
7,200.00	2,680.97	3,397.11	3,140.20	105.34	23.29	-140.01	1,579.84	-426.05	3,521.27	3,441.51	79.75	44.151			
7,300.00	2,679.97	3,409.38	3,151.96	107.79	23.36	-140.50	1,579.08	-429.47	3,619.71	3,538.92	80.80	44.801			
7,400.00	2,678.96	3,421.42	3,163.52	110.25	23.42	-140.97	1,578.37	-432.77	3,718.19	3,636.36	81.83	45.437			
7,500.00	2,677.96	3,433.24	3,174.88	112.71	23.48	-141.42	1,577.72	-435.94	3,816.69	3,733.83	82.86	46.059			
7,600.00	2,676.95	3,444.84	3,186.06	115.17	23.54	-141.86	1,577.13	-438.99	3,915.23	3,831.34	83.89	46.669			
7,700.00	2,675.95	3,453.00	3,193.93	117.64	23.58	-142.16	1,576.74	-441.11	4,013.80	3,928.70	85.10	47.168			
7,800.00	2,674.94	3,467.13	3,207.58	120.12	23.65	-142.68	1,576.10	-444.70	4,112.39	4,026.43	85.96	47.843			
7,900.00	2,673.94	3,477.91	3,218.01	122.60	23.70	-143.06	1,575.65	-447.40	4,211.01	4,124.02	86.99	48.410			
8,000.00	2,672.93	3,488.49	3,228.26	125.08	23.75	-143.43	1,575.23	-450.00	4,309.66	4,221.64	88.01	48.965			
8,100.00	2,671.93	3,498.89	3,238.34	127.56	23.80	-143.79	1,574.85	-452.51	4,408.33	4,319.29	89.04	49.509			
8,200.00	2,670.92	3,516.00	3,254.96	130.05	23.87	-144.36	1,574.27	-456.56	4,507.04	4,417.36	89.68	50.258			
8,300.00	2,669.92	3,516.00	3,254.96	132.54	23.87	-144.36	1,574.27	-456.56	4,605.75	4,514.49	91.26	50.466			
8,400.00	2,668.91	3,516.00	3,254.96	135.03	23.87	-144.36	1,574.27	-456.56	4,704.52	4,611.67	92.85	50.667			
8,500.00	2,667.91	3,516.00	3,254.96	137.53	23.87	-144.36	1,574.27	-456.56	4,803.34	4,708.91	94.44	50.862			
8,600.00	2,666.91	3,536.71	3,275.11	140.03	23.96	-145.04	1,573.65	-461.28	4,902.11	4,807.31	94.80	51.710			
8,700.00	2,665.90	3,542.62	3,280.87	142.53	23.98	-145.23	1,573.48	-462.59	5,000.96	4,904.94	96.02	52.083			
8,800.00	2,664.90	3,548.38	3,286.49	145.03	24.01	-145.42	1,573.32	-463.85	5,099.84	5,002.60	97.24	52.447			
8,900.00	2,663.89	3,554.00	3,291.98	147.54	24.03	-145.59	1,573.17	-465.06	5,198.75	5,100.29	98.46	52.802			
9,000.00	2,662.89	3,559.48	3,297.33	150.05	24.05	-145.77	1,573.03	-466.22	5,297.68	5,198.01	99.68	53.149			
9,100.00	2,661.88	3,579.00	3,316.42	152.56	24.13	-146.37	1,572.56	-470.25	5,396.69	5,296.66	100.03	53.949			
9,200.00	2,660.88	3,579.00	3,316.42	155.07	24.13	-146.37	1,572.56	-470.25	5,495.65	5,394.08	101.56	54.111			
9,300.00	2,659.87	3,579.00	3,316.42	157.58	24.13	-146.37	1,572.56	-470.25	5,594.64	5,491.55	103.09	54.267			
9,400.00	2,658.87	3,579.00	3,316.42	160.10	24.13	-146.37	1,572.56	-470.25	5,693.67	5,589.04	104.63	54.419			
9,500.00	2,657.86	3,579.00	3,316.42	162.61	24.13	-146.37	1,572.56	-470.25	5,792.74	5,686.58	106.16	54.566			
9,600.00	2,656.86	3,579.00	3,316.42	165.13	24.13	-146.37	1,572.56	-470.25	5,891.83	5,784.14	107.69	54.710			
9,700.00	2,655.85	3,600.02	3,337.03	167.65	24.21	-147.00	1,572.11	-474.39	5,990.88	5,883.03	107.85	55.547			

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.16-T32N-R06W - Allison Unit 006N - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 301-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
9,800.00	2,654.85	3,606.28	3,343.16	170.17	24.23	-147.19	1,571.98	-475.60	6,089.99	5,981.03	108.96	55.892	
9,900.00	2,653.84	3,612.42	3,349.20	172.70	24.25	-147.37	1,571.87	-476.77	6,189.11	6,079.05	110.07	56.231	
10,000.00	2,652.84	3,618.46	3,355.13	175.22	24.27	-147.54	1,571.77	-477.90	6,288.25	6,177.08	111.17	56.563	
10,083.34	2,652.00	3,623.41	3,359.99	177.32	24.29	-147.68	1,571.68	-478.82	6,370.89	6,258.79	112.09	56.836	



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.17-T32N-R06W - Allison Unit 002B - Original Hole - Original Hole														Offset Site Error: 0.00 usft
Survey Program: 125-INC_ONLY<10														Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)				Offset TVD Reference:	Offset Datum	
0.00	0.00	347.00	347.00	0.00	4.14	-42.31	5,045.12	-4,593.01	6,822.68					
100.00	100.00	447.00	447.00	0.10	5.59	-42.31	5,045.12	-4,593.01	6,822.68	6,816.99	5.69	1,199.254		
200.00	200.00	537.66	537.65	0.32	6.81	-42.31	5,045.20	-4,593.01	6,822.74	6,815.61	7.13	957.113		
300.00	300.00	642.26	642.25	0.55	8.04	-42.31	5,045.34	-4,593.01	6,822.85	6,814.26	8.59	794.679		
400.00	400.00	746.87	746.86	0.77	9.27	-42.31	5,045.40	-4,593.01	6,822.88	6,812.84	10.04	679.374		
500.00	500.00	851.48	851.47	0.99	10.51	-42.31	5,045.35	-4,593.01	6,822.85	6,811.35	11.50	593.283		
600.00	600.00	956.09	956.08	1.22	11.74	-42.31	5,045.21	-4,593.01	6,822.75	6,809.79	12.96	526.551		
700.00	700.00	1,047.01	1,047.00	1.44	12.69	-42.31	5,045.12	-4,593.01	6,822.68	6,808.55	14.13	482.804		
800.00	800.00	1,147.01	1,147.00	1.67	13.61	-42.31	5,045.12	-4,593.01	6,822.68	6,807.40	15.27	446.666		
900.00	900.00	1,247.01	1,247.00	1.89	14.52	-42.31	5,045.12	-4,593.01	6,822.68	6,806.26	16.42	415.562		
926.40	926.40	1,273.41	1,273.40	1.95	14.77	-42.31	5,045.12	-4,593.01	6,822.68	6,805.96	16.72	408.060		
1,000.00	999.98	1,346.99	1,346.98	2.12	15.44	-29.10	5,045.12	-4,593.01	6,821.44	6,803.88	17.56	388.490		
1,100.00	1,099.76	1,446.77	1,446.76	2.35	16.36	-29.21	5,045.12	-4,593.01	6,815.79	6,797.12	18.67	365.110		
1,200.00	1,199.07	1,562.53	1,562.51	2.59	17.75	-29.42	5,044.88	-4,593.01	6,805.43	6,785.22	20.21	336.680		
1,300.00	1,297.62	1,653.11	1,653.10	2.85	19.06	-29.71	5,044.66	-4,593.01	6,790.53	6,768.90	21.63	313.870		
1,400.00	1,395.16	1,742.81	1,742.79	3.17	20.36	-30.08	5,044.58	-4,593.01	6,771.28	6,748.27	23.01	294.338		
1,500.00	1,491.42	1,831.38	1,831.37	3.55	21.64	-30.56	5,044.64	-4,593.01	6,747.73	6,723.41	24.33	277.387		
1,600.00	1,586.12	1,918.62	1,918.60	4.02	22.90	-31.13	5,044.83	-4,593.01	6,719.97	6,694.37	25.60	262.472		
1,700.00	1,679.02	2,000.00	1,999.99	4.58	24.07	-31.79	5,045.12	-4,593.01	6,688.08	6,661.30	26.78	249.713		
1,800.00	1,769.85	2,116.87	2,116.85	5.24	26.41	-32.65	5,045.12	-4,593.01	6,651.76	6,622.71	29.05	228.941		
1,900.00	1,858.38	2,205.40	2,205.38	6.00	28.18	-33.59	5,045.12	-4,593.01	6,611.50	6,580.71	30.79	214.758		
2,000.00	1,944.34	2,291.37	2,291.34	6.86	29.89	-34.65	5,045.12	-4,593.01	6,567.37	6,534.88	32.49	202.130		
2,100.00	2,027.52	2,374.55	2,374.52	7.82	31.56	-35.86	5,045.12	-4,593.01	6,519.53	6,485.34	34.19	190.674		
2,200.00	2,107.68	2,454.71	2,454.68	8.87	33.16	-37.22	5,045.12	-4,593.01	6,468.14	6,432.23	35.92	180.082		
2,300.00	2,184.60	2,510.00	2,509.97	10.02	34.26	-38.66	5,045.12	-4,593.01	6,413.41	6,376.11	37.30	171.926		
2,400.00	2,258.08	2,630.25	2,630.21	11.25	38.43	-40.60	5,044.13	-4,593.01	6,354.77	6,313.21	41.55	152.925		
2,500.00	2,327.90	2,688.22	2,688.17	12.57	40.43	-42.45	5,043.89	-4,593.01	6,293.61	6,249.54	44.07	142.821		
2,600.00	2,393.88	2,743.26	2,743.21	13.97	42.34	-44.50	5,043.79	-4,593.01	6,229.80	6,183.06	46.74	133.292		
2,700.00	2,455.84	2,795.22	2,795.17	15.44	44.14	-46.76	5,043.82	-4,593.01	6,163.53	6,113.91	49.62	124.223		
2,800.00	2,513.61	2,843.95	2,843.91	16.99	45.82	-49.24	5,043.96	-4,593.01	6,095.01	6,042.26	52.74	115.564		
2,900.00	2,567.03	2,889.31	2,889.27	18.60	47.39	-51.94	5,044.19	-4,593.01	6,024.44	5,968.31	56.14	107.318		
3,000.00	2,615.95	2,931.15	2,931.11	20.28	48.84	-54.87	5,044.48	-4,593.01	5,952.06	5,892.25	59.80	99.526		
3,093.06	2,657.32	3,000.00	2,999.96	21.89	51.23	-58.17	5,045.12	-4,593.01	5,883.37	5,818.72	64.65	90.998		
3,100.00	2,660.21	3,000.00	2,999.96	21.98	51.23	-58.84	5,045.12	-4,593.01	5,878.17	5,813.15	65.01	90.416		
3,150.00	2,678.78	3,000.00	2,999.96	22.51	51.23	-64.05	5,045.12	-4,593.01	5,839.96	5,772.29	67.66	86.309		
3,200.00	2,693.23	3,000.00	2,999.96	23.08	51.23	-69.87	5,045.12	-4,593.01	5,800.71	5,730.21	70.51	82.272		
3,250.00	2,703.46	3,000.00	2,999.96	23.69	51.23	-76.24	5,045.12	-4,593.01	5,760.72	5,687.57	73.14	78.759		
3,300.00	2,709.38	3,000.00	2,999.96	24.34	51.23	-83.01	5,045.12	-4,593.01	5,720.26	5,645.10	75.16	76.108		
3,343.06	2,711.00	3,000.00	2,999.96	24.91	51.23	-89.00	5,045.12	-4,593.01	5,685.27	5,609.12	76.15	74.658		
3,400.00	2,711.00	3,000.00	2,999.96	25.70	51.23	-89.00	5,045.12	-4,593.01	5,639.12	5,562.18	76.94	73.293		
3,500.00	2,711.00	3,000.00	2,999.96	27.15	51.23	-89.00	5,045.12	-4,593.01	5,558.55	5,480.16	78.39	70.912		
3,600.00	2,711.00	3,000.00	2,999.96	28.66	51.23	-89.00	5,045.12	-4,593.01	5,478.61	5,398.71	79.90	68.567		
3,643.06	2,711.00	3,000.00	2,999.96	29.34	51.23	-89.00	5,045.12	-4,593.01	5,444.40	5,363.82	80.57	67.571		
3,700.00	2,710.98	3,000.00	2,999.96	30.22	51.23	-89.00	5,045.12	-4,593.01	5,398.83	5,317.38	81.45	66.284		
3,800.00	2,710.89	3,000.00	2,999.96	31.80	51.23	-89.00	5,045.12	-4,593.01	5,316.91	5,233.95	82.95	64.096		
3,900.00	2,710.70	3,000.00	2,999.96	33.45	51.23	-89.00	5,045.12	-4,593.01	5,232.55	5,148.20	84.45	61.965		
4,000.00	2,710.42	3,000.00	2,999.96	35.16	51.23	-89.01	5,045.12	-4,593.01	5,146.19	5,060.26	85.92	59.892		
4,100.00	2,710.05	3,000.00	2,999.96	36.92	51.23	-89.02	5,045.12	-4,593.01	5,057.65	4,970.27	87.38	57.880		
4,200.00	2,709.60	3,000.00	2,999.96	38.73	51.23	-89.04	5,045.12	-4,593.01	4,967.17	4,878.36	88.81	55.929		
4,300.00	2,709.05	3,000.00	2,999.96	40.58	51.23	-89.05	5,045.12	-4,593.01	4,874.90	4,784.69	90.21	54.040		
4,400.00	2,708.42	3,000.00	2,999.96	42.47	51.23	-89.07	5,045.12	-4,593.01	4,780.99	4,689.42	91.57	52.210		
4,500.00	2,707.71	3,000.00	2,999.96	44.40	51.23	-89.09	5,045.12	-4,593.01	4,685.61	4,592.72	92.89	50.441		

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.17-T32N-R06W - Allison Unit 002B - Original Hole - Original Hole														Offset Site Error:	0.00 usft
Survey Program: 125-INC_ONLY<10														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
4,600.00	2,706.91	3,000.00	2,999.96	46.35	51.23	-89.11	5,045.12	-4,593.01	4,588.95	4,494.78	94.17	48.732			
4,700.00	2,706.04	3,000.00	2,999.96	48.33	51.23	-89.13	5,045.12	-4,593.01	4,491.18	4,395.79	95.39	47.081			
4,800.00	2,705.09	3,000.00	2,999.96	50.32	51.23	-89.15	5,045.12	-4,593.01	4,392.52	4,295.95	96.56	45.489			
4,819.44	2,704.89	3,000.00	2,999.96	50.71	51.23	-89.15	5,045.12	-4,593.01	4,373.25	4,276.47	96.78	45.186			
4,900.00	2,704.08	3,000.00	2,999.96	52.34	51.23	-89.15	5,045.12	-4,593.01	4,293.37	4,194.76	98.61	43.537			
5,000.00	2,703.08	3,000.00	2,999.96	54.38	51.23	-89.15	5,045.12	-4,593.01	4,194.26	4,093.36	100.90	41.569			
5,100.00	2,702.07	3,000.00	2,999.96	56.47	51.23	-89.15	5,045.12	-4,593.01	4,095.18	3,991.97	103.21	39.678			
5,200.00	2,701.07	3,000.00	2,999.96	58.60	51.23	-89.15	5,045.12	-4,593.01	3,996.15	3,890.61	105.55	37.862			
5,300.00	2,700.06	3,000.00	2,999.96	60.75	51.23	-89.15	5,045.12	-4,593.01	3,897.18	3,789.28	107.90	36.118			
5,400.00	2,699.06	3,000.00	2,999.96	62.94	51.23	-89.15	5,045.12	-4,593.01	3,798.25	3,687.98	110.27	34.445			
5,500.00	2,698.05	3,000.00	2,999.96	65.16	51.23	-89.15	5,045.12	-4,593.01	3,699.39	3,586.73	112.66	32.837			
5,600.00	2,697.05	3,000.00	2,999.96	67.40	51.23	-89.15	5,045.12	-4,593.01	3,600.58	3,485.52	115.06	31.294			
5,700.00	2,696.05	3,000.00	2,999.96	69.66	51.23	-89.15	5,045.12	-4,593.01	3,501.85	3,384.37	117.47	29.810			
5,800.00	2,695.04	3,000.00	2,999.96	71.95	51.23	-89.15	5,045.12	-4,593.01	3,403.18	3,283.29	119.89	28.385			
5,900.00	2,694.04	3,000.00	2,999.96	74.25	51.23	-89.15	5,045.12	-4,593.01	3,304.60	3,182.27	122.33	27.014			
6,000.00	2,693.03	3,000.00	2,999.96	76.57	51.23	-89.15	5,045.12	-4,593.01	3,206.11	3,081.34	124.77	25.696			
6,100.00	2,692.03	3,000.00	2,999.96	78.91	51.23	-89.15	5,045.12	-4,593.01	3,107.71	2,980.49	127.22	24.428			
6,200.00	2,691.02	3,000.00	2,999.96	81.26	51.23	-89.15	5,045.12	-4,593.01	3,009.42	2,879.74	129.68	23.207			
6,300.00	2,690.02	3,000.00	2,999.96	83.63	51.23	-89.15	5,045.12	-4,593.01	2,911.24	2,779.10	132.14	22.031			
6,400.00	2,689.01	3,000.00	2,999.96	86.00	51.23	-89.15	5,045.12	-4,593.01	2,813.20	2,678.59	134.61	20.899			
6,500.00	2,688.01	3,000.00	2,999.96	88.39	51.23	-89.15	5,045.12	-4,593.01	2,715.29	2,578.21	137.09	19.807			
6,600.00	2,687.00	3,000.00	2,999.96	90.79	51.23	-89.15	5,045.12	-4,593.01	2,617.55	2,477.98	139.57	18.755			
6,700.00	2,686.00	3,000.00	2,999.96	93.19	51.23	-89.15	5,045.12	-4,593.01	2,519.98	2,377.93	142.05	17.740			
6,800.00	2,684.99	3,000.00	2,999.96	95.61	51.23	-89.15	5,045.12	-4,593.01	2,422.60	2,278.07	144.54	16.761			
6,900.00	2,683.99	3,000.00	2,999.96	98.03	51.23	-89.15	5,045.12	-4,593.01	2,325.46	2,178.42	147.03	15.816			
7,000.00	2,682.98	3,000.00	2,999.96	100.46	51.23	-89.15	5,045.12	-4,593.01	2,228.56	2,079.03	149.53	14.904			
7,100.00	2,681.98	3,000.00	2,999.96	102.90	51.23	-89.15	5,045.12	-4,593.01	2,131.95	1,979.92	152.03	14.023			
7,200.00	2,680.97	3,000.00	2,999.96	105.34	51.23	-89.15	5,045.12	-4,593.01	2,035.67	1,881.14	154.53	13.173			
7,300.00	2,679.97	3,000.00	2,999.96	107.79	51.23	-89.15	5,045.12	-4,593.01	1,939.77	1,782.73	157.04	12.352			
7,400.00	2,678.96	3,019.92	3,019.87	110.25	51.99	-91.18	5,045.29	-4,593.01	1,844.19	1,683.90	160.29	11.506			
7,500.00	2,677.96	3,019.45	3,019.40	112.71	51.97	-91.13	5,045.29	-4,593.01	1,749.23	1,586.45	162.78	10.746			
7,600.00	2,676.95	3,018.98	3,018.94	115.17	51.95	-91.08	5,045.28	-4,593.01	1,654.85	1,489.58	165.28	10.013			
7,700.00	2,675.95	3,018.52	3,018.47	117.64	51.94	-91.03	5,045.28	-4,593.01	1,561.18	1,393.41	167.78	9.305			
7,800.00	2,674.94	3,018.05	3,018.00	120.12	51.92	-90.99	5,045.28	-4,593.01	1,468.35	1,298.07	170.28	8.623			
7,900.00	2,673.94	3,017.59	3,017.54	122.60	51.90	-90.94	5,045.27	-4,593.01	1,376.52	1,203.74	172.78	7.967			
8,000.00	2,672.93	3,017.12	3,017.08	125.08	51.88	-90.89	5,045.27	-4,593.01	1,285.90	1,110.62	175.29	7.336			
8,100.00	2,671.93	3,016.66	3,016.62	127.56	51.86	-90.85	5,045.26	-4,593.01	1,196.79	1,018.99	177.79	6.731			
8,200.00	2,670.92	3,016.21	3,016.16	130.05	51.85	-90.80	5,045.26	-4,593.01	1,109.53	929.23	180.30	6.154			
8,300.00	2,669.92	3,015.75	3,015.70	132.54	51.83	-90.75	5,045.26	-4,593.01	1,024.60	841.79	182.81	5.605			
8,400.00	2,668.91	3,015.29	3,015.25	135.03	51.81	-90.71	5,045.25	-4,593.01	942.63	757.31	185.32	5.086			
8,500.00	2,667.91	3,014.84	3,014.79	137.53	51.79	-90.66	5,045.25	-4,593.01	864.46	676.63	187.83	4.602			
8,600.00	2,666.91	3,014.39	3,014.34	140.03	51.78	-90.61	5,045.25	-4,593.01	791.23	600.88	190.35	4.157			
8,700.00	2,665.90	3,013.94	3,013.89	142.53	51.76	-90.57	5,045.24	-4,593.01	724.43	531.56	192.86	3.756			
8,800.00	2,664.90	3,013.49	3,013.44	145.03	51.74	-90.52	5,045.24	-4,593.01	665.99	470.61	195.38	3.409			
8,900.00	2,663.89	3,013.04	3,013.00	147.54	51.73	-90.48	5,045.23	-4,593.01	618.29	420.40	197.90	3.124			
9,000.00	2,662.89	3,012.59	3,012.55	150.05	51.71	-90.43	5,045.23	-4,593.01	583.98	383.57	200.42	2.914			
9,100.00	2,661.88	3,012.15	3,012.11	152.56	51.69	-90.39	5,045.23	-4,593.01	565.49	362.56	202.94	2.787			
9,156.27	2,661.32	3,011.90	3,011.86	153.97	51.68	-90.36	5,045.22	-4,593.01	562.69	358.33	204.35	2.753 CC, ES			
9,200.00	2,660.88	3,011.71	3,011.66	155.07	51.67	-90.34	5,045.22	-4,593.01	564.38	358.93	205.46	2.747 SF			
9,300.00	2,659.87	3,011.27	3,011.22	157.58	51.66	-90.30	5,045.22	-4,593.01	580.75	372.77	207.98	2.792			
9,400.00	2,658.87	3,010.83	3,010.78	160.10	51.64	-90.25	5,045.22	-4,593.01	613.20	402.70	210.50	2.913			
9,500.00	2,657.86	3,010.39	3,010.34	162.61	51.62	-90.21	5,045.21	-4,593.01	659.37	446.34	213.02	3.095			

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.17-T32N-R06W - Allison Unit 002B - Original Hole - Original Hole														Offset Site Error:	0.00 usft
Survey Program: 125-INC_ONLY<10														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)							
9.600.00	2.656.86	3.009.95	3.009.91	165.13	51.61	-90.16	5.045.21	-4.593.01	716.59	501.05	215.55	3.325			
9.700.00	2.655.85	3.009.52	3.009.47	167.65	51.59	-90.12	5.045.20	-4.593.01	782.46	564.39	218.07	3.588			
9.800.00	2.654.85	3.009.08	3.009.04	170.17	51.57	-90.07	5.045.20	-4.593.01	854.98	634.38	220.60	3.876			
9.900.00	2.653.84	3.008.65	3.008.61	172.70	51.56	-90.03	5.045.20	-4.593.01	932.60	709.47	223.12	4.180			
10.000.00	2.652.84	3.000.00	2.999.96	175.22	51.23	-89.15	5.045.12	-4.593.01	1,014.17	788.86	225.32	4.501			
10.083.34	2.652.00	3.000.00	2.999.96	177.32	51.23	-89.15	5.045.12	-4.593.01	1,084.49	857.06	227.44	4.768			



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.17-T32N-R06W - Allison Unit 038B - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 217-INC_ONLY<10													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
0.00	0.00	0.00	0.00	0.00	0.00	-22.92	3,164.10	-1,337.96	3,435.36				
100.00	100.00	100.53	100.53	0.10	1.03	-22.92	3,163.75	-1,337.96	3,435.03	3,433.91	1.12	3,064.015	
109.50	109.50	108.51	108.50	0.12	1.11	-22.92	3,163.75	-1,337.96	3,435.03	3,433.81	1.22	2,806.778	
200.00	200.00	184.49	184.49	0.32	1.88	-22.92	3,163.92	-1,337.96	3,435.22	3,433.02	2.20	1,559.825	
300.00	300.00	294.26	294.26	0.55	3.56	-22.92	3,164.24	-1,337.96	3,435.49	3,431.39	4.10	836.990	
400.00	400.00	397.15	397.15	0.77	5.35	-22.92	3,164.35	-1,337.96	3,435.59	3,429.47	6.12	561.220	
500.00	500.00	500.04	500.04	0.99	7.14	-22.92	3,164.36	-1,337.96	3,435.60	3,427.46	8.14	422.127	
600.00	600.00	602.94	602.93	1.22	8.94	-22.92	3,164.28	-1,337.96	3,435.53	3,425.37	10.16	338.277	
700.00	700.00	705.84	705.83	1.44	10.73	-22.92	3,164.11	-1,337.96	3,435.37	3,423.20	12.17	282.208	
738.39	738.39	737.41	737.39	1.53	11.20	-22.92	3,164.10	-1,337.96	3,435.36	3,422.63	12.73	269.936	
800.00	800.00	799.02	799.00	1.67	12.09	-22.92	3,164.10	-1,337.96	3,435.36	3,421.60	13.76	249.688	
900.00	900.00	899.02	899.00	1.89	13.54	-22.92	3,164.10	-1,337.96	3,435.36	3,419.92	15.43	222.588	
926.40	926.40	925.42	925.40	1.95	13.92	-22.92	3,164.10	-1,337.96	3,435.36	3,419.48	15.88	216.387	
1,000.00	999.98	999.00	998.98	2.12	14.99	-9.69	3,164.10	-1,337.96	3,433.96	3,416.86	17.10	200.803	
1,100.00	1,099.76	1,098.78	1,098.76	2.35	16.44	-9.74	3,164.10	-1,337.96	3,427.59	3,408.86	18.72	183.063	
1,200.00	1,199.07	1,198.09	1,198.07	2.59	17.88	-9.84	3,164.10	-1,337.96	3,416.07	3,395.79	20.28	168.435	
1,300.00	1,297.62	1,296.64	1,296.62	2.85	19.31	-9.97	3,164.10	-1,337.96	3,399.46	3,377.69	21.77	156.182	
1,400.00	1,395.16	1,394.18	1,394.16	3.17	20.73	-10.15	3,164.10	-1,337.96	3,377.78	3,354.62	23.16	145.821	
1,500.00	1,491.42	1,490.44	1,490.42	3.55	22.12	-10.38	3,164.10	-1,337.96	3,351.11	3,326.65	24.47	136.974	
1,600.00	1,586.12	1,585.15	1,585.12	4.02	23.50	-10.67	3,164.10	-1,337.96	3,319.53	3,293.87	25.66	129.353	
1,700.00	1,679.02	1,678.05	1,678.02	4.58	24.85	-11.01	3,164.10	-1,337.96	3,283.12	3,256.36	26.75	122.728	
1,800.00	1,769.85	1,768.88	1,768.85	5.24	26.17	-11.41	3,164.10	-1,337.96	3,241.98	3,214.25	27.73	116.916	
1,900.00	1,858.38	1,857.40	1,857.38	6.00	27.46	-11.89	3,164.10	-1,337.96	3,196.25	3,167.65	28.59	111.789	
2,000.00	1,944.34	1,943.37	1,943.34	6.86	28.71	-12.45	3,164.10	-1,337.96	3,146.04	3,116.70	29.34	107.227	
2,100.00	2,027.52	2,026.55	2,026.52	7.82	29.92	-13.11	3,164.10	-1,337.96	3,091.51	3,061.53	29.98	103.123	
2,200.00	2,107.68	2,106.71	2,106.68	8.87	31.08	-13.87	3,164.10	-1,337.96	3,032.82	3,002.30	30.52	99.377	
2,300.00	2,184.60	2,183.64	2,183.60	10.02	32.20	-14.77	3,164.10	-1,337.96	2,970.13	2,939.15	30.98	95.876	
2,400.00	2,258.08	2,257.11	2,257.08	11.25	33.27	-15.81	3,164.10	-1,337.96	2,903.64	2,872.25	31.39	92.513	
2,500.00	2,327.90	2,326.94	2,326.90	12.57	34.28	-17.04	3,164.10	-1,337.96	2,833.53	2,801.76	31.78	89.171	
2,600.00	2,393.88	2,392.92	2,392.88	13.97	35.24	-18.49	3,164.10	-1,337.96	2,760.03	2,727.82	32.20	85.702	
2,700.00	2,455.84	2,454.88	2,454.84	15.44	36.14	-20.21	3,164.10	-1,337.96	2,683.34	2,650.59	32.75	81.931	
2,800.00	2,513.61	2,512.65	2,512.61	16.99	36.98	-22.25	3,164.10	-1,337.96	2,603.70	2,570.17	33.52	77.665	
2,900.00	2,567.03	2,566.07	2,566.03	18.60	37.76	-24.69	3,164.10	-1,337.96	2,521.35	2,486.68	34.67	72.724	
3,000.00	2,615.95	2,609.00	2,608.96	20.28	38.39	-27.52	3,164.10	-1,337.96	2,436.56	2,400.31	36.25	67.217	
3,093.06	2,657.32	2,656.35	2,656.32	21.89	39.07	-30.90	3,164.10	-1,337.96	2,355.66	2,317.03	38.63	60.979	
3,100.00	2,660.21	2,659.25	2,659.21	21.98	39.12	-31.65	3,164.10	-1,337.96	2,349.54	2,310.60	38.95	60.325	
3,150.00	2,678.78	2,677.82	2,677.78	22.51	39.39	-38.07	3,164.10	-1,337.96	2,304.59	2,262.30	42.29	54.497	
3,200.00	2,693.23	2,692.27	2,692.23	23.08	39.60	-46.96	3,164.10	-1,337.96	2,258.30	2,210.34	47.96	47.083	
3,250.00	2,703.46	2,702.50	2,702.46	23.69	39.74	-59.15	3,164.10	-1,337.96	2,211.04	2,155.62	55.42	39.894	
3,300.00	2,709.38	2,708.42	2,708.38	24.34	39.83	-74.84	3,164.10	-1,337.96	2,163.17	2,100.91	62.26	34.747	
3,343.06	2,711.00	2,710.04	2,710.00	24.91	39.85	-90.00	3,164.10	-1,337.96	2,121.74	2,056.97	64.77	32.759	
3,400.00	2,711.00	2,710.04	2,710.00	25.70	39.85	-90.00	3,164.10	-1,337.96	2,067.01	2,001.46	65.56	31.530	
3,500.00	2,711.00	2,710.04	2,710.00	27.15	39.85	-90.00	3,164.10	-1,337.96	1,971.20	1,904.19	67.00	29.419	
3,600.00	2,711.00	2,710.04	2,710.00	28.66	39.85	-90.00	3,164.10	-1,337.96	1,875.82	1,807.30	68.52	27.376	
3,643.06	2,711.00	2,710.04	2,710.00	29.34	39.85	-90.00	3,164.10	-1,337.96	1,834.90	1,765.71	69.19	26.519	
3,700.00	2,710.98	2,710.02	2,709.98	30.22	39.85	-90.10	3,164.10	-1,337.96	1,780.68	1,710.61	70.07	25.414	
3,800.00	2,710.89	2,709.93	2,709.89	31.80	39.85	-90.30	3,164.10	-1,337.96	1,684.63	1,613.06	71.57	23.539	
3,900.00	2,710.70	2,709.74	2,709.70	33.45	39.85	-90.58	3,164.10	-1,337.96	1,587.63	1,514.57	73.06	21.731	
4,000.00	2,710.42	2,709.46	2,709.42	35.16	39.85	-90.98	3,164.10	-1,337.96	1,489.77	1,415.24	74.53	19.989	
4,100.00	2,710.05	2,709.09	2,709.05	36.92	39.84	-91.60	3,164.10	-1,337.96	1,391.17	1,315.20	75.97	18.313	
4,200.00	2,709.60	2,708.63	2,708.60	38.73	39.83	-92.76	3,164.10	-1,337.96	1,291.96	1,214.61	77.34	16.704	
4,300.00	2,709.05	2,708.09	2,708.05	40.58	39.83	-95.82	3,164.10	-1,337.96	1,192.29	1,113.83	78.46	15.196	

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



Koltek Energy Services

Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.17-T32N-R06W - Allison Unit 038B - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 217-INC_ONLY<10													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)				Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	
4,400.00	2,708.42	2,707.46	2,707.42	42.47	39.82	-129.98	3,164.10	-1,337.96	1,092.36	1,029.75	62.61	17.446		
4,500.00	2,707.71	2,706.75	2,706.71	44.40	39.81	99.27	3,164.10	-1,337.96	992.39	912.05	80.35	12.351		
4,600.00	2,706.91	2,705.95	2,705.91	46.35	39.80	94.46	3,164.10	-1,337.96	892.70	810.26	82.44	10.829		
4,700.00	2,706.04	2,705.08	2,705.04	48.33	39.78	92.95	3,164.10	-1,337.96	793.70	709.91	83.80	9.472		
4,800.00	2,705.09	2,704.13	2,704.09	50.32	39.77	92.16	3,164.10	-1,337.96	696.04	611.03	85.01	8.188		
4,819.44	2,704.89	2,703.93	2,703.89	50.71	39.77	92.04	3,164.10	-1,337.96	677.28	592.05	85.23	7.946		
4,900.00	2,704.08	2,703.12	2,703.08	52.34	39.75	91.79	3,164.10	-1,337.96	600.14	513.07	87.07	6.893		
5,000.00	2,703.08	2,702.12	2,702.08	54.38	39.74	91.48	3,164.10	-1,337.96	505.86	416.50	89.36	5.661		
5,100.00	2,702.07	2,701.11	2,701.07	56.47	39.72	91.16	3,164.10	-1,337.96	414.27	322.60	91.67	4.519		
5,200.00	2,701.07	2,700.11	2,700.07	58.60	39.71	90.85	3,164.10	-1,337.96	327.64	233.63	94.00	3.485		
5,300.00	2,700.06	2,699.10	2,699.06	60.75	39.70	90.54	3,164.10	-1,337.96	251.13	154.78	96.35	2.606		
5,400.00	2,699.06	2,698.10	2,698.06	62.94	39.68	90.22	3,164.10	-1,337.96	196.95	98.23	98.72	1.995		
5,471.41	2,698.34	2,697.38	2,697.34	64.52	39.67	90.00	3,164.10	-1,337.96	183.55	83.13	100.41	1.828 CC, ES, SF		
5,500.00	2,698.05	2,697.09	2,697.05	65.16	39.67	89.91	3,164.10	-1,337.96	185.76	84.67	101.09	1.838		
5,600.00	2,697.05	2,696.09	2,696.05	67.40	39.65	89.60	3,164.10	-1,337.96	224.10	120.62	103.48	2.166		
5,700.00	2,696.05	2,695.08	2,695.05	69.66	39.64	89.28	3,164.10	-1,337.96	293.15	187.27	105.88	2.769		
5,800.00	2,695.04	2,694.08	2,694.04	71.95	39.62	88.97	3,164.10	-1,337.96	376.36	268.07	108.29	3.475		
5,900.00	2,694.04	2,693.07	2,693.04	74.25	39.61	88.66	3,164.10	-1,337.96	466.22	355.51	110.71	4.211		
6,000.00	2,693.03	2,692.07	2,692.03	76.57	39.59	88.34	3,164.10	-1,337.96	559.53	446.40	113.13	4.946		
6,100.00	2,692.03	2,691.07	2,691.03	78.91	39.58	88.03	3,164.10	-1,337.96	654.81	539.26	115.55	5.667		
6,200.00	2,691.02	2,690.06	2,690.02	81.26	39.56	87.72	3,164.10	-1,337.96	751.32	633.34	117.98	6.368		
6,300.00	2,690.02	2,689.06	2,689.02	83.63	39.55	87.40	3,164.10	-1,337.96	848.64	728.23	120.41	7.048		
6,400.00	2,689.01	2,688.05	2,688.01	86.00	39.53	87.09	3,164.10	-1,337.96	946.51	823.67	122.84	7.705		
6,500.00	2,688.01	2,687.05	2,687.01	88.39	39.52	86.78	3,164.10	-1,337.96	1,044.79	919.51	125.27	8.340		
6,600.00	2,687.00	2,686.04	2,686.00	90.79	39.51	86.46	3,164.10	-1,337.96	1,143.36	1,015.66	127.71	8.953		
6,700.00	2,686.00	2,685.04	2,685.00	93.19	39.49	86.15	3,164.10	-1,337.96	1,242.16	1,112.03	130.14	9.545		
6,800.00	2,684.99	2,684.03	2,683.99	95.61	39.48	85.84	3,164.10	-1,337.96	1,341.14	1,208.57	132.57	10.117		
6,900.00	2,683.99	2,683.03	2,682.99	98.03	39.46	85.53	3,164.10	-1,337.96	1,440.26	1,305.26	135.00	10.669		
7,000.00	2,682.98	2,682.02	2,681.98	100.46	39.45	85.22	3,164.10	-1,337.96	1,539.49	1,402.07	137.42	11.202		
7,100.00	2,681.98	2,681.02	2,680.98	102.90	39.43	84.91	3,164.10	-1,337.96	1,638.82	1,498.97	139.85	11.719		
7,200.00	2,680.97	2,680.01	2,679.97	105.34	39.42	84.59	3,164.10	-1,337.96	1,738.22	1,595.95	142.27	12.218		
7,300.00	2,679.97	2,679.01	2,678.97	107.79	39.40	84.28	3,164.10	-1,337.96	1,837.69	1,693.00	144.69	12.701		
7,400.00	2,678.96	2,678.00	2,677.96	110.25	39.39	83.97	3,164.10	-1,337.96	1,937.21	1,790.10	147.10	13.169		
7,500.00	2,677.96	2,677.00	2,676.96	112.71	39.37	83.66	3,164.10	-1,337.96	2,036.78	1,887.26	149.51	13.623		
7,600.00	2,676.95	2,675.99	2,675.95	115.17	39.36	83.35	3,164.10	-1,337.96	2,136.38	1,984.46	151.92	14.063		
7,700.00	2,675.95	2,674.99	2,674.95	117.64	39.34	83.04	3,164.10	-1,337.96	2,236.02	2,081.70	154.32	14.489		
7,800.00	2,674.94	2,673.98	2,673.94	120.12	39.33	82.74	3,164.10	-1,337.96	2,335.70	2,178.98	156.72	14.904		
7,900.00	2,673.94	2,672.98	2,672.94	122.60	39.32	82.43	3,164.10	-1,337.96	2,435.39	2,276.29	159.11	15.306		
8,000.00	2,672.93	2,671.97	2,671.93	125.08	39.30	82.12	3,164.10	-1,337.96	2,535.12	2,373.62	161.49	15.698		
8,100.00	2,671.93	2,670.97	2,670.93	127.56	39.29	81.81	3,164.10	-1,337.96	2,634.86	2,470.98	163.87	16.079		
8,200.00	2,670.92	2,669.96	2,669.92	130.05	39.27	81.50	3,164.10	-1,337.96	2,734.62	2,568.37	166.25	16.449		
8,300.00	2,669.92	2,668.96	2,668.92	132.54	39.26	81.20	3,164.10	-1,337.96	2,834.40	2,665.78	168.61	16.810		
8,400.00	2,668.91	2,667.95	2,667.91	135.03	39.24	80.89	3,164.10	-1,337.96	2,934.19	2,763.21	170.97	17.162		
8,500.00	2,667.91	2,666.95	2,666.91	137.53	39.23	80.59	3,164.10	-1,337.96	3,033.99	2,860.67	173.33	17.504		
8,600.00	2,666.91	2,665.94	2,665.91	140.03	39.21	80.28	3,164.10	-1,337.96	3,133.81	2,958.14	175.67	17.839		
8,700.00	2,665.90	2,664.94	2,664.90	142.53	39.20	79.98	3,164.10	-1,337.96	3,233.64	3,055.63	178.01	18.165		
8,800.00	2,664.90	2,663.93	2,663.90	145.03	39.18	79.67	3,164.10	-1,337.96	3,333.48	3,153.13	180.35	18.484		
8,900.00	2,663.89	2,662.93	2,662.89	147.54	39.17	79.37	3,164.10	-1,337.96	3,433.33	3,250.66	182.67	18.795		
9,000.00	2,662.89	2,661.92	2,661.89	150.05	39.15	79.07	3,164.10	-1,337.96	3,533.18	3,348.20	184.99	19.100		
9,100.00	2,661.88	2,660.92	2,660.88	152.56	39.14	78.77	3,164.10	-1,337.96	3,633.05	3,445.75	187.29	19.398		
9,200.00	2,660.88	2,659.91	2,659.88	155.07	39.13	78.46	3,164.10	-1,337.96	3,732.92	3,543.32	189.59	19.689		
9,300.00	2,659.87	2,658.91	2,658.87	157.58	39.11	78.16	3,164.10	-1,337.96	3,832.79	3,640.91	191.88	19.975		

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 217-INC_ONLY<10												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
9,400.00	2,658.87	2,657.91	2,657.87	160.10	39.10	77.86	3,164.10	-1,337.96	3,932.68	3,738.51	194.17	20.254	
9,500.00	2,657.86	2,656.90	2,656.86	162.61	39.08	77.56	3,164.10	-1,337.96	4,032.57	3,836.13	196.44	20.528	
9,600.00	2,656.86	2,655.90	2,655.86	165.13	39.07	77.26	3,164.10	-1,337.96	4,132.46	3,933.76	198.71	20.797	
9,700.00	2,655.85	2,654.89	2,654.85	167.65	39.05	76.97	3,164.10	-1,337.96	4,232.36	4,031.40	200.96	21.061	
9,800.00	2,654.85	2,653.89	2,653.85	170.17	39.04	76.67	3,164.10	-1,337.96	4,332.26	4,129.05	203.21	21.319	
9,900.00	2,653.84	2,652.88	2,652.84	172.70	39.02	76.37	3,164.10	-1,337.96	4,432.17	4,226.72	205.45	21.574	
10,000.00	2,652.84	2,651.88	2,651.84	175.22	39.01	76.08	3,164.10	-1,337.96	4,532.08	4,324.41	207.67	21.823	
10,083.34	2,652.00	2,651.04	2,651.00	177.32	39.00	75.83	3,164.10	-1,337.96	4,615.35	4,405.83	209.52	22.028	



Koltek Energy Services

Anticollision Report



Company: Hilcorp Energy Company
 Project: San Juan Co., NM (NAD27)
 Reference Site: Sec.21-T32N-R06W
 Site Error: 0.00 usft
 Reference Well: Allison Unit 110H
 Well Error: 0.00 usft
 Reference Wellbore: Lat 1
 Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
 TVD Reference: KB @ 6167.00usft
 MD Reference: KB @ 6167.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: EDM 5000.1 Single User Db
 Offset TVD Reference: Offset Datum

Offset Design Sec.17-T32N-R06W - Allison Unit 038M - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 255-INC_ONLY<10													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	314.49	314.49	0.00	2.56	-20.51	5,109.81	-1,911.95	5,455.80				
100.00	100.00	419.14	419.14	0.10	3.79	-20.51	5,109.93	-1,911.95	5,455.91	5,452.03	3.89	1,402.992	
200.00	200.00	523.79	523.79	0.32	5.03	-20.51	5,109.96	-1,911.95	5,455.94	5,450.59	5.35	1,019.918	
300.00	300.00	628.44	628.44	0.55	6.26	-20.51	5,109.90	-1,911.95	5,455.89	5,449.08	6.81	801.153	
400.00	400.00	733.10	733.09	0.77	7.50	-20.51	5,109.74	-1,911.95	5,455.74	5,447.47	8.27	659.646	
500.00	500.00	850.75	850.74	0.99	9.67	-20.52	5,109.03	-1,911.95	5,455.14	5,444.47	10.66	511.507	
600.00	600.00	935.52	935.51	1.22	11.38	-20.52	5,108.69	-1,911.95	5,454.77	5,442.17	12.60	433.062	
682.01	682.01	1,005.03	1,005.02	1.40	12.78	-20.52	5,108.61	-1,911.95	5,454.67	5,440.49	14.18	384.695	
700.00	700.00	1,020.28	1,020.27	1.44	13.08	-20.52	5,108.61	-1,911.95	5,454.68	5,440.15	14.53	375.496	
800.00	800.00	1,105.03	1,105.02	1.67	14.79	-20.52	5,108.79	-1,911.95	5,454.87	5,438.41	16.46	331.459	
900.00	900.00	1,189.76	1,189.75	1.89	16.49	-20.52	5,109.21	-1,911.95	5,455.34	5,436.95	18.39	296.688	
926.40	926.40	1,212.13	1,212.12	1.95	16.94	-20.52	5,109.36	-1,911.95	5,455.51	5,436.61	18.90	288.697	
1,000.00	999.98	1,253.00	1,252.99	2.12	17.77	-7.28	5,109.69	-1,911.95	5,454.73	5,434.85	19.88	274.421	
1,100.00	1,099.76	1,426.21	1,426.19	2.35	23.87	-7.32	5,109.44	-1,911.95	5,447.64	5,421.50	26.14	208.436	
1,200.00	1,199.07	1,521.29	1,521.26	2.59	27.22	-7.38	5,109.42	-1,911.95	5,436.03	5,406.48	29.55	183.986	
1,300.00	1,297.62	1,615.67	1,615.63	2.85	30.55	-7.46	5,109.47	-1,911.95	5,419.36	5,386.54	32.81	165.165	
1,400.00	1,395.16	1,709.10	1,709.06	3.17	33.85	-7.58	5,109.60	-1,911.95	5,397.67	5,361.76	35.90	150.341	
1,500.00	1,491.42	1,753.00	1,752.95	3.55	35.39	-7.71	5,109.69	-1,911.95	5,371.25	5,334.09	37.16	144.559	
1,600.00	1,586.12	1,889.51	1,889.45	4.02	39.01	-7.90	5,110.56	-1,911.95	5,339.94	5,299.69	40.24	132.696	
1,700.00	1,679.02	2,002.20	2,002.13	4.58	41.99	-8.13	5,110.78	-1,911.95	5,303.44	5,260.90	42.54	124.679	
1,800.00	1,769.85	2,112.04	2,111.96	5.24	44.90	-8.41	5,110.56	-1,911.95	5,261.83	5,217.27	44.56	118.074	
1,900.00	1,858.38	2,218.70	2,218.60	6.00	47.72	-8.74	5,109.95	-1,911.95	5,215.27	5,168.97	46.31	112.622	
2,000.00	1,944.34	2,250.00	2,249.90	6.86	48.55	-9.05	5,109.69	-1,911.95	5,164.32	5,118.21	46.12	111.986	
2,100.00	2,027.52	2,362.03	2,361.92	7.82	50.83	-9.50	5,109.31	-1,911.95	5,108.97	5,061.93	47.04	108.603	
2,200.00	2,107.68	2,435.92	2,435.81	8.87	52.34	-9.98	5,109.19	-1,911.95	5,049.63	5,002.48	47.15	107.108	
2,300.00	2,184.60	2,506.95	2,506.84	10.02	53.79	-10.53	5,109.15	-1,911.95	4,986.32	4,939.26	47.06	105.950	
2,400.00	2,258.08	2,574.93	2,574.82	11.25	55.17	-11.18	5,109.20	-1,911.95	4,919.22	4,872.41	46.81	105.086	
2,500.00	2,327.90	2,639.69	2,639.58	12.57	56.50	-11.94	5,109.33	-1,911.95	4,848.49	4,802.08	46.42	104.457	
2,600.00	2,393.88	2,701.04	2,700.93	13.97	57.75	-12.82	5,109.52	-1,911.95	4,774.33	4,728.42	45.92	103.979	
2,700.00	2,455.84	2,745.00	2,744.89	15.44	58.64	-13.81	5,109.69	-1,911.95	4,696.95	4,651.79	45.17	103.990	
2,800.00	2,513.61	2,830.55	2,830.44	16.99	60.65	-15.19	5,109.85	-1,911.95	4,616.27	4,570.98	45.29	101.935	
2,900.00	2,567.03	2,886.12	2,886.00	18.60	61.95	-16.74	5,109.91	-1,911.95	4,532.78	4,487.65	45.13	100.439	
3,000.00	2,615.95	2,936.93	2,936.82	20.28	63.14	-18.62	5,109.95	-1,911.95	4,446.64	4,401.32	45.32	98.119	
3,093.06	2,657.32	2,979.85	2,979.73	21.89	64.15	-20.77	5,109.96	-1,911.95	4,364.34	4,318.28	46.05	94.767	
3,100.00	2,660.21	2,982.85	2,982.73	21.98	64.22	-21.30	5,109.97	-1,911.95	4,358.11	4,312.07	46.04	94.650	
3,150.00	2,678.78	3,002.09	3,001.97	22.51	64.67	-26.15	5,109.97	-1,911.95	4,312.30	4,264.73	47.57	90.659	
3,200.00	2,693.23	3,017.05	3,016.93	23.08	65.02	-33.61	5,109.96	-1,911.95	4,265.07	4,211.49	53.58	79.605	
3,250.00	2,703.46	3,027.63	3,027.50	23.69	65.27	-45.81	5,109.96	-1,911.95	4,216.79	4,150.92	65.87	64.013	
3,300.00	2,709.38	3,033.74	3,033.62	24.34	65.41	-66.01	5,109.96	-1,911.95	4,167.84	4,085.16	82.68	50.411	
3,343.06	2,711.00	3,035.40	3,035.28	24.91	65.45	-90.11	5,109.96	-1,911.95	4,125.42	4,035.06	90.36	45.655	
3,400.00	2,711.00	3,035.38	3,035.26	25.70	65.45	-90.10	5,109.96	-1,911.95	4,069.30	3,978.15	91.15	44.644	
3,500.00	2,711.00	3,035.35	3,035.22	27.15	65.45	-90.10	5,109.96	-1,911.95	3,970.78	3,878.19	92.60	42.883	
3,600.00	2,711.00	3,035.31	3,035.19	28.66	65.45	-90.10	5,109.96	-1,911.95	3,872.35	3,778.24	94.11	41.146	
3,643.06	2,711.00	3,035.30	3,035.18	29.34	65.44	-90.10	5,109.96	-1,911.95	3,829.99	3,735.20	94.78	40.408	
3,700.00	2,710.98	3,035.27	3,035.14	30.22	65.44	-90.31	5,109.96	-1,911.95	3,773.85	3,678.19	95.66	39.453	
3,800.00	2,710.89	3,035.13	3,035.01	31.80	65.44	-90.94	5,109.96	-1,911.95	3,674.70	3,577.55	97.15	37.827	
3,900.00	2,710.70	3,034.91	3,034.78	33.45	65.44	-92.74	5,109.96	-1,911.95	3,575.03	3,476.48	98.54	36.278	
4,000.00	2,710.42	3,034.59	3,034.46	35.16	65.43	-135.28	5,109.96	-1,911.95	3,475.08	3,403.63	71.45	48.636	
4,100.00	2,710.05	3,034.18	3,034.06	36.92	65.42	95.10	5,109.96	-1,911.95	3,375.12	3,273.98	101.14	33.370	
4,200.00	2,709.60	3,033.68	3,033.56	38.73	65.41	92.90	5,109.96	-1,911.95	3,275.43	3,172.60	102.83	31.852	
4,300.00	2,709.05	3,033.10	3,032.97	40.58	65.39	92.18	5,109.96	-1,911.95	3,176.32	3,072.04	104.28	30.460	
4,400.00	2,708.42	3,032.42	3,032.30	42.47	65.38	91.80	5,109.96	-1,911.95	3,078.13	2,972.48	105.65	29.136	

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.17-T32N-R06W - Allison Unit 038M - Original Hole - Original Hole														Offset Site Error: 0.00 usft
Survey Program: 255-INC_ONLY<10														Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance				Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
4,500.00	2,707.71	3,031.67	3,031.54	44.40	65.36	91.56	5,109.96	-1,911.95	2,981.23	2,874.27	106.96	27.872		
4,600.00	2,706.91	3,030.83	3,030.71	45.35	65.34	91.39	5,109.96	-1,911.95	2,886.04	2,777.81	108.23	26.667		
4,700.00	2,706.04	3,029.91	3,029.79	48.33	65.32	91.25	5,109.96	-1,911.95	2,793.00	2,683.56	109.44	25.522		
4,800.00	2,705.09	3,028.92	3,028.80	50.32	65.30	91.13	5,109.96	-1,911.95	2,702.60	2,592.01	110.59	24.439		
4,819.44	2,704.89	3,028.72	3,028.59	50.71	65.29	91.11	5,109.96	-1,911.95	2,685.38	2,574.57	110.80	24.235		
4,900.00	2,704.08	3,027.87	3,027.75	52.34	65.27	91.08	5,109.96	-1,911.95	2,614.53	2,501.92	112.62	23.216		
5,000.00	2,703.08	3,026.83	3,026.71	54.38	65.25	91.03	5,109.96	-1,911.95	2,527.41	2,412.53	114.88	22.000		
5,100.00	2,702.07	3,025.79	3,025.66	56.47	65.22	90.98	5,109.96	-1,911.95	2,441.27	2,324.10	117.17	20.835		
5,200.00	2,701.07	3,024.74	3,024.62	58.60	65.20	90.93	5,109.96	-1,911.95	2,356.22	2,236.74	119.48	19.720		
5,300.00	2,700.06	3,023.70	3,023.58	60.75	65.17	90.89	5,109.96	-1,911.95	2,272.39	2,150.58	121.81	18.655		
5,400.00	2,699.06	3,022.66	3,022.54	62.94	65.15	90.84	5,109.96	-1,911.95	2,189.92	2,065.76	124.16	17.637		
5,500.00	2,698.05	3,021.62	3,021.50	65.16	65.12	90.79	5,109.96	-1,911.95	2,108.97	1,982.44	126.53	16.668		
5,600.00	2,697.05	3,020.59	3,020.46	67.40	65.10	90.74	5,109.96	-1,911.95	2,029.71	1,900.81	128.91	15.746		
5,700.00	2,696.05	3,019.55	3,019.43	69.66	65.08	90.70	5,109.96	-1,911.95	1,952.36	1,821.06	131.30	14.870		
5,800.00	2,695.04	3,018.52	3,018.39	71.95	65.05	90.65	5,109.96	-1,911.95	1,877.15	1,743.45	133.70	14.040		
5,900.00	2,694.04	3,017.48	3,017.36	74.25	65.03	90.60	5,109.96	-1,911.95	1,804.35	1,668.24	136.11	13.257		
6,000.00	2,693.03	3,016.45	3,016.33	76.57	65.00	90.56	5,109.96	-1,911.95	1,734.26	1,595.73	138.53	12.519		
6,100.00	2,692.03	3,015.42	3,015.30	78.91	64.98	90.51	5,109.96	-1,911.95	1,667.22	1,526.27	140.95	11.828		
6,200.00	2,691.02	3,014.39	3,014.27	81.26	64.95	90.46	5,109.96	-1,911.95	1,603.62	1,460.23	143.39	11.184		
6,300.00	2,690.02	3,013.36	3,013.24	83.63	64.93	90.42	5,109.96	-1,911.95	1,543.88	1,398.05	145.83	10.587		
6,400.00	2,689.01	3,012.33	3,012.21	86.00	64.91	90.37	5,109.96	-1,911.95	1,488.47	1,340.19	148.28	10.038		
6,500.00	2,688.01	3,011.31	3,011.18	88.39	64.88	90.32	5,109.97	-1,911.95	1,437.88	1,287.15	150.73	9.539		
6,600.00	2,687.00	3,010.28	3,010.16	90.79	64.86	90.28	5,109.97	-1,911.95	1,392.65	1,239.46	153.19	9.091		
6,700.00	2,686.00	3,009.26	3,009.13	93.19	64.83	90.23	5,109.97	-1,911.95	1,353.30	1,197.65	155.65	8.695		
6,800.00	2,684.99	3,008.23	3,008.11	95.61	64.81	90.18	5,109.97	-1,911.95	1,320.37	1,162.26	158.12	8.351		
6,900.00	2,683.99	3,007.21	3,007.09	98.03	64.79	90.14	5,109.97	-1,911.95	1,294.35	1,133.77	160.59	8.060		
7,000.00	2,682.98	3,006.19	3,006.07	100.46	64.76	90.09	5,109.97	-1,911.95	1,275.66	1,112.60	163.06	7.823		
7,100.00	2,681.98	3,005.17	3,005.05	102.90	64.74	90.04	5,109.97	-1,911.95	1,264.62	1,099.08	165.54	7.640		
7,190.25	2,681.07	3,004.25	3,004.13	105.11	64.72	90.00	5,109.97	-1,911.95	1,261.39	1,093.62	167.77	7.518 CC		
7,200.00	2,680.97	3,004.15	3,004.03	105.34	64.72	90.00	5,109.97	-1,911.95	1,261.43	1,093.41	168.02	7.508 ES		
7,300.00	2,679.97	3,003.14	3,003.01	107.79	64.69	89.95	5,109.97	-1,911.95	1,266.16	1,095.66	170.50	7.426		
7,400.00	2,678.96	3,002.12	3,002.00	110.25	64.67	89.91	5,109.97	-1,911.95	1,278.71	1,105.73	172.98	7.392 SF		
7,500.00	2,677.96	3,001.11	3,000.98	112.71	64.64	89.86	5,109.97	-1,911.95	1,298.86	1,123.39	175.47	7.402		
7,600.00	2,676.95	3,000.09	2,999.97	115.17	64.62	89.81	5,109.97	-1,911.95	1,326.27	1,148.31	177.96	7.453		
7,700.00	2,675.95	2,999.08	2,998.96	117.64	64.60	89.77	5,109.97	-1,911.95	1,360.49	1,180.04	180.45	7.539		
7,800.00	2,674.94	2,998.07	2,997.95	120.12	64.57	89.72	5,109.97	-1,911.95	1,401.03	1,218.08	182.95	7.658		
7,900.00	2,673.94	2,997.06	2,996.94	122.60	64.55	89.68	5,109.97	-1,911.95	1,447.35	1,261.90	185.44	7.805		
8,000.00	2,672.93	2,996.05	2,995.93	125.08	64.53	89.63	5,109.97	-1,911.95	1,498.92	1,310.98	187.94	7.976		
8,100.00	2,671.93	2,995.04	2,994.92	127.56	64.50	89.58	5,109.97	-1,911.95	1,555.21	1,364.77	190.44	8.166		
8,200.00	2,670.92	2,994.04	2,993.91	130.05	64.48	89.54	5,109.97	-1,911.95	1,615.74	1,422.80	192.94	8.374		
8,300.00	2,669.92	2,993.03	2,992.91	132.54	64.45	89.49	5,109.97	-1,911.95	1,680.04	1,484.60	195.44	8.596		
8,400.00	2,668.91	2,992.03	2,991.90	135.03	64.43	89.45	5,109.97	-1,911.95	1,747.70	1,549.76	197.94	8.829		
8,500.00	2,667.91	2,991.02	2,990.90	137.53	64.41	89.40	5,109.97	-1,911.95	1,818.35	1,617.90	200.45	9.071		
8,600.00	2,666.91	2,990.02	2,989.90	140.03	64.38	89.36	5,109.97	-1,911.95	1,891.64	1,688.69	202.95	9.321		
8,700.00	2,665.90	2,989.02	2,988.90	142.53	64.36	89.31	5,109.97	-1,911.95	1,967.29	1,761.83	205.46	9.575		
8,800.00	2,664.90	2,988.02	2,987.90	145.03	64.34	89.27	5,109.97	-1,911.95	2,045.03	1,837.06	207.97	9.833		
8,900.00	2,663.89	2,987.02	2,986.90	147.54	64.31	89.22	5,109.97	-1,911.95	2,124.64	1,914.16	210.48	10.094		
9,000.00	2,662.89	2,986.03	2,985.90	150.05	64.29	89.17	5,109.97	-1,911.95	2,205.90	1,992.91	212.99	10.357		
9,100.00	2,661.88	2,985.03	2,984.91	152.56	64.27	89.13	5,109.97	-1,911.95	2,288.65	2,073.15	215.50	10.620		
9,200.00	2,660.88	2,984.03	2,983.91	155.07	64.24	89.08	5,109.97	-1,911.95	2,372.72	2,154.71	218.01	10.884		
9,300.00	2,659.87	2,983.04	2,982.92	157.58	64.22	89.04	5,109.97	-1,911.95	2,457.99	2,237.47	220.52	11.146		
9,400.00	2,658.87	2,982.05	2,981.93	160.10	64.20	88.99	5,109.97	-1,911.95	2,544.33	2,321.30	223.04	11.408		

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.17-T32N-R06W - Allison Unit 038M - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 255-INC_ONLY<10													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore +N/-S (usft)	Centre +E/-W (usft)						
9,500.00	2,657.86	2,981.06	2,980.94	162.61	64.17	88.95	5,109.96	-1,911.95	2,631.64	2,406.09	225.55	11.668		
9,600.00	2,656.86	2,980.07	2,979.94	165.13	64.15	88.90	5,109.96	-1,911.95	2,719.82	2,491.76	228.06	11.926		
9,700.00	2,655.85	2,979.08	2,978.96	167.65	64.13	88.86	5,109.96	-1,911.95	2,808.80	2,578.22	230.58	12.182		
9,800.00	2,654.85	2,978.09	2,977.97	170.17	64.10	88.81	5,109.96	-1,911.95	2,898.49	2,665.40	233.09	12.435		
9,900.00	2,653.84	2,977.10	2,976.98	172.70	64.08	88.77	5,109.96	-1,911.95	2,988.84	2,753.23	235.61	12.686		
10,000.00	2,652.84	2,976.12	2,975.99	175.22	64.06	88.72	5,109.96	-1,911.95	3,079.78	2,841.65	238.13	12.933		
10,083.34	2,652.00	2,975.29	2,975.17	177.32	64.04	88.69	5,109.96	-1,911.95	3,155.99	2,915.77	240.22	13.138		



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.17-T32N-R06W - Allison Unit 038N - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 288-INC_ONLY<10													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	288.00	288.00	0.00	3.82	-38.21	4,495.62	-3,539.48	5,721.77				
100.00	100.00	360.00	360.00	0.10	5.73	-38.21	4,495.62	-3,539.48	5,721.88	5,716.06	5.82	982.942	
200.00	200.00	500.76	500.74	0.32	10.33	-38.22	4,495.24	-3,539.48	5,721.47	5,710.82	10.65	537.229	
249.50	249.50	545.52	545.50	0.43	11.79	-38.22	4,495.22	-3,539.48	5,721.45	5,709.22	12.23	467.997	
300.00	300.00	591.19	591.17	0.55	13.29	-38.22	4,495.24	-3,539.48	5,721.47	5,707.63	13.83	413.616	
400.00	400.00	681.61	681.59	0.77	16.25	-38.22	4,495.44	-3,539.48	5,721.63	5,704.62	17.02	336.267	
500.00	500.00	731.00	730.98	0.99	17.86	-38.21	4,495.62	-3,539.48	5,722.13	5,703.28	18.86	303.476	
600.00	600.00	927.58	927.54	1.22	23.07	-38.21	4,495.79	-3,539.48	5,721.98	5,697.69	24.29	235.586	
700.00	700.00	1,009.73	1,009.68	1.44	24.87	-38.22	4,495.40	-3,539.48	5,721.60	5,695.29	26.31	217.436	
800.00	800.00	1,100.82	1,100.77	1.67	26.72	-38.22	4,495.21	-3,539.48	5,721.44	5,693.05	28.39	201.536	
853.46	853.46	1,149.51	1,149.46	1.79	27.71	-38.22	4,495.19	-3,539.48	5,721.42	5,691.92	29.50	193.957	
900.00	900.00	1,191.91	1,191.86	1.89	28.57	-38.22	4,495.21	-3,539.48	5,721.44	5,690.97	30.46	187.809	
926.40	926.40	1,215.95	1,215.90	1.95	29.06	-38.22	4,495.24	-3,539.48	5,721.46	5,690.45	31.01	184.493	
1,000.00	999.98	1,282.97	1,282.92	2.12	30.42	-25.00	4,495.38	-3,539.48	5,720.30	5,687.78	32.52	175.879	
1,100.00	1,099.76	1,350.00	1,349.95	2.35	31.78	-25.08	4,495.62	-3,539.48	5,714.80	5,680.77	34.03	167.939	
1,200.00	1,199.07	1,490.34	1,490.28	2.59	35.07	-25.28	4,495.85	-3,539.48	5,704.22	5,666.85	37.37	152.648	
1,300.00	1,297.62	1,592.53	1,592.47	2.85	37.46	-25.55	4,495.92	-3,539.48	5,689.00	5,649.28	39.72	143.231	
1,400.00	1,395.16	1,693.65	1,693.58	3.17	39.83	-25.92	4,495.91	-3,539.48	5,669.08	5,627.14	41.94	135.162	
1,500.00	1,491.42	1,793.39	1,793.32	3.55	42.17	-26.38	4,495.81	-3,539.48	5,644.53	5,600.50	44.03	128.188	
1,600.00	1,586.12	1,891.48	1,891.40	4.02	44.47	-26.94	4,495.64	-3,539.48	5,615.43	5,569.45	45.99	122.109	
1,700.00	1,679.02	1,968.28	1,968.20	4.58	45.85	-27.56	4,495.75	-3,539.48	5,582.15	5,535.16	46.99	118.797	
1,800.00	1,769.85	2,062.84	2,062.75	5.24	47.48	-28.34	4,495.86	-3,539.48	5,544.59	5,496.40	48.18	115.075	
1,900.00	1,858.38	2,154.92	2,154.83	6.00	49.07	-29.24	4,495.89	-3,539.48	5,502.80	5,453.50	49.30	111.616	
2,000.00	1,944.34	2,244.26	2,244.17	6.86	50.62	-30.28	4,495.84	-3,539.48	5,456.93	5,406.56	50.37	108.335	
2,100.00	2,027.52	2,330.62	2,330.53	7.82	52.11	-31.46	4,495.73	-3,539.48	5,407.15	5,355.72	51.42	105.148	
2,200.00	2,107.68	2,386.00	2,385.91	8.87	53.07	-32.68	4,495.62	-3,539.48	5,353.69	5,301.63	52.06	102.846	
2,300.00	2,184.60	2,480.70	2,480.60	10.02	54.43	-34.26	4,495.62	-3,539.48	5,296.73	5,243.51	53.22	99.525	
2,400.00	2,258.08	2,554.17	2,554.08	11.25	55.48	-35.96	4,495.62	-3,539.48	5,236.47	5,182.17	54.30	96.444	
2,500.00	2,327.90	2,624.00	2,623.90	12.57	56.47	-37.86	4,495.62	-3,539.48	5,173.07	5,117.48	55.59	93.057	
2,600.00	2,393.88	2,689.98	2,689.88	13.97	57.42	-39.99	4,495.62	-3,539.48	5,106.76	5,049.59	57.18	89.318	
2,700.00	2,455.84	2,751.94	2,751.84	15.44	58.30	-42.38	4,495.62	-3,539.48	5,037.76	4,978.64	59.12	85.214	
2,800.00	2,513.61	2,809.71	2,809.61	16.99	59.13	-45.03	4,495.62	-3,539.48	4,966.29	4,904.81	61.48	80.778	
2,900.00	2,567.03	2,863.13	2,863.03	18.60	59.89	-47.96	4,495.62	-3,539.48	4,892.62	4,828.31	64.30	76.089	
3,000.00	2,615.95	2,900.00	2,899.90	20.28	60.42	-51.04	4,495.62	-3,539.48	4,816.99	4,749.65	67.34	71.531	
3,093.06	2,657.32	2,965.54	2,965.44	21.89	61.76	-54.63	4,495.37	-3,539.48	4,744.88	4,673.23	71.65	66.220	
3,100.00	2,660.21	2,968.29	2,968.19	21.98	61.81	-55.39	4,495.36	-3,539.48	4,739.44	4,667.28	72.17	65.675	
3,150.00	2,678.78	2,985.96	2,985.85	22.51	62.17	-61.31	4,495.30	-3,539.48	4,699.53	4,623.48	76.05	61.794	
3,200.00	2,693.23	2,999.69	2,999.58	23.08	62.45	-68.04	4,495.25	-3,539.48	4,658.52	4,578.30	80.22	58.073	
3,250.00	2,703.46	3,009.37	3,009.26	23.69	62.65	-75.46	4,495.22	-3,539.48	4,616.74	4,532.74	83.99	54.967	
3,300.00	2,709.38	3,014.92	3,014.82	24.34	62.76	-83.34	4,495.21	-3,539.48	4,574.50	4,487.84	86.66	52.784	
3,343.06	2,711.00	3,016.36	3,016.25	24.91	62.79	-90.22	4,495.20	-3,539.48	4,538.02	4,450.32	87.70	51.742	
3,400.00	2,711.00	3,016.20	3,016.10	25.70	62.79	-90.22	4,495.20	-3,539.48	4,489.93	4,401.44	88.49	50.739	
3,500.00	2,711.00	3,015.93	3,015.83	27.15	62.78	-90.21	4,495.20	-3,539.48	4,405.97	4,316.03	89.93	48.992	
3,600.00	2,711.00	3,015.66	3,015.55	28.66	62.78	-90.20	4,495.20	-3,539.48	4,322.69	4,231.24	91.44	47.272	
3,643.06	2,711.00	3,015.54	3,015.44	29.34	62.78	-90.20	4,495.20	-3,539.48	4,287.05	4,194.93	92.11	46.542	
3,700.00	2,710.98	3,015.37	3,015.27	30.22	62.77	-90.25	4,495.20	-3,539.48	4,239.65	4,146.67	92.98	45.595	
3,800.00	2,710.89	3,015.01	3,014.90	31.80	62.77	-90.35	4,495.21	-3,539.48	4,154.74	4,060.26	94.48	43.975	
3,900.00	2,710.70	3,014.56	3,014.45	33.45	62.76	-90.48	4,495.21	-3,539.48	4,067.79	3,971.82	95.96	42.389	
4,000.00	2,710.42	3,014.03	3,013.92	35.16	62.75	-90.62	4,495.21	-3,539.48	3,978.90	3,881.47	97.43	40.838	
4,100.00	2,710.05	3,013.41	3,013.31	36.92	62.73	-90.80	4,495.21	-3,539.48	3,888.19	3,789.32	98.87	39.325	
4,200.00	2,709.60	3,012.72	3,012.62	38.73	62.72	-91.03	4,495.21	-3,539.48	3,795.80	3,695.51	100.29	37.850	
4,300.00	2,709.05	3,011.95	3,011.84	40.58	62.70	-91.31	4,495.21	-3,539.48	3,701.86	3,600.19	101.66	36.413	

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.17-T32N-R06W - Allison Unit 038N - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 288-INC_ONLY<10													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
4,400.00	2,708.42	3,011.10	3,010.99	42.47	62.69	-91.69	4,495.22	-3,539.48	3,606.51	3,503.51	103.00	35.016	
4,500.00	2,707.71	3,010.17	3,010.07	44.40	62.67	-92.21	4,495.22	-3,539.48	3,509.92	3,405.64	104.27	33.661	
4,600.00	2,706.91	3,009.18	3,009.07	46.35	62.65	-92.99	4,495.22	-3,539.48	3,412.25	3,306.77	105.48	32.351	
4,700.00	2,706.04	3,008.11	3,008.01	48.33	62.62	-94.29	4,495.23	-3,539.48	3,313.68	3,207.13	106.55	31.099	
4,800.00	2,705.09	3,006.98	3,006.87	50.32	62.60	-96.90	4,495.23	-3,539.48	3,214.43	3,107.15	107.28	29.964	
4,819.44	2,704.89	3,006.75	3,006.65	50.71	62.60	-97.76	4,495.23	-3,539.48	3,195.07	3,087.76	107.31	29.775	
4,900.00	2,704.08	3,005.80	3,005.70	52.34	62.58	-97.56	4,495.23	-3,539.48	3,114.83	3,005.68	109.15	28.538	
5,000.00	2,703.08	3,004.62	3,004.52	54.38	62.55	-97.32	4,495.24	-3,539.48	3,015.25	2,903.80	111.44	27.056	
5,100.00	2,702.07	3,003.44	3,003.34	56.47	62.53	-97.08	4,495.24	-3,539.48	2,915.69	2,801.92	113.77	25.629	
5,200.00	2,701.07	3,002.26	3,002.15	58.60	62.51	-96.84	4,495.24	-3,539.48	2,816.17	2,700.05	116.11	24.254	
5,300.00	2,700.06	3,001.07	3,000.97	60.75	62.48	-96.60	4,495.25	-3,539.48	2,716.68	2,598.20	118.48	22.930	
5,400.00	2,699.06	2,999.89	2,999.78	62.94	62.46	-96.36	4,495.25	-3,539.48	2,617.22	2,496.36	120.86	21.655	
5,500.00	2,698.05	2,998.70	2,998.59	65.16	62.43	-96.12	4,495.26	-3,539.48	2,517.81	2,394.55	123.26	20.427	
5,600.00	2,697.05	2,997.51	2,997.40	67.40	62.41	-95.87	4,495.26	-3,539.48	2,418.45	2,292.78	125.68	19.244	
5,700.00	2,696.05	2,996.31	2,996.21	69.66	62.38	-95.63	4,495.26	-3,539.48	2,319.15	2,191.05	128.10	18.104	
5,800.00	2,695.04	2,995.12	2,995.01	71.95	62.36	-95.38	4,495.27	-3,539.48	2,219.90	2,089.37	130.54	17.006	
5,900.00	2,694.04	2,993.92	2,993.82	74.25	62.34	-95.14	4,495.27	-3,539.48	2,120.73	1,987.75	132.98	15.947	
6,000.00	2,693.03	2,992.72	2,992.62	76.57	62.31	-94.89	4,495.27	-3,539.48	2,021.63	1,886.20	135.44	14.927	
6,100.00	2,692.03	2,991.52	2,991.42	78.91	62.29	-94.65	4,495.28	-3,539.48	1,922.63	1,784.74	137.90	13.943	
6,200.00	2,691.02	2,990.32	2,990.21	81.26	62.26	-94.40	4,495.28	-3,539.48	1,823.74	1,683.38	140.36	12.993	
6,300.00	2,690.02	2,989.11	2,989.01	83.63	62.24	-94.15	4,495.29	-3,539.48	1,724.97	1,582.14	142.84	12.076	
6,400.00	2,689.01	2,987.91	2,987.80	86.00	62.21	-93.90	4,495.29	-3,539.48	1,626.36	1,481.04	145.32	11.192	
6,500.00	2,688.01	2,986.70	2,986.59	88.39	62.19	-93.65	4,495.29	-3,539.48	1,527.92	1,380.12	147.80	10.338	
6,600.00	2,687.00	2,985.49	2,985.38	90.79	62.16	-93.40	4,495.30	-3,539.48	1,429.70	1,279.42	150.28	9.513	
6,700.00	2,686.00	2,984.27	2,984.17	93.19	62.14	-93.15	4,495.30	-3,539.48	1,331.74	1,178.97	152.77	8.717	
6,800.00	2,684.99	2,983.06	2,982.96	95.61	62.11	-92.90	4,495.31	-3,539.48	1,234.11	1,078.85	155.27	7.948	
6,900.00	2,683.99	2,981.84	2,981.74	98.03	62.09	-92.65	4,495.31	-3,539.48	1,136.89	979.13	157.76	7.206	
7,000.00	2,682.98	2,980.62	2,980.52	100.46	62.06	-92.40	4,495.31	-3,539.48	1,040.20	879.94	160.26	6.491	
7,100.00	2,681.98	2,979.40	2,979.30	102.90	62.04	-92.15	4,495.32	-3,539.48	944.19	781.44	162.75	5.801	
7,200.00	2,680.97	2,978.18	2,978.08	105.34	62.01	-91.90	4,495.32	-3,539.48	849.10	683.85	165.25	5.138	
7,300.00	2,679.97	2,976.95	2,976.85	107.79	61.99	-91.64	4,495.33	-3,539.48	755.29	587.54	167.75	4.502	
7,400.00	2,678.96	2,975.73	2,975.62	110.25	61.96	-91.39	4,495.33	-3,539.48	663.27	493.03	170.25	3.896	
7,500.00	2,677.96	2,974.50	2,974.40	112.71	61.94	-91.14	4,495.33	-3,539.48	573.94	401.19	172.75	3.322	
7,600.00	2,676.95	2,973.27	2,973.16	115.17	61.91	-90.88	4,495.34	-3,539.48	487.95	313.50	175.24	2.789	
7,700.00	2,675.95	2,972.03	2,971.93	117.64	61.89	-90.63	4,495.34	-3,539.48	410.29	232.55	177.74	2.308	
7,800.00	2,674.94	2,970.80	2,970.70	120.12	61.86	-90.37	4,495.35	-3,539.48	343.22	162.98	180.24	1.904	
7,900.00	2,673.94	2,969.56	2,969.46	122.60	61.84	-90.11	4,495.35	-3,539.48	295.40	112.66	182.74	1.617	
8,000.00	2,672.93	2,968.32	2,968.22	125.08	61.81	-89.86	4,495.36	-3,539.48	276.98	91.74	185.24	1.495 Level 3	
8,002.72	2,672.91	2,968.29	2,968.19	125.14	61.81	-89.85	4,495.36	-3,539.48	276.97	91.66	185.31	1.495 Level 3, CC, ES, SF	
8,100.00	2,671.93	2,967.08	2,966.98	127.56	61.79	-89.60	4,495.36	-3,539.48	293.55	105.82	187.73	1.564	
8,200.00	2,670.92	2,965.84	2,965.74	130.05	61.76	-89.34	4,495.36	-3,539.48	340.04	149.81	190.23	1.788	
8,300.00	2,669.92	2,964.59	2,964.49	132.54	61.74	-89.09	4,495.37	-3,539.48	406.29	213.57	192.72	2.108	
8,400.00	2,668.91	2,963.35	2,963.24	135.03	61.71	-88.83	4,495.37	-3,539.48	484.27	289.06	195.21	2.481	
8,500.00	2,667.91	2,962.10	2,961.99	137.53	61.69	-88.57	4,495.38	-3,539.48	569.17	371.48	197.70	2.879	
8,600.00	2,666.91	2,960.84	2,960.74	140.03	61.66	-88.31	4,495.38	-3,539.48	658.33	458.15	200.18	3.289	
8,700.00	2,665.90	2,959.59	2,959.49	142.53	61.64	-88.05	4,495.39	-3,539.48	750.22	547.56	202.66	3.702	
8,800.00	2,664.90	2,958.33	2,958.23	145.03	61.61	-87.79	4,495.39	-3,539.48	843.96	638.82	205.14	4.114	
8,900.00	2,663.89	2,957.08	2,956.97	147.54	61.58	-87.53	4,495.40	-3,539.48	938.99	731.38	207.61	4.523	
9,000.00	2,662.89	2,955.82	2,955.71	150.05	61.56	-87.27	4,495.40	-3,539.48	1,034.95	824.87	210.08	4.927	
9,100.00	2,661.88	2,954.55	2,954.45	152.56	61.53	-87.01	4,495.41	-3,539.48	1,131.61	919.07	212.54	5.324	
9,200.00	2,660.88	2,953.29	2,953.19	155.07	61.51	-86.75	4,495.41	-3,539.48	1,228.81	1,013.81	215.00	5.715	
9,300.00	2,659.87	2,952.02	2,951.92	157.58	61.48	-86.49	4,495.41	-3,539.48	1,326.42	1,108.96	217.45	6.100	

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
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Offset TVD Reference: Offset Datum

Offset Design Sec.17-T32N-R06W - Allison Unit 038N - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 288-INC_ONLY<10													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
9,400.00	2,658.87	2,950.75	2,950.65	160.10	61.45	-86.23	4,495.42	-3,539.48	1,424.36	1,204.45	219.90	6.477	
9,500.00	2,657.86	2,949.48	2,949.38	162.61	61.43	-85.97	4,495.42	-3,539.48	1,522.56	1,300.21	222.35	6.848	
9,600.00	2,656.86	2,948.21	2,948.11	165.13	61.40	-85.70	4,495.43	-3,539.48	1,620.99	1,396.20	224.79	7.211	
9,700.00	2,655.85	2,946.94	2,946.83	167.65	61.38	-85.44	4,495.43	-3,539.48	1,719.60	1,492.37	227.22	7.568	
9,800.00	2,654.85	2,945.66	2,945.56	170.17	61.35	-85.18	4,495.44	-3,539.48	1,818.35	1,588.70	229.65	7.918	
9,900.00	2,653.84	2,944.38	2,944.28	172.70	61.32	-84.92	4,495.44	-3,539.48	1,917.24	1,685.16	232.08	8.261	
10,000.00	2,652.84	2,943.10	2,942.99	175.22	61.30	-84.65	4,495.45	-3,539.48	2,016.24	1,781.74	234.49	8.598	
10,083.34	2,652.00	2,942.03	2,941.92	177.32	61.28	-84.43	4,495.45	-3,539.48	2,098.81	1,862.31	236.50	8.874	



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.17-T32N-R06W - Allison Unit 110 - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 186-INC_ONLY<10													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	315.59	315.59	0.00	3.10	-21.37	5,087.22	-1,990.73	5,462.87				
100.00	100.00	398.00	398.00	0.10	4.51	-21.37	5,087.55	-1,990.73	5,463.22	5,458.62	4.61	1,186.156	
197.50	197.50	520.51	520.50	0.31	8.09	-21.37	5,087.42	-1,990.73	5,463.04	5,454.63	8.41	649.745	
200.00	200.00	522.80	522.79	0.32	8.16	-21.37	5,087.42	-1,990.73	5,463.04	5,454.56	8.48	644.167	
300.00	300.00	614.49	614.48	0.55	10.84	-21.37	5,087.50	-1,990.73	5,463.12	5,451.74	11.39	479.757	
400.00	400.00	643.00	642.99	0.77	11.68	-21.37	5,087.55	-1,990.73	5,463.75	5,451.31	12.45	439.002	
500.00	500.00	823.03	823.00	0.99	17.54	-21.37	5,087.55	-1,990.73	5,463.17	5,444.63	18.54	294.696	
566.65	566.65	889.69	889.65	1.14	19.72	-21.37	5,087.55	-1,990.73	5,463.17	5,442.31	20.86	261.887	
600.00	600.00	923.00	922.96	1.22	20.80	-21.37	5,087.55	-1,990.73	5,463.17	5,441.15	22.02	248.083	
700.00	700.00	923.00	922.96	1.44	20.80	-21.37	5,087.55	-1,990.73	5,464.08	5,441.84	22.25	245.618	
800.00	800.00	1,123.05	1,123.00	1.67	27.34	-21.37	5,087.55	-1,990.73	5,463.17	5,434.16	29.01	188.325	
900.00	900.00	1,223.06	1,223.00	1.89	30.61	-21.37	5,087.55	-1,990.73	5,463.17	5,430.66	32.50	168.085	
926.40	926.40	1,249.46	1,249.40	1.95	31.47	-21.37	5,087.55	-1,990.73	5,463.17	5,429.74	33.42	163.447	
1,000.00	999.98	1,323.05	1,322.98	2.12	33.88	-8.14	5,087.55	-1,990.73	5,461.76	5,425.79	35.97	151.824	
1,100.00	1,099.76	1,422.84	1,422.76	2.35	37.14	-8.18	5,087.55	-1,990.73	5,455.36	5,416.02	39.34	138.655	
1,200.00	1,199.07	1,423.00	1,422.93	2.59	37.14	-8.22	5,087.55	-1,990.73	5,444.70	5,405.35	39.36	138.338	
1,300.00	1,297.62	1,620.71	1,620.62	2.85	43.61	-8.34	5,087.55	-1,990.73	5,427.11	5,381.48	45.63	118.945	
1,400.00	1,395.16	1,718.26	1,718.16	3.17	46.80	-8.47	5,087.55	-1,990.73	5,405.34	5,356.87	48.47	111.508	
1,500.00	1,491.42	1,814.52	1,814.42	3.55	49.95	-8.64	5,087.55	-1,990.73	5,378.55	5,327.46	51.09	105.275	
1,600.00	1,586.12	1,909.23	1,909.12	4.02	53.05	-8.84	5,087.55	-1,990.73	5,346.81	5,293.36	53.45	100.033	
1,700.00	1,679.02	1,952.00	1,951.88	4.58	54.45	-9.05	5,087.55	-1,990.73	5,310.46	5,256.44	54.01	98.317	
1,800.00	1,769.85	2,083.29	2,083.17	5.24	57.92	-9.37	5,087.97	-1,990.73	5,269.27	5,212.96	56.31	93.578	
1,900.00	1,858.38	2,180.48	2,180.35	6.00	60.50	-9.72	5,088.07	-1,990.73	5,223.37	5,165.83	57.54	90.772	
2,000.00	1,944.34	2,274.70	2,274.56	6.86	63.00	-10.13	5,088.01	-1,990.73	5,172.83	5,114.34	58.49	88.445	
2,100.00	2,027.52	2,365.68	2,365.53	7.82	65.41	-10.61	5,087.80	-1,990.73	5,117.79	5,058.65	59.14	86.543	
2,200.00	2,107.68	2,453.14	2,452.98	8.87	67.73	-11.17	5,087.46	-1,990.73	5,058.42	4,998.92	59.50	85.021	
2,300.00	2,184.60	2,507.76	2,507.60	10.02	68.70	-11.75	5,087.55	-1,990.73	4,995.34	4,936.72	58.62	85.213	
2,400.00	2,258.08	2,581.24	2,581.08	11.25	70.20	-12.49	5,087.55	-1,990.73	4,928.35	4,870.31	58.04	84.910	
2,500.00	2,327.90	2,651.06	2,650.90	12.57	71.61	-13.34	5,087.55	-1,990.73	4,857.68	4,800.36	57.32	84.748	
2,600.00	2,393.88	2,717.05	2,716.88	13.97	72.95	-14.34	5,087.55	-1,990.73	4,783.52	4,727.01	56.51	84.650	
2,700.00	2,455.84	2,779.01	2,778.84	15.44	74.21	-15.53	5,087.55	-1,990.73	4,706.09	4,650.39	55.70	84.494	
2,800.00	2,513.61	2,836.78	2,836.61	16.99	75.39	-16.94	5,087.55	-1,990.73	4,625.60	4,570.60	55.00	84.097	
2,900.00	2,567.03	2,890.20	2,890.03	18.60	76.47	-18.63	5,087.55	-1,990.73	4,542.29	4,487.69	54.60	83.191	
3,000.00	2,615.92	2,939.12	2,938.95	20.28	77.46	-20.68	5,087.55	-1,990.73	4,456.38	4,401.65	54.73	81.419	
3,093.06	2,657.35	2,953.00	2,952.83	21.89	77.75	-22.73	5,087.55	-1,990.73	4,374.40	4,319.36	55.04	79.475	
3,100.00	2,660.21	2,953.00	2,952.83	21.98	77.75	-23.26	5,087.55	-1,990.73	4,368.21	4,313.20	55.01	79.403	
3,150.00	2,678.78	2,953.00	2,952.83	22.51	77.75	-28.01	5,087.55	-1,990.73	4,322.72	4,266.12	56.60	76.373	
3,200.00	2,693.23	3,016.40	3,016.23	23.08	79.03	-36.63	5,087.55	-1,990.73	4,275.37	4,209.74	65.63	65.142	
3,250.00	2,703.46	3,026.63	3,026.46	23.69	79.24	-48.98	5,087.55	-1,990.73	4,227.26	4,147.66	79.60	53.104	
3,300.00	2,709.38	3,032.55	3,032.38	24.34	79.36	-68.24	5,087.55	-1,990.73	4,178.47	4,081.55	96.92	43.113	
3,343.06	2,711.00	3,034.17	3,034.00	24.91	79.40	-90.00	5,087.55	-1,990.73	4,136.20	4,031.89	104.31	39.652	
3,400.00	2,711.00	3,034.17	3,034.00	25.70	79.40	-90.00	5,087.55	-1,990.73	4,080.28	3,975.18	105.10	38.822	
3,500.00	2,711.00	3,034.17	3,034.00	27.15	79.40	-90.00	5,087.55	-1,990.73	3,982.13	3,875.58	106.55	37.374	
3,600.00	2,711.00	3,034.17	3,034.00	28.66	79.40	-90.00	5,087.55	-1,990.73	3,884.08	3,776.02	108.06	35.942	
3,643.06	2,711.00	3,034.17	3,034.00	29.34	79.40	-90.00	5,087.55	-1,990.73	3,841.89	3,733.16	108.74	35.332	
3,700.00	2,710.98	3,034.16	3,033.98	30.22	79.40	-90.17	5,087.55	-1,990.73	3,785.97	3,676.36	109.61	34.541	
3,800.00	2,710.89	3,034.06	3,033.89	31.80	79.39	-90.64	5,087.55	-1,990.73	3,687.12	3,576.02	111.10	33.186	
3,900.00	2,710.70	3,033.87	3,033.70	33.45	79.39	-91.72	5,087.55	-1,990.73	3,587.66	3,475.10	112.56	31.874	
4,000.00	2,710.42	3,033.59	3,033.42	35.16	79.38	-96.89	5,087.55	-1,990.73	3,487.80	3,374.51	113.30	30.784	
4,100.00	2,710.05	3,033.22	3,033.05	36.92	79.38	-99.15	5,087.55	-1,990.73	3,387.82	3,273.79	114.03	29.710	
4,200.00	2,709.60	3,032.77	3,032.60	38.73	79.37	-93.59	5,087.55	-1,990.73	3,287.97	3,171.27	116.69	28.176	
4,300.00	2,709.05	3,032.22	3,032.05	40.58	79.36	-92.47	5,087.55	-1,990.73	3,188.56	3,070.35	118.20	26.975	

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.17-T32N-R06W - Allison Unit 110 - Original Hole - Original Hole														Offset Site Error:	0.00 usft
Survey Program: 186-INC_ONLY<10														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
4,400.00	2,708.42	3,031.60	3,031.42	42.47	79.34	91.97	5,087.55	-1,990.73	3,089.91	2,970.32	119.59	25.837			
4,500.00	2,707.71	3,030.88	3,030.71	44.40	79.33	91.68	5,087.55	-1,990.73	2,992.39	2,871.47	120.92	24.747			
4,600.00	2,706.91	3,030.09	3,029.91	46.35	79.31	91.47	5,087.55	-1,990.73	2,896.39	2,774.20	122.19	23.704			
4,700.00	2,706.04	3,029.21	3,029.04	48.33	79.30	91.32	5,087.55	-1,990.73	2,802.34	2,678.93	123.41	22.708			
4,800.00	2,705.09	3,028.26	3,028.09	50.32	79.28	91.19	5,087.55	-1,990.73	2,710.71	2,586.15	124.56	21.762			
4,819.44	2,704.89	3,028.07	3,027.89	50.71	79.27	91.17	5,087.55	-1,990.73	2,693.23	2,568.45	124.78	21.584			
4,900.00	2,704.08	3,027.26	3,027.08	52.34	79.26	91.13	5,087.55	-1,990.73	2,621.24	2,494.64	126.60	20.706			
5,000.00	2,703.08	3,026.25	3,026.08	54.38	79.24	91.08	5,087.55	-1,990.73	2,532.60	2,403.73	128.86	19.653			
5,100.00	2,702.07	3,025.25	3,025.07	56.47	79.21	91.03	5,087.55	-1,990.73	2,444.83	2,313.68	131.16	18.640			
5,200.00	2,701.07	3,024.24	3,024.07	58.60	79.19	90.98	5,087.55	-1,990.73	2,358.04	2,224.57	133.47	17.667			
5,300.00	2,700.06	3,023.24	3,023.06	60.75	79.17	90.93	5,087.55	-1,990.73	2,272.34	2,136.53	135.81	16.732			
5,400.00	2,699.06	3,022.23	3,022.06	62.94	79.15	90.89	5,087.55	-1,990.73	2,187.85	2,049.68	138.16	15.835			
5,500.00	2,698.05	3,021.23	3,021.05	65.16	79.13	90.84	5,087.55	-1,990.73	2,104.71	1,964.18	140.53	14.977			
5,600.00	2,697.05	3,020.22	3,020.05	67.40	79.11	90.79	5,087.55	-1,990.73	2,023.11	1,880.20	142.91	14.156			
5,700.00	2,696.05	3,019.22	3,019.05	69.66	79.09	90.74	5,087.55	-1,990.73	1,943.22	1,797.91	145.31	13.373			
5,800.00	2,695.04	3,018.21	3,018.04	71.95	79.07	90.69	5,087.55	-1,990.73	1,865.28	1,717.56	147.71	12.628			
5,900.00	2,694.04	3,017.21	3,017.04	74.25	79.05	90.64	5,087.55	-1,990.73	1,789.53	1,639.40	150.13	11.920			
6,000.00	2,693.03	3,016.20	3,016.03	76.57	79.03	90.60	5,087.55	-1,990.73	1,716.26	1,563.71	152.55	11.250			
6,100.00	2,692.03	3,015.20	3,015.03	78.91	79.01	90.55	5,087.55	-1,990.73	1,645.81	1,490.82	154.98	10.619			
6,200.00	2,691.02	3,014.19	3,014.02	81.26	78.99	90.50	5,087.55	-1,990.73	1,578.55	1,421.13	157.42	10.027			
6,300.00	2,690.02	3,013.19	3,013.02	83.63	78.97	90.45	5,087.55	-1,990.73	1,514.91	1,355.04	159.87	9.476			
6,400.00	2,689.01	3,012.18	3,012.01	86.00	78.95	90.40	5,087.55	-1,990.73	1,455.36	1,293.05	162.32	8.966			
6,500.00	2,688.01	3,011.18	3,011.01	88.39	78.93	90.35	5,087.55	-1,990.73	1,400.43	1,235.66	164.78	8.499			
6,600.00	2,687.00	3,010.17	3,010.00	90.79	78.91	90.31	5,087.55	-1,990.73	1,350.68	1,183.45	167.24	8.076			
6,700.00	2,686.00	3,009.17	3,009.00	93.19	78.89	90.26	5,087.55	-1,990.73	1,306.70	1,137.00	169.70	7.700			
6,800.00	2,684.99	3,008.16	3,007.99	95.61	78.87	90.21	5,087.55	-1,990.73	1,269.09	1,096.92	172.17	7.371			
6,900.00	2,683.99	3,007.16	3,006.99	98.03	78.85	90.16	5,087.55	-1,990.73	1,238.43	1,063.79	174.65	7.091			
7,000.00	2,682.98	3,006.15	3,005.98	100.46	78.83	90.11	5,087.55	-1,990.73	1,215.25	1,038.13	177.12	6.861			
7,100.00	2,681.98	3,005.15	3,004.98	102.90	78.81	90.06	5,087.55	-1,990.73	1,199.98	1,020.38	179.60	6.681			
7,200.00	2,680.97	3,004.14	3,003.97	105.34	78.79	90.02	5,087.55	-1,990.73	1,192.92	1,010.84	182.09	6.551			
7,234.43	2,680.63	3,003.80	3,003.63	106.19	78.78	90.00	5,087.55	-1,990.73	1,192.43	1,009.48	182.94	6.518 CC, ES			
7,300.00	2,679.97	3,003.14	3,002.97	107.79	78.77	89.97	5,087.55	-1,990.73	1,194.23	1,009.66	184.57	6.470			
7,400.00	2,678.96	3,002.13	3,001.96	110.25	78.74	89.92	5,087.55	-1,990.73	1,203.86	1,016.80	187.06	6.436 SF			
7,500.00	2,677.96	3,001.13	3,000.96	112.71	78.72	89.87	5,087.55	-1,990.73	1,221.64	1,032.09	189.55	6.445			
7,600.00	2,676.95	3,000.12	2,999.95	115.17	78.70	89.82	5,087.55	-1,990.73	1,247.20	1,055.16	192.04	6.494			
7,700.00	2,675.95	2,999.12	2,998.95	117.64	78.68	89.78	5,087.55	-1,990.73	1,280.08	1,085.54	194.54	6.580			
7,800.00	2,674.94	2,998.11	2,997.94	120.12	78.66	89.73	5,087.55	-1,990.73	1,319.74	1,122.70	197.04	6.698			
7,900.00	2,673.94	2,997.11	2,996.94	122.60	78.64	89.68	5,087.55	-1,990.73	1,365.58	1,166.05	199.54	6.844			
8,000.00	2,672.93	2,996.11	2,995.93	125.08	78.62	89.63	5,087.55	-1,990.73	1,417.01	1,214.97	202.04	7.014			
8,100.00	2,671.93	2,995.10	2,994.93	127.56	78.60	89.58	5,087.55	-1,990.73	1,473.44	1,268.90	204.54	7.204			
8,200.00	2,670.92	2,994.10	2,993.92	130.05	78.58	89.53	5,087.55	-1,990.73	1,534.31	1,327.27	207.04	7.411			
8,300.00	2,669.92	2,993.09	2,992.92	132.54	78.56	89.49	5,087.55	-1,990.73	1,599.13	1,389.58	209.55	7.631			
8,400.00	2,668.91	2,992.09	2,991.91	135.03	78.54	89.44	5,087.55	-1,990.73	1,667.42	1,455.37	212.05	7.863			
8,500.00	2,667.91	2,991.08	2,990.91	137.53	78.52	89.39	5,087.55	-1,990.73	1,738.79	1,524.23	214.56	8.104			
8,600.00	2,666.91	2,990.08	2,989.91	140.03	78.50	89.34	5,087.55	-1,990.73	1,812.86	1,595.80	217.07	8.352			
8,700.00	2,665.90	2,989.07	2,988.90	142.53	78.48	89.29	5,087.55	-1,990.73	1,889.33	1,669.75	219.58	8.604			
8,800.00	2,664.90	2,988.07	2,987.90	145.03	78.46	89.24	5,087.55	-1,990.73	1,967.90	1,745.82	222.09	8.861			
8,900.00	2,663.89	2,987.06	2,986.89	147.54	78.44	89.20	5,087.55	-1,990.73	2,048.35	1,823.75	224.60	9.120			
9,000.00	2,662.89	2,986.06	2,985.89	150.05	78.42	89.15	5,087.55	-1,990.73	2,130.45	1,903.34	227.11	9.381			
9,100.00	2,661.88	2,985.05	2,984.88	152.56	78.40	89.10	5,087.55	-1,990.73	2,214.02	1,984.39	229.62	9.642			
9,200.00	2,660.88	2,984.05	2,983.88	155.07	78.38	89.05	5,087.55	-1,990.73	2,298.90	2,066.76	232.14	9.903			
9,300.00	2,659.87	2,983.04	2,982.87	157.58	78.36	89.00	5,087.55	-1,990.73	2,384.96	2,150.30	234.65	10.164			

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.17-T32N-R06W - Allison Unit 110 - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 186-INC_ONLY<10													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,400.00	2,658.87	2,982.04	2,981.87	160.10	78.34	88.95	5,087.55	-1,990.73	2,472.06	2,234.89	237.17	10.423		
9,500.00	2,657.86	2,981.03	2,980.86	162.61	78.32	88.91	5,087.55	-1,990.73	2,560.11	2,320.43	239.69	10.681		
9,600.00	2,656.86	2,980.03	2,979.86	165.13	78.30	88.86	5,087.55	-1,990.73	2,649.01	2,406.80	242.20	10.937		
9,700.00	2,655.85	2,979.02	2,978.85	167.65	78.28	88.81	5,087.55	-1,990.73	2,738.67	2,493.95	244.72	11.191		
9,800.00	2,654.85	2,978.02	2,977.85	170.17	78.25	88.76	5,087.55	-1,990.73	2,829.02	2,581.79	247.24	11.443		
9,900.00	2,653.84	2,977.01	2,976.84	172.70	78.23	88.71	5,087.55	-1,990.73	2,920.00	2,670.25	249.75	11.691		
10,000.00	2,652.84	2,976.01	2,975.84	175.22	78.21	88.67	5,087.55	-1,990.73	3,011.56	2,759.29	252.27	11.938		
10,083.34	2,652.00	2,975.17	2,975.00	177.32	78.20	88.62	5,087.55	-1,990.73	3,088.26	2,833.89	254.37	12.141		



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.18-T32N-R06W - Allison Unit 039N - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 100-INC_ONLY<10													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	348.00	348.00	0.00	4.34	-51.36	5,466.58	-6,837.69	8,754.28					
100.00	100.00	448.00	448.00	0.10	5.79	-51.36	5,466.58	-6,837.69	8,754.28	8,748.40	5.89	1,487.435		
200.00	200.00	548.01	548.00	0.32	7.24	-51.36	5,466.58	-6,837.69	8,754.28	8,746.72	7.57	1,157.208		
300.00	300.00	648.01	648.00	0.55	8.70	-51.36	5,466.58	-6,837.69	8,754.28	8,745.04	9.24	946.969		
400.00	400.00	748.01	748.00	0.77	10.15	-51.36	5,466.58	-6,837.69	8,754.28	8,743.36	10.92	801.377		
500.00	500.00	848.01	848.00	0.99	11.61	-51.36	5,466.58	-6,837.69	8,754.28	8,741.68	12.60	694.587		
600.00	600.00	948.01	948.00	1.22	13.06	-51.36	5,466.58	-6,837.69	8,754.28	8,740.00	14.28	612.912		
700.00	700.00	1,057.91	1,057.90	1.44	15.61	-51.36	5,466.16	-6,837.69	8,754.03	8,736.98	17.05	513.433		
723.00	723.00	1,071.02	1,071.00	1.50	15.98	-51.36	5,466.15	-6,837.69	8,754.01	8,736.53	17.48	500.805		
800.00	800.00	1,114.89	1,114.87	1.67	17.25	-51.36	5,466.28	-6,837.69	8,754.16	8,735.24	18.92	462.716		
900.00	900.00	900.00	1,248.00	1.89	10.98	-51.36	5,466.58	-6,837.69	8,754.28	8,741.41	12.88	679.893		
926.40	926.40	1,250.00	1,249.97	1.95	21.18	-51.36	5,466.58	-6,837.69	8,754.32	8,731.19	23.13	378.499		
1,000.00	999.98	1,358.59	1,358.56	2.12	23.39	-38.15	5,466.24	-6,837.69	8,752.96	8,727.46	25.50	343.240		
1,100.00	1,099.76	1,447.50	1,447.46	2.35	25.20	-38.27	5,466.16	-6,837.69	8,747.82	8,720.32	27.49	318.183		
1,200.00	1,199.07	1,536.00	1,535.97	2.59	27.00	-38.48	5,466.25	-6,837.69	8,738.70	8,709.27	29.43	296.932		
1,300.00	1,297.62	1,640.00	1,639.97	2.85	29.12	-38.80	5,466.58	-6,837.69	8,725.66	8,694.02	31.63	275.831		
1,400.00	1,395.16	1,720.58	1,720.54	3.17	30.53	-39.20	5,467.01	-6,837.69	8,708.69	8,675.60	33.09	263.162		
1,500.00	1,491.42	1,835.03	1,834.99	3.55	32.52	-39.74	5,467.30	-6,837.69	8,687.63	8,652.52	35.11	247.464		
1,600.00	1,586.12	1,947.43	1,947.39	4.02	34.48	-40.40	5,467.21	-6,837.69	8,662.49	8,625.43	37.07	233.692		
1,700.00	1,679.02	2,057.43	2,057.38	4.58	36.40	-41.18	5,466.76	-6,837.69	8,633.38	8,594.40	38.99	221.439		
1,800.00	1,769.85	2,142.94	2,142.89	5.24	37.89	-42.05	5,466.26	-6,837.69	8,600.51	8,559.99	40.52	212.269		
1,900.00	1,858.38	2,218.73	2,218.67	6.00	39.21	-43.01	5,465.99	-6,837.69	8,564.20	8,522.27	41.93	204.246		
2,000.00	1,944.34	2,292.50	2,292.44	6.86	40.49	-44.09	5,465.90	-6,837.69	8,524.59	8,481.20	43.38	196.499		
2,100.00	2,027.52	2,364.07	2,364.01	7.82	41.74	-45.30	5,465.98	-6,837.69	8,481.80	8,436.91	44.90	188.924		
2,200.00	2,107.68	2,433.25	2,433.20	8.87	42.94	-46.64	5,466.21	-6,837.69	8,435.98	8,389.49	46.49	181.441		
2,300.00	2,184.60	2,500.00	2,499.94	10.02	44.11	-48.11	5,466.58	-6,837.69	8,387.28	8,339.07	48.21	173.979		
2,400.00	2,258.08	2,599.65	2,599.59	11.25	46.43	-49.88	5,466.75	-6,837.69	8,335.57	8,284.37	51.20	162.789		
2,500.00	2,327.90	2,672.68	2,672.61	12.57	48.14	-51.72	5,466.83	-6,837.69	8,281.25	8,227.42	53.83	153.845		
2,600.00	2,393.88	2,741.60	2,741.53	13.97	49.75	-53.71	5,466.85	-6,837.69	8,224.48	8,167.87	56.61	145.281		
2,700.00	2,455.84	2,806.23	2,806.16	15.44	51.26	-55.86	5,466.84	-6,837.69	8,165.48	8,105.91	59.57	137.077		
2,800.00	2,513.61	2,866.40	2,866.33	16.99	52.66	-58.16	5,466.79	-6,837.69	8,104.45	8,041.74	62.71	129.243		
2,900.00	2,567.03	2,921.95	2,921.88	18.60	53.96	-60.62	5,466.72	-6,837.69	8,041.62	7,975.60	66.02	121.811		
3,000.00	2,615.95	2,972.74	2,972.66	20.28	55.15	-63.21	5,466.64	-6,837.69	7,977.20	7,907.73	69.47	114.823		
3,093.06	2,657.32	3,000.00	2,999.92	21.89	55.78	-65.62	5,466.58	-6,837.69	7,916.06	7,843.67	72.39	109.355		
3,100.00	2,660.21	3,000.00	2,999.92	21.98	55.78	-66.18	5,466.58	-6,837.69	7,911.45	7,838.78	72.68	108.859		
3,150.00	2,678.78	3,000.00	2,999.92	22.51	55.78	-70.44	5,466.58	-6,837.69	7,877.67	7,803.00	74.67	105.507		
3,200.00	2,693.23	3,000.00	2,999.92	23.08	55.78	-75.03	5,466.58	-6,837.69	7,842.98	7,766.30	76.68	102.280		
3,250.00	2,703.46	3,000.00	2,999.92	23.69	55.78	-79.90	5,466.58	-6,837.69	7,807.66	7,729.15	78.50	99.457		
3,300.00	2,709.38	3,050.14	3,050.05	24.34	56.66	-85.49	5,466.68	-6,837.69	7,771.80	7,690.95	80.85	96.132		
3,343.06	2,711.00	3,051.89	3,051.81	24.91	56.69	-89.92	5,466.68	-6,837.69	7,740.94	7,659.33	81.60	94.859		
3,400.00	2,711.00	3,051.99	3,051.91	25.70	56.69	-89.92	5,466.68	-6,837.69	7,700.27	7,617.88	82.39	93.456		
3,500.00	2,711.00	3,052.17	3,052.08	27.15	56.69	-89.93	5,466.68	-6,837.69	7,629.35	7,545.51	83.85	90.993		
3,600.00	2,711.00	3,052.34	3,052.26	28.66	56.70	-89.93	5,466.68	-6,837.69	7,559.10	7,473.73	85.36	88.551		
3,643.06	2,711.00	3,052.42	3,052.33	29.34	56.70	-89.93	5,466.68	-6,837.69	7,529.05	7,443.01	86.04	87.510		
3,700.00	2,710.98	3,052.50	3,052.41	30.22	56.70	-89.96	5,466.68	-6,837.69	7,488.91	7,401.99	86.91	86.164		
3,800.00	2,710.89	3,052.57	3,052.48	31.80	56.70	-90.02	5,466.68	-6,837.69	7,416.05	7,327.64	88.42	83.874		
3,900.00	2,710.70	3,052.54	3,052.46	33.45	56.70	-90.09	5,466.68	-6,837.69	7,340.31	7,250.39	89.91	81.639		
4,000.00	2,710.42	3,052.42	3,052.34	35.16	56.70	-90.17	5,466.68	-6,837.69	7,261.78	7,170.39	91.39	79.461		
4,100.00	2,710.05	3,052.20	3,052.12	36.92	56.69	-90.26	5,466.68	-6,837.69	7,180.60	7,087.76	92.84	77.343		
4,200.00	2,709.60	3,051.89	3,051.80	38.73	56.69	-90.37	5,466.68	-6,837.69	7,096.91	7,002.64	94.26	75.287		
4,300.00	2,709.05	3,051.48	3,051.40	40.58	56.68	-90.50	5,466.68	-6,837.69	7,010.84	6,915.18	95.66	73.292		
4,400.00	2,708.42	3,050.98	3,050.90	42.47	56.67	-90.66	5,466.68	-6,837.69	6,922.56	6,825.55	97.01	71.360		

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



Koltek Energy Services

Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.18-T32N-R06W - Allison Unit 039N - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 100-INC_ONLY<10													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
4,500.00	2,707.71	3,050.39	3,050.30	44.40	56.66	-90.86	5,466.68	-6,837.69	6,832.21	6,733.89	98.32	69.491	
4,600.00	2,706.91	3,049.71	3,049.62	46.35	56.65	-91.10	5,466.68	-6,837.69	6,739.98	6,640.40	99.58	67.685	
4,700.00	2,706.04	3,048.94	3,048.86	48.33	56.64	-91.41	5,466.68	-6,837.69	6,646.04	6,545.25	100.78	65.943	
4,800.00	2,705.09	3,048.09	3,048.00	50.32	56.62	-91.83	5,466.68	-6,837.69	6,550.57	6,448.65	101.93	64.268	
4,819.44	2,704.89	3,047.91	3,047.83	50.71	56.62	-91.92	5,466.68	-6,837.69	6,531.86	6,429.71	102.14	63.950	
4,900.00	2,704.08	3,047.18	3,047.09	52.34	56.61	-91.90	5,466.67	-6,837.69	6,454.22	6,350.26	103.96	62.085	
5,000.00	2,703.08	3,046.27	3,046.18	54.38	56.59	-91.87	5,466.67	-6,837.69	6,357.96	6,251.73	106.23	59.852	
5,100.00	2,702.07	3,045.36	3,045.28	56.47	56.57	-91.84	5,466.67	-6,837.69	6,261.81	6,153.29	108.52	57.700	
5,200.00	2,701.07	3,044.45	3,044.37	58.60	56.56	-91.81	5,466.67	-6,837.69	6,165.78	6,054.94	110.84	55.627	
5,300.00	2,700.06	3,043.55	3,043.46	60.75	56.54	-91.78	5,466.67	-6,837.69	6,069.89	5,956.71	113.18	53.631	
5,400.00	2,699.06	3,042.64	3,042.56	62.94	56.53	-91.75	5,466.67	-6,837.69	5,974.12	5,858.59	115.54	51.708	
5,500.00	2,698.05	3,041.74	3,041.65	65.16	56.51	-91.72	5,466.66	-6,837.69	5,878.50	5,760.60	117.91	49.857	
5,600.00	2,697.05	3,040.83	3,040.75	67.40	56.49	-91.69	5,466.66	-6,837.69	5,783.03	5,662.74	120.29	48.075	
5,700.00	2,696.05	3,039.93	3,039.85	69.66	56.48	-91.66	5,466.66	-6,837.69	5,687.71	5,565.02	122.69	46.359	
5,800.00	2,695.04	3,039.03	3,038.95	71.95	56.46	-91.63	5,466.66	-6,837.69	5,592.55	5,467.46	125.10	44.706	
5,900.00	2,694.04	3,038.13	3,038.05	74.25	56.45	-91.60	5,466.66	-6,837.69	5,497.57	5,370.06	127.51	43.113	
6,000.00	2,693.03	3,037.23	3,037.15	76.57	56.43	-91.57	5,466.66	-6,837.69	5,402.77	5,272.83	129.94	41.578	
6,100.00	2,692.03	3,036.33	3,036.25	78.91	56.42	-91.54	5,466.65	-6,837.69	5,308.16	5,175.78	132.38	40.099	
6,200.00	2,691.02	3,035.44	3,035.35	81.26	56.40	-91.51	5,466.65	-6,837.69	5,213.74	5,078.93	134.82	38.672	
6,300.00	2,690.02	3,034.54	3,034.46	83.63	56.39	-91.48	5,466.65	-6,837.69	5,119.55	4,982.28	137.27	37.296	
6,400.00	2,689.01	3,033.65	3,033.56	86.00	56.37	-91.45	5,466.65	-6,837.69	5,025.57	4,885.85	139.72	35.968	
6,500.00	2,688.01	3,032.75	3,032.67	88.39	56.35	-91.42	5,466.65	-6,837.69	4,931.83	4,789.65	142.18	34.687	
6,600.00	2,687.00	3,031.86	3,031.78	90.79	56.34	-91.39	5,466.65	-6,837.69	4,838.35	4,693.70	144.65	33.449	
6,700.00	2,686.00	3,030.97	3,030.89	93.19	56.32	-91.36	5,466.64	-6,837.69	4,745.12	4,598.01	147.12	32.254	
6,800.00	2,684.99	3,030.08	3,030.00	95.61	56.31	-91.33	5,466.64	-6,837.69	4,652.18	4,502.59	149.59	31.099	
6,900.00	2,683.99	3,029.19	3,029.11	98.03	56.29	-91.31	5,466.64	-6,837.69	4,559.54	4,407.47	152.07	29.983	
7,000.00	2,682.98	3,028.30	3,028.22	100.46	56.28	-91.28	5,466.64	-6,837.69	4,467.22	4,312.66	154.55	28.904	
7,100.00	2,681.98	3,027.42	3,027.33	102.90	56.26	-91.25	5,466.64	-6,837.69	4,375.23	4,218.19	157.04	27.861	
7,200.00	2,680.97	3,026.53	3,026.45	105.34	56.25	-91.22	5,466.64	-6,837.69	4,283.60	4,124.07	159.53	26.852	
7,300.00	2,679.97	3,025.64	3,025.56	107.79	56.23	-91.19	5,466.63	-6,837.69	4,192.35	4,030.33	162.02	25.876	
7,400.00	2,678.96	3,024.76	3,024.68	110.25	56.21	-91.16	5,466.63	-6,837.69	4,101.51	3,937.00	164.51	24.932	
7,500.00	2,677.96	3,023.88	3,023.79	112.71	56.20	-91.13	5,466.63	-6,837.69	4,011.11	3,844.10	167.01	24.018	
7,600.00	2,676.95	3,022.99	3,022.91	115.17	56.18	-91.10	5,466.63	-6,837.69	3,921.17	3,751.67	169.51	23.133	
7,700.00	2,675.95	3,022.11	3,022.03	117.64	56.17	-91.07	5,466.63	-6,837.69	3,831.74	3,659.73	172.01	22.277	
7,800.00	2,674.94	3,021.23	3,021.15	120.12	56.15	-91.04	5,466.63	-6,837.69	3,742.83	3,568.32	174.51	21.448	
7,900.00	2,673.94	3,020.35	3,020.27	122.60	56.14	-91.01	5,466.62	-6,837.69	3,654.50	3,477.49	177.02	20.645	
8,000.00	2,672.93	3,019.48	3,019.39	125.08	56.12	-90.98	5,466.62	-6,837.69	3,566.79	3,387.26	179.52	19.868	
8,100.00	2,671.93	3,018.60	3,018.52	127.56	56.11	-90.96	5,466.62	-6,837.69	3,479.74	3,297.70	182.03	19.116	
8,200.00	2,670.92	3,017.72	3,017.64	130.05	56.09	-90.93	5,466.62	-6,837.69	3,393.40	3,208.86	184.54	18.388	
8,300.00	2,669.92	3,016.85	3,016.77	132.54	56.08	-90.90	5,466.62	-6,837.69	3,307.83	3,120.78	187.05	17.684	
8,400.00	2,668.91	3,015.98	3,015.89	135.03	56.06	-90.87	5,466.61	-6,837.69	3,223.09	3,033.52	189.57	17.002	
8,500.00	2,667.91	3,015.10	3,015.02	137.53	56.05	-90.84	5,466.61	-6,837.69	3,139.25	2,947.17	192.08	16.343	
8,600.00	2,666.91	3,014.23	3,014.15	140.03	56.03	-90.81	5,466.61	-6,837.69	3,056.38	2,861.79	194.60	15.706	
8,700.00	2,665.90	3,013.36	3,013.28	142.53	56.02	-90.78	5,466.61	-6,837.69	2,974.57	2,777.45	197.11	15.091	
8,800.00	2,664.90	3,012.49	3,012.41	145.03	56.00	-90.75	5,466.61	-6,837.69	2,893.89	2,694.26	199.63	14.496	
8,900.00	2,663.89	3,011.62	3,011.54	147.54	55.99	-90.72	5,466.61	-6,837.69	2,814.46	2,612.31	202.15	13.923	
9,000.00	2,662.89	3,010.75	3,010.67	150.05	55.97	-90.70	5,466.60	-6,837.69	2,736.38	2,531.71	204.67	13.370	
9,100.00	2,661.88	3,009.89	3,009.80	152.56	55.96	-90.67	5,466.60	-6,837.69	2,659.76	2,452.57	207.19	12.837	
9,200.00	2,660.88	3,009.02	3,008.94	155.07	55.94	-90.64	5,466.60	-6,837.69	2,584.75	2,375.03	209.71	12.325	
9,300.00	2,659.87	3,008.16	3,008.07	157.58	55.93	-90.61	5,466.60	-6,837.69	2,511.47	2,299.24	212.24	11.833	
9,400.00	2,658.87	3,007.29	3,007.21	160.10	55.91	-90.58	5,466.60	-6,837.69	2,440.09	2,225.33	214.76	11.362	
9,500.00	2,657.86	3,006.43	3,006.35	162.61	55.90	-90.55	5,466.59	-6,837.69	2,370.79	2,153.50	217.28	10.911	

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.18-T32N-R06W - Allison Unit 039N - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 100-INC_ONLY<10													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,600.00	2,656.86	3,005.57	3,005.48	165.13	55.88	-90.52	5,466.59	-6,837.69	2,303.73	2,083.92	219.81	10.481	
9,700.00	2,655.85	3,004.71	3,004.62	167.65	55.87	-90.50	5,466.59	-6,837.69	2,239.14	2,016.80	222.34	10.071	
9,800.00	2,654.85	3,003.85	3,003.76	170.17	55.85	-90.47	5,466.59	-6,837.69	2,177.23	1,952.36	224.86	9.682	
9,900.00	2,653.84	3,002.99	3,002.90	172.70	55.84	-90.44	5,466.59	-6,837.69	2,118.22	1,890.83	227.39	9.315	
10,000.00	2,652.84	3,002.13	3,002.05	175.22	55.82	-90.41	5,466.59	-6,837.69	2,062.38	1,832.47	229.92	8.970	
10,083.34	2,652.00	3,001.42	3,001.33	177.32	55.81	-90.39	5,466.58	-6,837.69	2,018.45	1,786.43	232.03	8.699 CC, ES, SF	



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design														Sec.21-T32N-R06W - Allison Unit 110H - Pilot Hole - Rev0		Offset Site Error: 0.00 usft	
Survey Program: 0-MWD														Offset Well Error: 0.00 usft			
Reference		Offset		Semi Major Axis		Distance								Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor					
3,093.06	2,657.32	3,093.06	2,657.32	0.00	0.00	0.00	1,073.40	-252.56	0.00	0.00	0.00	0.000	Level 1, CC, SF				
3,093.13	2,657.34	3,093.13	2,657.34	0.00	0.00	-180.00	1,073.46	-252.57	0.00	0.00	0.00	0.003	Level 1				
3,100.00	2,660.21	3,100.00	2,660.25	0.18	0.12	180.00	1,079.53	-254.00	0.04	-0.10	0.14	0.301	Level 1, ES				
3,150.00	2,678.78	3,149.91	2,681.34	0.62	1.00	180.00	1,123.55	-264.35	2.83	2.36	0.47	6.054					
3,200.00	2,693.23	3,199.38	2,702.25	1.19	1.87	-180.00	1,167.20	-274.62	9.95	9.17	0.78	12.793					
3,250.00	2,703.46	3,248.04	2,722.82	1.80	2.73	-180.00	1,210.13	-284.73	21.36	20.30	1.06	20.118					
3,300.00	2,709.38	3,295.53	2,742.88	2.45	3.57	180.00	1,252.03	-294.58	36.97	35.66	1.30	28.386					
3,343.06	2,711.00	3,335.20	2,759.65	3.03	4.28	180.00	1,287.03	-302.82	53.68	52.18	1.50	35.752					
3,400.00	2,711.00	3,386.81	2,781.46	3.82	5.19	180.00	1,332.55	-313.53	77.75	75.81	1.94	40.127					
3,500.00	2,711.00	3,477.44	2,819.76	5.27	6.80	180.00	1,412.51	-332.34	120.01	117.24	2.77	43.400					
3,600.00	2,711.00	3,539.52	2,846.00	6.79	7.91	-180.00	1,467.28	-345.23	164.76	161.27	3.49	47.183					
3,643.06	2,711.00	3,539.52	2,846.00	7.46	7.91	-180.00	1,467.28	-345.23	192.70	189.04	3.66	52.591					
3,700.00	2,710.98	3,539.52	2,846.00	8.35	7.91	-177.90	1,467.28	-345.23	236.72	232.76	3.96	59.799					
3,800.00	2,710.89	3,539.52	2,846.00	9.93	7.91	-172.50	1,467.28	-345.23	323.87	318.90	4.98	65.073					
3,900.00	2,710.70	3,539.52	2,846.00	11.59	7.91	-165.12	1,467.28	-345.23	416.63	409.68	6.96	59.880					
4,000.00	2,710.42	3,539.52	2,846.00	13.31	7.91	-156.31	1,467.28	-345.23	511.78	501.88	9.90	51.688					
4,100.00	2,710.05	3,539.52	2,846.00	15.09	7.91	-146.92	1,467.28	-345.23	608.00	594.56	13.43	45.263					
4,200.00	2,709.60	3,539.52	2,846.00	16.93	7.91	-137.91	1,467.28	-345.23	704.63	687.57	17.06	41.295					
4,300.00	2,709.05	3,539.52	2,846.00	18.83	7.91	-129.92	1,467.28	-345.23	801.32	780.88	20.44	39.194					
4,400.00	2,708.42	3,539.52	2,846.00	20.78	7.91	-123.23	1,467.28	-345.23	897.83	874.38	23.44	38.296					
4,500.00	2,707.71	3,539.52	2,846.00	22.78	7.91	-117.80	1,467.28	-345.23	993.97	967.90	26.07	38.123					
4,600.00	2,706.91	3,539.52	2,846.00	24.83	7.91	-113.44	1,467.28	-345.23	1,089.62	1,061.22	28.40	38.372					
4,700.00	2,706.04	3,539.52	2,846.00	26.92	7.91	-109.95	1,467.28	-345.23	1,184.67	1,154.19	30.48	38.864					
4,800.00	2,705.09	3,539.52	2,846.00	29.05	7.91	-107.15	1,467.28	-345.23	1,279.01	1,246.63	32.38	39.497					
4,819.44	2,704.89	3,539.52	2,846.00	29.47	7.91	-106.67	1,467.28	-345.23	1,297.27	1,264.53	32.73	39.630					
4,900.00	2,704.08	3,539.52	2,846.00	31.22	7.91	-106.67	1,467.28	-345.23	1,373.12	1,338.60	34.53	39.772					
5,000.00	2,703.08	3,539.52	2,846.00	33.41	7.91	-106.67	1,467.28	-345.23	1,467.98	1,431.22	36.76	39.933					
5,100.00	2,702.07	3,539.52	2,846.00	35.65	7.91	-106.67	1,467.28	-345.23	1,563.49	1,524.46	39.02	40.066					
5,200.00	2,701.07	3,539.52	2,846.00	37.91	7.91	-106.67	1,467.28	-345.23	1,659.52	1,618.21	41.31	40.177					
5,300.00	2,700.06	3,539.52	2,846.00	40.21	7.91	-106.67	1,467.28	-345.23	1,755.99	1,712.39	43.61	40.270					
5,400.00	2,699.06	3,539.52	2,846.00	42.53	7.91	-106.67	1,467.28	-345.23	1,852.84	1,806.92	45.92	40.348					
5,500.00	2,698.05	3,539.52	2,846.00	44.87	7.91	-106.67	1,467.28	-345.23	1,950.01	1,901.76	48.25	40.414					
5,600.00	2,697.05	3,539.52	2,846.00	47.24	7.91	-106.67	1,467.28	-345.23	2,047.45	1,996.85	50.59	40.469					
5,700.00	2,696.05	3,539.52	2,846.00	49.62	7.91	-106.67	1,467.28	-345.23	2,145.12	2,092.18	52.94	40.517					
5,800.00	2,695.04	3,539.52	2,846.00	52.01	7.91	-106.67	1,467.28	-345.23	2,243.00	2,187.70	55.30	40.557					
5,900.00	2,694.04	3,539.52	2,846.00	54.42	7.91	-106.67	1,467.28	-345.23	2,341.06	2,283.39	57.67	40.591					
6,000.00	2,693.03	3,539.52	2,846.00	56.84	7.91	-106.67	1,467.28	-345.23	2,439.28	2,379.23	60.05	40.621					
6,100.00	2,692.03	3,539.52	2,846.00	59.27	7.91	-106.67	1,467.28	-345.23	2,537.63	2,475.20	62.43	40.645					
6,200.00	2,691.02	3,539.52	2,846.00	61.71	7.91	-106.67	1,467.28	-345.23	2,636.11	2,571.29	64.83	40.665					
6,300.00	2,690.02	3,539.52	2,846.00	64.15	7.91	-106.67	1,467.28	-345.23	2,734.70	2,667.47	67.23	40.674					
6,400.00	2,689.01	3,539.52	2,846.00	66.61	7.91	-106.67	1,467.28	-345.23	2,833.39	2,763.75	69.64	40.687					
6,500.00	2,688.01	3,539.52	2,846.00	69.07	7.91	-106.67	1,467.28	-345.23	2,932.17	2,860.13	72.04	40.700					
6,600.00	2,687.00	3,539.52	2,846.00	71.54	7.91	-106.67	1,467.28	-345.23	3,031.03	2,956.58	74.45	40.711					
6,700.00	2,686.00	3,539.52	2,846.00	74.01	7.91	-106.67	1,467.28	-345.23	3,129.96	3,053.09	76.86	40.721					
6,800.00	2,684.99	3,539.52	2,846.00	76.49	7.91	-106.67	1,467.28	-345.23	3,228.95	3,149.68	79.28	40.730					
6,900.00	2,683.99	3,539.52	2,846.00	78.98	7.91	-106.67	1,467.28	-345.23	3,328.01	3,246.32	81.69	40.738					
7,000.00	2,682.98	3,539.52	2,846.00	81.46	7.91	-106.67	1,467.28	-345.23	3,427.12	3,343.01	84.11	40.744					
7,100.00	2,681.98	3,539.52	2,846.00	83.96	7.91	-106.67	1,467.28	-345.23	3,526.28	3,439.75	86.53	40.750					
7,200.00	2,680.97	3,539.52	2,846.00	86.45	7.91	-106.67	1,467.28	-345.23	3,625.49	3,536.53	88.96	40.755					
7,300.00	2,679.97	3,539.52	2,846.00	88.95	7.91	-106.67	1,467.28	-345.23	3,724.74	3,633.36	91.38	40.760					
7,400.00	2,678.96	3,539.52	2,846.00	91.46	7.91	-106.67	1,467.28	-345.23	3,824.03	3,730.22	93.81	40.764					
7,500.00	2,677.96	3,539.52	2,846.00	93.96	7.91	-106.67	1,467.28	-345.23	3,923.35	3,827.12	96.24	40.767					

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 110H - Pilot Hole - Rev0													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
7,600.00	2,676.95	3,539.52	2,846.00	96.47	7.91	-106.67	1,467.28	-345.23	4,022.71	3,924.04	98.67	40.770		
7,700.00	2,675.95	3,539.52	2,846.00	98.98	7.91	-106.67	1,467.28	-345.23	4,122.10	4,021.00	101.10	40.772		
7,800.00	2,674.94	3,539.52	2,846.00	101.50	7.91	-106.67	1,467.28	-345.23	4,221.52	4,117.99	103.53	40.774		
7,900.00	2,673.94	3,539.52	2,846.00	104.01	7.91	-106.67	1,467.28	-345.23	4,320.97	4,215.00	105.97	40.776		
8,000.00	2,672.93	3,539.52	2,846.00	106.53	7.91	-106.67	1,467.28	-345.23	4,420.44	4,312.03	108.41	40.777		
8,100.00	2,671.93	3,539.52	2,846.00	109.05	7.91	-106.67	1,467.28	-345.23	4,519.93	4,409.09	110.84	40.778		
8,200.00	2,670.92	3,539.52	2,846.00	111.57	7.91	-106.67	1,467.28	-345.23	4,619.45	4,506.16	113.28	40.779		
8,300.00	2,669.92	3,539.52	2,846.00	114.09	7.91	-106.67	1,467.28	-345.23	4,718.98	4,603.26	115.72	40.779		
8,400.00	2,668.91	3,539.52	2,846.00	116.62	7.91	-106.67	1,467.28	-345.23	4,818.54	4,700.38	118.16	40.780		
8,500.00	2,667.91	3,539.52	2,846.00	119.14	7.91	-106.67	1,467.28	-345.23	4,918.11	4,797.51	120.60	40.780		
8,600.00	2,666.91	3,539.52	2,846.00	121.67	7.91	-106.67	1,467.28	-345.23	5,017.70	4,894.66	123.04	40.780		
8,700.00	2,665.90	3,539.52	2,846.00	124.20	7.91	-106.67	1,467.28	-345.23	5,117.31	4,991.82	125.49	40.780		
8,800.00	2,664.90	3,539.52	2,846.00	126.73	7.91	-106.67	1,467.28	-345.23	5,216.93	5,089.00	127.93	40.780		
8,900.00	2,663.89	3,539.52	2,846.00	129.26	7.91	-106.67	1,467.28	-345.23	5,316.56	5,186.19	130.37	40.779		
9,000.00	2,662.89	3,539.52	2,846.00	131.80	7.91	-106.67	1,467.28	-345.23	5,416.21	5,283.39	132.82	40.779		
9,100.00	2,661.88	3,539.52	2,846.00	134.33	7.91	-106.67	1,467.28	-345.23	5,515.87	5,380.61	135.27	40.778		
9,200.00	2,660.88	3,539.52	2,846.00	136.87	7.91	-106.67	1,467.28	-345.23	5,615.55	5,477.84	137.71	40.778		
9,300.00	2,659.87	3,539.52	2,846.00	139.40	7.91	-106.67	1,467.28	-345.23	5,715.23	5,575.07	140.16	40.777		
9,400.00	2,658.87	3,539.52	2,846.00	141.94	7.91	-106.67	1,467.28	-345.23	5,814.93	5,672.32	142.61	40.776		
9,500.00	2,657.86	3,539.52	2,846.00	144.48	7.91	-106.67	1,467.28	-345.23	5,914.63	5,769.58	145.05	40.775		
9,600.00	2,656.86	3,539.52	2,846.00	147.01	7.91	-106.67	1,467.28	-345.23	6,014.35	5,866.85	147.50	40.774		
9,700.00	2,655.85	3,539.52	2,846.00	149.55	7.91	-106.67	1,467.28	-345.23	6,114.08	5,964.12	149.95	40.773		
9,800.00	2,654.85	3,539.52	2,846.00	152.09	7.91	-106.67	1,467.28	-345.23	6,213.81	6,061.41	152.40	40.772		
9,900.00	2,653.84	3,539.52	2,846.00	154.63	7.91	-106.67	1,467.28	-345.23	6,313.55	6,158.70	154.85	40.771		
10,000.00	2,652.84	3,539.52	2,846.00	157.17	7.91	-106.67	1,467.28	-345.23	6,413.30	6,256.00	157.30	40.770		
10,083.34	2,652.00	3,539.52	2,846.00	159.29	7.91	-106.67	1,467.28	-345.23	6,496.44	6,337.10	159.35	40.770		



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 152H - Original Hole - Original Hole												Offset Site Error:	0.00 usft
Survey Program: 527-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	109.10	-23.41	67.57	72.51				
100.00	100.00	88.00	88.00	0.10	0.10	109.10	-23.41	67.57	71.51	71.32	0.19	367.498	
200.00	200.00	188.00	188.00	0.32	0.21	109.10	-23.41	67.57	71.51	70.98	0.53	134.495	
300.00	300.00	288.00	288.00	0.55	0.32	109.10	-23.41	67.57	71.51	70.64	0.87	82.309	
400.00	400.00	388.00	388.00	0.77	0.44	109.10	-23.41	67.57	71.51	70.31	1.21	59.300	
500.00	500.00	488.00	488.00	0.99	0.55	109.10	-23.41	67.57	71.51	69.97	1.54	46.345	
600.00	600.00	592.26	592.18	1.22	0.75	110.11	-23.67	64.64	68.96	67.00	1.96	35.148	
700.00	700.00	690.84	690.58	1.44	0.96	110.42	-22.04	59.21	63.24	60.83	2.40	26.341	
794.61	794.61	782.89	782.61	1.66	1.14	109.29	-20.34	58.09	61.55	58.75	2.79	22.044 CC	
800.00	800.00	788.22	787.93	1.67	1.15	109.23	-20.27	58.11	61.55	58.73	2.81	21.870 ES	
900.00	900.00	887.79	887.50	1.89	1.35	108.21	-19.40	58.98	62.09	58.85	3.24	19.176	
926.40	926.40	914.15	913.86	1.95	1.40	107.91	-19.16	59.29	62.31	58.96	3.35	18.589	
1,000.00	999.98	987.87	987.56	2.12	1.56	121.35	-18.43	60.13	63.62	59.95	3.67	17.314	
1,100.00	1,099.76	1,087.79	1,087.48	2.35	1.76	124.93	-17.46	60.97	67.62	63.52	4.10	16.494	
1,200.00	1,199.07	1,187.07	1,186.75	2.59	1.96	131.12	-16.51	61.84	75.25	70.72	4.53	16.601	
1,300.00	1,297.62	1,283.16	1,282.81	2.85	2.16	137.74	-15.68	63.90	88.55	83.58	4.97	17.812	
1,400.00	1,395.16	1,378.29	1,377.52	3.17	2.38	141.02	-12.43	71.86	110.00	104.56	5.44	20.210	
1,500.00	1,491.42	1,476.35	1,474.16	3.55	2.62	140.98	-3.13	85.38	136.02	130.06	5.96	22.828	
1,600.00	1,586.12	1,576.19	1,571.36	4.02	2.93	139.57	12.60	101.82	164.17	157.60	6.57	24.987	
1,700.00	1,679.02	1,680.20	1,671.21	4.58	3.32	137.73	35.80	119.32	192.61	185.29	7.32	26.317	
1,800.00	1,769.85	1,789.77	1,775.32	5.24	3.81	136.41	66.04	135.02	219.88	211.67	8.21	26.783	
1,900.00	1,858.38	1,912.35	1,890.08	6.00	4.43	135.86	107.87	144.66	241.94	232.67	9.28	26.081	
2,000.00	1,944.34	2,027.66	1,994.20	6.86	5.14	135.08	157.16	148.39	258.80	248.28	10.52	24.601	
2,100.00	2,027.52	2,150.58	2,099.27	7.82	6.09	133.42	220.79	150.22	272.50	260.38	12.11	22.493	
2,200.00	2,107.68	2,272.42	2,195.74	8.87	7.25	131.09	295.06	147.64	280.91	266.86	14.05	19.992	
2,300.00	2,184.60	2,385.02	2,277.02	10.02	8.51	128.04	372.83	143.92	286.73	270.43	16.30	17.588	
2,400.00	2,258.08	2,494.03	2,348.02	11.25	9.89	124.18	455.46	141.18	292.72	273.78	18.93	15.460	
2,500.00	2,327.90	2,609.72	2,416.12	12.57	11.50	119.81	548.79	136.01	297.68	275.66	22.02	13.519	
2,600.00	2,393.88	2,718.69	2,473.88	13.97	13.13	115.61	640.87	128.41	301.65	276.39	25.26	11.941	
2,700.00	2,455.84	2,824.62	2,525.93	15.44	14.78	111.84	732.65	119.14	306.08	277.47	28.62	10.696	
2,800.00	2,513.61	2,931.19	2,574.86	16.99	16.50	108.49	826.67	108.18	311.07	278.97	32.10	9.690	
2,900.00	2,567.03	3,036.31	2,619.21	18.60	18.24	105.53	921.17	95.79	316.18	280.52	35.66	8.867	
3,000.00	2,615.95	3,142.03	2,662.22	20.28	19.99	103.35	1,016.67	81.47	321.21	282.00	39.21	8.192	
3,093.06	2,657.32	3,240.63	2,700.99	21.89	21.68	102.05	1,106.08	66.45	325.47	282.91	42.56	7.648	
3,100.00	2,660.21	3,248.00	2,703.83	21.98	21.80	101.96	1,112.77	65.26	325.77	283.00	42.78	7.616	
3,150.00	2,678.78	3,302.48	2,724.53	22.51	22.75	101.74	1,162.34	56.17	328.12	283.94	44.18	7.427	
3,200.00	2,693.23	3,356.12	2,744.26	23.08	23.69	102.19	1,211.26	46.45	330.57	285.05	45.52	7.261	
3,250.00	2,703.46	3,385.00	2,754.80	23.69	24.20	102.50	1,237.62	41.12	334.49	288.01	46.48	7.196 SF	
3,300.00	2,709.38	3,385.00	2,754.80	24.34	24.20	101.40	1,237.62	41.12	345.37	298.18	47.20	7.318	
3,343.06	2,711.00	3,385.00	2,754.80	24.91	24.20	99.79	1,237.62	41.12	360.71	312.78	47.94	7.525	
3,400.00	2,711.00	3,385.00	2,754.80	25.70	24.20	99.79	1,237.62	41.12	387.80	339.08	48.72	7.960	
3,500.00	2,711.00	3,385.00	2,754.80	27.15	24.20	99.79	1,237.62	41.12	449.09	398.95	50.14	8.956	
3,600.00	2,711.00	3,385.00	2,754.80	28.66	24.20	99.79	1,237.62	41.12	522.48	470.84	51.64	10.118	
3,643.06	2,711.00	3,385.00	2,754.80	29.34	24.20	99.79	1,237.62	41.12	556.64	504.34	52.30	10.643	
3,700.00	2,710.98	3,385.00	2,754.80	30.22	24.20	100.19	1,237.62	41.12	604.01	551.06	52.95	11.407	
3,800.00	2,710.89	3,385.00	2,754.80	31.80	24.20	101.15	1,237.62	41.12	692.52	638.57	53.95	12.837	
3,900.00	2,710.70	3,385.00	2,754.80	33.45	24.20	102.61	1,237.62	41.12	785.67	730.92	54.75	14.349	
4,000.00	2,710.42	3,385.00	2,754.80	35.16	24.20	104.93	1,237.62	41.12	881.77	826.55	55.22	15.967	
4,100.00	2,710.05	3,385.00	2,754.80	36.92	24.20	108.99	1,237.62	41.12	979.73	924.77	54.96	17.825	
4,200.00	2,709.60	3,385.00	2,754.80	38.73	24.20	117.41	1,237.62	41.12	1,078.81	1,026.33	52.48	20.558	
4,300.00	2,709.05	3,385.00	2,754.80	40.58	24.20	141.06	1,237.62	41.12	1,178.49	1,139.52	38.97	30.243	
4,400.00	2,708.42	3,385.00	2,754.80	42.47	24.20	-155.07	1,237.62	41.12	1,278.39	1,246.25	32.14	39.780	

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design													Sec.21-T32N-R06W - Allison Unit 152H - Original Hole - Original Hole		Offset Site Error:	0.00 usft
Survey Program: 527-MWD															Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
4,500.00	2,707.71	3,385.00	2,754.80	44.40	24.20	-117.76	1,237.62	41.12	1,378.22	1,322.02	56.20	24.526				
4,600.00	2,706.91	3,385.00	2,754.80	46.35	24.20	-105.92	1,237.62	41.12	1,477.75	1,417.09	60.65	24.363				
4,700.00	2,706.04	3,385.00	2,754.80	48.33	24.20	-100.71	1,237.62	41.12	1,576.78	1,514.63	62.15	25.372				
4,800.00	2,705.09	3,385.00	2,754.80	50.32	24.20	-97.85	1,237.62	41.12	1,675.16	1,612.25	62.91	26.629				
4,819.44	2,704.89	3,385.00	2,754.80	50.71	24.20	-97.44	1,237.62	41.12	1,694.19	1,631.18	63.01	26.886				
4,900.00	2,704.08	3,385.00	2,754.80	52.34	24.20	-97.44	1,237.62	41.12	1,773.10	1,708.27	64.83	27.351				
5,000.00	2,703.08	3,385.00	2,754.80	54.38	24.20	-97.44	1,237.62	41.12	1,871.24	1,804.15	67.09	27.890				
5,100.00	2,702.07	3,385.00	2,754.80	56.47	24.20	-97.44	1,237.62	41.12	1,969.57	1,900.18	69.39	28.386				
5,200.00	2,701.07	3,385.00	2,754.80	58.60	24.20	-97.44	1,237.62	41.12	2,068.06	1,996.36	71.70	28.843				
5,300.00	2,700.06	3,385.00	2,754.80	60.75	24.20	-97.44	1,237.62	41.12	2,166.68	2,092.65	74.03	29.266				
5,400.00	2,699.06	3,385.00	2,754.80	62.94	24.20	-97.44	1,237.62	41.12	2,265.43	2,189.04	76.39	29.657				
5,500.00	2,698.05	3,385.00	2,754.80	65.16	24.20	-97.44	1,237.62	41.12	2,364.28	2,285.53	78.75	30.021				
5,600.00	2,697.05	3,385.00	2,754.80	67.40	24.20	-97.44	1,237.62	41.12	2,463.23	2,382.10	81.13	30.360				
5,700.00	2,696.05	3,385.00	2,754.80	69.66	24.20	-97.44	1,237.62	41.12	2,562.26	2,478.73	83.53	30.676				
5,800.00	2,695.04	3,385.00	2,754.80	71.95	24.20	-97.44	1,237.62	41.12	2,661.36	2,575.43	85.93	30.971				
5,900.00	2,694.04	3,385.00	2,754.80	74.25	24.20	-97.44	1,237.62	41.12	2,760.52	2,672.18	88.34	31.247				
6,000.00	2,693.03	3,385.00	2,754.80	76.57	24.20	-97.44	1,237.62	41.12	2,859.75	2,768.98	90.77	31.506				
6,100.00	2,692.03	3,385.00	2,754.80	78.91	24.20	-97.44	1,237.62	41.12	2,959.02	2,865.82	93.20	31.750				
6,200.00	2,691.02	3,385.00	2,754.80	81.26	24.20	-97.44	1,237.62	41.12	3,058.34	2,962.71	95.64	31.979				
6,300.00	2,690.02	3,385.00	2,754.80	83.63	24.20	-97.44	1,237.62	41.12	3,157.71	3,059.63	98.08	32.195				
6,400.00	2,689.01	3,385.00	2,754.80	86.00	24.20	-97.44	1,237.62	41.12	3,257.11	3,156.58	100.53	32.399				
6,500.00	2,688.01	3,385.00	2,754.80	88.39	24.20	-97.44	1,237.62	41.12	3,356.55	3,253.57	102.99	32.592				
6,600.00	2,687.00	3,385.00	2,754.80	90.79	24.20	-97.44	1,237.62	41.12	3,456.02	3,350.58	105.45	32.775				
6,700.00	2,686.00	3,385.00	2,754.80	93.19	24.20	-97.44	1,237.62	41.12	3,555.53	3,447.61	107.91	32.948				
6,800.00	2,684.99	3,385.00	2,754.80	95.61	24.20	-97.44	1,237.62	41.12	3,655.05	3,544.67	110.38	33.113				
6,900.00	2,683.99	3,385.00	2,754.80	98.03	24.20	-97.44	1,237.62	41.12	3,754.61	3,641.75	112.85	33.269				
7,000.00	2,682.98	3,385.00	2,754.80	100.46	24.20	-97.44	1,237.62	41.12	3,854.19	3,738.85	115.33	33.418				
7,100.00	2,681.98	3,385.00	2,754.80	102.90	24.20	-97.44	1,237.62	41.12	3,953.78	3,835.97	117.81	33.560				
7,200.00	2,680.97	3,385.00	2,754.80	105.34	24.20	-97.44	1,237.62	41.12	4,053.40	3,933.11	120.30	33.695				
7,300.00	2,679.97	3,385.00	2,754.80	107.79	24.20	-97.44	1,237.62	41.12	4,153.04	4,030.26	122.78	33.824				
7,400.00	2,678.96	3,385.00	2,754.80	110.25	24.20	-97.44	1,237.62	41.12	4,252.69	4,127.42	125.27	33.948				
7,500.00	2,677.96	3,385.00	2,754.80	112.71	24.20	-97.44	1,237.62	41.12	4,352.36	4,224.60	127.76	34.066				
7,600.00	2,676.95	3,385.00	2,754.80	115.17	24.20	-97.44	1,237.62	41.12	4,452.05	4,321.79	130.26	34.179				
7,700.00	2,675.95	3,385.00	2,754.80	117.64	24.20	-97.44	1,237.62	41.12	4,551.74	4,418.99	132.75	34.287				
7,800.00	2,674.94	3,385.00	2,754.80	120.12	24.20	-97.44	1,237.62	41.12	4,651.45	4,516.20	135.25	34.391				
7,900.00	2,673.94	3,385.00	2,754.80	122.60	24.20	-97.44	1,237.62	41.12	4,751.18	4,613.43	137.75	34.491				
8,000.00	2,672.93	3,385.00	2,754.80	125.08	24.20	-97.44	1,237.62	41.12	4,850.91	4,710.66	140.25	34.587				
8,100.00	2,671.93	3,385.00	2,754.80	127.56	24.20	-97.44	1,237.62	41.12	4,950.66	4,807.90	142.76	34.679				
8,200.00	2,670.92	3,385.00	2,754.80	130.05	24.20	-97.44	1,237.62	41.12	5,050.41	4,905.15	145.26	34.768				
8,300.00	2,669.92	3,385.00	2,754.80	132.54	24.20	-97.44	1,237.62	41.12	5,150.18	5,002.41	147.77	34.853				
8,400.00	2,668.91	3,385.00	2,754.80	135.03	24.20	-97.44	1,237.62	41.12	5,249.95	5,099.68	150.28	34.935				
8,500.00	2,667.91	3,385.00	2,754.80	137.53	24.20	-97.44	1,237.62	41.12	5,349.73	5,196.95	152.79	35.015				
8,600.00	2,666.91	3,385.00	2,754.80	140.03	24.20	-97.44	1,237.62	41.12	5,449.52	5,294.23	155.30	35.091				
8,700.00	2,665.90	3,385.00	2,754.80	142.53	24.20	-97.44	1,237.62	41.12	5,549.32	5,391.51	157.81	35.165				
8,800.00	2,664.90	3,385.00	2,754.80	145.03	24.20	-97.44	1,237.62	41.12	5,649.13	5,488.81	160.32	35.236				
8,900.00	2,663.89	3,385.00	2,754.80	147.54	24.20	-97.44	1,237.62	41.12	5,748.94	5,586.10	162.84	35.305				
9,000.00	2,662.89	3,385.00	2,754.80	150.05	24.20	-97.44	1,237.62	41.12	5,848.76	5,683.41	165.35	35.372				
9,100.00	2,661.88	3,385.00	2,754.80	152.56	24.20	-97.44	1,237.62	41.12	5,948.58	5,780.71	167.87	35.436				
9,200.00	2,660.88	3,385.00	2,754.80	155.07	24.20	-97.44	1,237.62	41.12	6,048.41	5,878.03	170.38	35.499				
9,300.00	2,659.87	3,385.00	2,754.80	157.58	24.20	-97.44	1,237.62	41.12	6,148.25	5,975.35	172.90	35.559				
9,400.00	2,658.87	3,385.00	2,754.80	160.10	24.20	-97.44	1,237.62	41.12	6,248.09	6,072.67	175.42	35.618				
9,500.00	2,657.86	3,385.00	2,754.80	162.61	24.20	-97.44	1,237.62	41.12	6,347.93	6,169.99	177.94	35.675				

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design														Sec.21-T32N-R06W - Allison Unit 152H - Original Hole - Original Hole		Offset Site Error:		0.00 usft	
Survey Program: 527-MWD																Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis			Distance							Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor							
9,600.00	2,656.86	3,385.00	2,754.80	165.13	24.20	-97.44	1,237.62	41.12	6,447.78	6,267.32	180.46	35.730							
9,700.00	2,655.85	3,385.00	2,754.80	167.65	24.20	-97.44	1,237.62	41.12	6,547.64	6,364.66	182.98	35.783							
9,800.00	2,654.85	3,385.00	2,754.80	170.17	24.20	-97.44	1,237.62	41.12	6,647.50	6,462.00	185.50	35.835							
9,900.00	2,653.84	3,385.00	2,754.80	172.70	24.20	-97.44	1,237.62	41.12	6,747.36	6,559.34	188.02	35.885							
10,000.00	2,652.84	3,385.00	2,754.80	175.22	24.20	-97.44	1,237.62	41.12	6,847.23	6,656.68	190.55	35.934							
10,083.34	2,652.00	3,385.00	2,754.80	177.32	24.20	-97.44	1,237.62	41.12	6,930.47	6,737.81	192.65	35.974							



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 152H - ST 1 - ST 1													Offset Site Error: 0.00 usft
Survey Program: 527-MWD, 3176-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
0.00	0.00	0.00	0.00	0.00	0.00	109.10	-23.41	67.57	72.51				
100.00	100.00	88.00	88.00	0.10	0.10	109.10	-23.41	67.57	71.51	71.32	0.19	367.498	
200.00	200.00	188.00	188.00	0.32	0.21	109.10	-23.41	67.57	71.51	70.98	0.53	134.495	
300.00	300.00	288.00	288.00	0.55	0.32	109.10	-23.41	67.57	71.51	70.64	0.87	82.309	
400.00	400.00	388.00	388.00	0.77	0.44	109.10	-23.41	67.57	71.51	70.31	1.21	59.300	
500.00	500.00	488.00	488.00	0.99	0.55	109.10	-23.41	67.57	71.51	69.97	1.54	46.345	
600.00	600.00	592.26	592.18	1.22	0.75	110.11	-23.67	64.64	68.96	67.00	1.96	35.148	
700.00	700.00	690.84	690.58	1.44	0.96	110.42	-22.04	59.21	63.24	60.83	2.40	26.341	
794.61	794.61	782.89	782.61	1.66	1.14	109.29	-20.34	58.09	61.55	58.75	2.79	22.044 CC	
800.00	800.00	788.22	787.93	1.67	1.15	109.23	-20.27	58.11	61.55	58.73	2.81	21.870 ES	
900.00	900.00	887.79	887.50	1.89	1.35	108.21	-19.40	58.98	62.09	58.85	3.24	19.176	
926.40	926.40	914.15	913.86	1.95	1.40	107.91	-19.16	59.29	62.31	58.96	3.35	18.589	
1,000.00	999.98	987.87	987.56	2.12	1.56	121.35	-18.43	60.13	63.62	59.95	3.67	17.314	
1,100.00	1,099.76	1,087.79	1,087.48	2.35	1.76	124.93	-17.46	60.97	67.62	63.52	4.10	16.494	
1,200.00	1,199.07	1,187.07	1,186.75	2.59	1.96	131.12	-16.51	61.84	75.25	70.72	4.53	16.601	
1,300.00	1,297.62	1,283.16	1,282.81	2.85	2.16	137.74	-15.68	63.90	88.55	83.58	4.97	17.812	
1,400.00	1,395.16	1,378.29	1,377.52	3.17	2.38	141.02	-12.43	71.86	110.00	104.56	5.44	20.210	
1,500.00	1,491.42	1,476.35	1,474.16	3.55	2.62	140.98	-3.13	85.38	136.02	130.06	5.96	22.828	
1,600.00	1,586.12	1,576.19	1,571.36	4.02	2.93	139.57	12.60	101.82	164.17	157.60	6.57	24.987	
1,700.00	1,679.02	1,680.20	1,671.21	4.58	3.32	137.73	35.80	119.32	192.61	185.29	7.32	26.317	
1,800.00	1,769.85	1,789.77	1,775.32	5.24	3.81	136.41	66.04	135.02	219.88	211.67	8.21	26.783	
1,900.00	1,858.38	1,912.35	1,890.08	6.00	4.43	135.86	107.87	144.66	241.94	232.67	9.28	26.081	
2,000.00	1,944.34	2,027.66	1,994.20	6.86	5.14	135.08	157.16	148.39	258.80	248.28	10.52	24.601	
2,100.00	2,027.52	2,150.58	2,099.27	7.82	6.09	133.42	220.79	150.22	272.50	260.38	12.11	22.493	
2,200.00	2,107.68	2,272.42	2,195.74	8.87	7.25	131.09	295.06	147.64	280.91	266.86	14.05	19.992	
2,300.00	2,184.60	2,385.02	2,277.02	10.02	8.51	128.04	372.83	143.92	286.73	270.43	16.30	17.588	
2,400.00	2,258.08	2,494.03	2,348.02	11.25	9.89	124.18	455.46	141.18	292.72	273.78	18.93	15.460	
2,500.00	2,327.90	2,609.72	2,416.12	12.57	11.50	119.81	548.79	136.01	297.68	275.66	22.02	13.519	
2,600.00	2,393.88	2,718.69	2,473.88	13.97	13.13	115.61	640.87	128.41	301.65	276.39	25.26	11.941	
2,700.00	2,455.84	2,824.62	2,525.93	15.44	14.78	111.84	732.65	119.14	306.08	277.47	28.62	10.696	
2,800.00	2,513.61	2,931.19	2,574.86	16.99	16.50	108.49	826.67	108.18	311.07	278.97	32.10	9.690	
2,900.00	2,567.03	3,036.31	2,619.21	18.60	18.24	105.53	921.17	95.79	316.18	280.52	35.66	8.867	
3,000.00	2,615.95	3,142.03	2,662.22	20.28	19.99	103.35	1,016.67	81.47	321.21	282.00	39.21	8.192	
3,093.06	2,657.32	3,236.47	2,695.41	21.89	21.16	101.32	1,103.94	68.11	325.99	283.88	42.11	7.741	
3,100.00	2,660.21	3,244.23	2,697.37	21.98	21.25	101.02	1,111.39	67.09	326.39	284.07	42.32	7.713	
3,150.00	2,678.78	3,298.35	2,707.95	22.51	21.90	98.89	1,163.93	59.72	329.29	285.67	43.62	7.549	
3,200.00	2,693.23	3,344.97	2,713.89	23.08	22.50	97.10	1,209.74	53.50	332.93	288.05	44.88	7.419	
3,250.00	2,703.46	3,389.31	2,717.46	23.69	23.09	95.57	1,253.62	48.33	337.92	291.78	46.13	7.325	
3,300.00	2,709.38	3,432.72	2,719.56	24.34	23.68	94.35	1,296.77	44.08	344.23	296.82	47.41	7.261	
3,343.06	2,711.00	3,473.89	2,720.80	24.91	24.25	93.61	1,337.78	40.63	350.49	301.92	48.57	7.216	
3,400.00	2,711.00	3,527.91	2,722.35	25.70	25.00	93.78	1,391.59	36.14	358.98	308.89	50.09	7.166	
3,500.00	2,711.00	3,619.05	2,723.24	27.15	26.32	93.76	1,482.54	30.38	375.69	322.85	52.84	7.110	
3,600.00	2,711.00	3,715.23	2,720.89	28.66	27.77	93.24	1,578.56	25.60	393.55	337.74	55.81	7.052	
3,643.06	2,711.00	3,758.04	2,719.92	29.34	28.41	93.04	1,621.31	23.52	401.30	344.18	57.12	7.026 SF	
3,700.00	2,710.98	3,809.34	2,719.22	30.22	29.15	92.87	1,672.56	21.25	412.65	354.10	58.56	7.047	
3,800.00	2,710.89	3,909.53	2,718.02	31.80	30.66	92.58	1,772.64	16.82	436.62	375.45	61.16	7.139	
3,900.00	2,710.70	3,987.36	2,715.32	33.45	31.87	92.13	1,850.38	14.39	466.89	403.52	63.37	7.368	
4,000.00	2,710.42	4,060.79	2,713.26	35.16	33.02	91.77	1,923.77	15.45	506.26	440.91	65.35	7.747	
4,100.00	2,710.05	4,138.00	2,711.67	36.92	34.21	91.49	2,000.90	18.61	552.83	485.63	67.20	8.226	
4,200.00	2,709.60	4,223.01	2,710.59	38.73	35.59	91.28	2,085.78	23.04	604.95	535.92	69.03	8.763	
4,300.00	2,709.05	4,307.65	2,708.29	40.58	36.93	90.96	2,170.29	27.23	661.22	590.58	70.64	9.360	
4,400.00	2,708.42	4,382.05	2,707.05	42.47	38.08	90.77	2,244.58	31.08	721.96	650.06	71.90	10.041	

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



Koltek Energy Services

Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design														Offset Site Error:		0.00 usft
Survey Program: 527-MWD, 3176-MWD														Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
4,500.00	2,707.71	4,439.37	2,706.62	44.40	38.99	90.68	2,301.77	34.93	787.95	715.18	72.77	10.829				
4,600.00	2,706.91	4,508.03	2,705.58	46.35	40.10	90.53	2,370.18	40.62	858.88	785.31	73.57	11.674				
4,700.00	2,706.04	4,571.07	2,704.81	48.33	41.09	90.40	2,432.99	45.89	933.46	859.37	74.09	12.599				
4,800.00	2,705.09	4,628.11	2,704.29	50.32	42.01	90.30	2,489.81	50.93	1,011.73	937.38	74.35	13.608				
4,819.44	2,704.89	4,639.00	2,704.15	50.71	42.19	90.28	2,500.65	51.93	1,027.35	952.98	74.37	13.813				
4,900.00	2,704.08	4,677.97	2,703.52	52.34	42.84	90.23	2,539.44	55.67	1,092.55	1,015.97	76.58	14.267				
5,000.00	2,703.08	4,731.19	2,702.51	54.38	43.71	90.15	2,592.37	61.16	1,173.89	1,094.52	79.37	14.790				
5,100.00	2,702.07	4,793.70	2,701.63	56.47	44.71	90.10	2,654.53	67.61	1,255.25	1,172.99	82.26	15.259				
5,200.00	2,701.07	4,856.88	2,700.02	58.60	45.73	90.01	2,717.39	73.79	1,336.29	1,251.11	85.18	15.688				
5,300.00	2,700.06	4,904.52	2,698.36	60.75	46.51	89.91	2,764.76	78.48	1,417.39	1,329.37	88.02	16.104				
5,400.00	2,699.06	4,937.15	2,697.62	62.94	47.05	89.87	2,797.18	82.17	1,499.32	1,408.63	90.69	16.532				
5,500.00	2,698.05	4,969.09	2,697.40	65.16	47.56	89.88	2,828.85	86.31	1,582.19	1,488.84	93.35	16.948				
5,600.00	2,697.05	5,000.43	2,697.55	67.40	48.07	89.90	2,859.86	90.82	1,665.88	1,569.86	96.03	17.348				
5,700.00	2,696.05	5,016.00	2,697.75	69.66	48.32	89.92	2,875.24	93.23	1,750.44	1,651.87	98.57	17.758				
5,800.00	2,695.04	5,051.75	2,698.50	71.95	48.89	89.98	2,910.47	99.30	1,835.66	1,734.37	101.29	18.122				
5,900.00	2,694.04	5,079.00	2,699.33	74.25	49.33	90.04	2,937.20	104.49	1,921.79	1,817.84	103.95	18.488				
6,000.00	2,693.03	5,079.00	2,699.33	76.57	49.33	90.04	2,937.20	104.49	2,008.78	1,902.39	106.39	18.881				
6,100.00	2,692.03	5,112.37	2,700.50	78.91	49.86	90.11	2,969.79	111.57	2,096.23	1,987.13	109.10	19.214				
6,200.00	2,691.02	5,141.00	2,701.53	81.26	50.33	90.17	2,997.59	118.34	2,184.58	2,072.81	111.77	19.545				
6,300.00	2,690.02	5,141.00	2,701.53	83.63	50.33	90.17	2,997.59	118.34	2,273.41	2,159.18	114.24	19.901				
6,400.00	2,689.01	5,161.25	2,702.25	86.00	50.65	90.22	3,017.16	123.51	2,362.88	2,246.03	116.85	20.221				
6,500.00	2,688.01	5,190.00	2,703.20	88.39	51.11	90.27	3,044.78	131.43	2,453.04	2,333.51	119.53	20.523				
6,600.00	2,687.00	5,190.00	2,703.20	90.79	51.11	90.27	3,044.78	131.43	2,543.45	2,421.44	122.01	20.846				
6,700.00	2,686.00	5,204.00	2,703.65	93.19	51.33	90.29	3,058.16	135.52	2,634.46	2,509.87	124.59	21.145				
6,800.00	2,684.99	5,224.20	2,704.35	95.61	51.65	90.33	3,077.42	141.59	2,725.83	2,598.62	127.21	21.428				
6,900.00	2,683.99	5,244.96	2,705.22	98.03	51.97	90.37	3,097.15	147.95	2,817.49	2,687.66	129.83	21.701				
7,000.00	2,682.98	5,267.00	2,706.32	100.46	52.32	90.42	3,118.05	154.86	2,909.43	2,776.96	132.46	21.964				
7,100.00	2,681.98	5,267.00	2,706.32	102.90	52.32	90.42	3,118.05	154.86	3,001.72	2,866.75	134.96	22.241				
7,200.00	2,680.97	5,294.49	2,707.62	105.34	52.75	90.48	3,144.02	163.76	3,094.16	2,956.53	137.63	22.481				
7,300.00	2,679.97	5,308.17	2,708.13	107.79	52.96	90.51	3,156.91	168.35	3,186.97	3,046.75	140.22	22.728				
7,400.00	2,678.96	5,330.00	2,708.74	110.25	53.30	90.53	3,177.39	175.86	3,280.08	3,137.22	142.85	22.961				
7,500.00	2,677.96	5,701.00	2,714.92	112.71	59.12	90.70	3,531.17	284.75	3,370.56	3,222.78	147.78	22.808				
7,600.00	2,676.95	5,701.00	2,714.92	115.17	59.12	90.70	3,531.17	284.75	3,459.91	3,309.62	150.29	23.022				
7,700.00	2,675.95	5,701.00	2,714.92	117.64	59.12	90.70	3,531.17	284.75	3,549.83	3,397.03	152.81	23.231				
7,800.00	2,674.94	5,736.29	2,716.33	120.12	59.70	90.75	3,565.13	294.24	3,639.88	3,484.31	155.57	23.396				
7,900.00	2,673.94	5,762.00	2,717.19	122.60	60.13	90.77	3,589.80	301.42	3,730.33	3,572.05	158.28	23.568				
8,000.00	2,672.93	5,762.00	2,717.19	125.08	60.13	90.77	3,589.80	301.42	3,821.05	3,660.25	160.80	23.763				
8,100.00	2,671.93	5,783.35	2,717.96	127.56	60.47	90.79	3,610.21	307.60	3,912.04	3,748.57	163.46	23.932				
8,200.00	2,670.92	5,796.21	2,718.55	130.05	60.68	90.81	3,622.48	311.44	4,003.34	3,837.27	166.07	24.106				
8,300.00	2,669.92	5,824.00	2,720.11	132.54	61.14	90.85	3,648.87	320.01	4,095.03	3,926.25	168.78	24.263				
8,400.00	2,668.91	5,824.00	2,720.11	135.03	61.14	90.85	3,648.87	320.01	4,186.80	4,015.49	171.31	24.440				
8,500.00	2,667.91	5,885.00	2,723.66	137.53	62.11	90.95	3,706.79	338.81	4,278.49	4,104.27	174.22	24.559				
8,600.00	2,666.91	5,917.56	2,725.17	140.03	62.63	90.99	3,737.75	348.77	4,370.15	4,193.20	176.95	24.696				
8,700.00	2,665.90	5,946.00	2,726.18	142.53	63.09	91.01	3,764.73	357.72	4,462.11	4,282.44	179.67	24.835				
8,800.00	2,664.90	5,962.02	2,726.62	145.03	63.35	91.02	3,779.90	362.82	4,554.18	4,371.88	182.30	24.981				
8,900.00	2,663.89	6,008.00	2,727.27	147.54	64.11	91.02	3,823.50	377.41	4,646.26	4,461.12	185.13	25.097				
9,000.00	2,662.89	6,039.57	2,727.42	150.05	64.63	91.02	3,853.44	387.43	4,738.34	4,550.47	187.87	25.221				
9,100.00	2,661.88	6,069.00	2,727.54	152.56	65.11	91.01	3,881.33	396.84	4,830.51	4,639.91	190.60	25.344				
9,200.00	2,660.88	6,087.86	2,727.59	155.07	65.43	91.00	3,899.17	402.92	4,922.79	4,729.53	193.25	25.473				
9,300.00	2,659.87	6,107.12	2,727.58	157.58	65.75	91.00	3,917.38	409.20	5,015.22	4,819.30	195.91	25.599				
9,400.00	2,658.87	6,130.00	2,727.48	160.10	66.13	90.98	3,938.98	416.76	5,107.79	4,909.20	198.60	25.719				
9,500.00	2,657.86	6,209.18	2,726.12	162.61	67.43	90.92	4,013.80	442.62	5,200.21	4,998.57	201.64	25.789				

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.21-T32N-R06W - Allison Unit 152H - ST 1 - ST 1													Offset Site Error:	0.00 usft
Survey Program: 527-MWD, 3176-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (")	Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,600.00	2,656.86	6,241.30	2,725.20	165.13	67.96		90.88	4,044.18	453.03	5,292.54	5,088.15	204.39		25.895
9,700.00	2,655.85	6,474.57	2,718.84	167.65	71.75		90.66	4,266.09	524.56	5,384.02	5,175.56	208.46		25.828
9,800.00	2,654.85	6,584.37	2,717.20	170.17	73.54	90.60	4,371.38	555.68	5,474.59	5,262.83	211.76	25.853		
9,900.00	2,653.84	6,620.00	2,716.39	172.70	74.13	90.58	4,405.59	565.60	5,564.99	5,350.44	214.55	25.938		
10,000.00	2,652.84	6,643.85	2,715.70	175.22	74.54	90.56	4,428.46	572.29	5,655.49	5,438.22	217.26	26.030		
10,083.34	2,652.00	6,661.63	2,715.11	177.32	74.84	90.54	4,445.50	577.35	5,731.04	5,511.52	219.51	26.108		



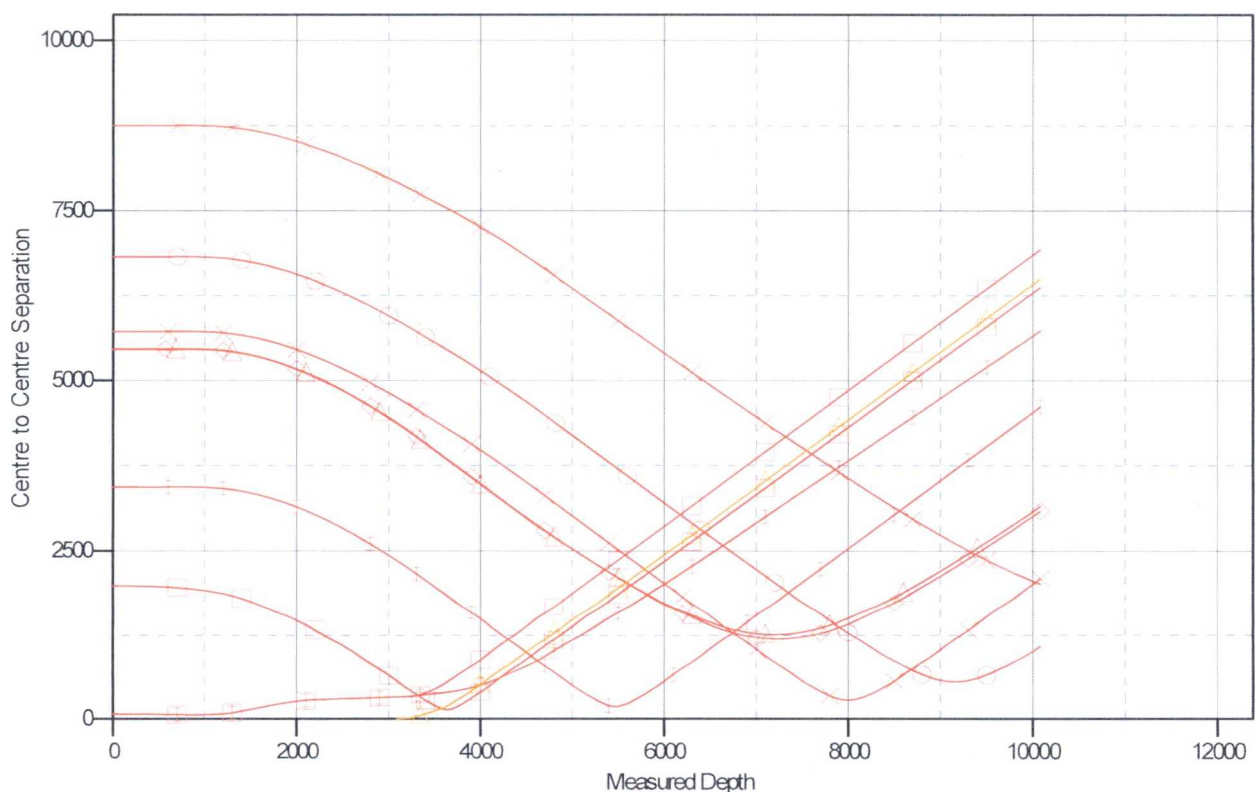
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 6167.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.83334°W

Coordinates are relative to: Allison Unit 110H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.22°

Ladder Plot



LEGEND

- Allison Unit039N, Original Hole, Original Hole V0
- Allison Unit002B, Original Hole, Original Hole V0
- Allison Unit 110, Original Hole, Original Hole V0
- Allison Unit038M, Original Hole, Original Hole V0
- Allison Unit038B, Original Hole, Original Hole V0
- Allison Unit038N, Original Hole, Original Hole V0
- Allison Unit006N, Original Hole, Original Hole V0
- Allison Unit 152H, ST 1, ST 1 V0
- Allison Unit 152H, Original Hole, Original Hole V0
- Allison Unit 110H, Pilot Hole, Rev0 V0



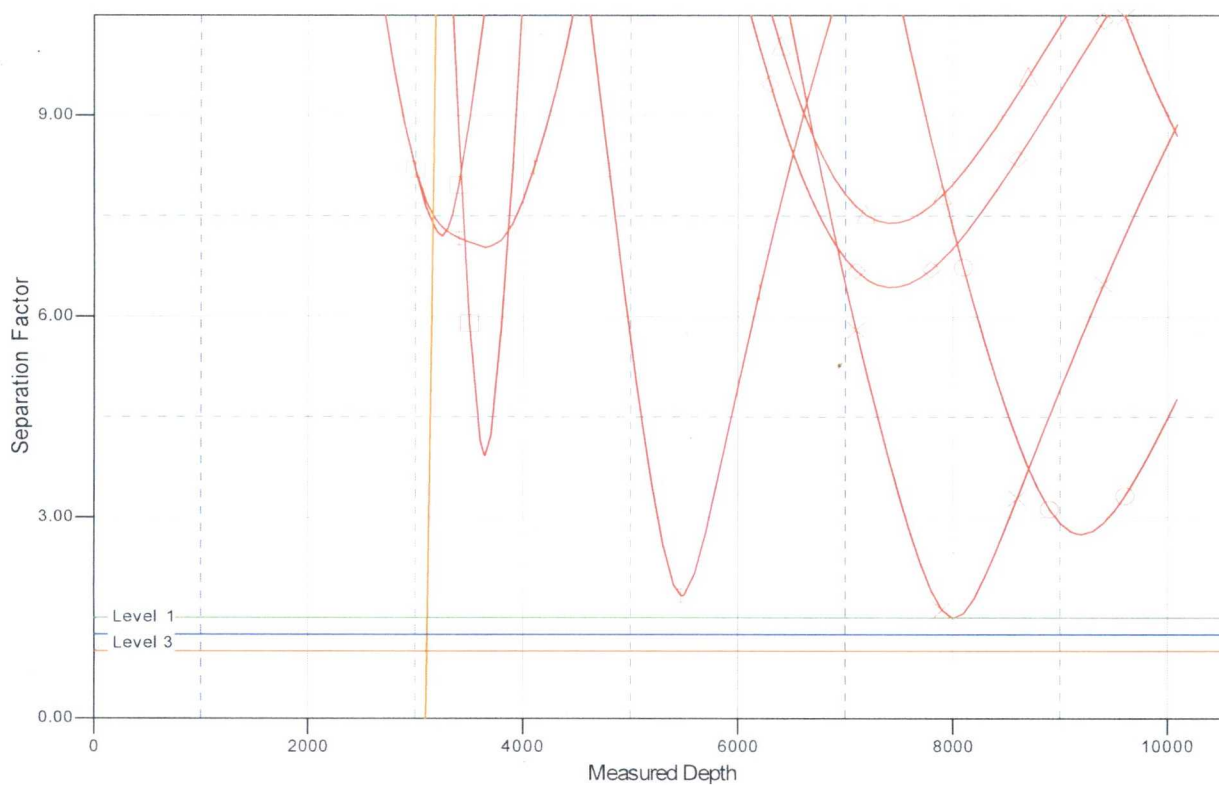
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.21-T32N-R06W
Site Error: 0.00 usft
Reference Well: Allison Unit 110H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well Allison Unit 110H
TVD Reference: KB @ 6167.00usft
MD Reference: KB @ 6167.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 6167.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.83334°W

Coordinates are relative to: Allison Unit 110H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.22°

Separation Factor Plot



LEGEND

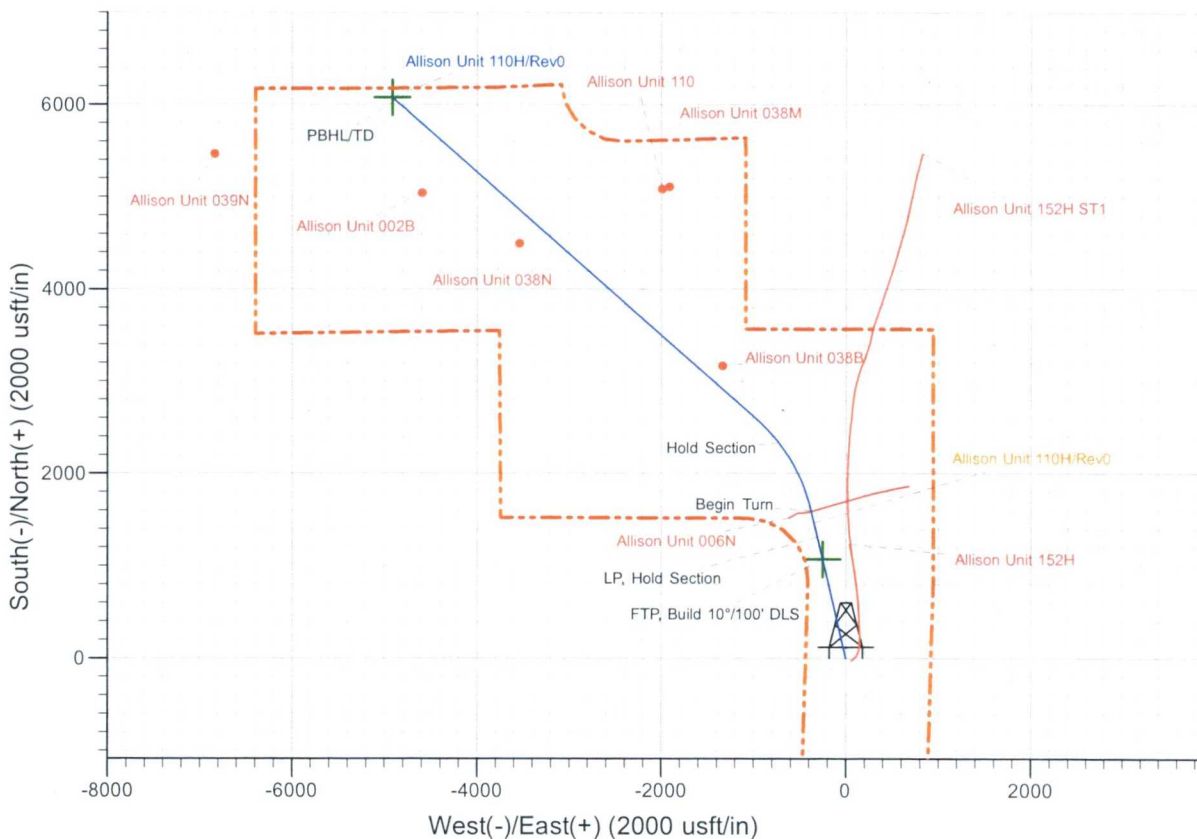
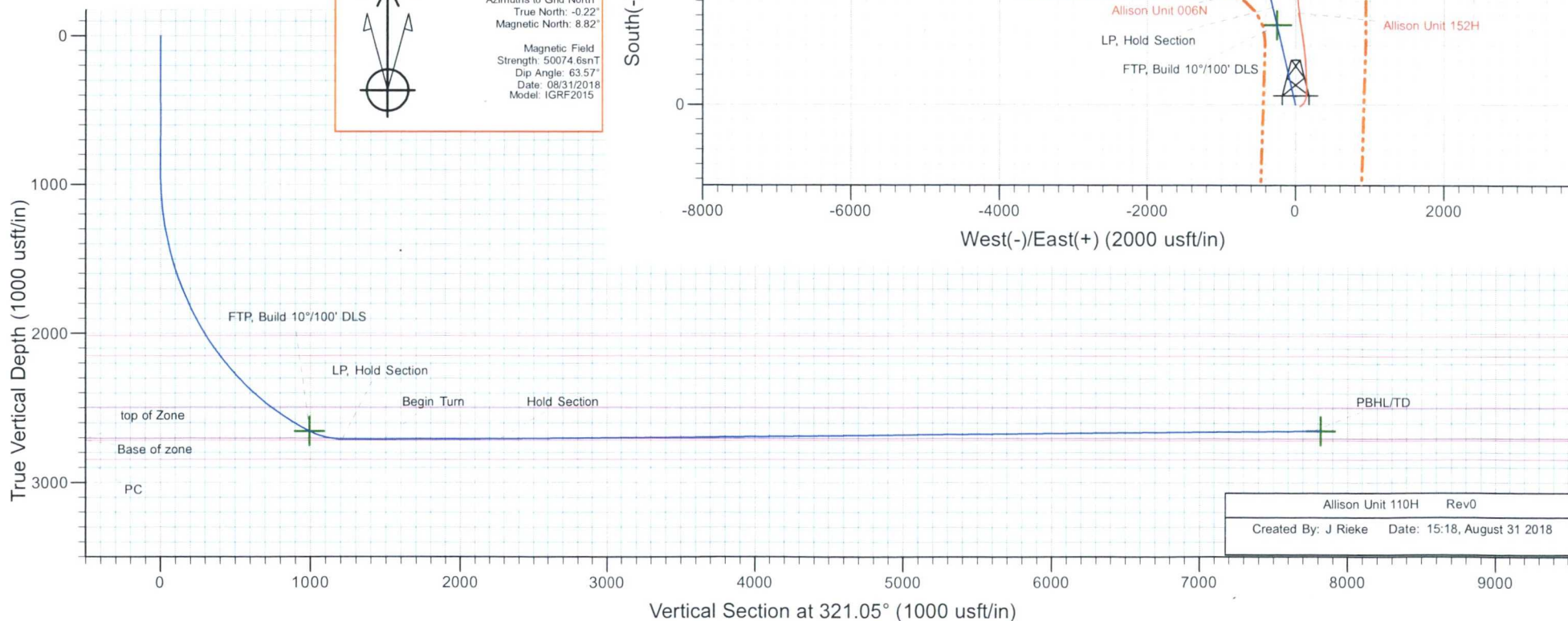
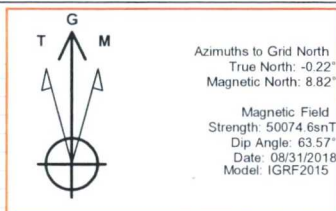
- Allison Unit 039N, Original Hole, Original Hole V0
- Allison Unit 002B, Original Hole, Original Hole V0
- Allison Unit 110, Original Hole, Original Hole V0
- Allison Unit 038M, Original Hole, Original Hole V0
- Allison Unit 038B, Original Hole, Original Hole V0
- Allison Unit 038N, Original Hole, Original Hole V0
- Allison Unit 006N, Original Hole, Original Hole V0
- Allison Unit 152H, ST 1, ST 1 V0
- Allison Unit 152H, Original Hole, Original Hole V0
- Allison Unit 110H, Pilot Hole, Rev0 V0



Company: Hilcorp Energy Company
 Field: San Juan Co., NM (NAD27)
 Location: Sec.21-T32N-R06W
 Well: Allison Unit 110H
 Borehole: Lat 1
 Plan: Rev0



WELL DETAILS: Allison Unit 110H									
+N/-S		+E/-W		GL 6152.00		KB @ 6167.00usft			
0.00		0.00		Northing 2172794.07		Easting 606580.63		Latitude 36.97066°N	
								Longitude 107.46849°W	
SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec
1	3093.06	65.00	346.76	2657.32	1073.40	-252.56	0.00	0.00	993.56
2	3343.06	90.00	346.76	2711.00	1309.11	-308.01	10.00	0.00	1211.74
3	3643.06	90.00	346.76	2711.00	1601.13	-376.72	0.00	0.00	1482.04
4	4819.44	90.58	311.47	2704.89	2594.82	-971.04	3.00	-89.00	2628.45
5	10083.34	90.58	311.47	2652.00	6080.73	-4914.93	0.00	0.00	7818.69
DESIGN TARGET DETAILS									
Name				TVD	+N/-S	+E/-W	Latitude		Longitude
Allison Unit 110H Toe				2652.00	6080.73	-4914.93	36.98742°N		107.48524°W
Allison Unit 110H FTP				2657.32	1073.40	-252.56	36.97362°N		107.46934°W
FORMATION TOP DETAILS					ANNOTATIONS				
TVDPath	MDPath	Formation			TVD	MD	Annotation		
2015.00	2084.72	Ojo Alamo			2657.32	3093.06	FTP, Build 10"/100' DLS		
2151.00	2255.78	Kirtland			2711.00	3343.06	LP, Hold Section		
2495.00	2766.96	Fruitland			2711.00	3643.06	Begin Turn		
2706.00	3267.33	top of Zone			2708.01	4459.69	Hold Section		
					2652.53	10030.93	PBHL/TD		



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;

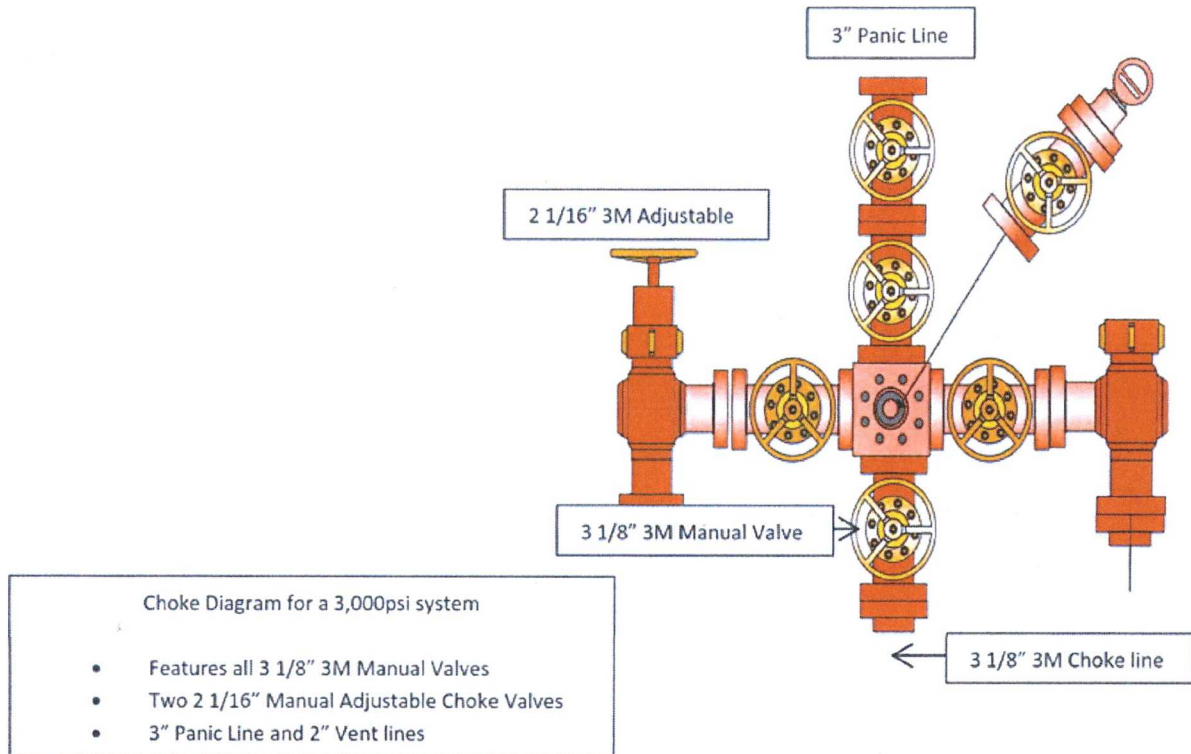
Go Right (Southerly) on existing roadway for 0.2 miles to fork in roadway;

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;

Allison 110H

Choke Manifold Schematic – Aztec 777



Allison 110H



Hilcorp Energy Company

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

