

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Heather Riley, Division Director
Oil Conservation Division



Matthias Sayer
Deputy Cabinet Secretary

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: 9/17/2018

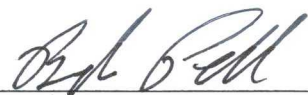
Well information;

Operator Hilcorp, Well Name and Number San Juan 32-8 Unit 232H

API# 30-045-35881.5 Section 28 Township 32N S, Range 8 E/W 7

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
 - ☐ Hold C-104 for NSL, NSP, DHC
 - ☐ 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.


NMOCD Approved by Signature

11/15/19
Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMSF0079013
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. SAN JUAN 32-8 / NMNM078424X
2. Name of Operator HILCORP ENERGY COMPANY		8. Lease Name and Well No. SAN JUAN 32-8 UNIT 232H
3a. Address 1111 Travis Street Houston TX 77002	3b. Phone No. (include area code) (713)209-2400	9. API Well No. 30-045-35881
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface NWNW / 994 FNL / 686 FWL / LAT 36.959647 / LONG -107.687056 At proposed prod. zone NWNE / 546 FNL / 2142 FEL / LAT 36.961145 / LONG -107.714523		10. Field and Pool, or Exploratory BASIN FRUITLAND COAL
11. Sec., T. R. M. or Blk. and Survey or Area SEC 28 / T32N / R08W / NMP		
14. Distance in miles and direction from nearest town or post office*		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) 686 feet	16. No of acres in lease 1720	17. Spacing Unit dedicated to this well 1280
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 100 feet	19. Proposed Depth 3107 feet / 8044 feet	20. BLM/BIA Bond No. in file FED: NMB001486
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6656 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) Amanda Walker / Ph: (505)324-5122	Date 09/17/2018
Title Operations/Regulatory Technician		
Approved by (Signature) 	Name (Printed/Typed) Richard A Fields	Date DEC 13 2018
Title Field Manager		
Office FARMINGTON		

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

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"

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

PLAT MAP OF A PORTION OF THE 30TH AND 29TH TOWNSHIPS, 28TH RANGE, T28N R28E

(RECORD) NO *01'E 2630.43'
 NO *04'14"W 2622.74' (MEASURED)

(RECORD) NO *39'W 2631.09'
 NO *53'06"W 2635.51' (MEASURED)

(RECORD) S89 *10'W 1782.66'
 S89 *04'47"W 1783.67' (MEASURED)

(RECORD) S89 *10'W 2597.76'
 S88 *59'35"W 2595.45' (MEASURED)

(RECORD) N88 *44'W 2593.14'
 N88 *54'00"W 2586.16' (MEASURED)

(RECORD) N88 *44'W 2593.14'
 N88 *48'02"W 2597.57' (MEASURED)

(RECORD) N88 *17'W 2590.17'
 N88 *19'52"W 2585.04' (MEASURED)

(RECORD) N88 *17'W 2590.17'
 N88 *21'20"W 2593.11' (MEASURED)

LOT 1
 LOT 2
 LOT 3
 LOT 4

30 29 28

(MEASURED) S89 *12'04"W 1817.01'
 S89 *23'W 1828.86' (RECORD)

(MEASURED) S89 *17'30"W 2631.04'
 S89 *23'W 2626.80' (RECORD)

(MEASURED) N88 *43'22"W 2626.17'
 N88 *40'W 2624.82' (RECORD)

(MEASURED) N88 *42'36"W 2624.64'
 N88 *40'W 2624.82' (RECORD)

(MEASURED) N87 *56'14"W 2628.94'
 N87 *53'W 2622.51' (RECORD)

(MEASURED) N88 *00'07"W 2615.58'
 N87 *53'W 2622.51' (RECORD)

(MEASURED) NO *02'57'W 2630.83'
 NO *01'E 2630.43' (RECORD)

(MEASURED) NO *41'15"W 2632.17'
 NO *39'W 2631.09' (RECORD)

(MEASURED) NO *28'35"W 2647.71'
 NO *19'W 2648.25' (RECORD)

(MEASURED) NO *29'40"W 2657.37'
 NO *19'W 2648.25' (RECORD)

Hilcorp Energy Company

Technical Plan

1. Location

San Juan 32-8 Unit 232H

SHL: 994' FNL, 686' FWL, Sec 28, T32N, R8W

Lat-1 BHL: 546' FNL, 2142' FEL, Sec 30, T32N, R8W

GL: 6656'

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	2301'	Wet
Kirtland	2346'	Wet
Fruitland	3107'	Possible Gas/Water
Pictured Cliffs	3576'	Wet

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

32-8 Unit 9 and Susco 16 State 002 were used for regional formation top correlations

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.

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' - 4,236.55' (MD)
Prod Liner (predrilled)	6-1/4"	4-1/2"	11.6# J-55/L-80	3,670' - 10,884.41' (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 - 3,658.53' MD / 3,331.72' TVD.

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

The 7" casing shoe and the window / casing exit will be set inside the setback boundary line.

B) The proposed cement program is shown below:

Cement Program						
Interval	Depth (MD)	Sacks	Slurry	Excess	Volume	Planned Cement Top
Surface	500'	265	Lead Cmt: Varicem Cement 2% Calcium Chloride, pellet 0.1250 lbm/sk Poly-E-Flake 1.18 ft ³ / sk - 5.24 gal/sk 15.8 ppg	100%	313 ft ³	Surface
Intermediate	4,236.55'	452	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%	955 ft ³	Surface
Production		N/A	N/A – Open hole with pre-drilled liner	N/A	N/A	N/A

Actual cement volumes will be determined and may be adjusted onsite based on well conditions. For the intermediate hole, a 2-stage cement job may be performed if hole conditions indicate during operations. Stage tool will be placed appropriately as conditions indicate.

C) The proposed centralizer program is shown below:

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

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

5. Drilling Fluids

A) The proposed drilling fluid program is outlined below:

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

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

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

- ✓ B) Closed loop equipment will be utilized for solids control. Cuttings from surface, intermediate, and production hole will be hauled to an approved disposal site.

6. Abnormal Pressures & Hazards

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

7. Intermediate Hole Section / Pilot Hole

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

8. Testing, Logging, Coring

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

9. Directional Plan

The planned wellbore directional plan and plot is attached.

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



Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.28-T32N-R08W

San Juan 32-8 Unit 232H

Lat 1

Rev0

Anticollision Report

04 September, 2018





Koltek Energy Services
Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well San Juan 32-8 Unit 232H
Project:	San Juan Co., NM (NAD27)	TVD Reference:	KB @ 6671.00usft
Reference Site:	Sec.28-T32N-R08W	MD Reference:	KB @ 6671.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	San Juan 32-8 Unit 232H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev0	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	09/04/18		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	3,658.53	Rev0 (Pilot Hole)	MWD	MWD - Standard	
3,658.53	10,884.41	Rev0 (Lat 1)			

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)		Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec.19-T32N-R08W						
San Juan 32-8 Unit 257A - Original Hole - Original Hole	9,556.77	3,404.00	2,517.86	2,161.93	7.074	CC
San Juan 32-8 Unit 257A - Original Hole - Original Hole	9,600.00	3,404.00	2,518.23	2,161.11	7.051	ES
San Juan 32-8 Unit 257A - Original Hole - Original Hole	10,000.00	3,404.00	2,556.58	2,188.39	6.944	SF
Sec.20-T32N-R08W						
Rattlesnake Canyon 003 - Original Hole - Original Hole	4,837.71	3,078.02	2,396.44	2,296.12	23.886	CC
Rattlesnake Canyon 003 - Original Hole - Original Hole	4,900.00	3,078.42	2,397.25	2,295.37	23.529	ES
Rattlesnake Canyon 003 - Original Hole - Original Hole	6,400.00	3,088.11	2,860.70	2,719.01	20.190	SF
San Juan 32-8 Unit 009 - Original Hole - Original Hole	7,741.57	3,560.70	2,362.26	2,228.68	17.684	CC
San Juan 32-8 Unit 009 - Original Hole - Original Hole	7,800.00	3,561.08	2,362.98	2,227.79	17.479	ES
San Juan 32-8 Unit 009 - Original Hole - Original Hole	8,900.00	3,568.18	2,631.01	2,465.45	15.892	SF
Sec.28-T32N-R08W						
San Juan 32-8 Unit 050 - Original Hole - Original Hole	987.48	976.49	111.61	94.76	6.622	CC
San Juan 32-8 Unit 050 - Original Hole - Original Hole	2,100.00	2,089.02	113.16	72.46	2.780	ES, SF
San Juan 32-8 Unit 231A - Original Hole - Original Hole	2,682.03	2,696.81	300.08	194.02	2.829	CC
San Juan 32-8 Unit 231A - Original Hole - Original Hole	2,700.00	2,713.10	300.18	193.41	2.811	ES
San Juan 32-8 Unit 231A - Original Hole - Original Hole	2,800.00	2,798.23	305.89	196.45	2.795	SF
San Juan 32-8 Unit 232H - Pilot Hole - Rev0	3,658.53	3,658.53	0.00	0.00	10,000.000	CC, ES
San Juan 32-8 Unit 232H - Pilot Hole - Rev0	3,680.46	3,680.46	0.42	0.12	1.395	Level 3, SF
Sec.29-T32N-R08W						
San Juan 32-8 Unit 232 - Original Hole - Original Hole	4,345.56	3,356.15	611.17	451.22	3.821	CC, ES
San Juan 32-8 Unit 232 - Original Hole - Original Hole	4,400.00	3,356.51	613.59	452.44	3.807	SF
San Juan 32-8 Unit 232A - Original Hole - Original Hole	6,885.57	3,363.35	887.96	694.54	4.591	CC
San Juan 32-8 Unit 232A - Original Hole - Original Hole	6,900.00	3,363.45	888.07	694.26	4.582	ES
San Juan 32-8 Unit 232A - Original Hole - Original Hole	7,000.00	3,364.09	895.30	698.72	4.554	SF
Sec.30-T32N-R08W						
San Juan 32-8 Unit 233 - Original Hole - Original Hole	10,205.09	3,347.78	1,899.00	1,627.50	6.994	CC
San Juan 32-8 Unit 233 - Original Hole - Original Hole	10,300.00	3,348.40	1,901.37	1,627.22	6.936	ES
San Juan 32-8 Unit 233 - Original Hole - Original Hole	10,600.00	3,350.33	1,939.62	1,657.10	6.865	SF
San Juan 32-8 Unit 239A - Original Hole - Original Hole	10,884.41	3,439.23	2,181.92	1,867.31	6.935	CC, ES, SF

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.19-T32N-R08W - San Juan 32-8 Unit 257A - Original Hole - Original Hole													Offset Site Error: 0.00 usft	
Survey Program: 215-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	130.22	130.22	0.00	2.13	-65.70	2,941.58	-6,515.74	7,148.97					
100.00	100.00	215.00	215.00	0.10	3.52	-65.70	2,942.14	-6,515.74	7,149.23	7,145.62	3.61	1,978.559		
200.00	200.00	333.67	333.67	0.32	7.03	-65.70	2,942.34	-6,515.74	7,149.28	7,141.93	7.35	972.514		
300.00	300.00	436.36	436.34	0.55	10.07	-65.70	2,942.41	-6,515.74	7,149.31	7,138.69	10.62	673.454		
400.00	400.00	539.04	539.02	0.77	13.11	-65.70	2,942.38	-6,515.74	7,149.30	7,135.42	13.88	515.056		
500.00	500.00	641.74	641.70	0.99	16.15	-65.70	2,942.27	-6,515.74	7,149.25	7,132.11	17.15	416.975		
567.80	567.80	711.36	711.32	1.15	18.21	-65.70	2,942.13	-6,515.74	7,149.20	7,129.84	19.36	369.293		
600.00	600.00	708.00	707.96	1.22	18.11	-65.70	2,942.14	-6,515.74	7,149.26	7,129.93	19.33	369.815		
700.00	700.00	857.34	857.26	1.44	25.81	-65.71	2,940.33	-6,515.74	7,148.48	7,121.23	27.25	262.320		
800.00	800.00	940.08	940.00	1.67	30.07	-65.71	2,940.00	-6,515.74	7,148.32	7,116.58	31.74	225.222		
817.02	817.02	954.16	954.09	1.71	30.80	-65.71	2,940.00	-6,515.74	7,148.32	7,115.81	32.50	219.930		
900.00	900.00	1,022.77	1,022.70	1.89	34.33	-65.71	2,940.16	-6,515.74	7,148.40	7,112.18	36.22	197.338		
1,000.00	1,000.00	1,105.40	1,105.33	2.12	38.59	-65.71	2,940.81	-6,515.74	7,148.72	7,108.02	40.71	175.618		
1,100.00	1,100.00	1,200.00	1,199.94	2.34	43.46	-65.70	2,942.14	-6,515.74	7,149.30	7,103.49	45.81	156.081		
1,200.00	1,200.00	1,200.00	1,199.94	2.57	43.46	-65.70	2,942.14	-6,515.74	7,150.51	7,104.48	46.03	155.345		
1,300.00	1,300.00	1,437.17	1,437.00	2.79	61.70	-65.70	2,942.14	-6,515.74	7,149.20	7,084.71	64.49	110.855		
1,400.00	1,400.00	1,537.22	1,537.00	3.02	69.39	-65.70	2,942.14	-6,515.74	7,149.20	7,076.79	72.41	98.734		
1,500.00	1,500.00	1,637.26	1,637.00	3.24	77.08	-65.70	2,942.14	-6,515.74	7,149.20	7,068.87	80.33	89.002		
1,545.98	1,545.98	1,683.27	1,682.98	3.35	80.62	-65.70	2,942.14	-6,515.74	7,149.20	7,065.23	83.97	85.143		
1,600.00	1,600.00	1,699.00	1,698.71	3.47	81.83	-65.70	2,942.14	-6,515.74	7,149.30	7,064.00	85.30	83.815		
1,700.00	1,700.00	1,699.00	1,698.71	3.69	81.83	-65.70	2,942.14	-6,515.74	7,150.54	7,065.01	85.52	83.609		
1,800.00	1,800.00	1,937.40	1,937.00	3.92	100.19	-65.70	2,942.14	-6,515.74	7,149.20	7,045.10	104.10	68.675		
1,900.00	1,900.00	2,037.45	2,037.00	4.14	107.89	-65.70	2,942.14	-6,515.74	7,149.20	7,037.17	112.03	63.816		
2,000.00	2,000.00	2,137.49	2,137.00	4.37	115.59	-65.70	2,942.14	-6,515.74	7,149.20	7,029.24	119.96	59.599		
2,033.53	2,033.53	2,171.04	2,170.53	4.44	118.17	-65.70	2,942.14	-6,515.74	7,149.20	7,026.59	122.61	58.307		
2,100.00	2,099.98	2,198.00	2,197.48	4.58	120.25	23.88	2,942.14	-6,515.74	7,147.90	7,023.17	124.73	57.306		
2,200.00	2,199.63	2,198.00	2,197.48	4.79	120.25	23.98	2,942.14	-6,515.74	7,141.72	7,017.33	124.39	57.416		
2,300.00	2,298.47	2,435.28	2,434.67	5.01	135.51	24.32	2,943.21	-6,515.74	7,127.04	6,988.43	138.62	51.415		
2,400.00	2,396.02	2,544.39	2,543.73	5.27	142.53	24.74	2,943.02	-6,515.74	7,106.96	6,962.97	143.99	49.359		
2,500.00	2,491.80	2,651.58	2,650.86	5.59	149.42	25.31	2,942.43	-6,515.74	7,080.57	6,932.02	148.55	47.665		
2,600.00	2,585.35	2,687.00	2,686.26	6.01	151.70	25.94	2,942.14	-6,515.74	7,048.32	6,900.26	148.06	47.604		
2,700.00	2,676.21	2,799.91	2,799.15	6.55	156.09	26.85	2,942.90	-6,515.74	7,010.55	6,861.44	149.11	47.017		
2,800.00	2,763.94	2,897.75	2,896.97	7.24	159.90	27.94	2,943.20	-6,515.74	6,967.01	6,817.82	149.19	46.698		
2,900.00	2,848.12	2,991.64	2,990.84	8.10	163.56	29.25	2,943.17	-6,515.74	6,917.96	6,789.05	148.90	46.459		
3,000.00	2,928.32	3,081.12	3,080.30	9.14	167.04	30.81	2,942.86	-6,515.74	6,863.66	6,715.20	148.45	46.234		
3,100.00	3,004.16	3,165.76	3,164.92	10.38	170.34	32.65	2,942.30	-6,515.74	6,804.42	6,656.28	148.15	45.931		
3,200.00	3,075.28	3,185.00	3,184.16	11.81	171.09	34.55	2,942.14	-6,515.74	6,740.83	6,594.66	146.17	46.116		
3,300.00	3,141.32	3,285.58	3,284.71	13.42	177.55	37.21	2,940.72	-6,515.74	6,672.42	6,522.13	150.29	44.398		
3,400.00	3,201.96	3,321.19	3,320.32	15.20	179.84	39.98	2,940.79	-6,515.74	6,600.92	6,448.66	152.26	43.353		
3,500.00	3,256.92	3,353.42	3,352.55	17.15	181.92	43.20	2,941.12	-6,515.74	6,526.19	6,370.17	156.02	41.829		
3,600.00	3,305.91	3,404.00	3,403.14	19.25	185.17	47.15	2,942.14	-6,515.74	6,448.62	6,285.23	163.39	39.467		
3,658.53	3,331.72	3,404.00	3,403.14	20.54	185.17	49.47	2,942.14	-6,515.74	6,401.94	6,235.10	166.84	38.372		
3,658.53	3,331.72	3,404.00	3,403.14	20.54	185.17	49.47	2,942.14	-6,515.74	6,401.93	6,235.09	166.84	38.372		
3,700.00	3,347.89	3,404.00	3,403.14	21.18	185.17	53.19	2,942.14	-6,515.74	6,367.98	6,196.17	171.80	37.065		
3,750.00	3,363.69	3,404.00	3,403.14	21.66	185.17	58.83	2,942.14	-6,515.74	6,325.59	6,145.34	180.25	35.093		
3,800.00	3,375.35	3,404.00	3,403.14	22.22	185.17	65.93	2,942.14	-6,515.74	6,281.89	6,091.15	190.74	32.935		
3,850.00	3,382.77	3,404.00	3,403.14	22.86	185.17	74.62	2,942.14	-6,515.74	6,237.20	6,036.13	201.06	31.021		
3,900.00	3,385.89	3,404.00	3,403.14	23.57	185.17	84.81	2,942.14	-6,515.74	6,191.82	5,983.89	207.93	29.779		
3,911.24	3,386.00	3,404.00	3,403.14	23.73	185.17	87.27	2,942.14	-6,515.74	6,181.56	5,972.92	208.64	29.629		
3,923.58	3,386.04	3,404.00	3,403.14	23.92	185.17	86.44	2,942.14	-6,515.74	6,170.29	5,961.61	208.68	29.568		
4,000.00	3,386.54	3,404.00	3,403.14	25.15	185.17	86.44	2,942.14	-6,515.74	6,100.60	5,890.69	209.92	29.062		
4,100.00	3,387.18	3,404.00	3,403.14	26.94	185.17	86.44	2,942.14	-6,515.74	6,009.66	5,797.96	211.70	28.388		

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	Local Co-ordinate Reference:	Well San Juan 32-8 Unit 232H
Project:	San Juan Co., NM (NAD27)	TVD Reference:	KB @ 6671.00usft
Reference Site:	Sec.28-T32N-R08W	MD Reference:	KB @ 6671.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	San Juan 32-8 Unit 232H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev0	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Sec.19-T32N-R08W - San Juan 32-8 Unit 257A - Original Hole - Original Hole													Offset Well Error:	0.00 usft
Survey Program: 215-INC_ONLY<10														
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)				Reference	Offset	Well Error
4,200.00	3,387.83	3,404.00	3,403.14	28.88	185.17	86.44	2,942.14	-6,515.74	5,919.01	5,705.37		213.64	27.705	
4,300.00	3,388.47	3,404.00	3,403.14	30.95	185.17	86.44	2,942.14	-6,515.74	5,828.66	5,612.95		215.72	27.020	
4,400.00	3,389.12	3,404.00	3,403.14	33.13	185.17	86.44	2,942.14	-6,515.74	5,738.64	5,520.74		217.89	26.337	
4,500.00	3,389.77	3,404.00	3,403.14	35.39	185.17	86.44	2,942.14	-6,515.74	5,648.95	5,428.79		220.16	25.659	
4,600.00	3,390.41	3,404.00	3,403.14	37.73	185.17	86.44	2,942.14	-6,515.74	5,559.61	5,337.12		222.49	24.988	
4,700.00	3,391.06	3,404.00	3,403.14	40.12	185.17	86.44	2,942.14	-6,515.74	5,470.64	5,245.76		224.88	24.327	
4,800.00	3,391.70	3,404.00	3,403.14	42.56	185.17	86.44	2,942.14	-6,515.74	5,382.06	5,154.74		227.32	23.677	
4,900.00	3,392.35	3,404.00	3,403.14	45.04	185.17	86.44	2,942.14	-6,515.74	5,293.88	5,064.09		229.79	23.037	
5,000.00	3,392.99	3,404.00	3,403.14	47.56	185.17	86.44	2,942.14	-6,515.74	5,206.13	4,973.83		232.31	22.411	
5,100.00	3,393.64	3,404.00	3,403.14	50.10	185.17	86.44	2,942.14	-6,515.74	5,118.84	4,883.99		234.85	21.796	
5,200.00	3,394.29	3,404.00	3,403.14	52.67	185.17	86.44	2,942.14	-6,515.74	5,032.01	4,794.60		237.41	21.195	
5,300.00	3,394.93	3,404.00	3,403.14	55.26	185.17	86.44	2,942.14	-6,515.74	4,945.68	4,705.68		240.00	20.607	
5,400.00	3,395.58	3,404.00	3,403.14	57.87	185.17	86.44	2,942.14	-6,515.74	4,859.88	4,617.27		242.60	20.032	
5,500.00	3,396.22	3,404.00	3,403.14	60.49	185.17	86.44	2,942.14	-6,515.74	4,774.63	4,529.40		245.22	19.470	
5,600.00	3,396.87	3,404.00	3,403.14	63.13	185.17	86.44	2,942.14	-6,515.74	4,689.96	4,442.10		247.86	18.922	
5,700.00	3,397.52	3,404.00	3,403.14	65.78	185.17	86.44	2,942.14	-6,515.74	4,605.90	4,355.40		250.51	18.386	
5,800.00	3,398.16	3,404.00	3,403.14	68.44	185.17	86.44	2,942.14	-6,515.74	4,522.50	4,269.33		253.16	17.864	
5,900.00	3,398.81	3,404.00	3,403.14	71.12	185.17	86.44	2,942.14	-6,515.74	4,439.78	4,183.95		255.83	17.354	
6,000.00	3,399.45	3,404.00	3,403.14	73.80	185.17	86.44	2,942.14	-6,515.74	4,357.78	4,099.28		258.51	16.857	
6,100.00	3,400.10	3,404.00	3,403.14	76.48	185.17	86.44	2,942.14	-6,515.74	4,276.56	4,015.36		261.19	16.373	
6,200.00	3,400.75	3,404.00	3,403.14	79.18	185.17	86.44	2,942.14	-6,515.74	4,196.14	3,932.26		263.88	15.902	
6,300.00	3,401.39	3,404.00	3,403.14	81.88	185.17	86.44	2,942.14	-6,515.74	4,116.58	3,850.00		266.58	15.442	
6,400.00	3,402.04	3,404.00	3,403.14	84.59	185.17	86.44	2,942.14	-6,515.74	4,037.93	3,768.65		269.28	14.995	
6,500.00	3,402.68	3,404.00	3,403.14	87.30	185.17	86.44	2,942.14	-6,515.74	3,960.24	3,688.25		271.99	14.560	
6,600.00	3,403.33	3,404.00	3,403.14	90.02	185.17	86.44	2,942.14	-6,515.74	3,883.57	3,608.87		274.70	14.137	
6,700.00	3,403.97	3,404.00	3,403.14	92.74	185.17	86.44	2,942.14	-6,515.74	3,807.99	3,530.57		277.42	13.727	
6,800.00	3,404.62	3,404.00	3,403.14	95.46	185.17	86.44	2,942.14	-6,515.74	3,733.56	3,453.42		280.14	13.328	
6,900.00	3,405.27	3,404.00	3,403.14	98.19	185.17	86.44	2,942.14	-6,515.74	3,660.34	3,377.48		282.86	12.940	
7,000.00	3,405.91	3,404.00	3,403.14	100.92	185.17	86.44	2,942.14	-6,515.74	3,588.42	3,302.83		285.59	12.565	
7,100.00	3,406.56	3,404.00	3,403.14	103.66	185.17	86.44	2,942.14	-6,515.74	3,517.87	3,229.55		288.32	12.201	
7,200.00	3,407.20	3,404.00	3,403.14	106.39	185.17	86.44	2,942.14	-6,515.74	3,448.77	3,157.72		291.05	11.849	
7,300.00	3,407.85	3,404.00	3,403.14	109.13	185.17	86.44	2,942.14	-6,515.74	3,381.22	3,087.44		293.79	11.509	
7,400.00	3,408.50	3,404.00	3,403.14	111.88	185.17	86.44	2,942.14	-6,515.74	3,315.31	3,018.79		296.52	11.181	
7,500.00	3,409.14	3,404.00	3,403.14	114.62	185.17	86.44	2,942.14	-6,515.74	3,251.15	2,951.88		299.26	10.864	
7,600.00	3,409.79	3,404.00	3,403.14	117.37	185.17	86.44	2,942.14	-6,515.74	3,188.82	2,886.82		302.01	10.559	
7,700.00	3,410.43	3,404.00	3,403.14	120.11	185.17	86.44	2,942.14	-6,515.74	3,128.46	2,823.71		304.75	10.266	
7,800.00	3,411.08	3,404.00	3,403.14	122.87	185.17	86.44	2,942.14	-6,515.74	3,070.16	2,762.67		307.50	9.984	
7,900.00	3,411.72	3,404.00	3,403.14	125.62	185.17	86.44	2,942.14	-6,515.74	3,014.06	2,703.81		310.24	9.715	
8,000.00	3,412.37	3,404.00	3,403.14	128.37	185.17	86.44	2,942.14	-6,515.74	2,960.27	2,647.27		312.99	9.458	
8,100.00	3,413.02	3,404.00	3,403.14	131.13	185.17	86.44	2,942.14	-6,515.74	2,908.92	2,593.18		315.74	9.213	
8,200.00	3,413.66	3,404.00	3,403.14	133.88	185.17	86.44	2,942.14	-6,515.74	2,860.15	2,541.66		318.50	8.980	
8,300.00	3,414.31	3,404.00	3,403.14	136.64	185.17	86.44	2,942.14	-6,515.74	2,814.09	2,492.84		321.25	8.760	
8,400.00	3,414.95	3,404.00	3,403.14	139.40	185.17	86.44	2,942.14	-6,515.74	2,770.88	2,446.88		324.00	8.552	
8,500.00	3,415.60	3,404.00	3,403.14	142.16	185.17	86.44	2,942.14	-6,515.74	2,730.64	2,403.88		326.76	8.357	
8,600.00	3,416.25	3,404.00	3,403.14	144.92	185.17	86.44	2,942.14	-6,515.74	2,693.52	2,364.01		329.51	8.174	
8,700.00	3,416.89	3,404.00	3,403.14	147.68	185.17	86.44	2,942.14	-6,515.74	2,659.64	2,327.37		332.27	8.004	
8,800.00	3,417.54	3,404.00	3,403.14	150.45	185.17	86.44	2,942.14	-6,515.74	2,629.13	2,294.10		335.03	7.847	
8,900.00	3,418.18	3,404.00	3,403.14	153.21	185.17	86.44	2,942.14	-6,515.74	2,602.11	2,264.32		337.79	7.703	
9,000.00	3,418.83	3,404.00	3,403.14	155.97	185.17	86.44	2,942.14	-6,515.74	2,578.69	2,238.14		340.55	7.572	
9,100.00	3,419.48	3,404.00	3,403.14	158.74	185.17	86.44	2,942.14	-6,515.74	2,558.96	2,215.65		343.31	7.454	
9,200.00	3,420.12	3,404.00	3,403.14	161.51	185.17	86.44	2,942.14	-6,515.74	2,543.02	2,196.94		346.07	7.348	
9,300.00	3,420.77	3,404.00	3,403.14	164.27	185.17	86.44	2,942.14	-6,515.74	2,530.92	2,182.09		348.84	7.255	

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



Kolttek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.19-T32N-R08W - San Juan 32-8 Unit 257A - Original Hole - Original Hole														Offset Site Error:	0.00 usft
Survey Program: 215-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	3,421.41	3,404.00	3,403.14	167.04	185.17	86.44	2,942.14	-6,515.74	2,522.74	2,171.14	351.60	7.175			
9,500.00	3,422.06	3,404.00	3,403.14	169.81	185.17	86.44	2,942.14	-6,515.74	2,518.50	2,164.14	354.36	7.107			
9,556.77	3,422.43	3,404.00	3,403.14	171.38	185.17	86.44	2,942.14	-6,515.74	2,517.86	2,161.93	355.93	7.074 CC			
9,600.00	3,422.70	3,404.00	3,403.14	172.58	185.17	86.44	2,942.14	-6,515.74	2,518.23	2,161.11	357.13	7.051 ES			
9,700.00	3,423.35	3,404.00	3,403.14	175.35	185.17	86.44	2,942.14	-6,515.74	2,521.93	2,162.04	359.89	7.007			
9,800.00	3,424.00	3,404.00	3,403.14	178.12	185.17	86.44	2,942.14	-6,515.74	2,529.58	2,166.93	362.66	6.975			
9,900.00	3,424.64	3,404.00	3,403.14	180.89	185.17	86.44	2,942.14	-6,515.74	2,541.15	2,175.73	365.42	6.954			
10,000.00	3,425.29	3,404.00	3,403.14	183.66	185.17	86.44	2,942.14	-6,515.74	2,556.58	2,188.39	368.19	6.944 SF			
10,100.00	3,425.93	3,404.00	3,403.14	186.43	185.17	86.44	2,942.14	-6,515.74	2,575.80	2,204.84	370.96	6.944			
10,200.00	3,426.58	3,404.00	3,403.14	189.21	185.17	86.44	2,942.14	-6,515.74	2,598.73	2,225.00	373.73	6.954			
10,300.00	3,427.23	3,404.00	3,403.14	191.98	185.17	86.44	2,942.14	-6,515.74	2,625.27	2,248.77	376.49	6.973			
10,400.00	3,427.87	3,404.00	3,403.14	194.75	185.17	86.44	2,942.14	-6,515.74	2,655.31	2,276.05	379.26	7.001			
10,500.00	3,428.52	3,404.00	3,403.14	197.53	185.17	86.44	2,942.14	-6,515.74	2,688.74	2,306.71	382.03	7.038			
10,600.00	3,429.16	3,404.00	3,403.14	200.30	185.17	86.44	2,942.14	-6,515.74	2,725.43	2,340.63	384.80	7.083			
10,700.00	3,429.81	3,404.00	3,403.14	203.07	185.17	86.44	2,942.14	-6,515.74	2,765.25	2,377.68	387.57	7.135			
10,800.00	3,430.45	3,404.00	3,403.14	205.85	185.17	86.44	2,942.14	-6,515.74	2,808.07	2,417.73	390.34	7.194			
10,884.41	3,431.00	3,404.00	3,403.14	208.19	185.17	86.44	2,942.14	-6,515.74	2,846.44	2,453.76	392.68	7.249			

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.20-T32N-R08W - Rattlesnake Canyon 003 - Original Hole - Original Hole												Offset Site Error:	0.00 usft
Survey Program: 265-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)					
0.00	0.00	0.00	0.00	0.00	0.00	-36.29	2,475.41	-1,817.45	3,086.96				
100.00	100.00	0.00	0.00	0.10	0.00	-36.29	2,475.41	-1,817.45	3,078.40	0.10	N/A		
200.00	200.00	0.00	0.00	0.32	0.00	-36.29	2,475.41	-1,817.45	3,073.07	0.32	9,588.605		
300.00	300.00	0.00	0.00	0.55	0.00	-36.29	2,475.41	-1,817.45	3,070.99	0.55	5,632.172		
400.00	400.00	89.51	89.51	0.77	0.65	-36.29	2,475.15	-1,817.45	3,070.75	1.42	2,160.970		
446.50	446.50	132.50	132.50	0.87	0.96	-36.29	2,475.12	-1,817.45	3,070.72	1.84	1,670.474		
500.00	500.00	181.97	181.97	0.99	1.32	-36.29	2,475.16	-1,817.45	3,070.76	2.32	1,324.606		
600.00	600.00	265.00	265.00	1.22	1.93	-36.29	2,475.41	-1,817.45	3,071.03	3.15	975.890		
700.00	700.00	389.49	389.48	1.44	4.10	-36.29	2,475.18	-1,817.45	3,070.78	5.54	554.300		
800.00	800.00	487.97	487.97	1.67	5.81	-36.29	2,475.07	-1,817.45	3,070.69	7.48	410.517		
900.00	900.00	586.45	586.45	1.89	7.53	-36.29	2,475.03	-1,817.45	3,070.65	9.42	325.967		
929.00	929.00	615.01	615.01	1.96	8.02	-36.29	2,475.02	-1,817.45	3,070.65	9.98	307.595		
1,000.00	1,000.00	684.93	684.92	2.12	9.24	-36.29	2,475.04	-1,817.45	3,070.66	11.36	270.300		
1,100.00	1,100.00	783.41	783.40	2.34	10.96	-36.29	2,475.11	-1,817.45	3,070.72	13.30	230.878		
1,200.00	1,200.00	881.88	881.87	2.57	12.67	-36.29	2,475.25	-1,817.45	3,070.83	15.24	201.496		
1,300.00	1,300.00	965.00	964.99	2.79	14.12	-36.29	2,475.41	-1,817.45	3,071.03	16.91	181.582		
1,400.00	1,400.00	1,086.01	1,086.00	3.02	16.58	-36.29	2,475.41	-1,817.45	3,070.95	19.60	156.663		
1,500.00	1,500.00	1,186.02	1,186.00	3.24	18.62	-36.29	2,475.41	-1,817.45	3,070.95	21.86	140.457		
1,600.00	1,600.00	1,286.02	1,286.00	3.47	20.66	-36.29	2,475.41	-1,817.45	3,070.95	24.13	127.290		
1,700.00	1,700.00	1,386.02	1,386.00	3.69	22.70	-36.29	2,475.41	-1,817.45	3,070.95	26.39	116.380		
1,757.79	1,757.79	1,443.82	1,443.79	3.82	23.87	-36.29	2,475.41	-1,817.45	3,070.95	27.69	110.887		
1,800.00	1,800.00	1,465.00	1,464.98	3.92	24.30	-36.29	2,475.41	-1,817.45	3,071.03	28.22	108.821		
1,900.00	1,900.00	1,586.03	1,586.00	4.14	26.77	-36.29	2,475.41	-1,817.45	3,070.95	30.91	99.342		
2,000.00	2,000.00	1,686.03	1,686.00	4.37	28.81	-36.29	2,475.41	-1,817.45	3,070.95	33.18	92.565		
2,033.53	2,033.53	1,719.56	1,719.53	4.44	29.49	-36.29	2,475.41	-1,817.45	3,070.95	33.94	90.495		
2,100.00	2,099.98	1,755.00	1,754.97	4.58	30.22	53.30	2,475.41	-1,817.45	3,070.19	34.79	88.243		
2,200.00	2,199.63	1,885.66	1,885.63	4.79	32.88	53.60	2,475.41	-1,817.45	3,065.18	37.61	81.508		
2,300.00	2,298.47	1,984.50	1,984.47	5.01	34.90	54.12	2,475.41	-1,817.45	3,056.24	39.72	76.944		
2,400.00	2,396.02	2,082.06	2,082.02	5.27	36.89	54.87	2,475.41	-1,817.45	3,043.30	41.77	72.852		
2,500.00	2,491.80	2,177.84	2,177.80	5.59	38.84	55.87	2,475.41	-1,817.45	3,026.53	43.79	69.119		
2,600.00	2,585.35	2,270.00	2,269.95	6.01	40.72	57.09	2,475.41	-1,817.45	3,006.15	45.77	65.682		
2,700.00	2,676.21	2,358.82	2,358.77	6.55	42.27	58.53	2,475.56	-1,817.45	2,982.53	47.53	62.756		
2,800.00	2,763.94	2,448.53	2,448.47	7.24	43.83	60.23	2,475.65	-1,817.45	2,955.79	49.47	59.755		
2,900.00	2,848.12	2,534.60	2,534.55	8.10	45.33	62.14	2,475.67	-1,817.45	2,926.28	51.57	56.748		
3,000.00	2,928.32	2,616.61	2,616.56	9.14	46.76	64.25	2,475.63	-1,817.45	2,894.41	53.87	53.727		
3,100.00	3,004.16	2,694.17	2,694.12	10.38	48.11	66.52	2,475.53	-1,817.45	2,860.59	56.41	50.713		
3,200.00	3,075.28	2,760.00	2,759.94	11.81	49.25	68.83	2,475.41	-1,817.45	2,825.33	59.04	47.858		
3,300.00	3,141.32	2,827.26	2,827.20	13.42	50.62	71.33	2,475.26	-1,817.45	2,789.11	62.20	44.843		
3,400.00	3,201.96	2,879.44	2,879.38	15.20	51.69	73.69	2,475.35	-1,817.45	2,752.71	65.29	42.163		
3,500.00	3,256.92	2,942.98	2,942.92	17.15	53.28	76.35	2,475.41	-1,817.45	2,716.37	69.18	39.267		
3,600.00	3,305.91	2,991.97	2,991.91	19.25	54.57	78.79	2,475.41	-1,817.45	2,680.67	72.90	36.772		
3,658.53	3,331.72	3,017.79	3,017.72	20.54	55.26	80.17	2,475.41	-1,817.45	2,660.30	75.06	35.443		
3,658.53	3,331.72	3,017.79	3,017.72	20.54	55.26	80.17	2,475.41	-1,817.45	2,660.30	75.06	35.443		
3,700.00	3,347.89	3,033.96	3,033.89	21.18	55.68	81.71	2,475.41	-1,817.45	2,645.83	76.33	34.662		
3,750.00	3,363.69	3,049.76	3,049.69	21.66	56.10	83.64	2,475.41	-1,817.45	2,627.95	77.45	33.930		
3,800.00	3,375.35	3,061.42	3,061.35	22.22	56.41	85.63	2,475.41	-1,817.45	2,609.79	78.49	33.251		
3,850.00	3,382.77	3,068.84	3,068.77	22.86	56.60	87.61	2,475.41	-1,817.45	2,591.53	79.41	32.635		
3,900.00	3,385.89	3,071.96	3,071.89	23.57	56.68	89.57	2,475.41	-1,817.45	2,573.35	80.21	32.083		
3,911.24	3,386.00	3,072.07	3,072.00	23.73	56.69	90.00	2,475.41	-1,817.45	2,569.29	80.38	31.965		
3,923.58	3,386.04	3,072.11	3,072.04	23.92	56.69	89.86	2,475.41	-1,817.45	2,564.87	80.57	31.835		
4,000.00	3,386.54	3,072.61	3,072.54	25.15	56.70	89.87	2,475.41	-1,817.45	2,538.63	81.82	31.028		
4,100.00	3,387.18	3,073.25	3,073.18	26.94	56.72	89.89	2,475.41	-1,817.45	2,507.42	83.62	29.985		

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.20-T32N-R08W - Rattlesnake Canyon 003 - Original Hole - Original Hole													Offset Site Error: 0.00 usft	
Survey Program: 265-INC_ONLY<10													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	+N/-S (usft)	+E/-W (usft)	(usft)	(usft)	(usft)			
4,200.00	3,387.83	3,073.90	3,073.83	28.88	56.74	89.90	2,475.41	-1,817.45	2,479.84	2,394.25	85.59	28.975		
4,300.00	3,388.47	3,074.54	3,074.47	30.95	56.75	89.92	2,475.41	-1,817.45	2,456.02	2,368.35	87.68	28.012		
4,400.00	3,389.12	3,075.19	3,075.12	33.13	56.77	89.93	2,475.41	-1,817.45	2,436.09	2,346.21	89.88	27.105		
4,500.00	3,389.77	3,075.84	3,075.77	35.39	56.79	89.95	2,475.41	-1,817.45	2,420.12	2,327.96	92.16	26.260		
4,600.00	3,390.41	3,076.48	3,076.41	37.73	56.80	89.96	2,475.41	-1,817.45	2,408.20	2,313.69	94.51	25.480		
4,700.00	3,391.06	3,077.13	3,077.06	40.12	56.82	89.98	2,475.41	-1,817.45	2,400.40	2,303.47	96.92	24.766		
4,800.00	3,391.70	3,077.77	3,077.70	42.56	56.84	89.99	2,475.41	-1,817.45	2,396.74	2,297.36	99.38	24.116		
4,837.71	3,391.95	3,078.02	3,077.95	43.50	56.84	90.00	2,475.41	-1,817.45	2,396.44	2,296.12	100.33	23.886 CC		
4,900.00	3,392.35	3,078.42	3,078.35	45.04	56.85	90.01	2,475.41	-1,817.45	2,397.25	2,295.37	101.88	23.529 ES		
5,000.00	3,392.99	3,079.07	3,078.99	47.56	56.87	90.03	2,475.41	-1,817.45	2,401.93	2,297.52	104.42	23.003		
5,100.00	3,393.64	3,079.71	3,079.64	50.10	56.89	90.04	2,475.41	-1,817.45	2,410.75	2,303.77	106.98	22.535		
5,200.00	3,394.29	3,080.36	3,080.29	52.67	56.91	90.06	2,475.41	-1,817.45	2,423.67	2,314.11	109.57	22.121		
5,300.00	3,394.93	3,081.00	3,080.93	55.26	56.92	90.07	2,475.41	-1,817.45	2,440.62	2,328.45	112.17	21.758		
5,400.00	3,395.58	3,081.65	3,081.58	57.87	56.94	90.09	2,475.41	-1,817.45	2,461.52	2,346.72	114.80	21.442		
5,500.00	3,396.22	3,082.30	3,082.22	60.49	56.96	90.10	2,475.41	-1,817.45	2,486.27	2,368.83	117.44	21.170		
5,600.00	3,396.87	3,082.94	3,082.87	63.13	56.97	90.12	2,475.41	-1,817.45	2,514.76	2,394.66	120.10	20.939		
5,700.00	3,397.52	3,083.59	3,083.52	65.78	56.99	90.13	2,475.41	-1,817.45	2,546.85	2,424.09	122.77	20.746		
5,800.00	3,398.16	3,084.23	3,084.16	68.44	57.01	90.15	2,475.41	-1,817.45	2,582.42	2,456.98	125.45	20.586		
5,900.00	3,398.81	3,084.88	3,084.81	71.12	57.03	90.16	2,475.41	-1,817.45	2,621.33	2,493.19	128.13	20.458		
6,000.00	3,399.45	3,085.53	3,085.45	73.80	57.04	90.18	2,475.41	-1,817.45	2,663.42	2,532.59	130.83	20.358		
6,100.00	3,400.10	3,086.17	3,086.10	76.48	57.06	90.19	2,475.41	-1,817.45	2,708.55	2,575.01	133.54	20.283		
6,200.00	3,400.75	3,086.82	3,086.75	79.18	57.08	90.21	2,475.41	-1,817.45	2,756.57	2,620.33	136.25	20.232		
6,300.00	3,401.39	3,087.46	3,087.39	81.88	57.09	90.23	2,475.41	-1,817.45	2,807.34	2,668.37	138.97	20.201		
6,400.00	3,402.04	3,088.11	3,088.04	84.59	57.11	90.24	2,475.41	-1,817.45	2,860.70	2,719.01	141.69	20.190 SF		
6,500.00	3,402.68	3,088.75	3,088.68	87.30	57.13	90.26	2,475.41	-1,817.45	2,916.51	2,772.09	144.42	20.195		
6,600.00	3,403.33	3,089.40	3,089.33	90.02	57.14	90.27	2,475.41	-1,817.45	2,974.64	2,827.49	147.15	20.215		
6,700.00	3,403.97	3,090.05	3,089.97	92.74	57.16	90.29	2,475.41	-1,817.45	3,034.95	2,885.06	149.89	20.248		
6,800.00	3,404.62	3,090.69	3,090.62	95.46	57.18	90.30	2,475.41	-1,817.45	3,097.32	2,944.68	152.63	20.293		
6,900.00	3,405.27	3,091.34	3,091.27	98.19	57.20	90.32	2,475.41	-1,817.45	3,161.61	3,006.24	155.38	20.348		
7,000.00	3,405.91	3,091.98	3,091.91	100.92	57.21	90.33	2,475.41	-1,817.45	3,227.73	3,069.60	158.13	20.412		
7,100.00	3,406.56	3,092.63	3,092.56	103.66	57.23	90.35	2,475.41	-1,817.45	3,295.56	3,134.68	160.88	20.485		
7,200.00	3,407.20	3,093.28	3,093.20	106.39	57.25	90.36	2,475.41	-1,817.45	3,364.99	3,201.35	163.63	20.564		
7,300.00	3,407.85	3,093.92	3,093.85	109.13	57.26	90.38	2,475.41	-1,817.45	3,435.92	3,269.53	166.39	20.650		
7,400.00	3,408.50	3,094.57	3,094.50	111.88	57.28	90.40	2,475.41	-1,817.45	3,508.28	3,339.13	169.15	20.741		
7,500.00	3,409.14	3,095.21	3,095.14	114.62	57.30	90.41	2,475.41	-1,817.45	3,581.96	3,410.05	171.91	20.836		
7,600.00	3,409.79	3,095.86	3,095.79	117.37	57.31	90.43	2,475.41	-1,817.45	3,656.89	3,482.22	174.67	20.936		
7,700.00	3,410.43	3,096.51	3,096.43	120.11	57.33	90.44	2,475.41	-1,817.45	3,733.00	3,555.57	177.44	21.038		
7,800.00	3,411.08	3,097.15	3,097.08	122.87	57.35	90.46	2,475.41	-1,817.45	3,810.22	3,630.01	180.20	21.144		
7,900.00	3,411.72	3,097.80	3,097.72	125.62	57.37	90.47	2,475.41	-1,817.45	3,888.47	3,705.49	182.97	21.252		
8,000.00	3,412.37	3,098.44	3,098.37	128.37	57.38	90.49	2,475.41	-1,817.45	3,967.70	3,781.95	185.74	21.361		
8,100.00	3,413.02	3,099.09	3,099.02	131.13	57.40	90.50	2,475.41	-1,817.45	4,047.84	3,859.33	188.51	21.472		
8,200.00	3,413.66	3,099.73	3,099.66	133.88	57.42	90.52	2,475.41	-1,817.45	4,128.86	3,937.57	191.29	21.585		
8,300.00	3,414.31	3,100.38	3,100.31	136.64	57.43	90.53	2,475.41	-1,817.45	4,210.69	4,016.63	194.06	21.698		
8,400.00	3,414.95	3,101.03	3,100.95	139.40	57.45	90.55	2,475.41	-1,817.45	4,293.29	4,096.45	196.84	21.811		
8,500.00	3,415.60	3,101.67	3,101.60	142.16	57.47	90.57	2,475.41	-1,817.45	4,376.62	4,177.00	199.61	21.925		
8,600.00	3,416.25	3,102.32	3,102.25	144.92	57.49	90.58	2,475.41	-1,817.45	4,460.63	4,258.24	202.39	22.040		
8,700.00	3,416.89	3,102.96	3,102.89	147.68	57.50	90.60	2,475.41	-1,817.45	4,545.28	4,340.12	205.17	22.154		
8,800.00	3,417.54	3,103.61	3,103.54	150.45	57.52	90.61	2,475.41	-1,817.45	4,630.55	4,422.61	207.95	22.268		
8,900.00	3,418.18	3,104.26	3,104.18	153.21	57.54	90.63	2,475.41	-1,817.45	4,716.40	4,505.67	210.73	22.381		
9,000.00	3,418.83	3,104.90	3,104.83	155.97	57.55	90.64	2,475.41	-1,817.45	4,802.80	4,589.29	213.51	22.495		
9,100.00	3,419.48	3,105.55	3,105.48	158.74	57.57	90.66	2,475.41	-1,817.45	4,889.71	4,673.42	216.29	22.607		
9,200.00	3,420.12	3,106.19	3,106.12	161.51	57.59	90.67	2,475.41	-1,817.45	4,977.12	4,758.05	219.07	22.719		

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	Local Co-ordinate Reference:	Well San Juan 32-8 Unit 232H
Project:	San Juan Co., NM (NAD27)	TVD Reference:	KB @ 6671.00usft
Reference Site:	Sec.28-T32N-R08W	MD Reference:	KB @ 6671.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	San Juan 32-8 Unit 232H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev0	Offset TVD Reference:	Offset Datum

Offset Design Sec.20-T32N-R08W - Rattlesnake Canyon 003 - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 265-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		
9,300.00	3,420.77	3,106.84	3,106.77	164.27	57.60	90.69	2,475.41	-1,817.45	5,064.99	4,843.14	221.86	22.830		
9,400.00	3,421.41	3,107.49	3,107.41	167.04	57.62	90.70	2,475.41	-1,817.45	5,153.31	4,928.67	224.64	22.940		
9,500.00	3,422.06	3,108.13	3,108.06	169.81	57.64	90.72	2,475.41	-1,817.45	5,242.04	5,014.62	227.43	23.049		
9,600.00	3,422.70	3,108.78	3,108.70	172.58	57.66	90.74	2,475.41	-1,817.45	5,331.17	5,100.96	230.21	23.158		
9,700.00	3,423.35	3,109.42	3,109.35	175.35	57.67	90.75	2,475.41	-1,817.45	5,420.69	5,187.69	233.00	23.265		
9,800.00	3,424.00	3,110.07	3,110.00	178.12	57.69	90.77	2,475.41	-1,817.45	5,510.56	5,274.77	235.78	23.371		
9,900.00	3,424.64	3,110.72	3,110.64	180.89	57.71	90.78	2,475.41	-1,817.45	5,600.77	5,362.20	238.57	23.476		
10,000.00	3,425.29	3,111.36	3,111.29	183.66	57.72	90.80	2,475.41	-1,817.45	5,691.32	5,449.96	241.36	23.580		
10,100.00	3,425.93	3,112.01	3,111.93	186.43	57.74	90.81	2,475.41	-1,817.45	5,782.17	5,538.03	244.14	23.683		
10,200.00	3,426.58	3,112.65	3,112.58	189.21	57.76	90.83	2,475.41	-1,817.45	5,873.32	5,626.39	246.93	23.785		
10,300.00	3,427.23	3,113.30	3,113.23	191.98	57.77	90.84	2,475.41	-1,817.45	5,964.76	5,715.04	249.72	23.886		
10,400.00	3,427.87	3,113.94	3,113.87	194.75	57.79	90.86	2,475.41	-1,817.45	6,056.46	5,803.95	252.51	23.985		
10,500.00	3,428.52	3,114.59	3,114.52	197.53	57.81	90.87	2,475.41	-1,817.45	6,148.43	5,893.13	255.30	24.083		
10,600.00	3,429.16	3,115.24	3,115.16	200.30	57.83	90.89	2,475.41	-1,817.45	6,240.64	5,982.55	258.09	24.180		
10,700.00	3,429.81	3,115.88	3,115.81	203.07	57.84	90.91	2,475.41	-1,817.45	6,333.09	6,072.21	260.88	24.276		
10,800.00	3,430.45	3,116.53	3,116.45	205.85	57.86	90.92	2,475.41	-1,817.45	6,425.76	6,162.09	263.67	24.370		
10,884.41	3,431.00	3,117.07	3,117.00	208.19	57.87	90.93	2,475.41	-1,817.45	6,504.15	6,238.12	266.03	24.449		



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.20-T32N-R08W - San Juan 32-8 Unit 009 - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 6284-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	150.00	150.00	0.00	0.52	-60.60	2,656.95	-4,715.77	5,412.75					
100.00	100.00	250.00	250.00	0.10	0.87	-60.60	2,656.95	-4,715.77	5,412.75	5,411.79	0.96	5,630.888		
200.00	200.00	350.00	350.00	0.32	1.21	-60.60	2,656.95	-4,715.77	5,412.75	5,411.22	1.53	3,532.572		
300.00	300.00	450.00	450.00	0.55	1.56	-60.60	2,656.95	-4,715.77	5,412.75	5,410.65	2.10	2,573.553		
400.00	400.00	550.00	550.00	0.77	1.90	-60.60	2,656.95	-4,715.77	5,412.75	5,410.08	2.67	2,024.063		
500.00	500.00	650.00	650.00	0.99	2.25	-60.60	2,656.95	-4,715.77	5,412.75	5,409.50	3.25	1,667.935		
600.00	600.00	750.00	750.00	1.22	2.60	-60.60	2,656.95	-4,715.77	5,412.75	5,408.93	3.82	1,418.376		
700.00	700.00	850.00	850.00	1.44	2.94	-60.60	2,656.95	-4,715.77	5,412.75	5,408.36	4.39	1,233.776		
800.00	800.00	950.00	950.00	1.67	3.29	-60.60	2,656.95	-4,715.77	5,412.75	5,407.79	4.96	1,091.694		
900.00	900.00	1,050.00	1,050.00	1.89	3.64	-60.60	2,656.95	-4,715.77	5,412.75	5,407.22	5.53	978.957		
1,000.00	1,000.00	1,150.00	1,150.00	2.12	3.98	-60.60	2,656.95	-4,715.77	5,412.75	5,406.65	6.10	887.324		
1,100.00	1,100.00	1,250.00	1,250.00	2.34	4.33	-60.60	2,656.95	-4,715.77	5,412.75	5,406.08	6.67	811.378		
1,200.00	1,200.00	1,350.00	1,350.00	2.57	4.67	-60.60	2,656.95	-4,715.77	5,412.75	5,405.51	7.24	747.407		
1,300.00	1,300.00	1,450.00	1,450.00	2.79	5.02	-60.60	2,656.95	-4,715.77	5,412.75	5,404.94	7.81	692.786		
1,400.00	1,400.00	1,550.00	1,550.00	3.02	5.37	-60.60	2,656.95	-4,715.77	5,412.75	5,404.37	8.38	645.605		
1,500.00	1,500.00	1,650.00	1,650.00	3.24	5.71	-60.60	2,656.95	-4,715.77	5,412.75	5,403.79	8.95	604.440		
1,600.00	1,600.00	1,750.00	1,750.00	3.47	6.06	-60.60	2,656.95	-4,715.77	5,412.75	5,403.22	9.53	568.210		
1,700.00	1,700.00	1,850.00	1,850.00	3.69	6.41	-60.60	2,656.95	-4,715.77	5,412.75	5,402.65	10.10	536.078		
1,800.00	1,800.00	1,950.00	1,950.00	3.92	6.75	-60.60	2,656.95	-4,715.77	5,412.75	5,402.08	10.67	507.386		
1,900.00	1,900.00	2,050.00	2,050.00	4.14	7.10	-60.60	2,656.95	-4,715.77	5,412.75	5,401.51	11.24	481.609		
2,000.00	2,000.00	2,150.00	2,150.00	4.37	7.44	-60.60	2,656.95	-4,715.77	5,412.75	5,400.94	11.81	458.324		
2,033.53	2,033.53	2,183.53	2,183.53	4.44	7.56	-60.60	2,656.95	-4,715.77	5,412.75	5,400.75	12.00	451.013		
2,100.00	2,099.98	2,249.98	2,249.98	4.58	7.79	28.99	2,656.95	-4,715.77	5,411.40	5,398.96	12.44	435.035		
2,200.00	2,199.63	2,349.63	2,349.63	4.79	8.13	29.17	2,656.95	-4,715.77	5,404.30	5,391.24	13.06	413.952		
2,300.00	2,298.47	2,448.47	2,448.47	5.01	8.48	29.51	2,656.95	-4,715.77	5,391.14	5,377.50	13.64	395.352		
2,400.00	2,396.02	2,546.02	2,546.02	5.27	8.81	30.01	2,656.95	-4,715.77	5,372.00	5,357.82	14.18	378.739		
2,500.00	2,491.80	2,641.80	2,641.80	5.59	9.15	30.69	2,656.95	-4,715.77	5,347.00	5,332.29	14.71	363.579		
2,600.00	2,585.35	2,735.35	2,735.35	6.01	9.47	31.55	2,656.95	-4,715.77	5,316.28	5,301.06	15.22	349.302		
2,700.00	2,676.21	2,826.21	2,826.21	6.55	9.78	32.61	2,656.95	-4,715.77	5,280.03	5,264.28	15.75	335.303		
2,800.00	2,763.94	2,913.94	2,913.94	7.24	10.09	33.89	2,656.95	-4,715.77	5,238.46	5,222.14	16.32	320.961		
2,900.00	2,848.12	2,998.12	2,998.12	8.10	10.38	35.41	2,656.95	-4,715.77	5,191.81	5,174.83	16.98	305.694		
3,000.00	2,928.32	3,078.32	3,078.32	9.14	10.66	37.20	2,656.95	-4,715.77	5,140.37	5,122.59	17.78	289.055		
3,100.00	3,004.16	3,154.16	3,154.16	10.38	10.92	39.28	2,656.95	-4,715.77	5,084.44	5,065.66	18.77	270.831		
3,200.00	3,075.28	3,225.28	3,225.28	11.81	11.17	41.69	2,656.95	-4,715.77	5,024.35	5,004.34	20.01	251.121		
3,300.00	3,141.32	3,291.32	3,291.32	13.42	11.40	44.47	2,656.95	-4,715.77	4,960.46	4,938.92	21.54	230.336		
3,400.00	3,201.96	3,351.96	3,351.96	15.20	11.61	47.63	2,656.95	-4,715.77	4,893.15	4,869.75	23.40	209.127		
3,500.00	3,256.92	3,406.92	3,406.92	17.15	11.80	51.22	2,656.95	-4,715.77	4,822.82	4,797.20	25.62	188.265		
3,600.00	3,305.91	3,455.91	3,455.91	19.25	11.97	55.23	2,656.95	-4,715.77	4,749.89	4,721.70	28.19	168.491		
3,658.53	3,331.72	3,481.72	3,481.72	20.54	12.05	57.77	2,656.95	-4,715.77	4,706.18	4,676.33	29.85	157.670		
3,658.53	3,331.72	3,481.72	3,481.72	20.54	12.05	57.77	2,656.95	-4,715.77	4,706.17	4,676.33	29.85	157.669		
3,700.00	3,347.89	3,497.89	3,497.89	21.18	12.11	61.59	2,656.95	-4,715.77	4,674.38	4,643.20	31.18	149.894		
3,750.00	3,363.69	3,513.69	3,513.69	21.66	12.17	67.01	2,656.95	-4,715.77	4,634.68	4,602.11	32.58	142.260		
3,800.00	3,375.35	3,525.35	3,525.35	22.22	12.21	73.32	2,656.95	-4,715.77	4,593.79	4,559.84	33.96	135.284		
3,850.00	3,382.77	3,532.77	3,532.77	22.86	12.23	80.45	2,656.95	-4,715.77	4,552.02	4,516.90	35.12	129.623		
3,900.00	3,385.89	3,535.89	3,535.89	23.57	12.24	88.20	2,656.95	-4,715.77	4,509.68	4,473.84	35.85	125.805		
3,911.24	3,386.00	3,536.00	3,536.00	23.73	12.24	90.00	2,656.95	-4,715.77	4,500.12	4,464.18	35.93	125.235		
3,923.58	3,386.04	3,536.04	3,536.04	23.92	12.24	89.40	2,656.95	-4,715.77	4,489.62	4,453.47	36.15	124.192		
4,000.00	3,386.54	3,536.54	3,536.54	25.15	12.24	89.41	2,656.95	-4,715.77	4,424.82	4,387.43	37.39	118.347		
4,100.00	3,387.18	3,537.18	3,537.18	26.94	12.25	89.43	2,656.95	-4,715.77	4,340.59	4,301.42	39.18	110.792		
4,200.00	3,387.83	3,537.83	3,537.83	28.88	12.25	89.45	2,656.95	-4,715.77	4,257.05	4,215.92	41.13	103.511		
4,300.00	3,388.47	3,538.47	3,538.47	30.95	12.25	89.46	2,656.95	-4,715.77	4,174.23	4,131.02	43.20	96.617		
4,400.00	3,389.12	3,539.12	3,539.12	33.13	12.25	89.48	2,656.95	-4,715.77	4,092.18	4,046.79	45.39	90.163		

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.20-T32N-R08W - San Juan 32-8 Unit 009 - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 6284-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	3,389.77	3,539.77	3,539.77	35.39	12.26	89.49	2,656.95	-4,715.77	4,010.94	3,963.28	47.65	84.168		
4,600.00	3,390.41	3,540.41	3,540.41	37.73	12.26	89.51	2,656.95	-4,715.77	3,930.56	3,880.57	49.99	78.624		
4,700.00	3,391.06	3,541.06	3,541.06	40.12	12.26	89.52	2,656.95	-4,715.77	3,851.11	3,798.72	52.39	73.512		
4,800.00	3,391.70	3,541.70	3,541.70	42.56	12.26	89.54	2,656.95	-4,715.77	3,772.63	3,717.80	54.83	68.805		
4,900.00	3,392.35	3,542.35	3,542.35	45.04	12.26	89.55	2,656.95	-4,715.77	3,695.19	3,637.88	57.31	64.472		
5,000.00	3,392.99	3,542.99	3,542.99	47.56	12.27	89.57	2,656.95	-4,715.77	3,618.86	3,559.03	59.83	60.483		
5,100.00	3,393.64	3,543.64	3,543.64	50.10	12.27	89.59	2,656.95	-4,715.77	3,543.71	3,481.33	62.38	56.809		
5,200.00	3,394.29	3,544.29	3,544.29	52.67	12.27	89.60	2,656.95	-4,715.77	3,469.81	3,404.86	64.95	53.422		
5,300.00	3,394.93	3,544.93	3,544.93	55.26	12.27	89.62	2,656.95	-4,715.77	3,397.25	3,329.70	67.54	50.298		
5,400.00	3,395.58	3,545.58	3,545.58	57.87	12.28	89.63	2,656.95	-4,715.77	3,326.11	3,255.95	70.15	47.412		
5,500.00	3,396.22	3,546.22	3,546.22	60.49	12.28	89.65	2,656.95	-4,715.77	3,256.49	3,183.71	72.78	44.744		
5,600.00	3,396.87	3,546.87	3,546.87	63.13	12.28	89.66	2,656.95	-4,715.77	3,188.48	3,113.06	75.42	42.276		
5,700.00	3,397.52	3,547.52	3,547.52	65.78	12.28	89.68	2,656.95	-4,715.77	3,122.20	3,044.12	78.07	39.990		
5,800.00	3,398.16	3,548.16	3,548.16	68.44	12.28	89.70	2,656.95	-4,715.77	3,057.75	2,977.01	80.74	37.873		
5,900.00	3,398.81	3,548.81	3,548.81	71.12	12.29	89.71	2,656.95	-4,715.77	2,995.25	2,911.84	83.41	35.909		
6,000.00	3,399.45	3,549.45	3,549.45	73.80	12.29	89.73	2,656.95	-4,715.77	2,934.83	2,848.74	86.09	34.089		
6,100.00	3,400.10	3,550.10	3,550.10	76.48	12.29	89.74	2,656.95	-4,715.77	2,876.62	2,787.83	88.78	32.401		
6,200.00	3,400.75	3,550.75	3,550.75	79.18	12.29	89.76	2,656.95	-4,715.77	2,820.75	2,729.27	91.48	30.835		
6,300.00	3,401.39	3,551.39	3,551.39	81.88	12.30	89.77	2,656.95	-4,715.77	2,767.37	2,673.18	94.18	29.383		
6,400.00	3,402.04	3,552.04	3,552.04	84.59	12.30	89.79	2,656.95	-4,715.77	2,716.62	2,619.73	96.89	28.038		
6,500.00	3,402.68	3,552.68	3,552.68	87.30	12.30	89.81	2,656.95	-4,715.77	2,668.65	2,569.05	99.60	26.792		
6,600.00	3,403.33	3,553.33	3,553.33	90.02	12.30	89.82	2,656.95	-4,715.77	2,623.62	2,521.30	102.32	25.641		
6,700.00	3,403.97	3,553.97	3,553.97	92.74	12.30	89.84	2,656.95	-4,715.77	2,581.69	2,476.64	105.05	24.577		
6,800.00	3,404.62	3,554.62	3,554.62	95.46	12.31	89.85	2,656.95	-4,715.77	2,542.99	2,435.22	107.77	23.596		
6,900.00	3,405.27	3,555.27	3,555.27	98.19	12.31	89.87	2,656.95	-4,715.77	2,507.69	2,397.18	110.50	22.694		
7,000.00	3,405.91	3,555.91	3,555.91	100.92	12.31	89.88	2,656.95	-4,715.77	2,475.92	2,362.69	113.23	21.865		
7,100.00	3,406.56	3,556.56	3,556.56	103.66	12.31	89.90	2,656.95	-4,715.77	2,447.83	2,331.86	115.97	21.107		
7,200.00	3,407.20	3,557.20	3,557.20	106.39	12.32	89.92	2,656.95	-4,715.77	2,423.54	2,304.83	118.71	20.416		
7,300.00	3,407.85	3,557.85	3,557.85	109.13	12.32	89.93	2,656.95	-4,715.77	2,403.18	2,281.72	121.45	19.787		
7,400.00	3,408.50	3,558.50	3,558.50	111.88	12.32	89.95	2,656.95	-4,715.77	2,386.83	2,262.63	124.20	19.218		
7,500.00	3,409.14	3,559.14	3,559.14	114.62	12.32	89.96	2,656.95	-4,715.77	2,374.58	2,247.64	126.94	18.706		
7,600.00	3,409.79	3,559.79	3,559.79	117.37	12.32	89.98	2,656.95	-4,715.77	2,366.50	2,236.81	129.69	18.247		
7,700.00	3,410.43	3,560.43	3,560.43	120.11	12.33	89.99	2,656.95	-4,715.77	2,362.63	2,230.19	132.44	17.839		
7,741.57	3,410.70	3,560.70	3,560.70	121.26	12.33	90.00	2,656.95	-4,715.77	2,362.26	2,228.68	133.58	17.684 CC		
7,800.00	3,411.08	3,561.08	3,561.08	122.87	12.33	90.01	2,656.95	-4,715.77	2,362.98	2,227.79	135.19	17.479 ES		
7,900.00	3,411.72	3,561.72	3,561.72	125.62	12.33	90.02	2,656.95	-4,715.77	2,367.57	2,229.62	137.95	17.163		
8,000.00	3,412.37	3,562.37	3,562.37	128.37	12.33	90.04	2,656.95	-4,715.77	2,376.36	2,235.65	140.70	16.889		
8,100.00	3,413.02	3,563.02	3,563.02	131.13	12.34	90.06	2,656.95	-4,715.77	2,389.30	2,245.84	143.46	16.655		
8,200.00	3,413.66	3,563.66	3,563.66	133.88	12.34	90.07	2,656.95	-4,715.77	2,406.33	2,260.11	146.22	16.457		
8,300.00	3,414.31	3,564.31	3,564.31	136.64	12.34	90.09	2,656.95	-4,715.77	2,427.37	2,278.39	148.98	16.294		
8,400.00	3,414.95	3,564.95	3,564.95	139.40	12.34	90.10	2,656.95	-4,715.77	2,452.30	2,300.57	151.74	16.161		
8,500.00	3,415.60	3,565.60	3,565.60	142.16	12.34	90.12	2,656.95	-4,715.77	2,481.02	2,326.52	154.50	16.058		
8,600.00	3,416.25	3,566.25	3,566.25	144.92	12.35	90.13	2,656.95	-4,715.77	2,513.40	2,356.13	157.26	15.982		
8,700.00	3,416.89	3,566.89	3,566.89	147.68	12.35	90.15	2,656.95	-4,715.77	2,549.28	2,389.25	160.03	15.930		
8,800.00	3,417.54	3,567.54	3,567.54	150.45	12.35	90.17	2,656.95	-4,715.77	2,588.54	2,425.74	162.79	15.901		
8,900.00	3,418.18	3,568.18	3,568.18	153.21	12.35	90.18	2,656.95	-4,715.77	2,631.01	2,465.45	165.56	15.892 SF		
9,000.00	3,418.83	3,568.83	3,568.83	155.97	12.36	90.20	2,656.95	-4,715.77	2,676.54	2,508.21	168.33	15.901		
9,100.00	3,419.48	3,569.48	3,569.48	158.74	12.36	90.21	2,656.95	-4,715.77	2,724.98	2,553.89	171.09	15.927		
9,200.00	3,420.12	3,570.12	3,570.12	161.51	12.36	90.23	2,656.95	-4,715.77	2,776.19	2,602.32	173.86	15.968		
9,300.00	3,420.77	3,570.77	3,570.77	164.27	12.36	90.24	2,656.95	-4,715.77	2,830.00	2,653.37	176.63	16.022		
9,400.00	3,421.41	3,571.41	3,571.41	167.04	12.36	90.26	2,656.95	-4,715.77	2,886.27	2,706.87	179.40	16.088		
9,500.00	3,422.06	3,572.06	3,572.06	169.81	12.37	90.28	2,656.95	-4,715.77	2,944.87	2,762.69	182.17	16.165		

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.20-T32N-R08W - San Juan 32-8 Unit 009 - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 6284-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	3,422.70	3,572.70	3,572.70	172.58	12.37	90.29	2,656.95	-4,715.77	3,005.65	2,820.70	184.94	16.252		
9,700.00	3,423.35	3,573.35	3,573.35	175.35	12.37	90.31	2,656.95	-4,715.77	3,068.48	2,880.77	187.71	16.347		
9,800.00	3,424.00	3,574.00	3,574.00	178.12	12.37	90.32	2,656.95	-4,715.77	3,133.25	2,942.76	190.49	16.449		
9,900.00	3,424.64	3,574.64	3,574.64	180.89	12.38	90.34	2,656.95	-4,715.77	3,199.83	3,006.57	193.26	16.557		
10,000.00	3,425.29	3,575.29	3,575.29	183.66	12.38	90.35	2,656.95	-4,715.77	3,268.12	3,072.08	196.03	16.671		
10,100.00	3,425.93	3,575.93	3,575.93	186.43	12.38	90.37	2,656.95	-4,715.77	3,338.00	3,139.19	198.81	16.790		
10,200.00	3,426.58	3,576.58	3,576.58	189.21	12.38	90.39	2,656.95	-4,715.77	3,409.39	3,207.81	201.58	16.913		
10,300.00	3,427.23	3,577.23	3,577.23	191.98	12.39	90.40	2,656.95	-4,715.77	3,482.18	3,277.83	204.36	17.040		
10,400.00	3,427.87	3,577.87	3,577.87	194.75	12.39	90.42	2,656.95	-4,715.77	3,556.30	3,349.17	207.13	17.169		
10,500.00	3,428.52	3,578.52	3,578.52	197.53	12.39	90.43	2,656.95	-4,715.77	3,631.65	3,421.75	209.91	17.301		
10,600.00	3,429.16	3,579.16	3,579.16	200.30	12.39	90.45	2,656.95	-4,715.77	3,708.18	3,495.49	212.68	17.435		
10,700.00	3,429.81	3,579.81	3,579.81	203.07	12.39	90.46	2,656.95	-4,715.77	3,785.79	3,570.34	215.46	17.571		
10,800.00	3,430.45	3,580.45	3,580.45	205.85	12.40	90.48	2,656.95	-4,715.77	3,864.44	3,646.21	218.23	17.708		
10,884.41	3,431.00	3,581.00	3,581.00	208.19	12.40	90.49	2,656.95	-4,715.77	3,931.58	3,711.00	220.58	17.824		



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.28-T32N-R08W - San Juan 32-8 Unit 050 - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 126-INC_ONLY<10													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		
0.00	0.00	0.00	0.00	0.00	0.00	90.47	-0.92	111.61	112.15					
100.00	100.00	89.00	89.00	0.10	0.42	90.50	-0.98	111.61	111.61	111.10	0.52	216.681		
129.83	129.83	118.83	118.83	0.16	0.56	90.48	-0.94	111.61	111.61	110.89	0.72	154.438		
200.00	200.00	189.00	189.00	0.32	1.33	90.50	-0.98	111.61	111.61	109.96	1.65	67.444		
214.46	214.46	203.46	203.46	0.35	1.50	90.50	-0.97	111.61	111.61	109.76	1.86	60.090		
300.00	300.00	289.00	289.00	0.55	2.84	90.53	-1.04	111.61	111.61	108.23	3.38	32.993		
300.14	300.14	289.14	289.14	0.55	2.84	90.53	-1.04	111.61	111.61	108.23	3.39	32.966		
400.00	400.00	389.01	389.00	0.77	4.57	90.60	-1.16	111.61	111.62	106.28	5.34	20.907		
412.64	412.64	401.65	401.64	0.80	4.79	90.60	-1.17	111.61	111.62	106.03	5.59	19.981		
500.00	500.00	489.01	489.00	0.99	6.30	90.61	-1.19	111.61	111.62	104.32	7.29	15.301		
559.32	559.32	548.32	548.32	1.13	7.33	90.60	-1.17	111.61	111.62	103.16	8.45	13.202		
600.00	600.00	589.01	589.00	1.22	8.03	90.59	-1.14	111.61	111.62	102.37	9.25	12.066		
677.56	677.56	666.56	666.56	1.39	9.37	90.54	-1.04	111.61	111.61	100.85	10.77	10.366		
700.00	700.00	689.00	688.99	1.44	9.76	90.52	-1.00	111.61	111.61	100.41	11.21	9.960		
800.00	800.00	789.01	789.00	1.67	11.50	90.42	-0.81	111.61	111.61	98.44	13.17	8.476		
801.36	801.36	790.37	790.36	1.67	11.52	90.41	-0.81	111.61	111.61	98.42	13.19	8.459		
880.44	880.44	869.45	869.44	1.85	12.90	90.36	-0.70	111.61	111.61	96.86	14.75	7.567		
900.00	900.00	889.01	889.00	1.89	13.24	90.35	-0.69	111.61	111.61	96.48	15.13	7.375		
987.48	987.48	976.49	976.47	2.09	14.76	90.33	-0.65	111.61	111.61	94.76	16.86	6.622 CC		
1,000.00	1,000.00	989.01	989.00	2.12	14.98	90.33	-0.65	111.61	111.61	94.51	17.10	6.526		
1,100.00	1,100.00	1,089.02	1,089.00	2.34	16.72	90.36	-0.70	111.61	111.61	92.54	19.07	5.853		
1,100.00	1,100.00	1,089.02	1,089.00	2.34	16.72	90.36	-0.70	111.61	111.61	92.54	19.07	5.853		
1,200.00	1,200.00	1,189.03	1,189.01	2.57	18.46	90.43	-0.84	111.61	111.61	90.58	21.03	5.306		
1,215.29	1,215.29	1,204.32	1,204.30	2.60	18.73	90.45	-0.87	111.61	111.61	90.28	21.34	5.231		
1,300.00	1,300.00	1,289.02	1,289.00	2.79	20.21	90.53	-1.04	111.61	111.61	88.61	23.00	4.852		
1,300.06	1,300.06	1,289.08	1,289.06	2.79	20.21	90.53	-1.04	111.61	111.61	88.61	23.00	4.852		
1,400.00	1,400.00	1,389.03	1,389.00	3.02	21.95	90.60	-1.16	111.61	111.62	86.65	24.97	4.470		
1,411.95	1,411.95	1,400.97	1,400.95	3.04	22.16	90.60	-1.17	111.61	111.62	86.41	25.20	4.428		
1,500.00	1,500.00	1,489.03	1,489.00	3.24	23.69	90.62	-1.20	111.61	111.62	84.68	26.94	4.144		
1,547.97	1,547.97	1,536.99	1,536.97	3.35	24.53	90.61	-1.19	111.61	111.62	83.74	27.88	4.003		
1,600.00	1,600.00	1,589.03	1,589.00	3.47	25.43	90.60	-1.16	111.61	111.62	82.71	28.90	3.862		
1,677.47	1,677.47	1,666.50	1,666.47	3.64	26.78	90.55	-1.07	111.61	111.61	81.19	30.43	3.668		
1,700.00	1,700.00	1,689.02	1,688.99	3.69	27.18	90.53	-1.03	111.61	111.61	80.74	30.87	3.615		
1,800.00	1,800.00	1,789.03	1,789.00	3.92	29.17	90.52	-1.01	111.61	111.61	78.52	33.09	3.373		
1,800.00	1,800.00	1,789.03	1,789.00	3.92	29.17	90.52	-1.01	111.61	111.61	78.52	33.09	3.373		
1,900.00	1,900.00	1,889.04	1,889.00	4.14	31.50	90.59	-1.16	111.61	111.62	75.97	35.65	3.131		
1,910.78	1,910.78	1,899.82	1,899.79	4.17	31.75	90.60	-1.17	111.61	111.62	75.69	35.92	3.107		
2,000.00	2,000.00	1,989.04	1,989.01	4.37	33.83	90.63	-1.22	111.61	111.62	73.41	38.21	2.921		
2,001.44	2,001.44	1,990.48	1,990.45	4.37	33.87	90.63	-1.22	111.61	111.62	73.37	38.24	2.919		
2,033.53	2,033.53	2,022.57	2,022.53	4.44	34.61	90.63	-1.23	111.61	111.62	72.55	39.06	2.857		
2,033.54	2,033.54	2,022.58	2,022.54	4.44	34.61	90.63	-1.23	111.61	111.62	72.55	39.06	2.857		
2,100.00	2,099.98	2,089.02	2,088.98	4.58	36.16	-179.82	-1.21	111.61	113.16	72.46	40.70	2.780 ES, SF		
2,200.00	2,199.63	2,188.66	2,188.62	4.79	38.49	-179.87	-1.13	111.61	121.28	78.30	42.98	2.822		
2,300.00	2,298.47	2,287.50	2,287.45	5.01	40.79	-179.95	-0.97	111.61	136.33	91.33	45.00	3.030		
2,400.00	2,396.02	2,385.06	2,385.02	5.27	43.29	-179.98	-0.92	111.61	158.24	111.30	46.94	3.371		
2,500.00	2,491.80	2,480.85	2,480.80	5.59	45.82	-179.98	-0.92	111.61	186.90	138.31	48.59	3.846		
2,600.00	2,585.35	2,574.41	2,574.35	6.01	48.28	-179.98	-0.92	111.61	222.17	172.32	49.86	4.456		
2,700.00	2,676.21	2,665.27	2,665.21	6.55	50.68	-179.98	-0.92	111.61	263.89	213.18	50.70	5.205		
2,800.00	2,763.94	2,753.01	2,752.95	7.24	52.78	-179.98	-0.78	111.61	311.83	260.91	50.92	6.124		
2,900.00	2,848.12	2,837.18	2,837.11	8.10	54.50	-179.94	-0.53	111.61	365.78	315.32	50.46	7.249		
3,000.00	2,928.32	2,917.39	2,917.31	9.14	56.14	-179.92	-0.40	111.61	425.48	375.89	49.59	8.580		
3,100.00	3,004.16	2,993.23	2,993.16	10.38	57.68	-179.93	-0.39	111.61	490.62	442.30	48.31	10.155		

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.28-T32N-R08W - San Juan 32-8 Unit 050 - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 126-INC_ONLY<10													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	+N/-S (usft)	+E/-W (usft)	(usft)	(usft)	(usft)			
3,200.00	3,075.28	3,064.36	3,064.28	11.81	59.13	179.94	-0.47	111.61	560.89	514.26	46.64	12.027		
3,300.00	3,141.32	3,130.40	3,130.32	13.42	60.48	179.97	-0.63	111.61	635.96	591.39	44.57	14.268		
3,400.00	3,201.96	3,191.05	3,190.97	15.20	61.72	180.00	-0.84	111.61	715.45	673.31	42.13	16.980		
3,500.00	3,256.92	3,245.99	3,245.89	17.15	62.84	-179.97	-1.06	111.61	798.97	759.63	39.35	20.306		
3,600.00	3,305.91	3,294.98	3,294.89	19.25	63.84	-179.95	-1.24	111.61	886.13	849.89	36.24	24.454		
3,658.53	3,331.72	3,320.80	3,320.70	20.54	64.36	-179.93	-1.32	111.61	938.65	904.37	34.28	27.382		
3,658.53	3,331.72	3,320.80	3,320.71	20.54	64.36	-179.93	-1.32	111.61	938.66	904.38	34.28	27.383		
3,700.00	3,347.89	3,336.97	3,336.87	21.18	64.69	178.18	-1.37	111.61	976.83	946.79	30.05	32.511		
3,750.00	3,363.69	3,352.77	3,352.68	21.66	65.02	174.98	-1.41	111.61	1,024.25	998.90	25.35	40.408		
3,800.00	3,375.35	3,364.42	3,364.33	22.22	65.25	169.38	-1.44	111.61	1,072.83	1,048.55	24.29	44.176		
3,850.00	3,382.77	3,371.84	3,371.74	22.86	65.41	156.20	-1.46	111.61	1,122.22	1,084.64	37.58	29.859		
3,900.00	3,385.89	3,374.96	3,374.87	23.57	65.47	108.88	-1.47	111.61	1,172.04	1,087.78	84.26	13.910		
3,911.24	3,386.00	3,375.07	3,374.97	23.73	65.47	89.98	-1.47	111.61	1,183.26	1,094.10	89.16	13.271		
3,923.58	3,386.04	3,375.10	3,375.01	23.92	65.47	96.29	-1.47	111.61	1,195.58	1,106.76	88.82	13.461		
4,000.00	3,386.54	3,375.59	3,375.49	25.15	65.48	96.68	-1.47	111.61	1,271.88	1,181.89	89.99	14.134		
4,100.00	3,387.18	3,376.21	3,376.12	26.94	65.50	97.19	-1.47	111.61	1,371.74	1,280.06	91.68	14.962		
4,200.00	3,387.83	3,376.84	3,376.75	28.88	65.51	97.70	-1.47	111.61	1,471.61	1,378.10	93.52	15.736		
4,300.00	3,388.47	3,377.47	3,377.38	30.95	65.52	98.21	-1.47	111.61	1,571.51	1,476.04	95.47	16.461		
4,400.00	3,389.12	3,378.10	3,378.01	33.13	65.53	98.71	-1.47	111.61	1,671.41	1,573.90	97.52	17.140		
4,500.00	3,389.77	3,378.73	3,378.64	35.39	65.55	99.22	-1.47	111.61	1,771.33	1,671.70	99.63	17.779		
4,600.00	3,390.41	3,379.36	3,379.27	37.73	65.56	99.72	-1.48	111.61	1,871.25	1,769.45	101.81	18.381		
4,700.00	3,391.06	3,379.99	3,379.90	40.12	65.57	100.23	-1.48	111.61	1,971.18	1,867.16	104.02	18.950		
4,800.00	3,391.70	3,380.62	3,380.53	42.56	65.59	100.73	-1.48	111.61	2,071.12	1,964.85	106.27	19.489		
4,900.00	3,392.35	3,381.25	3,381.16	45.04	65.60	101.23	-1.48	111.61	2,171.07	2,062.52	108.54	20.002		
5,000.00	3,392.99	3,381.88	3,381.79	47.56	65.61	101.73	-1.48	111.61	2,271.02	2,160.18	110.84	20.490		
5,100.00	3,393.64	3,382.51	3,382.42	50.10	65.62	102.22	-1.48	111.61	2,370.97	2,257.83	113.14	20.956		
5,200.00	3,394.29	3,383.14	3,383.05	52.67	65.64	102.72	-1.48	111.61	2,470.93	2,355.47	115.45	21.402		
5,300.00	3,394.93	3,383.77	3,383.68	55.26	65.65	103.21	-1.48	111.61	2,570.89	2,453.12	117.77	21.830		
5,400.00	3,395.58	3,384.40	3,384.31	57.87	65.66	103.70	-1.49	111.61	2,670.85	2,550.77	120.08	22.242		
5,500.00	3,396.22	3,385.04	3,384.94	60.49	65.68	104.19	-1.49	111.61	2,770.81	2,648.42	122.40	22.638		
5,600.00	3,396.87	3,385.67	3,385.57	63.13	65.69	104.68	-1.49	111.61	2,870.78	2,746.07	124.71	23.020		
5,700.00	3,397.52	3,386.30	3,386.20	65.78	65.70	105.16	-1.49	111.61	2,970.75	2,843.74	127.01	23.390		
5,800.00	3,398.16	3,386.93	3,386.83	68.44	65.71	105.64	-1.49	111.61	3,070.72	2,941.42	129.30	23.748		
5,900.00	3,398.81	3,387.56	3,387.47	71.12	65.73	106.13	-1.49	111.61	3,170.69	3,039.10	131.59	24.095		
6,000.00	3,399.45	3,388.19	3,388.10	73.80	65.74	106.60	-1.49	111.61	3,270.67	3,136.80	133.87	24.433		
6,100.00	3,400.10	3,388.82	3,388.73	76.48	65.75	107.08	-1.50	111.61	3,370.65	3,234.52	136.13	24.761		
6,200.00	3,400.75	3,389.45	3,389.36	79.18	65.77	107.55	-1.50	111.61	3,470.62	3,332.24	138.38	25.081		
6,300.00	3,401.39	3,390.09	3,389.99	81.88	65.78	108.03	-1.50	111.61	3,570.60	3,429.99	140.61	25.393		
6,400.00	3,402.04	3,390.72	3,390.62	84.59	65.79	108.50	-1.50	111.61	3,670.58	3,527.75	142.84	25.698		
6,500.00	3,402.68	3,391.35	3,391.26	87.30	65.80	108.96	-1.50	111.61	3,770.56	3,625.52	145.04	25.997		
6,600.00	3,403.33	3,391.98	3,391.89	90.02	65.82	109.43	-1.50	111.61	3,870.54	3,723.31	147.23	26.289		
6,700.00	3,403.97	3,392.61	3,392.52	92.74	65.83	109.89	-1.50	111.61	3,970.52	3,821.12	149.40	26.576		
6,800.00	3,404.62	3,393.25	3,393.15	95.46	65.84	110.35	-1.51	111.61	4,070.51	3,918.95	151.56	26.858		
6,900.00	3,405.27	3,393.88	3,393.78	98.19	65.86	110.80	-1.51	111.61	4,170.49	4,016.79	153.70	27.134		
7,000.00	3,405.91	3,394.51	3,394.42	100.92	65.87	111.26	-1.51	111.61	4,270.48	4,114.66	155.82	27.407		
7,100.00	3,406.56	3,395.14	3,395.05	103.66	65.88	111.71	-1.51	111.61	4,370.46	4,212.54	157.92	27.675		
7,200.00	3,407.20	3,395.78	3,395.68	106.39	65.89	112.16	-1.51	111.61	4,470.45	4,310.44	160.00	27.940		
7,300.00	3,407.85	3,396.41	3,396.32	109.13	65.91	112.60	-1.51	111.61	4,570.43	4,408.37	162.07	28.201		
7,400.00	3,408.50	3,397.04	3,396.95	111.88	65.92	113.05	-1.51	111.61	4,670.42	4,506.31	164.11	28.459		
7,500.00	3,409.14	3,397.68	3,397.58	114.62	65.93	113.49	-1.51	111.61	4,770.41	4,604.27	166.14	28.714		
7,600.00	3,409.79	3,398.31	3,398.22	117.37	65.95	113.92	-1.52	111.61	4,870.39	4,702.25	168.14	28.966		
7,700.00	3,410.43	3,398.94	3,398.85	120.11	65.96	114.36	-1.52	111.61	4,970.38	4,800.25	170.13	29.215		

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	Local Co-ordinate Reference:	Well San Juan 32-8 Unit 232H
Project:	San Juan Co., NM (NAD27)	TVD Reference:	KB @ 6671.00usft
Reference Site:	Sec.28-T32N-R08W	MD Reference:	KB @ 6671.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	San Juan 32-8 Unit 232H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev0	Offset TVD Reference:	Offset Datum

Offset Design Sec.28-T32N-R08W - San Juan 32-8 Unit 050 - Original Hole - Original Hole													Offset Site Error: 0.00 usft	
Survey Program: 126-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		
7,800.00	3,411.08	3,399.58	3,399.48	122.87	65.97	114.79	-1.52	111.61	5,070.37	4,898.27	172.10	29.462		
7,900.00	3,411.72	3,400.21	3,400.12	125.62	65.98	115.22	-1.52	111.61	5,170.36	4,996.32	174.04	29.707		
8,000.00	3,412.37	3,400.84	3,400.75	128.37	66.00	115.65	-1.52	111.61	5,270.35	5,094.38	175.97	29.950		
8,100.00	3,413.02	3,401.48	3,401.38	131.13	66.01	116.07	-1.52	111.61	5,370.34	5,192.46	177.88	30.191		
8,200.00	3,413.66	3,402.11	3,402.02	133.88	66.02	116.49	-1.52	111.61	5,470.33	5,290.56	179.76	30.431		
8,300.00	3,414.31	3,402.75	3,402.65	136.64	66.04	116.91	-1.52	111.61	5,570.32	5,388.69	181.63	30.669		
8,400.00	3,414.95	3,403.38	3,403.29	139.40	66.05	117.32	-1.53	111.61	5,670.31	5,486.83	183.48	30.905		
8,500.00	3,415.60	3,404.02	3,403.92	142.16	66.06	117.73	-1.53	111.61	5,770.30	5,585.00	185.30	31.140		
8,600.00	3,416.25	3,404.65	3,404.56	144.92	66.08	118.14	-1.53	111.61	5,870.29	5,683.18	187.11	31.374		
8,700.00	3,416.89	3,405.28	3,405.19	147.68	66.09	118.54	-1.53	111.61	5,970.28	5,781.39	188.89	31.607		
8,800.00	3,417.54	3,405.92	3,405.82	150.45	66.10	118.95	-1.53	111.61	6,070.27	5,879.61	190.66	31.838		
8,900.00	3,418.18	3,406.55	3,406.46	153.21	66.11	119.35	-1.53	111.61	6,170.26	5,977.86	192.41	32.069		
9,000.00	3,418.83	3,407.19	3,407.09	155.97	66.13	119.74	-1.53	111.61	6,270.25	6,076.12	194.13	32.299		
9,100.00	3,419.48	3,407.82	3,407.73	158.74	66.14	120.13	-1.53	111.61	6,370.25	6,174.41	195.84	32.528		
9,200.00	3,420.12	3,408.46	3,408.36	161.51	66.15	120.52	-1.53	111.61	6,470.24	6,272.72	197.52	32.757		
9,300.00	3,420.77	3,409.10	3,409.00	164.27	66.17	120.91	-1.54	111.61	6,570.23	6,371.04	199.19	32.985		
9,400.00	3,421.41	3,409.73	3,409.64	167.04	66.18	121.30	-1.54	111.61	6,670.22	6,469.39	200.84	33.212		
9,500.00	3,422.06	3,410.37	3,410.27	169.81	66.19	121.68	-1.54	111.61	6,770.22	6,567.75	202.47	33.439		
9,600.00	3,422.70	3,411.00	3,410.91	172.58	66.20	122.05	-1.54	111.61	6,870.21	6,666.13	204.07	33.665		
9,700.00	3,423.35	3,411.64	3,411.54	175.35	66.22	122.43	-1.54	111.61	6,970.20	6,764.54	205.66	33.891		
9,800.00	3,424.00	3,412.27	3,412.18	178.12	66.23	122.80	-1.54	111.61	7,070.19	6,862.96	207.23	34.117		
9,900.00	3,424.64	3,412.91	3,412.81	180.89	66.24	123.17	-1.54	111.61	7,170.19	6,961.40	208.79	34.342		
10,000.00	3,425.29	3,413.55	3,413.45	183.66	66.26	123.54	-1.54	111.61	7,270.18	7,059.86	210.32	34.567		
10,100.00	3,425.93	3,414.18	3,414.09	186.43	66.27	123.90	-1.55	111.61	7,370.17	7,158.34	211.83	34.792		
10,200.00	3,426.58	3,414.82	3,414.72	189.21	66.28	124.26	-1.55	111.61	7,470.17	7,256.84	213.33	35.017		
10,300.00	3,427.23	3,415.46	3,415.36	191.98	66.30	124.62	-1.55	111.61	7,570.16	7,355.35	214.81	35.241		
10,400.00	3,427.87	3,416.09	3,416.00	194.75	66.31	124.97	-1.55	111.61	7,670.16	7,453.89	216.27	35.466		
10,500.00	3,428.52	3,416.73	3,416.63	197.53	66.32	125.32	-1.55	111.61	7,770.15	7,552.44	217.71	35.690		
10,600.00	3,429.16	3,417.37	3,417.27	200.30	66.33	125.67	-1.55	111.61	7,870.14	7,651.01	219.14	35.914		
10,700.00	3,429.81	3,418.00	3,417.91	203.07	66.35	126.01	-1.55	111.61	7,970.14	7,749.59	220.54	36.138		
10,800.00	3,430.45	3,418.64	3,418.54	205.85	66.36	126.36	-1.55	111.61	8,070.13	7,848.20	221.94	36.363		
10,884.41	3,431.00	3,419.18	3,419.08	208.19	66.37	126.64	-1.55	111.61	8,154.53	7,931.44	223.10	36.552		



Koltek Energy Services

Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.28-T32N-R08W - San Juan 32-8 Unit 231A - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 221-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)		+N/-S (usft)	+E/-W (usft)						
0.00	0.00	35.78	35.78	0.00	0.47	-24.53	300.60	-137.20	330.44					
100.00	100.00	133.46	133.46	0.10	1.77	-24.55	300.40	-137.20	330.25	328.39	1.86	177.135		
200.00	200.00	234.00	234.00	0.32	3.27	-24.51	300.86	-137.20	330.67	327.08	3.59	92.008		
300.00	300.00	334.01	334.00	0.55	5.92	-24.51	300.86	-137.20	330.67	324.20	6.47	51.112		
400.00	400.00	434.01	434.00	0.77	8.58	-24.51	300.86	-137.20	330.67	321.32	9.35	35.384		
500.00	500.00	534.02	534.00	0.99	11.23	-24.51	300.86	-137.20	330.67	318.45	12.22	27.058		
600.00	600.00	634.02	634.00	1.22	13.88	-24.51	300.86	-137.20	330.67	315.57	15.10	21.904		
700.00	700.00	736.50	736.47	1.44	16.99	-24.53	300.60	-137.20	330.44	312.01	18.43	17.930		
800.00	800.00	836.02	835.97	1.67	20.86	-24.59	299.87	-137.20	329.77	307.24	22.53	14.636		
900.00	900.00	935.52	935.47	1.89	24.74	-24.63	299.32	-137.20	329.27	302.64	26.63	12.364		
1,000.00	1,000.00	1,035.01	1,034.95	2.12	28.61	-24.65	298.94	-137.20	328.92	298.19	30.73	10.703		
1,100.00	1,100.00	1,134.49	1,134.43	2.34	32.49	-24.67	298.73	-137.20	328.73	293.90	34.83	9.438		
1,168.54	1,168.54	1,202.67	1,202.60	2.50	35.14	-24.67	298.69	-137.20	328.70	291.05	37.64	8.732		
1,200.00	1,200.00	1,233.95	1,233.88	2.57	36.36	-24.67	298.70	-137.20	328.70	289.77	38.93	8.443		
1,300.00	1,300.00	1,333.40	1,333.33	2.79	40.24	-24.66	298.84	-137.20	328.83	285.80	43.03	7.642		
1,400.00	1,400.00	1,432.83	1,432.76	3.02	44.11	-24.64	299.16	-137.20	329.12	281.99	47.13	6.984		
1,500.00	1,500.00	1,532.25	1,532.17	3.24	47.98	-24.60	299.65	-137.20	329.57	278.34	51.23	6.434		
1,600.00	1,600.00	1,631.65	1,631.57	3.47	51.86	-24.55	300.31	-137.20	330.17	274.85	55.32	5.968		
1,700.00	1,700.00	1,734.08	1,734.00	3.69	56.27	-24.51	300.86	-137.20	330.67	270.70	59.97	5.514		
1,800.00	1,800.00	1,834.10	1,834.00	3.92	61.43	-24.51	300.86	-137.20	330.67	265.32	65.35	5.060		
1,900.00	1,900.00	1,934.12	1,934.00	4.14	66.59	-24.51	300.86	-137.20	330.67	259.94	70.73	4.675		
2,000.00	2,000.00	2,034.14	2,034.00	4.37	71.74	-24.51	300.86	-137.20	330.67	254.56	76.11	4.345		
2,033.53	2,033.53	2,067.68	2,067.53	4.44	73.47	-24.51	300.86	-137.20	330.67	252.76	77.91	4.244		
2,100.00	2,099.98	2,134.14	2,133.98	4.58	76.90	65.31	300.86	-137.20	330.02	248.56	81.46	4.051		
2,200.00	2,199.63	2,231.52	2,231.34	4.79	81.47	66.70	301.15	-137.20	326.98	240.80	86.18	3.794		
2,300.00	2,298.47	2,331.34	2,331.14	5.01	85.36	69.39	301.74	-137.20	321.85	231.64	90.21	3.568		
2,400.00	2,396.02	2,429.89	2,429.68	5.27	89.21	73.36	302.00	-137.20	314.95	220.69	94.26	3.341		
2,500.00	2,491.80	2,526.68	2,526.45	5.59	92.98	78.60	301.94	-137.20	307.66	209.26	98.41	3.126		
2,600.00	2,585.35	2,621.24	2,620.98	6.01	96.67	85.04	301.59	-137.20	301.92	199.30	102.62	2.942		
2,682.03	2,660.10	2,696.81	2,696.54	6.45	99.62	91.03	301.10	-137.20	300.08	194.02	106.06	2.829 CC		
2,700.00	2,676.21	2,713.10	2,712.82	6.55	100.25	92.40	300.96	-137.20	300.18	193.41	106.78	2.811 ES		
2,800.00	2,763.94	2,798.23	2,797.94	7.24	102.65	99.88	300.86	-137.20	305.89	196.45	109.44	2.795 SF		
2,900.00	2,848.12	2,882.41	2,882.12	8.10	104.87	107.46	300.86	-137.20	320.98	209.75	111.23	2.886		
3,000.00	2,928.32	2,962.62	2,962.32	9.14	106.99	114.43	300.86	-137.20	346.82	234.82	112.00	3.097		
3,100.00	3,004.16	3,038.46	3,038.16	10.38	109.00	120.43	300.86	-137.20	383.72	271.95	111.77	3.433		
3,200.00	3,075.28	3,109.58	3,109.28	11.81	110.88	125.34	300.86	-137.20	431.09	320.31	110.79	3.891		
3,300.00	3,141.32	3,175.63	3,175.32	13.42	112.62	129.14	300.86	-137.20	487.84	378.48	109.36	4.461		
3,400.00	3,201.96	3,236.27	3,235.96	15.20	114.23	131.86	300.86	-137.20	552.70	444.84	107.86	5.124		
3,500.00	3,256.92	3,291.23	3,290.92	17.15	115.68	133.55	300.86	-137.20	624.52	517.81	106.71	5.853		
3,600.00	3,305.91	3,340.22	3,339.91	19.25	116.97	134.21	300.86	-137.20	702.22	595.86	106.36	6.602		
3,658.53	3,331.72	3,366.03	3,365.72	20.54	117.66	134.10	300.86	-137.20	750.05	643.29	106.76	7.026		
3,658.53	3,331.72	3,366.03	3,365.72	20.54	117.66	134.10	300.86	-137.20	750.06	643.29	106.76	7.026		
3,700.00	3,347.89	3,382.20	3,381.89	21.18	118.08	129.88	300.86	-137.20	785.11	673.84	111.27	7.056		
3,750.00	3,363.69	3,398.01	3,397.69	21.66	118.50	123.44	300.86	-137.20	828.81	710.02	118.79	6.977		
3,800.00	3,375.35	3,409.66	3,409.35	22.22	118.81	115.19	300.86	-137.20	873.76	745.65	128.11	6.820		
3,850.00	3,382.77	3,417.08	3,416.77	22.86	119.01	104.90	300.86	-137.20	919.63	782.51	137.12	6.707		
3,900.00	3,385.89	3,420.21	3,419.89	23.57	119.09	92.86	300.86	-137.20	966.07	823.63	142.44	6.782		
3,911.24	3,386.00	3,420.32	3,420.00	23.73	119.09	90.00	300.86	-137.20	976.55	833.77	142.78	6.839		
3,923.58	3,386.04	3,420.36	3,420.04	23.92	119.09	90.97	300.86	-137.20	988.06	845.11	142.95	6.912		
4,000.00	3,386.54	3,420.85	3,420.54	25.15	119.11	91.05	300.86	-137.20	1,059.80	915.60	144.20	7.350		
4,100.00	3,387.18	3,421.50	3,421.18	26.94	119.12	91.15	300.86	-137.20	1,154.58	1,008.58	146.00	7.908		
4,200.00	3,387.83	3,422.15	3,421.83	28.88	119.14	91.26	300.86	-137.20	1,250.17	1,102.21	147.95	8.450		

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	Local Co-ordinate Reference:	Well San Juan 32-8 Unit 232H
Project:	San Juan Co., NM (NAD27)	TVD Reference:	KB @ 6671.00usft
Reference Site:	Sec.28-T32N-R08W	MD Reference:	KB @ 6671.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	San Juan 32-8 Unit 232H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev0	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error: 0.00 usft	
Survey Program: 221-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		
4,300.00	3,388.47	3,422.79	3,422.47	30.95	119.16	91.36	300.86	-137.20	1,346.40	1,196.36	150.04	8.974		
4,400.00	3,389.12	3,423.44	3,423.12	33.13	119.17	91.47	300.86	-137.20	1,443.14	1,290.91	152.23	9.480		
4,500.00	3,389.77	3,424.08	3,423.77	35.39	119.19	91.57	300.86	-137.20	1,540.30	1,385.80	154.51	9.969		
4,600.00	3,390.41	3,424.73	3,424.41	37.73	119.21	91.68	300.86	-137.20	1,637.81	1,480.95	156.85	10.442		
4,700.00	3,391.06	3,425.38	3,425.06	40.12	119.23	91.78	300.86	-137.20	1,735.59	1,576.34	159.25	10.898		
4,800.00	3,391.70	3,426.02	3,425.70	42.56	119.24	91.89	300.86	-137.20	1,833.62	1,671.91	161.70	11.340		
4,900.00	3,392.35	3,426.67	3,426.35	45.04	119.26	91.99	300.86	-137.20	1,931.84	1,767.65	164.19	11.766		
5,000.00	3,392.99	3,427.31	3,426.99	47.56	119.28	92.10	300.86	-137.20	2,030.24	1,863.53	166.71	12.178		
5,100.00	3,393.64	3,427.96	3,427.64	50.10	119.29	92.20	300.86	-137.20	2,128.79	1,959.53	169.26	12.577		
5,200.00	3,394.29	3,428.61	3,428.29	52.67	119.31	92.31	300.86	-137.20	2,227.47	2,055.64	171.83	12.963		
5,300.00	3,394.93	3,429.25	3,428.93	55.26	119.33	92.41	300.86	-137.20	2,326.26	2,151.83	174.42	13.337		
5,400.00	3,395.58	3,429.90	3,429.58	57.87	119.34	92.52	300.86	-137.20	2,425.15	2,248.11	177.03	13.699		
5,500.00	3,396.22	3,430.54	3,430.22	60.49	119.36	92.62	300.86	-137.20	2,524.12	2,344.47	179.66	14.050		
5,600.00	3,396.87	3,431.19	3,430.87	63.13	119.38	92.73	300.86	-137.20	2,623.18	2,440.88	182.30	14.390		
5,700.00	3,397.52	3,431.83	3,431.52	65.78	119.40	92.83	300.86	-137.20	2,722.30	2,537.36	184.95	14.719		
5,800.00	3,398.16	3,432.48	3,432.16	68.44	119.41	92.93	300.86	-137.20	2,821.49	2,633.88	187.61	15.039		
5,900.00	3,398.81	3,433.13	3,432.81	71.12	119.43	93.04	300.86	-137.20	2,920.73	2,730.45	190.27	15.350		
6,000.00	3,399.45	3,433.77	3,433.45	73.80	119.45	93.14	300.86	-137.20	3,020.02	2,827.07	192.95	15.652		
6,100.00	3,400.10	3,434.42	3,434.10	76.48	119.46	93.25	300.86	-137.20	3,119.35	2,923.72	195.63	15.945		
6,200.00	3,400.75	3,435.06	3,434.75	79.18	119.48	93.35	300.86	-137.20	3,218.73	3,020.41	198.32	16.230		
6,300.00	3,401.39	3,435.71	3,435.39	81.88	119.50	93.46	300.86	-137.20	3,318.14	3,117.13	201.01	16.507		
6,400.00	3,402.04	3,436.36	3,436.04	84.59	119.52	93.56	300.86	-137.20	3,417.59	3,213.89	203.71	16.777		
6,500.00	3,402.68	3,437.00	3,436.68	87.30	119.53	93.67	300.86	-137.20	3,517.07	3,310.66	206.41	17.040		
6,600.00	3,403.33	3,437.65	3,437.33	90.02	119.55	93.77	300.86	-137.20	3,616.58	3,407.47	209.11	17.295		
6,700.00	3,403.97	3,438.29	3,437.97	92.74	119.57	93.88	300.86	-137.20	3,716.11	3,504.30	211.82	17.544		
6,800.00	3,404.62	3,438.94	3,438.62	95.46	119.58	93.98	300.86	-137.20	3,815.67	3,601.14	214.53	17.786		
6,900.00	3,405.27	3,439.59	3,439.27	98.19	119.60	94.08	300.86	-137.20	3,915.25	3,698.01	217.24	18.023		
7,000.00	3,405.91	3,440.23	3,439.91	100.92	119.62	94.19	300.86	-137.20	4,014.85	3,794.90	219.95	18.253		
7,100.00	3,406.56	3,440.88	3,440.56	103.66	119.64	94.29	300.86	-137.20	4,114.47	3,891.81	222.67	18.478		
7,200.00	3,407.20	3,441.52	3,441.20	106.39	119.65	94.40	300.86	-137.20	4,214.11	3,988.73	225.38	18.698		
7,300.00	3,407.85	3,442.17	3,441.85	109.13	119.67	94.50	300.86	-137.20	4,313.77	4,085.67	228.10	18.912		
7,400.00	3,408.50	3,442.82	3,442.50	111.88	119.69	94.61	300.86	-137.20	4,413.44	4,182.62	230.82	19.121		
7,500.00	3,409.14	3,443.46	3,443.14	114.62	119.70	94.71	300.86	-137.20	4,513.12	4,279.59	233.54	19.325		
7,600.00	3,409.79	3,444.11	3,443.79	117.37	119.72	94.81	300.86	-137.20	4,612.82	4,376.56	236.26	19.524		
7,700.00	3,410.43	3,444.75	3,444.43	120.11	119.74	94.92	300.86	-137.20	4,712.53	4,473.56	238.98	19.719		
7,800.00	3,411.08	3,445.40	3,445.08	122.87	119.75	95.02	300.86	-137.20	4,812.26	4,570.56	241.70	19.910		
7,900.00	3,411.72	3,446.04	3,445.72	125.62	119.77	95.13	300.86	-137.20	4,911.99	4,667.57	244.42	20.097		
8,000.00	3,412.37	3,446.69	3,446.37	128.37	119.79	95.23	300.86	-137.20	5,011.74	4,764.60	247.14	20.279		
8,100.00	3,413.02	3,447.34	3,447.02	131.13	119.81	95.34	300.86	-137.20	5,111.49	4,861.63	249.86	20.457		
8,200.00	3,413.66	3,447.98	3,447.66	133.88	119.82	95.44	300.86	-137.20	5,211.26	4,958.68	252.58	20.632		
8,300.00	3,414.31	3,448.63	3,448.31	136.64	119.84	95.54	300.86	-137.20	5,311.03	5,055.73	255.30	20.803		
8,400.00	3,414.95	3,449.27	3,448.95	139.40	119.86	95.65	300.86	-137.20	5,410.81	5,152.79	258.02	20.971		
8,500.00	3,415.60	3,449.92	3,449.60	142.16	119.87	95.75	300.86	-137.20	5,510.60	5,249.86	260.74	21.135		
8,600.00	3,416.25	3,450.57	3,450.25	144.92	119.89	95.85	300.86	-137.20	5,610.40	5,346.94	263.45	21.296		
8,700.00	3,416.89	3,451.21	3,450.89	147.68	119.91	95.96	300.86	-137.20	5,710.20	5,444.03	266.17	21.453		
8,800.00	3,417.54	3,451.86	3,451.54	150.45	119.93	96.06	300.86	-137.20	5,810.01	5,541.12	268.89	21.608		
8,900.00	3,418.18	3,452.50	3,452.18	153.21	119.94	96.17	300.86	-137.20	5,909.83	5,638.23	271.60	21.759		
9,000.00	3,418.83	3,453.15	3,452.83	155.97	119.96	96.27	300.86	-137.20	6,009.65	5,735.33	274.31	21.908		
9,100.00	3,419.48	3,453.80	3,453.48	158.74	119.98	96.37	300.86	-137.20	6,109.48	5,832.45	277.03	22.054		
9,200.00	3,420.12	3,454.44	3,454.12	161.51	119.99	96.48	300.86	-137.20	6,209.31	5,929.57	279.74	22.197		
9,300.00	3,420.77	3,455.09	3,454.77	164.27	120.01	96.58	300.86	-137.20	6,309.15	6,026.70	282.45	22.337		
9,400.00	3,421.41	3,455.73	3,455.41	167.04	120.03	96.68	300.86	-137.20	6,408.99	6,123.84	285.16	22.475		

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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
Sec.28-T32N-R08W - San Juan 32-8 Unit 231A - Original Hole - Original Hole													Offset Well Error:	0.00 usft
Survey Program: 221-INC_ONLY<10														
Reference		Offset		Semi Major Axis		Distance			Minimum			Separation		
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 (usft)	Factor	Warning	
9,500.00	3,422.06	3,456.38	3,456.06	169.81	120.05	96.79	300.86	-137.20	6,508.84	6,220.98	287.87	22.611		
9,600.00	3,422.70	3,457.02	3,456.70	172.58	120.06	96.89	300.86	-137.20	6,608.70	6,318.12	290.57	22.744		
9,700.00	3,423.35	3,457.67	3,457.35	175.35	120.08	96.99	300.86	-137.20	6,708.55	6,415.28	293.28	22.874		
9,800.00	3,424.00	3,458.32	3,458.00	178.12	120.10	97.10	300.86	-137.20	6,808.42	6,512.43	295.98	23.003		
9,900.00	3,424.64	3,458.96	3,458.64	180.89	120.11	97.20	300.86	-137.20	6,908.28	6,609.60	298.68	23.129		
10,000.00	3,425.29	3,459.61	3,459.29	183.66	120.13	97.30	300.86	-137.20	7,008.15	6,706.77	301.38	23.253		
10,100.00	3,425.93	3,460.25	3,459.93	186.43	120.15	97.41	300.86	-137.20	7,108.02	6,803.94	304.08	23.375		
10,200.00	3,426.58	3,460.90	3,460.58	189.21	120.16	97.51	300.86	-137.20	7,207.90	6,901.12	306.78	23.495		
10,300.00	3,427.23	3,461.55	3,461.23	191.98	120.18	97.61	300.86	-137.20	7,307.78	6,998.30	309.48	23.613		
10,400.00	3,427.87	3,462.19	3,461.87	194.75	120.20	97.72	300.86	-137.20	7,407.66	7,095.49	312.17	23.730		
10,500.00	3,428.52	3,462.84	3,462.52	197.53	120.22	97.82	300.86	-137.20	7,507.55	7,192.69	314.86	23.844		
10,600.00	3,429.16	3,463.48	3,463.16	200.30	120.23	97.92	300.86	-137.20	7,607.44	7,289.89	317.55	23.956		
10,700.00	3,429.81	3,464.13	3,463.81	203.07	120.25	98.03	300.86	-137.20	7,707.33	7,387.09	320.24	24.067		
10,800.00	3,430.45	3,464.78	3,464.45	205.85	120.27	98.13	300.86	-137.20	7,807.22	7,484.30	322.93	24.176		
10,884.41	3,431.00	3,465.32	3,465.00	208.19	120.28	98.22	300.86	-137.20	7,891.54	7,566.35	325.19	24.267		



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.28-T32N-R08W - San Juan 32-8 Unit 232H - Pilot Hole - Rev0														Offset Site Error:	0.00 usft
Survey Program: 0-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)							
3,658.53	3,331.72	3,658.53	3,331.72	0.00	0.00	0.00	6.35	-827.02	0.00	0.00	0.00	N/A	CC, ES		
3,680.46	3,340.61	3,680.46	3,340.99	0.34	0.49	-171.18	6.50	-846.89	0.42	0.12	0.30	1.395	Level 3, SF		
3,700.00	3,347.89	3,699.96	3,349.23	0.64	0.93	-171.30	6.64	-864.57	1.50	0.95	0.55	2.710			
3,750.00	3,363.69	3,749.61	3,370.21	1.12	2.06	-171.54	6.99	-909.56	7.29	6.37	0.92	7.923			
3,800.00	3,375.35	3,798.57	3,390.90	1.68	3.17	-171.72	7.33	-953.93	17.38	16.10	1.28	13.601			
3,850.00	3,382.77	3,846.46	3,411.14	2.33	4.27	-171.83	7.66	-997.33	31.70	30.08	1.62	19.585			
3,900.00	3,385.89	3,892.92	3,430.77	3.04	5.34	-171.87	7.98	-1,039.43	50.13	48.20	1.94	25.900			
3,911.24	3,386.00	3,903.13	3,435.09	3.21	5.58	-171.87	8.05	-1,048.69	54.83	52.83	2.01	27.334			
3,923.58	3,386.04	3,914.30	3,439.81	3.40	5.84	-171.89	8.13	-1,058.82	60.06	57.95	2.12	28.368			
4,000.00	3,386.54	3,983.62	3,469.11	4.66	7.44	-171.84	8.61	-1,121.63	92.25	89.43	2.82	32.738			
4,100.00	3,387.18	4,074.32	3,507.44	6.47	9.55	-171.82	9.24	-1,203.83	134.36	130.53	3.83	35.089			
4,200.00	3,387.83	4,165.02	3,545.77	8.43	11.67	-171.80	9.88	-1,286.03	176.47	171.55	4.92	35.832			
4,300.00	3,388.47	4,236.55	3,576.00	10.52	13.35	-171.80	10.37	-1,350.86	219.42	213.46	5.96	36.837			
4,400.00	3,389.12	4,236.55	3,576.00	12.70	13.35	-171.80	10.37	-1,350.86	282.90	276.34	6.56	43.153			
4,500.00	3,389.77	4,236.55	3,576.00	14.97	13.35	-171.80	10.37	-1,350.86	363.21	356.01	7.19	50.494			
4,600.00	3,390.41	4,236.55	3,576.00	17.31	13.35	-171.80	10.37	-1,350.86	451.45	443.59	7.86	57.431			
4,700.00	3,391.06	4,236.55	3,576.00	19.71	13.35	-171.80	10.37	-1,350.86	543.78	535.22	8.55	63.582			
4,800.00	3,391.70	4,236.55	3,576.00	22.15	13.35	-171.80	10.37	-1,350.86	638.42	629.16	9.26	68.918			
4,900.00	3,392.35	4,236.55	3,576.00	24.64	13.35	-171.80	10.37	-1,350.86	734.48	724.49	9.99	73.519			
5,000.00	3,392.99	4,236.55	3,576.00	27.15	13.35	-171.80	10.37	-1,350.86	831.48	820.75	10.73	77.488			
5,100.00	3,393.64	4,236.55	3,576.00	29.70	13.35	-171.80	10.37	-1,350.86	929.11	917.63	11.48	80.925			
5,200.00	3,394.29	4,236.55	3,576.00	32.27	13.35	-171.80	10.37	-1,350.86	1,027.19	1,014.95	12.24	83.915			
5,300.00	3,394.93	4,236.55	3,576.00	34.86	13.35	-171.80	10.37	-1,350.86	1,125.62	1,112.61	13.01	86.531			
5,400.00	3,395.58	4,236.55	3,576.00	37.47	13.35	-171.80	10.37	-1,350.86	1,224.30	1,210.51	13.78	88.833			
5,500.00	3,396.22	4,236.55	3,576.00	40.09	13.35	-171.80	10.37	-1,350.86	1,323.17	1,308.61	14.56	90.868			
5,600.00	3,396.87	4,236.55	3,576.00	42.73	13.35	-171.80	10.37	-1,350.86	1,422.21	1,406.86	15.35	92.679			
5,700.00	3,397.52	4,236.55	3,576.00	45.38	13.35	-171.80	10.37	-1,350.86	1,521.37	1,505.23	16.13	94.297			
5,800.00	3,398.16	4,236.55	3,576.00	48.04	13.35	-171.80	10.37	-1,350.86	1,620.63	1,603.71	16.93	95.749			
5,900.00	3,398.81	4,236.55	3,576.00	50.71	13.35	-171.80	10.37	-1,350.86	1,719.98	1,702.26	17.72	97.059			
6,000.00	3,399.45	4,236.55	3,576.00	53.39	13.35	-171.80	10.37	-1,350.86	1,819.40	1,800.88	18.52	98.246			
6,100.00	3,400.10	4,236.55	3,576.00	56.08	13.35	-171.80	10.37	-1,350.86	1,918.88	1,899.56	19.32	99.325			
6,200.00	3,400.75	4,236.55	3,576.00	58.78	13.35	-171.80	10.37	-1,350.86	2,018.41	1,998.29	20.12	100.310			
6,300.00	3,401.39	4,236.55	3,576.00	61.48	13.35	-171.80	10.37	-1,350.86	2,117.99	2,097.06	20.93	101.212			
6,400.00	3,402.04	4,236.55	3,576.00	64.18	13.35	-171.80	10.37	-1,350.86	2,217.61	2,195.87	21.73	102.040			
6,500.00	3,402.68	4,236.55	3,576.00	66.89	13.35	-171.80	10.37	-1,350.86	2,317.25	2,294.71	22.54	102.804			
6,600.00	3,403.33	4,236.55	3,576.00	69.61	13.35	-171.80	10.37	-1,350.86	2,416.93	2,393.58	23.35	103.509			
6,700.00	3,403.97	4,236.55	3,576.00	72.33	13.35	-171.80	10.37	-1,350.86	2,516.63	2,492.47	24.16	104.162			
6,800.00	3,404.62	4,236.55	3,576.00	75.06	13.35	-171.80	10.37	-1,350.86	2,616.36	2,591.38	24.97	104.769			
6,900.00	3,405.27	4,236.55	3,576.00	77.78	13.35	-171.80	10.37	-1,350.86	2,716.10	2,690.32	25.79	105.335			
7,000.00	3,405.91	4,236.55	3,576.00	80.52	13.35	-171.80	10.37	-1,350.86	2,815.86	2,789.27	26.60	105.862			
7,100.00	3,406.56	4,236.55	3,576.00	83.25	13.35	-171.80	10.37	-1,350.86	2,915.64	2,888.23	27.41	106.355			
7,200.00	3,407.20	4,236.55	3,576.00	85.99	13.35	-171.80	10.37	-1,350.86	3,015.44	2,987.21	28.23	106.817			
7,300.00	3,407.85	4,236.55	3,576.00	88.73	13.35	-171.80	10.37	-1,350.86	3,115.25	3,086.20	29.05	107.251			
7,400.00	3,408.50	4,236.55	3,576.00	91.47	13.35	-171.80	10.37	-1,350.86	3,215.06	3,185.20	29.86	107.659			
7,500.00	3,409.14	4,236.55	3,576.00	94.21	13.35	-171.80	10.37	-1,350.86	3,314.90	3,284.21	30.68	108.043			
7,600.00	3,409.79	4,236.55	3,576.00	96.96	13.35	-171.80	10.37	-1,350.86	3,414.74	3,383.24	31.50	108.405			
7,700.00	3,410.43	4,236.55	3,576.00	99.71	13.35	-171.80	10.37	-1,350.86	3,514.58	3,482.27	32.32	108.748			
7,800.00	3,411.08	4,236.55	3,576.00	102.46	13.35	-171.80	10.37	-1,350.86	3,614.44	3,581.30	33.14	109.072			
7,900.00	3,411.72	4,236.55	3,576.00	105.21	13.35	-171.80	10.37	-1,350.86	3,714.31	3,680.35	33.96	109.379			
8,000.00	3,412.37	4,236.55	3,576.00	107.96	13.35	-171.80	10.37	-1,350.86	3,814.18	3,779.40	34.78	109.671			
8,100.00	3,413.02	4,236.55	3,576.00	110.72	13.35	-171.80	10.37	-1,350.86	3,914.06	3,878.46	35.60	109.947			
8,200.00	3,413.66	4,236.55	3,576.00	113.47	13.35	-171.80	10.37	-1,350.86	4,013.94	3,977.52	36.42	110.211			

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.28-T32N-R08W - San Juan 32-8 Unit 232H - 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											
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning					
8,300.00	3,414.31	4,236.55	3,576.00	116.23	13.35	-171.80	10.37	-1,350.86	4,113.83	4,076.59	37.24	110.461						
8,400.00	3,414.95	4,236.55	3,576.00	118.99	13.35	-171.80	10.37	-1,350.86	4,213.73	4,175.66	38.06	110.701						
8,500.00	3,415.60	4,236.55	3,576.00	121.75	13.35	-171.80	10.37	-1,350.86	4,313.63	4,274.74	38.89	110.929						
8,600.00	3,416.25	4,236.55	3,576.00	124.51	13.35	-171.80	10.37	-1,350.86	4,413.53	4,373.83	39.71	111.147						
8,700.00	3,416.89	4,236.55	3,576.00	127.27	13.35	-171.80	10.37	-1,350.86	4,513.44	4,472.91	40.53	111.355						
8,800.00	3,417.54	4,236.55	3,576.00	130.04	13.35	-171.80	10.37	-1,350.86	4,613.36	4,572.00	41.36	111.555						
8,900.00	3,418.18	4,236.55	3,576.00	132.80	13.35	-171.80	10.37	-1,350.86	4,713.27	4,671.09	42.18	111.746						
9,000.00	3,418.83	4,236.55	3,576.00	135.56	13.35	-171.80	10.37	-1,350.86	4,813.19	4,770.19	43.00	111.929						
9,100.00	3,419.48	4,236.55	3,576.00	138.33	13.35	-171.80	10.37	-1,350.86	4,913.12	4,869.29	43.83	112.105						
9,200.00	3,420.12	4,236.55	3,576.00	141.10	13.35	-171.80	10.37	-1,350.86	5,013.04	4,968.39	44.65	112.274						
9,300.00	3,420.77	4,236.55	3,576.00	143.86	13.35	-171.80	10.37	-1,350.86	5,112.97	5,067.50	45.47	112.436						
9,400.00	3,421.41	4,236.55	3,576.00	146.63	13.35	-171.80	10.37	-1,350.86	5,212.91	5,166.61	46.30	112.592						
9,500.00	3,422.06	4,236.55	3,576.00	149.40	13.35	-171.80	10.37	-1,350.86	5,312.84	5,265.72	47.12	112.742						
9,600.00	3,422.70	4,236.55	3,576.00	152.17	13.35	-171.80	10.37	-1,350.86	5,412.78	5,364.83	47.95	112.887						
9,700.00	3,423.35	4,236.55	3,576.00	154.94	13.35	-171.80	10.37	-1,350.86	5,512.72	5,463.94	48.77	113.026						
9,800.00	3,424.00	4,236.55	3,576.00	157.71	13.35	-171.80	10.37	-1,350.86	5,612.66	5,563.06	49.60	113.161						
9,900.00	3,424.64	4,236.55	3,576.00	160.48	13.35	-171.80	10.37	-1,350.86	5,712.60	5,662.18	50.42	113.291						
10,000.00	3,425.29	4,236.55	3,576.00	163.25	13.35	-171.80	10.37	-1,350.86	5,812.55	5,761.30	51.25	113.416						
10,100.00	3,425.93	4,236.55	3,576.00	166.02	13.35	-171.80	10.37	-1,350.86	5,912.49	5,860.42	52.08	113.537						
10,200.00	3,426.58	4,236.55	3,576.00	168.79	13.35	-171.80	10.37	-1,350.86	6,012.44	5,959.54	52.90	113.654						
10,300.00	3,427.23	4,236.55	3,576.00	171.57	13.35	-171.80	10.37	-1,350.86	6,112.39	6,058.67	53.73	113.767						
10,400.00	3,427.87	4,236.55	3,576.00	174.34	13.35	-171.80	10.37	-1,350.86	6,212.35	6,157.79	54.55	113.877						
10,500.00	3,428.52	4,236.55	3,576.00	177.11	13.35	-171.80	10.37	-1,350.86	6,312.30	6,256.92	55.38	113.983						
10,600.00	3,429.16	4,236.55	3,576.00	179.89	13.35	-171.80	10.37	-1,350.86	6,412.26	6,356.05	56.21	114.086						
10,700.00	3,429.81	4,236.55	3,576.00	182.66	13.35	-171.80	10.37	-1,350.86	6,512.21	6,455.18	57.03	114.185						
10,800.00	3,430.45	4,236.55	3,576.00	185.44	13.35	-171.80	10.37	-1,350.86	6,612.17	6,554.31	57.86	114.282						
10,884.41	3,431.00	4,236.55	3,576.00	187.78	13.35	-171.80	10.37	-1,350.86	6,696.54	6,637.99	58.56	114.361						



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.29-T32N-R08W - San Juan 32-8 Unit 232 - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 119-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	0.00	0.00	0.00	0.00	-109.88	-560.45	-1,550.01	1,648.55				
100.00	100.00	67.49	67.49	0.10	0.69	-109.89	-560.64	-1,550.01	1,648.29	1,647.50	0.78	2,102.017	
180.81	180.81	146.93	146.93	0.28	1.87	-109.88	-560.50	-1,550.01	1,648.24	1,646.09	2.15	768.244	
200.00	200.00	166.35	166.34	0.32	2.32	-109.88	-560.53	-1,550.01	1,648.25	1,645.60	2.64	623.494	
300.00	300.00	267.55	267.55	0.55	4.69	-109.88	-560.54	-1,550.01	1,648.25	1,643.01	5.24	314.575	
400.00	400.00	368.02	368.01	0.77	7.05	-109.88	-560.36	-1,550.01	1,648.19	1,640.37	7.82	210.807	
500.00	500.00	467.55	467.54	0.99	9.38	-109.87	-560.22	-1,550.01	1,648.14	1,637.77	10.38	158.847	
600.00	600.00	567.08	567.07	1.22	11.71	-109.87	-560.17	-1,550.01	1,648.13	1,635.19	12.93	127.436	
615.42	615.42	582.43	582.41	1.25	12.07	-109.87	-560.17	-1,550.01	1,648.13	1,634.80	13.33	123.666	
700.00	700.00	666.62	666.60	1.44	14.05	-109.87	-560.20	-1,550.01	1,648.14	1,632.65	15.49	106.397	
800.00	800.00	766.17	766.14	1.67	16.38	-109.87	-560.31	-1,550.01	1,648.17	1,630.13	18.05	91.322	
900.00	900.00	864.82	864.78	1.89	18.76	-109.88	-560.55	-1,550.01	1,648.26	1,627.60	20.66	79.791	
1,000.00	1,000.00	965.78	965.74	2.12	21.44	-109.89	-560.86	-1,550.01	1,648.36	1,624.81	23.56	69.973	
1,100.00	1,100.00	1,066.73	1,066.69	2.34	24.11	-109.90	-561.01	-1,550.01	1,648.41	1,621.95	26.46	62.306	
1,200.00	1,200.00	1,167.67	1,167.62	2.57	26.79	-109.90	-560.98	-1,550.01	1,648.40	1,619.05	29.36	56.153	
1,300.00	1,300.00	1,268.60	1,268.55	2.79	29.46	-109.89	-560.79	-1,550.01	1,648.34	1,616.08	32.25	51.104	
1,380.62	1,380.62	1,349.97	1,349.92	2.97	31.62	-109.88	-560.50	-1,550.01	1,648.24	1,613.65	34.59	47.648	
1,400.00	1,400.00	1,363.40	1,363.35	3.02	32.00	-109.88	-560.46	-1,550.01	1,648.23	1,613.22	35.01	47.075	
1,500.00	1,500.00	1,464.77	1,464.71	3.24	36.25	-109.90	-561.00	-1,550.01	1,648.41	1,608.92	39.49	41.740	
1,600.00	1,600.00	1,566.12	1,566.05	3.47	40.50	-109.91	-561.30	-1,550.01	1,648.51	1,604.54	43.97	37.491	
1,700.00	1,700.00	1,667.45	1,667.38	3.69	44.76	-109.91	-561.35	-1,550.01	1,648.53	1,600.08	48.45	34.027	
1,800.00	1,800.00	1,768.76	1,768.68	3.92	49.01	-109.90	-561.17	-1,550.01	1,648.47	1,595.54	52.92	31.148	
1,900.00	1,900.00	1,870.04	1,869.95	4.14	53.26	-109.89	-560.74	-1,550.01	1,648.32	1,590.92	57.40	28.717	
1,973.75	1,973.75	1,939.73	1,939.63	4.31	56.44	-109.88	-560.49	-1,550.01	1,648.24	1,587.48	60.75	27.131	
2,000.00	2,000.00	1,966.12	1,966.02	4.37	57.88	-109.88	-560.54	-1,550.01	1,648.25	1,586.00	62.25	26.478	
2,033.53	2,033.53	1,999.83	1,999.72	4.44	59.72	-109.88	-560.60	-1,550.01	1,648.27	1,584.11	64.17	25.687	
2,100.00	2,099.98	2,066.62	2,066.50	4.58	63.37	-20.36	-560.68	-1,550.01	1,646.85	1,578.93	67.92	24.247	
2,200.00	2,199.63	2,166.79	2,166.64	4.79	68.84	-20.57	-560.72	-1,550.01	1,639.26	1,565.99	73.26	22.375	
2,300.00	2,298.47	2,266.13	2,265.96	5.01	74.26	-20.96	-560.67	-1,550.01	1,625.14	1,546.95	78.19	20.783	
2,400.00	2,396.02	2,364.16	2,363.98	5.27	79.61	-21.54	-560.55	-1,550.01	1,604.61	1,521.97	82.64	19.417	
2,500.00	2,491.80	2,460.93	2,460.73	5.59	84.75	-22.34	-560.26	-1,550.01	1,577.77	1,491.33	86.44	18.253	
2,600.00	2,585.35	2,553.55	2,553.33	6.01	89.52	-23.36	-560.02	-1,550.01	1,544.86	1,455.40	89.46	17.268	
2,700.00	2,676.21	2,643.52	2,643.28	6.55	94.16	-24.66	-559.93	-1,550.01	1,506.16	1,414.18	91.98	16.375	
2,800.00	2,763.94	2,730.41	2,730.14	7.24	98.64	-26.29	-559.98	-1,550.01	1,461.93	1,367.86	94.07	15.541	
2,900.00	2,848.12	2,813.79	2,813.49	8.10	102.93	-28.28	-560.17	-1,550.01	1,412.51	1,316.63	95.88	14.732	
3,000.00	2,928.32	2,895.64	2,895.32	9.14	107.13	-30.75	-560.45	-1,550.01	1,358.26	1,260.50	97.77	13.893	
3,100.00	3,004.16	2,971.49	2,971.16	10.38	110.57	-33.71	-560.45	-1,550.01	1,299.48	1,199.95	99.52	13.057	
3,200.00	3,075.28	3,042.62	3,042.28	11.81	113.79	-37.26	-560.45	-1,550.01	1,236.77	1,134.69	102.08	12.115	
3,300.00	3,141.32	3,108.67	3,108.32	13.42	116.78	-41.48	-560.45	-1,550.01	1,170.75	1,064.82	105.92	11.053	
3,400.00	3,201.96	3,169.32	3,168.96	15.20	119.53	-46.41	-560.45	-1,550.01	1,102.09	990.67	111.42	9.891	
3,500.00	3,256.92	3,224.28	3,223.92	17.15	122.01	-52.05	-560.45	-1,550.01	1,031.62	912.97	118.65	8.694	
3,600.00	3,305.91	3,273.28	3,272.91	19.25	124.23	-58.25	-560.45	-1,550.01	960.33	833.09	127.24	7.547	
3,658.53	3,331.72	3,299.10	3,298.72	20.54	125.40	-62.05	-560.45	-1,550.01	918.69	786.12	132.57	6.930	
3,658.53	3,331.72	3,299.10	3,298.72	20.54	125.40	-62.05	-560.45	-1,550.01	918.69	786.12	132.57	6.930	
3,700.00	3,347.89	3,315.27	3,314.89	21.18	126.13	-67.52	-560.45	-1,550.01	889.29	751.23	138.06	6.441	
3,750.00	3,363.69	3,331.07	3,330.69	21.66	126.85	-73.92	-560.45	-1,550.01	854.17	710.63	143.53	5.951	
3,800.00	3,375.35	3,342.73	3,342.35	22.22	127.38	-79.82	-560.45	-1,550.01	819.92	672.32	147.60	5.555	
3,850.00	3,382.77	3,350.15	3,349.77	22.86	127.71	-84.96	-560.45	-1,550.01	787.12	636.98	150.14	5.243	
3,900.00	3,385.89	3,353.28	3,352.89	23.57	127.86	-89.18	-560.45	-1,550.01	756.35	604.92	151.43	4.995	
3,911.24	3,386.00	3,353.39	3,353.00	23.73	127.86	-90.00	-560.45	-1,550.01	749.77	598.17	151.60	4.946	
3,923.58	3,386.04	3,353.43	3,353.04	23.92	127.86	-89.74	-560.45	-1,550.01	742.69	590.90	151.79	4.893	
4,000.00	3,386.54	3,353.92	3,353.54	25.15	127.88	-89.79	-560.45	-1,550.01	702.10	549.05	153.05	4.587	

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.29-T32N-R08W - San Juan 32-8 Unit 232 - Original Hole - Original Hole														Offset Site Error:	0.00 usft
Survey Program: 119-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)					
4,100.00	3,387.18	3,354.57	3,354.18	26.94	127.91	-89.85	-560.45	-1,550.01	658.66	503.79	154.84	4.253			
4,200.00	3,387.83	3,355.21	3,354.83	28.88	127.94	-89.91	-560.45	-1,550.01	628.27	471.43	156.87	4.006			
4,300.00	3,388.47	3,355.86	3,355.47	30.95	127.97	-89.97	-560.45	-1,550.01	612.87	453.92	158.95	3.856			
4,345.56	3,388.77	3,356.15	3,355.77	31.94	127.99	-90.00	-560.45	-1,550.01	611.17	451.22	159.95	3.821 CC, ES			
4,400.00	3,389.12	3,356.51	3,356.12	33.13	128.00	-90.03	-560.45	-1,550.01	613.59	452.44	161.15	3.807 SF			
4,500.00	3,389.77	3,357.15	3,356.77	35.39	128.03	-90.09	-560.45	-1,550.01	630.38	466.93	163.45	3.857			
4,600.00	3,390.41	3,357.80	3,357.41	37.73	128.06	-90.15	-560.45	-1,550.01	662.02	496.21	165.81	3.993			
4,700.00	3,391.06	3,358.44	3,358.06	40.12	128.09	-90.21	-560.45	-1,550.01	706.51	538.27	168.23	4.200			
4,800.00	3,391.70	3,359.09	3,358.70	42.56	128.12	-90.28	-560.45	-1,550.01	761.60	590.90	170.70	4.462			
4,900.00	3,392.35	3,359.74	3,359.35	45.04	128.15	-90.34	-560.45	-1,550.01	825.18	651.97	173.21	4.764			
5,000.00	3,392.99	3,360.38	3,359.99	47.56	128.18	-90.40	-560.45	-1,550.01	895.43	719.68	175.75	5.095			
5,100.00	3,393.64	3,361.03	3,360.64	50.10	128.21	-90.46	-560.45	-1,550.01	970.92	792.59	178.33	5.445			
5,200.00	3,394.29	3,361.67	3,361.29	52.67	128.24	-90.52	-560.45	-1,550.01	1,050.51	869.59	180.92	5.806			
5,300.00	3,394.93	3,362.32	3,361.93	55.26	128.27	-90.58	-560.45	-1,550.01	1,133.33	949.80	183.54	6.175			
5,400.00	3,395.58	3,362.97	3,362.58	57.87	128.29	-90.64	-560.45	-1,550.01	1,218.74	1,032.57	186.17	6.546			
5,500.00	3,396.22	3,363.61	3,363.22	60.49	128.32	-90.70	-560.45	-1,550.01	1,306.22	1,117.39	188.82	6.918			
5,600.00	3,396.87	3,364.26	3,363.87	63.13	128.35	-90.76	-560.45	-1,550.01	1,395.38	1,203.89	191.49	7.287			
5,700.00	3,397.52	3,364.90	3,364.52	65.78	128.38	-90.82	-560.45	-1,550.01	1,485.92	1,291.76	194.16	7.653			
5,800.00	3,398.16	3,365.55	3,365.16	68.44	128.41	-90.88	-560.45	-1,550.01	1,577.60	1,380.75	196.85	8.014			
5,900.00	3,398.81	3,366.20	3,365.81	71.12	128.44	-90.94	-560.45	-1,550.01	1,670.24	1,470.70	199.55	8.370			
6,000.00	3,399.45	3,366.84	3,366.45	73.80	128.47	-91.00	-560.45	-1,550.01	1,763.68	1,561.43	202.25	8.720			
6,100.00	3,400.10	3,390.00	3,389.61	76.48	129.52	-93.17	-560.45	-1,550.01	1,857.95	1,652.25	205.70	9.033			
6,200.00	3,400.75	3,390.00	3,389.61	79.18	129.52	-93.17	-560.45	-1,550.01	1,952.64	1,744.25	208.39	9.370			
6,300.00	3,401.39	3,390.00	3,389.61	81.88	129.52	-93.17	-560.45	-1,550.01	2,047.84	1,836.76	211.08	9.702			
6,400.00	3,402.04	3,390.00	3,389.61	84.59	129.52	-93.17	-560.45	-1,550.01	2,143.48	1,929.69	213.79	10.026			
6,500.00	3,402.68	3,390.00	3,389.61	87.30	129.52	-93.17	-560.45	-1,550.01	2,239.50	2,023.00	216.50	10.344			
6,600.00	3,403.33	3,390.00	3,389.61	90.02	129.52	-93.17	-560.45	-1,550.01	2,335.85	2,116.64	219.21	10.656			
6,700.00	3,403.97	3,390.00	3,389.61	92.74	129.52	-93.17	-560.45	-1,550.01	2,432.49	2,210.57	221.93	10.961			
6,800.00	3,404.62	3,390.00	3,389.61	95.46	129.52	-93.17	-560.45	-1,550.01	2,529.40	2,304.75	224.65	11.259			
6,900.00	3,405.27	3,390.00	3,389.61	98.19	129.52	-93.17	-560.45	-1,550.01	2,626.54	2,399.17	227.37	11.552			
7,000.00	3,405.91	3,390.00	3,389.61	100.92	129.52	-93.17	-560.45	-1,550.01	2,723.89	2,493.79	230.10	11.838			
7,100.00	3,406.56	3,390.00	3,389.61	103.66	129.52	-93.17	-560.45	-1,550.01	2,821.42	2,588.59	232.83	12.118			
7,200.00	3,407.20	3,390.00	3,389.61	106.39	129.52	-93.17	-560.45	-1,550.01	2,919.12	2,683.55	235.57	12.392			
7,300.00	3,407.85	3,390.00	3,389.61	109.13	129.52	-93.17	-560.45	-1,550.01	3,016.97	2,778.66	238.30	12.660			
7,400.00	3,408.50	3,390.00	3,389.61	111.88	129.52	-93.17	-560.45	-1,550.01	3,114.95	2,873.91	241.04	12.923			
7,500.00	3,409.14	3,390.00	3,389.61	114.62	129.52	-93.17	-560.45	-1,550.01	3,213.06	2,969.28	243.78	13.180			
7,600.00	3,409.79	3,390.00	3,389.61	117.37	129.52	-93.17	-560.45	-1,550.01	3,311.29	3,064.76	246.53	13.432			
7,700.00	3,410.43	3,390.00	3,389.61	120.11	129.52	-93.17	-560.45	-1,550.01	3,409.61	3,160.34	249.27	13.678			
7,800.00	3,411.08	3,390.00	3,389.61	122.87	129.52	-93.17	-560.45	-1,550.01	3,508.04	3,256.02	252.02	13.920			
7,900.00	3,411.72	3,390.00	3,389.61	125.62	129.52	-93.17	-560.45	-1,550.01	3,606.54	3,351.78	254.77	14.156			
8,000.00	3,412.37	3,390.00	3,389.61	128.37	129.52	-93.17	-560.45	-1,550.01	3,705.13	3,447.62	257.52	14.388			
8,100.00	3,413.02	3,390.00	3,389.61	131.13	129.52	-93.17	-560.45	-1,550.01	3,803.79	3,543.53	260.27	14.615			
8,200.00	3,413.66	3,390.00	3,389.61	133.88	129.52	-93.17	-560.45	-1,550.01	3,902.52	3,639.50	263.02	14.837			
8,300.00	3,414.31	3,390.00	3,389.61	136.64	129.52	-93.17	-560.45	-1,550.01	4,001.32	3,735.54	265.77	15.055			
8,400.00	3,414.95	3,390.00	3,389.61	139.40	129.52	-93.17	-560.45	-1,550.01	4,100.17	3,831.64	268.53	15.269			
8,500.00	3,415.60	3,390.00	3,389.61	142.16	129.52	-93.17	-560.45	-1,550.01	4,199.07	3,927.79	271.29	15.478			
8,600.00	3,416.25	3,390.00	3,389.61	144.92	129.52	-93.17	-560.45	-1,550.01	4,298.03	4,023.99	274.04	15.684			
8,700.00	3,416.89	3,390.00	3,389.61	147.68	129.52	-93.17	-560.45	-1,550.01	4,397.03	4,120.23	276.80	15.885			
8,800.00	3,417.54	3,390.00	3,389.61	150.45	129.52	-93.17	-560.45	-1,550.01	4,496.08	4,216.52	279.56	16.083			
8,900.00	3,418.18	3,390.00	3,389.61	153.21	129.52	-93.17	-560.45	-1,550.01	4,595.17	4,312.85	282.32	16.276			
9,000.00	3,418.83	3,390.00	3,389.61	155.97	129.52	-93.17	-560.45	-1,550.01	4,694.30	4,409.22	285.08	16.466			
9,100.00	3,419.48	3,390.00	3,389.61	158.74	129.52	-93.17	-560.45	-1,550.01	4,793.46	4,505.62	287.85	16.653			

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.29-T32N-R08W - San Juan 32-8 Unit 232 - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 119-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)			
9,200.00	3,420.12	3,390.00	3,389.61	161.51	129.52	-93.17	-560.45	-1,550.01	4,892.66	4,602.05	290.61	16.836	
9,300.00	3,420.77	3,390.00	3,389.61	164.27	129.52	-93.17	-560.45	-1,550.01	4,991.89	4,698.52	293.37	17.016	
9,400.00	3,421.41	3,390.00	3,389.61	167.04	129.52	-93.17	-560.45	-1,550.01	5,091.15	4,795.01	296.14	17.192	
9,500.00	3,422.06	3,390.00	3,389.61	169.81	129.52	-93.17	-560.45	-1,550.01	5,190.44	4,891.54	298.90	17.365	
9,600.00	3,422.70	3,390.10	3,389.70	172.58	129.52	-93.18	-560.45	-1,550.01	5,289.75	4,988.09	301.67	17.535	
9,700.00	3,423.35	3,390.74	3,390.35	175.35	129.55	-93.24	-560.45	-1,550.01	5,389.10	5,084.65	304.45	17.701	
9,800.00	3,424.00	3,391.39	3,391.00	178.12	129.58	-93.30	-560.45	-1,550.01	5,488.46	5,181.24	307.22	17.865	
9,900.00	3,424.64	3,392.03	3,391.64	180.89	129.61	-93.36	-560.45	-1,550.01	5,587.85	5,277.84	310.00	18.025	
10,000.00	3,425.29	3,392.68	3,392.29	183.66	129.64	-93.42	-560.45	-1,550.01	5,687.26	5,374.47	312.78	18.183	
10,100.00	3,425.93	3,393.33	3,392.93	186.43	129.67	-93.48	-560.45	-1,550.01	5,786.68	5,471.13	315.56	18.338	
10,200.00	3,426.58	3,393.97	3,393.58	189.21	129.70	-93.54	-560.45	-1,550.01	5,886.13	5,567.80	318.34	18.490	
10,300.00	3,427.23	3,394.62	3,394.23	191.98	129.73	-93.60	-560.45	-1,550.01	5,985.60	5,664.48	321.11	18.640	
10,400.00	3,427.87	3,395.26	3,394.87	194.75	129.76	-93.66	-560.45	-1,550.01	6,085.08	5,761.19	323.89	18.787	
10,500.00	3,428.52	3,395.91	3,395.52	197.53	129.79	-93.72	-560.45	-1,550.01	6,184.58	5,857.91	326.67	18.932	
10,600.00	3,429.16	3,396.56	3,396.16	200.30	129.82	-93.78	-560.45	-1,550.01	6,284.10	5,954.65	329.44	19.075	
10,700.00	3,429.81	3,397.20	3,396.81	203.07	129.84	-93.84	-560.45	-1,550.01	6,383.63	6,051.41	332.22	19.215	
10,800.00	3,430.45	3,397.85	3,397.45	205.85	129.87	-93.90	-560.45	-1,550.01	6,483.18	6,148.18	335.00	19.353	
10,884.41	3,431.00	3,398.39	3,398.00	208.19	129.90	-93.95	-560.45	-1,550.01	6,567.21	6,229.87	337.34	19.468	



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.29-T32N-R08W - San Juan 32-8 Unit 232A - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 219-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	0.00	0.00	0.00	0.00	-98.97	-647.86	-4,103.51	4,154.55					
100.00	100.00	55.20	55.20	0.10	0.73	-98.98	-648.22	-4,103.51	4,154.39	4,153.56	0.83	5,021.584		
200.00	200.00	160.64	160.64	0.32	2.13	-98.98	-648.23	-4,103.51	4,154.39	4,151.94	2.45	1,696.064		
300.00	300.00	258.00	258.00	0.55	3.94	-98.97	-647.86	-4,103.51	4,154.33	4,149.85	4.48	927.004		
400.00	400.00	358.01	358.00	0.77	6.59	-98.97	-647.86	-4,103.51	4,154.33	4,146.98	7.36	564.673		
500.00	500.00	458.01	458.00	0.99	9.24	-98.97	-647.86	-4,103.51	4,154.33	4,144.10	10.23	405.988		
600.00	600.00	558.02	558.00	1.22	11.89	-98.97	-647.86	-4,103.51	4,154.33	4,141.23	13.11	316.925		
700.00	700.00	658.02	658.00	1.44	14.54	-98.97	-647.86	-4,103.51	4,154.33	4,138.35	15.98	259.908		
800.00	800.00	758.03	758.00	1.67	17.19	-98.97	-647.86	-4,103.51	4,154.33	4,135.47	18.86	220.279		
900.00	900.00	858.03	858.00	1.89	19.84	-98.97	-647.86	-4,103.51	4,154.33	4,132.60	21.74	191.135		
1,000.00	1,000.00	958.04	958.00	2.12	22.49	-98.97	-647.86	-4,103.51	4,154.33	4,129.72	24.61	168.803		
1,100.00	1,100.00	1,058.04	1,058.00	2.34	25.14	-98.97	-647.86	-4,103.51	4,154.33	4,126.85	27.49	151.142		
1,200.00	1,200.00	1,158.05	1,158.00	2.57	27.79	-98.97	-647.86	-4,103.51	4,154.33	4,123.97	30.36	136.828		
1,300.00	1,300.00	1,258.05	1,258.00	2.79	30.44	-98.97	-647.86	-4,103.51	4,154.33	4,121.10	33.24	124.990		
1,400.00	1,400.00	1,358.06	1,358.00	3.02	33.10	-98.97	-647.86	-4,103.51	4,154.33	4,118.22	36.11	115.037		
1,500.00	1,500.00	1,458.06	1,458.00	3.24	35.75	-98.97	-647.86	-4,103.51	4,154.33	4,115.35	38.99	106.553		
1,600.00	1,600.00	1,558.07	1,558.00	3.47	38.40	-98.97	-647.86	-4,103.51	4,154.33	4,112.47	41.86	99.234		
1,700.00	1,700.00	1,658.07	1,658.00	3.69	41.05	-98.97	-647.86	-4,103.51	4,154.33	4,109.59	44.74	92.856		
1,800.00	1,800.00	1,758.08	1,758.00	3.92	43.70	-98.97	-647.86	-4,103.51	4,154.33	4,106.72	47.62	87.248		
1,900.00	1,900.00	1,858.08	1,858.00	4.14	46.35	-98.97	-647.86	-4,103.51	4,154.33	4,103.84	50.49	82.279		
2,000.00	2,000.00	1,958.09	1,958.00	4.37	49.00	-98.97	-647.86	-4,103.51	4,154.33	4,100.97	53.37	77.845		
2,033.53	2,033.53	1,991.62	1,991.53	4.44	49.89	-98.97	-647.86	-4,103.51	4,154.33	4,100.00	54.33	76.464		
2,100.00	2,099.98	2,058.07	2,057.98	4.58	51.65	-9.43	-647.86	-4,103.51	4,152.81	4,096.61	56.20	73.891		
2,200.00	2,199.63	2,157.72	2,157.63	4.79	54.29	-9.50	-647.86	-4,103.51	4,144.80	4,086.04	58.76	70.533		
2,300.00	2,298.47	2,256.57	2,256.47	5.01	56.91	-9.63	-647.86	-4,103.51	4,129.95	4,068.96	61.00	67.706		
2,400.00	2,396.02	2,354.12	2,354.02	5.27	59.50	-9.83	-647.86	-4,103.51	4,108.34	4,045.48	62.87	65.351		
2,500.00	2,491.80	2,449.91	2,449.80	5.59	62.04	-10.11	-647.86	-4,103.51	4,080.08	4,015.75	64.33	63.425		
2,600.00	2,585.35	2,543.47	2,543.35	6.01	64.52	-10.46	-647.86	-4,103.51	4,045.30	3,979.94	65.36	61.892		
2,700.00	2,676.21	2,634.33	2,634.21	6.55	66.93	-10.90	-647.86	-4,103.51	4,004.19	3,938.25	65.94	60.724		
2,800.00	2,763.94	2,722.07	2,721.94	7.24	69.25	-11.45	-647.86	-4,103.51	3,956.94	3,890.88	66.07	59.893		
2,900.00	2,848.12	2,802.07	2,801.93	8.10	72.16	-12.12	-648.35	-4,103.51	3,903.89	3,837.57	66.32	58.866		
3,000.00	2,928.32	2,884.16	2,884.02	9.14	75.36	-12.96	-648.76	-4,103.51	3,845.19	3,778.77	66.42	57.894		
3,100.00	3,004.16	2,961.78	2,961.63	10.38	78.37	-13.97	-648.93	-4,103.51	3,781.12	3,715.08	66.04	57.257		
3,200.00	3,075.28	3,034.55	3,034.39	11.81	81.20	-15.20	-648.90	-4,103.51	3,712.01	3,646.72	65.29	56.858		
3,300.00	3,141.32	3,102.11	3,101.95	13.42	83.83	-16.72	-648.71	-4,103.51	3,638.21	3,573.87	64.34	56.548		
3,400.00	3,201.96	3,164.13	3,163.98	15.20	86.24	-18.62	-648.39	-4,103.51	3,560.10	3,496.62	63.48	56.083		
3,500.00	3,256.92	3,235.00	3,234.85	17.15	89.00	-21.14	-647.86	-4,103.51	3,478.10	3,414.49	63.61	54.680		
3,600.00	3,305.91	3,264.07	3,263.91	19.25	90.49	-23.99	-647.86	-4,103.51	3,392.61	3,328.60	64.01	53.004		
3,658.53	3,331.72	3,289.88	3,289.72	20.54	91.82	-26.17	-647.86	-4,103.51	3,341.17	3,275.60	65.57	50.958		
3,658.53	3,331.72	3,289.88	3,289.72	20.54	91.82	-26.17	-647.86	-4,103.51	3,341.17	3,275.60	65.57	50.958		
3,700.00	3,347.89	3,306.05	3,305.89	21.18	92.65	-31.99	-647.86	-4,103.51	3,303.84	3,233.65	70.19	47.067		
3,750.00	3,363.69	3,321.86	3,321.69	21.66	93.46	-41.21	-647.86	-4,103.51	3,257.65	3,177.12	80.53	40.454		
3,800.00	3,375.35	3,333.52	3,333.35	22.22	94.06	-53.54	-647.86	-4,103.51	3,210.49	3,115.11	95.38	33.659		
3,850.00	3,382.77	3,340.94	3,340.77	22.86	94.44	-69.08	-647.86	-4,103.51	3,162.74	3,052.52	110.22	28.696		
3,900.00	3,385.89	3,344.07	3,343.89	23.57	94.60	-86.23	-647.86	-4,103.51	3,114.76	2,996.76	118.00	26.396		
3,911.24	3,386.00	3,344.18	3,344.00	23.73	94.61	-90.00	-647.86	-4,103.51	3,103.99	2,985.66	118.33	26.232		
3,923.58	3,386.04	3,344.22	3,344.04	23.92	94.61	-88.77	-647.86	-4,103.51	3,092.17	2,973.64	118.52	26.089		
4,000.00	3,386.54	3,344.71	3,344.54	25.15	94.63	-88.80	-647.86	-4,103.51	3,019.05	2,899.26	119.79	25.204		
4,100.00	3,387.18	3,345.36	3,345.18	26.94	94.67	-88.84	-647.86	-4,103.51	2,923.62	2,802.01	121.61	24.042		
4,200.00	3,387.83	3,346.00	3,345.83	28.88	94.70	-88.88	-647.86	-4,103.51	2,828.51	2,704.92	123.59	22.887		
4,300.00	3,388.47	3,346.65	3,346.47	30.95	94.73	-88.92	-647.86	-4,103.51	2,733.75	2,608.05	125.70	21.749		
4,400.00	3,389.12	3,347.30	3,347.12	33.13	94.77	-88.96	-647.86	-4,103.51	2,639.37	2,511.46	127.91	20.634		

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	Local Co-ordinate Reference:	Well San Juan 32-8 Unit 232H
Project:	San Juan Co., NM (NAD27)	TVD Reference:	KB @ 6671.00usft
Reference Site:	Sec.28-T32N-R08W	MD Reference:	KB @ 6671.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	San Juan 32-8 Unit 232H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev0	Offset TVD Reference:	Offset Datum

Sec.29-T32N-R08W - San Juan 32-8 Unit 232A - Original Hole - Original Hole														Offset Site Error:	0.00 usft
Survey Program: 219-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)							
4,500.00	3,389.77	3,347.94	3,347.77	35.39	94.80	-89.01	-647.86	-4,103.51	2,545.42	2,415.21	130.21	19.548			
4,600.00	3,390.41	3,348.59	3,348.41	37.73	94.83	-89.05	-647.86	-4,103.51	2,451.96	2,319.37	132.58	18.494			
4,700.00	3,391.06	3,349.23	3,349.06	40.12	94.87	-89.09	-647.86	-4,103.51	2,359.02	2,224.02	135.01	17.473			
4,800.00	3,391.70	3,349.88	3,349.70	42.56	94.90	-89.13	-647.86	-4,103.51	2,266.69	2,129.21	137.48	16.487			
4,900.00	3,392.35	3,350.53	3,350.35	45.04	94.93	-89.17	-647.86	-4,103.51	2,175.04	2,035.04	140.00	15.536			
5,000.00	3,392.99	3,351.17	3,350.99	47.56	94.97	-89.21	-647.86	-4,103.51	2,084.15	1,941.61	142.55	14.621			
5,100.00	3,393.64	3,351.82	3,351.64	50.10	95.00	-89.26	-647.86	-4,103.51	1,994.14	1,849.01	145.13	13.741			
5,200.00	3,394.29	3,352.46	3,352.29	52.67	95.03	-89.30	-647.86	-4,103.51	1,905.12	1,757.39	147.73	12.896			
5,300.00	3,394.93	3,353.11	3,352.93	55.26	95.07	-89.34	-647.86	-4,103.51	1,817.25	1,666.90	150.35	12.086			
5,400.00	3,395.58	3,353.76	3,353.58	57.87	95.10	-89.38	-647.86	-4,103.51	1,730.69	1,577.70	153.00	11.312			
5,500.00	3,396.22	3,354.40	3,354.22	60.49	95.13	-89.42	-647.86	-4,103.51	1,645.66	1,490.00	155.66	10.572			
5,600.00	3,396.87	3,355.05	3,354.87	63.13	95.17	-89.46	-647.86	-4,103.51	1,562.40	1,404.07	158.33	9.868			
5,700.00	3,397.52	3,355.69	3,355.52	65.78	95.20	-89.51	-647.86	-4,103.51	1,481.21	1,320.20	161.01	9.199			
5,800.00	3,398.16	3,356.34	3,356.16	68.44	95.23	-89.55	-647.86	-4,103.51	1,402.46	1,238.75	163.71	8.567			
5,900.00	3,398.81	3,356.99	3,356.81	71.12	95.26	-89.59	-647.86	-4,103.51	1,326.57	1,160.15	166.41	7.972			
6,000.00	3,399.45	3,357.63	3,357.45	73.80	95.30	-89.63	-647.86	-4,103.51	1,254.06	1,084.94	169.13	7.415			
6,100.00	3,400.10	3,358.28	3,358.10	76.48	95.33	-89.67	-647.86	-4,103.51	1,185.56	1,013.72	171.85	6.899			
6,200.00	3,400.75	3,358.92	3,358.75	79.18	95.36	-89.71	-647.86	-4,103.51	1,121.81	947.23	174.57	6.426			
6,300.00	3,401.39	3,359.57	3,359.39	81.88	95.40	-89.76	-647.86	-4,103.51	1,063.65	886.34	177.31	5.999			
6,400.00	3,402.04	3,360.22	3,360.04	84.59	95.43	-89.80	-647.86	-4,103.51	1,012.05	832.00	180.05	5.621			
6,500.00	3,402.68	3,360.86	3,360.68	87.30	95.46	-89.84	-647.86	-4,103.51	968.05	785.26	182.79	5.296			
6,600.00	3,403.33	3,361.51	3,361.33	90.02	95.50	-89.88	-647.86	-4,103.51	932.75	747.20	185.54	5.027			
6,700.00	3,403.97	3,362.15	3,361.97	92.74	95.53	-89.92	-647.86	-4,103.51	907.14	718.84	188.30	4.818			
6,800.00	3,404.62	3,362.80	3,362.62	95.46	95.56	-89.96	-647.86	-4,103.51	892.07	701.02	191.05	4.669			
6,885.57	3,405.17	3,363.35	3,363.17	97.80	95.59	-90.00	-647.86	-4,103.51	887.96	694.54	193.42	4.591 CC			
6,900.00	3,405.27	3,363.45	3,363.27	98.19	95.60	-90.01	-647.86	-4,103.51	888.07	694.26	193.81	4.582 ES			
7,000.00	3,405.91	3,364.09	3,363.91	100.92	95.63	-90.05	-647.86	-4,103.51	895.30	698.72	196.58	4.554 SF			
7,100.00	3,406.56	3,364.74	3,364.56	103.66	95.66	-90.09	-647.86	-4,103.51	913.48	714.13	199.34	4.582			
7,200.00	3,407.20	3,365.38	3,365.20	106.39	95.70	-90.13	-647.86	-4,103.51	941.98	739.87	202.11	4.661			
7,300.00	3,407.85	3,366.03	3,365.85	109.13	95.73	-90.17	-647.86	-4,103.51	979.90	775.02	204.89	4.783			
7,400.00	3,408.50	3,366.68	3,366.50	111.88	95.76	-90.21	-647.86	-4,103.51	1,026.20	818.54	207.66	4.942			
7,500.00	3,409.14	3,367.32	3,367.14	114.62	95.80	-90.26	-647.86	-4,103.51	1,079.80	869.37	210.44	5.131			
7,600.00	3,409.79	3,367.97	3,367.79	117.37	95.83	-90.30	-647.86	-4,103.51	1,139.67	926.46	213.21	5.345			
7,700.00	3,410.43	3,368.61	3,368.43	120.11	95.86	-90.34	-647.86	-4,103.51	1,204.88	988.88	215.99	5.578			
7,800.00	3,411.08	3,369.26	3,369.08	122.87	95.90	-90.38	-647.86	-4,103.51	1,274.60	1,055.83	218.78	5.826			
7,900.00	3,411.72	3,369.91	3,369.72	125.62	95.93	-90.42	-647.86	-4,103.51	1,348.14	1,126.58	221.56	6.085			
8,000.00	3,412.37	3,370.55	3,370.37	128.37	95.96	-90.46	-647.86	-4,103.51	1,424.91	1,200.56	224.34	6.351			
8,100.00	3,413.02	3,371.20	3,371.02	131.13	95.99	-90.51	-647.86	-4,103.51	1,504.41	1,277.28	227.13	6.624			
8,200.00	3,413.66	3,371.84	3,371.66	133.88	96.03	-90.55	-647.86	-4,103.51	1,586.23	1,356.31	229.92	6.899			
8,300.00	3,414.31	3,372.49	3,372.31	136.64	96.06	-90.59	-647.86	-4,103.51	1,670.03	1,437.32	232.71	7.177			
8,400.00	3,414.95	3,373.14	3,372.95	139.40	96.09	-90.63	-647.86	-4,103.51	1,755.52	1,520.03	235.49	7.455			
8,500.00	3,415.60	3,373.78	3,373.60	142.16	96.13	-90.67	-647.86	-4,103.51	1,842.48	1,604.20	238.29	7.732			
8,600.00	3,416.25	3,374.43	3,374.25	144.92	96.16	-90.71	-647.86	-4,103.51	1,930.70	1,689.63	241.08	8.009			
8,700.00	3,416.89	3,375.07	3,374.89	147.68	96.19	-90.76	-647.86	-4,103.51	2,020.02	1,776.15	243.87	8.283			
8,800.00	3,417.54	3,375.72	3,375.54	150.45	96.23	-90.80	-647.86	-4,103.51	2,110.30	1,863.63	246.66	8.555			
8,900.00	3,418.18	3,376.37	3,376.18	153.21	96.26	-90.84	-647.86	-4,103.51	2,201.41	1,951.96	249.45	8.825			
9,000.00	3,418.83	3,377.01	3,376.83	155.97	96.29	-90.88	-647.86	-4,103.51	2,293.27	2,041.02	252.25	9.091			
9,100.00	3,419.48	3,377.66	3,377.48	158.74	96.33	-90.92	-647.86	-4,103.51	2,385.78	2,130.74	255.04	9.354			
9,200.00	3,420.12	3,378.30	3,378.12	161.51	96.36	-90.96	-647.86	-4,103.51	2,478.88	2,221.04	257.84	9.614			
9,300.00	3,420.77	3,378.95	3,378.77	164.27	96.39	-91.01	-647.86	-4,103.51	2,572.49	2,311.85	260.64	9.870			
9,400.00	3,421.41	3,379.60	3,379.41	167.04	96.43	-91.05	-647.86	-4,103.51	2,666.56	2,403.13	263.43	10.122			
9,500.00	3,422.06	3,380.24	3,380.06	169.81	96.46	-91.09	-647.86	-4,103.51	2,761.05	2,494.82	266.23	10.371			

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.29-T32N-R08W - San Juan 32-8 Unit 232A - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 219-INC_ONLY<10													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (")	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	3,422.70	3,380.89	3,380.70	172.58	96.49	-91.13	-647.86	-4,103.51	2,855.92	2,586.89	269.03	10.616		
9,700.00	3,423.35	3,381.53	3,381.35	175.35	96.53	-91.17	-647.86	-4,103.51	2,951.13	2,679.30	271.82	10.857		
9,800.00	3,424.00	3,382.18	3,382.00	178.12	96.56	-91.21	-647.86	-4,103.51	3,046.64	2,772.02	274.62	11.094		
9,900.00	3,424.64	3,382.83	3,382.64	180.89	96.59	-91.26	-647.86	-4,103.51	3,142.43	2,865.01	277.42	11.327		
10,000.00	3,425.29	3,383.47	3,383.29	183.66	96.63	-91.30	-647.86	-4,103.51	3,238.48	2,958.25	280.22	11.557		
10,100.00	3,425.93	3,384.12	3,383.93	186.43	96.66	-91.34	-647.86	-4,103.51	3,334.75	3,051.73	283.02	11.783		
10,200.00	3,426.58	3,384.76	3,384.58	189.21	96.69	-91.38	-647.86	-4,103.51	3,431.25	3,145.42	285.82	12.005		
10,300.00	3,427.23	3,385.41	3,385.23	191.98	96.72	-91.42	-647.86	-4,103.51	3,527.93	3,239.31	288.62	12.223		
10,400.00	3,427.87	3,386.06	3,385.87	194.75	96.76	-91.46	-647.86	-4,103.51	3,624.80	3,333.37	291.43	12.438		
10,500.00	3,428.52	3,386.70	3,386.52	197.53	96.79	-91.51	-647.86	-4,103.51	3,721.83	3,427.60	294.23	12.650		
10,600.00	3,429.16	3,387.35	3,387.16	200.30	96.82	-91.55	-647.86	-4,103.51	3,819.01	3,521.99	297.03	12.857		
10,700.00	3,429.81	3,387.99	3,387.81	203.07	96.86	-91.59	-647.86	-4,103.51	3,916.34	3,616.51	299.83	13.062		
10,800.00	3,430.45	3,388.64	3,388.45	205.85	96.89	-91.63	-647.86	-4,103.51	4,013.80	3,711.17	302.63	13.263		
10,884.41	3,431.00	3,389.18	3,389.00	208.19	96.92	-91.67	-647.86	-4,103.51	4,096.15	3,791.16	305.00	13.430		



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.30-T32N-R08W - San Juan 32-8 Unit 233 - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 123-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	-100.66	-1,409.62	-7,488.87	7,620.79				
100.00	100.00	13.85	13.85	0.10	0.14	-100.66	-1,409.70	-7,488.87	7,620.40	7,620.16	0.24	N/A	
200.00	200.00	123.00	123.00	0.32	1.25	-100.66	-1,409.62	-7,488.87	7,620.38	7,618.80	1.58	4,838.142	
234.01	234.01	155.01	155.01	0.40	1.91	-100.66	-1,409.62	-7,488.87	7,620.38	7,618.07	2.30	3,306.514	
300.00	300.00	221.00	221.00	0.55	3.25	-100.66	-1,409.62	-7,488.87	7,620.38	7,616.58	3.80	2,005.771	
400.00	400.00	328.00	327.99	0.77	5.44	-100.66	-1,409.62	-7,488.87	7,620.38	7,614.17	6.21	1,227.729	
500.00	500.00	422.96	422.95	0.99	7.09	-100.66	-1,409.45	-7,488.87	7,620.35	7,612.26	8.09	942.498	
600.00	600.00	521.79	521.78	1.22	8.81	-100.66	-1,409.35	-7,488.87	7,620.33	7,610.30	10.03	759.667	
667.48	667.48	588.49	588.48	1.37	9.97	-100.66	-1,409.33	-7,488.87	7,620.33	7,608.98	11.34	671.730	
700.00	700.00	620.63	620.62	1.44	10.53	-100.66	-1,409.34	-7,488.87	7,620.33	7,608.35	11.98	636.243	
800.00	800.00	719.47	719.46	1.67	12.25	-100.66	-1,409.40	-7,488.87	7,620.34	7,606.42	13.92	547.318	
900.00	900.00	818.32	818.30	1.89	13.98	-100.66	-1,409.55	-7,488.87	7,620.37	7,604.50	15.87	480.202	
1,000.00	1,000.00	921.02	921.00	2.12	15.55	-100.66	-1,409.62	-7,488.87	7,620.38	7,602.71	17.67	431.222	
1,100.00	1,100.00	1,021.02	1,021.00	2.34	17.00	-100.66	-1,409.62	-7,488.87	7,620.38	7,601.03	19.35	393.916	
1,200.00	1,200.00	1,121.02	1,121.00	2.57	18.45	-100.66	-1,409.62	-7,488.87	7,620.38	7,599.36	21.02	362.551	
1,300.00	1,300.00	1,221.03	1,221.00	2.79	19.90	-100.66	-1,409.62	-7,488.87	7,620.38	7,597.69	22.69	335.813	
1,400.00	1,400.00	1,321.03	1,321.00	3.02	21.35	-100.66	-1,409.62	-7,488.87	7,620.38	7,596.01	24.37	312.748	
1,500.00	1,500.00	1,411.92	1,411.89	3.24	23.41	-100.66	-1,410.09	-7,488.87	7,620.47	7,593.82	26.65	285.938	
1,600.00	1,600.00	1,517.26	1,517.22	3.47	26.18	-100.67	-1,410.58	-7,488.87	7,620.56	7,590.91	29.65	257.055	
1,700.00	1,700.00	1,622.57	1,622.53	3.69	28.95	-100.67	-1,410.66	-7,488.87	7,620.57	7,587.93	32.64	233.474	
1,800.00	1,800.00	1,727.86	1,727.82	3.92	31.72	-100.67	-1,410.35	-7,488.87	7,620.52	7,584.88	35.63	213.857	
1,900.00	1,900.00	1,836.00	1,835.97	4.14	34.56	-100.66	-1,409.62	-7,488.87	7,620.39	7,581.69	38.70	196.897	
1,939.20	1,939.20	1,860.24	1,860.20	4.23	35.50	-100.66	-1,409.62	-7,488.87	7,620.38	7,580.65	39.73	191.824	
2,000.00	2,000.00	1,921.04	1,921.00	4.37	37.84	-100.66	-1,409.62	-7,488.87	7,620.38	7,578.17	42.21	180.539	
2,033.53	2,033.53	1,954.58	1,954.53	4.44	39.14	-100.66	-1,409.62	-7,488.87	7,620.38	7,576.80	43.58	174.866	
2,100.00	2,099.98	2,021.03	2,020.98	4.58	41.70	-11.11	-1,409.62	-7,488.87	7,618.87	7,572.60	46.26	164.687	
2,200.00	2,199.63	2,120.69	2,120.63	4.79	45.55	-11.19	-1,409.62	-7,488.87	7,610.90	7,560.82	50.08	151.981	
2,300.00	2,298.47	2,219.54	2,219.47	5.01	49.36	-11.33	-1,409.62	-7,488.87	7,596.13	7,542.55	53.58	141.765	
2,400.00	2,396.02	2,317.10	2,317.02	5.27	53.13	-11.53	-1,409.62	-7,488.87	7,574.63	7,517.92	56.71	133.564	
2,500.00	2,491.80	2,421.31	2,421.21	5.59	56.96	-11.82	-1,409.48	-7,488.87	7,546.49	7,486.96	59.54	126.753	
2,600.00	2,585.35	2,511.42	2,511.31	6.01	59.62	-12.18	-1,409.05	-7,488.87	7,511.81	7,450.93	60.88	123.383	
2,700.00	2,676.21	2,598.95	2,598.83	6.55	62.21	-12.63	-1,408.85	-7,488.87	7,470.87	7,409.07	61.79	120.901	
2,800.00	2,763.94	2,683.48	2,683.35	7.24	64.71	-13.18	-1,408.85	-7,488.87	7,423.86	7,361.59	62.26	119.231	
2,900.00	2,848.12	2,764.59	2,764.45	8.10	67.11	-13.86	-1,409.03	-7,488.87	7,371.01	7,308.70	62.31	118.302	
3,000.00	2,928.32	2,841.88	2,841.73	9.14	69.39	-14.68	-1,409.36	-7,488.87	7,312.59	7,250.63	61.95	118.033	
3,100.00	3,004.16	2,923.16	2,923.01	10.38	71.55	-15.69	-1,409.69	-7,488.87	7,248.84	7,187.56	61.28	118.291	
3,200.00	3,075.28	2,996.00	2,995.85	11.81	73.26	-16.92	-1,409.76	-7,488.87	7,180.05	7,119.90	60.15	119.372	
3,300.00	3,141.32	3,063.64	3,063.48	13.42	74.85	-18.41	-1,409.74	-7,488.87	7,106.58	7,047.59	59.00	120.458	
3,400.00	3,201.96	3,145.00	3,144.84	15.20	76.75	-20.34	-1,409.62	-7,488.87	7,028.83	6,970.42	58.41	120.328	
3,500.00	3,256.92	3,178.08	3,177.92	17.15	77.63	-22.56	-1,409.62	-7,488.87	6,947.14	6,889.41	57.73	120.345	
3,600.00	3,305.91	3,227.07	3,226.91	19.25	78.93	-25.48	-1,409.62	-7,488.87	6,861.97	6,803.40	58.57	117.156	
3,658.53	3,331.72	3,252.88	3,252.72	20.54	79.61	-27.56	-1,409.62	-7,488.87	6,810.67	6,750.83	59.85	113.799	
3,658.53	3,331.72	3,252.89	3,252.72	20.54	79.61	-27.56	-1,409.62	-7,488.87	6,810.67	6,750.82	59.85	113.799	
3,700.00	3,347.89	3,269.05	3,268.89	21.18	80.04	-33.33	-1,409.62	-7,488.87	6,773.45	6,709.44	64.00	105.833	
3,750.00	3,363.69	3,284.86	3,284.69	21.66	80.46	-42.38	-1,409.62	-7,488.87	6,727.36	6,654.48	72.89	92.296	
3,800.00	3,375.35	3,296.51	3,296.35	22.22	80.77	-54.40	-1,409.62	-7,488.87	6,680.31	6,594.90	85.41	78.213	
3,850.00	3,382.77	3,303.93	3,303.77	22.86	80.96	-69.50	-1,409.62	-7,488.87	6,632.64	6,534.79	97.86	67.779	
3,900.00	3,385.89	3,307.06	3,306.89	23.57	81.05	-86.27	-1,409.62	-7,488.87	6,584.74	6,480.26	104.47	63.027	
3,911.24	3,386.00	3,307.17	3,307.00	23.73	81.05	-90.00	-1,409.62	-7,488.87	6,573.97	6,469.20	104.77	62.748	
3,923.58	3,386.04	3,307.21	3,307.04	23.92	81.05	-88.78	-1,409.62	-7,488.87	6,562.16	6,457.19	104.96	62.518	
4,000.00	3,386.54	3,307.70	3,307.54	25.15	81.06	-88.79	-1,409.62	-7,488.87	6,489.05	6,382.83	106.21	61.094	
4,100.00	3,387.18	3,308.35	3,308.18	26.94	81.08	-88.81	-1,409.62	-7,488.87	6,393.49	6,285.47	108.02	59.189	

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.30-T32N-R08W - San Juan 32-8 Unit 233 - Original Hole - Original Hole														Offset Site Error:	0.00 usft
Survey Program: 123-INC_ONLY<10														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (")	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)	Offset Wellbore Centre +E/-W (usft)							
4,200.00	3,387.83	3,309.00	3,308.83	28.88	81.10	-88.83	-1,409.62	-7,488.87	6,298.08	6,188.10	109.98	57.264			
4,300.00	3,388.47	3,309.64	3,309.47	30.95	81.12	-88.85	-1,409.62	-7,488.87	6,202.81	6,090.73	112.08	55.345			
4,400.00	3,389.12	3,310.29	3,310.12	33.13	81.13	-88.87	-1,409.62	-7,488.87	6,107.69	5,993.41	114.27	53.448			
4,500.00	3,389.77	3,310.93	3,310.77	35.39	81.15	-88.89	-1,409.62	-7,488.87	6,012.73	5,896.17	116.56	51.586			
4,600.00	3,390.41	3,311.58	3,311.41	37.73	81.17	-88.91	-1,409.62	-7,488.87	5,917.93	5,799.02	118.91	49.768			
4,700.00	3,391.06	3,312.23	3,312.06	40.12	81.18	-88.93	-1,409.62	-7,488.87	5,823.31	5,701.99	121.32	47.999			
4,800.00	3,391.70	3,312.87	3,312.70	42.56	81.20	-88.95	-1,409.62	-7,488.87	5,728.87	5,605.09	123.78	46.283			
4,900.00	3,392.35	3,313.52	3,313.35	45.04	81.22	-88.97	-1,409.62	-7,488.87	5,634.62	5,508.34	126.28	44.620			
5,000.00	3,392.99	3,314.16	3,313.99	47.56	81.24	-88.99	-1,409.62	-7,488.87	5,540.58	5,411.77	128.81	43.013			
5,100.00	3,393.64	3,314.81	3,314.64	50.10	81.25	-89.01	-1,409.62	-7,488.87	5,446.75	5,315.37	131.37	41.460			
5,200.00	3,394.29	3,315.46	3,315.29	52.67	81.27	-89.02	-1,409.62	-7,488.87	5,353.14	5,219.17	133.96	39.960			
5,300.00	3,394.93	3,316.10	3,315.93	55.26	81.29	-89.04	-1,409.62	-7,488.87	5,259.76	5,123.19	136.57	38.513			
5,400.00	3,395.58	3,316.75	3,316.58	57.87	81.30	-89.06	-1,409.62	-7,488.87	5,166.63	5,027.44	139.20	37.118			
5,500.00	3,396.22	3,317.39	3,317.22	60.49	81.32	-89.08	-1,409.62	-7,488.87	5,073.77	4,931.93	141.84	35.772			
5,600.00	3,396.87	3,318.04	3,317.87	63.13	81.34	-89.10	-1,409.62	-7,488.87	4,981.18	4,836.69	144.49	34.473			
5,700.00	3,397.52	3,318.69	3,318.52	65.78	81.36	-89.12	-1,409.62	-7,488.87	4,888.88	4,741.72	147.16	33.221			
5,800.00	3,398.16	3,319.33	3,319.16	68.44	81.37	-89.14	-1,409.62	-7,488.87	4,796.89	4,647.05	149.84	32.013			
5,900.00	3,398.81	3,319.98	3,319.81	71.12	81.39	-89.16	-1,409.62	-7,488.87	4,705.23	4,552.70	152.53	30.848			
6,000.00	3,399.45	3,320.62	3,320.45	73.80	81.41	-89.18	-1,409.62	-7,488.87	4,613.92	4,458.69	155.23	29.723			
6,100.00	3,400.10	3,321.27	3,321.10	76.48	81.42	-89.20	-1,409.62	-7,488.87	4,522.97	4,365.03	157.93	28.638			
6,200.00	3,400.75	3,321.91	3,321.75	79.18	81.44	-89.22	-1,409.62	-7,488.87	4,432.41	4,271.76	160.65	27.591			
6,300.00	3,401.39	3,322.56	3,322.39	81.88	81.46	-89.24	-1,409.62	-7,488.87	4,342.27	4,178.90	163.36	26.580			
6,400.00	3,402.04	3,323.21	3,323.04	84.59	81.48	-89.26	-1,409.62	-7,488.87	4,252.56	4,086.47	166.09	25.604			
6,500.00	3,402.68	3,323.85	3,323.68	87.30	81.49	-89.28	-1,409.62	-7,488.87	4,163.33	3,994.51	168.82	24.662			
6,600.00	3,403.33	3,324.50	3,324.33	90.02	81.51	-89.30	-1,409.62	-7,488.87	4,074.59	3,903.04	171.55	23.751			
6,700.00	3,403.97	3,325.14	3,324.97	92.74	81.53	-89.32	-1,409.62	-7,488.87	3,986.39	3,812.10	174.29	22.872			
6,800.00	3,404.62	3,325.79	3,325.62	95.46	81.54	-89.34	-1,409.62	-7,488.87	3,898.76	3,721.73	177.03	22.023			
6,900.00	3,405.27	3,326.44	3,326.27	98.19	81.56	-89.36	-1,409.62	-7,488.87	3,811.74	3,631.96	179.78	21.202			
7,000.00	3,405.91	3,327.08	3,326.91	100.92	81.58	-89.38	-1,409.62	-7,488.87	3,725.37	3,542.84	182.53	20.410			
7,100.00	3,406.56	3,327.73	3,327.56	103.66	81.60	-89.39	-1,409.62	-7,488.87	3,639.69	3,454.41	185.28	19.644			
7,200.00	3,407.20	3,328.37	3,328.20	106.39	81.61	-89.41	-1,409.62	-7,488.87	3,554.77	3,366.73	188.03	18.905			
7,300.00	3,407.85	3,329.02	3,328.85	109.13	81.63	-89.43	-1,409.62	-7,488.87	3,470.65	3,279.86	190.79	18.191			
7,400.00	3,408.50	3,329.67	3,329.50	111.88	81.65	-89.45	-1,409.62	-7,488.87	3,387.39	3,193.84	193.55	17.501			
7,500.00	3,409.14	3,330.31	3,330.14	114.62	81.66	-89.47	-1,409.62	-7,488.87	3,305.06	3,108.74	196.31	16.836			
7,600.00	3,409.79	3,330.96	3,330.79	117.37	81.68	-89.49	-1,409.62	-7,488.87	3,223.72	3,024.65	199.08	16.193			
7,700.00	3,410.43	3,331.60	3,331.43	120.11	81.70	-89.51	-1,409.62	-7,488.87	3,143.47	2,941.63	201.84	15.574			
7,800.00	3,411.08	3,332.25	3,332.08	122.87	81.72	-89.53	-1,409.62	-7,488.87	3,064.38	2,859.77	204.61	14.977			
7,900.00	3,411.72	3,332.89	3,332.72	125.62	81.73	-89.55	-1,409.62	-7,488.87	2,986.54	2,779.16	207.38	14.401			
8,000.00	3,412.37	3,333.54	3,333.37	128.37	81.75	-89.57	-1,409.62	-7,488.87	2,910.05	2,699.90	210.15	13.848			
8,100.00	3,413.02	3,334.19	3,334.02	131.13	81.77	-89.59	-1,409.62	-7,488.87	2,835.03	2,622.11	212.92	13.315			
8,200.00	3,413.66	3,334.83	3,334.66	133.88	81.78	-89.61	-1,409.62	-7,488.87	2,761.59	2,545.90	215.69	12.803			
8,300.00	3,414.31	3,335.48	3,335.31	136.64	81.80	-89.63	-1,409.62	-7,488.87	2,689.87	2,471.40	218.47	12.312			
8,400.00	3,414.95	3,336.12	3,335.95	139.40	81.82	-89.65	-1,409.62	-7,488.87	2,620.00	2,398.75	221.25	11.842			
8,500.00	3,415.60	3,336.77	3,336.60	142.16	81.83	-89.67	-1,409.62	-7,488.87	2,552.14	2,328.11	224.02	11.392			
8,600.00	3,416.25	3,337.42	3,337.25	144.92	81.85	-89.69	-1,409.62	-7,488.87	2,486.44	2,259.64	226.80	10.963			
8,700.00	3,416.89	3,338.06	3,337.89	147.68	81.87	-89.71	-1,409.62	-7,488.87	2,423.09	2,193.51	229.58	10.554			
8,800.00	3,417.54	3,338.71	3,338.54	150.45	81.89	-89.73	-1,409.62	-7,488.87	2,362.28	2,129.92	232.36	10.166			
8,900.00	3,418.18	3,339.35	3,339.18	153.21	81.90	-89.75	-1,409.62	-7,488.87	2,304.21	2,069.07	235.14	9.799			
9,000.00	3,418.83	3,340.00	3,339.83	155.97	81.92	-89.77	-1,409.62	-7,488.87	2,249.08	2,011.16	237.92	9.453			
9,100.00	3,419.48	3,340.65	3,340.48	158.74	81.94	-89.78	-1,409.62	-7,488.87	2,197.12	1,956.42	240.71	9.128			
9,200.00	3,420.12	3,341.29	3,341.12	161.51	81.95	-89.80	-1,409.62	-7,488.87	2,148.57	1,905.08	243.49	8.824			
9,300.00	3,420.77	3,341.94	3,341.77	164.27	81.97	-89.82	-1,409.62	-7,488.87	2,103.65	1,857.38	246.27	8.542			

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.30-T32N-R08W - San Juan 32-8 Unit 233 - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 123-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)						
9,400.00	3,421.41	3,342.58	3,342.41	167.04	81.99	-89.84	-1,409.62	-7,488.87	2,062.60	1,813.54	249.06	8.282		
9,500.00	3,422.06	3,343.23	3,343.06	169.81	82.01	-89.86	-1,409.62	-7,488.87	2,025.66	1,773.82	251.84	8.043		
9,600.00	3,422.70	3,343.88	3,343.70	172.58	82.02	-89.88	-1,409.62	-7,488.87	1,993.06	1,738.43	254.63	7.827		
9,700.00	3,423.35	3,344.52	3,344.35	175.35	82.04	-89.90	-1,409.62	-7,488.87	1,965.02	1,707.60	257.42	7.634		
9,800.00	3,424.00	3,345.17	3,345.00	178.12	82.06	-89.92	-1,409.62	-7,488.87	1,941.72	1,681.52	260.20	7.462		
9,900.00	3,424.64	3,345.81	3,345.64	180.89	82.07	-89.94	-1,409.62	-7,488.87	1,923.35	1,660.35	262.99	7.313		
10,000.00	3,425.29	3,346.46	3,346.29	183.66	82.09	-89.96	-1,409.62	-7,488.87	1,910.04	1,644.26	265.78	7.187		
10,100.00	3,425.93	3,347.10	3,346.93	186.43	82.11	-89.98	-1,409.62	-7,488.87	1,901.90	1,633.33	268.57	7.082		
10,200.00	3,426.58	3,347.75	3,347.58	189.21	82.13	-90.00	-1,409.62	-7,488.87	1,899.00	1,627.64	271.36	6.998		
10,205.09	3,426.61	3,347.78	3,347.61	189.35	82.13	-90.00	-1,409.62	-7,488.87	1,899.00	1,627.50	271.50	6.994 CC		
10,300.00	3,427.23	3,348.40	3,348.23	191.98	82.14	-90.02	-1,409.62	-7,488.87	1,901.37	1,627.22	274.15	6.936 ES		
10,400.00	3,427.87	3,349.04	3,348.87	194.75	82.16	-90.04	-1,409.62	-7,488.87	1,908.97	1,632.03	276.94	6.893		
10,500.00	3,428.52	3,349.69	3,349.52	197.53	82.18	-90.06	-1,409.62	-7,488.87	1,921.76	1,642.03	279.73	6.870		
10,600.00	3,429.16	3,350.33	3,350.16	200.30	82.19	-90.08	-1,409.62	-7,488.87	1,939.62	1,657.10	282.52	6.865 SF		
10,700.00	3,429.81	3,350.98	3,350.81	203.07	82.21	-90.10	-1,409.62	-7,488.87	1,962.42	1,677.12	285.31	6.878		
10,800.00	3,430.45	3,351.63	3,351.45	205.85	82.23	-90.12	-1,409.62	-7,488.87	1,990.00	1,701.90	288.10	6.907		
10,884.41	3,431.00	3,352.17	3,352.00	208.19	82.24	-90.13	-1,409.62	-7,488.87	2,016.84	1,726.38	290.46	6.944		

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	Local Co-ordinate Reference:	Well San Juan 32-8 Unit 232H
Project:	San Juan Co., NM (NAD27)	TVD Reference:	KB @ 6671.00usft
Reference Site:	Sec.28-T32N-R08W	MD Reference:	KB @ 6671.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	San Juan 32-8 Unit 232H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev0	Offset TVD Reference:	Offset Datum

Offset Design Sec.30-T32N-R08W - San Juan 32-8 Unit 239A - Original Hole - Original Hole													Offset Site Error: 0.00 usft			
Survey Program: 220-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)	Offset Wellbore Centre +E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-95.97	-1,000.81	-9,575.56	9,627.72							
100.00	100.00	107.83	107.83	0.10	1.43	-95.97	-1,001.29	-9,575.56	9,627.77	9,626.24	1.52	6,314.008				
200.00	200.00	220.00	220.00	-0.32	2.92	-95.97	-1,000.81	-9,575.56	9,627.72	9,624.49	3.24	2,975.077				
237.88	237.88	245.88	245.88	0.41	3.60	-95.97	-1,000.81	-9,575.56	9,627.72	9,623.71	4.01	2,402.564				
300.00	300.00	308.00	308.00	0.55	5.25	-95.97	-1,000.81	-9,575.56	9,627.72	9,621.92	5.79	1,661.779				
400.00	400.00	408.01	408.00	0.77	7.90	-95.97	-1,000.81	-9,575.56	9,627.72	9,619.05	8.67	1,110.564				
500.00	500.00	508.01	508.00	0.99	10.55	-95.97	-1,000.81	-9,575.56	9,627.72	9,616.17	11.54	833.943				
600.00	600.00	608.02	608.00	1.22	13.20	-95.97	-1,000.81	-9,575.56	9,627.72	9,613.30	14.42	667.645				
700.00	700.00	714.00	713.97	1.44	16.01	-95.97	-1,000.81	-9,575.56	9,627.72	9,610.26	17.45	551.593				
735.45	735.45	743.48	743.45	1.52	16.79	-95.97	-1,000.81	-9,575.56	9,627.72	9,609.40	18.32	525.661				
800.00	800.00	808.03	808.00	1.67	18.50	-95.97	-1,000.81	-9,575.56	9,627.72	9,607.54	20.17	477.291				
900.00	900.00	908.03	908.00	1.89	21.15	-95.97	-1,000.81	-9,575.56	9,627.72	9,604.67	23.05	417.739				
1,000.00	1,000.00	1,008.04	1,008.00	2.12	23.80	-95.97	-1,000.81	-9,575.56	9,627.72	9,601.79	25.92	371.400				
1,100.00	1,100.00	1,108.05	1,108.00	2.34	26.46	-95.97	-1,000.81	-9,575.56	9,627.72	9,598.92	28.80	334.315				
1,200.00	1,200.00	1,208.05	1,208.00	2.57	29.11	-95.97	-1,000.81	-9,575.56	9,627.72	9,596.04	31.67	303.963				
1,300.00	1,300.00	1,308.06	1,308.00	2.79	31.76	-95.97	-1,000.81	-9,575.56	9,627.72	9,593.17	34.55	278.664				
1,400.00	1,400.00	1,408.06	1,408.00	3.02	34.41	-95.97	-1,000.81	-9,575.56	9,627.72	9,590.29	37.43	257.253				
1,500.00	1,500.00	1,508.07	1,508.00	3.24	37.06	-95.97	-1,000.81	-9,575.56	9,627.72	9,587.41	40.30	238.897				
1,600.00	1,600.00	1,608.07	1,608.00	3.47	39.71	-95.97	-1,000.81	-9,575.56	9,627.72	9,584.54	43.18	222.986				
1,700.00	1,700.00	1,711.00	1,710.92	3.69	42.44	-95.97	-1,000.81	-9,575.56	9,627.72	9,581.59	46.13	208.711				
1,702.95	1,702.95	1,711.00	1,710.92	3.70	42.44	-95.97	-1,000.81	-9,575.56	9,627.72	9,581.58	46.14	208.681				
1,800.00	1,800.00	1,800.97	1,800.88	3.92	45.94	-95.97	-1,001.52	-9,575.56	9,627.79	9,577.94	49.86	193.113				
1,900.00	1,900.00	1,902.79	1,902.69	4.14	49.90	-95.97	-1,002.16	-9,575.56	9,627.86	9,573.81	54.04	178.150				
2,000.00	2,000.00	2,004.60	2,004.49	4.37	53.86	-95.98	-1,002.61	-9,575.56	9,627.90	9,569.67	58.23	165.340				
2,033.53	2,033.53	2,038.73	2,038.62	4.44	55.19	-95.98	-1,002.72	-9,575.56	9,627.92	9,568.28	59.63	161.448				
2,100.00	2,099.98	2,106.37	2,106.25	4.58	57.83	-6.43	-1,002.89	-9,575.56	9,626.40	9,564.03	62.37	154.339				
2,200.00	2,199.63	2,207.79	2,207.67	4.79	61.77	-6.47	-1,002.98	-9,575.56	9,618.34	9,552.14	66.20	145.301				
2,300.00	2,298.47	2,308.37	2,308.25	5.01	65.69	-6.55	-1,002.89	-9,575.56	9,603.37	9,533.75	69.62	137.939				
2,400.00	2,396.02	2,407.63	2,407.50	5.27	69.55	-6.66	-1,002.63	-9,575.56	9,581.57	9,509.00	72.58	132.020				
2,500.00	2,491.80	2,505.07	2,504.94	5.59	73.34	-6.82	-1,002.21	-9,575.56	9,553.05	9,478.05	75.00	127.367				
2,600.00	2,585.35	2,600.22	2,600.10	6.01	77.05	-7.03	-1,001.63	-9,575.56	9,517.94	9,441.09	76.85	123.850				
2,700.00	2,676.21	2,706.00	2,705.87	6.55	81.16	-7.28	-1,000.81	-9,575.56	9,476.43	9,397.89	78.54	120.654				
2,800.00	2,763.94	2,778.09	2,777.95	7.24	83.97	-7.59	-1,000.28	-9,575.56	9,428.72	9,350.19	78.52	120.074				
2,900.00	2,848.12	2,859.21	2,859.06	8.10	87.13	-7.98	-999.91	-9,575.56	9,375.08	9,296.78	78.30	119.736				
3,000.00	2,928.32	2,936.53	2,936.37	9.14	90.15	-8.45	-999.79	-9,575.56	9,315.77	9,238.34	77.43	120.319				
3,100.00	3,004.16	3,009.66	3,009.48	10.38	93.00	-9.02	-999.89	-9,575.56	9,251.07	9,175.14	75.93	121.832				
3,200.00	3,075.28	3,078.25	3,078.05	11.81	95.67	-9.73	-1,000.16	-9,575.56	9,181.31	9,107.43	73.87	124.289				
3,300.00	3,141.32	3,141.95	3,141.73	13.42	98.15	-10.60	-1,000.57	-9,575.56	9,106.81	9,035.48	71.33	127.671				
3,400.00	3,201.96	3,210.19	3,209.96	15.20	100.32	-11.71	-1,000.81	-9,575.56	9,027.90	8,959.49	68.42	131.954				
3,500.00	3,256.92	3,265.14	3,264.92	17.15	101.77	-13.09	-1,000.81	-9,575.56	8,944.98	8,879.81	65.16	137.269				
3,600.00	3,305.91	3,314.13	3,313.91	19.25	103.07	-14.90	-1,000.81	-9,575.56	8,858.46	8,796.09	62.37	142.035				
3,658.53	3,331.72	3,339.95	3,339.72	20.54	103.76	-16.22	-1,000.81	-9,575.56	8,806.33	8,745.11	61.22	143.852				
3,658.53	3,331.72	3,339.95	3,339.72	20.54	103.76	-16.22	-1,000.81	-9,575.56	8,806.32	8,745.11	61.22	143.852				
3,700.00	3,347.89	3,356.12	3,355.89	21.18	104.18	-20.83	-1,000.81	-9,575.56	8,768.46	8,706.59	61.87	141.731				
3,750.00	3,363.69	3,371.92	3,371.69	21.66	104.60	-28.70	-1,000.81	-9,575.56	8,721.52	8,652.35	69.17	126.087				
3,800.00	3,375.35	3,383.58	3,383.35	22.22	104.91	-40.79	-1,000.81	-9,575.56	8,673.51	8,587.10	86.41	100.374				
3,850.00	3,382.77	3,391.00	3,390.77	22.86	105.11	-59.43	-1,000.81	-9,575.56	8,624.79	8,513.52	111.28	77.508				
3,900.00	3,385.89	3,394.13	3,393.89	23.57	105.19	-84.24	-1,000.81	-9,575.56	8,575.74	8,447.49	128.26	66.862				
3,911.24	3,386.00	3,394.23	3,394.00	23.73	105.19	-90.00	-1,000.81	-9,575.56	8,564.71	8,435.79	128.92	66.435				
3,923.58	3,386.04	3,394.27	3,394.04	23.92	105.19	-88.11	-1,000.81	-9,575.56	8,552.60	8,423.51	129.09	66.254				
4,000.00	3,386.54	3,394.77	3,394.54	25.15	105.21	-88.13	-1,000.81	-9,575.56	8,477.63	8,347.29	130.34	65.043				
4,100.00	3,387.18	3,395.41	3,395.18	26.94	105.22	-88.15	-1,000.81	-9,575.56	8,379.55	8,247.41	132.14	63.412				

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.30-T32N-R08W - San Juan 32-8 Unit 239A - Original Hole - Original Hole												Offset Site Error:	0.00 usft
Survey Program: 220-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
4,200.00	3,387.83	3,396.06	3,395.83	28.88	105.24	-88.18	-1,000.81	-9,575.56	8,281.53	8,147.42	134.11	61.753	
4,300.00	3,388.47	3,396.71	3,396.47	30.95	105.26	-88.20	-1,000.81	-9,575.56	8,183.55	8,047.35	136.20	60.084	
4,400.00	3,389.12	3,397.35	3,397.12	33.13	105.28	-88.22	-1,000.81	-9,575.56	8,085.62	7,947.22	138.40	58.422	
4,500.00	3,389.77	3,398.00	3,397.77	35.39	105.29	-88.24	-1,000.81	-9,575.56	7,987.74	7,847.06	140.68	56.778	
4,600.00	3,390.41	3,398.64	3,398.41	37.73	105.31	-88.27	-1,000.81	-9,575.56	7,889.92	7,746.88	143.04	55.160	
4,700.00	3,391.06	3,399.29	3,399.06	40.12	105.33	-88.29	-1,000.81	-9,575.56	7,792.15	7,646.70	145.45	53.574	
4,800.00	3,391.70	3,399.94	3,399.70	42.56	105.34	-88.31	-1,000.81	-9,575.56	7,694.44	7,546.53	147.91	52.022	
4,900.00	3,392.35	3,400.58	3,400.35	45.04	105.36	-88.33	-1,000.81	-9,575.56	7,596.79	7,446.38	150.41	50.509	
5,000.00	3,392.99	3,401.23	3,400.99	47.56	105.38	-88.36	-1,000.81	-9,575.56	7,499.20	7,346.26	152.94	49.034	
5,100.00	3,393.64	3,401.87	3,401.64	50.10	105.40	-88.38	-1,000.81	-9,575.56	7,401.67	7,246.17	155.50	47.599	
5,200.00	3,394.29	3,402.52	3,402.29	52.67	105.41	-88.40	-1,000.81	-9,575.56	7,304.21	7,146.12	158.09	46.203	
5,300.00	3,394.93	3,403.16	3,402.93	55.26	105.43	-88.42	-1,000.81	-9,575.56	7,206.82	7,046.13	160.70	44.847	
5,400.00	3,395.58	3,403.81	3,403.58	57.87	105.45	-88.45	-1,000.81	-9,575.56	7,109.50	6,946.18	163.32	43.530	
5,500.00	3,396.22	3,404.46	3,404.22	60.49	105.46	-88.47	-1,000.81	-9,575.56	7,012.26	6,846.30	165.97	42.251	
5,600.00	3,396.87	3,405.10	3,404.87	63.13	105.48	-88.49	-1,000.81	-9,575.56	6,915.10	6,746.48	168.62	41.010	
5,700.00	3,397.52	3,405.75	3,405.52	65.78	105.50	-88.51	-1,000.81	-9,575.56	6,818.02	6,646.73	171.29	39.804	
5,800.00	3,398.16	3,406.39	3,406.16	68.44	105.51	-88.54	-1,000.81	-9,575.56	6,721.02	6,547.05	173.97	38.633	
5,900.00	3,398.81	3,407.04	3,406.81	71.12	105.53	-88.56	-1,000.81	-9,575.56	6,624.12	6,447.46	176.66	37.497	
6,000.00	3,399.45	3,407.69	3,407.45	73.80	105.55	-88.58	-1,000.81	-9,575.56	6,527.30	6,347.95	179.36	36.393	
6,100.00	3,400.10	3,408.33	3,408.10	76.48	105.57	-88.60	-1,000.81	-9,575.56	6,430.59	6,248.52	182.06	35.321	
6,200.00	3,400.75	3,408.98	3,408.75	79.18	105.58	-88.63	-1,000.81	-9,575.56	6,333.97	6,149.20	184.78	34.279	
6,300.00	3,401.39	3,409.62	3,409.39	81.88	105.60	-88.65	-1,000.81	-9,575.56	6,237.47	6,049.97	187.49	33.267	
6,400.00	3,402.04	3,410.27	3,410.04	84.59	105.62	-88.67	-1,000.81	-9,575.56	6,141.07	5,950.85	190.22	32.284	
6,500.00	3,402.68	3,410.92	3,410.68	87.30	105.63	-88.69	-1,000.81	-9,575.56	6,044.79	5,851.84	192.95	31.329	
6,600.00	3,403.33	3,411.56	3,411.33	90.02	105.65	-88.72	-1,000.81	-9,575.56	5,948.64	5,752.95	195.68	30.399	
6,700.00	3,403.97	3,412.21	3,411.97	92.74	105.67	-88.74	-1,000.81	-9,575.56	5,852.61	5,654.19	198.42	29.496	
6,800.00	3,404.62	3,412.85	3,412.62	95.46	105.69	-88.76	-1,000.81	-9,575.56	5,756.72	5,555.55	201.16	28.617	
6,900.00	3,405.27	3,413.50	3,413.27	98.19	105.70	-88.78	-1,000.81	-9,575.56	5,660.97	5,457.06	203.91	27.762	
7,000.00	3,405.91	3,414.15	3,413.91	100.92	105.72	-88.81	-1,000.81	-9,575.56	5,565.37	5,358.71	206.66	26.930	
7,100.00	3,406.56	3,414.79	3,414.56	103.66	105.74	-88.83	-1,000.81	-9,575.56	5,469.93	5,260.51	209.41	26.120	
7,200.00	3,407.20	3,415.44	3,415.20	106.39	105.75	-88.85	-1,000.81	-9,575.56	5,374.65	5,162.48	212.17	25.332	
7,300.00	3,407.85	3,416.08	3,415.85	109.13	105.77	-88.87	-1,000.81	-9,575.56	5,279.55	5,064.62	214.92	24.565	
7,400.00	3,408.50	3,416.73	3,416.50	111.88	105.79	-88.90	-1,000.81	-9,575.56	5,184.63	4,966.94	217.68	23.817	
7,500.00	3,409.14	3,417.37	3,417.14	114.62	105.81	-88.92	-1,000.81	-9,575.56	5,089.90	4,869.46	220.45	23.089	
7,600.00	3,409.79	3,418.02	3,417.79	117.37	105.82	-88.94	-1,000.81	-9,575.56	4,995.39	4,772.17	223.21	22.380	
7,700.00	3,410.43	3,418.67	3,418.43	120.11	105.84	-88.96	-1,000.81	-9,575.56	4,901.08	4,675.11	225.98	21.688	
7,800.00	3,411.08	3,419.31	3,419.08	122.87	105.86	-88.98	-1,000.81	-9,575.56	4,807.01	4,578.27	228.75	21.015	
7,900.00	3,411.72	3,419.96	3,419.72	125.62	105.87	-89.01	-1,000.81	-9,575.56	4,713.19	4,481.67	231.51	20.358	
8,000.00	3,412.37	3,420.60	3,420.37	128.37	105.89	-89.03	-1,000.81	-9,575.56	4,619.62	4,385.33	234.29	19.718	
8,100.00	3,413.02	3,421.25	3,421.02	131.13	105.91	-89.05	-1,000.81	-9,575.56	4,526.33	4,289.27	237.06	19.094	
8,200.00	3,413.66	3,421.90	3,421.66	133.88	105.93	-89.07	-1,000.81	-9,575.56	4,433.33	4,193.49	239.83	18.485	
8,300.00	3,414.31	3,422.54	3,422.31	136.64	105.94	-89.10	-1,000.81	-9,575.56	4,340.64	4,098.03	242.61	17.892	
8,400.00	3,414.95	3,423.19	3,422.95	139.40	105.96	-89.12	-1,000.81	-9,575.56	4,248.28	4,002.90	245.38	17.313	
8,500.00	3,415.60	3,423.83	3,423.60	142.16	105.98	-89.14	-1,000.81	-9,575.56	4,156.28	3,908.11	248.16	16.748	
8,600.00	3,416.25	3,424.48	3,424.25	144.92	105.99	-89.16	-1,000.81	-9,575.56	4,064.65	3,813.71	250.94	16.198	
8,700.00	3,416.89	3,425.13	3,424.89	147.68	106.01	-89.19	-1,000.81	-9,575.56	3,973.43	3,719.71	253.72	15.661	
8,800.00	3,417.54	3,425.77	3,425.54	150.45	106.03	-89.21	-1,000.81	-9,575.56	3,882.64	3,626.14	256.50	15.137	
8,900.00	3,418.18	3,426.42	3,426.18	153.21	106.04	-89.23	-1,000.81	-9,575.56	3,792.31	3,533.03	259.28	14.626	
9,000.00	3,418.83	3,427.06	3,426.83	155.97	106.06	-89.25	-1,000.81	-9,575.56	3,702.48	3,440.42	262.07	14.128	
9,100.00	3,419.48	3,427.71	3,427.48	158.74	106.08	-89.28	-1,000.81	-9,575.56	3,613.19	3,348.34	264.85	13.642	
9,200.00	3,420.12	3,428.35	3,428.12	161.51	106.10	-89.30	-1,000.81	-9,575.56	3,524.47	3,256.83	267.63	13.169	
9,300.00	3,420.77	3,429.00	3,428.77	164.27	106.11	-89.32	-1,000.81	-9,575.56	3,436.36	3,165.95	270.42	12.708	

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.30-T32N-R08W - San Juan 32-8 Unit 239A - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 220-INC_ONLY<10													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							
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	Warning	
9,400.00	3,421.41	3,429.65	3,429.41	167.04	106.13	-89.34	-1,000.81	-9,575.56	3,348.93	3,075.73	273.20	12.258		
9,500.00	3,422.06	3,430.29	3,430.06	169.81	106.15	-89.37	-1,000.81	-9,575.56	3,262.22	2,986.23	275.99	11.820		
9,600.00	3,422.70	3,430.94	3,430.70	172.58	106.16	-89.39	-1,000.81	-9,575.56	3,176.29	2,897.51	278.78	11.394		
9,700.00	3,423.35	3,431.58	3,431.35	175.35	106.18	-89.41	-1,000.81	-9,575.56	3,091.21	2,809.64	281.56	10.979		
9,800.00	3,424.00	3,432.23	3,432.00	178.12	106.20	-89.43	-1,000.81	-9,575.56	3,007.04	2,722.69	284.35	10.575		
9,900.00	3,424.64	3,432.88	3,432.64	180.89	106.22	-89.46	-1,000.81	-9,575.56	2,923.87	2,636.73	287.14	10.183		
10,000.00	3,425.29	3,433.52	3,433.29	183.66	106.23	-89.48	-1,000.81	-9,575.56	2,841.79	2,551.86	289.93	9.802		
10,100.00	3,425.93	3,434.17	3,433.93	186.43	106.25	-89.50	-1,000.81	-9,575.56	2,760.89	2,468.17	292.72	9.432		
10,200.00	3,426.58	3,434.81	3,434.58	189.21	106.27	-89.52	-1,000.81	-9,575.56	2,681.28	2,385.77	295.51	9.073		
10,300.00	3,427.23	3,435.46	3,435.23	191.98	106.28	-89.55	-1,000.81	-9,575.56	2,603.07	2,304.77	298.30	8.726		
10,400.00	3,427.87	3,436.11	3,435.87	194.75	106.30	-89.57	-1,000.81	-9,575.56	2,526.40	2,225.31	301.09	8.391		
10,500.00	3,428.52	3,436.75	3,436.52	197.53	106.32	-89.59	-1,000.81	-9,575.56	2,451.41	2,147.53	303.88	8.067		
10,600.00	3,429.16	3,437.40	3,437.16	200.30	106.34	-89.61	-1,000.81	-9,575.56	2,378.27	2,071.60	306.67	7.755		
10,700.00	3,429.81	3,438.04	3,437.81	203.07	106.35	-89.64	-1,000.81	-9,575.56	2,307.14	1,997.68	309.46	7.455		
10,800.00	3,430.45	3,438.69	3,438.45	205.85	106.37	-89.66	-1,000.81	-9,575.56	2,238.22	1,925.96	312.26	7.168		
10,884.41	3,431.00	3,439.23	3,439.00	208.19	106.38	-89.68	-1,000.81	-9,575.56	2,181.92	1,867.31	314.61	6.935 CC, ES, SF		

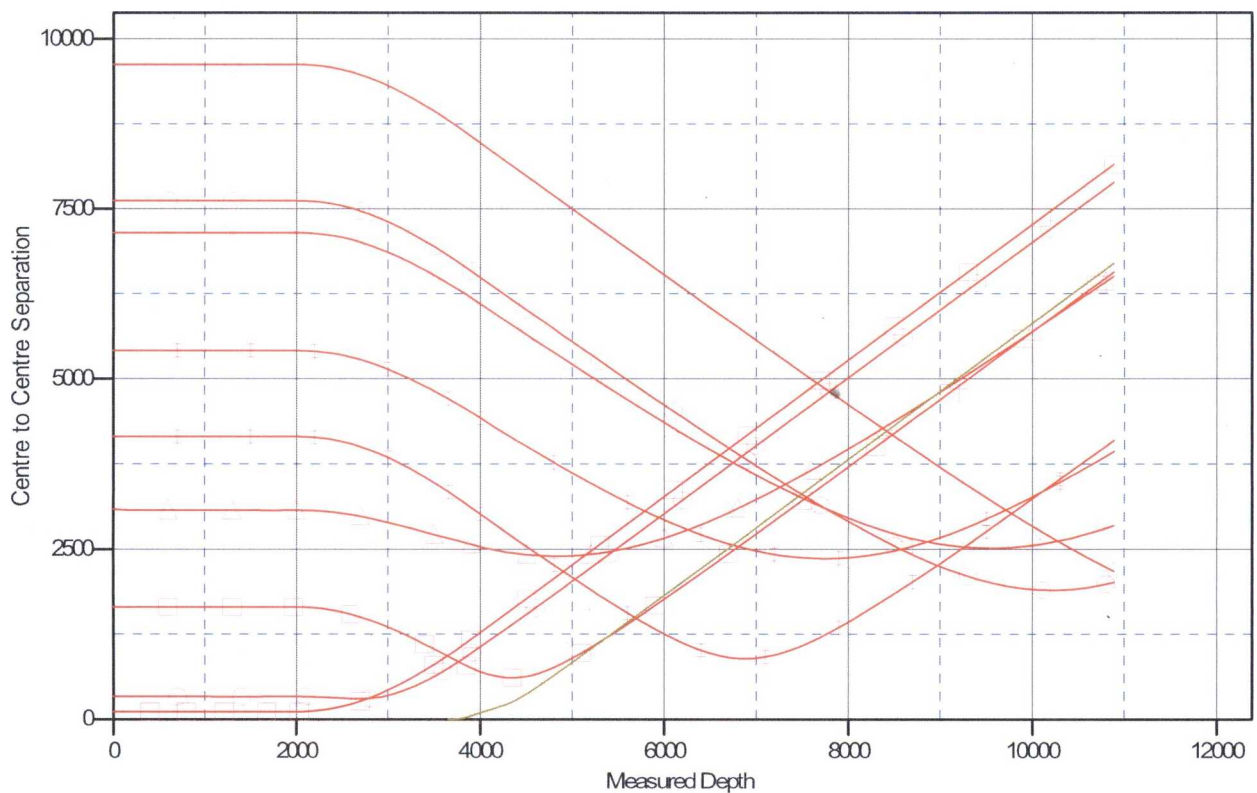
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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 @ 6671.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.83334°W

Coordinates are relative to: San Juan 32-8 Unit 232H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.09°

Ladder Plot



LEGEND

San Juan 32-8 Unit 232A, Original Hole, Original Hole V0	San Juan 32-8 Unit 257A, Original Hole, Original Hole V0	San Juan 32-8 Unit 231A, Original Hole, Original Hole V0
San Juan 32-8 Unit 232, Original Hole, Original Hole V0	Rattlesnake Canyon 003, Original Hole, Original Hole V0	San Juan 32-8 Unit 232H, Pilot Hole, Rev0
San Juan 32-8 Unit 239A, Original Hole, Original Hole V0	San Juan 32-8 Unit 009, Original Hole, Original Hole V0	
San Juan 32-8 Unit 233, Original Hole, Original Hole V0	San Juan 32-8 Unit 050, Original Hole, Original Hole V0	



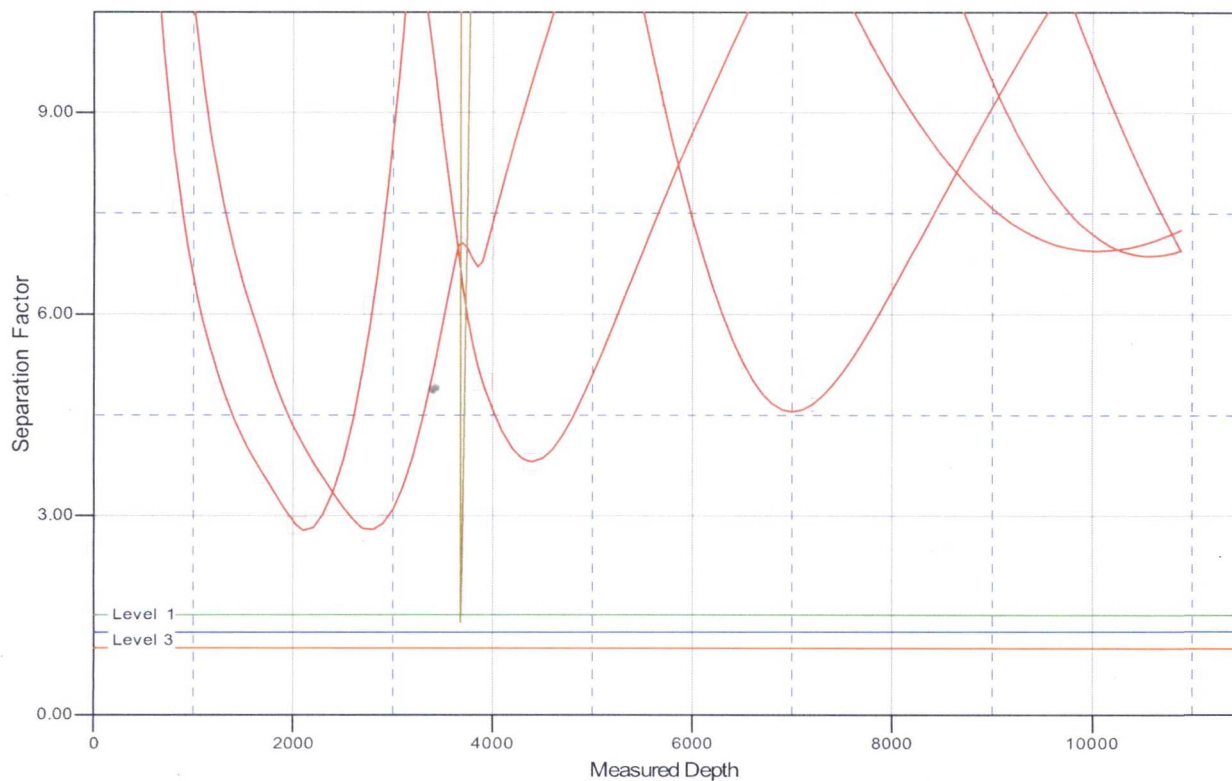
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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 @ 6671.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.83334°W

Coordinates are relative to: San Juan 32-8 Unit 232H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.09°

Separation Factor Plot



LEGEND

San Juan 32-8 Unit 232A, Original Hole, Original Hole V0	San Juan 32-8 Unit 257A, Original Hole, Original Hole V0	San Juan 32-8 Unit 231A, Original Hole, Original Hole V0
San Juan 32-8 Unit 232, Original Hole, Original Hole V0	Rattlesnake Canyon 003, Original Hole, Original Hole V0	San Juan 32-8 Unit 232H, Pilot Hole, Rev0
San Juan 32-8 Unit 239A, Original Hole, Original Hole V0	San Juan 32-8 Unit 009, Original Hole, Original Hole V0	
San Juan 32-8 Unit 233, Original Hole, Original Hole V0	San Juan 32-8 Unit 050, Original Hole, Original Hole V0	



Company: Hilcorp Energy Company
Field: San Juan Co., NM (NAD27)
Location: Sec.28-T32N-R08W
Well: San Juan 32-8 Unit 232H
Borehole: Lat 1
Plan: Rev0



WELL DETAILS: San Juan 32-8 Unit 232H

+N/-S	+E/-W	GL 6656.00	KB @ 6671.00usft	Latitude	Longitude
0.00	0.00	Northings 2168610.42	Eastings 542917.18	36.95964°N	107.68644°W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec
1	3658.53	65.00	270.44	3331.72	6.35	-827.02	0.00	0.00	825.61
2	3911.24	90.00	274.26	3386.00	16.78	-1071.51	10.00	8.97	1070.26
3	3923.58	89.63	274.26	3386.04	17.70	-1083.82	3.00	180.00	1082.60
4	10884.41	89.63	274.26	3431.00	534.58	-8025.28	0.00	0.00	8043.07

DESIGN TARGET DETAILS

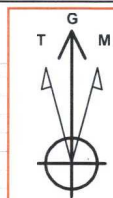
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
SJ 32-8 Unit 232H FTP	3331.72	6.35	-827.02	36.95966°N	107.68927°W
SJ 32-8 Unit 232H Toe	3431.00	534.58	-8025.28	36.96114°N	107.71391°W

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2301.00	2302.58	Ojo Alamo
2346.00	2348.53	Kirtland
3107.00	3247.04	Fruitland
3381.00	3835.09	top of target
3395.00	5310.48	base of target

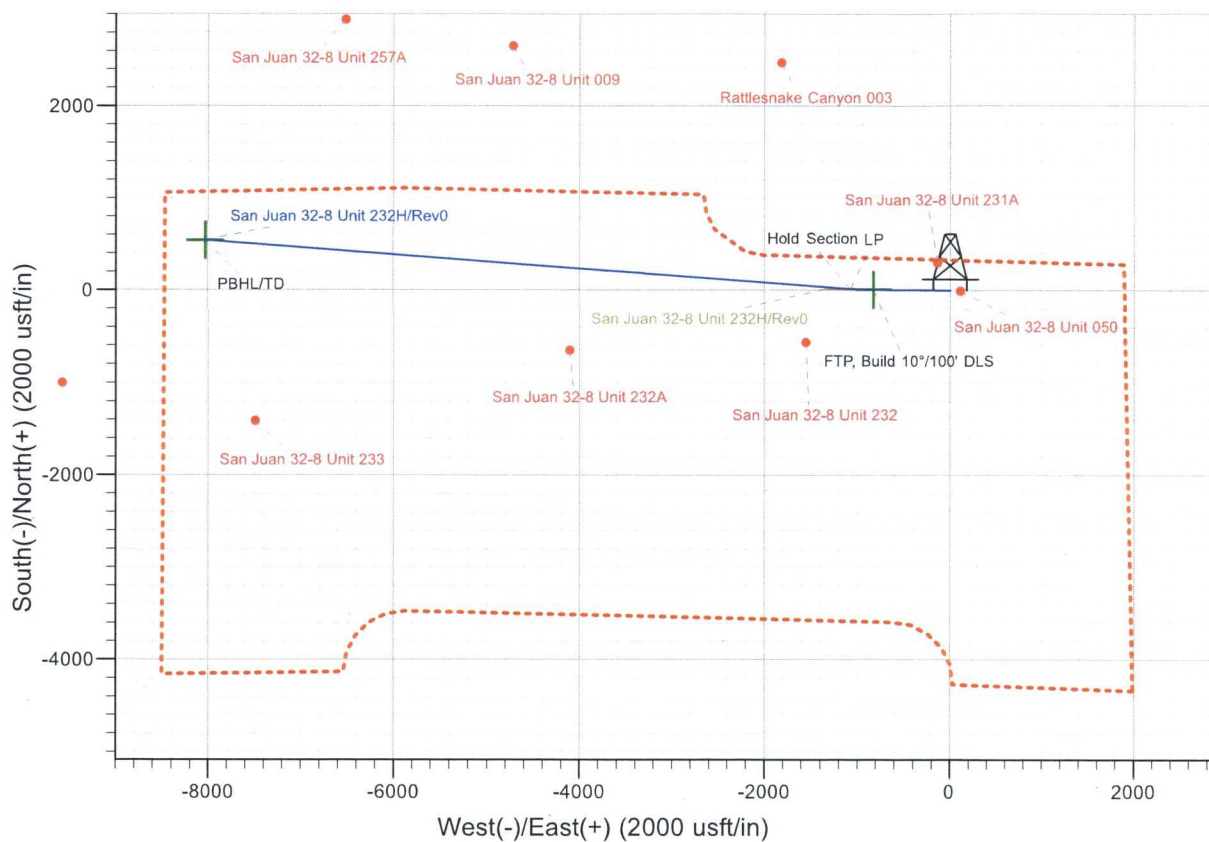
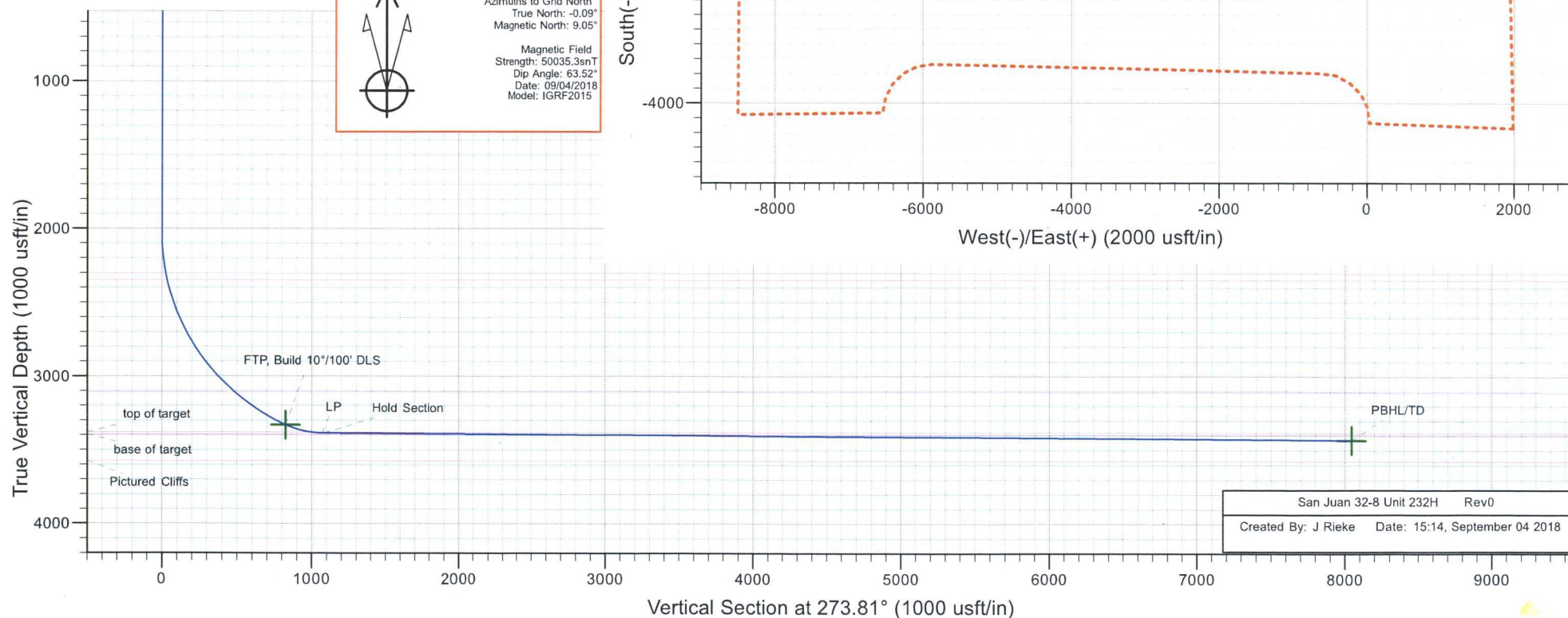
ANNOTATIONS

TVD	MD	Annotation
3331.72	3658.53	FTP, Build 10°/100' DLS
3386.00	3911.24	LP
3386.04	3923.58	Hold Section
3431.00	10884.41	PBHL/TD



Azimuths to Grid North
True North: -0.09°
Magnetic North: 9.05°

Magnetic Field
Strength: 50035.3snT
Dip Angle: 63.52°
Date: 09/04/2018
Model: IGRF2015





Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.28-T32N-R08W

San Juan 32-8 Unit 232H

Lat 1

Plan: Rev0

Standard Planning Report - Geographic

04 September, 2018





Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.28-T32N-R08W
Well: San Juan 32-8 Unit 232H
Wellbore: Lat 1
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.28-T32N-R08W

Site Position: Northing: 2,168,610.42 usft Latitude: 36.95964°N
From: Map Easting: 542,917.18 usft Longitude: 107.68644°W
Position Uncertainty: 0.00 usft Slot Radius: 13.200 in Grid Convergence: 0.09 °

Well San Juan 32-8 Unit 232H

Well Position +N/-S 0.00 usft Northing: 2,168,610.42 usft Latitude: 36.95964°N
+E/-W 0.00 usft Easting: 542,917.18 usft Longitude: 107.68644°W
Position Uncertainty 0.00 usft Wellhead Elevation: 0.00 usft Ground Level: 6,656.00 usft

Wellbore Lat 1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	09/04/18	9.14	63.52	50,035

Design Rev0

Audit Notes:

Version: Phase: PROTOTYPE Tie On Depth: 3,658.53

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	273.81

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
3,658.53	65.00	270.44	3,331.72	6.35	-827.02	0.00	0.00	0.00	0.00	
3,911.24	90.00	274.26	3,386.00	16.78	-1,071.51	10.00	9.89	1.51	8.97	SJ 32-8 Unit 232H To
3,923.58	89.63	274.26	3,386.04	17.70	-1,083.82	3.00	-3.00	0.00	180.00	
10,884.41	89.63	274.26	3,431.00	534.58	-8,025.28	0.00	0.00	0.00	0.00	SJ 32-8 Unit 232H To



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.28-T32N-R08W
Well: San Juan 32-8 Unit 232H
Wellbore: Lat 1
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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
3,658.53	65.00	270.44	3,331.72	6.35	-827.02	2,168,616.77	542,090.17	36.95966°N	107.68928°W
FTP, Build 10°/100' DLS									
3,700.00	69.10	271.13	3,347.89	6.88	-865.19	2,168,617.30	542,051.99	36.95967°N	107.68941°W
3,800.00	78.99	272.67	3,375.35	10.09	-961.16	2,168,620.51	541,956.02	36.95968°N	107.68973°W
3,900.00	88.89	274.10	3,385.89	15.96	-1,060.30	2,168,626.38	541,856.88	36.95969°N	107.69007°W
3,911.24	90.00	274.26	3,386.00	16.78	-1,071.51	2,168,627.20	541,845.67	36.95969°N	107.69011°W
LP									
3,923.58	89.63	274.26	3,386.04	17.70	-1,083.82	2,168,628.12	541,833.37	36.95970°N	107.69015°W
Hold Section									
4,000.00	89.63	274.26	3,386.54	23.37	-1,160.02	2,168,633.79	541,757.16	36.95971°N	107.69041°W
4,100.00	89.63	274.26	3,387.18	30.80	-1,259.75	2,168,641.22	541,657.44	36.95973°N	107.69076°W
4,200.00	89.63	274.26	3,387.83	38.22	-1,359.47	2,168,648.64	541,557.71	36.95975°N	107.69110°W
4,300.00	89.63	274.26	3,388.47	45.65	-1,459.19	2,168,656.07	541,457.99	36.95978°N	107.69144°W
4,400.00	89.63	274.26	3,389.12	53.08	-1,558.91	2,168,663.49	541,358.27	36.95980°N	107.69178°W
4,500.00	89.63	274.26	3,389.77	60.50	-1,658.63	2,168,670.92	541,258.55	36.95982°N	107.69212°W
4,600.00	89.63	274.26	3,390.41	67.93	-1,758.36	2,168,678.35	541,158.83	36.95984°N	107.69246°W
4,700.00	89.63	274.26	3,391.06	75.35	-1,858.08	2,168,685.77	541,059.10	36.95986°N	107.69280°W
4,800.00	89.63	274.26	3,391.70	82.78	-1,957.80	2,168,693.20	540,959.38	36.95988°N	107.69315°W
4,900.00	89.63	274.26	3,392.35	90.20	-2,057.52	2,168,700.62	540,859.66	36.95990°N	107.69349°W
5,000.00	89.63	274.26	3,392.99	97.63	-2,157.24	2,168,708.05	540,759.94	36.95992°N	107.69383°W
5,100.00	89.63	274.26	3,393.64	105.06	-2,256.96	2,168,715.47	540,660.22	36.95994°N	107.69417°W
5,200.00	89.63	274.26	3,394.29	112.48	-2,356.69	2,168,722.90	540,560.50	36.95996°N	107.69451°W
5,300.00	89.63	274.26	3,394.93	119.91	-2,456.41	2,168,730.32	540,460.77	36.95998°N	107.69485°W
5,400.00	89.63	274.26	3,395.58	127.33	-2,556.13	2,168,737.75	540,361.05	36.96000°N	107.69519°W
5,500.00	89.63	274.26	3,396.22	134.76	-2,655.85	2,168,745.18	540,261.33	36.96002°N	107.69553°W
5,600.00	89.63	274.26	3,396.87	142.18	-2,755.57	2,168,752.60	540,161.61	36.96005°N	107.69588°W
5,700.00	89.63	274.26	3,397.52	149.61	-2,855.30	2,168,760.03	540,061.89	36.96007°N	107.69622°W
5,800.00	89.63	274.26	3,398.16	157.03	-2,955.02	2,168,767.45	539,962.16	36.96009°N	107.69656°W
5,900.00	89.63	274.26	3,398.81	164.46	-3,054.74	2,168,774.88	539,862.44	36.96011°N	107.69690°W
6,000.00	89.63	274.26	3,399.45	171.89	-3,154.46	2,168,782.30	539,762.72	36.96013°N	107.69724°W
6,100.00	89.63	274.26	3,400.10	179.31	-3,254.18	2,168,789.73	539,663.00	36.96015°N	107.69758°W
6,200.00	89.63	274.26	3,400.75	186.74	-3,353.90	2,168,797.15	539,563.28	36.96017°N	107.69792°W
6,300.00	89.63	274.26	3,401.39	194.16	-3,453.63	2,168,804.58	539,463.56	36.96019°N	107.69826°W
6,400.00	89.63	274.26	3,402.04	201.59	-3,553.35	2,168,812.01	539,363.83	36.96021°N	107.69861°W
6,500.00	89.63	274.26	3,402.68	209.01	-3,653.07	2,168,819.43	539,264.11	36.96023°N	107.69895°W
6,600.00	89.63	274.26	3,403.33	216.44	-3,752.79	2,168,826.86	539,164.39	36.96025°N	107.69929°W
6,700.00	89.63	274.26	3,403.97	223.86	-3,852.51	2,168,834.28	539,064.67	36.96027°N	107.69963°W
6,800.00	89.63	274.26	3,404.62	231.29	-3,952.24	2,168,841.71	538,964.95	36.96030°N	107.69997°W
6,900.00	89.63	274.26	3,405.27	238.72	-4,051.96	2,168,849.13	538,865.22	36.96032°N	107.70031°W
7,000.00	89.63	274.26	3,405.91	246.14	-4,151.68	2,168,856.56	538,765.50	36.96034°N	107.70065°W
7,100.00	89.63	274.26	3,406.56	253.57	-4,251.40	2,168,863.98	538,665.78	36.96036°N	107.70099°W
7,200.00	89.63	274.26	3,407.20	260.99	-4,351.12	2,168,871.41	538,566.06	36.96038°N	107.70134°W
7,300.00	89.63	274.26	3,407.85	268.42	-4,450.84	2,168,878.84	538,466.34	36.96040°N	107.70168°W
7,400.00	89.63	274.26	3,408.50	275.84	-4,550.57	2,168,886.26	538,366.62	36.96042°N	107.70202°W
7,500.00	89.63	274.26	3,409.14	283.27	-4,650.29	2,168,893.69	538,266.89	36.96044°N	107.70236°W
7,600.00	89.63	274.26	3,409.79	290.69	-4,750.01	2,168,901.11	538,167.17	36.96046°N	107.70270°W
7,700.00	89.63	274.26	3,410.43	298.12	-4,849.73	2,168,908.54	538,067.45	36.96048°N	107.70304°W
7,800.00	89.63	274.26	3,411.08	305.55	-4,949.45	2,168,915.96	537,967.73	36.96050°N	107.70338°W
7,900.00	89.63	274.26	3,411.72	312.97	-5,049.18	2,168,923.39	537,868.01	36.96052°N	107.70372°W
8,000.00	89.63	274.26	3,412.37	320.40	-5,148.90	2,168,930.81	537,768.28	36.96054°N	107.70407°W
8,100.00	89.63	274.26	3,413.02	327.82	-5,248.62	2,168,938.24	537,668.56	36.96057°N	107.70441°W
8,200.00	89.63	274.26	3,413.66	335.25	-5,348.34	2,168,945.67	537,568.84	36.96059°N	107.70475°W
8,300.00	89.63	274.26	3,414.31	342.67	-5,448.06	2,168,953.09	537,469.12	36.96061°N	107.70509°W
8,400.00	89.63	274.26	3,414.95	350.10	-5,547.79	2,168,960.52	537,369.40	36.96063°N	107.70543°W



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.28-T32N-R08W
Well: San Juan 32-8 Unit 232H
Wellbore: Lat 1
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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
8,500.00	89.63	274.26	3,415.60	357.52	-5,647.51	2,168,967.94	537,269.68	36.96065°N	107.70577°W
8,600.00	89.63	274.26	3,416.25	364.95	-5,747.23	2,168,975.37	537,169.95	36.96067°N	107.70611°W
8,700.00	89.63	274.26	3,416.89	372.38	-5,846.95	2,168,982.79	537,070.23	36.96069°N	107.70646°W
8,800.00	89.63	274.26	3,417.54	379.80	-5,946.67	2,168,990.22	536,970.51	36.96071°N	107.70680°W
8,900.00	89.63	274.26	3,418.18	387.23	-6,046.39	2,168,997.65	536,870.79	36.96073°N	107.70714°W
9,000.00	89.63	274.26	3,418.83	394.65	-6,146.12	2,169,005.07	536,771.07	36.96075°N	107.70748°W
9,100.00	89.63	274.26	3,419.48	402.08	-6,245.84	2,169,012.50	536,671.34	36.96077°N	107.70782°W
9,200.00	89.63	274.26	3,420.12	409.50	-6,345.56	2,169,019.92	536,571.62	36.96079°N	107.70816°W
9,300.00	89.63	274.26	3,420.77	416.93	-6,445.28	2,169,027.35	536,471.90	36.96081°N	107.70850°W
9,400.00	89.63	274.26	3,421.41	424.35	-6,545.00	2,169,034.77	536,372.18	36.96084°N	107.70884°W
9,500.00	89.63	274.26	3,422.06	431.78	-6,644.73	2,169,042.20	536,272.46	36.96086°N	107.70919°W
9,600.00	89.63	274.26	3,422.70	439.21	-6,744.45	2,169,049.62	536,172.73	36.96088°N	107.70953°W
9,700.00	89.63	274.26	3,423.35	446.63	-6,844.17	2,169,057.05	536,073.01	36.96090°N	107.70987°W
9,800.00	89.63	274.26	3,424.00	454.06	-6,943.89	2,169,064.48	535,973.29	36.96092°N	107.71021°W
9,900.00	89.63	274.26	3,424.64	461.48	-7,043.61	2,169,071.90	535,873.57	36.96094°N	107.71055°W
10,000.00	89.63	274.26	3,425.29	468.91	-7,143.33	2,169,079.33	535,773.85	36.96096°N	107.71089°W
10,100.00	89.63	274.26	3,425.93	476.33	-7,243.06	2,169,086.75	535,674.13	36.96098°N	107.71123°W
10,200.00	89.63	274.26	3,426.58	483.76	-7,342.78	2,169,094.18	535,574.40	36.96100°N	107.71157°W
10,300.00	89.63	274.26	3,427.23	491.18	-7,442.50	2,169,101.60	535,474.68	36.96102°N	107.71192°W
10,400.00	89.63	274.26	3,427.87	498.61	-7,542.22	2,169,109.03	535,374.96	36.96104°N	107.71226°W
10,500.00	89.63	274.26	3,428.52	506.04	-7,641.94	2,169,116.45	535,275.24	36.96106°N	107.71260°W
10,600.00	89.63	274.26	3,429.16	513.46	-7,741.67	2,169,123.88	535,175.52	36.96108°N	107.71294°W
10,700.00	89.63	274.26	3,429.81	520.89	-7,841.39	2,169,131.31	535,075.79	36.96110°N	107.71328°W
10,800.00	89.63	274.26	3,430.45	528.31	-7,941.11	2,169,138.73	534,976.07	36.96113°N	107.71362°W
10,884.41	89.63	274.26	3,431.00	534.58	-8,025.28	2,169,145.00	534,891.90	36.96114°N	107.71391°W

PBHL/TD

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SJ 32-8 Unit 232H FTP - plan hits target center - Point	0.00	0.00	3,331.72	6.35	-827.02	2,168,616.77	542,090.17	36.95966°N	107.68928°W
SJ 32-8 Unit 232H Toe - plan hits target center - Point	0.00	0.00	3,431.00	534.58	-8,025.28	2,169,145.00	534,891.90	36.96114°N	107.71391°W

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,302.58	2,301.00	Ojo Alamo		0.00	
2,348.53	2,346.00	Kirtland		0.00	
3,247.04	3,107.00	Fruitland		0.00	
3,835.09	3,381.00	top of target		0.00	
5,310.48	3,395.00	base of target		0.00	



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.28-T32N-R08W
Well: San Juan 32-8 Unit 232H
Wellbore: Lat 1
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,658.53	3,331.72	6.35	-827.02	FTP, Build 10°/100' DLS
3,911.24	3,386.00	16.78	-1,071.51	LP
3,923.58	3,386.04	17.70	-1,083.82	Hold Section
10,884.41	3,431.00	534.58	-8,025.28	PBHL/TD



Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.28-T32N-R08W

San Juan 32-8 Unit 232H

Pilot Hole

Rev0

Anticollision Report

04 September, 2018





Koltek Energy Services
Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well San Juan 32-8 Unit 232H
Project:	San Juan Co., NM (NAD27)	TVD Reference:	KB @ 6671.00usft
Reference Site:	Sec.28-T32N-R08W	MD Reference:	KB @ 6671.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	San Juan 32-8 Unit 232H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Pilot Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev0	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	09/04/18		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	4,236.55	Rev0 (Pilot Hole)	MWD	MWD - Standard	

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.28-T32N-R08W						
San Juan 32-8 Unit 050 - Original Hole - Original Hole	987.48	976.49	111.61	94.76	6.622 CC	
San Juan 32-8 Unit 050 - Original Hole - Original Hole	2,100.00	2,089.02	113.16	72.46	2.780 ES, SF	
San Juan 32-8 Unit 231A - Original Hole - Original Hole	2,682.03	2,696.81	300.08	194.02	2.829 CC	
San Juan 32-8 Unit 231A - Original Hole - Original Hole	2,700.00	2,713.10	300.18	193.41	2.811 ES	
San Juan 32-8 Unit 231A - Original Hole - Original Hole	2,800.00	2,798.23	305.89	196.45	2.795 SF	
Sec.29-T32N-R08W						
San Juan 32-8 Unit 232 - Original Hole - Original Hole	4,236.55	3,543.42	604.57	435.42	3.574 CC, ES, SF	

Sec.28-T32N-R08W - San Juan 32-8 Unit 050 - Original Hole - Original Hole												Offset Site Error:	0.00 usft
Survey Program: 126-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	0.00	0.00	0.00	0.00	90.47	-0.92	111.61	112.15				
100.00	100.00	89.00	89.00	0.10	0.42	90.50	-0.98	111.61	111.61	111.10	0.52	216.681	
129.83	129.83	118.83	118.83	0.16	0.56	90.48	-0.94	111.61	111.61	110.89	0.72	154.438	
200.00	200.00	189.00	189.00	0.32	1.33	90.50	-0.98	111.61	111.61	109.96	1.65	67.444	
214.46	214.46	203.46	203.46	0.35	1.50	90.50	-0.97	111.61	111.61	109.76	1.86	60.090	
300.00	300.00	289.00	289.00	0.55	2.84	90.53	-1.04	111.61	111.61	108.23	3.38	32.993	
300.14	300.14	289.14	289.14	0.55	2.84	90.53	-1.04	111.61	111.61	108.23	3.39	32.966	
400.00	400.00	389.01	389.00	0.77	4.57	90.60	-1.16	111.61	111.62	106.28	5.34	20.907	
412.64	412.64	401.65	401.64	0.80	4.79	90.60	-1.17	111.61	111.62	106.03	5.59	19.981	
500.00	500.00	489.01	489.00	0.99	6.30	90.61	-1.19	111.61	111.62	104.32	7.29	15.301	
559.32	559.32	548.32	548.32	1.13	7.33	90.60	-1.17	111.61	111.62	103.16	8.45	13.202	
600.00	600.00	589.01	589.00	1.22	8.03	90.59	-1.14	111.61	111.62	102.37	9.25	12.066	
677.56	677.56	666.56	666.56	1.39	9.37	90.54	-1.04	111.61	111.61	100.85	10.77	10.366	
700.00	700.00	689.00	688.99	1.44	9.76	90.52	-1.00	111.61	111.61	100.41	11.21	9.960	
800.00	800.00	789.01	789.00	1.67	11.50	90.42	-0.81	111.61	111.61	98.44	13.17	8.476	
801.36	801.36	790.37	790.36	1.67	11.52	90.41	-0.81	111.61	111.61	98.42	13.19	8.459	
880.44	880.44	869.45	869.44	1.85	12.90	90.36	-0.70	111.61	111.61	96.86	14.75	7.567	
900.00	900.00	889.01	889.00	1.89	13.24	90.35	-0.69	111.61	111.61	96.48	15.13	7.375	
987.48	987.48	976.49	976.47	2.09	14.76	90.33	-0.65	111.61	111.61	94.76	16.86	6.622 CC	
1,000.00	1,000.00	989.01	989.00	2.12	14.98	90.33	-0.65	111.61	111.61	94.51	17.10	6.526	

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.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.28-T32N-R08W - San Juan 32-8 Unit 050 - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 126-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)				Reference	Offset	Reference
1,100.00	1,100.00	1,089.02	1,089.00	2.34	16.72	90.36	-0.70	111.61	111.61	92.54	19.07	5.853		
1,100.00	1,100.00	1,089.02	1,089.00	2.34	16.72	90.36	-0.70	111.61	111.61	92.54	19.07	5.853		
1,200.00	1,200.00	1,189.03	1,189.01	2.57	18.46	90.43	-0.84	111.61	111.61	90.58	21.03	5.306		
1,215.29	1,215.29	1,204.32	1,204.30	2.60	18.73	90.45	-0.87	111.61	111.61	90.28	21.34	5.231		
1,300.00	1,300.00	1,289.02	1,289.00	2.79	20.21	90.53	-1.04	111.61	111.61	88.61	23.00	4.852		
1,300.06	1,300.06	1,289.08	1,289.06	2.79	20.21	90.53	-1.04	111.61	111.61	88.61	23.00	4.852		
1,400.00	1,400.00	1,389.03	1,389.00	3.02	21.95	90.60	-1.16	111.61	111.62	86.65	24.97	4.470		
1,411.95	1,411.95	1,400.97	1,400.95	3.04	22.16	90.60	-1.17	111.61	111.62	86.41	25.20	4.428		
1,500.00	1,500.00	1,489.03	1,489.00	3.24	23.69	90.62	-1.20	111.61	111.62	84.68	26.94	4.144		
1,547.97	1,547.97	1,536.99	1,536.97	3.35	24.53	90.61	-1.19	111.61	111.62	83.74	27.88	4.003		
1,600.00	1,600.00	1,589.03	1,589.00	3.47	25.43	90.60	-1.16	111.61	111.62	82.71	28.90	3.862		
1,677.47	1,677.47	1,666.50	1,666.47	3.64	26.78	90.55	-1.07	111.61	111.61	81.19	30.43	3.668		
1,700.00	1,700.00	1,689.02	1,688.99	3.69	27.18	90.53	-1.03	111.61	111.61	80.74	30.87	3.615		
1,800.00	1,800.00	1,789.03	1,789.00	3.92	29.17	90.52	-1.01	111.61	111.61	78.52	33.09	3.373		
1,800.00	1,800.00	1,789.03	1,789.00	3.92	29.17	90.52	-1.01	111.61	111.61	78.52	33.09	3.373		
1,900.00	1,900.00	1,889.04	1,889.00	4.14	31.50	90.59	-1.16	111.61	111.62	75.97	35.65	3.131		
1,910.78	1,910.78	1,899.82	1,899.79	4.17	31.75	90.60	-1.17	111.61	111.62	75.69	35.92	3.107		
2,000.00	2,000.00	1,989.04	1,989.01	4.37	33.83	90.63	-1.22	111.61	111.62	73.41	38.21	2.921		
2,001.44	2,001.44	1,990.48	1,990.45	4.37	33.87	90.63	-1.22	111.61	111.62	73.37	38.24	2.919		
2,033.53	2,033.53	2,022.57	2,022.53	4.44	34.61	90.63	-1.23	111.61	111.62	72.55	39.06	2.857		
2,033.54	2,033.54	2,022.58	2,022.54	4.44	34.61	90.63	-1.23	111.61	111.62	72.55	39.06	2.857		
2,100.00	2,099.98	2,089.02	2,088.98	4.58	36.16	-179.82	-1.21	111.61	113.16	72.46	40.70	2.780 ES, SF		
2,200.00	2,199.63	2,188.66	2,188.62	4.79	38.49	-179.87	-1.13	111.61	121.28	78.30	42.98	2.822		
2,300.00	2,298.47	2,287.50	2,287.45	5.01	40.79	-179.95	-0.97	111.61	136.33	91.33	45.00	3.030		
2,400.00	2,396.02	2,385.06	2,385.02	5.27	43.29	-179.98	-0.92	111.61	158.24	111.30	46.94	3.371		
2,500.00	2,491.80	2,480.85	2,480.80	5.59	45.82	-179.98	-0.92	111.61	186.90	138.31	48.59	3.846		
2,600.00	2,585.35	2,574.41	2,574.35	6.01	48.28	-179.98	-0.92	111.61	222.17	172.32	49.86	4.456		
2,700.00	2,676.21	2,665.27	2,665.21	6.55	50.68	-179.98	-0.92	111.61	263.89	213.18	50.70	5.205		
2,800.00	2,763.94	2,753.01	2,752.95	7.24	52.78	-179.98	-0.78	111.61	311.83	260.91	50.92	6.124		
2,900.00	2,848.12	2,837.18	2,837.11	8.10	54.50	-179.94	-0.53	111.61	365.78	315.32	50.46	7.249		
3,000.00	2,928.32	2,917.39	2,917.31	9.14	56.14	-179.92	-0.40	111.61	425.48	375.89	49.59	8.580		
3,100.00	3,004.16	2,993.23	2,993.16	10.38	57.68	-179.93	-0.39	111.61	490.62	442.30	48.31	10.155		
3,200.00	3,075.28	3,064.36	3,064.28	11.81	59.13	-179.94	-0.47	111.61	560.89	514.26	46.64	12.027		
3,300.00	3,141.32	3,130.40	3,130.32	13.42	60.48	-179.97	-0.63	111.61	635.96	591.39	44.57	14.268		
3,400.00	3,201.96	3,191.05	3,190.97	15.20	61.72	-180.00	-0.84	111.61	715.45	673.31	42.13	16.980		
3,500.00	3,256.92	3,245.99	3,245.89	17.15	62.84	-179.97	-1.06	111.61	798.97	759.63	39.35	20.306		
3,600.00	3,305.91	3,294.98	3,294.89	19.25	63.84	-179.95	-1.24	111.61	886.13	849.89	36.24	24.454		
3,658.53	3,331.72	3,320.80	3,320.70	20.54	64.36	-179.93	-1.32	111.61	938.65	904.37	34.28	27.382		
3,700.00	3,349.25	3,338.33	3,338.23	21.47	64.72	-179.93	-1.37	111.61	976.24	941.57	34.67	28.158		
3,800.00	3,391.51	3,380.59	3,380.50	23.74	65.58	-179.92	-1.48	111.61	1,066.87	1,031.25	35.62	29.949		
3,900.00	3,433.77	3,422.86	3,422.77	26.04	66.45	-179.92	-1.56	111.61	1,157.50	1,120.92	36.59	31.636		
4,000.00	3,476.03	3,465.13	3,465.03	28.36	67.31	-179.92	-1.62	111.61	1,248.14	1,210.57	37.56	33.227		
4,100.00	3,518.29	3,507.39	3,507.30	30.69	68.17	-179.92	-1.66	111.61	1,338.77	1,300.22	38.55	34.731		
4,200.00	3,560.55	3,549.66	3,549.56	33.03	69.03	-179.92	-1.67	111.61	1,429.40	1,389.86	39.54	36.153		
4,236.55	3,576.00	3,565.11	3,565.01	33.89	69.35	-179.92	-1.67	111.61	1,462.52	1,422.62	39.90	36.653		



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.28-T32N-R08W - San Juan 32-8 Unit 231A - Original Hole - Original Hole		Offset Site Error:	0.00 usft
Survey Program: 221-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 Tooface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
0.00	0.00	35.78	35.78	0.00	0.47	-24.53	300.60	-137.20	330.44							
100.00	100.00	133.46	133.46	0.10	1.77	-24.55	300.40	-137.20	330.25	328.39	1.86	177.135				
200.00	200.00	234.00	234.00	0.32	3.27	-24.51	300.86	-137.20	330.67	327.08	3.59	92.008				
300.00	300.00	334.01	334.00	0.55	5.92	-24.51	300.86	-137.20	330.67	324.20	6.47	51.112				
400.00	400.00	434.01	434.00	0.77	8.58	-24.51	300.86	-137.20	330.67	321.32	9.35	35.384				
500.00	500.00	534.02	534.00	0.99	11.23	-24.51	300.86	-137.20	330.67	318.45	12.22	27.058				
600.00	600.00	634.02	634.00	1.22	13.88	-24.51	300.86	-137.20	330.67	315.57	15.10	21.904				
700.00	700.00	736.50	736.47	1.44	16.99	-24.53	300.60	-137.20	330.44	312.01	18.43	17.930				
800.00	800.00	836.02	835.97	1.67	20.86	-24.59	299.87	-137.20	329.77	307.24	22.53	14.636				
900.00	900.00	935.52	935.47	1.89	24.74	-24.63	299.32	-137.20	329.27	302.64	26.63	12.364				
1,000.00	1,000.00	1,035.01	1,034.95	2.12	28.61	-24.65	298.94	-137.20	328.92	298.19	30.73	10.703				
1,100.00	1,100.00	1,134.49	1,134.43	2.34	32.49	-24.67	298.73	-137.20	328.73	293.90	34.83	9.438				
1,168.54	1,168.54	1,202.67	1,202.60	2.50	35.14	-24.67	298.69	-137.20	328.70	291.05	37.64	8.732				
1,200.00	1,200.00	1,233.95	1,233.88	2.57	36.36	-24.67	298.70	-137.20	328.70	289.77	38.93	8.443				
1,300.00	1,300.00	1,333.40	1,333.33	2.79	40.24	-24.66	298.84	-137.20	328.83	285.80	43.03	7.642				
1,400.00	1,400.00	1,432.83	1,432.76	3.02	44.11	-24.64	299.16	-137.20	329.12	281.99	47.13	6.984				
1,500.00	1,500.00	1,532.25	1,532.17	3.24	47.98	-24.60	299.65	-137.20	329.57	278.34	51.23	6.434				
1,600.00	1,600.00	1,631.65	1,631.57	3.47	51.86	-24.55	300.31	-137.20	330.17	274.85	55.32	5.968				
1,700.00	1,700.00	1,734.08	1,734.00	3.69	56.27	-24.51	300.86	-137.20	330.67	270.70	59.97	5.514				
1,800.00	1,800.00	1,834.10	1,834.00	3.92	61.43	-24.51	300.86	-137.20	330.67	265.32	65.35	5.060				
1,900.00	1,900.00	1,934.12	1,934.00	4.14	66.59	-24.51	300.86	-137.20	330.67	259.94	70.73	4.675				
2,000.00	2,000.00	2,034.14	2,034.00	4.37	71.74	-24.51	300.86	-137.20	330.67	254.56	76.11	4.345				
2,033.53	2,033.53	2,067.68	2,067.53	4.44	73.47	-24.51	300.86	-137.20	330.67	252.76	77.91	4.244				
2,100.00	2,099.98	2,134.14	2,133.98	4.58	76.90	65.31	300.86	-137.20	330.02	248.56	81.46	4.051				
2,200.00	2,199.63	2,231.52	2,231.34	4.79	81.47	66.70	301.15	-137.20	326.98	240.80	86.18	3.794				
2,300.00	2,298.47	2,331.34	2,331.14	5.01	85.36	69.39	301.74	-137.20	321.85	231.64	90.21	3.568				
2,400.00	2,396.02	2,429.89	2,429.68	5.27	89.21	73.36	302.00	-137.20	314.95	220.69	94.26	3.341				
2,500.00	2,491.80	2,526.68	2,526.45	5.59	92.98	78.60	301.94	-137.20	307.66	209.26	98.41	3.126				
2,600.00	2,585.35	2,621.24	2,620.98	6.01	96.67	85.04	301.59	-137.20	301.92	199.30	102.62	2.942				
2,682.03	2,660.10	2,696.81	2,696.54	6.45	99.62	91.03	301.10	-137.20	300.08	194.02	106.06	2.829 CC				
2,700.00	2,676.21	2,713.10	2,712.82	6.55	100.25	92.40	300.96	-137.20	300.18	193.41	106.78	2.811 ES				
2,800.00	2,763.94	2,798.23	2,797.94	7.24	102.65	99.88	300.86	-137.20	305.89	196.45	109.44	2.795 SF				
2,900.00	2,848.12	2,882.41	2,882.12	8.10	104.87	107.46	300.86	-137.20	320.98	209.75	111.23	2.886				
3,000.00	2,928.32	2,962.62	2,962.32	9.14	106.99	114.43	300.86	-137.20	346.82	234.82	112.00	3.097				
3,100.00	3,004.16	3,038.46	3,038.16	10.38	109.00	120.43	300.86	-137.20	383.72	271.95	111.77	3.433				
3,200.00	3,075.28	3,109.58	3,109.28	11.81	110.88	125.34	300.86	-137.20	431.09	320.31	110.79	3.891				
3,300.00	3,141.32	3,175.63	3,175.32	13.42	112.62	129.14	300.86	-137.20	487.84	378.48	109.36	4.461				
3,400.00	3,201.96	3,236.27	3,235.96	15.20	114.23	131.86	300.86	-137.20	552.70	444.84	107.86	5.124				
3,500.00	3,256.92	3,291.23	3,290.92	17.15	115.68	133.55	300.86	-137.20	624.52	517.81	106.71	5.853				
3,600.00	3,305.91	3,340.22	3,339.91	19.25	116.97	134.21	300.86	-137.20	702.22	595.86	106.36	6.602				
3,658.53	3,331.72	3,366.03	3,365.72	20.54	117.66	134.10	300.86	-137.20	750.05	643.29	106.76	7.026				
3,700.00	3,349.25	3,383.56	3,383.25	21.47	118.12	135.63	300.86	-137.20	784.65	678.86	105.79	7.417				
3,800.00	3,391.51	3,425.83	3,425.51	23.74	119.24	138.99	300.86	-137.20	869.10	765.52	103.58	8.391				
3,900.00	3,433.77	3,468.09	3,467.77	26.04	120.35	141.95	300.86	-137.20	954.68	853.09	101.59	9.398				
4,000.00	3,476.03	3,510.35	3,510.03	28.36	121.47	144.57	300.86	-137.20	1,041.11	941.28	99.84	10.428				
4,100.00	3,518.29	3,552.62	3,552.29	30.69	122.59	146.89	300.86	-137.20	1,128.20	1,029.88	98.32	11.474				
4,200.00	3,560.55	3,594.88	3,594.55	33.03	123.71	148.95	300.86	-137.20	1,215.82	1,118.77	97.04	12.529				
4,236.55	3,576.00	3,610.33	3,610.00	33.89	124.12	149.65	300.86	-137.20	1,247.94	1,151.31	96.63	12.915				

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	Local Co-ordinate Reference:	Well San Juan 32-8 Unit 232H
Project:	San Juan Co., NM (NAD27)	TVD Reference:	KB @ 6671.00usft
Reference Site:	Sec.28-T32N-R08W	MD Reference:	KB @ 6671.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	San Juan 32-8 Unit 232H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Pilot Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev0	Offset TVD Reference:	Offset Datum

Offset Design Sec.29-T32N-R08W - San Juan 32-8 Unit 232 - Original Hole - Original Hole														Offset Site Error:	0.00 usft
Survey Program: 119-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)					
0.00	0.00	0.00	0.00	0.00	0.00	-109.88	-560.45	-1,550.01	1,648.55						
100.00	100.00	67.49	67.49	0.10	0.69	-109.89	-560.64	-1,550.01	1,648.29	1,647.50	0.78	2,102.017			
180.81	180.81	146.93	146.93	0.28	1.87	-109.88	-560.50	-1,550.01	1,648.24	1,646.09	2.15	768.244			
200.00	200.00	166.35	166.34	0.32	2.32	-109.88	-560.53	-1,550.01	1,648.25	1,645.60	2.64	623.494			
300.00	300.00	267.55	267.55	0.55	4.69	-109.88	-560.54	-1,550.01	1,648.25	1,643.01	5.24	314.575			
400.00	400.00	368.02	368.01	0.77	7.05	-109.88	-560.36	-1,550.01	1,648.19	1,640.37	7.82	210.807			
500.00	500.00	467.55	467.54	0.99	9.38	-109.87	-560.22	-1,550.01	1,648.14	1,637.77	10.38	158.847			
600.00	600.00	567.08	567.07	1.22	11.71	-109.87	-560.17	-1,550.01	1,648.13	1,635.19	12.93	127.436			
615.42	615.42	582.43	582.41	1.25	12.07	-109.87	-560.17	-1,550.01	1,648.13	1,634.80	13.33	123.666			
700.00	700.00	666.62	666.60	1.44	14.05	-109.87	-560.20	-1,550.01	1,648.14	1,632.65	15.49	106.397			
800.00	800.00	766.17	766.14	1.67	16.38	-109.87	-560.31	-1,550.01	1,648.17	1,630.13	18.05	91.322			
900.00	900.00	864.82	864.78	1.89	18.76	-109.88	-560.55	-1,550.01	1,648.26	1,627.60	20.66	79.791			
1,000.00	1,000.00	965.78	965.74	2.12	21.44	-109.89	-560.86	-1,550.01	1,648.36	1,624.81	23.56	69.973			
1,100.00	1,100.00	1,066.73	1,066.69	2.34	24.11	-109.90	-561.01	-1,550.01	1,648.41	1,621.95	26.46	62.306			
1,200.00	1,200.00	1,167.67	1,167.62	2.57	26.79	-109.90	-560.98	-1,550.01	1,648.40	1,619.05	29.36	56.153			
1,300.00	1,300.00	1,268.60	1,268.55	2.79	29.46	-109.89	-560.79	-1,550.01	1,648.34	1,616.08	32.25	51.104			
1,380.62	1,380.62	1,349.97	1,349.92	2.97	31.62	-109.88	-560.50	-1,550.01	1,648.24	1,613.65	34.59	47.648			
1,400.00	1,400.00	1,363.40	1,363.35	3.02	32.00	-109.88	-560.46	-1,550.01	1,648.23	1,613.22	35.01	47.075			
1,500.00	1,500.00	1,464.77	1,464.71	3.24	36.25	-109.90	-561.00	-1,550.01	1,648.41	1,608.92	39.49	41.740			
1,600.00	1,600.00	1,566.12	1,566.05	3.47	40.50	-109.91	-561.30	-1,550.01	1,648.51	1,604.54	43.97	37.491			
1,700.00	1,700.00	1,667.45	1,667.38	3.69	44.76	-109.91	-561.35	-1,550.01	1,648.53	1,600.08	48.45	34.027			
1,800.00	1,800.00	1,768.76	1,768.68	3.92	49.01	-109.90	-561.17	-1,550.01	1,648.47	1,595.54	52.92	31.148			
1,900.00	1,900.00	1,870.04	1,869.95	4.14	53.26	-109.89	-560.74	-1,550.01	1,648.32	1,590.92	57.40	28.717			
1,973.75	1,973.75	1,939.73	1,939.63	4.31	56.44	-109.88	-560.49	-1,550.01	1,648.24	1,587.48	60.75	27.131			
2,000.00	2,000.00	1,966.12	1,966.02	4.37	57.88	-109.88	-560.54	-1,550.01	1,648.25	1,586.00	62.25	26.478			
2,033.53	2,033.53	1,999.83	1,999.72	4.44	59.72	-109.88	-560.60	-1,550.01	1,648.27	1,584.11	64.17	25.687			
2,100.00	2,099.98	2,066.62	2,066.50	4.58	63.37	-20.36	-560.68	-1,550.01	1,646.85	1,578.93	67.92	24.247			
2,200.00	2,199.63	2,166.79	2,166.64	4.79	68.84	-20.57	-560.72	-1,550.01	1,639.26	1,565.99	73.26	22.375			
2,300.00	2,298.47	2,266.13	2,265.96	5.01	74.26	-20.96	-560.67	-1,550.01	1,625.14	1,546.95	78.19	20.783			
2,400.00	2,396.02	2,364.16	2,363.98	5.27	79.61	-21.54	-560.55	-1,550.01	1,604.61	1,521.97	82.64	19.417			
2,500.00	2,491.80	2,460.93	2,460.73	5.59	84.75	-22.34	-560.26	-1,550.01	1,577.77	1,491.33	86.44	18.253			
2,600.00	2,585.35	2,553.55	2,553.33	6.01	89.52	-23.36	-560.02	-1,550.01	1,544.86	1,455.40	89.46	17.268			
2,700.00	2,676.21	2,643.52	2,643.28	6.55	94.16	-24.66	-559.93	-1,550.01	1,506.16	1,414.18	91.98	16.375			
2,800.00	2,763.94	2,730.41	2,730.14	7.24	98.64	-26.29	-559.98	-1,550.01	1,461.93	1,367.86	94.07	15.541			
2,900.00	2,848.12	2,813.79	2,813.49	8.10	102.93	-28.28	-560.17	-1,550.01	1,412.51	1,316.63	95.88	14.732			
3,000.00	2,928.32	2,895.64	2,895.32	9.14	107.13	-30.75	-560.45	-1,550.01	1,358.26	1,260.50	97.77	13.893			
3,100.00	3,004.16	2,971.49	2,971.16	10.38	110.57	-33.71	-560.45	-1,550.01	1,299.48	1,199.95	99.52	13.057			
3,200.00	3,075.28	3,042.62	3,042.28	11.81	113.79	-37.26	-560.45	-1,550.01	1,236.77	1,134.69	102.08	12.115			
3,300.00	3,141.32	3,108.67	3,108.32	13.42	116.78	-41.48	-560.45	-1,550.01	1,170.75	1,064.82	105.92	11.053			
3,400.00	3,201.96	3,169.32	3,168.96	15.20	119.53	-46.41	-560.45	-1,550.01	1,102.09	990.67	111.42	9.891			
3,500.00	3,256.92	3,224.28	3,223.92	17.15	122.01	-52.05	-560.45	-1,550.01	1,031.62	912.97	118.65	8.694			
3,600.00	3,305.91	3,273.28	3,272.91	19.25	124.23	-58.25	-560.45	-1,550.01	960.33	833.09	127.24	7.547			
3,658.53	3,331.72	3,299.10	3,298.72	20.54	125.40	-62.05	-560.45	-1,550.01	918.69	786.12	132.57	6.930			
3,700.00	3,349.25	3,316.63	3,316.25	21.47	126.20	-63.30	-560.45	-1,550.01	889.59	754.29	135.31	6.575			
3,800.00	3,391.51	3,358.89	3,358.51	23.74	128.11	-66.44	-560.45	-1,550.01	822.28	680.34	141.94	5.793			
3,900.00	3,433.77	3,401.16	3,400.77	26.04	130.02	-69.74	-560.45	-1,550.01	759.83	611.28	148.55	5.115			
4,000.00	3,476.03	3,443.43	3,443.03	28.36	131.94	-73.19	-560.45	-1,550.01	703.54	548.52	155.02	4.538			
4,100.00	3,518.29	3,485.70	3,485.29	30.69	133.85	-76.77	-560.45	-1,550.01	655.00	493.75	161.25	4.062			
4,200.00	3,560.55	3,527.97	3,527.55	33.03	135.77	-80.45	-560.45	-1,550.01	616.04	448.92	167.12	3.686			
4,236.55	3,576.00	3,543.42	3,543.00	33.89	136.47	-81.82	-560.45	-1,550.01	604.57	435.42	169.15	3.574 CC, ES, SF			

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



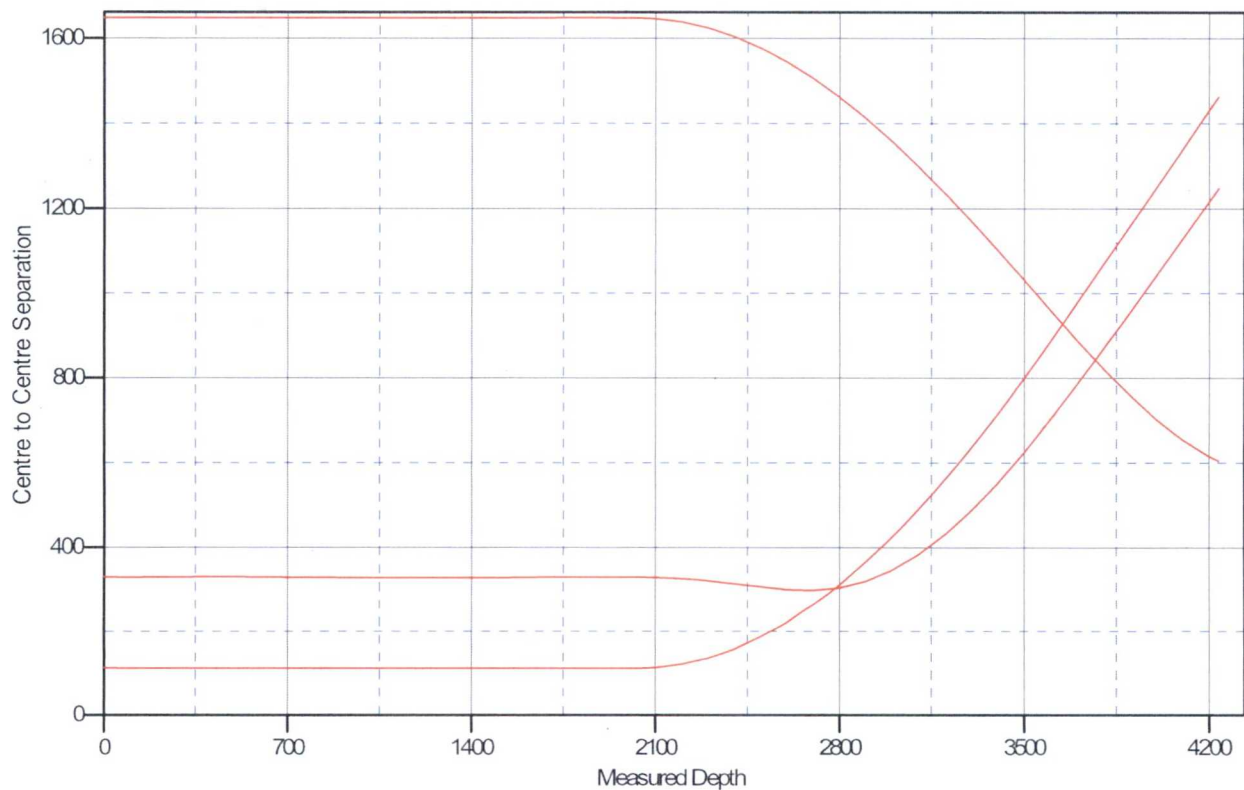
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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 @ 6671.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.83334°W

Coordinates are relative to: San Juan 32-8 Unit 232H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.09°

Ladder Plot



LEGEND

San Juan 32-8 Unit 232, Original Hole, Original Hole V0 San Juan 32-8 Unit 050, Original Hole, Original Hole V0 San Juan 32-8 Unit 231A, Original Hole, Original Hole V0



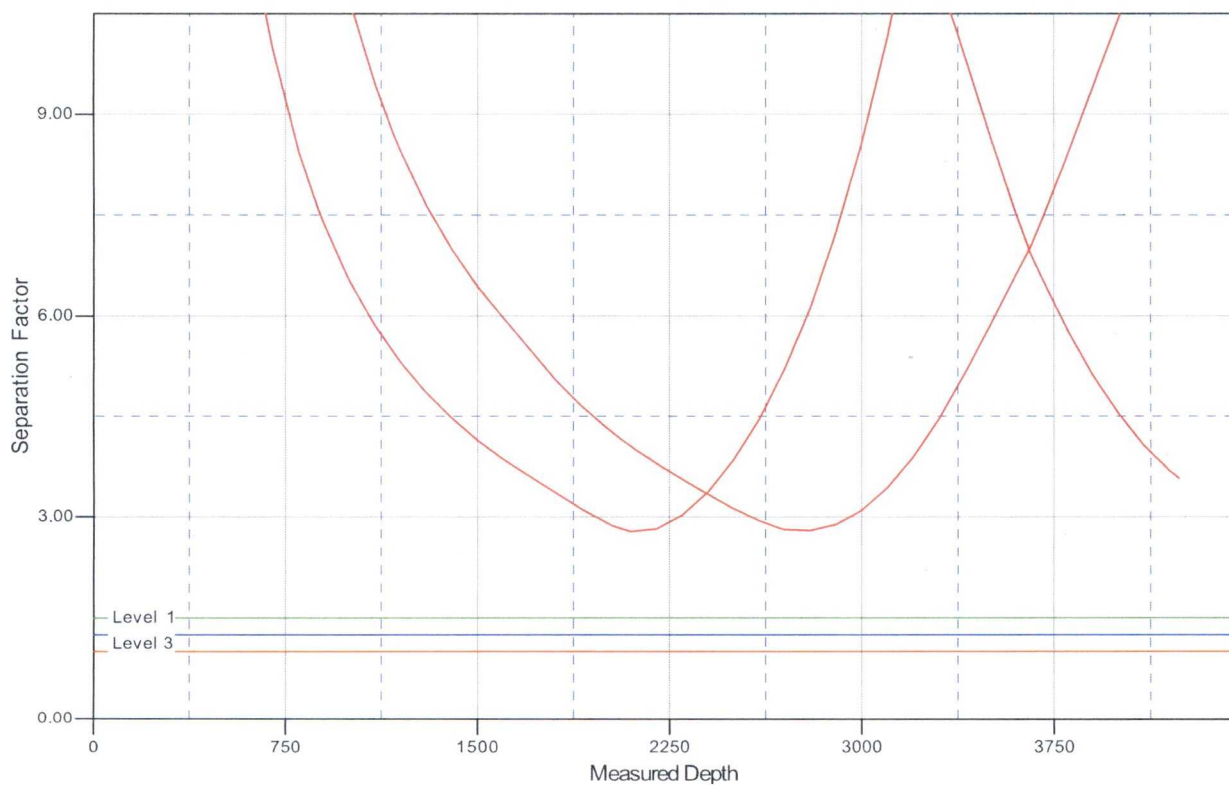
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.28-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 232H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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 @ 6671.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.83334°W

Coordinates are relative to: San Juan 32-8 Unit 232H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.09°

Separation Factor Plot

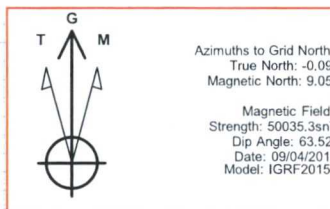
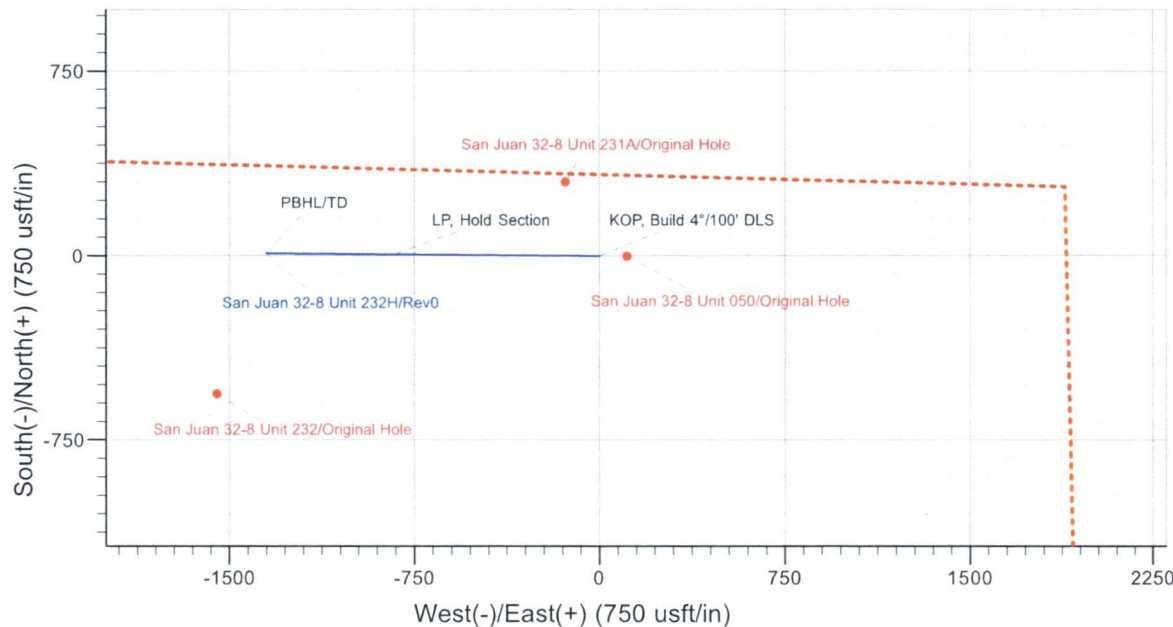
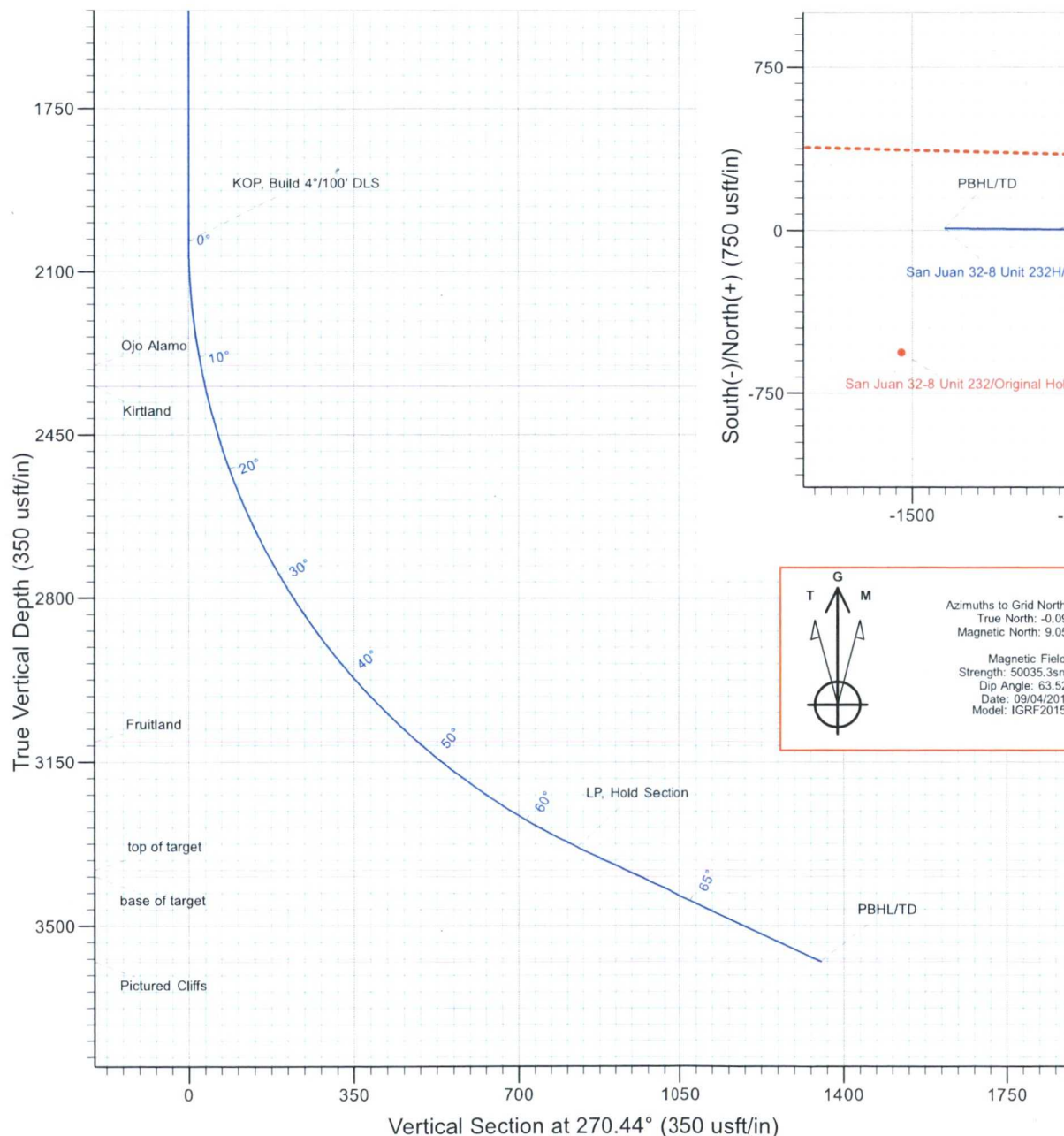


LEGEND

San Juan 32-8 Unit 232, Original Hole, Original Hole V0 San Juan 32-8 Unit 050, Original Hole, Original Hole V0 San Juan 32-8 Unit 231A, Original Hole, Original Hole V0



Company: Hilcorp Energy Company
 Field: San Juan Co., NM (NAD27)
 Location: Sec.28-T32N-R08W
 Well: San Juan 32-8 Unit 232H
 Borehole: Pilot Hole
 Plan: Rev0



WELL DETAILS: San Juan 32-8 Unit 232H									
		GL 6656.00		KB @ 6671.00usft					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude				
0.00	0.00	2168610.42	542917.18	36.95964°N	107.68644°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	2033.53	0.00	0.00	2033.53	0.00	0.00	0.00	0.00	0.00
3	3658.53	65.00	270.44	3331.72	6.35	-827.01	4.00	270.44	827.04
4	4236.55	65.00	270.44	3576.00	10.37	-1350.86	0.00	0.00	1350.90

FORMATION TOP DETAILS			ANNOTATIONS		
TVDPath	MDPath	Formation	TVD	MD	Annotation
2301.00	2302.58	Ojo Alamo	2033.53	2033.53	KOP, Build 4"/100' DLS
2346.00	2348.53	Kirtland	3331.72	3658.53	LP, Hold Section
3107.00	3247.04	Fruitland	3576.00	4236.55	PBHL/TD
3381.00	3775.14	top of target			
3395.00	3808.27	base of target			
3576.00	4236.55	Pictured Cliffs			

San Juan 32-8 Unit 232H Rev0
 Created By: J Rieke Date: 14:44, September 04 2018



Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.28-T32N-R08W

San Juan 32-8 Unit 232H

Pilot Hole

Plan: Rev0

Standard Planning Report - Geographic

04 September, 2018





Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.28-T32N-R08W
Well: San Juan 32-8 Unit 232H
Wellbore: Pilot Hole
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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.28-T32N-R08W				
Site Position:		Northing:	2,168,610.42 usft	Latitude:	36.95964°N
From:	Map	Easting:	542,917.18 usft	Longitude:	107.68644°W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.09 °

Well	San Juan 32-8 Unit 232H					
Well Position	+N/-S	0.00 usft	Northing:	2,168,610.42 usft	Latitude:	36.95964°N
	+E/-W	0.00 usft	Easting:	542,917.18 usft	Longitude:	107.68644°W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,656.00 usft

Wellbore	Pilot Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	09/04/18	9.14	63.52	50,035

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	270.44

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	
2,033.53	0.00	0.00	2,033.53	0.00	0.00	0.00	0.00	0.00	0.00	
3,658.53	65.00	270.44	3,331.72	6.35	-827.01	4.00	4.00	0.00	270.44	
4,236.55	65.00	270.44	3,576.00	10.37	-1,350.86	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.28-T32N-R08W
Well: San Juan 32-8 Unit 232H
Wellbore: Pilot Hole
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
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	2,168,610.42	542,917.18	36.95964°N	107.68644°W
100.00	0.00	0.00	100.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
200.00	0.00	0.00	200.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
300.00	0.00	0.00	300.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
400.00	0.00	0.00	400.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
500.00	0.00	0.00	500.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
600.00	0.00	0.00	600.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
700.00	0.00	0.00	700.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
800.00	0.00	0.00	800.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
900.00	0.00	0.00	900.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
1,000.00	0.00	0.00	1,000.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
1,100.00	0.00	0.00	1,100.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
1,200.00	0.00	0.00	1,200.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
1,300.00	0.00	0.00	1,300.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
1,400.00	0.00	0.00	1,400.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
1,500.00	0.00	0.00	1,500.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
1,600.00	0.00	0.00	1,600.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
1,700.00	0.00	0.00	1,700.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
1,800.00	0.00	0.00	1,800.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
1,900.00	0.00	0.00	1,900.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
2,000.00	0.00	0.00	2,000.00	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
2,033.53	0.00	0.00	2,033.53	0.00	0.00	2,168,610.42	542,917.18	36.95964°N	107.68644°W
KOP, Build 4"/100' DLS									
2,100.00	2.66	270.44	2,099.98	0.01	-1.54	2,168,610.43	542,915.64	36.95964°N	107.68645°W
2,200.00	6.66	270.44	2,199.63	0.07	-9.66	2,168,610.49	542,907.52	36.95964°N	107.68648°W
2,300.00	10.66	270.44	2,298.47	0.19	-24.71	2,168,610.61	542,892.47	36.95964°N	107.68653°W
2,400.00	14.66	270.44	2,396.02	0.36	-46.62	2,168,610.78	542,870.56	36.95965°N	107.68660°W
2,500.00	18.66	270.44	2,491.80	0.58	-75.28	2,168,611.00	542,841.90	36.95965°N	107.68670°W
2,600.00	22.66	270.44	2,585.35	0.85	-110.56	2,168,611.27	542,806.63	36.95965°N	107.68682°W
2,700.00	26.66	270.44	2,676.21	1.17	-152.27	2,168,611.59	542,764.91	36.95965°N	107.68697°W
2,800.00	30.66	270.44	2,763.94	1.54	-200.22	2,168,611.96	542,716.97	36.95965°N	107.68713°W
2,900.00	34.66	270.44	2,848.12	1.95	-254.17	2,168,612.37	542,663.02	36.95965°N	107.68731°W
3,000.00	38.66	270.44	2,928.32	2.41	-313.86	2,168,612.83	542,603.32	36.95965°N	107.68752°W
3,100.00	42.66	270.44	3,004.16	2.91	-379.00	2,168,613.33	542,538.18	36.95965°N	107.68774°W
3,200.00	46.66	270.44	3,075.28	3.45	-449.27	2,168,613.87	542,467.91	36.95966°N	107.68798°W
3,300.00	50.66	270.44	3,141.32	4.03	-524.33	2,168,614.45	542,392.85	36.95966°N	107.68824°W
3,400.00	54.66	270.44	3,201.96	4.64	-603.82	2,168,615.06	542,313.36	36.95966°N	107.68851°W
3,500.00	58.66	270.44	3,256.92	5.28	-687.34	2,168,615.70	542,229.84	36.95966°N	107.68880°W
3,600.00	62.66	270.44	3,305.91	5.95	-774.49	2,168,616.37	542,142.69	36.95966°N	107.68910°W
3,658.53	65.00	270.44	3,331.72	6.35	-827.01	2,168,616.77	542,090.17	36.95966°N	107.68928°W
LP, Hold Section									
3,700.00	65.00	270.44	3,349.25	6.64	-864.60	2,168,617.06	542,052.58	36.95967°N	107.68940°W
3,800.00	65.00	270.44	3,391.51	7.34	-955.23	2,168,617.75	541,961.96	36.95967°N	107.68971°W
3,900.00	65.00	270.44	3,433.77	8.03	-1,045.86	2,168,618.45	541,871.33	36.95967°N	107.69002°W
4,000.00	65.00	270.44	3,476.03	8.73	-1,136.48	2,168,619.15	541,780.70	36.95967°N	107.69033°W
4,100.00	65.00	270.44	3,518.29	9.42	-1,227.11	2,168,619.84	541,690.07	36.95967°N	107.69064°W
4,200.00	65.00	270.44	3,560.55	10.12	-1,317.74	2,168,620.54	541,599.44	36.95968°N	107.69095°W
4,236.55	65.00	270.44	3,576.00	10.37	-1,350.86	2,168,620.79	541,566.32	36.95968°N	107.69107°W
PBHL/TD									



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.28-T32N-R08W
Well: San Juan 32-8 Unit 232H
Wellbore: Pilot Hole
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 232H
TVD Reference: KB @ 6671.00usft
MD Reference: KB @ 6671.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,302.58	2,301.00	Ojo Alamo		0.00	
2,348.53	2,346.00	Kirtland		0.00	
3,247.04	3,107.00	Fruitland		0.00	
3,775.14	3,381.00	top of target		0.00	
3,808.27	3,395.00	base of target		0.00	
4,236.55	3,576.00	Pictured Cliffs		0.00	

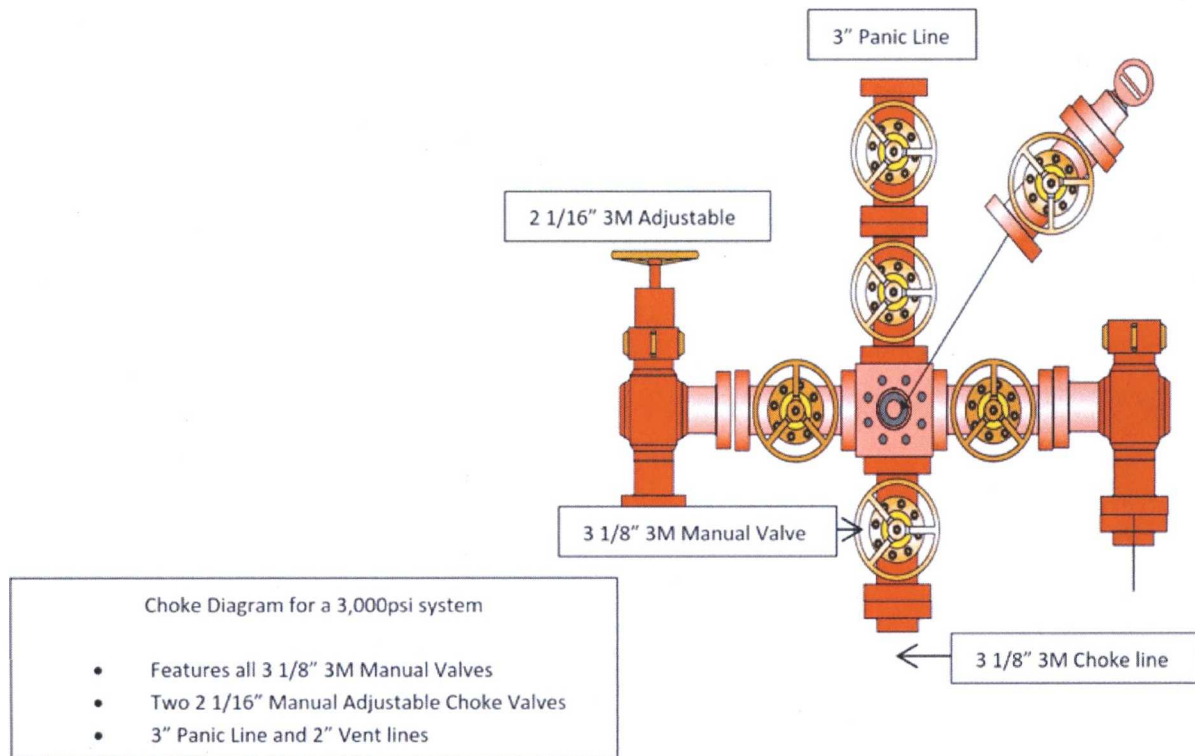
Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,033.53	2,033.53	0.00	0.00	KOP, Build 4"/100' DLS
3,658.53	3,331.72	6.35	-827.01	LP, Hold Section
4,236.55	3,576.00	10.37	-1,350.86	PBHL/TD

Review and Appeal Rights

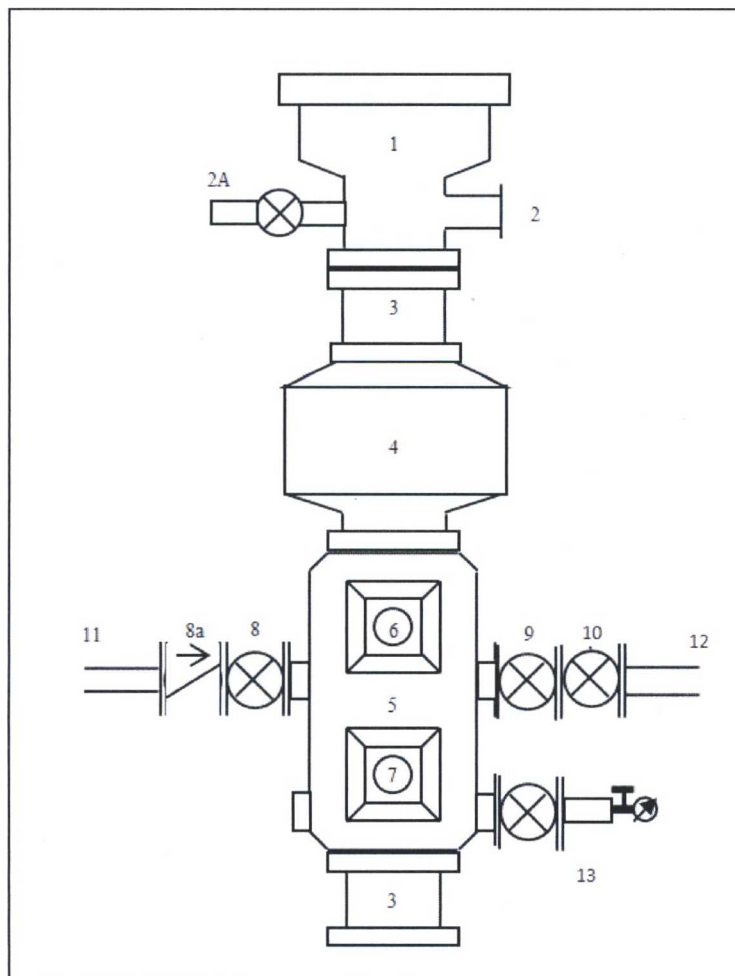
A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

Choke Manifold Schematic – Aztec 777



BOPE Schematic – Aztec 777

1. Rotating Head
2. Flow line
- 2A. Fill up line and valve
3. Spacer Spools (as needed)
4. 11" 3M Annular Preventer
5. 11" 3M Double Ram Preventer
6. Blind Rams
7. Pipe Rams
8. 3M Gate Valve (2")
- 8a. Check valve
9. 3M Manual Gate Valve (3")
10. 3M Manual Gate Valve (3")
11. Kill Line Connection, 2" hard line
12. Choke Line (3" Co-Flex)
13. Secondary outlet with valve, bull plug, needle valve, and pressure gauge



Directions from the Intersection of US Hwy 550 & State Hwy 173

in Aztec, NM to Hilcorp Energy Company San Juan 32-8 Unit #232H

994' FNL & 686' FWL, Section 28, T32N, R8W, N.M.P.M., San Juan County, NM

Latitude: 36.959647°N Longitude: 107.687056°W Datum: NAD1983

From the intersection of US Hwy 550 & State Hwy 173 in Aztec, NM, travel Easterly on State Hwy 173 for 1.0 mile to fork in roadway;

Go Left (Easterly) remaining on State Hwy 173 for 17.0 miles to Tee-intersection;

Go Left (North-Easterly) exiting State Hwy 173 onto State Hwy 511 for 17.9 miles to existing roadway on left-hand side of State Hwy 511 @ Mile Marker 26;

Go Left (North-westerly) exiting State Hwy 511 onto existing roadway for 0.4 miles to fork in roadway;

Go Left (South-westerly) for 0.1 mile to fork in roadway on existing location;

Go Right (Westerly) continuing on existing roadway for 0.9 miles to existing Hilcorp San Juan 32-8 Unit #50 well location, with the Hilcorp San Juan 32-8 Unit #232H staked offset #50 wellhead.