

State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Sarah Cottrell Propst
Cabinet Secretary

Todd E. Leahy, JD, PhD
Deputy Secretary

Gabriel Wade, Acting Director
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-3 APD form.

Operator Signature Date: 3/5/2019

Well information;

Operator Hikorp, Well Name and Number San Juan 32-7 Unit 243H

API# 30-045-35904, Section 18, Township 32 N/S, Range 7 E/W

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

- ☒ Notify Aztec OCD 24hrs prior to casing & cement.
- ☒ Hold C-104 for directional survey & "As Drilled" Plat
 - ☐ 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,

Brach Powell
NMOCD Approved by Signature

3/13/19
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. NMSF0078460
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 32-7 / NMNM078423X
2. Name of Operator HILCORP ENERGY COMPANY		8. Lease Name and Well No. SAN JUAN 32-7 UNIT 243H
3a. Address 1111 Travis Street Houston TX 77002	3b. Phone No. (include area code) (713)209-2400	9. API Well No. 30-045-35904
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface N ESW / 1363 FSL / 2468 FWL / LAT 36.977638 / LONG -107.609755 At proposed prod. zone N ESW / 830 FSL / 1421 FWL / LAT 36.962326 / LONG -107.61342		10. Field and Pool, or Exploratory BASIN FRUITLAND COAL
11. Sec., T. R. M. or Blk. and Survey or Area SEC 18 / T32N / R07W / 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) 259.82 feet	16. No of acres in lease 2484.35	17. Spacing Unit dedicated to this well 487.72
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 50 feet	19. Proposed Depth 2694 feet / 4662 feet	20. BLM/BIA Bond No. in file FED: NMB001486
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6361 feet	22. Approximate date work will start* 04/01/2019	23. Estimated duration 45 days NMOC

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 10/25/2018
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Title

Operations/Regulatory Technician

Approved by (Signature)

Name (Printed/Typed)

Richard A Fields

Date

MAR 05 2019

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.

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

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

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

District I
1625 N. French Drive, Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

District II
811 S. First Street, Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

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

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30045-35904		*Pool Code 71629	*Pool Name BASIN FRUITLAND COAL
*Property Code 318434	*Property Name SAN JUAN 32-7 UNIT		*Well Number 243H
*OGRID No. 372171	*Operator Name HILCORP ENERGY COMPANY		*Elevation 6361'

¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
K	18	32N	7W		1363	SOUTH	2468	WEST	SAN JUAN

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	19	32N	7W	14	830	SOUTH	1421	WEST	SAN JUAN

¹² Dedicated Acres 487.72	SW/4 - Section 18 W/2 - Section 19	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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NO ALLOWABLE WILL BE ASSIGNED
TO THIS COMPLETION UNTIL ALL
INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN
APPROVED BY THE DIVISION

¹⁷ OPERATOR CERTIFICATION
I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom-hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Amanda Walker 10/9/18
Signature Date
Printed Name
mwalker@hilcorp.com
E-mail Address

¹⁸ SURVEYOR CERTIFICATION
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date Revised: OCTOBER 3, 2018
Survey Date: AUGUST 17, 2018

Signature and Seal of Professional Surveyor

JASON C. EDWARDS
NEW MEXICO
REGISTERED PROFESSIONAL SURVEYOR
15269

JASON C. EDWARDS
Certificate Number 15269

SURFACE LOCATION
1363' FSL 2468' FWL
SEC 18, T32N, R7W
LAT: 36.977634° N
LONG: 107.609144° W
DATUM: NAD1927

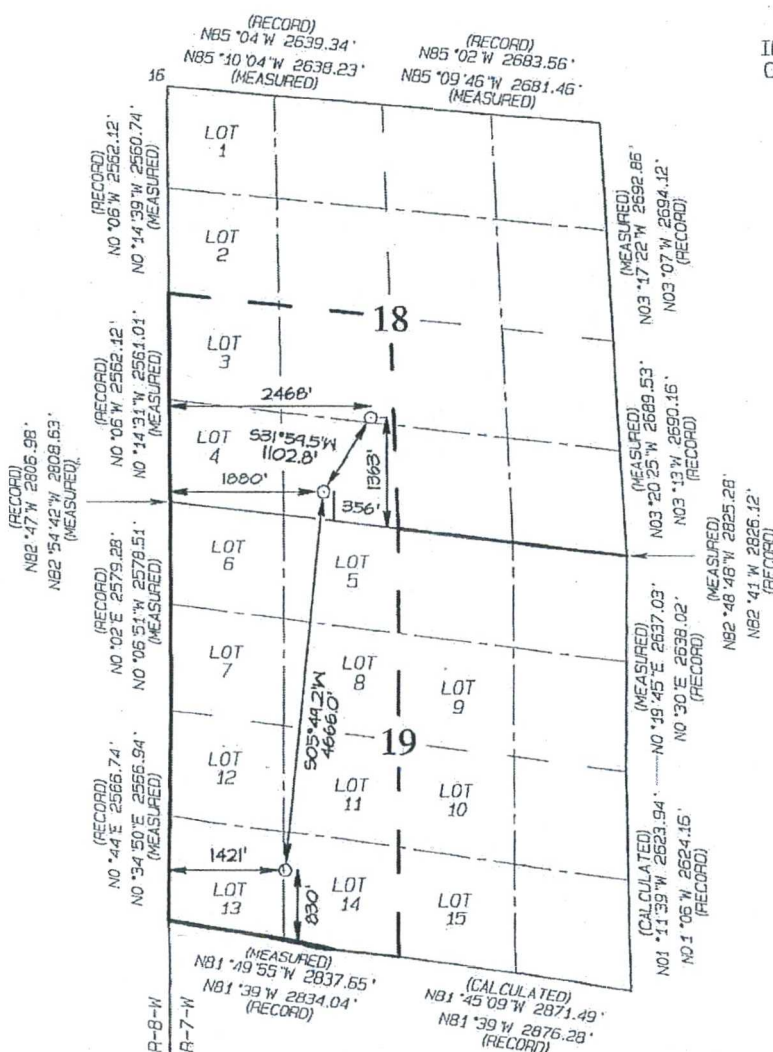
LAT: 36.977638° N
LONG: 107.609755° W
DATUM: NAD1983

FIRST TAKE POINT
356' FSL 1880' FWL
SEC 18, T32N, R7W
LAT: 36.975069° N
LONG: 107.611152° W
DATUM: NAD1927

LAT: 36.975073° N
LONG: 107.611763° W
DATUM: NAD1983

BOTTOM-HOLE LOCATION
830' FSL 1421' FWL
SEC 19, T32N, R7W
LAT: 36.962322° N
LONG: 107.612809° W
DATUM: NAD1927

LAT: 36.962326° N
LONG: 107.613420° W
DATUM: NAD1983



Federal Surface



Hilcorp Energy Company Technical Plan

1. Location

San Juan 32-7 Unit 243H

SHL: 1363' FSL, 2468' FWL, Sec 18, T32N, R7W

Lat-1 BHL: 830' FSL, 1421' FWL, Sec 29, T32N, R7W

GL: 6361'

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	2024'	Wet
Kirtland	2089'	Wet
Fruitland	2694'	Possible Gas/Water
Pictured Cliffs	3248'	Wet

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

Formation Top Selection: Used tops from SJ 32-7 Unit 3-18 for well; assumed would be close; used Reese Mesa 101H as correlation well; assumed regional tops would be on strike with this offset

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' - 4,030.33' (MD)
Prod Liner (predrilled)	6-1/4"	4-1/2"	11.6# J-55/L-80	3,440' - 8,171.68' (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 - 3,430.06' MD / 2,994.32' TVD.

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

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



Hilcorp Energy Company

San Juan 32-7 Unit 243H Tech Plan

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	4,030.33'	431	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%	909 ft ³	Surface
Production		N/A	N/A - Open hole with pre-drilled liner	N/A	N/A	N/A

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

C) The proposed centralizer program is shown below:

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

To allow adequate time for cement to achieve a minimum of 500 psi compressive strength, a minimum of 8 hours wait on cement time for each hole section will be observed. The



Hilcorp Energy Company

San Juan 32-7 Unit 243H Tech Plan

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.



Hilcorp Energy Company

San Juan 32-7 Unit 243H Tech Plan

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.



Company: Hilcorp Energy Company
 Field: San Juan Co., NM (NAD27)
 Location: Sec.18-T32N-R07W
 Well: San Juan 32-7 Unit 243H
 Borehole: Lat 1
 Plan: Rev0

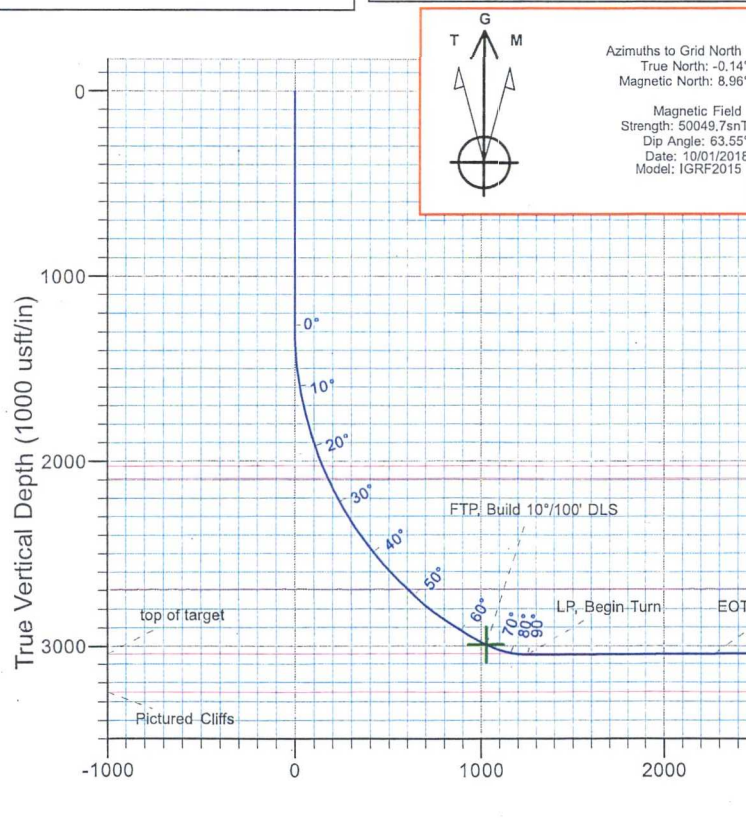
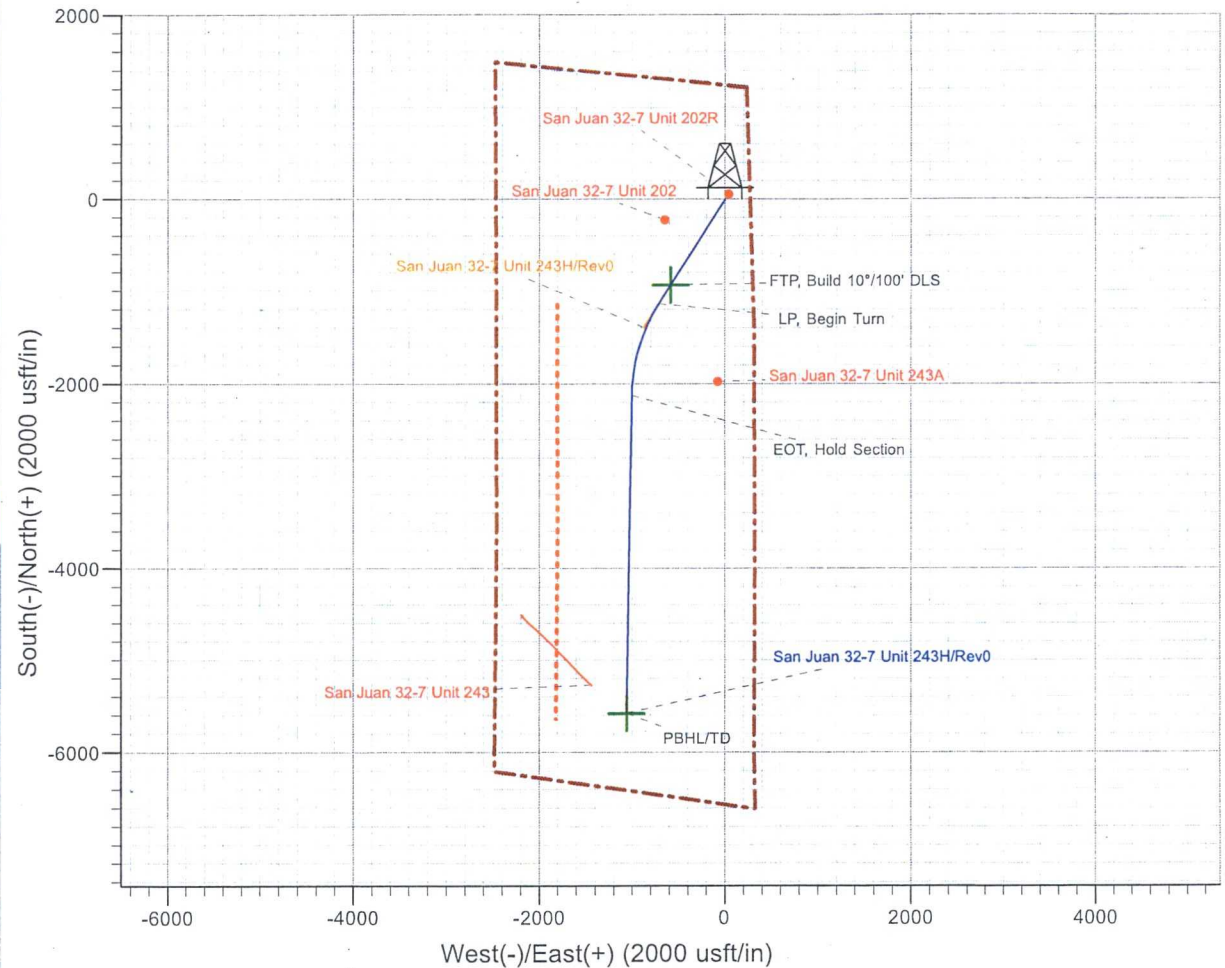


WELL DETAILS: San Juan 32-7 Unit 243H									
+N/-S	+E/-W	North	GL 6361.00	KB @ 6376.00usft	Latitude	Longitude			
0.00	0.00	2175204.18	Easting	565485.92	36.977634°N	107.609144°W			

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec
1	3430.06	65.00	212.00	2994.32	-935.15	-584.35	0.00	0.00	1027.65
2	3680.06	90.00	212.00	3048.00	-1140.50	-712.67	10.00	0.00	1253.31
3	4716.49	90.43	180.91	3044.00	-2122.32	-1002.66	3.00	-89.17	2271.96
4	8171.68	90.43	180.91	3018.00	-5576.98	-1057.52	0.00	0.00	5676.36

DESIGN TARGET DETAILS									
Name	TVD	+N/-S	+E/-W	Latitude	Longitude				
SJ 32-7 Unit 243H FTP	2994.32	-935.15	-584.35	36.975069°N	107.611152°W				
SJ 32-7 Unit 243H Toe	3018.00	-5576.98	-1057.52	36.962322°N	107.612809°W				

FORMATION TOP DETAILS					ANNOTATIONS				
TVDPath	MDPath	Formation			TVD	MD	Annotation		
2024.00	2045.69	Ojo Alamo			2994.32	3430.06	FTP, Build 10°/100' DLS		
2089.00	2117.15	Kirtland			3048.00	3680.06	LP, Begin Turn		
2694.00	2880.37	Fruitland			3044.00	4716.49	EOT, Hold Section		
3041.00	3590.42	top of target			3018.00	8171.68	PBHL/TD		



San Juan 32-7 Unit 243H Rev0
 Created By: J Rieke Date: 8:41, October 02 2018



Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.18-T32N-R07W

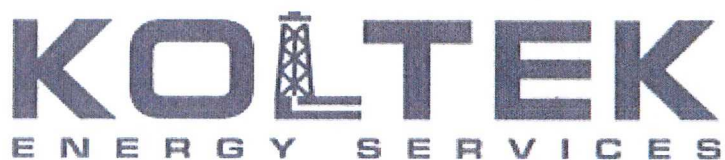
San Juan 32-7 Unit 243H

Lat 1

Plan: Rev0

Standard Planning Report - Geographic

02 October, 2018





Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.18-T32N-R07W
Well: San Juan 32-7 Unit 243H
Wellbore: Lat 1
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
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.18-T32N-R07W

Site Position: **From:** Map **Northing:** 2,176,499.15 usft **Latitude:** 36.981184°N
Easting: 566,563.90 usft **Longitude:** 107.605443°W
Position Uncertainty: 0.00 usft **Slot Radius:** 13.200 in **Grid Convergence:** 0.14 °

Well San Juan 32-7 Unit 243H

Well Position **+N/-S** 0.00 usft **Northing:** 2,175,204.18 usft **Latitude:** 36.977634°N
+E/-W 0.00 usft **Easting:** 565,485.92 usft **Longitude:** 107.609144°W
Position Uncertainty 0.00 usft **Wellhead Elevation:** 0.00 usft **Ground Level:** 6,361.00 usft

Wellbore Lat 1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/01/18	9.10	63.55	50,050

Design Rev0

Audit Notes:

Version: **Phase:** PROTOTYPE **Tie On Depth:** 3,430.06

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	190.74

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
3,430.06	65.00	212.00	2,994.32	-935.15	-584.35	0.00	0.00	0.00	0.00	
3,680.06	90.00	212.00	3,048.00	-1,140.50	-712.67	10.00	10.00	0.00	0.00	
4,716.49	90.43	180.91	3,044.00	-2,122.32	-1,002.66	3.00	0.04	-3.00	-89.17	
8,171.68	90.43	180.91	3,018.00	-5,576.98	-1,057.52	0.00	0.00	0.00	0.00	SJ 32-7 Unit 243H To



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.18-T32N-R07W
Well: San Juan 32-7 Unit 243H
Wellbore: Lat 1
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
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
3,430.06	65.00	212.00	2,994.32	-935.15	-584.35	2,174,269.02	564,901.57	36.975069°N	107.611152°W
FTP, Build 10°/100' DLS									
3,500.00	71.99	212.00	3,019.94	-990.30	-618.81	2,174,213.87	564,867.11	36.974918°N	107.611271°W
3,600.00	81.99	212.00	3,042.41	-1,072.83	-670.38	2,174,131.35	564,815.54	36.974692°N	107.611448°W
3,680.06	90.00	212.00	3,048.00	-1,140.50	-712.67	2,174,063.67	564,773.25	36.974506°N	107.611593°W
LP, Begin Turn									
3,700.00	90.01	211.40	3,048.00	-1,157.47	-723.14	2,174,046.71	564,762.78	36.974459°N	107.611629°W
3,800.00	90.05	208.40	3,047.94	-1,244.15	-772.99	2,173,960.03	564,712.93	36.974222°N	107.611800°W
3,900.00	90.10	205.40	3,047.81	-1,333.31	-818.23	2,173,870.86	564,667.69	36.973977°N	107.611956°W
4,000.00	90.14	202.40	3,047.61	-1,424.73	-858.74	2,173,779.45	564,627.18	36.973726°N	107.612095°W
4,100.00	90.18	199.40	3,047.33	-1,518.13	-894.42	2,173,686.04	564,591.50	36.973470°N	107.612218°W
4,200.00	90.22	196.40	3,046.97	-1,613.28	-925.16	2,173,590.90	564,560.76	36.973209°N	107.612324°W
4,300.00	90.27	193.40	3,046.54	-1,709.90	-950.87	2,173,494.27	564,535.05	36.972943°N	107.612413°W
4,400.00	90.31	190.40	3,046.04	-1,807.74	-971.50	2,173,396.43	564,514.42	36.972675°N	107.612484°W
4,500.00	90.35	187.40	3,045.47	-1,906.52	-986.97	2,173,297.65	564,498.95	36.972404°N	107.612538°W
4,600.00	90.39	184.40	3,044.83	-2,005.98	-997.26	2,173,198.20	564,488.66	36.972130°N	107.612574°W
4,700.00	90.42	181.40	3,044.12	-2,105.84	-1,002.32	2,173,098.34	564,483.60	36.971856°N	107.612592°W
4,716.49	90.43	180.91	3,044.00	-2,122.32	-1,002.66	2,173,081.85	564,483.26	36.971811°N	107.612594°W
EOT, Hold Section									
4,800.00	90.43	180.91	3,043.37	-2,205.82	-1,003.98	2,172,998.36	564,481.94	36.971582°N	107.612599°W
4,900.00	90.43	180.91	3,042.62	-2,305.80	-1,005.57	2,172,898.37	564,480.35	36.971307°N	107.612605°W
5,000.00	90.43	180.91	3,041.87	-2,405.79	-1,007.16	2,172,798.39	564,478.76	36.971032°N	107.612611°W
5,100.00	90.43	180.91	3,041.11	-2,505.77	-1,008.75	2,172,698.40	564,477.17	36.970758°N	107.612618°W
5,200.00	90.43	180.91	3,040.36	-2,605.76	-1,010.33	2,172,598.42	564,475.59	36.970483°N	107.612624°W
5,300.00	90.43	180.91	3,039.61	-2,705.74	-1,011.92	2,172,498.43	564,474.00	36.970208°N	107.612630°W
5,400.00	90.43	180.91	3,038.86	-2,805.73	-1,013.51	2,172,398.45	564,472.41	36.969934°N	107.612636°W
5,500.00	90.43	180.91	3,038.10	-2,905.71	-1,015.10	2,172,298.46	564,470.82	36.969659°N	107.612642°W
5,600.00	90.43	180.91	3,037.35	-3,005.68	-1,016.68	2,172,198.48	564,469.24	36.969385°N	107.612649°W
5,700.00	90.43	180.91	3,036.60	-3,105.68	-1,018.27	2,172,098.49	564,467.65	36.969110°N	107.612655°W
5,800.00	90.43	180.91	3,035.85	-3,205.67	-1,019.86	2,171,998.51	564,466.06	36.968835°N	107.612661°W
5,900.00	90.43	180.91	3,035.09	-3,305.65	-1,021.45	2,171,898.52	564,464.47	36.968561°N	107.612667°W
6,000.00	90.43	180.91	3,034.34	-3,405.63	-1,023.04	2,171,798.54	564,462.88	36.968286°N	107.612674°W
6,100.00	90.43	180.91	3,033.59	-3,505.62	-1,024.62	2,171,698.56	564,461.30	36.968011°N	107.612680°W
6,200.00	90.43	180.91	3,032.84	-3,605.60	-1,026.21	2,171,598.57	564,459.71	36.967737°N	107.612686°W
6,300.00	90.43	180.91	3,032.08	-3,705.59	-1,027.80	2,171,498.59	564,458.12	36.967462°N	107.612692°W
6,400.00	90.43	180.91	3,031.33	-3,805.57	-1,029.39	2,171,398.60	564,456.53	36.967188°N	107.612699°W
6,500.00	90.43	180.91	3,030.58	-3,905.56	-1,030.97	2,171,298.62	564,454.95	36.966913°N	107.612705°W
6,600.00	90.43	180.91	3,029.83	-4,005.54	-1,032.56	2,171,198.63	564,453.36	36.966638°N	107.612711°W
6,700.00	90.43	180.91	3,029.07	-4,105.53	-1,034.15	2,171,098.65	564,451.77	36.966364°N	107.612717°W
6,800.00	90.43	180.91	3,028.32	-4,205.51	-1,035.74	2,170,998.66	564,450.18	36.966089°N	107.612723°W
6,900.00	90.43	180.91	3,027.57	-4,305.50	-1,037.33	2,170,898.68	564,448.59	36.965814°N	107.612730°W
7,000.00	90.43	180.91	3,026.82	-4,405.48	-1,038.91	2,170,798.69	564,447.01	36.965540°N	107.612736°W
7,100.00	90.43	180.91	3,026.06	-4,505.47	-1,040.50	2,170,698.71	564,445.42	36.965265°N	107.612742°W
7,200.00	90.43	180.91	3,025.31	-4,605.45	-1,042.09	2,170,598.73	564,443.83	36.964991°N	107.612748°W
7,300.00	90.43	180.91	3,024.56	-4,705.43	-1,043.68	2,170,498.74	564,442.24	36.964716°N	107.612755°W
7,400.00	90.43	180.91	3,023.81	-4,805.42	-1,045.26	2,170,398.76	564,440.66	36.964441°N	107.612761°W
7,500.00	90.43	180.91	3,023.05	-4,905.40	-1,046.85	2,170,298.77	564,439.07	36.964167°N	107.612767°W
7,600.00	90.43	180.91	3,022.30	-5,005.39	-1,048.44	2,170,198.79	564,437.48	36.963892°N	107.612773°W
7,700.00	90.43	180.91	3,021.55	-5,105.37	-1,050.03	2,170,098.80	564,435.89	36.963617°N	107.612779°W
7,800.00	90.43	180.91	3,020.80	-5,205.36	-1,051.62	2,169,998.82	564,434.30	36.963343°N	107.612786°W
7,900.00	90.43	180.91	3,020.04	-5,305.34	-1,053.20	2,169,898.83	564,432.72	36.963068°N	107.612792°W
8,000.00	90.43	180.91	3,019.29	-5,405.33	-1,054.79	2,169,798.85	564,431.13	36.962794°N	107.612798°W
8,100.00	90.43	180.91	3,018.54	-5,505.31	-1,056.38	2,169,698.86	564,429.54	36.962519°N	107.612804°W



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.18-T32N-R07W
Well: San Juan 32-7 Unit 243H
Wellbore: Lat 1
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
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
8,171.68	90.43	180.91	3,018.00	-5,576.98	-1,057.52	2,169,627.20	564,428.40	36.962322°N	107.612809°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 32-7 Unit 243H FTP - plan hits target center - Point	0.00	0.00	2,994.32	-935.15	-584.35	2,174,269.02	564,901.57	36.975069°N	107.611152°W
SJ 32-7 Unit 243H Toe - plan hits target center - Point	0.00	0.00	3,018.00	-5,576.98	-1,057.52	2,169,627.20	564,428.40	36.962322°N	107.612809°W

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,045.69	2,024.00	Ojo Alamo		0.00	
2,117.15	2,089.00	Kirtland		0.00	
2,880.37	2,694.00	Fruitland		0.00	
3,590.42	3,041.00	top of target		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,430.06	2,994.32	-935.15	-584.35	FTP, Build 10"/100' DLS
3,680.06	3,048.00	-1,140.50	-712.67	LP, Begin Turn
4,716.49	3,044.00	-2,122.32	-1,002.66	EOT, Hold Section
8,171.68	3,018.00	-5,576.98	-1,057.52	PBHL/TD



Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.18-T32N-R07W

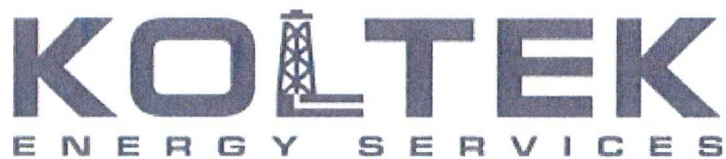
San Juan 32-7 Unit 243H

Pilot Hole

Rev0

Anticollision Report

02 October, 2018





Koltek Energy Services

Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well San Juan 32-7 Unit 243H
Project:	San Juan Co., NM (NAD27)	TVD Reference:	KB @ 6376.00usft
Reference Site:	Sec.18-T32N-R07W	MD Reference:	KB @ 6376.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	San Juan 32-7 Unit 243H	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	10/02/18		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	4,030.33	Rev0 (Pilot Hole)	MWD	MWD - Standard	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec.18-T32N-R07W						
San Juan 32-7 Unit 202 - Original Hole - Original Hole	2,725.74	2,610.78	430.44	360.59	6.162	CC, ES
San Juan 32-7 Unit 202 - Original Hole - Original Hole	2,800.00	2,663.40	433.63	361.73	6.031	SF
San Juan 32-7 Unit 202R - Original Hole - Original Hole	413.02	395.04	71.63	65.60	11.869	CC
San Juan 32-7 Unit 202R - Original Hole - Original Hole	1,300.00	1,282.02	73.38	47.09	2.791	ES
San Juan 32-7 Unit 202R - Original Hole - Original Hole	1,400.00	1,381.91	77.91	48.86	2.682	SF
Sec.19-T32N-R07W						
San Juan 32-7 Unit 243A - Original Hole - Original Hole	4,030.33	3,247.19	984.45	858.54	7.819	CC, ES, SF

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 799-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	22.15	22.15	0.00	0.29	-109.12	-224.51	-647.65	685.47					
100.00	100.00	122.66	122.65	0.10	1.63	-109.18	-225.23	-647.65	685.70	683.98	1.72	398.356		
200.00	200.00	223.16	223.15	0.32	2.96	-109.21	-225.73	-647.65	685.86	682.59	3.28	209.230		
300.00	300.00	323.65	323.64	0.55	4.29	-109.24	-226.00	-647.65	685.95	681.12	4.83	141.882		
400.00	400.00	424.14	424.13	0.77	5.62	-109.24	-226.06	-647.65	685.97	679.58	6.39	107.330		
500.00	500.00	524.62	524.62	0.99	6.95	-109.23	-225.89	-647.65	685.92	677.97	7.95	86.304		
600.00	600.00	625.10	625.09	1.22	8.28	-109.20	-225.51	-647.65	685.79	676.29	9.50	72.157		
700.00	700.00	725.56	725.56	1.44	9.62	-109.15	-224.90	-647.65	685.59	674.53	11.06	61.987		
800.00	800.00	824.00	824.00	1.67	11.25	-109.10	-224.32	-647.65	685.40	672.48	12.92	53.045		
900.00	900.00	924.01	924.00	1.89	13.90	-109.10	-224.32	-647.65	685.40	669.61	15.80	43.389		
1,000.00	1,000.00	1,024.01	1,024.00	2.12	16.55	-109.10	-224.32	-647.65	685.40	666.73	18.67	36.707		
1,100.00	1,100.00	1,124.02	1,124.00	2.34	19.20	-109.10	-224.32	-647.65	685.40	663.85	21.55	31.808		
1,200.00	1,200.00	1,224.02	1,224.00	2.57	21.86	-109.10	-224.32	-647.65	685.40	660.98	24.42	28.063		
1,263.40	1,263.40	1,287.42	1,287.40	2.71	23.54	-109.10	-224.32	-647.65	685.40	659.16	26.25	26.114		
1,300.00	1,300.00	1,326.00	1,325.97	2.78	24.56	38.92	-224.32	-647.65	685.13	657.79	27.34	25.057		
1,400.00	1,399.88	1,423.92	1,423.88	2.96	27.15	39.23	-224.32	-647.65	681.61	651.53	30.08	22.657		
1,500.00	1,499.40	1,523.43	1,523.40	3.15	29.79	39.89	-224.32	-647.65	674.07	641.25	32.82	20.538		
1,600.00	1,598.26	1,622.30	1,622.26	3.36	32.41	40.94	-224.32	-647.65	662.64	627.14	35.50	18.667		
1,700.00	1,696.21	1,720.25	1,720.21	3.62	35.01	42.41	-224.32	-647.65	647.48	609.37	38.12	16.986		
1,800.00	1,792.97	1,817.02	1,816.97	3.95	37.57	44.33	-224.32	-647.65	628.88	588.17	40.70	15.450		

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.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design													Offset Site Error:		0.00 usft
Survey Program: 799-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			
1,900.00	1,888.28	1,912.33	1,912.28	4.35	40.10	46.76	-224.32	-647.65	607.19	563.89	43.29	14.025			
2,000.00	1,981.87	2,005.93	2,005.87	4.85	42.58	49.76	-224.32	-647.65	582.91	536.96	45.95	12.687			
2,100.00	2,073.50	2,097.57	2,097.50	5.44	45.01	53.39	-224.32	-647.65	556.70	507.97	48.73	11.424			
2,200.00	2,162.91	2,186.98	2,186.91	6.14	47.38	57.71	-224.32	-647.65	529.43	477.71	51.72	10.237			
2,300.00	2,249.85	2,273.92	2,273.85	6.95	49.69	62.74	-224.32	-647.65	502.27	447.31	54.97	9.138			
2,400.00	2,334.09	2,358.17	2,358.09	7.85	51.92	68.46	-224.32	-647.65	476.74	418.26	58.48	8.152			
2,500.00	2,415.39	2,439.47	2,439.39	8.86	54.07	74.77	-224.32	-647.65	454.75	392.58	62.17	7.315			
2,600.00	2,493.53	2,517.62	2,517.53	9.97	56.14	81.46	-224.32	-647.65	438.59	372.74	65.85	6.660			
2,700.00	2,568.31	2,592.08	2,591.99	11.17	57.92	88.22	-224.20	-647.65	430.81	361.73	69.08	6.236			
2,725.74	2,586.98	2,610.78	2,610.68	11.50	58.36	89.94	-224.18	-647.65	430.44	360.59	69.86	6.162 CC, ES			
2,800.00	2,639.50	2,663.40	2,663.31	12.45	59.59	94.79	-224.13	-647.65	433.63	361.73	71.90	6.031 SF			
2,900.00	2,706.93	2,731.03	2,730.93	13.82	61.18	100.86	-224.10	-647.65	448.57	374.40	74.18	6.047			
3,000.00	2,770.40	2,794.78	2,794.68	15.27	62.67	106.21	-224.13	-647.65	476.08	400.17	75.91	6.272			
3,100.00	2,829.74	2,854.48	2,854.38	16.79	64.07	110.73	-224.19	-647.65	515.56	438.35	77.21	6.678			
3,200.00	2,884.78	2,909.96	2,909.85	18.38	65.37	114.37	-224.28	-647.65	565.72	487.48	78.24	7.230			
3,300.00	2,935.38	2,959.49	2,959.38	20.04	66.44	116.98	-224.32	-647.65	625.10	545.93	79.17	7.896			
3,400.00	2,981.40	3,005.51	3,005.40	21.75	67.37	118.82	-224.32	-647.65	692.19	612.03	80.16	8.635			
3,430.06	2,994.32	3,018.43	3,018.32	22.27	67.63	119.21	-224.32	-647.65	713.65	633.13	80.52	8.863			
3,500.00	3,023.87	3,047.99	3,047.87	23.50	68.24	121.85	-224.32	-647.65	765.16	684.75	80.41	9.516			
3,600.00	3,066.14	3,090.25	3,090.14	25.27	69.10	125.38	-224.32	-647.65	841.65	761.53	80.12	10.505			
3,700.00	3,108.40	3,131.00	3,130.89	27.04	69.92	128.52	-224.32	-647.65	920.70	840.93	79.77	11.541			
3,800.00	3,150.66	3,131.00	3,130.89	28.82	69.92	128.52	-224.32	-647.65	1,002.67	921.45	81.22	12.345			
3,900.00	3,192.92	3,131.00	3,130.89	30.61	69.92	128.52	-224.32	-647.65	1,087.66	1,004.99	82.67	13.157			
4,000.00	3,235.18	3,131.00	3,130.89	32.39	69.92	128.52	-224.32	-647.65	1,175.02	1,090.90	84.12	13.968			
4,030.33	3,248.00	3,131.00	3,130.89	32.93	69.92	128.52	-224.32	-647.65	1,201.90	1,117.34	84.56	14.213			



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.18-T32N-R07W - San Juan 32-7 Unit 202R - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 790-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	35.03	59.80	41.92	75.22					
100.00	100.00	82.42	82.42	0.10	1.09	35.32	59.16	41.92	72.51	71.32	1.19	61.026		
200.00	200.00	182.30	182.29	0.32	2.42	35.59	58.58	41.92	72.04	69.30	2.74	26.322		
300.00	300.00	282.17	282.17	0.55	3.74	35.76	58.22	41.92	71.74	67.46	4.29	16.742		
400.00	400.00	382.04	382.03	0.77	5.06	35.82	58.08	41.92	71.63	65.80	5.83	12.279		
413.02	413.02	395.04	395.03	0.80	5.24	35.82	58.08	41.92	71.63	65.60	6.04	11.869	CC	
500.00	500.00	481.90	481.89	0.99	6.39	35.78	58.16	41.92	71.70	64.32	7.38	9.713		
600.00	600.00	581.75	581.75	1.22	7.71	35.64	58.47	41.92	71.94	63.01	8.93	8.056		
700.00	700.00	681.60	681.60	1.44	9.03	35.40	58.99	41.92	72.37	61.89	10.48	6.907		
800.00	800.00	781.43	781.43	1.67	10.36	35.06	59.73	41.92	72.98	60.95	12.03	6.068		
900.00	900.00	882.00	882.00	1.89	12.91	35.03	59.80	41.92	73.03	58.23	14.80	4.933		
1,000.00	1,000.00	982.01	982.00	2.12	15.56	35.03	59.80	41.92	73.03	55.35	17.68	4.131		
1,100.00	1,100.00	1,082.01	1,082.00	2.34	18.21	35.03	59.80	41.92	73.03	52.48	20.56	3.553		
1,200.00	1,200.00	1,182.02	1,182.00	2.57	20.86	35.03	59.80	41.92	73.03	49.60	23.43	3.117		
1,263.40	1,263.40	1,245.42	1,245.40	2.71	22.54	35.03	59.80	41.92	73.03	47.78	25.26	2.892		
1,300.00	1,300.00	1,282.02	1,282.00	2.78	23.51	-176.98	59.80	41.92	73.38	47.09	26.29	2.791	ES	
1,400.00	1,399.88	1,381.91	1,381.88	2.96	26.16	-177.15	59.80	41.92	77.91	48.86	29.05	2.682	SF	
1,500.00	1,499.40	1,481.43	1,481.40	3.15	28.80	-177.46	59.80	41.92	87.65	55.95	31.70	2.765		
1,600.00	1,598.26	1,580.30	1,580.26	3.36	31.42	-177.81	59.80	41.92	102.59	68.36	34.23	2.997		
1,700.00	1,696.21	1,678.25	1,678.21	3.62	34.02	-178.15	59.80	41.92	122.68	86.08	36.60	3.352		
1,800.00	1,792.97	1,775.02	1,774.97	3.95	36.58	-178.44	59.80	41.92	147.87	109.08	38.79	3.812		
1,900.00	1,888.28	1,870.33	1,870.28	4.35	39.11	-178.69	59.80	41.92	178.09	137.31	40.78	4.367		
2,000.00	1,981.87	1,963.93	1,963.87	4.85	41.59	-178.88	59.80	41.92	213.26	170.71	42.55	5.012		
2,100.00	2,073.50	2,055.57	2,055.50	5.44	44.02	-179.04	59.80	41.92	253.28	209.20	44.08	5.746		
2,200.00	2,162.91	2,144.98	2,144.91	6.14	46.39	-179.16	59.80	41.92	298.05	252.69	45.36	6.571		
2,300.00	2,249.85	2,231.92	2,231.85	6.95	48.69	-179.26	59.80	41.92	347.43	301.07	46.36	7.494		
2,400.00	2,334.09	2,316.16	2,316.09	7.85	50.92	-179.33	59.80	41.92	401.30	354.21	47.09	8.523		
2,500.00	2,415.39	2,397.47	2,397.39	8.86	53.08	-179.40	59.80	41.92	459.50	411.98	47.52	9.670		
2,600.00	2,493.53	2,475.62	2,475.53	9.97	55.15	-179.45	59.80	41.92	521.87	474.21	47.66	10.951		
2,700.00	2,568.31	2,550.40	2,550.31	11.17	57.13	-179.49	59.80	41.92	588.25	540.76	47.49	12.386		
2,800.00	2,639.50	2,621.60	2,621.50	12.45	59.02	-179.52	59.80	41.92	658.46	611.43	47.03	14.002		
2,900.00	2,706.93	2,689.03	2,688.93	13.82	60.81	-179.54	59.80	41.92	732.29	686.03	46.26	15.831		
3,000.00	2,770.40	2,752.50	2,752.40	15.27	62.49	-179.56	59.80	41.92	809.55	764.36	45.19	17.915		
3,100.00	2,829.74	2,811.84	2,811.74	16.79	64.06	-179.57	59.80	41.92	890.03	846.20	43.83	20.308		
3,200.00	2,884.78	2,866.00	2,865.90	18.38	65.23	-179.56	59.80	41.92	973.56	931.53	42.03	23.164		
3,300.00	2,935.38	2,917.49	2,917.38	20.04	66.86	-179.57	59.80	41.92	1,059.74	1,019.47	40.27	26.318		
3,400.00	2,981.40	2,963.51	2,963.40	21.75	68.08	-179.56	59.80	41.92	1,148.51	1,110.42	38.10	30.148		
3,430.06	2,994.32	2,976.43	2,976.32	22.27	68.43	-179.55	59.80	41.92	1,175.65	1,138.26	37.39	31.439		
3,500.00	3,023.87	3,005.99	3,005.87	23.50	69.21	-179.58	59.80	41.92	1,239.04	1,200.88	38.16	32.468		
3,600.00	3,066.14	3,048.25	3,048.14	25.27	70.33	-179.61	59.80	41.92	1,329.67	1,290.41	39.26	33.865		
3,700.00	3,108.40	3,090.51	3,090.40	27.04	71.45	-179.63	59.80	41.92	1,420.30	1,379.93	40.37	35.180		
3,800.00	3,150.66	3,132.78	3,132.66	28.82	72.57	-179.65	59.80	41.92	1,510.93	1,469.45	41.49	36.421		
3,900.00	3,192.92	3,175.04	3,174.92	30.61	73.69	-179.67	59.80	41.92	1,601.56	1,558.96	42.60	37.594		
4,000.00	3,235.18	3,217.31	3,217.18	32.39	74.81	-179.69	59.80	41.92	1,692.19	1,648.47	43.72	38.703		
4,030.33	3,248.00	3,230.12	3,230.00	32.93	75.15	-179.70	59.80	41.92	1,719.68	1,675.62	44.06	39.028		



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
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-R07W - San Juan 32-7 Unit 243A - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 875-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	-177.80	-1,974.85	-75.98	1,976.31					
100.00	100.00	73.97	73.96	0.10	1.68	-177.80	-1,975.88	-75.98	1,977.50	1,975.73	1.77	1,116.399		
200.00	200.00	181.40	181.39	0.32	4.11	-177.80	-1,977.04	-75.98	1,978.58	1,974.15	4.43	446.672		
300.00	300.00	288.82	288.80	0.55	6.54	-177.80	-1,977.80	-75.98	1,979.29	1,972.20	7.09	279.261		
400.00	400.00	396.22	396.20	0.77	8.98	-177.80	-1,978.16	-75.98	1,979.62	1,969.87	9.75	203.138		
500.00	500.00	503.61	503.59	0.99	11.41	-177.80	-1,978.11	-75.98	1,979.58	1,967.17	12.40	159.612		
600.00	600.00	610.97	610.96	1.22	13.84	-177.80	-1,977.66	-75.98	1,979.16	1,964.10	15.06	131.426		
700.00	700.00	718.30	718.30	1.44	16.27	-177.80	-1,976.81	-75.98	1,978.37	1,960.65	17.72	111.676		
800.00	800.00	825.61	825.61	1.67	18.70	-177.80	-1,975.56	-75.98	1,977.20	1,956.63	20.37	97.061		
900.00	900.00	910.09	910.09	1.89	21.08	-177.80	-1,974.63	-75.98	1,976.13	1,953.16	22.97	86.023		
1,000.00	1,000.00	1,005.16	1,005.14	2.12	24.49	-177.80	-1,974.22	-75.98	1,975.69	1,949.09	26.60	74.264		
1,100.00	1,100.00	1,100.24	1,100.21	2.34	27.89	-177.80	-1,974.04	-75.98	1,975.50	1,945.27	30.24	65.336		
1,124.94	1,124.94	1,123.96	1,123.92	2.40	28.74	-177.80	-1,974.03	-75.98	1,975.50	1,944.35	31.14	63.435		
1,200.00	1,200.00	1,195.34	1,195.29	2.57	31.30	-177.80	-1,974.10	-75.98	1,975.57	1,941.70	33.87	58.330		
1,263.40	1,263.40	1,255.64	1,255.59	2.71	33.46	-177.80	-1,974.26	-75.98	1,975.73	1,939.56	36.17	54.620		
1,300.00	1,300.00	1,290.46	1,290.40	2.78	34.71	-29.80	-1,974.40	-75.98	1,975.57	1,938.08	37.50	52.687		
1,400.00	1,399.88	1,398.96	1,398.88	2.96	38.35	-29.93	-1,974.85	-75.98	1,972.07	1,930.82	41.26	47.799		
1,500.00	1,499.40	1,498.48	1,498.40	3.15	40.98	-30.20	-1,974.85	-75.98	1,963.62	1,919.70	43.92	44.708		
1,600.00	1,599.26	1,597.35	1,597.26	3.36	43.60	-30.62	-1,974.85	-75.98	1,950.69	1,904.22	46.47	41.973		
1,700.00	1,696.21	1,695.30	1,695.21	3.62	46.18	-31.19	-1,974.85	-75.98	1,933.35	1,884.44	48.91	39.529		
1,800.00	1,792.97	1,792.07	1,791.97	3.95	48.74	-31.93	-1,974.85	-75.98	1,911.68	1,860.46	51.22	37.321		
1,900.00	1,888.28	1,894.74	1,894.64	4.35	51.30	-32.89	-1,974.75	-75.98	1,885.72	1,832.26	53.47	35.270		
2,000.00	1,981.87	1,985.10	1,985.00	4.85	53.13	-33.97	-1,974.47	-75.98	1,855.50	1,800.54	54.95	33.296		
2,100.00	2,073.50	2,073.66	2,073.55	5.44	54.92	-35.26	-1,974.34	-75.98	1,821.53	1,765.13	56.40	32.764		
2,200.00	2,162.91	2,160.19	2,160.08	6.14	56.67	-36.75	-1,974.36	-75.98	1,784.00	1,726.16	57.85	30.841		
2,300.00	2,249.85	2,244.47	2,244.35	6.95	58.37	-38.47	-1,974.52	-75.98	1,743.14	1,683.80	59.34	29.378		
2,400.00	2,334.09	2,340.00	2,339.87	7.85	60.30	-40.63	-1,974.85	-75.98	1,699.24	1,638.01	61.23	27.752		
2,500.00	2,415.39	2,400.65	2,400.52	8.86	62.09	-42.60	-1,975.43	-75.98	1,652.71	1,589.61	63.11	26.189		
2,600.00	2,493.53	2,484.72	2,484.58	9.97	64.58	-45.24	-1,976.00	-75.98	1,603.51	1,537.50	66.01	24.292		
2,700.00	2,568.31	2,564.80	2,564.66	11.17	66.95	-48.20	-1,976.27	-75.98	1,551.83	1,482.64	69.19	22.427		
2,800.00	2,639.50	2,640.66	2,640.52	12.45	69.20	-51.47	-1,976.28	-75.98	1,498.18	1,425.45	72.72	20.601		
2,900.00	2,706.93	2,712.10	2,711.96	13.82	71.31	-55.03	-1,976.08	-75.98	1,443.08	1,366.46	76.62	18.834		
3,000.00	2,770.40	2,778.93	2,778.80	15.27	73.29	-58.84	-1,975.71	-75.98	1,387.15	1,306.29	80.86	17.154		
3,100.00	2,829.74	2,840.99	2,840.86	16.79	75.13	-62.84	-1,975.20	-75.98	1,331.09	1,245.73	85.36	15.593		
3,200.00	2,884.78	2,883.91	2,883.78	18.38	76.54	-66.33	-1,974.85	-75.98	1,275.87	1,186.42	89.44	14.265		
3,300.00	2,935.38	2,934.52	2,934.38	20.04	78.83	-70.28	-1,974.85	-75.98	1,222.62	1,127.91	94.70	12.910		
3,400.00	2,981.40	2,980.55	2,980.40	21.75	80.91	-74.12	-1,974.85	-75.98	1,171.91	1,072.16	99.76	11.748		
3,430.06	2,994.32	2,993.47	2,993.32	22.27	81.49	-75.24	-1,974.85	-75.98	1,157.33	1,056.11	101.22	11.434		
3,500.00	3,023.87	3,023.03	3,022.87	23.50	82.83	-76.71	-1,974.85	-75.98	1,125.08	1,020.84	104.24	10.794		
3,600.00	3,066.14	3,065.30	3,065.14	25.27	84.74	-78.84	-1,974.85	-75.98	1,083.75	975.23	108.51	9.987		
3,700.00	3,108.40	3,107.57	3,107.40	27.04	86.65	-81.01	-1,974.85	-75.98	1,048.64	935.92	112.73	9.303		
3,800.00	3,150.66	3,149.84	3,149.66	28.82	88.56	-83.20	-1,974.85	-75.98	1,020.40	903.55	116.85	8.733		
3,900.00	3,192.92	3,192.10	3,191.92	30.61	90.47	-85.41	-1,974.85	-75.98	999.61	878.74	120.87	8.270		
4,000.00	3,235.18	3,234.37	3,234.18	32.39	92.39	-87.64	-1,974.85	-75.98	986.74	861.98	124.76	7.909		
4,030.33	3,248.00	3,247.19	3,247.00	32.93	92.97	-88.32	-1,974.85	-75.98	984.45	858.54	125.91	7.819 CC, ES, SF		

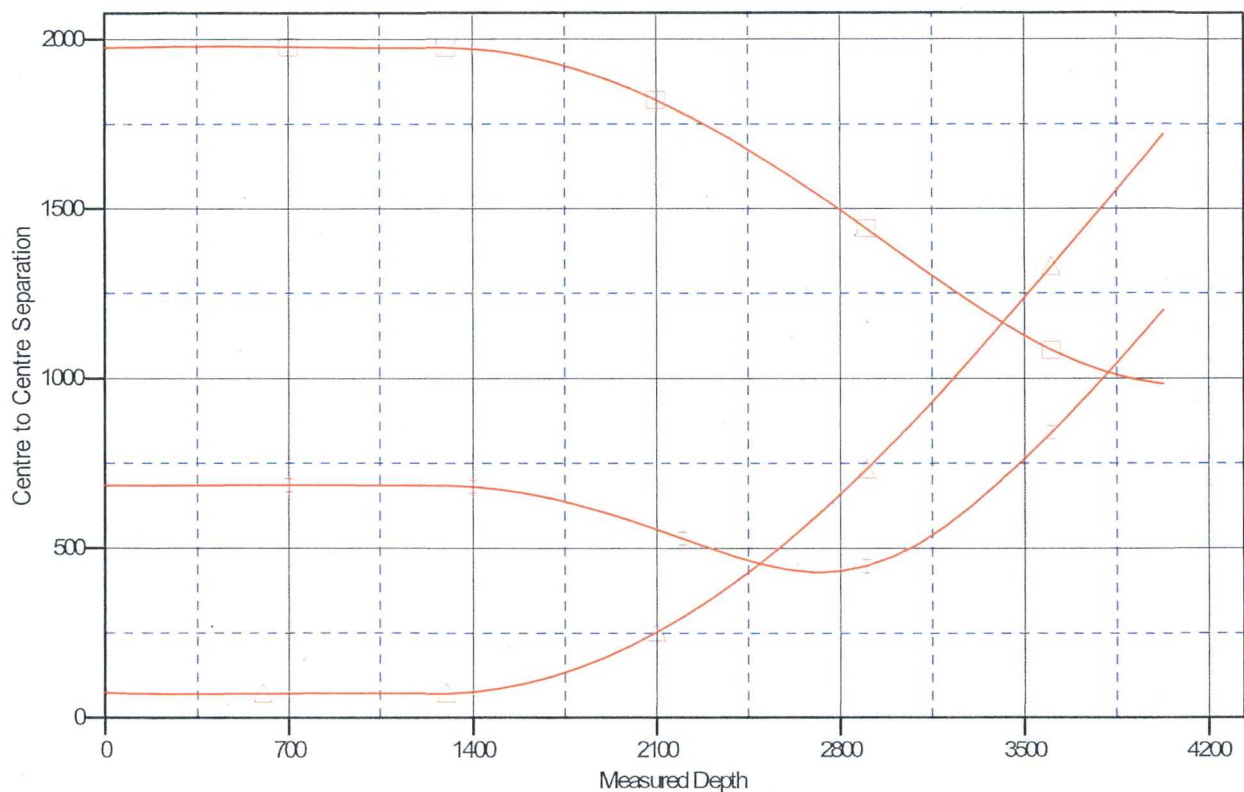
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
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 @ 6376.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.833334°W

Coordinates are relative to: San Juan 32-7 Unit 243H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.13°

Ladder Plot



LEGEND

San Juan 32-7 Unit 202R, Original Hole, Original Hole V0  San Juan 32-7 Unit 202, Original Hole, Original Hole V0  San Juan 32-7 Unit 243A, Original Hole, Original Hole V0



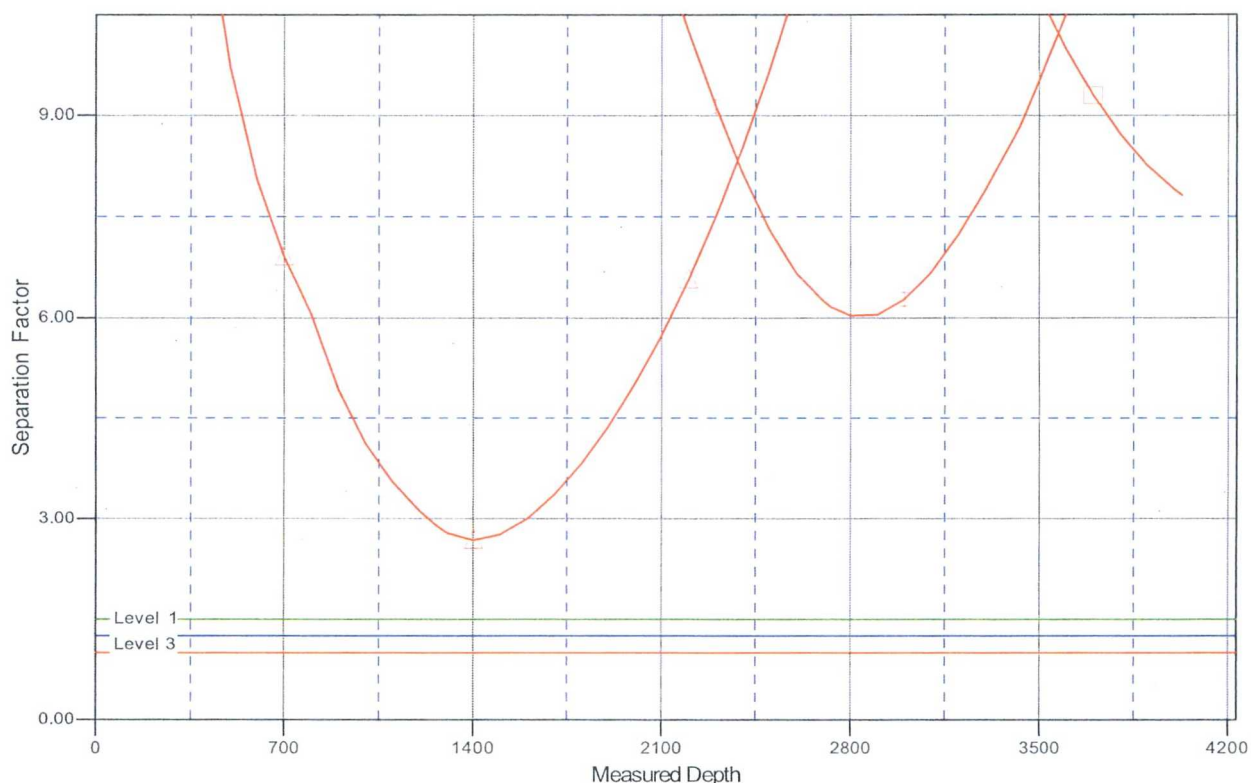
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
2.00 sigma
Output errors are at EDM 5000.1 Single User Db
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 6376.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.833334°W

Coordinates are relative to: San Juan 32-7 Unit 243H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.13°

Separation Factor Plot

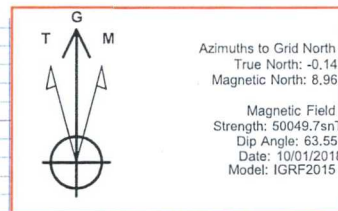
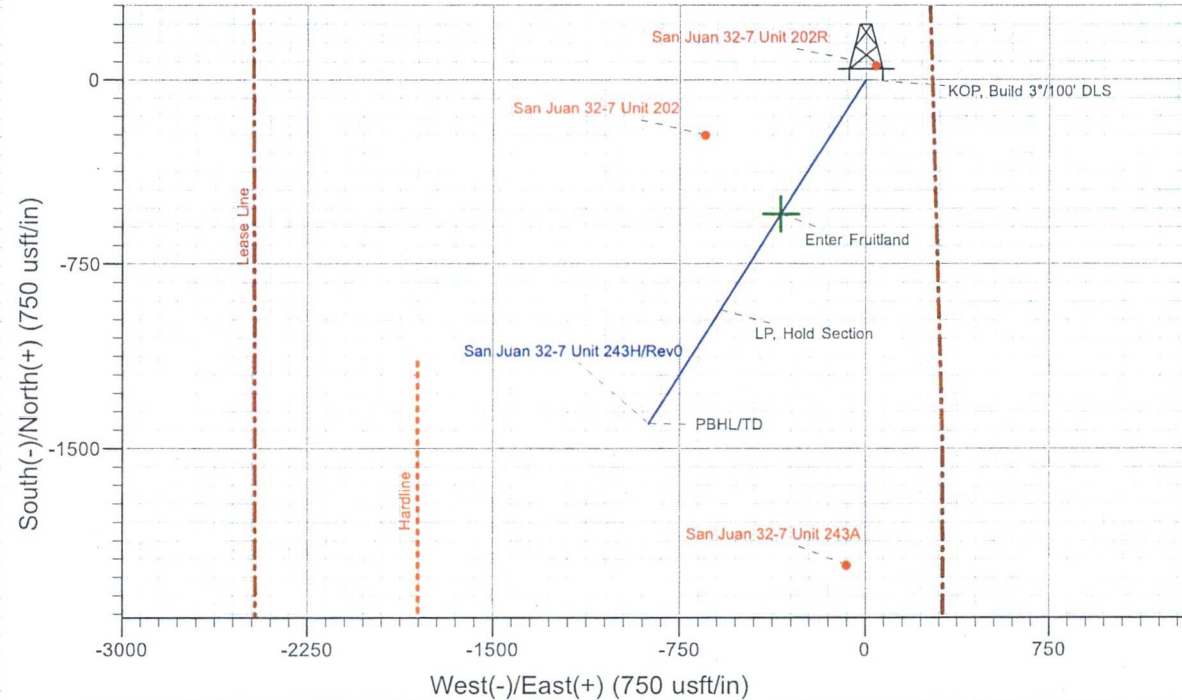
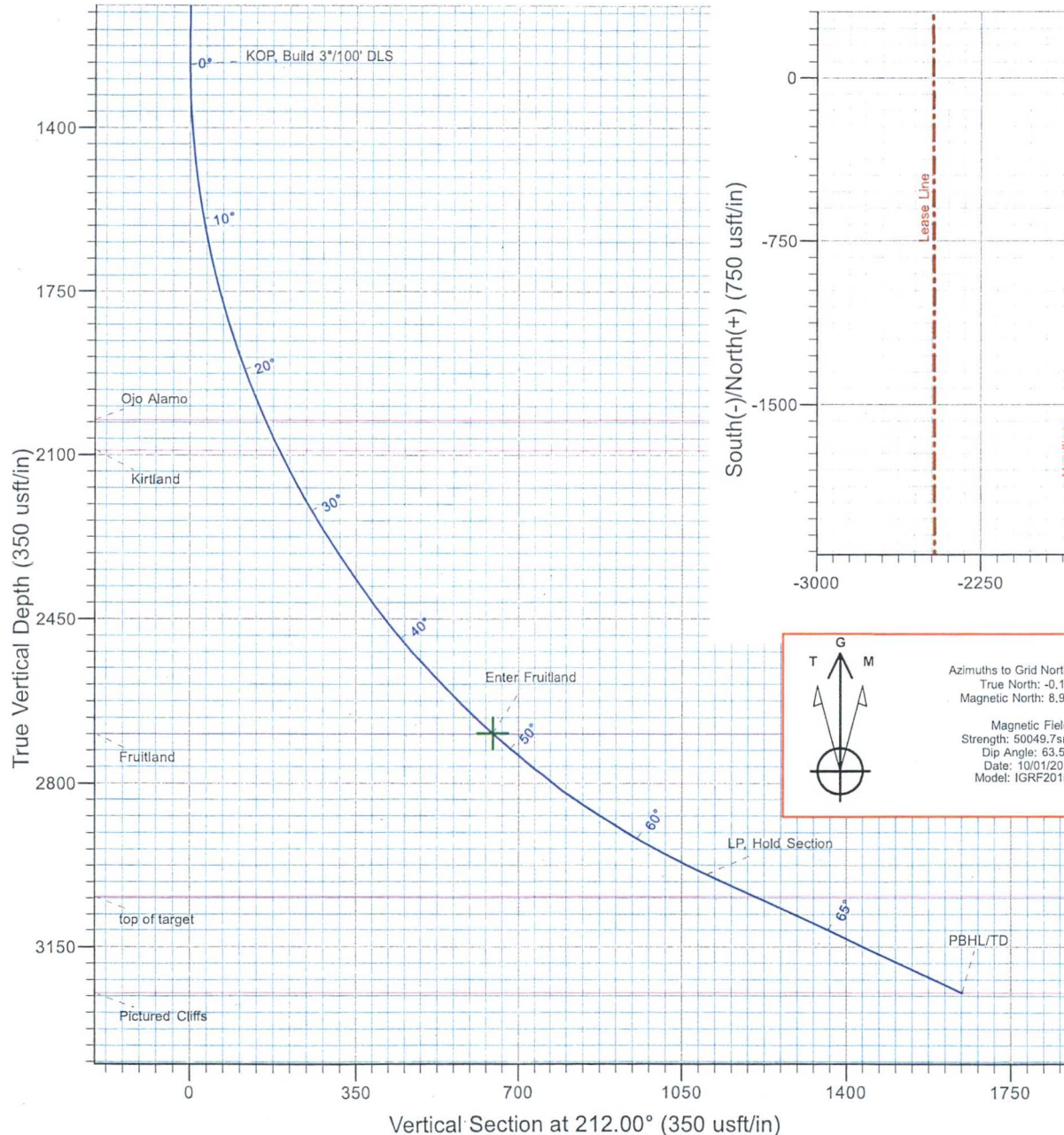


LEGEND

San Juan 32-7 Unit 202R, Original Hole, Original Hole V0 San Juan 32-7 Unit 202, Original Hole, Original Hole V0 San Juan 32-7 Unit 243A, Original Hole, Original Hole V0



Company: Hilcorp Energy Company
 Field: San Juan Co., NM (NAD27)
 Location: Sec.18-T32N-R07W
 Well: San Juan 32-7 Unit 243H
 Borehole: Pilot Hole
 Plan: Rev0



WELL DETAILS: San Juan 32-7 Unit 243H					
+N/-S	+E/-W	GL	KB	Latitude	Longitude
0.00	0.00	2175204.18	6361.00	36.977634°N	107.609144°W

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1263.40	0.00	0.00	1263.40	0.00	0.00	0.00	0.00	0.00
3	3430.06	65.00	212.00	2994.32	-935.16	-584.35	3.00	212.00	1102.72
4	4030.33	65.00	212.00	3248.00	-1396.52	-872.64	0.00	0.00	1646.74

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
2024.00	2045.69	Ojo Alamo
2089.00	2117.15	Kirtland
2694.00	2880.37	Fruitland
3041.00	3540.52	top of target
3248.00	4030.33	Pictured Cliffs

ANNOTATIONS		
TVD	MD	Annotation
1263.40	1263.40	KOP, Build 3"/100' DLS
2694.00	2880.37	Enter Fruitland
2994.32	3430.06	LP, Hold Section
3248.00	4030.33	PBHL/TD

San Juan 32-7 Unit 243H Rev0
 Created By: J Rieke Date: 8:29, October 02 2018



Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.18-T32N-R07W

San Juan 32-7 Unit 243H

Pilot Hole

Plan: Rev0

Standard Planning Report - Geographic

02 October, 2018





Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.18-T32N-R07W
Well: San Juan 32-7 Unit 243H
Wellbore: Pilot Hole
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
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.18-T32N-R07W			
Site Position:		Northing:	2,176,499.15 usft	Latitude: 36.981184°N
From:	Map	Easting:	566,563.90 usft	Longitude: 107.605443°W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence: 0.14 °

Well	San Juan 32-7 Unit 243H			
Well Position	+N/-S	0.00 usft	Northing:	2,175,204.18 usft
	+E/-W	0.00 usft	Easting:	565,485.92 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level: 6,361.00 usft

Wellbore	Pilot Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/01/18	9.10	63.55	50,050

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	212.00

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,263.40	0.00	0.00	1,263.40	0.00	0.00	0.00	0.00	0.00	0.00	
3,430.06	65.00	212.00	2,994.32	-935.16	-584.35	3.00	3.00	0.00	212.00	
4,030.33	65.00	212.00	3,248.00	-1,396.52	-872.64	0.00	0.00	0.00	0.00	



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.18-T32N-R07W
Well: San Juan 32-7 Unit 243H
Wellbore: Pilot Hole
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
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	2,175,204.18	565,485.92	36.977634°N	107.609144°W
100.00	0.00	0.00	100.00	0.00	0.00	2,175,204.18	565,485.92	36.977634°N	107.609144°W
200.00	0.00	0.00	200.00	0.00	0.00	2,175,204.18	565,485.92	36.977634°N	107.609144°W
300.00	0.00	0.00	300.00	0.00	0.00	2,175,204.18	565,485.92	36.977634°N	107.609144°W
400.00	0.00	0.00	400.00	0.00	0.00	2,175,204.18	565,485.92	36.977634°N	107.609144°W
500.00	0.00	0.00	500.00	0.00	0.00	2,175,204.18	565,485.92	36.977634°N	107.609144°W
600.00	0.00	0.00	600.00	0.00	0.00	2,175,204.18	565,485.92	36.977634°N	107.609144°W
700.00	0.00	0.00	700.00	0.00	0.00	2,175,204.18	565,485.92	36.977634°N	107.609144°W
800.00	0.00	0.00	800.00	0.00	0.00	2,175,204.18	565,485.92	36.977634°N	107.609144°W
900.00	0.00	0.00	900.00	0.00	0.00	2,175,204.18	565,485.92	36.977634°N	107.609144°W
1,000.00	0.00	0.00	1,000.00	0.00	0.00	2,175,204.18	565,485.92	36.977634°N	107.609144°W
1,100.00	0.00	0.00	1,100.00	0.00	0.00	2,175,204.18	565,485.92	36.977634°N	107.609144°W
1,200.00	0.00	0.00	1,200.00	0.00	0.00	2,175,204.18	565,485.92	36.977634°N	107.609144°W
1,263.40	0.00	0.00	1,263.40	0.00	0.00	2,175,204.18	565,485.92	36.977634°N	107.609144°W
KOP, Build 3"/100' DLS									
1,300.00	1.10	212.00	1,300.00	-0.30	-0.19	2,175,203.88	565,485.73	36.977633°N	107.609145°W
1,400.00	4.10	212.00	1,399.88	-4.14	-2.59	2,175,200.03	565,483.33	36.977623°N	107.609153°W
1,500.00	7.10	212.00	1,499.40	-12.41	-7.76	2,175,191.76	565,478.16	36.977600°N	107.609171°W
1,600.00	10.10	212.00	1,598.26	-25.09	-15.68	2,175,179.09	565,470.24	36.977565°N	107.609198°W
1,700.00	13.10	212.00	1,696.21	-42.14	-26.33	2,175,162.04	565,459.59	36.977519°N	107.609235°W
1,800.00	16.10	212.00	1,792.97	-63.51	-39.68	2,175,140.67	565,446.24	36.977460°N	107.609281°W
1,900.00	19.10	212.00	1,888.28	-89.15	-55.70	2,175,115.03	565,430.22	36.977390°N	107.609336°W
2,000.00	22.10	212.00	1,981.87	-118.98	-74.35	2,175,085.20	565,411.57	36.977308°N	107.609400°W
2,100.00	25.10	212.00	2,073.50	-152.92	-95.56	2,175,051.25	565,390.36	36.977215°N	107.609473°W
2,200.00	28.10	212.00	2,162.91	-190.89	-119.28	2,175,013.29	565,366.64	36.977111°N	107.609554°W
2,300.00	31.10	212.00	2,249.85	-232.77	-145.45	2,174,971.41	565,340.47	36.976996°N	107.609644°W
2,400.00	34.10	212.00	2,334.09	-278.45	-174.00	2,174,925.72	565,311.92	36.976870°N	107.609742°W
2,500.00	37.10	212.00	2,415.39	-327.81	-204.84	2,174,876.37	565,281.08	36.976735°N	107.609848°W
2,600.00	40.10	212.00	2,493.53	-380.71	-237.89	2,174,823.47	565,248.03	36.976590°N	107.609962°W
2,700.00	43.10	212.00	2,568.31	-437.01	-273.07	2,174,767.17	565,212.85	36.976435°N	107.610083°W
2,800.00	46.10	212.00	2,639.50	-496.54	-310.27	2,174,707.63	565,175.65	36.976272°N	107.610210°W
2,880.37	48.51	212.00	2,694.00	-546.63	-341.57	2,174,657.54	565,144.35	36.976135°N	107.610318°W
Enter Fruitland									
2,900.00	49.10	212.00	2,706.93	-559.16	-349.40	2,174,645.02	565,136.52	36.976100°N	107.610345°W
3,000.00	52.10	212.00	2,770.40	-624.68	-390.34	2,174,579.49	565,095.58	36.975921°N	107.610486°W
3,100.00	55.10	212.00	2,829.74	-692.93	-432.99	2,174,511.25	565,052.93	36.975734°N	107.610632°W
3,200.00	58.10	212.00	2,884.78	-763.72	-477.22	2,174,440.46	565,008.70	36.975539°N	107.610784°W
3,300.00	61.10	212.00	2,935.38	-836.85	-522.92	2,174,367.32	564,963.00	36.975339°N	107.610941°W
3,400.00	64.10	212.00	2,981.40	-912.14	-569.97	2,174,292.04	564,915.95	36.975132°N	107.611103°W
3,430.06	65.00	212.00	2,994.32	-935.15	-584.35	2,174,269.02	564,901.57	36.975069°N	107.611152°W
LP, Hold Section									
3,500.00	65.00	212.00	3,023.87	-988.91	-617.94	2,174,215.27	564,867.98	36.974922°N	107.611268°W
3,600.00	65.00	212.00	3,066.14	-1,065.77	-665.97	2,174,138.41	564,819.95	36.974711°N	107.611433°W
3,700.00	65.00	212.00	3,108.40	-1,142.63	-713.99	2,174,061.55	564,771.93	36.974500°N	107.611598°W
3,800.00	65.00	212.00	3,150.66	-1,219.49	-762.02	2,173,984.69	564,723.90	36.974289°N	107.611763°W
3,900.00	65.00	212.00	3,192.92	-1,296.35	-810.05	2,173,907.83	564,675.87	36.974079°N	107.611928°W
4,000.00	65.00	212.00	3,235.18	-1,373.21	-858.07	2,173,830.97	564,627.85	36.973868°N	107.612093°W
4,030.33	65.00	212.00	3,248.00	-1,396.52	-872.64	2,173,807.66	564,613.28	36.973804°N	107.612143°W
PBHL/TD									



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.18-T32N-R07W
Well: San Juan 32-7 Unit 243H
Wellbore: Pilot Hole
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Design Targets

Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
SJ 32-7 Unit 243H Enter	0.00	0.00	2,694.00	-546.63	-341.57	2,174,657.54	565,144.35	36.976135°N	107.610318°W
- plan hits target center									
- Point									

Formations

Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction
(usft)	(usft)			(°)	(°)
2,045.69	2,024.00	Ojo Alamo		0.00	
2,117.15	2,089.00	Kirtland		0.00	
2,880.37	2,694.00	Fruitland		0.00	
3,540.52	3,041.00	top of target		0.00	
4,030.33	3,248.00	Pictured Cliffs		0.00	

Plan Annotations

Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
1,263.40	1,263.40	0.00	0.00	KOP, Build 3"/100' DLS
2,880.37	2,694.00	-546.63	-341.57	Enter Fruitland
3,430.06	2,994.32	-935.15	-584.35	LP, Hold Section
4,030.33	3,248.00	-1,396.52	-872.64	PBHL/TD



Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.18-T32N-R07W

San Juan 32-7 Unit 243H

Lat 1

Rev0

Anticollision Report

02 October, 2018





Koltek Energy Services
Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well San Juan 32-7 Unit 243H
Project:	San Juan Co., NM (NAD27)	TVD Reference:	KB @ 6376.00usft
Reference Site:	Sec.18-T32N-R07W	MD Reference:	KB @ 6376.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	San Juan 32-7 Unit 243H	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	10/02/18		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	3,430.06	Rev0 (Pilot Hole)	MWD	MWD - Standard	
3,430.06	8,171.68	Rev0 (Lat 1)	MWD	MWD - Standard	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec.18-T32N-R07W						
San Juan 32-7 Unit 202 - Original Hole - Original Hole	2,725.74	2,610.78	430.44	360.59	6.162	CC, ES
San Juan 32-7 Unit 202 - Original Hole - Original Hole	2,800.00	2,663.40	433.63	361.73	6.031	SF
San Juan 32-7 Unit 202R - Original Hole - Original Hole	413.02	395.04	71.63	65.60	11.869	CC
San Juan 32-7 Unit 202R - Original Hole - Original Hole	1,300.00	1,282.02	73.38	47.09	2.791	ES
San Juan 32-7 Unit 202R - Original Hole - Original Hole	1,400.00	1,381.91	77.91	48.86	2.682	SF
San Juan 32-7 Unit 243H - Pilot Hole - Rev0	3,430.06	3,430.06	0.00	0.00	0.000	Level 1, CC, SF
San Juan 32-7 Unit 243H - Pilot Hole - Rev0	3,437.76	3,437.76	0.05	-0.05	0.502	Level 1, ES
Sec.19-T32N-R07W						
San Juan 32-7 Unit 243 - Original Hole - Original Hole	7,868.25	3,768.28	388.34	280.57	3.603	CC, ES
San Juan 32-7 Unit 243 - Original Hole - Original Hole	7,900.00	3,769.43	389.63	281.29	3.596	SF
San Juan 32-7 Unit 243A - Original Hole - Original Hole	4,405.05	3,045.18	910.97	793.00	7.722	CC, ES
San Juan 32-7 Unit 243A - Original Hole - Original Hole	4,500.00	3,044.63	913.55	794.68	7.685	SF

Offset Design Sec.18-T32N-R07W - San Juan 32-7 Unit 202 - Original Hole - Original Hole												Offset Site Error:	0.00 usft
Survey Program: 799-INC_ONLY<10												Offset Well Error:	0.00 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	22.15	22.15	0.00	0.29	-109.12	-224.51	-647.65	685.47				
100.00	100.00	122.66	122.65	0.10	1.63	-109.18	-225.23	-647.65	685.70	683.98	1.72	398.356	
200.00	200.00	223.16	223.15	0.32	2.96	-109.21	-225.73	-647.65	685.86	682.59	3.28	209.230	
300.00	300.00	323.65	323.64	0.55	4.29	-109.24	-226.00	-647.65	685.95	681.12	4.83	141.882	
400.00	400.00	424.14	424.13	0.77	5.62	-109.24	-226.06	-647.65	685.97	679.58	6.39	107.330	
500.00	500.00	524.62	524.62	0.99	6.95	-109.23	-225.89	-647.65	685.92	677.97	7.95	86.304	
600.00	600.00	625.10	625.09	1.22	8.28	-109.20	-225.51	-647.65	685.79	676.29	9.50	72.157	
700.00	700.00	725.56	725.56	1.44	9.62	-109.15	-224.90	-647.65	685.59	674.53	11.06	61.987	
800.00	800.00	824.00	824.00	1.67	11.25	-109.10	-224.32	-647.65	685.40	672.48	12.92	53.045	
900.00	900.00	924.01	924.00	1.89	13.90	-109.10	-224.32	-647.65	685.40	669.61	15.80	43.389	
1,000.00	1,000.00	1,024.01	1,024.00	2.12	16.55	-109.10	-224.32	-647.65	685.40	666.73	18.67	36.707	
1,100.00	1,100.00	1,124.02	1,124.00	2.34	19.20	-109.10	-224.32	-647.65	685.40	663.85	21.55	31.808	
1,200.00	1,200.00	1,224.02	1,224.00	2.57	21.86	-109.10	-224.32	-647.65	685.40	660.98	24.42	28.063	
1,263.40	1,263.40	1,287.42	1,287.40	2.71	23.54	-109.10	-224.32	-647.65	685.40	659.16	26.25	26.114	

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.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: EDM 5000.1
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.18-T32N-R07W - San Juan 32-7 Unit 202 - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 799-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	
1,300.00	1,300.00	1,326.00	1,325.97	2.78	24.56	38.92	-224.32	-647.65	685.13	657.79	27.34	25.057	
1,400.00	1,399.88	1,423.92	1,423.88	2.96	27.15	39.23	-224.32	-647.65	681.61	651.53	30.08	22.657	
1,500.00	1,499.40	1,523.43	1,523.40	3.15	29.79	39.89	-224.32	-647.65	674.07	641.25	32.82	20.538	
1,600.00	1,598.26	1,622.30	1,622.26	3.36	32.41	40.94	-224.32	-647.65	662.64	627.14	35.50	18.667	
1,700.00	1,696.21	1,720.25	1,720.21	3.62	35.01	42.41	-224.32	-647.65	647.48	609.37	38.12	16.986	
1,800.00	1,792.97	1,817.02	1,816.97	3.95	37.57	44.33	-224.32	-647.65	628.88	588.17	40.70	15.450	
1,900.00	1,888.28	1,912.33	1,912.28	4.35	40.10	46.76	-224.32	-647.65	607.19	563.89	43.29	14.025	
2,000.00	1,981.87	2,005.93	2,005.87	4.85	42.58	49.76	-224.32	-647.65	582.91	536.96	45.95	12.687	
2,100.00	2,073.50	2,097.57	2,097.50	5.44	45.01	53.39	-224.32	-647.65	556.70	507.97	48.73	11.424	
2,200.00	2,162.91	2,186.98	2,186.91	6.14	47.38	57.71	-224.32	-647.65	529.43	477.71	51.72	10.237	
2,300.00	2,249.85	2,273.92	2,273.85	6.95	49.69	62.74	-224.32	-647.65	502.27	447.31	54.97	9.138	
2,400.00	2,334.09	2,358.17	2,358.09	7.85	51.92	68.46	-224.32	-647.65	476.74	418.26	58.48	8.152	
2,500.00	2,415.39	2,439.47	2,439.39	8.86	54.07	74.77	-224.32	-647.65	454.75	392.58	62.17	7.315	
2,600.00	2,493.53	2,517.62	2,517.53	9.97	56.14	81.46	-224.32	-647.65	438.59	372.74	65.85	6.660	
2,700.00	2,568.31	2,592.08	2,591.99	11.17	57.92	88.22	-224.20	-647.65	430.81	361.73	69.08	6.236	
2,725.74	2,586.98	2,610.78	2,610.68	11.50	58.36	89.94	-224.18	-647.65	430.44	360.59	69.86	6.162 CC, ES	
2,800.00	2,639.50	2,663.40	2,663.31	12.45	59.59	94.79	-224.13	-647.65	433.63	361.73	71.90	6.031 SF	
2,900.00	2,706.93	2,731.03	2,730.93	13.82	61.18	100.86	-224.10	-647.65	448.57	374.40	74.18	6.047	
3,000.00	2,770.40	2,794.78	2,794.68	15.27	62.67	106.21	-224.13	-647.65	476.08	400.17	75.91	6.272	
3,100.00	2,829.74	2,854.48	2,854.38	16.79	64.07	110.73	-224.19	-647.65	515.56	438.35	77.21	6.678	
3,200.00	2,884.78	2,909.96	2,909.85	18.38	65.37	114.37	-224.28	-647.65	565.72	487.48	78.24	7.230	
3,300.00	2,935.38	2,959.49	2,959.38	20.04	66.44	116.98	-224.32	-647.65	625.10	545.93	79.17	7.896	
3,400.00	2,981.40	3,005.51	3,005.40	21.75	67.37	118.82	-224.32	-647.65	692.19	612.03	80.16	8.633	
3,430.06	2,994.32	3,018.43	3,018.32	22.27	67.63	119.21	-224.32	-647.65	713.64	633.13	80.52	8.865	
3,450.00	3,002.43	3,026.54	3,026.43	22.55	67.80	118.08	-224.32	-647.65	728.26	646.89	81.36	8.951	
3,500.00	3,019.94	3,044.05	3,043.94	23.08	68.16	114.49	-224.32	-647.65	766.52	682.65	83.87	9.139	
3,550.00	3,033.30	3,057.41	3,057.30	23.64	68.43	109.64	-224.32	-647.65	806.83	719.79	87.05	9.269	
3,600.00	3,042.41	3,066.53	3,066.41	24.25	68.61	103.32	-224.32	-647.65	848.81	758.36	90.45	9.385	
3,650.00	3,047.21	3,071.32	3,071.21	24.89	68.71	95.44	-224.32	-647.65	892.05	798.87	93.19	9.573	
3,680.06	3,048.00	3,072.11	3,072.00	25.29	68.73	90.00	-224.32	-647.65	918.48	824.47	94.02	9.769	
3,700.00	3,048.00	3,072.11	3,072.00	25.56	68.73	89.98	-224.32	-647.65	936.19	841.91	94.28	9.930	
3,800.00	3,047.94	3,072.06	3,071.94	26.91	68.73	89.87	-224.32	-647.65	1,027.50	931.90	95.59	10.749	
3,900.00	3,047.81	3,071.93	3,071.81	28.32	68.72	89.68	-224.32	-647.65	1,122.03	1,025.14	96.90	11.580	
4,000.00	3,047.61	3,071.72	3,071.61	29.78	68.72	89.37	-224.32	-647.65	1,218.82	1,120.64	98.18	12.414	
4,100.00	3,047.33	3,071.44	3,071.33	31.25	68.71	88.80	-224.32	-647.65	1,317.13	1,217.71	99.42	13.248	
4,200.00	3,046.97	3,071.09	3,070.97	32.74	68.71	87.49	-224.32	-647.65	1,416.41	1,315.84	100.57	14.083	
4,300.00	3,046.54	3,070.66	3,070.54	34.23	68.70	81.89	-224.32	-647.65	1,516.21	1,415.24	100.97	15.017	
4,400.00	3,046.04	3,070.16	3,070.04	35.72	68.69	-75.10	-224.32	-647.65	1,616.20	1,516.61	99.59	16.229	
4,500.00	3,045.47	3,069.58	3,069.47	37.20	68.68	-85.04	-224.32	-647.65	1,716.08	1,612.66	103.42	16.593	
4,600.00	3,044.83	3,068.94	3,068.83	38.67	68.66	-86.71	-224.32	-647.65	1,815.63	1,711.13	104.50	17.375	
4,700.00	3,044.12	3,068.24	3,068.12	40.12	68.65	-87.40	-224.32	-647.65	1,914.65	1,809.29	105.36	18.172	
4,716.49	3,044.00	3,068.11	3,068.00	40.36	68.65	-87.48	-224.32	-647.65	1,930.91	1,825.42	105.49	18.304	
4,800.00	3,043.37	3,067.48	3,067.37	41.55	68.63	-87.36	-224.32	-647.65	2,013.28	1,906.50	106.78	18.855	
4,900.00	3,042.62	3,066.73	3,066.62	42.96	68.62	-87.23	-224.32	-647.65	2,112.03	2,003.73	108.30	19.502	
5,000.00	3,041.87	3,065.98	3,065.87	44.41	68.60	-87.10	-224.32	-647.65	2,210.89	2,101.04	109.85	20.126	
5,100.00	3,041.11	3,065.23	3,065.11	45.88	68.59	-86.97	-224.32	-647.65	2,309.85	2,198.43	111.42	20.731	
5,200.00	3,040.36	3,064.47	3,064.36	47.39	68.57	-86.84	-224.32	-647.65	2,408.89	2,295.88	113.01	21.315	
5,300.00	3,039.61	3,063.72	3,063.61	48.91	68.56	-86.70	-224.32	-647.65	2,508.01	2,393.39	114.63	21.880	
5,400.00	3,038.86	3,062.97	3,062.86	50.46	68.54	-86.57	-224.32	-647.65	2,607.20	2,490.95	116.25	22.427	
5,500.00	3,038.10	3,062.22	3,062.10	52.04	68.53	-86.44	-224.32	-647.65	2,706.45	2,588.56	117.89	22.957	
5,600.00	3,037.35	3,061.46	3,061.35	53.63	68.51	-86.31	-224.32	-647.65	2,805.75	2,686.20	119.55	23.470	
5,700.00	3,036.60	3,060.71	3,060.60	55.24	68.49	-86.17	-224.32	-647.65	2,905.10	2,783.88	121.21	23.967	

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.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.18-T32N-R07W - San Juan 32-7 Unit 202 - Original Hole - Original Hole											Offset Site Error: 0.00 usft	
Survey Program: 799-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)
5,800.00	3,035.85	3,059.96	3,059.85	56.86	68.48	-86.04	-224.32	-647.65	3,004.49	2,881.60	122.89	24.449
5,900.00	3,035.09	3,059.21	3,059.09	58.50	68.46	-85.91	-224.32	-647.65	3,103.92	2,979.34	124.57	24.916
6,000.00	3,034.34	3,058.45	3,058.34	60.16	68.45	-85.78	-224.32	-647.65	3,203.38	3,077.11	126.27	25.370
6,100.00	3,033.59	3,057.70	3,057.59	61.82	68.43	-85.65	-224.32	-647.65	3,302.88	3,174.91	127.97	25.810
6,200.00	3,032.84	3,056.95	3,056.84	63.50	68.42	-85.51	-224.32	-647.65	3,402.41	3,272.73	129.68	26.238
6,300.00	3,032.08	3,056.20	3,056.08	65.19	68.40	-85.38	-224.32	-647.65	3,501.96	3,370.57	131.39	26.653
6,400.00	3,031.33	3,055.44	3,055.33	66.89	68.39	-85.25	-224.32	-647.65	3,601.54	3,468.43	133.11	27.057
6,500.00	3,030.58	3,054.69	3,054.58	68.60	68.37	-85.12	-224.32	-647.65	3,701.14	3,566.30	134.83	27.450
6,600.00	3,029.83	3,053.94	3,053.83	70.32	68.36	-84.99	-224.32	-647.65	3,800.76	3,664.20	136.56	27.832
6,700.00	3,029.07	3,053.19	3,053.07	72.04	68.34	-84.85	-224.32	-647.65	3,900.40	3,762.11	138.30	28.203
6,800.00	3,028.32	3,052.43	3,052.32	73.78	68.33	-84.72	-224.32	-647.65	4,000.06	3,860.03	140.03	28.565
6,900.00	3,027.57	3,051.68	3,051.57	75.52	68.31	-84.59	-224.32	-647.65	4,099.73	3,957.96	141.77	28.918
7,000.00	3,026.82	3,050.93	3,050.82	77.26	68.30	-84.46	-224.32	-647.65	4,199.42	4,055.91	143.51	29.262
7,100.00	3,026.06	3,050.18	3,050.06	79.02	68.28	-84.33	-224.32	-647.65	4,299.13	4,153.87	145.26	29.597
7,200.00	3,025.31	3,049.42	3,049.31	80.78	68.27	-84.20	-224.32	-647.65	4,398.85	4,251.84	147.00	29.923
7,300.00	3,024.56	3,048.67	3,048.56	82.54	68.25	-84.07	-224.32	-647.65	4,498.58	4,349.82	148.75	30.242
7,400.00	3,023.81	3,047.92	3,047.81	84.31	68.23	-83.93	-224.32	-647.65	4,598.32	4,447.82	150.50	30.553
7,500.00	3,023.05	3,047.17	3,047.05	86.08	68.22	-83.80	-224.32	-647.65	4,698.07	4,545.82	152.26	30.857
7,600.00	3,022.30	3,046.41	3,046.30	87.86	68.20	-83.67	-224.32	-647.65	4,797.83	4,643.83	154.01	31.153
7,700.00	3,021.55	3,045.66	3,045.55	89.64	68.19	-83.54	-224.32	-647.65	4,897.61	4,741.84	155.76	31.443
7,800.00	3,020.80	3,044.91	3,044.80	91.43	68.17	-83.41	-224.32	-647.65	4,997.39	4,839.87	157.52	31.726
7,900.00	3,020.04	3,044.16	3,044.04	93.22	68.16	-83.28	-224.32	-647.65	5,097.18	4,937.90	159.27	32.003
8,000.00	3,019.29	3,043.40	3,043.29	95.01	68.14	-83.15	-224.32	-647.65	5,196.98	5,035.95	161.03	32.273
8,100.00	3,018.54	3,042.65	3,042.54	96.80	68.13	-83.02	-224.32	-647.65	5,296.78	5,133.99	162.79	32.538
8,171.68	3,018.00	3,042.11	3,042.00	98.09	68.12	-82.92	-224.32	-647.65	5,368.32	5,204.28	164.05	32.724



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.18-T32N-R07W - San Juan 32-7 Unit 202R - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 790-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	35.03	59.80	41.92	75.22				
100.00	100.00	82.42	82.42	0.10	1.09	35.32	59.16	41.92	72.51	71.32	1.19	61.026	
200.00	200.00	182.30	182.29	0.32	2.42	35.59	58.58	41.92	72.04	69.30	2.74	26.322	
300.00	300.00	282.17	282.17	0.55	3.74	35.76	58.22	41.92	71.74	67.46	4.29	16.742	
400.00	400.00	382.04	382.03	0.77	5.06	35.82	58.08	41.92	71.63	65.80	5.83	12.279	
413.02	413.02	395.04	395.03	0.80	5.24	35.82	58.08	41.92	71.63	65.60	6.04	11.869 CC	
500.00	500.00	481.90	481.89	0.99	6.39	35.78	58.16	41.92	71.70	64.32	7.38	9.713	
600.00	600.00	581.75	581.75	1.22	7.71	35.64	58.47	41.92	71.94	63.01	8.93	8.056	
700.00	700.00	681.60	681.60	1.44	9.03	35.40	58.99	41.92	72.37	61.89	10.48	6.907	
800.00	800.00	781.43	781.43	1.67	10.36	35.06	59.73	41.92	72.98	60.95	12.03	6.068	
900.00	900.00	882.00	882.00	1.89	12.91	35.03	59.80	41.92	73.03	58.23	14.80	4.933	
1,000.00	1,000.00	982.01	982.00	2.12	15.56	35.03	59.80	41.92	73.03	55.35	17.68	4.131	
1,100.00	1,100.00	1,082.01	1,082.00	2.34	18.21	35.03	59.80	41.92	73.03	52.48	20.56	3.553	
1,200.00	1,200.00	1,182.02	1,182.00	2.57	20.86	35.03	59.80	41.92	73.03	49.60	23.43	3.117	
1,263.40	1,263.40	1,245.42	1,245.40	2.71	22.54	35.03	59.80	41.92	73.03	47.78	25.26	2.892	
1,300.00	1,300.00	1,282.02	1,282.00	2.78	23.51	-176.98	59.80	41.92	73.38	47.09	26.29	2.791 ES	
1,400.00	1,399.88	1,381.91	1,381.88	2.96	26.16	-177.15	59.80	41.92	77.91	48.86	29.05	2.682 SF	
1,500.00	1,499.40	1,481.43	1,481.40	3.15	28.80	-177.46	59.80	41.92	87.65	55.95	31.70	2.765	
1,600.00	1,598.26	1,580.30	1,580.26	3.36	31.42	-177.81	59.80	41.92	102.59	68.36	34.23	2.997	
1,700.00	1,696.21	1,678.25	1,678.21	3.62	34.02	-178.15	59.80	41.92	122.68	86.08	36.60	3.352	
1,800.00	1,792.97	1,775.02	1,774.97	3.95	36.58	-178.44	59.80	41.92	147.87	109.08	38.79	3.812	
1,900.00	1,888.28	1,870.33	1,870.28	4.35	39.11	-178.69	59.80	41.92	178.09	137.31	40.78	4.367	
2,000.00	1,981.87	1,963.93	1,963.87	4.85	41.59	-178.88	59.80	41.92	213.26	170.71	42.55	5.016	
2,100.00	2,073.50	2,055.57	2,055.50	5.44	44.02	-179.04	59.80	41.92	253.28	209.20	44.08	5.746	
2,200.00	2,162.91	2,144.98	2,144.91	6.14	46.39	-179.16	59.80	41.92	298.05	252.69	45.36	6.571	
2,300.00	2,249.85	2,231.92	2,231.85	6.95	48.69	-179.26	59.80	41.92	347.43	301.07	46.36	7.494	
2,400.00	2,334.09	2,316.16	2,316.09	7.85	50.92	-179.33	59.80	41.92	401.30	354.21	47.09	8.523	
2,500.00	2,415.39	2,397.47	2,397.39	8.86	53.08	-179.40	59.80	41.92	459.50	411.98	47.52	9.670	
2,600.00	2,493.53	2,475.62	2,475.53	9.97	55.15	-179.45	59.80	41.92	521.87	474.21	47.66	10.951	
2,700.00	2,568.31	2,550.40	2,550.31	11.17	57.13	-179.49	59.80	41.92	588.25	540.76	47.49	12.386	
2,800.00	2,639.50	2,621.60	2,621.50	12.45	59.02	-179.52	59.80	41.92	658.46	611.43	47.03	14.002	
2,900.00	2,706.93	2,689.03	2,688.93	13.82	60.81	-179.54	59.80	41.92	732.29	686.03	46.26	15.831	
3,000.00	2,770.40	2,752.50	2,752.40	15.27	62.49	-179.56	59.80	41.92	809.55	764.36	45.19	17.915	
3,100.00	2,829.74	2,811.84	2,811.74	16.79	64.06	-179.57	59.80	41.92	890.03	846.20	43.83	20.308	
3,200.00	2,884.78	2,866.00	2,865.90	18.38	65.23	-179.56	59.80	41.92	973.56	931.53	42.03	23.164	
3,300.00	2,935.38	2,917.49	2,917.38	20.04	66.86	-179.57	59.80	41.92	1,059.74	1,019.47	40.27	26.318	
3,400.00	2,981.40	2,963.51	2,963.40	21.75	68.08	-179.56	59.80	41.92	1,148.51	1,110.42	38.10	30.148	
3,430.06	2,994.32	2,976.43	2,976.32	22.27	68.43	-179.55	59.80	41.92	1,175.65	1,138.26	37.39	31.439	
3,450.00	3,002.43	2,984.54	2,984.43	22.55	68.64	-179.53	59.80	41.92	1,193.87	1,158.65	35.22	33.901	
3,500.00	3,019.94	3,002.05	3,001.94	23.08	69.10	-179.42	59.80	41.92	1,240.68	1,211.34	29.35	42.274	
3,550.00	3,033.30	3,015.41	3,015.30	23.64	69.46	-179.24	59.80	41.92	1,288.85	1,265.62	23.23	55.483	
3,600.00	3,042.41	3,024.53	3,024.41	24.25	69.70	-178.81	59.80	41.92	1,337.99	1,320.95	17.04	78.501	
3,650.00	3,047.21	3,029.32	3,029.21	24.89	69.83	-176.96	59.80	41.92	1,387.75	1,375.39	12.36	112.322	
3,680.06	3,048.00	3,030.11	3,030.00	25.29	69.85	-90.00	59.80	41.92	1,417.79	1,322.64	95.15	14.901	
3,700.00	3,048.00	3,030.11	3,030.00	25.56	69.85	-89.33	59.80	41.92	1,437.73	1,342.31	95.42	15.067	
3,800.00	3,047.94	3,030.06	3,029.94	26.91	69.85	-89.17	59.80	41.92	1,537.65	1,440.92	96.73	15.896	
3,900.00	3,047.81	3,029.93	3,029.81	28.32	69.84	-89.13	59.80	41.92	1,637.27	1,539.28	98.03	16.702	
4,000.00	3,047.61	3,029.72	3,029.61	29.78	69.84	-89.11	59.80	41.92	1,736.38	1,637.08	99.31	17.485	
4,100.00	3,047.33	3,029.44	3,029.33	31.25	69.83	-89.09	59.80	41.92	1,834.84	1,734.30	100.54	18.250	
4,200.00	3,046.97	3,029.09	3,028.97	32.74	69.82	-89.07	59.80	41.92	1,932.47	1,830.75	101.72	18.998	
4,300.00	3,046.54	3,028.66	3,028.54	34.23	69.81	-89.06	59.80	41.92	2,029.16	1,926.33	102.84	19.732	
4,400.00	3,046.04	3,028.16	3,028.04	35.72	69.80	-89.06	59.80	41.92	2,124.79	2,020.91	103.88	20.455	

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.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.18-T32N-R07W - San Juan 32-7 Unit 202R - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 790-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)						
4,500.00	3,045.47	3,027.59	3,027.47	37.20	69.78	-89.06	59.80	41.92	2,219.25	2,114.40	104.85	21.167		
4,600.00	3,044.83	3,026.95	3,026.83	38.67	69.76	-89.06	59.80	41.92	2,312.44	2,206.70	105.73	21.871		
4,700.00	3,044.12	3,026.24	3,026.12	40.12	69.75	-89.06	59.80	41.92	2,404.26	2,297.72	106.53	22.568		
4,716.49	3,044.00	3,026.11	3,026.00	40.36	69.74	-89.06	59.80	41.92	2,419.26	2,312.60	106.66	22.682		
4,800.00	3,043.37	3,025.48	3,025.37	41.55	69.73	-89.03	59.80	41.92	2,495.39	2,387.44	107.95	23.116		
4,900.00	3,042.62	3,024.73	3,024.62	42.96	69.71	-88.98	59.80	41.92	2,587.15	2,477.67	109.48	23.632		
5,000.00	3,041.87	3,023.98	3,023.87	44.41	69.69	-88.94	59.80	41.92	2,679.50	2,568.47	111.03	24.133		
5,100.00	3,041.11	3,023.23	3,023.11	45.88	69.67	-88.90	59.80	41.92	2,772.38	2,659.77	112.61	24.619		
5,200.00	3,040.36	3,022.47	3,022.36	47.39	69.65	-88.86	59.80	41.92	2,865.74	2,751.53	114.21	25.092		
5,300.00	3,039.61	3,021.72	3,021.61	48.91	69.63	-88.81	59.80	41.92	2,959.53	2,843.70	115.83	25.551		
5,400.00	3,038.86	3,020.97	3,020.86	50.46	69.61	-88.77	59.80	41.92	3,053.72	2,936.25	117.47	25.997		
5,500.00	3,038.10	3,020.22	3,020.10	52.04	69.59	-88.73	59.80	41.92	3,148.27	3,029.15	119.12	26.430		
5,600.00	3,037.35	3,019.46	3,019.35	53.63	69.57	-88.68	59.80	41.92	3,243.14	3,122.36	120.78	26.851		
5,700.00	3,036.60	3,018.71	3,018.60	55.24	69.55	-88.64	59.80	41.92	3,338.31	3,215.85	122.46	27.260		
5,800.00	3,035.85	3,017.96	3,017.85	56.86	69.53	-88.60	59.80	41.92	3,433.76	3,309.61	124.15	27.658		
5,900.00	3,035.09	3,017.21	3,017.09	58.50	69.51	-88.56	59.80	41.92	3,529.45	3,403.61	125.85	28.045		
6,000.00	3,034.34	3,016.45	3,016.34	60.16	69.49	-88.51	59.80	41.92	3,625.38	3,497.83	127.56	28.422		
6,100.00	3,033.59	3,015.70	3,015.59	61.82	69.47	-88.47	59.80	41.92	3,721.53	3,592.26	129.27	28.788		
6,200.00	3,032.84	3,014.95	3,014.84	63.50	69.45	-88.43	59.80	41.92	3,817.87	3,686.87	131.00	29.145		
6,300.00	3,032.08	3,014.20	3,014.08	65.19	69.43	-88.39	59.80	41.92	3,914.40	3,781.67	132.73	29.492		
6,400.00	3,031.33	3,013.44	3,013.33	66.89	69.41	-88.34	59.80	41.92	4,011.09	3,876.62	134.47	29.830		
6,500.00	3,030.58	3,012.69	3,012.58	68.60	69.39	-88.30	59.80	41.92	4,107.94	3,971.73	136.21	30.159		
6,600.00	3,029.83	3,011.94	3,011.83	70.32	69.37	-88.26	59.80	41.92	4,204.95	4,066.99	137.96	30.479		
6,700.00	3,029.07	3,011.19	3,011.07	72.04	69.35	-88.22	59.80	41.92	4,302.08	4,162.37	139.71	30.792		
6,800.00	3,028.32	3,010.43	3,010.32	73.78	69.33	-88.17	59.80	41.92	4,399.35	4,257.88	141.47	31.096		
6,900.00	3,027.57	3,009.68	3,009.57	75.52	69.31	-88.13	59.80	41.92	4,496.74	4,353.50	143.24	31.393		
7,000.00	3,026.82	3,008.93	3,008.82	77.26	69.29	-88.09	59.80	41.92	4,594.23	4,449.23	145.01	31.683		
7,100.00	3,026.06	3,008.18	3,008.06	79.02	69.27	-88.04	59.80	41.92	4,691.84	4,545.06	146.78	31.966		
7,200.00	3,025.31	3,007.42	3,007.31	80.78	69.25	-88.00	59.80	41.92	4,789.54	4,640.99	148.55	32.242		
7,300.00	3,024.56	3,006.67	3,006.56	82.54	69.23	-87.96	59.80	41.92	4,887.33	4,737.00	150.33	32.511		
7,400.00	3,023.81	3,005.92	3,005.81	84.31	69.21	-87.92	59.80	41.92	4,985.22	4,833.10	152.11	32.774		
7,500.00	3,023.05	3,005.17	3,005.05	86.08	69.19	-87.87	59.80	41.92	5,083.18	4,929.29	153.89	33.030		
7,600.00	3,022.30	3,004.41	3,004.30	87.86	69.17	-87.83	59.80	41.92	5,181.22	5,025.54	155.68	33.281		
7,700.00	3,021.55	3,003.66	3,003.55	89.64	69.15	-87.79	59.80	41.92	5,279.34	5,121.87	157.47	33.526		
7,800.00	3,020.80	3,002.91	3,002.80	91.43	69.13	-87.75	59.80	41.92	5,377.52	5,218.26	159.26	33.765		
7,900.00	3,020.04	3,002.16	3,002.04	93.22	69.11	-87.70	59.80	41.92	5,475.77	5,314.72	161.05	33.999		
8,000.00	3,019.29	3,001.40	3,001.29	95.01	69.09	-87.66	59.80	41.92	5,574.09	5,411.24	162.85	34.228		
8,100.00	3,018.54	3,000.65	3,000.54	96.80	69.07	-87.62	59.80	41.92	5,672.46	5,507.81	164.65	34.452		
8,171.68	3,018.00	3,000.11	3,000.00	98.09	69.05	-87.59	59.80	41.92	5,743.00	5,577.07	165.94	34.610		



Koltek Energy Services

Anticollision Report



Company: Hilcorp Energy Company
 Project: San Juan Co., NM (NAD27)
 Reference Site: Sec.18-T32N-R07W
 Site Error: 0.00 usft
 Reference Well: San Juan 32-7 Unit 243H
 Well Error: 0.00 usft
 Reference Wellbore: Lat 1
 Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
 TVD Reference: KB @ 6376.00usft
 MD Reference: KB @ 6376.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: EDM 5000.1 Single User Db
 Offset TVD Reference: Offset Datum

Offset Design Sec.18-T32N-R07W - San Juan 32-7 Unit 243H - 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)							
3,430.06	2,994.32	3,430.06	2,994.32	0.00	0.00	0.00	-935.15	-584.35	0.00	0.00	0.00	0.000	Level 1, CC, SF		
3,437.76	2,997.52	3,437.76	2,997.52	0.11	0.14	180.00	-941.07	-588.05	0.05	-0.05	0.10	0.502	Level 1, ES		
3,450.00	3,002.43	3,450.00	3,002.74	0.28	0.35	180.00	-950.48	-593.92	0.35	0.08	0.26	1.321	Level 3		
3,500.00	3,019.94	3,499.83	3,023.80	0.80	1.23	180.00	-988.78	-617.86	4.26	3.68	0.59	7.270			
3,550.00	3,033.30	3,549.13	3,044.64	1.37	2.11	180.00	-1,026.67	-641.53	12.51	11.63	0.88	14.179			
3,600.00	3,042.41	3,597.52	3,065.09	1.98	2.96	180.00	-1,063.86	-664.77	25.02	23.87	1.14	21.866			
3,650.00	3,047.21	3,644.64	3,085.00	2.63	3.80	180.00	-1,100.08	-687.40	41.70	40.33	1.36	30.569			
3,680.06	3,048.00	3,672.20	3,096.65	3.03	4.29	180.00	-1,121.26	-700.64	53.68	52.19	1.49	36.062			
3,700.00	3,048.00	3,690.27	3,104.29	3.29	4.61	-179.83	-1,135.15	-709.32	62.11	60.47	1.64	37.958			
3,800.00	3,047.94	3,780.81	3,142.55	4.66	6.22	179.40	-1,204.74	-752.80	104.45	102.03	2.43	43.056			
3,900.00	3,047.81	3,871.02	3,180.67	6.08	7.83	177.65	-1,274.07	-796.13	147.14	143.81	3.33	44.165			
4,000.00	3,047.61	3,960.65	3,218.55	7.54	9.44	175.62	-1,342.96	-839.17	190.50	186.12	4.38	43.494			
4,100.00	3,047.33	4,030.33	3,248.00	9.03	10.68	174.34	-1,396.52	-872.64	235.66	230.30	5.36	43.972			
4,200.00	3,046.97	4,030.33	3,248.00	10.54	10.68	176.90	-1,396.52	-872.64	300.26	294.65	5.61	53.513			
4,300.00	3,046.54	4,030.33	3,248.00	12.06	10.68	-179.01	-1,396.52	-872.64	380.68	374.60	6.08	62.625			
4,400.00	3,046.04	4,030.33	3,248.00	13.58	10.68	-173.44	-1,396.52	-872.64	468.68	461.50	7.18	65.235			
4,500.00	3,045.47	4,030.33	3,248.00	15.11	10.68	-166.56	-1,396.52	-872.64	560.53	551.34	9.20	60.947			
4,600.00	3,044.83	4,030.33	3,248.00	16.64	10.68	-158.73	-1,396.52	-872.64	654.41	642.41	12.01	54.510			
4,700.00	3,044.12	4,030.33	3,248.00	18.17	10.68	-150.52	-1,396.52	-872.64	749.35	734.11	15.24	49.182			
4,716.49	3,044.00	4,030.33	3,248.00	18.42	10.68	-149.17	-1,396.52	-872.64	765.06	749.28	15.78	48.485			
4,800.00	3,043.37	4,030.33	3,248.00	19.67	10.68	-149.17	-1,396.52	-872.64	845.04	828.46	16.58	50.972			
4,900.00	3,042.62	4,030.33	3,248.00	21.17	10.68	-149.17	-1,396.52	-872.64	941.63	924.09	17.53	53.704			
5,000.00	3,041.87	4,030.33	3,248.00	22.70	10.68	-149.17	-1,396.52	-872.64	1,038.86	1,020.35	18.51	56.130			
5,100.00	3,041.11	4,030.33	3,248.00	24.25	10.68	-149.17	-1,396.52	-872.64	1,136.57	1,117.07	19.50	58.300			
5,200.00	3,040.36	4,030.33	3,248.00	25.83	10.68	-149.17	-1,396.52	-872.64	1,234.64	1,214.15	20.50	60.234			
5,300.00	3,039.61	4,030.33	3,248.00	27.43	10.68	-149.17	-1,396.52	-872.64	1,333.01	1,311.49	21.51	61.967			
5,400.00	3,038.86	4,030.33	3,248.00	29.06	10.68	-149.17	-1,396.52	-872.64	1,431.59	1,409.06	22.54	63.523			
5,500.00	3,038.10	4,030.33	3,248.00	30.70	10.68	-149.17	-1,396.52	-872.64	1,530.37	1,506.80	23.57	64.926			
5,600.00	3,037.35	4,030.33	3,248.00	32.36	10.68	-149.17	-1,396.52	-872.64	1,629.29	1,604.68	24.61	66.194			
5,700.00	3,036.60	4,030.33	3,248.00	34.03	10.68	-149.17	-1,396.52	-872.64	1,728.34	1,702.67	25.66	67.344			
5,800.00	3,035.85	4,030.33	3,248.00	35.72	10.68	-149.17	-1,396.52	-872.64	1,827.49	1,800.77	26.72	68.389			
5,900.00	3,035.09	4,030.33	3,248.00	37.42	10.68	-149.17	-1,396.52	-872.64	1,926.72	1,898.94	27.79	69.343			
6,000.00	3,034.34	4,030.33	3,248.00	39.13	10.68	-149.17	-1,396.52	-872.64	2,026.04	1,997.18	28.85	70.216			
6,100.00	3,033.59	4,030.33	3,248.00	40.85	10.68	-149.17	-1,396.52	-872.64	2,125.42	2,095.49	29.93	71.017			
6,200.00	3,032.84	4,030.33	3,248.00	42.58	10.68	-149.17	-1,396.52	-872.64	2,224.85	2,193.84	31.01	71.753			
6,300.00	3,032.08	4,030.33	3,248.00	44.32	10.68	-149.17	-1,396.52	-872.64	2,324.33	2,292.24	32.09	72.432			
6,400.00	3,031.33	4,030.33	3,248.00	46.06	10.68	-149.17	-1,396.52	-872.64	2,423.86	2,390.68	33.18	73.059			
6,500.00	3,030.58	4,030.33	3,248.00	47.82	10.68	-149.17	-1,396.52	-872.64	2,523.42	2,489.15	34.27	73.640			
6,600.00	3,029.83	4,030.33	3,248.00	49.58	10.68	-149.17	-1,396.52	-872.64	2,623.01	2,587.65	35.36	74.180			
6,700.00	3,029.07	4,030.33	3,248.00	51.34	10.68	-149.17	-1,396.52	-872.64	2,722.64	2,686.18	36.46	74.681			
6,800.00	3,028.32	4,030.33	3,248.00	53.11	10.68	-149.17	-1,396.52	-872.64	2,822.29	2,784.73	37.56	75.149			
6,900.00	3,027.57	4,030.33	3,248.00	54.89	10.68	-149.17	-1,396.52	-872.64	2,921.96	2,883.31	38.66	75.586			
7,000.00	3,026.82	4,030.33	3,248.00	56.67	10.68	-149.17	-1,396.52	-872.64	3,021.66	2,981.90	39.76	75.995			
7,100.00	3,026.06	4,030.33	3,248.00	58.46	10.68	-149.17	-1,396.52	-872.64	3,121.38	3,080.51	40.87	76.378			
7,200.00	3,025.31	4,030.33	3,248.00	60.25	10.68	-149.17	-1,396.52	-872.64	3,221.11	3,179.14	41.98	76.738			
7,300.00	3,024.56	4,030.33	3,248.00	62.04	10.68	-149.17	-1,396.52	-872.64	3,320.86	3,277.78	43.09	77.076			
7,400.00	3,023.81	4,030.33	3,248.00	63.84	10.68	-149.17	-1,396.52	-872.64	3,420.63	3,376.43	44.20	77.394			
7,500.00	3,023.05	4,030.33	3,248.00	65.64	10.68	-149.17	-1,396.52	-872.64	3,520.40	3,475.09	45.31	77.695			
7,600.00	3,022.30	4,030.33	3,248.00	67.44	10.68	-149.17	-1,396.52	-872.64	3,620.19	3,573.77	46.43	77.978			
7,700.00	3,021.55	4,030.33	3,248.00	69.25	10.68	-149.17	-1,396.52	-872.64	3,720.00	3,672.45	47.54	78.247			
7,800.00	3,020.80	4,030.33	3,248.00	71.06	10.68	-149.17	-1,396.52	-872.64	3,819.83	3,771.15	48.66	78.501			
7,900.00	3,020.04	4,030.33	3,248.00	72.87	10.68	-149.17	-1,396.52	-872.64	3,919.63	3,869.85	49.78	78.741			

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.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
8,000.00	3,019.29	4,030.33	3,248.00	74.68	10.68	-149.17	-1,396.52	-872.64	4,019.46	3,968.56	50.90	78.970		
8,100.00	3,018.54	4,030.33	3,248.00	76.50	10.68	-149.17	-1,396.52	-872.64	4,119.30	4,067.28	52.02	79.187		
8,171.68	3,018.00	4,030.33	3,248.00	77.80	10.68	-149.17	-1,396.52	-872.64	4,190.86	4,138.04	52.82	79.336		



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.19-T32N-R07W - San Juan 32-7 Unit 243 - Original Hole - Original Hole														Offset Site Error: 0.00 usft
Survey Program: 416-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)	Reference 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	493.02	492.62	0.00	0.68	-154.10	-4,511.71	-2,191.20	5,015.67					
100.00	100.00	525.00	524.60	0.10	0.74	-154.09	-4,511.59	-2,191.64	5,016.32	5,015.50	0.82	6,099.413		
200.00	200.00	585.00	584.58	0.32	0.85	-154.10	-4,512.84	-2,191.45	5,018.14	5,016.98	1.16	4,320.129		
300.00	300.00	626.18	625.70	0.55	0.92	-154.12	-4,514.82	-2,190.50	5,021.22	5,019.75	1.47	3,418.505		
400.00	400.00	672.87	672.22	0.77	1.02	-154.16	-4,517.98	-2,188.12	5,025.17	5,023.38	1.79	2,811.955		
500.00	500.00	713.24	712.33	0.99	1.11	-154.20	-4,521.64	-2,185.36	5,030.35	5,028.25	2.10	2,399.492		
600.00	600.00	787.69	785.88	1.22	1.29	-154.33	-4,530.20	-2,177.74	5,036.32	5,033.84	2.49	2,024.265		
700.00	700.00	847.38	844.32	1.44	1.45	-154.46	-4,538.66	-2,169.01	5,042.95	5,040.08	2.86	1,762.332		
800.00	800.00	890.00	885.67	1.67	1.59	-154.57	-4,545.71	-2,161.51	5,050.55	5,047.35	3.21	1,574.776		
900.00	900.00	922.99	917.46	1.89	1.72	-154.66	-4,551.83	-2,155.14	5,059.41	5,055.87	3.54	1,428.897		
1,000.00	1,000.00	950.00	943.33	2.12	1.84	-154.75	-4,557.34	-2,149.69	5,069.67	5,065.81	3.85	1,316.067		
1,100.00	1,100.00	1,013.00	1,003.03	2.34	2.16	-154.96	-4,571.59	-2,135.52	5,081.08	5,076.77	4.31	1,179.064		
1,200.00	1,200.00	1,047.45	1,035.24	2.57	2.38	-155.09	-4,580.15	-2,126.80	5,093.55	5,088.87	4.68	1,088.128		
1,263.40	1,263.40	1,075.00	1,060.75	2.71	2.55	-155.20	-4,587.42	-2,119.36	5,102.08	5,097.14	4.94	1,032.919		
1,300.00	1,300.00	1,093.14	1,077.44	2.78	2.69	-7.26	-4,592.38	-2,114.26	5,106.86	5,101.49	5.37	950.172		
1,400.00	1,399.88	1,137.00	1,117.46	2.96	3.01	-7.42	-4,604.78	-2,101.28	5,117.04	5,111.21	5.84	876.736		
1,500.00	1,499.40	1,199.00	1,173.30	3.15	3.51	-7.68	-4,623.43	-2,081.85	5,123.23	5,116.77	6.46	792.686		
1,600.00	1,598.26	1,230.17	1,201.04	3.36	3.79	-7.83	-4,633.32	-2,071.65	5,125.38	5,118.51	6.87	746.039		
1,700.00	1,696.21	1,278.91	1,243.89	3.62	4.24	-8.10	-4,649.36	-2,054.84	5,123.49	5,116.07	7.43	690.023		
1,800.00	1,792.97	1,323.00	1,282.00	3.95	4.68	-8.37	-4,664.55	-2,038.71	5,117.59	5,109.64	7.95	643.685		
1,900.00	1,888.28	1,385.00	1,334.64	4.35	5.34	-8.79	-4,686.78	-2,014.65	5,107.64	5,098.98	8.66	589.575		
2,000.00	1,981.87	1,413.68	1,358.63	4.85	5.66	-9.04	-4,697.41	-2,003.08	5,093.72	5,084.66	9.06	562.109		
2,100.00	2,073.50	1,447.00	1,386.22	5.44	6.05	-9.35	-4,710.13	-1,989.40	5,076.10	5,066.60	9.50	534.369		
2,200.00	2,162.91	1,527.93	1,452.74	6.14	6.94	-10.02	-4,741.43	-1,955.56	5,054.34	5,043.97	10.37	487.502		
2,300.00	2,249.85	1,634.00	1,540.50	6.95	8.05	-10.92	-4,782.33	-1,912.27	5,028.43	5,017.07	11.36	442.488		
2,400.00	2,334.09	1,697.00	1,593.37	7.85	8.72	-11.55	-4,806.05	-1,887.54	4,997.72	4,985.74	11.98	417.215		
2,500.00	2,415.39	1,760.00	1,646.65	8.86	9.37	-12.24	-4,829.74	-1,863.70	4,963.01	4,950.44	12.57	394.945		
2,600.00	2,493.53	1,829.58	1,706.38	9.97	10.03	-13.02	-4,855.70	-1,839.23	4,924.34	4,911.20	13.14	374.752		
2,700.00	2,568.31	2,122.33	1,965.01	11.17	12.59	-15.53	-4,956.06	-1,746.03	4,879.64	4,864.60	15.05	324.293		
2,800.00	2,639.50	2,381.42	2,201.26	12.45	14.62	-17.99	-5,032.27	-1,672.03	4,827.98	4,811.45	16.53	292.037		
2,900.00	2,706.93	2,468.92	2,282.23	13.82	15.25	-19.35	-5,055.91	-1,648.79	4,771.39	4,754.31	17.08	279.389		
3,000.00	2,770.40	2,608.08	2,412.27	15.27	16.21	-21.33	-5,091.51	-1,614.30	4,710.50	4,692.59	17.91	263.017		
3,100.00	2,829.74	2,770.13	2,565.32	16.79	17.24	-23.83	-5,129.03	-1,576.55	4,644.63	4,625.71	18.92	245.481		
3,200.00	2,884.78	2,823.03	2,615.29	18.38	17.57	-25.58	-5,140.91	-1,563.87	4,575.40	4,555.81	19.59	233.600		
3,300.00	2,935.38	2,865.08	2,654.97	20.04	17.83	-27.46	-5,150.47	-1,553.75	4,503.39	4,483.01	20.38	220.952		
3,400.00	2,981.40	3,011.62	2,794.70	21.75	18.68	-31.00	-5,181.86	-1,522.85	4,428.48	4,406.48	22.01	201.244		
3,430.06	2,994.32	3,046.00	2,827.87	22.27	18.86	-32.04	-5,188.48	-1,516.68	4,405.16	4,382.65	22.51	195.674		
3,450.00	3,002.43	3,046.00	2,827.87	22.55	18.86	-33.42	-5,188.48	-1,516.68	4,389.45	4,366.74	22.72	193.215		
3,500.00	3,019.94	3,067.76	2,848.91	23.08	18.97	-37.89	-5,192.60	-1,512.96	4,348.61	4,324.92	23.70	183.522		
3,550.00	3,033.30	3,078.18	2,858.98	23.64	19.02	-43.39	-5,194.59	-1,511.20	4,306.01	4,280.60	25.41	169.449		
3,600.00	3,042.41	3,086.12	2,866.66	24.25	19.05	-50.39	-5,196.12	-1,509.86	4,261.96	4,234.04	27.91	152.677		
3,650.00	3,047.21	3,623.86	3,395.63	24.89	20.89	-77.09	-5,261.15	-1,447.32	4,216.28	4,181.24	35.04	120.320		
3,680.06	3,048.00	3,625.25	3,397.01	25.29	20.89	-84.44	-5,261.21	-1,447.26	4,188.43	4,152.63	38.80	116.989		
3,700.00	3,048.00	3,625.56	3,397.33	25.56	20.89	-84.32	-5,261.22	-1,447.24	4,169.91	4,133.77	36.14	115.380		
3,800.00	3,047.94	3,627.31	3,399.07	26.91	20.90	-83.66	-5,261.30	-1,447.16	4,076.09	4,038.24	37.86	107.673		
3,900.00	3,047.81	3,629.36	3,401.12	28.32	20.90	-82.79	-5,261.40	-1,447.06	3,980.84	3,941.24	39.60	100.530		
4,000.00	3,047.61	3,631.70	3,403.45	29.78	20.91	-81.58	-5,261.50	-1,446.95	3,884.32	3,843.00	41.32	94.013		
4,100.00	3,047.33	3,634.31	3,406.05	31.25	20.91	-79.76	-5,261.62	-1,446.83	3,786.70	3,743.76	42.94	88.190		
4,200.00	3,046.97	3,637.18	3,408.91	32.74	20.91	-76.75	-5,261.75	-1,446.69	3,688.18	3,643.87	44.30	83.247		
4,300.00	3,046.54	3,640.30	3,412.03	34.23	20.92	-70.78	-5,261.89	-1,446.54	3,588.96	3,544.11	44.85	80.014		
4,400.00	3,046.04	3,643.65	3,415.37	35.72	20.93	-54.21	-5,262.04	-1,446.38	3,489.27	3,448.42	40.85	85.417		
4,500.00	3,045.47	3,646.92	3,418.64	37.20	20.93	12.10	-5,262.18	-1,446.23	3,389.35	3,372.38	16.97	199.687		

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



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
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-R07W - San Juan 32-7 Unit 243 - Original Hole - Original Hole												Offset Site Error:	0.00 usft
Survey Program: 416-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		
4,600.00	3,044.83	3,650.22	3,421.93	38.67	20.94	62.74	-5,262.33	-1,446.08	3,289.47	3,243.67	45.80	71.826	
4,700.00	3,044.12	3,653.71	3,425.42	40.12	20.94	75.27	-5,262.48	-1,445.91	3,189.91	3,138.82	51.09	62.443	
4,716.49	3,044.00	3,654.31	3,426.01	40.36	20.94	76.38	-5,262.51	-1,445.89	3,173.55	3,121.99	51.55	61.559	
4,800.00	3,043.37	3,657.33	3,429.02	41.55	20.95	76.79	-5,262.64	-1,445.74	3,090.73	3,037.82	52.92	58.407	
4,900.00	3,042.62	3,660.94	3,432.63	42.96	20.96	77.28	-5,262.80	-1,445.58	2,991.62	2,937.08	54.54	54.854	
5,000.00	3,041.87	3,664.56	3,436.24	44.41	20.96	77.78	-5,262.97	-1,445.41	2,892.56	2,836.37	56.19	51.480	
5,100.00	3,041.11	3,668.17	3,439.85	45.88	20.97	78.28	-5,263.13	-1,445.24	2,793.56	2,735.70	57.86	48.279	
5,200.00	3,040.36	3,671.79	3,443.46	47.39	20.97	78.78	-5,263.29	-1,445.07	2,694.63	2,635.07	59.56	45.242	
5,300.00	3,039.61	3,675.41	3,447.07	48.91	20.98	79.28	-5,263.45	-1,444.90	2,595.78	2,534.50	61.28	42.361	
5,400.00	3,038.86	3,679.02	3,450.67	50.46	20.99	79.79	-5,263.61	-1,444.73	2,497.01	2,434.00	63.01	39.626	
5,500.00	3,038.10	3,682.64	3,454.28	52.04	20.99	80.30	-5,263.77	-1,444.56	2,398.35	2,333.58	64.77	37.031	
5,600.00	3,037.35	3,686.26	3,457.89	53.63	21.00	80.81	-5,263.93	-1,444.39	2,299.79	2,233.25	66.53	34.566	
5,700.00	3,036.60	3,689.87	3,461.50	55.24	21.00	81.32	-5,264.09	-1,444.22	2,201.35	2,133.04	68.31	32.226	
5,800.00	3,035.85	3,693.49	3,465.11	56.86	21.01	81.83	-5,264.25	-1,444.05	2,103.06	2,032.96	70.10	30.001	
5,900.00	3,035.09	3,697.10	3,468.72	58.50	21.02	82.35	-5,264.41	-1,443.88	2,004.93	1,933.03	71.90	27.885	
6,000.00	3,034.34	3,700.72	3,472.33	60.16	21.02	82.86	-5,264.57	-1,443.71	1,906.98	1,833.28	73.71	25.873	
6,100.00	3,033.59	3,704.34	3,475.93	61.82	21.03	83.38	-5,264.73	-1,443.54	1,809.26	1,733.74	75.52	23.957	
6,200.00	3,032.84	3,707.95	3,479.54	63.50	21.03	83.90	-5,264.89	-1,443.37	1,711.79	1,634.45	77.34	22.133	
6,300.00	3,032.08	3,711.57	3,483.15	65.19	21.04	84.42	-5,265.05	-1,443.21	1,614.62	1,535.45	79.17	20.395	
6,400.00	3,031.33	3,715.18	3,486.76	66.89	21.05	84.94	-5,265.21	-1,443.04	1,517.81	1,436.81	81.00	18.739	
6,500.00	3,030.58	3,718.80	3,490.37	68.60	21.05	85.47	-5,265.38	-1,442.87	1,421.43	1,338.60	82.83	17.161	
6,600.00	3,029.83	3,722.42	3,493.98	70.32	21.06	85.99	-5,265.54	-1,442.70	1,325.58	1,240.92	84.66	15.657	
6,700.00	3,029.07	3,726.03	3,497.59	72.04	21.07	86.52	-5,265.70	-1,442.53	1,230.37	1,143.88	86.50	14.225	
6,800.00	3,028.32	3,729.65	3,501.20	73.78	21.07	87.05	-5,265.86	-1,442.36	1,135.99	1,047.65	88.33	12.861	
6,900.00	3,027.57	3,733.27	3,504.80	75.52	21.08	87.58	-5,266.02	-1,442.19	1,042.63	952.47	90.17	11.563	
7,000.00	3,026.82	3,736.88	3,508.41	77.26	21.08	88.11	-5,266.18	-1,442.02	950.62	858.62	92.00	10.333	
7,100.00	3,026.06	3,740.50	3,512.02	79.02	21.09	88.64	-5,266.34	-1,441.85	860.37	766.54	93.83	9.169	
7,200.00	3,025.31	3,744.11	3,515.63	80.78	21.10	89.17	-5,266.50	-1,441.68	772.51	676.85	95.66	8.076	
7,300.00	3,024.56	3,747.73	3,519.24	82.54	21.10	89.70	-5,266.66	-1,441.51	687.96	590.47	97.49	7.057	
7,400.00	3,023.81	3,751.35	3,522.85	84.31	21.11	90.23	-5,266.82	-1,441.34	608.09	508.78	99.31	6.123	
7,500.00	3,023.05	3,754.96	3,526.46	86.08	21.11	90.76	-5,266.98	-1,441.17	535.01	433.88	101.12	5.291	
7,600.00	3,022.30	3,758.58	3,530.06	87.86	21.12	91.29	-5,267.14	-1,441.00	471.88	368.94	102.94	4.584	
7,700.00	3,021.55	3,762.20	3,533.67	89.64	21.13	91.83	-5,267.30	-1,440.84	423.17	318.43	104.74	4.040	
7,800.00	3,020.80	3,765.81	3,537.28	91.43	21.13	92.36	-5,267.46	-1,440.67	394.28	287.74	106.54	3.701	
7,868.25	3,020.28	3,768.28	3,539.74	92.65	21.14	92.72	-5,267.57	-1,440.55	388.34	280.57	107.77	3.603 CC, ES	
7,900.00	3,020.04	3,769.43	3,540.89	93.22	21.14	92.89	-5,267.62	-1,440.50	389.63	281.29	108.34	3.596 SF	
8,000.00	3,019.29	3,773.04	3,544.50	95.01	21.14	93.43	-5,267.78	-1,440.33	410.05	299.93	110.12	3.724	
8,100.00	3,018.54	3,776.66	3,548.11	96.80	21.15	93.96	-5,267.95	-1,440.16	452.16	340.26	111.90	4.041	
8,171.68	3,018.00	3,779.25	3,550.69	98.09	21.16	94.34	-5,268.06	-1,440.04	492.70	379.53	113.17	4.354	

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.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at EDM 5000.1 Single User Db
Database: Offset TVD Reference: Offset Datum

Offset Design Sec.19-T32N-R07W - San Juan 32-7 Unit 243A - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 875-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	-177.80	-1,974.85	-75.98	1,976.31				
100.00	100.00	73.97	73.96	0.10	1.68	-177.80	-1,975.88	-75.98	1,977.50	1,975.73	1.77	1,116.399	
200.00	200.00	181.40	181.39	0.32	4.11	-177.80	-1,977.04	-75.98	1,978.58	1,974.15	4.43	446.672	
300.00	300.00	288.82	288.80	0.55	6.54	-177.80	-1,977.80	-75.98	1,979.29	1,972.20	7.09	279.261	
400.00	400.00	396.22	396.20	0.77	8.98	-177.80	-1,978.16	-75.98	1,979.62	1,969.87	9.75	203.138	
500.00	500.00	503.61	503.59	0.99	11.41	-177.80	-1,978.11	-75.98	1,979.58	1,967.17	12.40	159.612	
600.00	600.00	610.97	610.96	1.22	13.84	-177.80	-1,977.66	-75.98	1,979.16	1,964.10	15.06	131.426	
700.00	700.00	718.30	718.30	1.44	16.27	-177.80	-1,976.81	-75.98	1,978.37	1,960.65	17.72	111.676	
800.00	800.00	825.61	825.61	1.67	18.70	-177.80	-1,975.56	-75.98	1,977.20	1,956.83	20.37	97.061	
900.00	900.00	910.09	910.09	1.89	21.08	-177.80	-1,974.63	-75.98	1,976.13	1,953.16	22.97	86.023	
1,000.00	1,000.00	1,005.16	1,005.14	2.12	24.49	-177.80	-1,974.22	-75.98	1,975.69	1,949.09	26.60	74.264	
1,100.00	1,100.00	1,100.24	1,100.21	2.34	27.89	-177.80	-1,974.04	-75.98	1,975.50	1,945.27	30.24	65.336	
1,124.94	1,124.94	1,123.96	1,123.92	2.40	28.74	-177.80	-1,974.03	-75.98	1,975.50	1,944.35	31.14	63.435	
1,200.00	1,200.00	1,195.34	1,195.29	2.57	31.30	-177.80	-1,974.10	-75.98	1,975.57	1,941.70	33.87	58.330	
1,263.40	1,263.40	1,255.64	1,255.59	2.71	33.46	-177.80	-1,974.26	-75.98	1,975.73	1,939.56	36.17	54.620	
1,300.00	1,300.00	1,290.46	1,290.40	2.78	34.71	-29.80	-1,974.40	-75.98	1,975.57	1,938.08	37.50	52.687	
1,400.00	1,399.88	1,398.96	1,398.88	2.96	38.35	-29.93	-1,974.85	-75.98	1,972.07	1,930.82	41.26	47.799	
1,500.00	1,499.40	1,498.48	1,498.40	3.15	40.98	-30.20	-1,974.85	-75.98	1,963.62	1,919.70	43.92	44.708	
1,600.00	1,598.26	1,597.35	1,597.26	3.36	43.60	-30.62	-1,974.85	-75.98	1,950.69	1,904.22	46.47	41.973	
1,700.00	1,696.21	1,695.30	1,695.21	3.62	46.18	-31.19	-1,974.85	-75.98	1,933.35	1,884.44	48.91	39.529	
1,800.00	1,792.97	1,792.07	1,791.97	3.95	48.74	-31.93	-1,974.85	-75.98	1,911.68	1,860.46	51.22	37.321	
1,900.00	1,888.28	1,894.74	1,894.64	4.35	51.30	-32.89	-1,974.75	-75.98	1,885.72	1,832.26	53.47	35.270	
2,000.00	1,985.10	1,985.10	1,985.00	4.85	53.13	-33.97	-1,974.47	-75.98	1,855.50	1,800.54	54.95	33.764	
2,100.00	2,073.87	2,073.66	2,073.55	5.44	54.92	-35.26	-1,974.34	-75.98	1,821.53	1,765.13	56.40	32.296	
2,200.00	2,162.91	2,160.19	2,160.08	6.14	56.67	-36.75	-1,974.36	-75.98	1,784.00	1,726.16	57.85	30.841	
2,300.00	2,249.85	2,244.47	2,244.35	6.95	58.37	-38.47	-1,974.52	-75.98	1,743.14	1,683.80	59.34	29.378	
2,400.00	2,334.09	2,340.00	2,339.87	7.85	60.30	-40.63	-1,974.85	-75.98	1,699.24	1,638.01	61.23	27.752	
2,500.00	2,415.39	2,400.65	2,400.52	8.86	62.09	-42.60	-1,975.43	-75.98	1,652.71	1,589.61	63.11	26.199	
2,600.00	2,493.53	2,484.72	2,484.58	9.97	64.58	-45.24	-1,976.00	-75.98	1,603.51	1,537.50	66.01	24.292	
2,700.00	2,568.31	2,564.80	2,564.66	11.17	66.95	-48.20	-1,976.27	-75.98	1,551.83	1,482.64	69.19	22.427	
2,800.00	2,639.50	2,640.66	2,640.52	12.45	69.20	-51.47	-1,976.28	-75.98	1,498.18	1,425.45	72.72	20.601	
2,900.00	2,706.93	2,712.10	2,711.96	13.82	71.31	-55.03	-1,976.08	-75.98	1,443.08	1,366.46	76.62	18.834	
3,000.00	2,770.40	2,778.93	2,778.80	15.27	73.29	-58.84	-1,975.71	-75.98	1,387.15	1,306.29	80.86	17.154	
3,100.00	2,829.74	2,840.99	2,840.86	16.79	75.13	-62.84	-1,975.20	-75.98	1,331.09	1,245.73	85.36	15.593	
3,200.00	2,884.78	2,883.91	2,883.78	18.38	76.54	-66.33	-1,974.85	-75.98	1,275.87	1,186.42	89.44	14.265	
3,300.00	2,935.38	2,934.52	2,934.38	20.04	78.83	-70.28	-1,974.85	-75.98	1,222.62	1,127.91	94.70	12.910	
3,400.00	2,981.40	2,980.55	2,980.40	21.75	80.91	-74.12	-1,974.85	-75.98	1,171.91	1,072.16	99.76	11.748	
3,430.06	2,994.32	2,993.47	2,993.32	22.27	81.49	-75.24	-1,974.85	-75.98	1,157.33	1,056.11	101.22	11.434	
3,450.00	3,002.43	3,001.58	3,001.43	22.55	81.86	-76.70	-1,974.85	-75.98	1,147.79	1,045.50	102.29	11.221	
3,500.00	3,019.94	3,019.09	3,018.94	23.08	82.65	-80.23	-1,974.85	-75.98	1,124.27	1,019.72	104.55	10.753	
3,550.00	3,033.30	3,032.46	3,032.30	23.64	83.26	-83.47	-1,974.85	-75.98	1,101.63	995.24	106.39	10.354	
3,600.00	3,042.41	3,041.57	3,041.41	24.25	83.67	-86.35	-1,974.85	-75.98	1,080.25	972.46	107.80	10.021	
3,650.00	3,047.21	3,046.37	3,046.21	24.89	83.88	-88.78	-1,974.85	-75.98	1,060.50	951.70	108.79	9.748	
3,680.06	3,048.00	3,047.16	3,047.00	25.29	83.92	-90.00	-1,974.85	-75.98	1,049.52	940.30	109.22	9.609	
3,700.00	3,048.00	3,047.16	3,047.00	25.56	83.92	-90.00	-1,974.85	-75.98	1,042.56	933.07	109.49	9.522	
3,800.00	3,047.94	3,047.10	3,046.94	26.91	83.92	-90.02	-1,974.85	-75.98	1,009.83	899.03	110.79	9.114	
3,900.00	3,047.81	3,046.97	3,046.81	28.32	83.91	-90.03	-1,974.85	-75.98	981.07	868.98	112.10	8.752	
4,000.00	3,047.61	3,046.77	3,046.61	29.78	83.90	-90.03	-1,974.85	-75.98	956.74	843.37	113.37	8.439	
4,100.00	3,047.33	3,046.49	3,046.33	31.25	83.89	-90.03	-1,974.85	-75.98	937.25	822.65	114.60	8.179	
4,200.00	3,046.97	3,046.13	3,045.97	32.74	83.87	-90.03	-1,974.85	-75.98	922.95	807.18	115.77	7.972	
4,300.00	3,046.54	3,045.70	3,045.54	34.23	83.85	-90.02	-1,974.85	-75.98	914.13	797.25	116.88	7.821	
4,400.00	3,046.04	3,045.20	3,045.04	35.72	83.83	-90.00	-1,974.85	-75.98	910.98	793.06	117.92	7.726	

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.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
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-R07W - San Juan 32-7 Unit 243A - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 875-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)					
4,405.05	3,046.02	3,045.18	3,045.02	35.80	83.83	-90.00	-1,974.85	-75.98	910.97	793.00	117.97	7.722 CC, ES	
4,500.00	3,045.47	3,044.63	3,044.47	37.20	83.81	-89.98	-1,974.85	-75.98	913.55	794.68	118.87	7.685 SF	
4,600.00	3,044.83	3,043.99	3,043.83	38.67	83.78	-89.96	-1,974.85	-75.98	921.81	802.06	119.75	7.698	
4,700.00	3,044.12	3,043.28	3,043.12	40.12	83.75	-89.93	-1,974.85	-75.98	935.56	815.02	120.54	7.761	
4,716.49	3,044.00	3,043.16	3,043.00	40.36	83.74	-89.92	-1,974.85	-75.98	938.34	817.68	120.66	7.777	
4,800.00	3,043.37	3,042.53	3,042.37	41.55	83.71	-89.89	-1,974.85	-75.98	956.32	834.37	121.94	7.842	
4,900.00	3,042.62	3,041.78	3,041.62	42.96	83.68	-89.84	-1,974.85	-75.98	986.75	863.29	123.46	7.993	
5,000.00	3,041.87	3,041.03	3,040.87	44.41	83.64	-89.79	-1,974.85	-75.98	1,026.06	901.06	125.00	8.209	
5,100.00	3,041.11	3,040.27	3,040.11	45.88	83.61	-89.75	-1,974.85	-75.98	1,073.28	946.72	126.56	8.480	
5,200.00	3,040.36	3,039.52	3,039.36	47.39	83.58	-89.70	-1,974.85	-75.98	1,127.42	999.26	128.15	8.797	
5,300.00	3,039.61	3,038.77	3,038.61	48.91	83.54	-89.65	-1,974.85	-75.98	1,187.52	1,057.76	129.76	9.152	
5,400.00	3,038.86	3,038.02	3,037.86	50.46	83.51	-89.61	-1,974.85	-75.98	1,252.73	1,121.35	131.38	9.535	
5,500.00	3,038.10	3,037.26	3,037.10	52.04	83.47	-89.56	-1,974.85	-75.98	1,322.29	1,189.27	133.02	9.941	
5,600.00	3,037.35	3,036.51	3,036.35	53.63	83.44	-89.51	-1,974.85	-75.98	1,395.56	1,260.88	134.67	10.363	
5,700.00	3,036.60	3,035.76	3,035.60	55.24	83.40	-89.47	-1,974.85	-75.98	1,471.97	1,335.64	136.34	10.797	
5,800.00	3,035.85	3,035.00	3,034.85	56.86	83.37	-89.42	-1,974.85	-75.98	1,551.07	1,413.06	138.01	11.239	
5,900.00	3,035.09	3,034.25	3,034.09	58.50	83.34	-89.37	-1,974.85	-75.98	1,632.47	1,492.77	139.70	11.686	
6,000.00	3,034.34	3,033.50	3,033.34	60.16	83.30	-89.33	-1,974.85	-75.98	1,715.83	1,574.44	141.39	12.135	
6,100.00	3,033.59	3,032.75	3,032.59	61.82	83.27	-89.28	-1,974.85	-75.98	1,800.89	1,657.79	143.10	12.585	
6,200.00	3,032.84	3,031.99	3,031.84	63.50	83.23	-89.23	-1,974.85	-75.98	1,887.41	1,742.60	144.81	13.034	
6,300.00	3,032.08	3,031.24	3,031.08	65.19	83.20	-89.19	-1,974.85	-75.98	1,975.20	1,828.67	146.53	13.480	
6,400.00	3,031.33	3,030.49	3,030.33	66.89	83.17	-89.14	-1,974.85	-75.98	2,064.11	1,915.85	148.25	13.923	
6,500.00	3,030.58	3,029.74	3,029.58	68.60	83.13	-89.09	-1,974.85	-75.98	2,153.99	2,004.00	149.98	14.361	
6,600.00	3,029.83	3,028.98	3,028.83	70.32	83.10	-89.05	-1,974.85	-75.98	2,244.72	2,093.00	151.72	14.795	
6,700.00	3,029.07	3,028.23	3,028.07	72.04	83.06	-89.00	-1,974.85	-75.98	2,336.21	2,182.75	153.46	15.223	
6,800.00	3,028.32	3,027.48	3,027.32	73.78	83.03	-88.95	-1,974.85	-75.98	2,428.37	2,273.16	155.21	15.646	
6,900.00	3,027.57	3,026.73	3,026.57	75.52	83.00	-88.91	-1,974.85	-75.98	2,521.13	2,364.17	156.96	16.062	
7,000.00	3,026.82	3,025.97	3,025.82	77.26	82.96	-88.86	-1,974.85	-75.98	2,614.42	2,455.71	158.72	16.472	
7,100.00	3,026.06	3,025.22	3,025.06	79.02	82.93	-88.81	-1,974.85	-75.98	2,708.20	2,547.72	160.48	16.876	
7,200.00	3,025.31	3,024.47	3,024.31	80.78	82.89	-88.77	-1,974.85	-75.98	2,802.40	2,640.16	162.24	17.273	
7,300.00	3,024.56	3,023.72	3,023.56	82.54	82.86	-88.72	-1,974.85	-75.98	2,896.99	2,732.98	164.00	17.664	
7,400.00	3,023.81	3,022.96	3,022.81	84.31	82.83	-88.67	-1,974.85	-75.98	2,991.93	2,826.16	165.77	18.048	
7,500.00	3,023.05	3,022.21	3,022.05	86.08	82.79	-88.63	-1,974.85	-75.98	3,087.19	2,919.65	167.54	18.426	
7,600.00	3,022.30	3,021.46	3,021.30	87.86	82.76	-88.58	-1,974.85	-75.98	3,182.74	3,013.43	169.32	18.798	
7,700.00	3,021.55	3,020.71	3,020.55	89.64	82.72	-88.53	-1,974.85	-75.98	3,278.56	3,107.47	171.09	19.162	
7,800.00	3,020.80	3,019.95	3,019.80	91.43	82.69	-88.49	-1,974.85	-75.98	3,374.62	3,201.75	172.87	19.521	
7,900.00	3,020.04	3,019.20	3,019.04	93.22	82.66	-88.44	-1,974.85	-75.98	3,470.90	3,296.25	174.65	19.873	
8,000.00	3,019.29	3,018.45	3,018.29	95.01	82.62	-88.39	-1,974.85	-75.98	3,567.39	3,390.95	176.44	20.219	
8,100.00	3,018.54	3,017.69	3,017.54	96.80	82.59	-88.35	-1,974.85	-75.98	3,664.06	3,485.84	178.22	20.559	
8,171.68	3,018.00	3,017.16	3,017.00	98.09	82.56	-88.31	-1,974.85	-75.98	3,733.46	3,553.96	179.50	20.799	

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



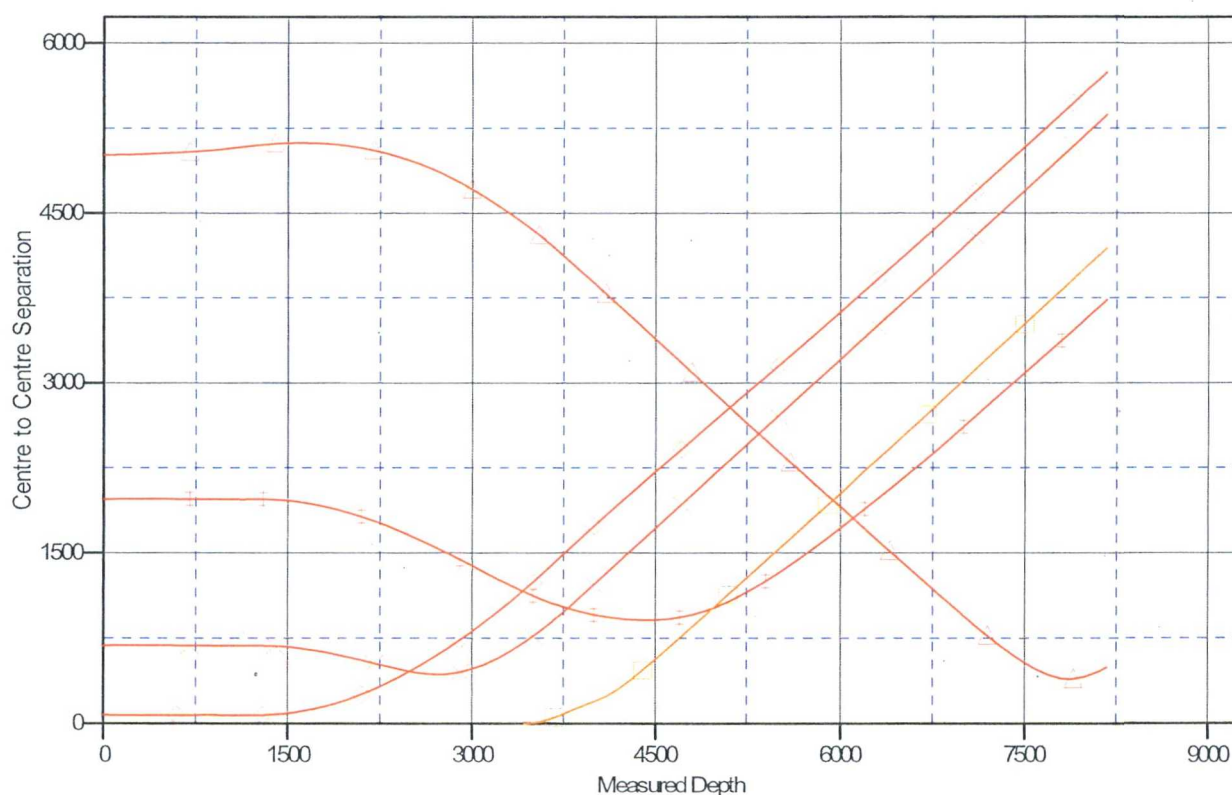
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
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 @ 6376.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.833334°W

Coordinates are relative to: San Juan 32-7 Unit 243H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.13°

Ladder Plot



LEGEND

San Juan 32-7 Unit 202R, Original Hole, Original Hole V0
San Juan 32-7 Unit 202, Original Hole, Original Hole V0
San Juan 32-7 Unit 243A, Original Hole, Original Hole V0
San Juan 32-7 Unit 243, Original Hole, Original Hole V0
San Juan 32-7 Unit 243H, Pilot Hole, Rev0



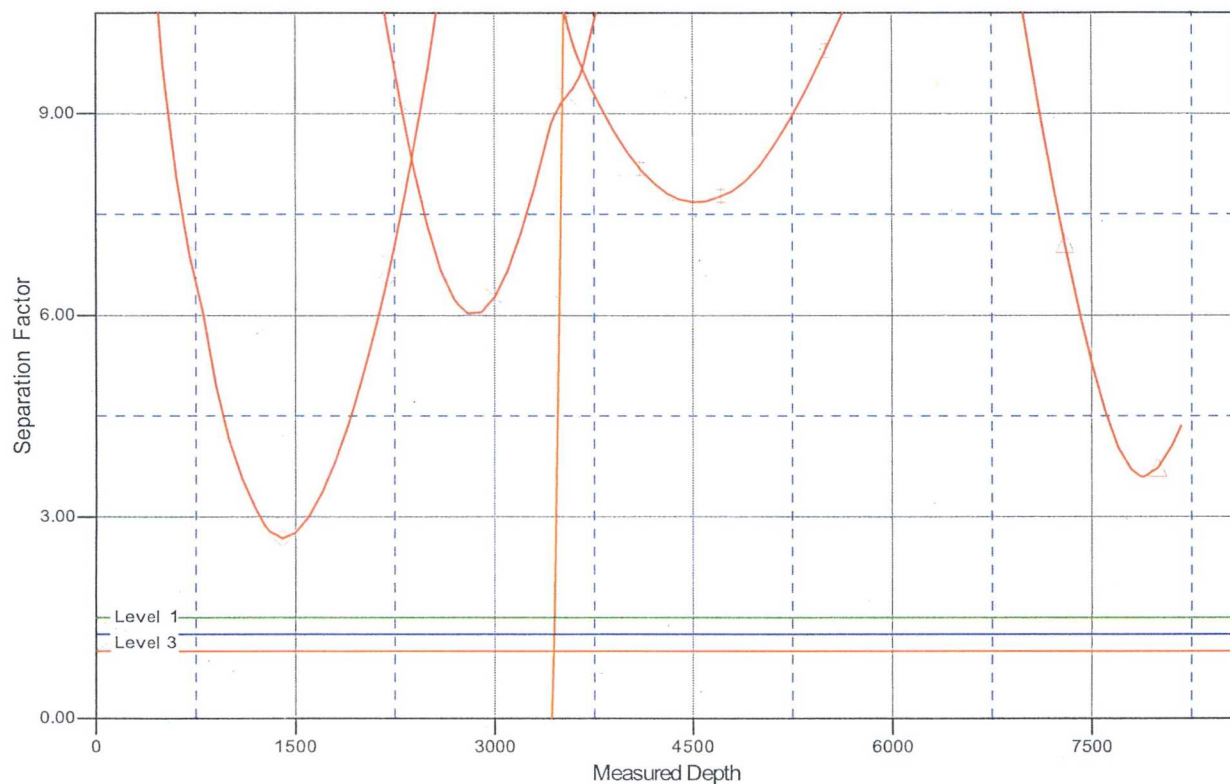
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.18-T32N-R07W
Site Error: 0.00 usft
Reference Well: San Juan 32-7 Unit 243H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-7 Unit 243H
TVD Reference: KB @ 6376.00usft
MD Reference: KB @ 6376.00usft
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 @ 6376.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107.833334°W

Coordinates are relative to: San Juan 32-7 Unit 243H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.13°

Separation Factor Plot



LEGEND

San Juan 32-7 Unit 202R, Original Hole, Original Hole V0 San Juan 32-7 Unit 243A, Original Hole, Original Hole V0 San Juan 32-7 Unit 243H, Pilot Hole, Rev0
San Juan 32-7 Unit 202, Original Hole, Original Hole V0 San Juan 32-7 Unit 243, Original Hole, Original Hole V0

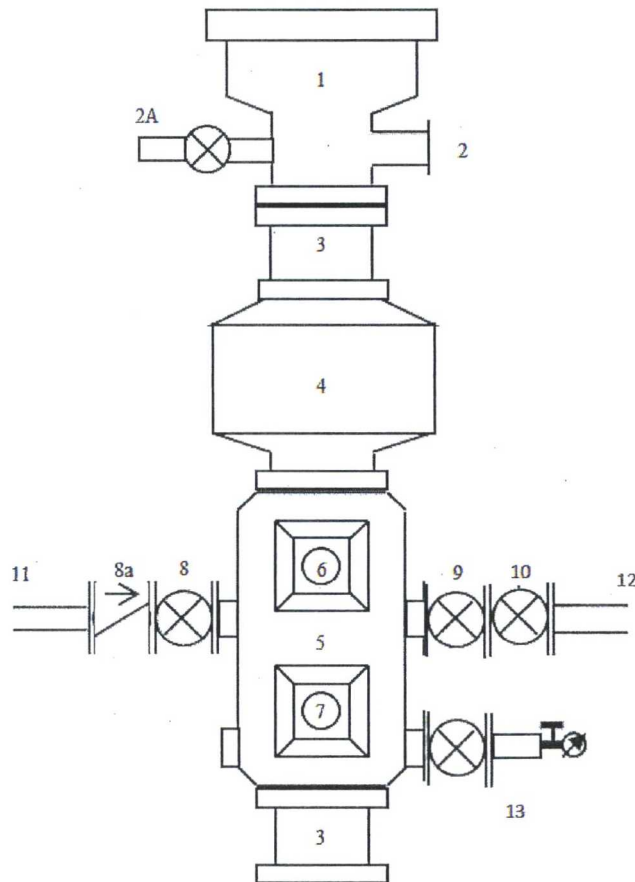


Hilcorp Energy Company

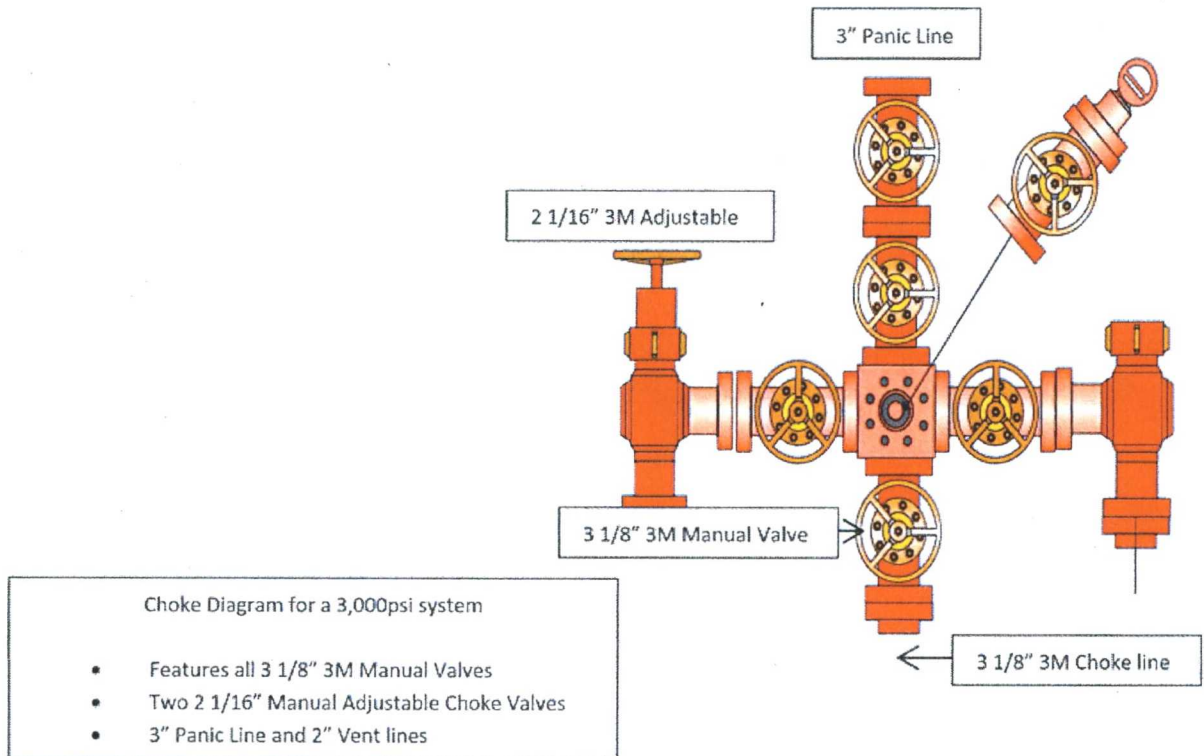
San Juan 32-7 Unit 243H Tech Plan

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

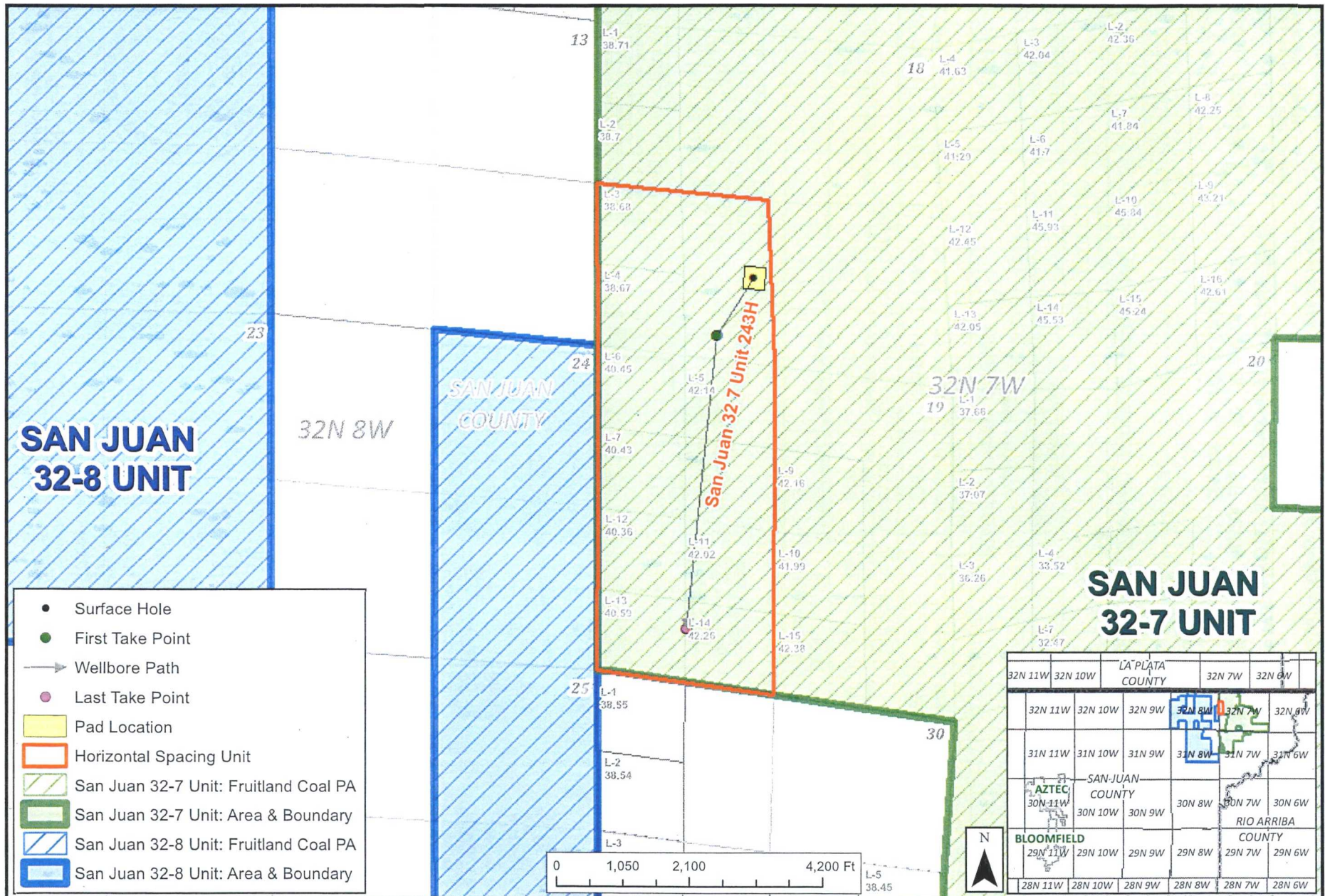


Choke Manifold Schematic – Aztec 777



Fruitland Coal HSU Reference Map

San Juan 32-7 Unit 243H



Scale 1:25,000

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

in Aztec, NM to Hilcorp Energy Company San Juan 32-7 Unit #243H

1363' FSL & 2468' FWL, Section 18, T32N, R7W, N.M.P.M., San Juan County, NM

Latitude: 36.977638°N Longitude: 107.609755°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 T-intersection;

Go Left (North-Easterly) exiting State Hwy 173 onto State Hwy 511 for 23.5 miles to County Road #4046 right-hand side of State Hwy 511 @ Mile Marker 31.7;

Go Right (Easterly) onto County Road #4046 for 200' proceeding through cattle-guard to immediate fork in roadway;

Go Right (Southerly) onto existing roadway for 1.0 mile to fork in roadway;

Go Right (Southerly) on existing roadway for 0.1 mile to fork in roadway;

Go Left (Southerly) on existing roadway for 0.4 mile to fork in roadway;

Go Right (Westerly) on existing roadway for 0.1 mile to existing Hilcorp San Juan 32-7 Unit #202R location, with the Hilcorp San Juan 32-7 Unit #243H wellflag staked offset #202R wellhead.