

Form 3160-3
(June 2015)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: <input type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No.
1b. Type of Well: <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator		8. Lease Name and Well No.
3a. Address		9. API Well No. 30 015 47972
3b. Phone No. (include area code)		10. Field and Pool, or Exploratory
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface At proposed prod. zone		11. Sec., T. R. M. or Blk. and Survey or Area
14. Distance in miles and direction from nearest town or post office*		12. County or Parish
		13. State
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
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)

- | | |
|---|---|
| <ul style="list-style-type: none"> 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). | <ul style="list-style-type: none"> 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). 5. Operator certification. 6. Such other site specific information and/or plans as may be requested by the BLM. |
|---|---|

25. Signature	Name (Printed/Typed)	Date
Title		
Approved by (Signature)	Name (Printed/Typed)	Date
Title		Office

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.



(Continued on page 2)

*(Instructions on page 2)

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., 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 Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-47972	Pool Code 50371/96473/11520	Pool Name Pierce Crossing, Bone Spring/ Pierce Crossing Bone Spring East/Cedar Canyon Bone Spring
Property Code 329996	Property Name VAGABOND CC "8_17" FEDERAL COM	Well Number 24H
OGRID No. 16696	Operator Name OXY USA INC.	Elevation 2927.5'

Surface Location

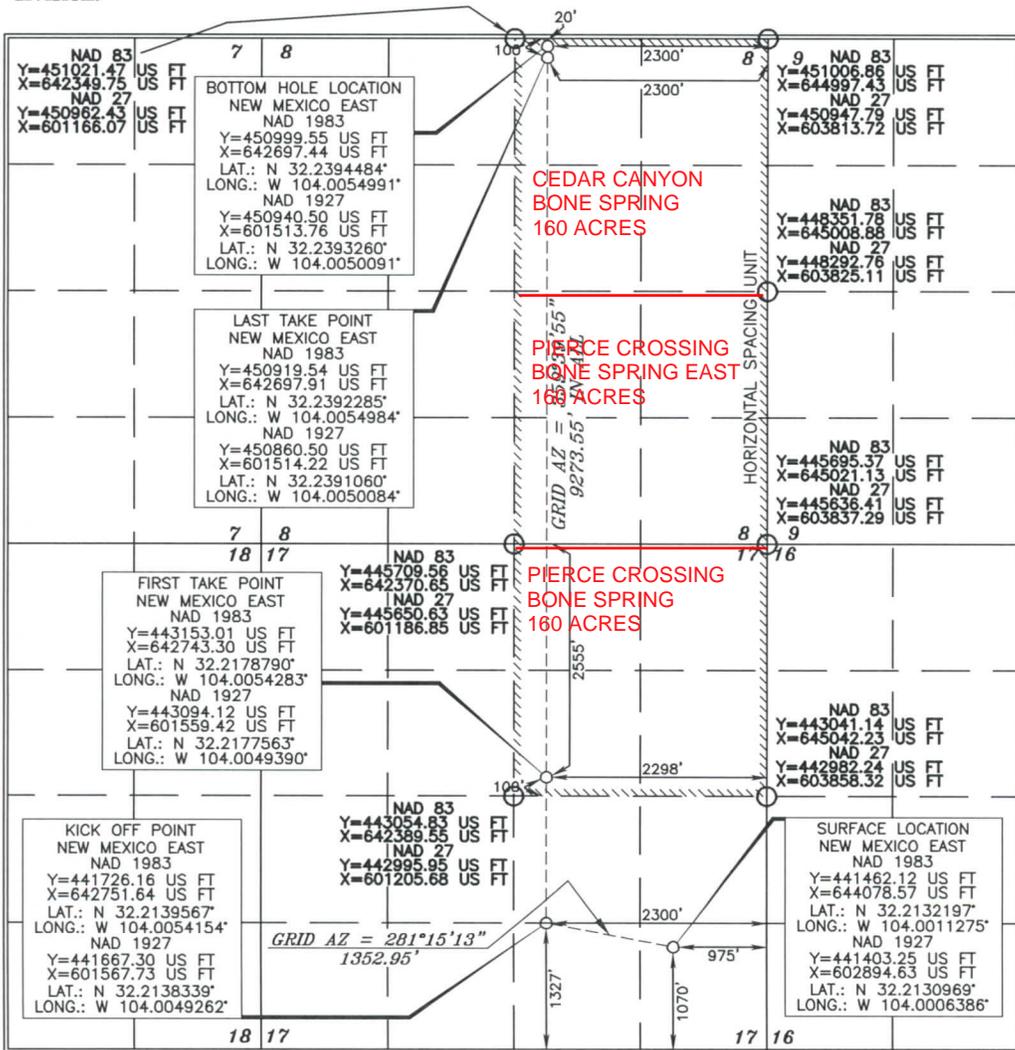
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	17	24 SOUTH	29 EAST, N.M.P.M.		1070'	SOUTH	975'	EAST	EDDY

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
B	8	24 SOUTH	29 EAST, N.M.P.M.		20'	NORTH	2300'	EAST	EDDY

Dedicated Acres 480	Joint or Infill y	Consolidation Code	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.



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.

Stephen Janacek
Signature _____ Date _____
Stephen Janacek
Printed Name
Stephen_Janacek@oxy.com
E-mail Address

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.

FERRY J. ASH
15079
JANUARY 31, 2020
Date of Survey _____
Signature and Seal of Professional Surveyor

Ferry J. Ash
Certificate Number **15079**

WO# 200131WL (KA)

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	OXY USA Incorporated
LEASE NO.:	NMNM117120
LOCATION:	Section 17, T.24 S., R.29 E., NMPM
COUNTY:	Eddy County, New Mexico

WELL NAME & NO.:	Vagabond CC 8 17 Federal Com 21H
SURFACE HOLE FOOTAGE:	546'/S & 1670'/W
BOTTOM HOLE FOOTAGE:	20'/N & 455'/W

WELL NAME & NO.:	Vagabond CC 8 17 Federal Com 22H
SURFACE HOLE FOOTAGE:	546'/S & 1705'/W
BOTTOM HOLE FOOTAGE:	20'/N & 1040'/W

WELL NAME & NO.:	Vagabond CC 8 17 Federal Com 23H
SURFACE HOLE FOOTAGE:	546'/S & 1740'/W
BOTTOM HOLE FOOTAGE:	20'/N & 1775'/W

WELL NAME & NO.:	Vagabond CC 8 17 Federal Com 24H
SURFACE HOLE FOOTAGE:	1070'/S & 975'/E
BOTTOM HOLE FOOTAGE:	20'/N & 2300'/E

WELL NAME & NO.:	Vagabond CC 8 17 Federal Com 25H
SURFACE HOLE FOOTAGE:	1070'/S & 940'/E
BOTTOM HOLE FOOTAGE:	20'/N & 1600'/E

WELL NAME & NO.:	Vagabond CC 8 17 Federal Com 26H
SURFACE HOLE FOOTAGE:	1070'/S & 905'/E
BOTTOM HOLE FOOTAGE:	20'/N & 715'/E

COA

H2S	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Potash	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Secretary	<input type="checkbox"/> R-111-P
Cave/Karst Potential	<input type="checkbox"/> Low	<input checked="" type="checkbox"/> Medium	<input type="checkbox"/> High
Cave/Karst Potential	<input type="checkbox"/> Critical		
Variance	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Flex Hose	<input type="checkbox"/> Other
Wellhead	<input type="checkbox"/> Conventional	<input checked="" type="checkbox"/> Multibowl	<input checked="" type="checkbox"/> Both
Other	<input type="checkbox"/> 4 String Area	<input type="checkbox"/> Capitan Reef	<input type="checkbox"/> WIPP
Other	<input type="checkbox"/> Fluid Filled	<input checked="" type="checkbox"/> Cement Squeeze	<input type="checkbox"/> Pilot Hole
Special Requirements	<input type="checkbox"/> Water Disposal	<input checked="" type="checkbox"/> COM	<input type="checkbox"/> Unit

A. HYDROGEN SULFIDE

Hydrogen Sulfide (H₂S) monitors shall be installed prior to drilling out the surface shoe. If H₂S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

B. CASING

1. The **10-3/4** inch surface casing shall be set at approximately **507 feet** (a minimum of **70 feet (Eddy County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the 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 six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the **7-5/8** inch intermediate casing is:

Option 1 (Single Stage):

- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash. Cement excess is less than 25%, more cement might be required.**

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
 - b. Second stage above DV tool:
 - Cement to surface. If cement does not circulate, contact the appropriate BLM office.
**Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.
 Cement excess is less than 25%, more cement might be required.**
- ❖ 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.

Operator has proposed to pump down 10-3/4" X 7-5/8" annulus. Operator must run a CBL from TD of the 7-5/8" casing to surface. Submit results to BLM.

3. The minimum required fill of cement behind the 5-1/2 inch production casing is:

Option 1 (Single Stage):

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
- b. Second stage above DV tool:
 - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'

2.

Option 1:

- a. 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.
- b. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **5000 (5M)** psi.

Option 2:

1. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. 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.
 - 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 OOGO2.III.A.2.i must be followed.

D. SPECIAL REQUIREMENT (S)**Communitization Agreement**

- The operator will submit a Communitization Agreement to the Santa Fe Office, 301 Dinosaur Trail Santa Fe, New Mexico 87508, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.

- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

Offline Cementing

Contact the BLM prior to the commencement of any offline cementing procedure.

BOP Break Testing Variance

- BOP break testing is not permitted on this well pending submission of break testing sundry.

GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

Eddy County

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,
(575) 361-2822

Lea County

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575)
393-3612

1. 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
 - Notify the BLM when moving in and removing the Spudder Rig.
 - 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.
 - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. 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.
3. 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 submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. 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 that portion of any 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. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. 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. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
 - e. 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.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the 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 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 not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
- 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 results of the test shall be reported to the appropriate BLM office.
- f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- g. 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 if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company 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

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

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.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.



Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
 Site: Vagabond CC 8_17
 Well: Vagabond CC 8_17 Federal Com 24H
 Wellbore: Wellbore #1
 Design: Permitting Plan

PROJECT DETAILS: NM DIRECTIONAL PLANS (NAD 1983)

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: New Mexico Eastern Zone
 System Datum: Mean Sea Level

WELL DETAILS: Vagabond CC 8_17 Federal Com 24H

						2927.50			
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude				
0.00	0.00	441462.12	644078.57	32° 12' 47.590790 N	104° 0' 4.058989 W				

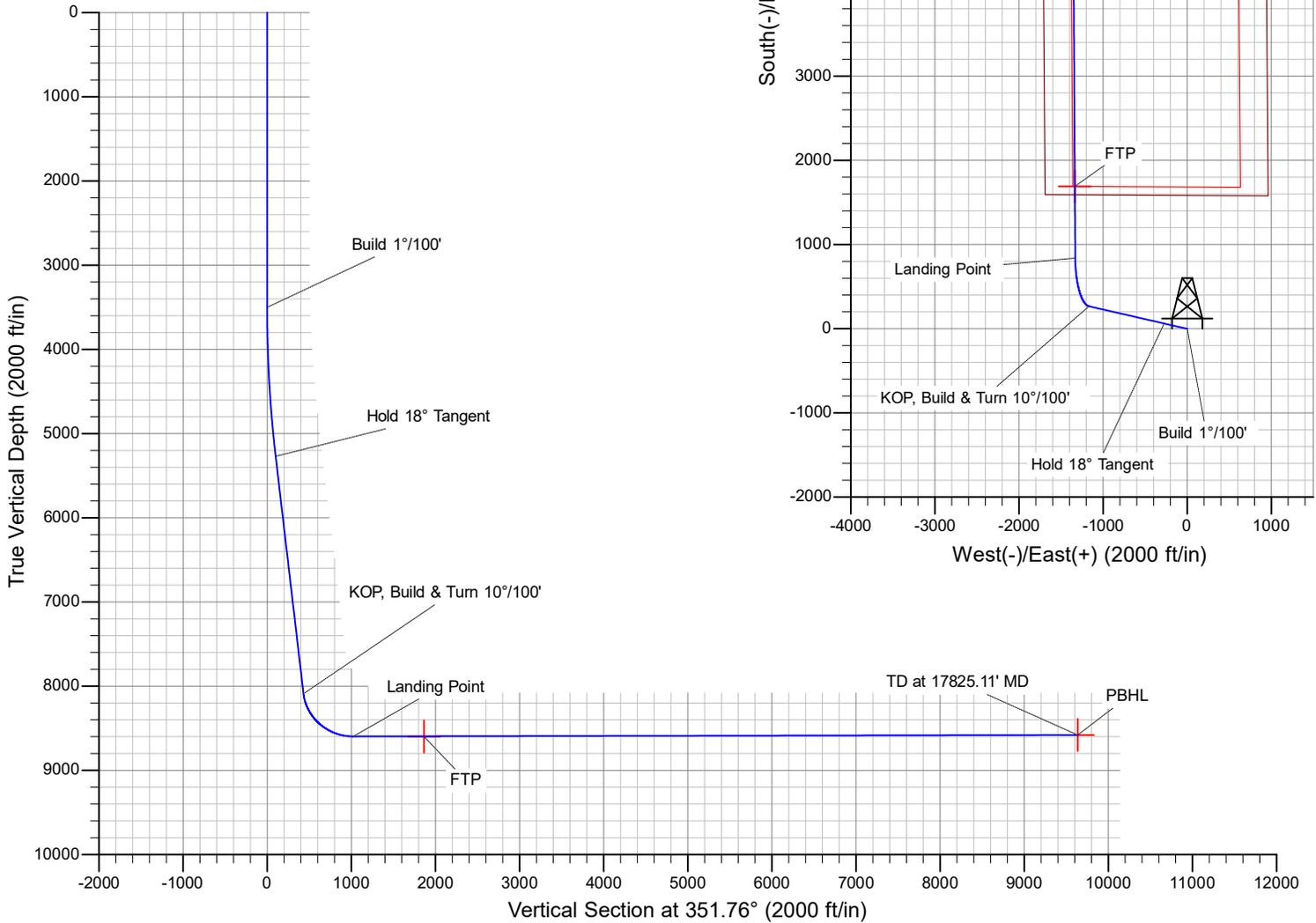
SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3500.00	0.00	0.00	3500.00	0.00	0.00	0.00	0.00	0.00	Build 1°/100'
5300.00	18.00	282.90	5270.54	62.61	-273.35	1.00	282.90	101.13	Hold 18° Tangent
8265.04	18.00	282.90	8090.46	267.16	-1166.47	0.00	0.00	431.56	KOP, Build & Turn 10°/100'
9125.54	90.11	359.67	8598.00	838.80	-1330.66	10.00	77.36	1020.83	Landing Point
17825.11	90.11	359.67	8581.00	9538.20	-1381.24	0.00	0.00	9637.69	TD at 17825.11' MD



Azimuths to Grid North
 True North: -0.18°
 Magnetic North: 6.71°

Magnetic Field
 Strength: 47829.5nT
 Dip Angle: 59.90°
 Date: 2/27/2020
 Model: HDGM_FILE



OXY

PRD NM DIRECTIONAL PLANS (NAD 1983)

Vagabond CC 8_17

Vagabond CC 8_17 Federal Com 24H

Wellbore #1

Plan: Permitting Plan

Standard Planning Report

27 February, 2020

Oxy Inc. Planning Report

Database:	HOPSP	Local Co-ordinate Reference:	Well Vagabond CC 8_17 Federal Com 24H
Company:	ENGINEERING DESIGNS	TVD Reference:	RKB=26.5' @ 2954.00ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	RKB=26.5' @ 2954.00ft
Site:	Vagabond CC 8_17	North Reference:	Grid
Well:	Vagabond CC 8_17 Federal Com 24H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permitting Plan		

Project	PRD NM DIRECTIONAL PLANS (NAD 1983)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		Using geodetic scale factor

Site	Vagabond CC 8_17				
Site Position:	Northing:	441,462.12 usft	Latitude:	32° 12' 47.590790 N	
From: Map	Easting:	644,078.57 usft	Longitude:	104° 0' 4.058989 W	
Position Uncertainty:	1.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.18 °

Well	Vagabond CC 8_17 Federal Com 24H					
Well Position	+N/-S	0.00 ft	Northing:	441,462.12 usft	Latitude:	32° 12' 47.590790 N
	+E/-W	0.00 ft	Easting:	644,078.57 usft	Longitude:	104° 0' 4.058989 W
Position Uncertainty		1.00 ft	Wellhead Elevation:		Ground Level:	2,927.50 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM_FILE	2/27/2020	6.88	59.90	47,829.50000000

Design	Permitting Plan			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	351.76

Plan Survey Tool Program	Date	2/27/2020		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	17,825.11	Permitting Plan (Wellbore #1)	B001Mb_MWD+HRGM OWSG MWD + HRGM

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	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	
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,300.00	18.00	282.90	5,270.54	62.61	-273.35	1.00	1.00	0.00	282.90	
8,265.04	18.00	282.90	8,090.46	267.16	-1,166.47	0.00	0.00	0.00	0.00	
9,125.54	90.11	359.67	8,598.00	838.80	-1,330.66	10.00	8.38	8.92	77.36	
17,825.11	90.11	359.67	8,581.00	9,538.20	-1,381.24	0.00	0.00	0.00	0.00	PBHL (Vagabond)

Oxy Inc. Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Vagabond CC 8_17 Federal Com 24H
Company:	ENGINEERING DESIGNS	TVD Reference:	RKB=26.5' @ 2954.00ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	RKB=26.5' @ 2954.00ft
Site:	Vagabond CC 8_17	North Reference:	Grid
Well:	Vagabond CC 8_17 Federal Com 24H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permitting Plan		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	1.00	282.90	3,600.00	0.19	-0.85	0.31	1.00	1.00	0.00
3,700.00	2.00	282.90	3,699.96	0.78	-3.40	1.26	1.00	1.00	0.00
3,800.00	3.00	282.90	3,799.86	1.75	-7.65	2.83	1.00	1.00	0.00
3,900.00	4.00	282.90	3,899.68	3.12	-13.60	5.03	1.00	1.00	0.00
4,000.00	5.00	282.90	3,999.37	4.87	-21.25	7.86	1.00	1.00	0.00
4,100.00	6.00	282.90	4,098.90	7.01	-30.60	11.32	1.00	1.00	0.00
4,200.00	7.00	282.90	4,198.26	9.53	-41.63	15.40	1.00	1.00	0.00
4,300.00	8.00	282.90	4,297.40	12.45	-54.35	20.11	1.00	1.00	0.00
4,400.00	9.00	282.90	4,396.30	15.75	-68.76	25.44	1.00	1.00	0.00
4,500.00	10.00	282.90	4,494.93	19.43	-84.85	31.39	1.00	1.00	0.00
4,600.00	11.00	282.90	4,593.26	23.50	-102.61	37.96	1.00	1.00	0.00
4,700.00	12.00	282.90	4,691.25	27.95	-122.05	45.15	1.00	1.00	0.00
4,800.00	13.00	282.90	4,788.87	32.78	-143.14	52.96	1.00	1.00	0.00
4,900.00	14.00	282.90	4,886.11	38.00	-165.90	61.38	1.00	1.00	0.00
5,000.00	15.00	282.90	4,982.92	43.59	-190.30	70.41	1.00	1.00	0.00
5,100.00	16.00	282.90	5,079.29	49.55	-216.35	80.04	1.00	1.00	0.00
5,200.00	17.00	282.90	5,175.17	55.89	-244.04	90.29	1.00	1.00	0.00
5,300.00	18.00	282.90	5,270.54	62.61	-273.35	101.13	1.00	1.00	0.00

Oxy Inc. Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Vagabond CC 8_17 Federal Com 24H
Company:	ENGINEERING DESIGNS	TVD Reference:	RKB=26.5' @ 2954.00ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	RKB=26.5' @ 2954.00ft
Site:	Vagabond CC 8_17	North Reference:	Grid
Well:	Vagabond CC 8_17 Federal Com 24H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permitting Plan		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
5,400.00	18.00	282.90	5,365.64	69.50	-303.47	112.27	0.00	0.00	0.00	
5,500.00	18.00	282.90	5,460.75	76.40	-333.59	123.42	0.00	0.00	0.00	
5,600.00	18.00	282.90	5,555.85	83.30	-363.71	134.56	0.00	0.00	0.00	
5,700.00	18.00	282.90	5,650.96	90.20	-393.84	145.71	0.00	0.00	0.00	
5,800.00	18.00	282.90	5,746.07	97.10	-423.96	156.85	0.00	0.00	0.00	
5,900.00	18.00	282.90	5,841.17	104.00	-454.08	168.00	0.00	0.00	0.00	
6,000.00	18.00	282.90	5,936.28	110.90	-484.20	179.14	0.00	0.00	0.00	
6,100.00	18.00	282.90	6,031.38	117.80	-514.32	190.28	0.00	0.00	0.00	
6,200.00	18.00	282.90	6,126.49	124.69	-544.44	201.43	0.00	0.00	0.00	
6,300.00	18.00	282.90	6,221.59	131.59	-574.57	212.57	0.00	0.00	0.00	
6,400.00	18.00	282.90	6,316.70	138.49	-604.69	223.72	0.00	0.00	0.00	
6,500.00	18.00	282.90	6,411.80	145.39	-634.81	234.86	0.00	0.00	0.00	
6,600.00	18.00	282.90	6,506.91	152.29	-664.93	246.00	0.00	0.00	0.00	
6,700.00	18.00	282.90	6,602.02	159.19	-695.05	257.15	0.00	0.00	0.00	
6,800.00	18.00	282.90	6,697.12	166.09	-725.17	268.29	0.00	0.00	0.00	
6,900.00	18.00	282.90	6,792.23	172.99	-755.30	279.44	0.00	0.00	0.00	
7,000.00	18.00	282.90	6,887.33	179.88	-785.42	290.58	0.00	0.00	0.00	
7,100.00	18.00	282.90	6,982.44	186.78	-815.54	301.73	0.00	0.00	0.00	
7,200.00	18.00	282.90	7,077.54	193.68	-845.66	312.87	0.00	0.00	0.00	
7,300.00	18.00	282.90	7,172.65	200.58	-875.78	324.01	0.00	0.00	0.00	
7,400.00	18.00	282.90	7,267.76	207.48	-905.91	335.16	0.00	0.00	0.00	
7,500.00	18.00	282.90	7,362.86	214.38	-936.03	346.30	0.00	0.00	0.00	
7,600.00	18.00	282.90	7,457.97	221.28	-966.15	357.45	0.00	0.00	0.00	
7,700.00	18.00	282.90	7,553.07	228.18	-996.27	368.59	0.00	0.00	0.00	
7,800.00	18.00	282.90	7,648.18	235.08	-1,026.39	379.74	0.00	0.00	0.00	
7,900.00	18.00	282.90	7,743.28	241.97	-1,056.51	390.88	0.00	0.00	0.00	
8,000.00	18.00	282.90	7,838.39	248.87	-1,086.64	402.02	0.00	0.00	0.00	
8,100.00	18.00	282.90	7,933.50	255.77	-1,116.76	413.17	0.00	0.00	0.00	
8,200.00	18.00	282.90	8,028.60	262.67	-1,146.88	424.31	0.00	0.00	0.00	
8,265.04	18.00	282.90	8,090.46	267.16	-1,166.47	431.56	0.00	0.00	0.00	
8,300.00	19.06	293.40	8,123.61	270.63	-1,176.98	436.50	10.00	3.04	30.03	
8,400.00	24.63	316.02	8,216.56	292.17	-1,206.51	462.05	10.00	5.57	22.62	
8,500.00	32.30	329.62	8,304.49	330.31	-1,234.57	503.82	10.00	7.67	13.60	
8,600.00	40.91	338.22	8,384.75	383.90	-1,260.29	560.54	10.00	8.60	8.61	
8,700.00	49.96	344.22	8,454.89	451.31	-1,282.91	630.50	10.00	9.05	6.00	
8,800.00	59.24	348.78	8,512.77	530.49	-1,301.72	711.56	10.00	9.29	4.56	
8,900.00	68.66	352.53	8,556.65	619.04	-1,316.17	801.26	10.00	9.42	3.75	
9,000.00	78.15	355.83	8,585.18	714.26	-1,325.81	896.88	10.00	9.49	3.29	
9,100.00	87.68	358.90	8,597.51	813.27	-1,330.34	995.52	10.00	9.53	3.07	
9,125.54	90.11	359.67	8,598.00	838.80	-1,330.66	1,020.83	10.00	9.53	3.02	
9,200.00	90.11	359.67	8,597.86	913.26	-1,331.09	1,094.58	0.00	0.00	0.00	
9,300.00	90.11	359.67	8,597.66	1,013.26	-1,331.67	1,193.63	0.00	0.00	0.00	
9,400.00	90.11	359.67	8,597.47	1,113.25	-1,332.26	1,292.68	0.00	0.00	0.00	
9,500.00	90.11	359.67	8,597.27	1,213.25	-1,332.84	1,391.73	0.00	0.00	0.00	
9,600.00	90.11	359.67	8,597.08	1,313.25	-1,333.42	1,490.78	0.00	0.00	0.00	
9,700.00	90.11	359.67	8,596.88	1,413.25	-1,334.00	1,589.83	0.00	0.00	0.00	
9,800.00	90.11	359.67	8,596.68	1,513.25	-1,334.58	1,688.88	0.00	0.00	0.00	
9,900.00	90.11	359.67	8,596.49	1,613.24	-1,335.16	1,787.93	0.00	0.00	0.00	
10,000.00	90.11	359.67	8,596.29	1,713.24	-1,335.74	1,886.98	0.00	0.00	0.00	
10,100.00	90.11	359.67	8,596.10	1,813.24	-1,336.33	1,986.03	0.00	0.00	0.00	
10,200.00	90.11	359.67	8,595.90	1,913.24	-1,336.91	2,085.08	0.00	0.00	0.00	
10,300.00	90.11	359.67	8,595.71	2,013.24	-1,337.49	2,184.13	0.00	0.00	0.00	
10,400.00	90.11	359.67	8,595.51	2,113.23	-1,338.07	2,283.17	0.00	0.00	0.00	
10,500.00	90.11	359.67	8,595.32	2,213.23	-1,338.65	2,382.22	0.00	0.00	0.00	

Oxy Inc. Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Vagabond CC 8_17 Federal Com 24H
Company:	ENGINEERING DESIGNS	TVD Reference:	RKB=26.5' @ 2954.00ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	RKB=26.5' @ 2954.00ft
Site:	Vagabond CC 8_17	North Reference:	Grid
Well:	Vagabond CC 8_17 Federal Com 24H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permitting Plan		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,600.00	90.11	359.67	8,595.12	2,313.23	-1,339.23	2,481.27	0.00	0.00	0.00
10,700.00	90.11	359.67	8,594.93	2,413.23	-1,339.81	2,580.32	0.00	0.00	0.00
10,800.00	90.11	359.67	8,594.73	2,513.23	-1,340.40	2,679.37	0.00	0.00	0.00
10,900.00	90.11	359.67	8,594.53	2,613.23	-1,340.98	2,778.42	0.00	0.00	0.00
11,000.00	90.11	359.67	8,594.34	2,713.22	-1,341.56	2,877.47	0.00	0.00	0.00
11,100.00	90.11	359.67	8,594.14	2,813.22	-1,342.14	2,976.52	0.00	0.00	0.00
11,200.00	90.11	359.67	8,593.95	2,913.22	-1,342.72	3,075.57	0.00	0.00	0.00
11,300.00	90.11	359.67	8,593.75	3,013.22	-1,343.30	3,174.62	0.00	0.00	0.00
11,400.00	90.11	359.67	8,593.56	3,113.22	-1,343.88	3,273.67	0.00	0.00	0.00
11,500.00	90.11	359.67	8,593.36	3,213.21	-1,344.47	3,372.72	0.00	0.00	0.00
11,600.00	90.11	359.67	8,593.17	3,313.21	-1,345.05	3,471.77	0.00	0.00	0.00
11,700.00	90.11	359.67	8,592.97	3,413.21	-1,345.63	3,570.82	0.00	0.00	0.00
11,800.00	90.11	359.67	8,592.78	3,513.21	-1,346.21	3,669.87	0.00	0.00	0.00
11,900.00	90.11	359.67	8,592.58	3,613.21	-1,346.79	3,768.91	0.00	0.00	0.00
12,000.00	90.11	359.67	8,592.38	3,713.20	-1,347.37	3,867.96	0.00	0.00	0.00
12,100.00	90.11	359.67	8,592.19	3,813.20	-1,347.95	3,967.01	0.00	0.00	0.00
12,200.00	90.11	359.67	8,591.99	3,913.20	-1,348.54	4,066.06	0.00	0.00	0.00
12,300.00	90.11	359.67	8,591.80	4,013.20	-1,349.12	4,165.11	0.00	0.00	0.00
12,400.00	90.11	359.67	8,591.60	4,113.20	-1,349.70	4,264.16	0.00	0.00	0.00
12,500.00	90.11	359.67	8,591.41	4,213.20	-1,350.28	4,363.21	0.00	0.00	0.00
12,600.00	90.11	359.67	8,591.21	4,313.19	-1,350.86	4,462.26	0.00	0.00	0.00
12,700.00	90.11	359.67	8,591.02	4,413.19	-1,351.44	4,561.31	0.00	0.00	0.00
12,800.00	90.11	359.67	8,590.82	4,513.19	-1,352.02	4,660.36	0.00	0.00	0.00
12,900.00	90.11	359.67	8,590.63	4,613.19	-1,352.61	4,759.41	0.00	0.00	0.00
13,000.00	90.11	359.67	8,590.43	4,713.19	-1,353.19	4,858.46	0.00	0.00	0.00
13,100.00	90.11	359.67	8,590.23	4,813.18	-1,353.77	4,957.51	0.00	0.00	0.00
13,200.00	90.11	359.67	8,590.04	4,913.18	-1,354.35	5,056.56	0.00	0.00	0.00
13,300.00	90.11	359.67	8,589.84	5,013.18	-1,354.93	5,155.61	0.00	0.00	0.00
13,400.00	90.11	359.67	8,589.65	5,113.18	-1,355.51	5,254.65	0.00	0.00	0.00
13,500.00	90.11	359.67	8,589.45	5,213.18	-1,356.09	5,353.70	0.00	0.00	0.00
13,600.00	90.11	359.67	8,589.26	5,313.17	-1,356.68	5,452.75	0.00	0.00	0.00
13,700.00	90.11	359.67	8,589.06	5,413.17	-1,357.26	5,551.80	0.00	0.00	0.00
13,800.00	90.11	359.67	8,588.87	5,513.17	-1,357.84	5,650.85	0.00	0.00	0.00
13,900.00	90.11	359.67	8,588.67	5,613.17	-1,358.42	5,749.90	0.00	0.00	0.00
14,000.00	90.11	359.67	8,588.48	5,713.17	-1,359.00	5,848.95	0.00	0.00	0.00
14,100.00	90.11	359.67	8,588.28	5,813.17	-1,359.58	5,948.00	0.00	0.00	0.00
14,200.00	90.11	359.67	8,588.08	5,913.16	-1,360.16	6,047.05	0.00	0.00	0.00
14,300.00	90.11	359.67	8,587.89	6,013.16	-1,360.75	6,146.10	0.00	0.00	0.00
14,400.00	90.11	359.67	8,587.69	6,113.16	-1,361.33	6,245.15	0.00	0.00	0.00
14,500.00	90.11	359.67	8,587.50	6,213.16	-1,361.91	6,344.20	0.00	0.00	0.00
14,600.00	90.11	359.67	8,587.30	6,313.16	-1,362.49	6,443.25	0.00	0.00	0.00
14,700.00	90.11	359.67	8,587.11	6,413.15	-1,363.07	6,542.30	0.00	0.00	0.00
14,800.00	90.11	359.67	8,586.91	6,513.15	-1,363.65	6,641.35	0.00	0.00	0.00
14,900.00	90.11	359.67	8,586.72	6,613.15	-1,364.23	6,740.39	0.00	0.00	0.00
15,000.00	90.11	359.67	8,586.52	6,713.15	-1,364.82	6,839.44	0.00	0.00	0.00
15,100.00	90.11	359.67	8,586.33	6,813.15	-1,365.40	6,938.49	0.00	0.00	0.00
15,200.00	90.11	359.67	8,586.13	6,913.14	-1,365.98	7,037.54	0.00	0.00	0.00
15,300.00	90.11	359.67	8,585.94	7,013.14	-1,366.56	7,136.59	0.00	0.00	0.00
15,400.00	90.11	359.67	8,585.74	7,113.14	-1,367.14	7,235.64	0.00	0.00	0.00
15,500.00	90.11	359.67	8,585.54	7,213.14	-1,367.72	7,334.69	0.00	0.00	0.00
15,600.00	90.11	359.67	8,585.35	7,313.14	-1,368.30	7,433.74	0.00	0.00	0.00
15,700.00	90.11	359.67	8,585.15	7,413.14	-1,368.89	7,532.79	0.00	0.00	0.00
15,800.00	90.11	359.67	8,584.96	7,513.13	-1,369.47	7,631.84	0.00	0.00	0.00
15,900.00	90.11	359.67	8,584.76	7,613.13	-1,370.05	7,730.89	0.00	0.00	0.00

Oxy Inc.
Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Vagabond CC 8_17 Federal Com 24H
Company:	ENGINEERING DESIGNS	TVD Reference:	RKB=26.5' @ 2954.00ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	RKB=26.5' @ 2954.00ft
Site:	Vagabond CC 8_17	North Reference:	Grid
Well:	Vagabond CC 8_17 Federal Com 24H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permitting Plan		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
16,000.00	90.11	359.67	8,584.57	7,713.13	-1,370.63	7,829.94	0.00	0.00	0.00	
16,100.00	90.11	359.67	8,584.37	7,813.13	-1,371.21	7,928.99	0.00	0.00	0.00	
16,200.00	90.11	359.67	8,584.18	7,913.13	-1,371.79	8,028.04	0.00	0.00	0.00	
16,300.00	90.11	359.67	8,583.98	8,013.12	-1,372.37	8,127.08	0.00	0.00	0.00	
16,400.00	90.11	359.67	8,583.79	8,113.12	-1,372.96	8,226.13	0.00	0.00	0.00	
16,500.00	90.11	359.67	8,583.59	8,213.12	-1,373.54	8,325.18	0.00	0.00	0.00	
16,600.00	90.11	359.67	8,583.39	8,313.12	-1,374.12	8,424.23	0.00	0.00	0.00	
16,700.00	90.11	359.67	8,583.20	8,413.12	-1,374.70	8,523.28	0.00	0.00	0.00	
16,800.00	90.11	359.67	8,583.00	8,513.11	-1,375.28	8,622.33	0.00	0.00	0.00	
16,900.00	90.11	359.67	8,582.81	8,613.11	-1,375.86	8,721.38	0.00	0.00	0.00	
17,000.00	90.11	359.67	8,582.61	8,713.11	-1,376.44	8,820.43	0.00	0.00	0.00	
17,100.00	90.11	359.67	8,582.42	8,813.11	-1,377.03	8,919.48	0.00	0.00	0.00	
17,200.00	90.11	359.67	8,582.22	8,913.11	-1,377.61	9,018.53	0.00	0.00	0.00	
17,300.00	90.11	359.67	8,582.03	9,013.11	-1,378.19	9,117.58	0.00	0.00	0.00	
17,400.00	90.11	359.67	8,581.83	9,113.10	-1,378.77	9,216.63	0.00	0.00	0.00	
17,500.00	90.11	359.67	8,581.64	9,213.10	-1,379.35	9,315.68	0.00	0.00	0.00	
17,600.00	90.11	359.67	8,581.44	9,313.10	-1,379.93	9,414.73	0.00	0.00	0.00	
17,700.00	90.11	359.67	8,581.24	9,413.10	-1,380.51	9,513.78	0.00	0.00	0.00	
17,800.00	90.11	359.67	8,581.05	9,513.10	-1,381.10	9,612.82	0.00	0.00	0.00	
17,825.11	90.11	359.67	8,581.00	9,538.20	-1,381.24	9,637.69	0.00	0.00	0.00	

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
PBHL (Vagabond CC - plan hits target center - Point	0.00	0.00	8,581.00	9,538.20	-1,381.24	450,999.55	642,697.44	32° 14' 22.014194 N	104° 0' 19.796842	
FTP (Vagabond CC - plan misses target center by 1.68ft at 9977.78ft MD (8596.34 TVD, 1691.02 N, -1335.62 E) - Point	0.00	0.00	8,598.00	1,691.03	-1,335.38	443,153.01	642,743.30	32° 13' 4.364271 N	104° 0' 19.541716	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
3,500.00	3,500.00	0.00	0.00	Build 1°/100'	
5,300.00	5,270.54	62.61	-273.35	Hold 18° Tangent	
8,265.04	8,090.46	267.16	-1,166.47	KOP, Build & Turn 10°/100'	
9,125.54	8,598.00	838.80	-1,330.66	Landing Point	
17,825.11	8,581.00	9,538.20	-1,381.24	TD at 17825.11' MD	

Oxy USA Inc. - Vagabond CC 8_17 Federal Com 24H

1. Geologic Formations

TVD of target	8598'	Pilot Hole Depth	N/A
MD at TD:	17825'	Deepest Expected fresh water:	397'

Delaware Basin

Formation	TVD - RKB	Expected Fluids
Rustler	254	
Salado	594	Salt
Castile	1,249	Salt
Lamar/Delaware	2,800	Oil/Gas/Brine
Bell Canyon	2,863	Oil/Gas/Brine
Cherry Canyon	3,732	Oil/Gas/Brine
Brushy Canyon	4,979	Losses
Bone Spring	6,573	Oil/Gas
1st Bone Spring	7,529	Oil/Gas
2nd Bone Spring	8,339	Oil/Gas

*H2S, water flows, loss of circulation, abnormal pressures, etc.

2. Casing Program

Hole Size (in)	Casing Interval		Csg. Size (in)	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	Buoyant	Buoyant
	From (ft)	To (ft)							Body SF Tension	Joint SF Tension
14.75	0	534	10.75	40.5	J-55	BTC	1.125	1.2	1.4	1.4
9.875	0	8165	7.625	26.4	L-80 HC	BTC	1.125	1.2	1.4	1.4
6.75	0	8715	5.5	20	P-110	DQX	1.125	1.2	1.4	1.4
6.75	8715	17825	4.5	13.5	P-110	DQX	1.125	1.2	1.4	1.4

SF Values will meet or Exceed

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

*Oxy requests the option to set casing shallower yet still below the salts if losses or hole conditions require this. Cement volumes may be adjusted if casing is set shallower and a DV tool may be run in case hole conditions merit pumping a second stage cement job to comply with permitted top of cement. If cement circulated to surface during first stage, we will drop a cancellation cone and not pump the second stage.

*Oxy requests the option to run production casing with DQX, SF TORQ, and/or DQW TORQ connections to accommodate hole conditions or drilling operations.

Oxy USA Inc. - Vagabond CC 8_17 Federal Com 24H

Annular Clearance Variance Request

As per the agreement reached in the Oxy/BLM face-to-face meeting on Feb 22, 2018, Oxy requests permission to allow deviation from the 0.422" annular clearance requirement from Onshore Order #2 under the following conditions:

1. Annular clearance to meet or exceed 0.422" between intermediate casing ID and production casing coupling only on the first 500' overlap between both casings.
2. Annular clearance less than 0.422" is acceptable for the curve and lateral portions of the production open hole section.

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	Y
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3 rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2 nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

Oxy USA Inc. - Vagabond CC 8_17 Federal Com 24H

3. Cementing Program

Casing String	# Sk	Wt. (lb/gal)	Yld (ft3/sack)	H2O (gal/sk)	500# Comp. Strength (hours)	Slurry Description
Surface (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Surface (Tail)	433	14.8	1.33	6.365	5:26	Class C Cement, Accelerator
Intermediate 1st Stage (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Intermediate 1st Stage (Tail)	409	13.2	1.65	8.640	11:54	Class H Cement, Retarder, Dispersant, Salt
Intermediate 2nd Stage (Tail Slurry) to be pumped as Bradenhead Squeeze from surface, down the Intermediate annulus						
Intermediate 2nd Stage (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Intermediate 2nd Stage (Tail)	643	12.9	1.92	10.41	23:10	Class C Cement, Accelerator
Production (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Production (Tail)	1176	13.2	1.38	6.686	3:39	Class H Cement, Retarder, Dispersant, Salt

Casing String	Top (ft)	Bottom (ft)	% Excess
Surface (Lead)	N/A	N/A	N/A
Surface (Tail)	0	534	100%
Intermediate 1st Stage (Lead)	N/A	N/A	N/A
Intermediate 1st Stage (Tail)	5229	8165	5%
Intermediate 2nd Stage (Lead)	N/A	N/A	N/A
Intermediate 2nd Stage (Tail)	0	5229	10%
Production (Lead)	N/A	N/A	N/A
Production (Tail)	7665	17825	20%

Oxy requests a variance to cement the 9.625” and/or 7.625” intermediate casing strings offline in accordance to the approved variance, EC Tran 461365.

The summarized operational sequence will be as follows:

1. Run casing as per normal operations. While running casing, conduct negative pressure test and confirm integrity of the float equipment (float collar and shoe).
2. Land casing.
3. Fill pipe with kill weight fluid, and confirm well is static.
 - a. If well is not static notify BLM and kill well.
 - b. Once well is static notify BLM with intent to proceed with nipple down and offline cementing.
4. Set and pressure test annular packoff.
5. After confirmation of both annular barriers and internal barriers, nipple down BOP and install cap flange. If any barrier fails to test, the BOP stack will not be nipped down until after the cement job is completed.
6. Skid rig to next well on pad.
7. Confirm well is static before removing cap flange.
8. If well is not static notify BLM and kill well prior to cementing or nipping up for further remediation.

Oxy USA Inc. - Vagabond CC 8_17 Federal Com 24H

9. Install offline cement tool.
10. Rig up cement equipment.
 - a. Notify BLM prior to cement job.
11. Perform cement job.
12. Confirm well is static and floats are holding after cement job.
13. Remove cement equipment, offline cement tools and install night cap with pressure gauge for monitoring.

Oxy requests permission to adjust the CBL requirement after bradenhead cement jobs, on 7-5/8” intermediate casings, as per the agreement reached in the OXY/BLM meeting on September 5, 2019.

Three string wells:

- CBL will be required on one well per pad
- If the pumped volume of cement is less than permitted in the APD, BLM will be notified and a CBL may be run
- Echometer will be used after bradenhead cement job to determine TOC before pumping top-out cement

Pilot Hole Cementing specs:

Pilot hole depth: N/A

KOP: N/A

Plug top	Plug Bottom	% Excess	No. Sacks	Wt. lb/gal	Yld ft3/sack	Water gal/sk	Slurry Description and Cement Type
N/A							
N/A							

Oxy USA Inc. - Vagabond CC 8_17 Federal Com 24H

4. Pressure Control Equipment

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
9.875" Hole	13-5/8"	3M	Annular	✓	70% of working pressure
			Blind Ram	✓	250 psi / 3000 psi
		Pipe Ram			
		Double Ram	✓		
Other*					
6.75" Hole	13-5/8"	3M	Annular	✓	70% of working pressure
			Blind Ram	✓	250 psi / 3000 psi
		Pipe Ram			
		Double Ram	✓		
Other*					

*Specify if additional ram is utilized.

Oxy will utilize a 5M annular with a 10M BOPE stack. The BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
Y Are anchors required by manufacturer?
A multibowl or a unionized multibowl wellhead system will be employed. The wellhead and connection to the BOPE will meet all API 6A requirements. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. We will test the flange connection of the wellhead with a test port that is directly in the flange. We are proposing that we will run the wellhead through the rotary prior to cementing surface casing as discussed with the BLM on October 8, 2015. See attached schematics.

Oxy USA Inc. - Vagabond CC 8_17 Federal Com 24H

BOP Break Testing Request

Oxy requests permission to adjust the BOP break testing requirements as per the agreement reached in the OXY/BLM meeting on September 5, 2019. A separate sundry will be sent prior to spud that reflects the pad based break testing plan.

BOP break test under the following conditions:

- After a full BOP test is conducted
- When skidding to drill an intermediate section where ICP is set into the third Bone Spring or shallower.
- When skidding to drill a production section that does not penetrate into the third Bone Spring or deeper.

If the kill line is broken prior to skid, two tests will be performed.

- 1) Wellhead flange, co-flex hose, kill line connections and upper pipe rams
- 2) Wellhead flange, HCR valve, check valve, upper pipe rams

If the kill line is not broken prior to skid, only one test will be performed.

- 1) Wellhead flange, co-flex hose, check valve, upper pipe rams

Oxy USA Inc. - Vagabond CC 8_17 Federal Com 24H

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From (ft)	To (ft)				
0	534	Water-Based Mud	8.6-8.8	40-60	N/C
534	8165	Saturated Brine-Based or Oil-Based Mud	8.0-10.0	35-45	N/C
8165	17825	Water-Based or Oil-Based Mud	8.0-9.6	38-50	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times. The following is a general list of products: Barite, Bentonite, Gypsum, Lime, Soda Ash, Caustic Soda, Nut Plug, Cedar Fiber, Cotton Seed Hulls, Drilling Paper, Salt Water Clay, CACL2. Oxy will use a closed mud system.

What will be used to monitor the loss or gain of fluid?	PVT/MD Totco/Visual Monitoring
---	--------------------------------

6. Logging and Testing Procedures

Logging, Coring and Testing.	
Yes	Will run GR from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
No	Logs are planned based on well control or offset log information.
No	Drill stem test? If yes, explain
No	Coring? If yes, explain

Additional logs planned	Interval
No	Resistivity
No	Density
No	CBL
Yes	Mud log
No	PEX

Oxy USA Inc. - Vagabond CC 8_17 Federal Com 24H

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4293 psi
Abnormal Temperature	No
BH Temperature at deepest TVD	149°F

Pump high viscosity sweeps as needed for hole cleaning. The mud system will be monitored visually/manually as well as with an electronic PVT. The necessary mud products for additional weight and fluid loss control will be on location at all times. Appropriately weighted mud will be used to isolate potential gas, oil, and water zones until such time as casing can be cemented into place for zonal isolation.

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H2S is present
Y	H2S Plan attached

8. Other facets of operation

	Yes/No
Will the well be drilled with a walking/skidding operation? If yes, describe. <ul style="list-style-type: none"> We plan to drill the three well pad in batch by section: all surface sections, intermediate sections and production sections. The wellhead will be secured with a night cap whenever the rig is not over the well. 	Yes
Will more than one drilling rig be used for drilling operations? If yes, describe. <ul style="list-style-type: none"> Oxy requests the option to contract a Surface Rig to drill, set surface casing, and cement for this well. If the timing between rigs is such that Oxy would not be able to preset surface, the Primary Rig will MIRU and drill the well in its entirety per the APD. Please see the attached document for information on the spudder rig. 	Yes

Total estimated cuttings volume: 1263.3 bbls.

Attachments

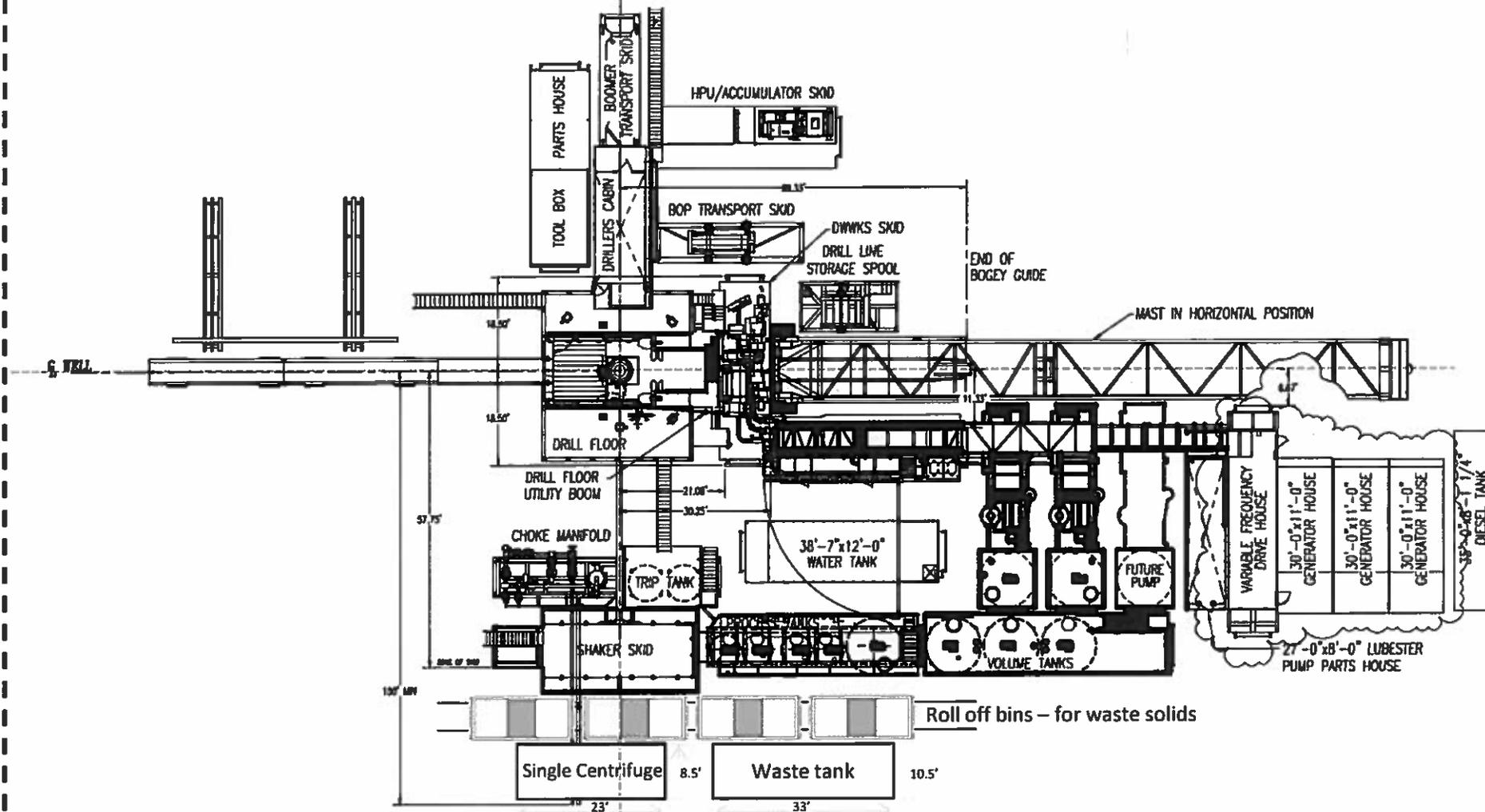
- Directional Plan
- H2S Contingency Plan
- Flex III Attachments
- Spudder Rig Attachment
- Premium Connection Specs

Oxy USA Inc. - Vagabond CC 8_17 Federal Com 24H

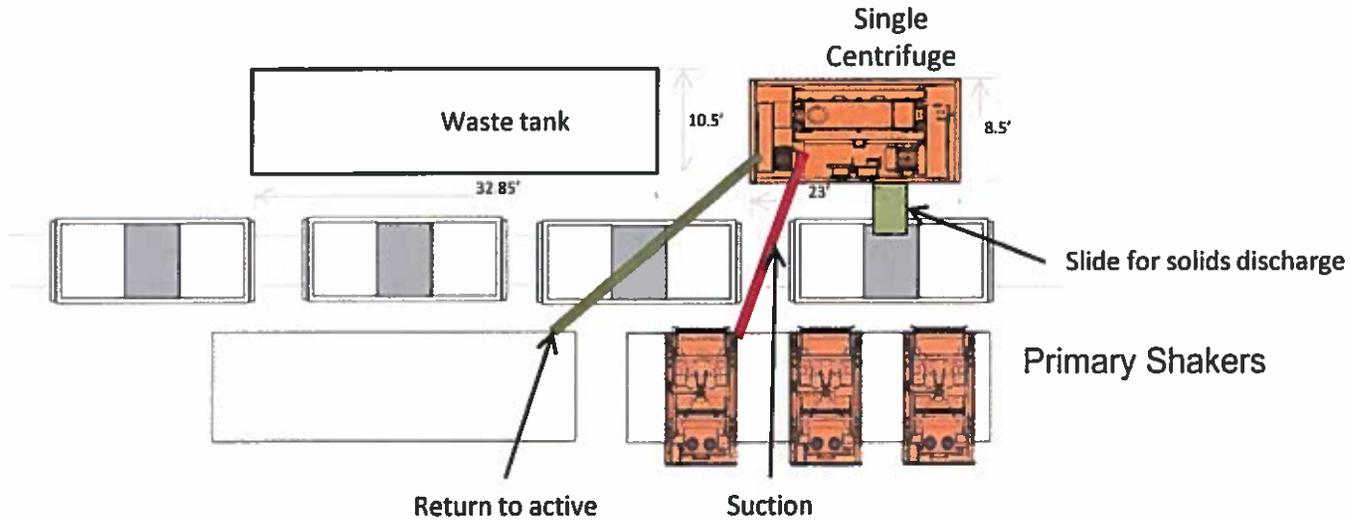
9. Company Personnel

<u>Name</u>	<u>Title</u>	<u>Office Phone</u>	<u>Mobile Phone</u>
Garrett Granier	Drilling Engineer	713-513-6633	832-265-0581
William Turner	Drilling Engineer Supervisor	713-350-4951	661-817-4586
Simon Benavides	Drilling Superintendent	713-522-8652	281-684-6897
Diego Tellez	Drilling Manager	713-350-4602	713-303-4932

Oxy Single Centrifuge
Closed Loop System – New
Mexico Flex III
May 28, 2013



Oxy



Oxy Single Centrifuge
Closed Loop System – New
Mexico Flex III
May 28, 2013

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Submit Original
to Appropriate
District Office

GAS CAPTURE PLAN

Date: 06/01/2020

Original Operator & OGRID No.: OXY USA INC. - 16696
 Amended - Reason for Amendment: _____

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomple to new zone, re-frac) activity.

Note: Form C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule (Subsection A of 19.15.18.12 NMAC).

Well(s)/Production Facility – Name of facility

The well(s) that will be located at the production facility are shown in the table below.

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vent	Comment
VAGABOND CC 8_17 FED COM 21H	pending	N-17-24S-29E	546 FSL 1670 FWL	3,600.00	0	
VAGABOND CC 8_17 FED COM 22H	pending	N-17-24S-29E	546 FSL 1705 FWL	3,600.00	0	
VAGABOND CC 8_17 FED COM 23H	pending	N-17-24S-29E	546 FSL 1740 FWL	3,600.00	0	
VAGABOND CC 8_17 FED COM 24H	pending	M-17-24S-29E	1070 FSL 975 FEL	3,600.00	0	
VAGABOND CC 8_17 FED COM 25H	pending	M-17-24S-29E	1070 FSL 940 FEL	3,600.00	0	
VAGABOND CC 8_17 FED COM 26H	pending	M-17-24S-29E	1070 FSL 905 FEL	3,600.00	0	

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, where a gas transporter system is in place. The gas produced from production facility is dedicated to Enterprise Field Services, LLC (“Enterprise”) and is connected to Enterprise low/high pressure gathering system located in Eddy County, New Mexico. This gas can also be offloaded to San Mateo Midstream, LLC (“San Mateo”). OXY USA INC. (“OXY”) provides (periodically) to Enterprise a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, OXY and Enterprise have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at OXY USA WTP LP Processing Plant located in Sec. 23, Twn. 21S, Rng. 23E, Eddy County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on Enterprise and/or San Mateo system(s) at that time. Based on current information, it is OXY's belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

Alternatives to Reduce Flaring

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
 - Only a portion of gas is consumed operating generators, remainder of gas would be flared
- Compressed Natural Gas – On lease
 - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
 - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines

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

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

District IV
 1220 S. St Francis Dr., Santa Fe, NM 87505
 Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

COMMENTS

Action 15346

COMMENTS

Operator:	OXY USA INC	P.O. Box 4294	Houston, TX772104294	OGRID:	16696	Action Number:	15346	Action Type:	FORM 3160-3
Created By	Comment			Comment Date					
kpickford	KP GEO Review 1/25/2021			01/25/2021					

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CONDITIONS

Action 15346

CONDITIONS OF APPROVAL

Operator:	OGRID:	Action Number:	Action Type:
OXY USA INC P.O. Box 4294 Houston, TX772104294	16696	15346	FORM 3160-3

OCD Reviewer	Condition
kpickford	Notify OCD 24 hours prior to casing & cement
kpickford	Will require a File As Drilled C-102 and a Directional Survey with the C-104
kpickford	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
kpickford	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