

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

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

1a. Type of work: ☒ DRILL ☐ REENTER
1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other
1c. Type of Completion: ☐ Hydraulic Fracturing ☒ Single Zone ☐ Multiple Zone

2. Name of Operator
KAISER FRANCIS OIL COMPANY

3a. Address
6733 S. Yale Ave. Tulsa OK 74121

3b. Phone No. (include area code)
(918)491-0000

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

At surface LOT 3 / 2195 FSL / 364 FWL / LAT 32.0858302 / LONG -103.6187419

At proposed prod. zone LOT 4 / 330 FSL / 350 FWL / LAT 32.0662002 / LONG -103.6187136

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

12. County or Parish
LEA

13. State
NM

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

16. No of acres in lease
838.8

17. Spacing Unit dedicated to this well
478.8

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

19. Proposed Depth
12822 feet / 20143 feet

20. BLM/BIA Bond No. in file
FED: WYB000055

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3407 feet

22. Approximate date work will start*
07/15/2019

23. Estimated duration
40 days

24. Attachments

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

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).

4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification.
6. Such other site specific information and/or plans as may be requested by the BLM.

25. Signature
(Electronic Submission)

Name (Printed/Typed)
Danielle Parker / Ph: (575)318-9704

Date
05/17/2019

Title
Regulatory Analyst

Approved by (Signature)
(Electronic Submission)

Name (Printed/Typed)
Christopher Walls / Ph: (575)234-2234

Date
11/20/2019

Title
Petroleum Engineer

Office
CARLSBAD

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.

6CA Rec 12/18/19

APPROVED WITH CONDITIONS
Approval Date: 11/20/2019

Ka
12/23/19

**PECOS DISTRICT
DRILLING OPERATIONS
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	Kaiser Francis Oil Company
LEASE NO.:	NMNM015321
WELL NAME & NO.:	Red Hills Federal 601H
SURFACE HOLE FOOTAGE:	2195' FSL & 364' FWL
BOTTOM HOLE FOOTAGE:	330' FSL & 350' FWL
LOCATION:	Section 31, T 25S, R 33E, NMPM
COUNTY:	Lea County, New Mexico

H2S	☒ Yes	☐ No	
Potash	☒ None	☐ Secretary	☐ R-111-P
Cave/Karst Potential	☐ Low	☒ Medium	☐ High
Variance	☐ None	☒ Flex Hose	☐ Other
Wellhead	☒ Conventional	☐ Multibowl	☐ Both
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP
Other	☐ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☐ COM	☐ Unit

A. HYDROGEN SULFIDE

1. A Hydrogen Sulfide (H2S) Drilling Plan shall be activated **500 feet** prior to drilling into the **Wolfcamp** formation. As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

B. CASING

1. The **10-3/4"** surface casing shall be set at approximately **885'** (a minimum of 25' into the Rustler Anhydrite and above the salt) and cemented to surface.
 - a. **If cement does not circulate to surface**, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of **6 hours** after pumping cement, ideally between 8-10 hours after.
 - b. WOC time for a primary cement job will be a minimum of **8 hours** or **500 psi** compressive strength, whichever is greater. This is to include the lead cement.
 - c. If cement falls back, remedial cementing will be done prior to drilling out the shoe.
 - d. WOC time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 psi compressive strength, whichever is greater.

2. The 7-5/8" intermediate casing shall cemented to surface.
 - a. **If cement does not circulate to surface**, see B.1.a, c & d.
3. The 5-1/2" production casing shall be cemented with at least **200' tie-back** into the previous casing. Operator shall provide method of verification.
 - a. In Medium Cave/Karst Areas, if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

C. PRESSURE CONTROL

1. Flex hose variance is approved. Flex hose must meet API 16C specification and be functionally equivalent to the hose specs attached to these conditions of approval.
2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M) psi**.
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **10,000 (10M) psi**.
4. Required safety valves, with appropriate wrenches and subs for the drill string being utilized, will be in the open position and accessible on the rig floor.
5. Choke manifold shall be functionally equivalent to Onshore Order 2 Attachment I-2 for 5M systems and Attachment I-3 for 10M systems.

DR 11/19/2019

GENERAL REQUIREMENTS

1. The BLM is to be notified in advance for a representative to witness:
 - a. Spudding the well (minimum of 24 hours)
 - b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
 - c. BOP/BOPE tests (minimum of 4 hours)
 - ☒ Eddy County: Call the Carlsbad Field Office, (575) 361-2822
 - ☒ Lea County: Call the Hobbs Field Station, (575) 393-3612
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
 - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
 - b. When the operator proposes to set surface casing with Spudder Rig:
 - i. Notify the BLM when moving in and removing the Spudder Rig.
 - ii. Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
 - iii. BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
4. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be available upon request. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the

following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well-specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On the portion of well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:

- a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
 - e. Whenever any seal subject to test pressure is broken, all the tests in Onshore Order 2 III.A.2.i must be followed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the BOP/BOPE tests.
- a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
 - b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test which can be initiated immediately after bumping the plug (only applies to single-stage cement jobs).
 - c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be made available upon request.
 - d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
 - e. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes. This test shall be performed prior to the test at full stack pressure.
 - f. BOP/BOPE must be tested within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth

exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

1. Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

D. WASTE MATERIAL AND FLUIDS

1. All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.
2. Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.



U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

APD Print Report

12/09/2019

APD ID: 10400041907

Submission Date: 05/17/2019

Operator Name: KAISER FRANCIS OIL COMPANY

Federal/Indian APD: FED

Well Name: RED HILLS FEDERAL

Well Number: 601H

[Show Final Text](#)

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill

Application

Section 1 - General

APD ID: 10400041907

Tie to previous NOS?

Submission Date: 05/17/2019

BLM Office: CARLSBAD

User: Danielle Parker

Title: Regulatory Analyst

Federal/Indian APD: FED

Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMNM015321

Lease Acres: 838.8

Surface access agreement in place?

Allotted?

Reservation:

Agreement in place? NO

Federal or Indian agreement:

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? NO

APD Operator: KAISER FRANCIS OIL COMPANY

Operator letter of designation:

Operator Info

Operator Organization Name: KAISER FRANCIS OIL COMPANY

Operator Address: 6733 S. Yale Ave.

Zip: 74121

Operator PO Box: PO Box 21468

Operator City: Tulsa

State: OK

Operator Phone: (918)491-0000

Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? NO

Master Development Plan name:

Well in Master SUPO? NO

Master SUPO name:

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: RED HILLS FEDERAL

Well Number: 601H

Well in Master Drilling Plan? NO

Master Drilling Plan name:

Well Name: RED HILLS FEDERAL

Well Number: 601H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: WC-025 G-09
S253236A

Pool Name: UPPER
WOLFCAMP

Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** YES **New surface disturbance?** N

Type of Well Pad: MULTIPLE WELL

Multiple Well Pad Name: RED **Number:** 1

Well Class: HORIZONTAL

HILLS

Number of Legs: 1

Well Work Type: Drill

Well Type: CONVENTIONAL GAS WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 30 Miles

Distance to nearest well: 40 FT

Distance to lease line: 330 FT

Reservoir well spacing assigned acres Measurement: 478.8 Acres

Well plat: Red_Hills_601H_C102_20190820090646.pdf

Well work start Date: 07/15/2019

Duration: 40 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number:

Reference Datum:

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	219 5	FSL	364	FWL	25S	33E	31	Lot 3	32.08583 02	- 103.6187 419	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 015321	340 7	0	0
KOP Leg #1	260 0	FSL	352	FWL	25S	33E	31	Lot 3	32.08694 3	- 103.6187 92	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 015321	- 877 2	122 00	121 79

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: RED HILLS FEDERAL

Well Number: 601H

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
PPP Leg #1-1	260 0	FSL	350	FWL	25S	33E	31	Lot 3	32.08694 34	- 103.6187 913	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 015321	- 887 2	123 00	122 79
EXIT Leg #1	330	FSL	350	FWL	26S	33E	6	Lot 4	32.06620 02	- 103.6187 136	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 015321	- 941 5	201 43	128 22
BHL Leg #1	330	FSL	350	FWL	26S	33E	6	Lot 4	32.06620 02	- 103.6187 136	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 015321	- 941 5	201 43	128 22

Drilling Plan

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	—	3407	0	0		NONE	N
2	RUSTLER	2548	860	860		NONE	N
3	SALADO	2208	1200	1200		NONE	N
4	TOP SALT	1408	2000	2000		NONE	N
5	BASE OF SALT	-1042	4450	4450		NONE	N
6	LAMAR	-1162	4570	4750		NATURAL GAS,OIL	N
7	BELL CANYON	-1462	4870	4870		NATURAL GAS,OIL	N
8	CHERRY CANYON	-2452	5860	5860		NATURAL GAS,OIL	N
9	BRUSHY CANYON	-5192	8600	8600		NATURAL GAS,OIL	N
10	BONE SPRING	-5393	8800	8800		NATURAL GAS,OIL	N
11	AVALON SAND	-5603	9010	9010		NATURAL GAS,OIL	N

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: RED HILLS FEDERAL

Well Number: 601H

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
12	BONE SPRING 1ST	-6543	9950	9950		NATURAL GAS,OIL	N
13	BONE SPRING 2ND	-7103	10510	10510		NATURAL GAS,OIL	N
14	BONE SPRING LIME	-7543	10950	10950		NATURAL GAS,OIL	N
15	BONE SPRING 3RD	-8278	11685	11685		NATURAL GAS,OIL	Y
16	WOLFCAMP	-8663	12070	12070		NATURAL GAS,OIL	N

Section 2 - Blowout Prevention

Pressure Rating (PSI): 10M

Rating Depth: 18000

Equipment: A 10M system will be installed according to Onshore Order #2 consisting of an Annular Preventer, BOP with two rams, a blind ram and safety valves and appropriate handles located on rig floor. BOP will be equipped with 2 side outlets (choke side shall be a minimum 3" line, and kill side will be a minimum 2" line). Kill line will be installed with (2) valves and a check valve (2" min) of proper pressure rating for the system. Remote kill line (2' min) will be installed and ran to the outer edge of the substructure and be unobstructed. A manual and hydraulic valve (3" min) will be installed on the choke line, 3 chokes will be used with one being remotely controlled. Fill up line will be installed above the uppermost preventer. Pressure gauge of proper pressure rating will be installed on choke manifold. Upper and lower kelly cocks will be utilized with handles readily available in plain sight. A float sub will be available at all times. All connections subject to well pressure will be flanged, welded, or clamped.

Requesting Variance? YES

Variance request: Flex Hose Variance

Testing Procedure: BOP/BOPE will be tested by an independent service company to 250 psi low and 10000 psi high. The System may be upgraded to a higher pressure but still tested to the working pressure stated. If the system is upgraded all the components installed will be functional and tested. Pipe rams will be operationally checked each 24 hour period. The Annular shall be functionally operated at least weekly. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.

Choke Diagram Attachment:

Red_Hills_601H__Choke_Manifold._20190823100904.pdf

BOP Diagram Attachment:

Red_Hills_601H__Flex_Hose_20190515203108.pdf

Red_Hills_601H__BOP_20190820124115.pdf

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: RED HILLS FEDERAL

Well Number: 601H

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type
1	SURFACE	14.75	10.75	NEW	API	N	0	882	0	882			882	J-55	40.5	ST&C	3.8	7.6	DRY	11.8	DRY
2	INTERMEDIATE	9.875	7.625	NEW	API	N	0	12170	0	12170			12170	HCP-110	29.7	LT&C	1.2	1.6	DRY	2.6	DRY
3	PRODUCTION	6.75	5.5	NEW	API	N	0	20143	0	12822			20143	P-110	20	OTHER - EAGLE SF	1.3	1.5	DRY	2.6	DRY

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Red_Hills_601H__Casing_Assumptions_20190515204514.pdf

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: RED HILLS FEDERAL

Well Number: 601H

Casing Attachments

Casing ID: 2 String Type: INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Red_Hills_601H__Casing_Assumptions_20190515204536.pdf

Casing ID: 3 String Type: PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Red_Hills_601H__Casing_Assumptions_20190515204550.pdf

Red_Hills_601H__Prod_Csg_Specs_20190515204553.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead					1.4				CEMENT	Retarder

INTERMEDIATE	Lead					2.8					
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Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: RED HILLS FEDERAL

Well Number: 601H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
INTERMEDIATE	Tail										
PRODUCTION	Lead					1.93					

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
882	1217 0	OTHER : DIESEL-BRINE EMULSION	8.8	9.2							
1217 0	2014 3	OTHER : OIL BASED MUD	10	12.5							
0	882	OTHER : FRESH WATER	8.4	9							

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: RED HILLS FEDERAL

Well Number: 601H

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

TOC determined by calculation

List of open and cased hole logs run in the well:

DS,GR,MUDLOG

Coring operation description for the well:

None planned

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 8139

Anticipated Surface Pressure: 5318.16

Anticipated Bottom Hole Temperature(F): 199

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geohazards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Red_Hills_601H__H2S_Plan_20190515205151.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Red_Hills_601H__Directional_Plan_20190515205400.pdf

Red_Hills_601H__Directional_Plan_Diagram_20190820091515.pdf

Other proposed operations facets description:

Gas Capture Plan attached

Other proposed operations facets attachment:

Red_Hills_601H__Gas_Capture_Plan_20190515205425.pdf

Other Variance attachment:

Red_Hills_601H__Flex_Hose_20190515205441.pdf

SUPO

Kaiser Francis

Red Hills 601H

Red Hills 601H

Red Hills 601H

Red Hills 601H

Plan: 190502 Red Hills 601H

Morcor Standard Plan

02 May, 2019

Morcor Engineering

Morcor Standard Plan

Company: Kaiser Francis
Project: Red Hills 601H
Site: Red Hills 601H
Well: Red Hills 601H
Wellbore: Red Hills 601H
Design: 190502 Red Hills 601H

Local Co-ordinate Reference: Well Red Hills 601H
TVD Reference: WELL @ 3427.1usft (Original Well Elev)
MD Reference: WELL @ 3427.1usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project	Red Hills 601H		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Red Hills 601H		
Site Position:		Northing:	395,695.40 usft
From:	Map	Easting:	762,684.50 usft
Position Uncertainty:	1.0 usft	Slot Radius:	17-1/2 "
		Latitude:	32° 5' 8.989 N
		Longitude:	103° 37' 7.049 W
		Grid Convergence:	0.38 °

Well	Red Hills 601H		
Well Position	+N/-S	0.0 usft	Northing: 395,695.40 usft
	+E/-W	0.0 usft	Easting: 762,684.50 usft
Position Uncertainty	1.0 usft		Wellhead Elevation: usft
			Latitude: 32° 5' 8.989 N
			Longitude: 103° 37' 7.049 W
			Ground Level: 3,405.1 usft

Wellbore	Red Hills 601H		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	5/2/2019	(°) 6.62
			Dip Angle 59.85
			(°)
			Field Strength 47,742
			(nT)

Design	190502 Red Hills 601H		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction 179.84
			(°)

Survey Tool Program	Date	5/2/2019		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
0.0	20,143.1	190502 Red Hills 601H (Red Hills 601H)	MWD	MWD - Standard

Morcor Engineering

Morcor Standard Plan

Company: Kaiser Francis
Project: Red Hills 601H
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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
0.0	0.00	0.00	0.0	-3,427.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
50.0	0.00	0.00	50.0	-3,377.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
100.0	0.00	352.29	100.0	-3,327.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
120.0	0.00	352.29	120.0	-3,307.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
20"										
150.0	0.00	352.29	150.0	-3,277.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
200.0	0.00	352.29	200.0	-3,227.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
250.0	0.00	352.29	250.0	-3,177.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
300.0	0.00	352.29	300.0	-3,127.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
350.0	0.00	352.29	350.0	-3,077.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
400.0	0.00	352.29	400.0	-3,027.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
450.0	0.00	352.29	450.0	-2,977.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
500.0	0.00	352.29	500.0	-2,927.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
550.0	0.00	352.29	550.0	-2,877.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
600.0	0.00	352.29	600.0	-2,827.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
650.0	0.00	352.29	650.0	-2,777.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
700.0	0.00	352.29	700.0	-2,727.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
750.0	0.00	352.29	750.0	-2,677.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
800.0	0.00	352.29	800.0	-2,627.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
850.0	0.00	352.29	850.0	-2,577.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
882.0	0.00	352.29	882.0	-2,545.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
Rustler - 10 3/4" Surface Casing										
900.0	0.00	352.29	900.0	-2,527.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
950.0	0.00	352.29	950.0	-2,477.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,000.0	0.00	352.29	1,000.0	-2,427.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,050.0	0.00	352.29	1,050.0	-2,377.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,100.0	0.00	352.29	1,100.0	-2,327.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00

Morcor Engineering

Morcor Standard Plan

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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
1,150.0	0.00	352.29	1,150.0	-2,277.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,200.0	0.00	352.29	1,200.0	-2,227.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,222.0	0.00	352.29	1,222.0	-2,205.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
Salado										
1,250.0	0.00	352.29	1,250.0	-2,177.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,300.0	0.00	352.29	1,300.0	-2,127.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,350.0	0.00	352.29	1,350.0	-2,077.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,400.0	0.00	352.29	1,400.0	-2,027.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,450.0	0.00	352.29	1,450.0	-1,977.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,500.0	0.00	352.29	1,500.0	-1,927.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,550.0	0.00	352.29	1,550.0	-1,877.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,600.0	0.00	352.29	1,600.0	-1,827.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,650.0	0.00	352.29	1,650.0	-1,777.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,700.0	0.00	352.29	1,700.0	-1,727.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,750.0	0.00	352.29	1,750.0	-1,677.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,800.0	0.00	352.29	1,800.0	-1,627.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,850.0	0.00	352.29	1,850.0	-1,577.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,900.0	0.00	352.29	1,900.0	-1,527.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
1,950.0	0.00	352.29	1,950.0	-1,477.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,000.0	0.00	352.29	2,000.0	-1,427.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,022.0	0.00	352.29	2,022.0	-1,405.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
Top of Salt										
2,050.0	0.00	352.29	2,050.0	-1,377.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,100.0	0.00	352.29	2,100.0	-1,327.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,150.0	0.00	352.29	2,150.0	-1,277.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,200.0	0.00	352.29	2,200.0	-1,227.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,250.0	0.00	352.29	2,250.0	-1,177.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00

Morcor Engineering

Morcor Standard Plan

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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
2,300.0	0.00	352.29	2,300.0	-1,127.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,350.0	0.00	352.29	2,350.0	-1,077.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,400.0	0.00	352.29	2,400.0	-1,027.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,450.0	0.00	352.29	2,450.0	-977.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,500.0	0.00	352.29	2,500.0	-927.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,550.0	0.00	352.29	2,550.0	-877.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,600.0	0.00	352.29	2,600.0	-827.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,650.0	0.00	352.29	2,650.0	-777.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,700.0	0.00	352.29	2,700.0	-727.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,750.0	0.00	352.29	2,750.0	-677.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,800.0	0.00	352.29	2,800.0	-627.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,850.0	0.00	352.29	2,850.0	-577.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,900.0	0.00	352.29	2,900.0	-527.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
2,950.0	0.00	352.29	2,950.0	-477.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,000.0	0.00	352.29	3,000.0	-427.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,050.0	0.00	352.29	3,050.0	-377.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,100.0	0.00	352.29	3,100.0	-327.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,150.0	0.00	352.29	3,150.0	-277.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,200.0	0.00	352.29	3,200.0	-227.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,250.0	0.00	352.29	3,250.0	-177.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,300.0	0.00	352.29	3,300.0	-127.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,350.0	0.00	352.29	3,350.0	-77.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,400.0	0.00	352.29	3,400.0	-27.1	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,450.0	0.00	352.29	3,450.0	22.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,500.0	0.00	352.29	3,500.0	72.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,550.0	0.00	352.29	3,550.0	122.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,600.0	0.00	352.29	3,600.0	172.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00

Morcor Engineering

Morcor Standard Plan

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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
3,650.0	0.00	352.29	3,650.0	222.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,700.0	0.00	352.29	3,700.0	272.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,750.0	0.00	352.29	3,750.0	322.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,800.0	0.00	352.29	3,800.0	372.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,850.0	0.00	352.29	3,850.0	422.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,900.0	0.00	352.29	3,900.0	472.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
3,950.0	0.00	352.29	3,950.0	522.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,000.0	0.00	352.29	4,000.0	572.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,050.0	0.00	352.29	4,050.0	622.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,100.0	0.00	352.29	4,100.0	672.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,150.0	0.00	352.29	4,150.0	722.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,200.0	0.00	352.29	4,200.0	772.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,250.0	0.00	352.29	4,250.0	822.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,300.0	0.00	352.29	4,300.0	872.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,350.0	0.00	352.29	4,350.0	922.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,400.0	0.00	352.29	4,400.0	972.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,450.0	0.00	352.29	4,450.0	1,022.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,472.0	0.00	352.29	4,472.0	1,044.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
Base of Salt										
4,500.0	0.00	352.29	4,500.0	1,072.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,550.0	0.00	352.29	4,550.0	1,122.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,600.0	0.00	352.29	4,600.0	1,172.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,650.0	0.00	352.29	4,650.0	1,222.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,700.0	0.00	352.29	4,700.0	1,272.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,750.0	0.00	352.29	4,750.0	1,322.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,772.0	0.00	352.29	4,772.0	1,344.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00

Lamar

Morcor Engineering

Morcor Standard Plan

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MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
4,800.0	0.00	352.29	4,800.0	1,372.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,850.0	0.00	352.29	4,850.0	1,422.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,892.0	0.00	352.29	4,892.0	1,464.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
Bell Canyon										
4,900.0	0.00	352.29	4,900.0	1,472.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
4,950.0	0.00	352.29	4,950.0	1,522.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,000.0	0.00	352.29	5,000.0	1,572.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,050.0	0.00	352.29	5,050.0	1,622.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,100.0	0.00	352.29	5,100.0	1,672.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,150.0	0.00	352.29	5,150.0	1,722.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,200.0	0.00	352.29	5,200.0	1,772.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,250.0	0.00	352.29	5,250.0	1,822.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,300.0	0.00	352.29	5,300.0	1,872.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,350.0	0.00	352.29	5,350.0	1,922.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,400.0	0.00	352.29	5,400.0	1,972.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,450.0	0.00	352.29	5,450.0	2,022.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,500.0	0.00	352.29	5,500.0	2,072.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,550.0	0.00	352.29	5,550.0	2,122.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,600.0	0.00	352.29	5,600.0	2,172.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,650.0	0.00	352.29	5,650.0	2,222.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,700.0	0.00	352.29	5,700.0	2,272.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,750.0	0.00	352.29	5,750.0	2,322.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,800.0	0.00	352.29	5,800.0	2,372.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,850.0	0.00	352.29	5,850.0	2,422.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
5,882.0	0.00	352.29	5,882.0	2,454.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
Cherry Canyon										
5,900.0	0.00	352.29	5,900.0	2,472.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00

Morcor Engineering

Morcor Standard Plan

Company: Kaiser Francis
Project: Red Hills 601H
Site: Red Hills 601H
Well: Red Hills 601H
Wellbore: Red Hills 601H
Design: 190502 Red Hills 601H

Local Co-ordinate Reference: Well Red Hills 601H
TVD Reference: WELL @ 3427.1usft (Original Well Elev)
MD Reference: WELL @ 3427.1usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
5,950.0	0.00	352.29	5,950.0	2,522.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,000.0	0.00	352.29	6,000.0	2,572.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,050.0	0.00	352.29	6,050.0	2,622.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,100.0	0.00	352.29	6,100.0	2,672.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,150.0	0.00	352.29	6,150.0	2,722.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,200.0	0.00	352.29	6,200.0	2,772.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,250.0	0.00	352.29	6,250.0	2,822.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,300.0	0.00	352.29	6,300.0	2,872.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,350.0	0.00	352.29	6,350.0	2,922.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,400.0	0.00	352.29	6,400.0	2,972.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,450.0	0.00	352.29	6,450.0	3,022.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,500.0	0.00	352.29	6,500.0	3,072.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,550.0	0.00	352.29	6,550.0	3,122.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,600.0	0.00	352.29	6,600.0	3,172.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,650.0	0.00	352.29	6,650.0	3,222.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,700.0	0.00	352.29	6,700.0	3,272.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,750.0	0.00	352.29	6,750.0	3,322.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,800.0	0.00	352.29	6,800.0	3,372.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,850.0	0.00	352.29	6,850.0	3,422.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,900.0	0.00	352.29	6,900.0	3,472.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
6,950.0	0.00	352.29	6,950.0	3,522.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,000.0	0.00	352.29	7,000.0	3,572.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,050.0	0.00	352.29	7,050.0	3,622.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,100.0	0.00	352.29	7,100.0	3,672.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,150.0	0.00	352.29	7,150.0	3,722.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,200.0	0.00	352.29	7,200.0	3,772.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,250.0	0.00	352.29	7,250.0	3,822.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00

Morcor Engineering

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MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
7,300.0	0.00	352.29	7,300.0	3,872.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,350.0	0.00	352.29	7,350.0	3,922.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,400.0	0.00	352.29	7,400.0	3,972.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,450.0	0.00	352.29	7,450.0	4,022.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,500.0	0.00	352.29	7,500.0	4,072.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,550.0	0.00	352.29	7,550.0	4,122.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,600.0	0.00	352.29	7,600.0	4,172.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,650.0	0.00	352.29	7,650.0	4,222.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,700.0	0.00	352.29	7,700.0	4,272.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,750.0	0.00	352.29	7,750.0	4,322.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,800.0	0.00	352.29	7,800.0	4,372.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,850.0	0.00	352.29	7,850.0	4,422.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,900.0	0.00	352.29	7,900.0	4,472.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
7,950.0	0.00	352.29	7,950.0	4,522.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
8,000.0	0.00	352.29	8,000.0	4,572.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
8,050.0	0.00	352.29	8,050.0	4,622.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
8,067.0	0.00	352.29	8,067.0	4,639.9	0.0	0.0	762,684.50	395,695.40	0.00	0.00
Start Build 3.00										
8,100.0	0.99	352.29	8,100.0	4,672.9	0.3	0.0	762,684.46	395,695.68	-0.28	3.00
8,150.0	2.49	352.29	8,150.0	4,722.9	1.8	-0.2	762,684.26	395,697.19	-1.79	3.00
8,200.0	3.99	352.29	8,199.9	4,772.8	4.6	-0.6	762,683.88	395,699.99	-4.59	3.00
8,250.0	5.49	352.29	8,249.7	4,822.6	8.7	-1.2	762,683.32	395,704.08	-8.68	3.00
8,267.0	6.00	352.29	8,266.6	4,839.5	10.4	-1.4	762,683.10	395,705.77	-10.37	3.00
Start 3703.0 hold at 8267.0 MD										
8,300.0	6.00	352.29	8,299.5	4,872.4	13.8	-1.9	762,682.63	395,709.19	-13.79	0.00
8,350.0	6.00	352.29	8,349.2	4,922.1	19.0	-2.6	762,681.93	395,714.37	-18.97	0.00
8,400.0	6.00	352.29	8,398.9	4,971.8	24.1	-3.3	762,681.23	395,719.54	-24.15	0.00

Morcor Engineering

Morcor Standard Plan

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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
8,450.0	6.00	352.29	8,448.6	5,021.5	29.3	-4.0	762,680.53	395,724.72	-29.33	0.00
8,500.0	6.00	352.29	8,498.4	5,071.3	34.5	-4.7	762,679.83	395,729.90	-34.52	0.00
8,550.0	6.00	352.29	8,548.1	5,121.0	39.7	-5.4	762,679.13	395,735.08	-39.70	0.00
8,600.0	6.00	352.29	8,597.8	5,170.7	44.9	-6.1	762,678.43	395,740.26	-44.88	0.00
8,624.3	6.00	352.29	8,622.0	5,194.9	47.4	-6.4	762,678.09	395,742.78	-47.40	0.00
Brushy Canyon										
8,650.0	6.00	352.29	8,647.5	5,220.4	50.0	-6.8	762,677.73	395,745.44	-50.06	0.00
8,700.0	6.00	352.29	8,697.3	5,270.2	55.2	-7.5	762,677.02	395,750.62	-55.24	0.00
8,750.0	6.00	352.29	8,747.0	5,319.9	60.4	-8.2	762,676.32	395,755.80	-60.42	0.00
8,800.0	6.00	352.29	8,796.7	5,369.6	65.6	-8.9	762,675.62	395,760.98	-65.60	0.00
8,825.4	6.00	352.29	8,822.0	5,394.9	68.2	-9.2	762,675.27	395,763.61	-68.24	0.00
Bone Spring										
8,850.0	6.00	352.29	8,846.4	5,419.3	70.8	-9.6	762,674.92	395,766.16	-70.78	0.00
8,900.0	6.00	352.29	8,896.2	5,469.1	75.9	-10.3	762,674.22	395,771.34	-75.97	0.00
8,950.0	6.00	352.29	8,945.9	5,518.8	81.1	-11.0	762,673.52	395,776.52	-81.15	0.00
9,000.0	6.00	352.29	8,995.6	5,568.5	86.3	-11.7	762,672.82	395,781.69	-86.33	0.00
9,036.6	6.00	352.29	9,032.0	5,604.9	90.1	-12.2	762,672.30	395,785.48	-90.12	0.00
Avalon										
9,050.0	6.00	352.29	9,045.3	5,618.2	91.5	-12.4	762,672.12	395,786.87	-91.51	0.00
9,100.0	6.00	352.29	9,095.1	5,668.0	96.7	-13.1	762,671.41	395,792.05	-96.69	0.00
9,150.0	6.00	352.29	9,144.8	5,717.7	101.8	-13.8	762,670.71	395,797.23	-101.87	0.00
9,200.0	6.00	352.29	9,194.5	5,767.4	107.0	-14.5	762,670.01	395,802.41	-107.05	0.00
9,250.0	6.00	352.29	9,244.2	5,817.1	112.2	-15.2	762,669.31	395,807.59	-112.23	0.00
9,300.0	6.00	352.29	9,294.0	5,866.9	117.4	-15.9	762,668.61	395,812.77	-117.41	0.00
9,350.0	6.00	352.29	9,343.7	5,916.6	122.5	-16.6	762,667.91	395,817.95	-122.60	0.00
9,400.0	6.00	352.29	9,393.4	5,966.3	127.7	-17.3	762,667.21	395,823.13	-127.78	0.00
9,450.0	6.00	352.29	9,443.2	6,016.1	132.9	-18.0	762,666.51	395,828.31	-132.96	0.00

Morcor Engineering

Morcor Standard Plan

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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
9,500.0	6.00	352.29	9,492.9	6,065.8	138.1	-18.7	762,665.81	395,833.49	-138.14	0.00
9,550.0	6.00	352.29	9,542.6	6,115.5	143.3	-19.4	762,665.10	395,838.67	-143.32	0.00
9,600.0	6.00	352.29	9,592.3	6,165.2	148.4	-20.1	762,664.40	395,843.84	-148.50	0.00
9,650.0	6.00	352.29	9,642.1	6,215.0	153.6	-20.8	762,663.70	395,849.02	-153.68	0.00
9,700.0	6.00	352.29	9,691.8	6,264.7	158.8	-21.5	762,663.00	395,854.20	-158.86	0.00
9,750.0	6.00	352.29	9,741.5	6,314.4	164.0	-22.2	762,662.30	395,859.38	-164.04	0.00
9,800.0	6.00	352.29	9,791.2	6,364.1	169.2	-22.9	762,661.60	395,864.56	-169.23	0.00
9,850.0	6.00	352.29	9,841.0	6,413.9	174.3	-23.6	762,660.90	395,869.74	-174.41	0.00
9,900.0	6.00	352.29	9,890.7	6,463.6	179.5	-24.3	762,660.20	395,874.92	-179.59	0.00
9,950.0	6.00	352.29	9,940.4	6,513.3	184.7	-25.0	762,659.49	395,880.10	-184.77	0.00
9,981.8	6.00	352.29	9,972.0	6,544.9	188.0	-25.5	762,659.05	395,883.39	-188.06	0.00
1st Bone Spring Sand										
10,000.0	6.00	352.29	9,990.1	6,563.0	189.9	-25.7	762,658.79	395,885.28	-189.95	0.00
10,050.0	6.00	352.29	10,039.9	6,612.8	195.1	-26.4	762,658.09	395,890.46	-195.13	0.00
10,100.0	6.00	352.29	10,089.6	6,662.5	200.2	-27.1	762,657.39	395,895.64	-200.31	0.00
10,150.0	6.00	352.29	10,139.3	6,712.2	205.4	-27.8	762,656.69	395,900.82	-205.49	0.00
10,200.0	6.00	352.29	10,189.0	6,761.9	210.6	-28.5	762,655.99	395,905.99	-210.68	0.00
10,250.0	6.00	352.29	10,238.8	6,811.7	215.8	-29.2	762,655.29	395,911.17	-215.86	0.00
10,300.0	6.00	352.29	10,288.5	6,861.4	221.0	-29.9	762,654.59	395,916.35	-221.04	0.00
10,350.0	6.00	352.29	10,338.2	6,911.1	226.1	-30.6	762,653.89	395,921.53	-226.22	0.00
10,400.0	6.00	352.29	10,387.9	6,960.8	231.3	-31.3	762,653.18	395,926.71	-231.40	0.00
10,450.0	6.00	352.29	10,437.7	7,010.6	236.5	-32.0	762,652.48	395,931.89	-236.58	0.00
10,500.0	6.00	352.29	10,487.4	7,060.3	241.7	-32.7	762,651.78	395,937.07	-241.76	0.00
10,544.8	6.00	352.29	10,532.0	7,104.9	246.3	-33.3	762,651.15	395,941.71	-246.41	0.00
2nd Bone Spring Sand										
10,550.0	6.00	352.29	10,537.1	7,110.0	246.8	-33.4	762,651.08	395,942.25	-246.94	0.00
10,600.0	6.00	352.29	10,586.9	7,159.8	252.0	-34.1	762,650.38	395,947.43	-252.12	0.00

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10,650.0	6.00	352.29	10,636.6	7,209.5	257.2	-34.8	762,649.68	395,952.61	-257.31	0.00
10,700.0	6.00	352.29	10,686.3	7,259.2	262.4	-35.5	762,648.98	395,957.79	-262.49	0.00
10,750.0	6.00	352.29	10,736.0	7,308.9	267.6	-36.2	762,648.28	395,962.97	-267.67	0.00
10,800.0	6.00	352.29	10,785.8	7,358.7	272.7	-36.9	762,647.57	395,968.14	-272.85	0.00
10,850.0	6.00	352.29	10,835.5	7,408.4	277.9	-37.6	762,646.87	395,973.32	-278.03	0.00
10,900.0	6.00	352.29	10,885.2	7,458.1	283.1	-38.3	762,646.17	395,978.50	-283.21	0.00
10,950.0	6.00	352.29	10,934.9	7,507.8	288.3	-39.0	762,645.47	395,983.68	-288.39	0.00
10,987.3	6.00	352.29	10,972.0	7,544.9	292.1	-39.6	762,644.95	395,987.54	-292.25	0.00
3rd BoneSpring Lime										
11,000.0	6.00	352.29	10,984.7	7,557.6	293.5	-39.7	762,644.77	395,988.86	-293.57	0.00
11,050.0	6.00	352.29	11,034.4	7,607.3	298.6	-40.4	762,644.07	395,994.04	-298.75	0.00
11,100.0	6.00	352.29	11,084.1	7,657.0	303.8	-41.1	762,643.37	395,999.22	-303.94	0.00
11,150.0	6.00	352.29	11,133.8	7,706.7	309.0	-41.8	762,642.67	396,004.40	-309.12	0.00
11,200.0	6.00	352.29	11,183.6	7,756.5	314.2	-42.5	762,641.97	396,009.58	-314.30	0.00
11,250.0	6.00	352.29	11,233.3	7,806.2	319.4	-43.2	762,641.26	396,014.76	-319.48	0.00
11,300.0	6.00	352.29	11,283.0	7,855.9	324.5	-43.9	762,640.56	396,019.94	-324.66	0.00
11,350.0	6.00	352.29	11,332.7	7,905.6	329.7	-44.6	762,639.86	396,025.12	-329.84	0.00
11,400.0	6.00	352.29	11,382.5	7,955.4	334.9	-45.3	762,639.16	396,030.29	-335.02	0.00
11,450.0	6.00	352.29	11,432.2	8,005.1	340.1	-46.0	762,638.46	396,035.47	-340.20	0.00
11,500.0	6.00	352.29	11,481.9	8,054.8	345.3	-46.7	762,637.76	396,040.65	-345.38	0.00
11,550.0	6.00	352.29	11,531.7	8,104.6	350.4	-47.4	762,637.06	396,045.83	-350.57	0.00
11,600.0	6.00	352.29	11,581.4	8,154.3	355.6	-48.1	762,636.36	396,051.01	-355.75	0.00
11,650.0	6.00	352.29	11,631.1	8,204.0	360.8	-48.8	762,635.66	396,056.19	-360.93	0.00
11,700.0	6.00	352.29	11,680.8	8,253.7	366.0	-49.5	762,634.95	396,061.37	-366.11	0.00
11,726.3	6.00	352.29	11,707.0	8,279.9	368.7	-49.9	762,634.58	396,064.10	-368.84	0.00
3rd Bone Spring Sand										
11,750.0	6.00	352.29	11,730.6	8,303.5	371.1	-50.2	762,634.25	396,066.55	-371.29	0.00

Morcor Engineering

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Wellbore: Red Hills 601H
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MD Reference: WELL @ 3427.1usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
11,800.0	6.00	352.29	11,780.3	8,353.2	376.3	-50.9	762,633.55	396,071.73	-376.47	0.00
11,850.0	6.00	352.29	11,830.0	8,402.9	381.5	-51.6	762,632.85	396,076.91	-381.65	0.00
11,900.0	6.00	352.29	11,879.7	8,452.6	386.7	-52.4	762,632.15	396,082.09	-386.83	0.00
11,950.0	6.00	352.29	11,929.5	8,502.4	391.9	-53.1	762,631.45	396,087.27	-392.02	0.00
11,970.0	6.00	352.29	11,949.3	8,522.2	393.9	-53.3	762,631.17	396,089.34	-394.09	0.00
Start Drop -3.00										
12,000.0	5.10	352.29	11,979.2	8,552.1	396.8	-53.7	762,630.78	396,092.21	-396.96	3.00
12,050.0	3.60	352.29	12,029.1	8,602.0	400.6	-54.2	762,630.27	396,095.97	-400.72	3.00
12,100.0	2.10	352.29	12,079.0	8,651.9	403.0	-54.6	762,629.94	396,098.43	-403.19	3.00
12,113.0	1.71	352.29	12,092.0	8,664.9	403.5	-54.6	762,629.88	396,098.86	-403.62	3.00
Wolfcamp										
12,150.0	0.60	352.29	12,129.0	8,701.9	404.2	-54.7	762,629.78	396,099.60	-404.36	3.00
12,170.0	0.00	0.00	12,149.0	8,721.9	404.3	-54.7	762,629.76	396,099.71	-404.46	3.00
Start 100.1 hold at 12170.0 MD - 7 5/8" Intermediate Casing										
12,200.0	0.00	0.00	12,179.0	8,751.9	404.3	-54.7	762,629.76	396,099.71	-404.46	0.00
12,250.0	0.00	179.43	12,229.0	8,801.9	404.3	-54.7	762,629.76	396,099.71	-404.46	0.00
12,270.1	0.00	179.43	12,249.1	8,822.0	404.3	-54.7	762,629.76	396,099.71	-404.46	0.00
Start Build 10.00										
12,300.0	2.99	179.43	12,279.0	8,851.9	403.5	-54.7	762,629.77	396,098.93	-403.68	10.00
12,350.0	7.99	179.43	12,328.7	8,901.6	398.7	-54.7	762,629.82	396,094.14	-398.90	10.00
12,400.0	12.99	179.43	12,377.9	8,950.8	389.6	-54.6	762,629.91	396,085.04	-389.80	10.00
12,450.0	17.99	179.43	12,426.0	8,998.9	376.3	-54.5	762,630.04	396,071.70	-376.45	10.00
12,500.0	22.99	179.43	12,472.9	9,045.8	358.8	-54.3	762,630.22	396,054.20	-358.95	10.00
12,550.0	27.99	179.43	12,518.0	9,090.9	337.3	-54.1	762,630.43	396,032.69	-337.44	10.00
12,600.0	32.99	179.43	12,561.1	9,134.0	311.9	-53.8	762,630.68	396,007.33	-312.08	10.00
12,650.0	37.99	179.43	12,601.8	9,174.7	282.9	-53.5	762,630.97	395,978.31	-283.06	10.00
12,700.0	42.99	179.43	12,639.8	9,212.7	250.5	-53.2	762,631.29	395,945.86	-250.61	10.00

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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
12,750.0	47.99	179.43	12,674.8	9,247.7	214.8	-52.9	762,631.65	395,910.21	-214.96	10.00
12,800.0	52.99	179.43	12,706.6	9,279.5	176.3	-52.5	762,632.03	395,871.65	-176.40	10.00
12,850.0	57.99	179.43	12,734.9	9,307.8	135.1	-52.1	762,632.44	395,830.47	-135.21	10.00
12,900.0	62.99	179.43	12,759.5	9,332.4	91.6	-51.6	762,632.88	395,786.97	-91.72	10.00
12,950.0	67.99	179.43	12,780.3	9,353.2	46.1	-51.2	762,633.33	395,741.49	-46.24	10.00
13,000.0	72.99	179.43	12,797.0	9,369.9	-1.0	-50.7	762,633.80	395,694.38	0.88	10.00
13,050.0	77.99	179.43	12,809.5	9,382.4	-49.4	-50.2	762,634.28	395,645.99	49.26	10.00
13,100.0	82.99	179.43	12,817.8	9,390.7	-98.7	-49.7	762,634.77	395,596.70	98.56	10.00
13,150.0	87.99	179.43	12,821.7	9,394.6	-148.5	-49.2	762,635.26	395,546.87	148.39	10.00
13,170.1	90.00	179.43	12,822.0	9,394.9	-168.6	-49.0	762,635.46	395,526.78	168.48	10.00
Start 6973.0 hold at 13170.1 MD										
13,200.0	90.00	179.43	12,822.0	9,394.9	-198.5	-48.7	762,635.76	395,496.88	198.38	0.00
13,250.0	90.00	179.43	12,822.0	9,394.9	-248.5	-48.2	762,636.26	395,446.88	248.38	0.00
13,300.0	90.00	179.43	12,822.0	9,394.9	-298.5	-47.7	762,636.76	395,396.88	298.38	0.00
13,350.0	90.00	179.43	12,822.0	9,394.9	-348.5	-47.2	762,637.25	395,346.88	348.38	0.00
13,400.0	90.00	179.43	12,822.0	9,394.9	-398.5	-46.7	762,637.75	395,296.89	398.38	0.00
13,450.0	90.00	179.43	12,822.0	9,394.9	-448.5	-46.3	762,638.25	395,246.89	448.38	0.00
13,500.0	90.00	179.43	12,822.0	9,394.9	-498.5	-45.8	762,638.75	395,196.89	498.38	0.00
13,550.0	90.00	179.43	12,822.0	9,394.9	-548.5	-45.3	762,639.24	395,146.89	548.37	0.00
13,600.0	90.00	179.43	12,822.0	9,394.9	-598.5	-44.8	762,639.74	395,096.90	598.37	0.00
13,650.0	90.00	179.43	12,822.0	9,394.9	-648.5	-44.3	762,640.24	395,046.90	648.37	0.00
13,700.0	90.00	179.43	12,822.0	9,394.9	-698.5	-43.8	762,640.74	394,996.90	698.37	0.00
13,750.0	90.00	179.43	12,822.0	9,394.9	-748.5	-43.3	762,641.23	394,946.90	748.37	0.00
13,800.0	90.00	179.43	12,822.0	9,394.9	-798.5	-42.8	762,641.73	394,896.91	798.37	0.00
13,850.0	90.00	179.43	12,822.0	9,394.9	-848.5	-42.3	762,642.23	394,846.91	848.37	0.00
13,900.0	90.00	179.43	12,822.0	9,394.9	-898.5	-41.8	762,642.73	394,796.91	898.37	0.00
13,950.0	90.00	179.43	12,822.0	9,394.9	-948.5	-41.3	762,643.22	394,746.91	948.36	0.00

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14,000.0	90.00	179.43	12,822.0	9,394.9	-998.5	-40.8	762,643.72	394,696.92	998.36	0.00
14,050.0	90.00	179.43	12,822.0	9,394.9	-1,048.5	-40.3	762,644.22	394,646.92	1,048.36	0.00
14,100.0	90.00	179.43	12,822.0	9,394.9	-1,098.5	-39.8	762,644.71	394,596.92	1,098.36	0.00
14,150.0	90.00	179.43	12,822.0	9,394.9	-1,148.5	-39.3	762,645.21	394,546.92	1,148.36	0.00
14,200.0	90.00	179.43	12,822.0	9,394.9	-1,198.5	-38.8	762,645.71	394,496.93	1,198.36	0.00
14,250.0	90.00	179.43	12,822.0	9,394.9	-1,248.5	-38.3	762,646.21	394,446.93	1,248.36	0.00
14,300.0	90.00	179.43	12,822.0	9,394.9	-1,298.5	-37.8	762,646.70	394,396.93	1,298.36	0.00
14,350.0	90.00	179.43	12,822.0	9,394.9	-1,348.5	-37.3	762,647.20	394,346.93	1,348.35	0.00
14,400.0	90.00	179.43	12,822.0	9,394.9	-1,398.5	-36.8	762,647.70	394,296.94	1,398.35	0.00
14,450.0	90.00	179.43	12,822.0	9,394.9	-1,448.5	-36.3	762,648.20	394,246.94	1,448.35	0.00
14,500.0	90.00	179.43	12,822.0	9,394.9	-1,498.5	-35.8	762,648.69	394,196.94	1,498.35	0.00
14,550.0	90.00	179.43	12,822.0	9,394.9	-1,548.5	-35.3	762,649.19	394,146.94	1,548.35	0.00
14,600.0	90.00	179.43	12,822.0	9,394.9	-1,598.5	-34.8	762,649.69	394,096.95	1,598.35	0.00
14,650.0	90.00	179.43	12,822.0	9,394.9	-1,648.5	-34.3	762,650.19	394,046.95	1,648.35	0.00
14,700.0	90.00	179.43	12,822.0	9,394.9	-1,698.4	-33.8	762,650.68	393,996.95	1,698.35	0.00
14,750.0	90.00	179.43	12,822.0	9,394.9	-1,748.4	-33.3	762,651.18	393,946.95	1,748.34	0.00
14,800.0	90.00	179.43	12,822.0	9,394.9	-1,798.4	-32.8	762,651.68	393,896.96	1,798.34	0.00
14,850.0	90.00	179.43	12,822.0	9,394.9	-1,848.4	-32.3	762,652.18	393,846.96	1,848.34	0.00
14,900.0	90.00	179.43	12,822.0	9,394.9	-1,898.4	-31.8	762,652.67	393,796.96	1,898.34	0.00
14,950.0	90.00	179.43	12,822.0	9,394.9	-1,948.4	-31.3	762,653.17	393,746.96	1,948.34	0.00
15,000.0	90.00	179.43	12,822.0	9,394.9	-1,998.4	-30.8	762,653.67	393,696.97	1,998.34	0.00
15,050.0	90.00	179.43	12,822.0	9,394.9	-2,048.4	-30.3	762,654.17	393,646.97	2,048.34	0.00
15,100.0	90.00	179.43	12,822.0	9,394.9	-2,098.4	-29.8	762,654.66	393,596.97	2,098.34	0.00
15,150.0	90.00	179.43	12,822.0	9,394.9	-2,148.4	-29.3	762,655.16	393,546.97	2,148.33	0.00
15,200.0	90.00	179.43	12,822.0	9,394.9	-2,198.4	-28.8	762,655.66	393,496.98	2,198.33	0.00
15,250.0	90.00	179.43	12,822.0	9,394.9	-2,248.4	-28.3	762,656.16	393,446.98	2,248.33	0.00
15,300.0	90.00	179.43	12,822.0	9,394.9	-2,298.4	-27.8	762,656.65	393,396.98	2,298.33	0.00

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15,350.0	90.00	179.43	12,822.0	9,394.9	-2,348.4	-27.4	762,657.15	393,346.98	2,348.33	0.00
15,400.0	90.00	179.43	12,822.0	9,394.9	-2,398.4	-26.9	762,657.65	393,296.99	2,398.33	0.00
15,450.0	90.00	179.43	12,822.0	9,394.9	-2,448.4	-26.4	762,658.14	393,246.99	2,448.33	0.00
15,500.0	90.00	179.43	12,822.0	9,394.9	-2,498.4	-25.9	762,658.64	393,196.99	2,498.33	0.00
15,550.0	90.00	179.43	12,822.0	9,394.9	-2,548.4	-25.4	762,659.14	393,146.99	2,548.32	0.00
15,600.0	90.00	179.43	12,822.0	9,394.9	-2,598.4	-24.9	762,659.64	393,097.00	2,598.32	0.00
15,650.0	90.00	179.43	12,822.0	9,394.9	-2,648.4	-24.4	762,660.13	393,047.00	2,648.32	0.00
15,700.0	90.00	179.43	12,822.0	9,394.9	-2,698.4	-23.9	762,660.63	392,997.00	2,698.32	0.00
15,750.0	90.00	179.43	12,822.0	9,394.9	-2,748.4	-23.4	762,661.13	392,947.00	2,748.32	0.00
15,800.0	90.00	179.43	12,822.0	9,394.9	-2,798.4	-22.9	762,661.63	392,897.01	2,798.32	0.00
15,850.0	90.00	179.43	12,822.0	9,394.9	-2,848.4	-22.4	762,662.12	392,847.01	2,848.32	0.00
15,900.0	90.00	179.43	12,822.0	9,394.9	-2,898.4	-21.9	762,662.62	392,797.01	2,898.31	0.00
15,950.0	90.00	179.43	12,822.0	9,394.9	-2,948.4	-21.4	762,663.12	392,747.01	2,948.31	0.00
16,000.0	90.00	179.43	12,822.0	9,394.9	-2,998.4	-20.9	762,663.62	392,697.02	2,998.31	0.00
16,050.0	90.00	179.43	12,822.0	9,394.9	-3,048.4	-20.4	762,664.11	392,647.02	3,048.31	0.00
16,100.0	90.00	179.43	12,822.0	9,394.9	-3,098.4	-19.9	762,664.61	392,597.02	3,098.31	0.00
16,150.0	90.00	179.43	12,822.0	9,394.9	-3,148.4	-19.4	762,665.11	392,547.02	3,148.31	0.00
16,200.0	90.00	179.43	12,822.0	9,394.9	-3,198.4	-18.9	762,665.61	392,497.03	3,198.31	0.00
16,250.0	90.00	179.43	12,822.0	9,394.9	-3,248.4	-18.4	762,666.10	392,447.03	3,248.31	0.00
16,300.0	90.00	179.43	12,822.0	9,394.9	-3,298.4	-17.9	762,666.60	392,397.03	3,298.30	0.00
16,350.0	90.00	179.43	12,822.0	9,394.9	-3,348.4	-17.4	762,667.10	392,347.03	3,348.30	0.00
16,400.0	90.00	179.43	12,822.0	9,394.9	-3,398.4	-16.9	762,667.60	392,297.04	3,398.30	0.00
16,450.0	90.00	179.43	12,822.0	9,394.9	-3,448.4	-16.4	762,668.09	392,247.04	3,448.30	0.00
16,500.0	90.00	179.43	12,822.0	9,394.9	-3,498.4	-15.9	762,668.59	392,197.04	3,498.30	0.00
16,550.0	90.00	179.43	12,822.0	9,394.9	-3,548.4	-15.4	762,669.09	392,147.04	3,548.30	0.00
16,600.0	90.00	179.43	12,822.0	9,394.9	-3,598.4	-14.9	762,669.59	392,097.05	3,598.30	0.00
16,650.0	90.00	179.43	12,822.0	9,394.9	-3,648.4	-14.4	762,670.08	392,047.05	3,648.30	0.00

Morcor Engineering

Morcor Standard Plan

Company: Kaiser Francis
Project: Red Hills 601H
Site: Red Hills 601H
Well: Red Hills 601H
Wellbore: Red Hills 601H
Design: 190502 Red Hills 601H

Local Co-ordinate Reference: Well Red Hills 601H
TVD Reference: WELL @ 3427.1usft (Original Well Elev)
MD Reference: WELL @ 3427.1usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
16,700.0	90.00	179.43	12,822.0	9,394.9	-3,698.3	-13.9	762,670.58	391,997.05	3,698.29	0.00
16,750.0	90.00	179.43	12,822.0	9,394.9	-3,748.3	-13.4	762,671.08	391,947.05	3,748.29	0.00
16,800.0	90.00	179.43	12,822.0	9,394.9	-3,798.3	-12.9	762,671.57	391,897.06	3,798.29	0.00
16,850.0	90.00	179.43	12,822.0	9,394.9	-3,848.3	-12.4	762,672.07	391,847.06	3,848.29	0.00
16,900.0	90.00	179.43	12,822.0	9,394.9	-3,898.3	-11.9	762,672.57	391,797.06	3,898.29	0.00
16,950.0	90.00	179.43	12,822.0	9,394.9	-3,948.3	-11.4	762,673.07	391,747.06	3,948.29	0.00
17,000.0	90.00	179.43	12,822.0	9,394.9	-3,998.3	-10.9	762,673.56	391,697.07	3,998.29	0.00
17,050.0	90.00	179.43	12,822.0	9,394.9	-4,048.3	-10.4	762,674.06	391,647.07	4,048.29	0.00
17,100.0	90.00	179.43	12,822.0	9,394.9	-4,098.3	-9.9	762,674.56	391,597.07	4,098.28	0.00
17,150.0	90.00	179.43	12,822.0	9,394.9	-4,148.3	-9.4	762,675.06	391,547.07	4,148.28	0.00
17,200.0	90.00	179.43	12,822.0	9,394.9	-4,198.3	-8.9	762,675.55	391,497.08	4,198.28	0.00
17,250.0	90.00	179.43	12,822.0	9,394.9	-4,248.3	-8.4	762,676.05	391,447.08	4,248.28	0.00
17,300.0	90.00	179.43	12,822.0	9,394.9	-4,298.3	-8.0	762,676.55	391,397.08	4,298.28	0.00
17,350.0	90.00	179.43	12,822.0	9,394.9	-4,348.3	-7.5	762,677.05	391,347.08	4,348.28	0.00
17,400.0	90.00	179.43	12,822.0	9,394.9	-4,398.3	-7.0	762,677.54	391,297.09	4,398.28	0.00
17,450.0	90.00	179.43	12,822.0	9,394.9	-4,448.3	-6.5	762,678.04	391,247.09	4,448.28	0.00
17,500.0	90.00	179.43	12,822.0	9,394.9	-4,498.3	-6.0	762,678.54	391,197.09	4,498.27	0.00
17,550.0	90.00	179.43	12,822.0	9,394.9	-4,548.3	-5.5	762,679.04	391,147.09	4,548.27	0.00
17,600.0	90.00	179.43	12,822.0	9,394.9	-4,598.3	-5.0	762,679.53	391,097.10	4,598.27	0.00
17,650.0	90.00	179.43	12,822.0	9,394.9	-4,648.3	-4.5	762,680.03	391,047.10	4,648.27	0.00
17,700.0	90.00	179.43	12,822.0	9,394.9	-4,698.3	-4.0	762,680.53	390,997.10	4,698.27	0.00
17,750.0	90.00	179.43	12,822.0	9,394.9	-4,748.3	-3.5	762,681.03	390,947.10	4,748.27	0.00
17,800.0	90.00	179.43	12,822.0	9,394.9	-4,798.3	-3.0	762,681.52	390,897.11	4,798.27	0.00
17,850.0	90.00	179.43	12,822.0	9,394.9	-4,848.3	-2.5	762,682.02	390,847.11	4,848.27	0.00
17,900.0	90.00	179.43	12,822.0	9,394.9	-4,898.3	-2.0	762,682.52	390,797.11	4,898.26	0.00
17,950.0	90.00	179.43	12,822.0	9,394.9	-4,948.3	-1.5	762,683.02	390,747.11	4,948.26	0.00
18,000.0	90.00	179.43	12,822.0	9,394.9	-4,998.3	-1.0	762,683.51	390,697.11	4,998.26	0.00

Morcor Engineering

Morcor Standard Plan

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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
18,050.0	90.00	179.43	12,822.0	9,394.9	-5,048.3	-0.5	762,684.01	390,647.12	5,048.26	0.00
18,100.0	90.00	179.43	12,822.0	9,394.9	-5,098.3	0.0	762,684.51	390,597.12	5,098.26	0.00
18,150.0	90.00	179.43	12,822.0	9,394.9	-5,148.3	0.5	762,685.00	390,547.12	5,148.26	0.00
18,200.0	90.00	179.43	12,822.0	9,394.9	-5,198.3	1.0	762,685.50	390,497.12	5,198.26	0.00
18,250.0	90.00	179.43	12,822.0	9,394.9	-5,248.3	1.5	762,686.00	390,447.13	5,248.26	0.00
18,300.0	90.00	179.43	12,822.0	9,394.9	-5,298.3	2.0	762,686.50	390,397.13	5,298.25	0.00
18,350.0	90.00	179.43	12,822.0	9,394.9	-5,348.3	2.5	762,686.99	390,347.13	5,348.25	0.00
18,400.0	90.00	179.43	12,822.0	9,394.9	-5,398.3	3.0	762,687.49	390,297.13	5,398.25	0.00
18,450.0	90.00	179.43	12,822.0	9,394.9	-5,448.3	3.5	762,687.99	390,247.14	5,448.25	0.00
18,500.0	90.00	179.43	12,822.0	9,394.9	-5,498.3	4.0	762,688.49	390,197.14	5,498.25	0.00
18,550.0	90.00	179.43	12,822.0	9,394.9	-5,548.3	4.5	762,688.98	390,147.14	5,548.25	0.00
18,600.0	90.00	179.43	12,822.0	9,394.9	-5,598.3	5.0	762,689.48	390,097.14	5,598.25	0.00
18,650.0	90.00	179.43	12,822.0	9,394.9	-5,648.3	5.5	762,689.98	390,047.15	5,648.25	0.00
18,700.0	90.00	179.43	12,822.0	9,394.9	-5,698.3	6.0	762,690.48	389,997.15	5,698.24	0.00
18,750.0	90.00	179.43	12,822.0	9,394.9	-5,748.2	6.5	762,690.97	389,947.15	5,748.24	0.00
18,800.0	90.00	179.43	12,822.0	9,394.9	-5,798.2	7.0	762,691.47	389,897.15	5,798.24	0.00
18,850.0	90.00	179.43	12,822.0	9,394.9	-5,848.2	7.5	762,691.97	389,847.16	5,848.24	0.00
18,900.0	90.00	179.43	12,822.0	9,394.9	-5,898.2	8.0	762,692.47	389,797.16	5,898.24	0.00
18,950.0	90.00	179.43	12,822.0	9,394.9	-5,948.2	8.5	762,692.96	389,747.16	5,948.24	0.00
19,000.0	90.00	179.43	12,822.0	9,394.9	-5,998.2	9.0	762,693.46	389,697.16	5,998.24	0.00
19,050.0	90.00	179.43	12,822.0	9,394.9	-6,048.2	9.5	762,693.96	389,647.17	6,048.24	0.00
19,100.0	90.00	179.43	12,822.0	9,394.9	-6,098.2	10.0	762,694.46	389,597.17	6,098.23	0.00
19,150.0	90.00	179.43	12,822.0	9,394.9	-6,148.2	10.5	762,694.95	389,547.17	6,148.23	0.00
19,200.0	90.00	179.43	12,822.0	9,394.9	-6,198.2	11.0	762,695.45	389,497.17	6,198.23	0.00
19,250.0	90.00	179.43	12,822.0	9,394.9	-6,248.2	11.4	762,695.95	389,447.18	6,248.23	0.00
19,300.0	90.00	179.43	12,822.0	9,394.9	-6,298.2	11.9	762,696.45	389,397.18	6,298.23	0.00
19,350.0	90.00	179.43	12,822.0	9,394.9	-6,348.2	12.4	762,696.94	389,347.18	6,348.23	0.00

Morcor Engineering

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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
19,400.0	90.00	179.43	12,822.0	9,394.9	-6,398.2	12.9	762,697.44	389,297.18	6,398.23	0.00
19,450.0	90.00	179.43	12,822.0	9,394.9	-6,448.2	13.4	762,697.94	389,247.19	6,448.23	0.00
19,500.0	90.00	179.43	12,822.0	9,394.9	-6,498.2	13.9	762,698.44	389,197.19	6,498.22	0.00
19,550.0	90.00	179.43	12,822.0	9,394.9	-6,548.2	14.4	762,698.93	389,147.19	6,548.22	0.00
19,600.0	90.00	179.43	12,822.0	9,394.9	-6,598.2	14.9	762,699.43	389,097.19	6,598.22	0.00
19,650.0	90.00	179.43	12,822.0	9,394.9	-6,648.2	15.4	762,699.93	389,047.20	6,648.22	0.00
19,700.0	90.00	179.43	12,822.0	9,394.9	-6,698.2	15.9	762,700.42	388,997.20	6,698.22	0.00
19,750.0	90.00	179.43	12,822.0	9,394.9	-6,748.2	16.4	762,700.92	388,947.20	6,748.22	0.00
19,800.0	90.00	179.43	12,822.0	9,394.9	-6,798.2	16.9	762,701.42	388,897.20	6,798.22	0.00
19,850.0	90.00	179.43	12,822.0	9,394.9	-6,848.2	17.4	762,701.92	388,847.21	6,848.22	0.00
19,900.0	90.00	179.43	12,822.0	9,394.9	-6,898.2	17.9	762,702.41	388,797.21	6,898.21	0.00
19,950.0	90.00	179.43	12,822.0	9,394.9	-6,948.2	18.4	762,702.91	388,747.21	6,948.21	0.00
20,000.0	90.00	179.43	12,822.0	9,394.9	-6,998.2	18.9	762,703.41	388,697.21	6,998.21	0.00
20,050.0	90.00	179.43	12,822.0	9,394.9	-7,048.2	19.4	762,703.91	388,647.22	7,048.21	0.00
20,100.0	90.00	179.43	12,822.0	9,394.9	-7,098.2	19.9	762,704.40	388,597.22	7,098.21	0.00
20,143.0	90.00	179.43	12,822.0	9,394.9	-7,141.2	20.3	762,704.83	388,554.22	7,141.21	0.00
5 1/2" Production Casing										
20,143.1	90.00	179.43	12,822.0	9,394.9	-7,141.3	20.3	762,704.83	388,554.12	7,141.31	0.00
TD at 20143.1										

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
12,170.0	12,149.0	7 5/8" Intermediate Casing	7-5/8	9-7/8
882.0	882.0	10 3/4" Surface Casing	10-3/4	12-1/4
20,143.0	12,822.0	5 1/2" Production Casing	5-1/2	6-3/4
120.0	120.0	20"	20	26

Morcor Engineering

Morcor Standard Plan

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Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,222.0	1,222.0	Salado		0.00	
8,825.4	8,822.0	Bone Spring		0.00	
10,544.8	10,532.0	2nd Bone Spring Sand		0.00	
5,882.0	5,882.0	Cherry Canyon		0.00	
4,772.0	4,772.0	Lamar		0.00	
9,981.8	9,972.0	1st Bone Spring Sand		0.00	
10,987.3	10,972.0	3rd BoneSpring Lime		0.00	
4,892.0	4,892.0	Bell Canyon		0.00	
11,726.3	11,707.0	3rd Bone Spring Sand		0.00	
12,113.0	12,092.0	Wolfcamp		0.00	
9,036.6	9,032.0	Avalon		0.00	
4,472.0	4,472.0	Base of Salt		0.00	
2,022.0	2,022.0	Top of Salt		0.00	
8,624.3	8,622.0	Brushy Canyon		0.00	
882.0	882.0	Rustler		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,067.0	8,067.0	0.0	0.0	Start Build 3.00
8,267.0	8,266.6	10.4	-1.4	Start 3703.0 hold at 8267.0 MD
11,970.0	11,949.3	393.9	-53.3	Start Drop -3.00
12,170.0	12,149.0	404.3	-54.7	Start 100.1 hold at 12170.0 MD
12,270.1	12,249.1	404.3	-54.7	Start Build 10.00
13,170.1	12,822.0	-168.6	-49.0	Start 6973.0 hold at 13170.1 MD
20,143.1	12,822.0	-7,141.3	20.3	TD at 20143.1

Checked By: _____ Approved By: _____ Date: _____